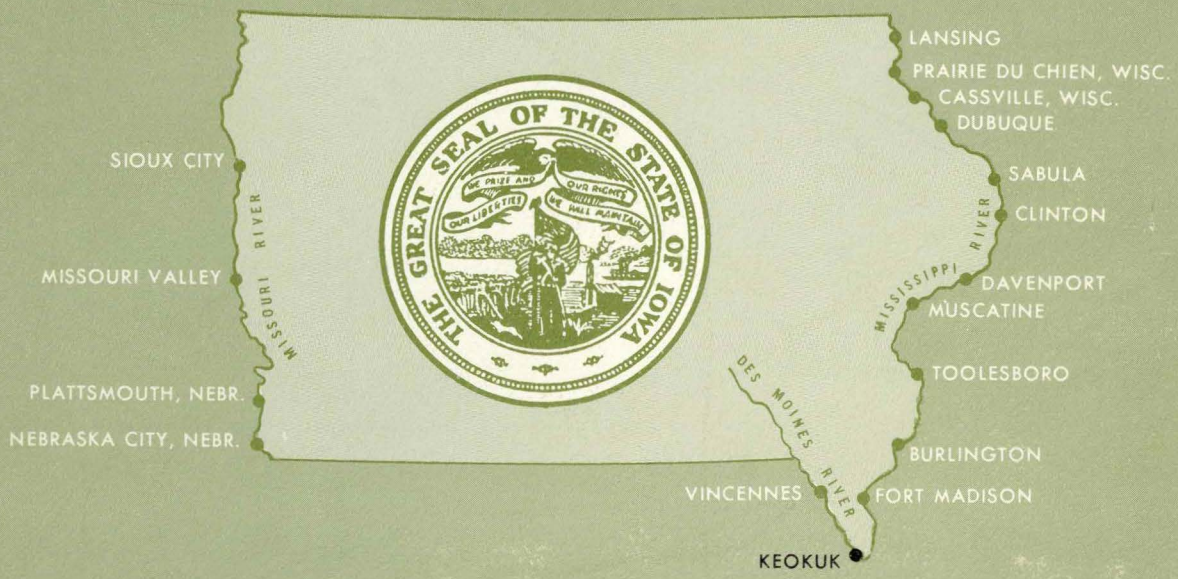
SEPTEMBER 1968

IOWA STATE HIGHWAY COMMISSION




*Bridge Location, Revenue and Traffic Studies*

AT

# KEOKUK, IOWA

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
consulting engineers
KANSAS CITY, MO. NEW YORK, N.Y.

WILBUR SMITH & ASSOCIATES
traffic consultants
NEW HAVEN, CONN.



MISSISSIPPI RIVER TOLL BRIDGE

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TRANSPORTATION CONSULTANTS
155 WHITNEY AVENUE • P. O. BOX 993
New Haven, Conn. 06510

September 20, 1968

Mr. J. R. Coupal, Jr.
Director of Highways
Iowa State Highway Commission
Ames, Iowa 50010

Dear Mr. Coupal:

We are pleased to submit this preliminary feasibility report for a proposed new Mississippi River bridge at Keokuk.

The report includes an analysis of alternate bridge locations, preliminary engineering studies, traffic and toll revenue estimates, preliminary project costs and an indication of project feasibility.

The feasibility calculations indicate that annual net revenues will provide coverage levels of first year interest and level debt service considerably in excess of those normally considered indicative of project feasibility.

We gratefully acknowledge the assistance and cooperation given to us by members of your staff and the numerous other public and private agencies and individuals contacted in the course of our studies.

Respectfully submitted,

HOWARD, NEEDLES, TAMMEN & BERGENDOFF

Paul L. Heineman

Paul L. Heineman

WILBUR SMITH & ASSOCIATES, INC. N.E.

Wilbur S. Smith

Wilbur S. Smith

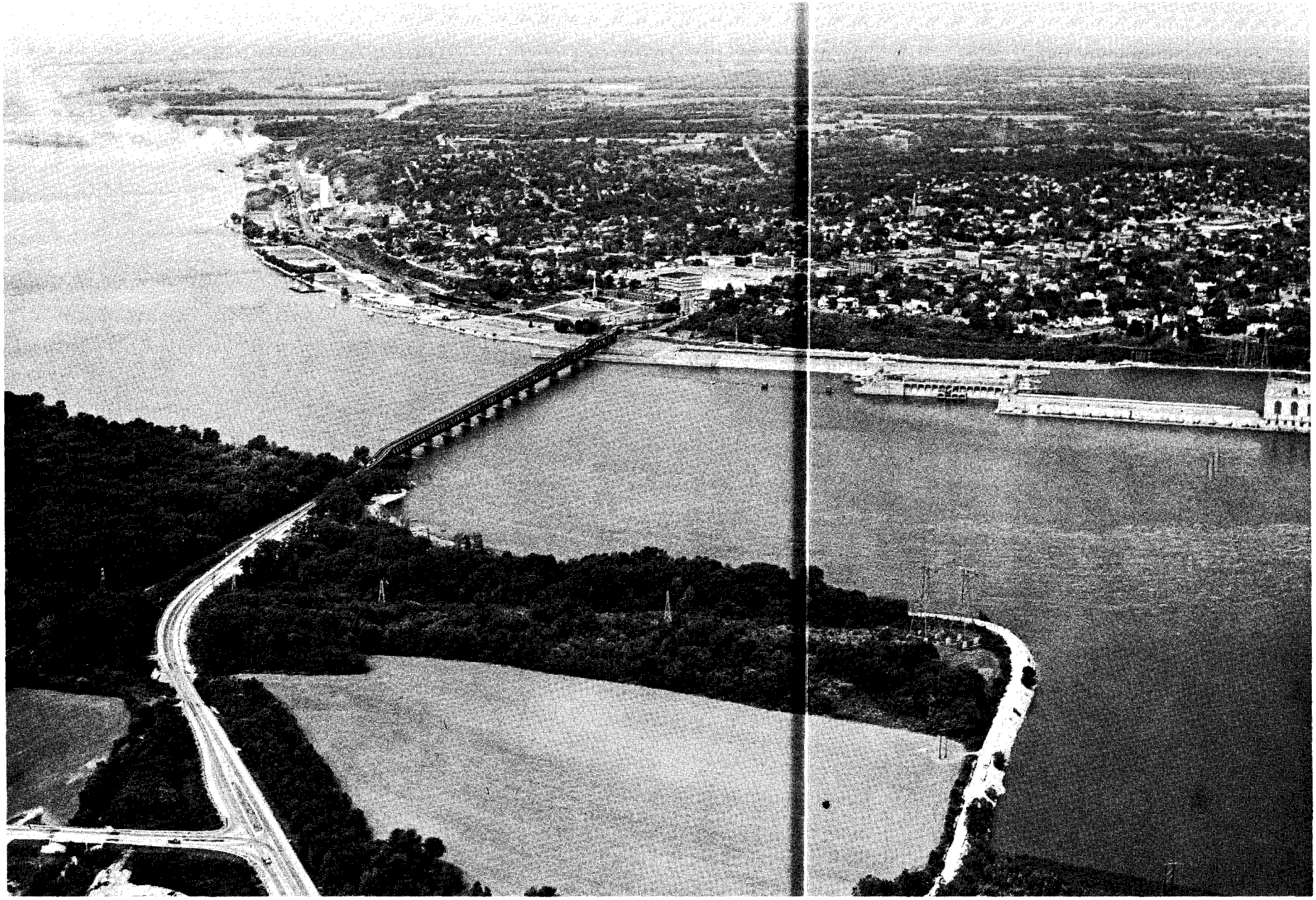
I hereby certify that this plan, specification or report was prepared by me or under my direct personal supervision and that I am a duly registered Professional Engineer under the laws of the State of Iowa.

Signed ..... Date

Paul L. Heineman, P.E. Iowa Reg. No. 5156 Sept. 20, 1968

Signed .....

Wilbur S. Smith, P.E. Iowa Reg. No. 4007 Sept. 20, 1968



VIEW OF KEOKUK, IOWA, FROM HAMILTON, ILLINOIS, LOOKING WEST

# KEOKUK, IOWA

# MISSISSIPPI RIVER TOLL BRIDGE

**SEPTEMBER 1968**

## PRELIMINARY ENGINEERING REPORT

- LOCATION STUDIES
- PRELIMINARY DESIGN
- COST ESTIMATES
- TRAFFIC AND REVENUE STUDIES

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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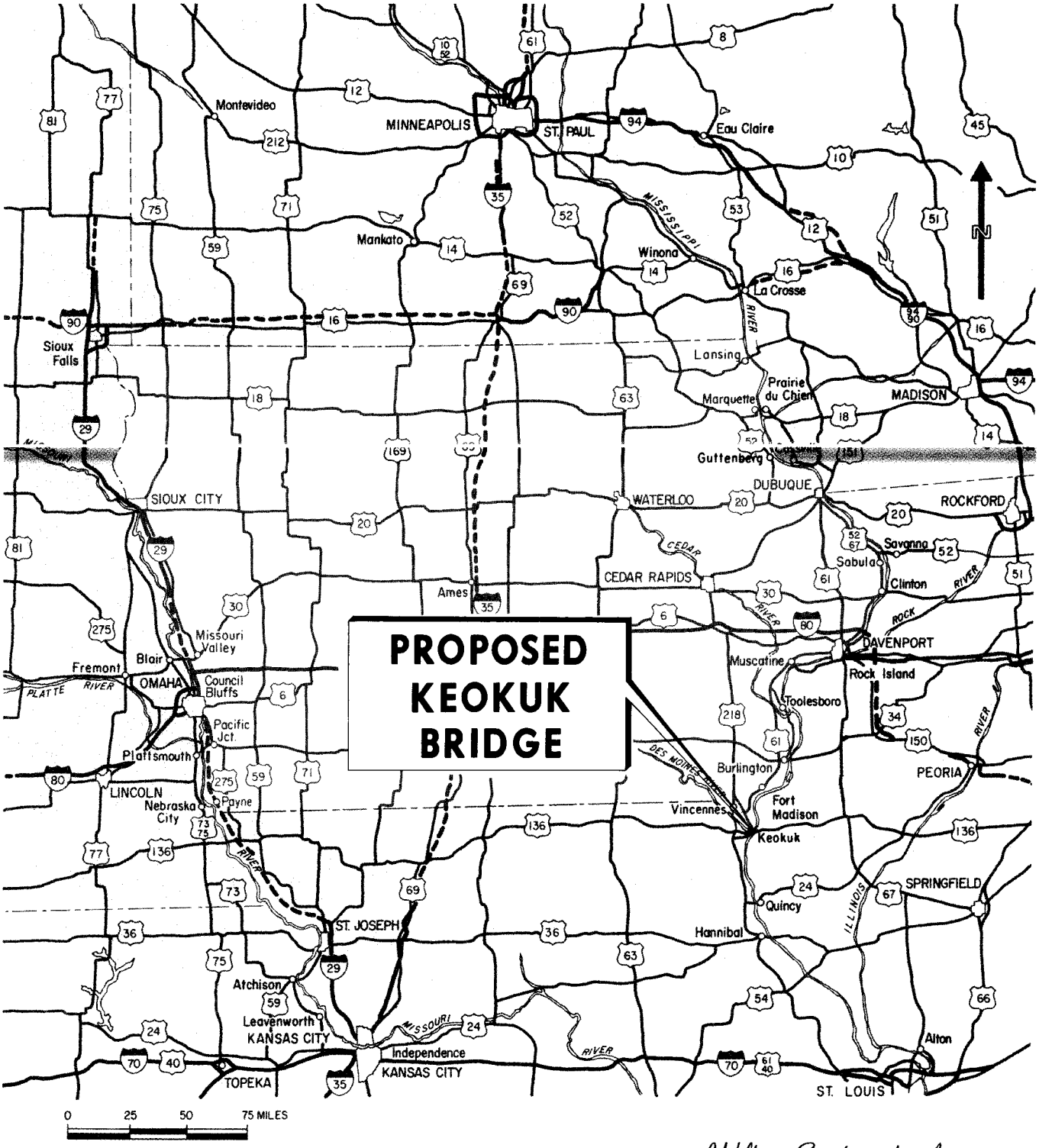


*Wilbur Smith and Associates*

Exhibit 1

## REGIONAL MAP

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# LIST OF ILLUSTRATIONS

PART II



# APPENDIX

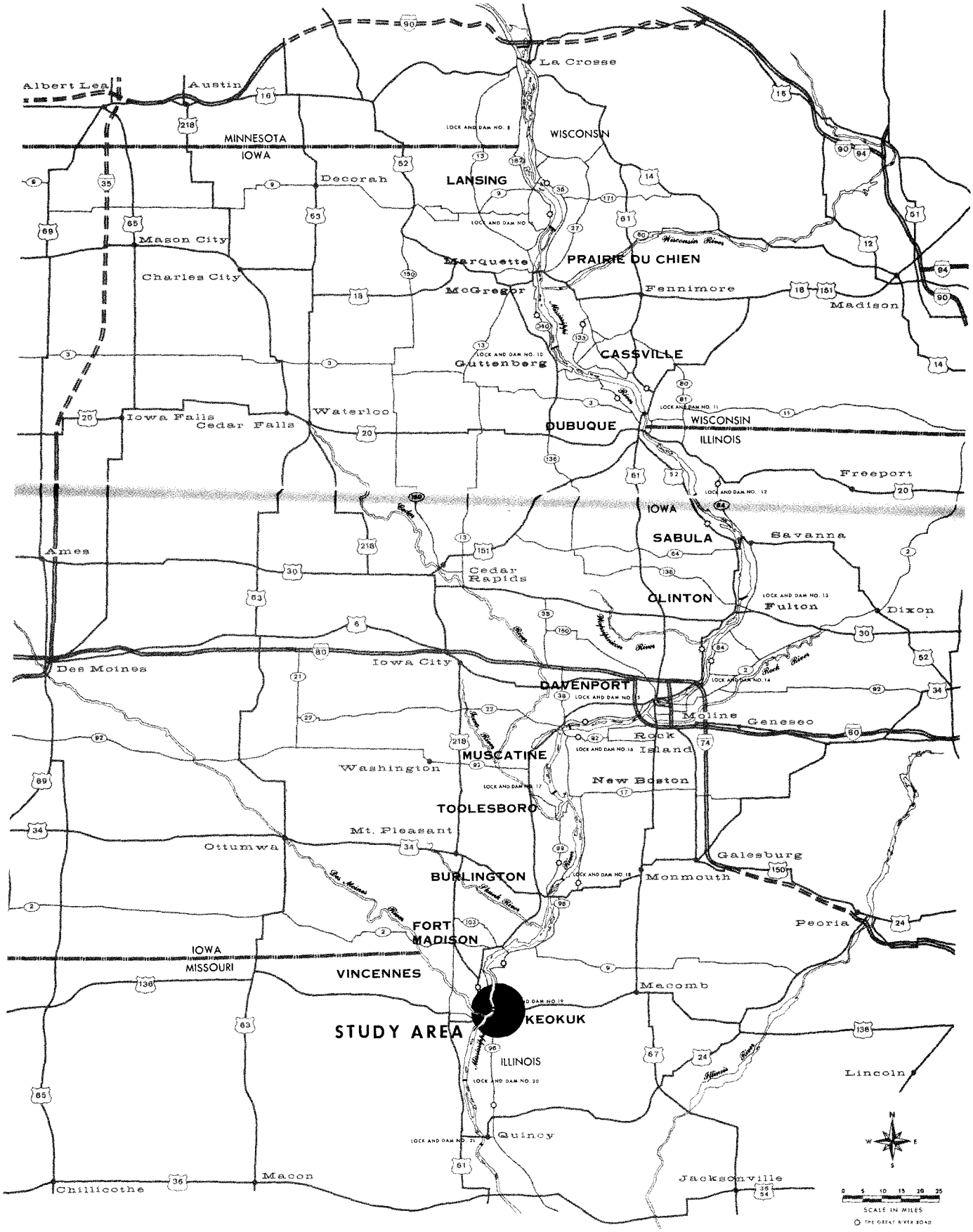



Exhibit 2

# VICINITY MAP

## SUMMARY OF FINDINGS

Although the present Keokuk Municipal Bridge provides a reasonable level of traffic service in the Keokuk urban area, the crossing does not meet modern roadway design standards. In addition, the present low-level combination railroad-highway bridge is required to open for river navigation, causing inconvenience and delays to trans-river highway traffic.

If a new high-level bridge were constructed on a Main Street alignment, an estimated bond issue of $6,030,000 would be required to finance the project. Net toll revenues of $840,000 are estimated for the first full year of operation, increasing to an average of $1,065,000 per year over the 28-year earning period.

Preliminary feasibility calculations indicate that first year net toll revenues would provide a 2.53 coverage of first year interest; annual average net revenues over the bond earning period would provide a level debt service coverage of 2.73. Both of these coverage values are substantially above the minimum levels normally considered indicative of financial feasibility.

# INTRODUCTION

Keokuk, Iowa, is located in the extreme southeastern corner of Iowa at the confluence of the Des Moines and Mississippi Rivers. As the largest city and the county seat of Lee County, Keokuk is an important employment and commercial center for a trade area extending into Hancock County, Illinois, Clark County, Missouri, and southern Lee County in Iowa.

At present, traffic crossing the Mississippi River at Keokuk is served by a combination railroad-highway bridge owned and operated by the Keokuk Municipal Bridge Commission. No vehicle load limitations are in effect, however, bridge traffic is subject to interruption when the swing-span is opened to permit river navigation. The bridge is operated as a toll crossing.

As shown in Exhibit 1, Keokuk is located approximately 25 miles south of Fort Madison, where trans-river traffic is served by a toll bridge which is also a combination railway-highway structure with a swing-span. Approximately 40 miles south, in Quincy, Illinois, a toll-free bridge carries U. S. Route 24 across the Mississippi River.

## Authority and Purpose of Report

In December, 1967, the Iowa State Highway Commission authorized preparation of a preliminary feasibility report for a proposed new toll bridge at Keokuk. This report is one of several comparable bridge studies to be conducted as part of the Iowa Toll Bridge Program, in accordance with legislation enacted by the Iowa General Assembly a copy of which is included in the Appendix. The various locations in southeastern Iowa to be studied under this program are shown in Exhibit 2.

A copy of the Federal Legislation permitting construction and operation of a bridge at Keokuk is included in the Appendix. Chapter CCXLVI of the 39th Congress permits the collection of tolls for an indefinite period on the present bridge. The General Bridge Act of 1946, a Federal Law permitting operation

of privately-owned toll bridges, is applicable to the proposed Keokuk Bridge and a copy is also included in the Appendix. If a new bridge were constructed at Keokuk, the period of time during which it could be operated as a toll facility is limited by this Act to thirty years.

## Scope of Services

This report summarizes preliminary engineering, traffic and revenues and feasibility studies for a proposed new Keokuk Bridge. These studies included:

1. Analysis of the physical limitations imposed by navigational requirements, terrain, existing levees, railroads, real property values and the present street and highway network.

2. Comparison of alternative bridge and approach road locations based on estimates of project cost and annual maintenance and operating expenses.

3. Analysis of the adequacy of present trans-river traffic service in the vicinity of the proposed bridge, as measured against present travel demands and anticipated future growth.

4. Development of preliminary traffic estimates for the various alternative alignments and estimates of annual traffic and revenues for the recommended bridge location, assuming operation as a toll facility.

5. A determination of the preliminary feasibility of the project, based on the relationship of anticipated project cost and estimated toll revenues.

The engineering, location and cost studies relating to the proposed bridge were prepared by Howard, Needles, Tammen & Bergendoff and are discussed in Part I of this report.

Part II, prepared by Wilbur Smith and Associates, discusses the preliminary traffic and revenue potential of the crossing and project feasibility calculations.

## Present Highway System

U. S. Route 136 serves an east-west travel corridor through Illinois, crossing the Mississippi River via the Keokuk Municipal Bridge, and then continuing westward through northern Missouri after crossing the Des Moines River west of Keokuk. Iowa Route 2 traverses the study area on an east-west orientation north of Keokuk and west of Fort Madison. North-south traffic in the Keokuk area is served by U. S. Routes 61 and 218. U. S. Route 61 follows an alignment close to the Mississippi River as it enters Keokuk from Missouri and then continues northward to Davenport. U. S. Route 218 proceeds northwesterly from its terminus in Keokuk to Iowa City. The Iowa Great River Road follows county roads close to the Mississippi River, north of Keokuk. In Illinois, the Great River Road follows Illinois Route 96 from a point between Warsaw and Hamilton, northward to the vicinity of Dallas City.

## Planned Highway Improvements

In Keokuk, reconstruction is scheduled for a two-mile section of U. S. Route 136 east of Hamilton and for additional route segments further east in McDonough County. In addition, widening and repaving of U. S. Route 218 between U. S. Route 61 and Iowa Route 2 is programmed. By 1971, further improvements to U. S. Route 218 will be underway to a point north of Iowa Route 16. A continuing program of upgrading Iowa Route 2 will result in improvements to a 40-mile section west of the Lee County Line.

In Illinois, resurfacing is currently scheduled for a section of U. S. Route 136 east of Hamilton and for additional route segments further east in McDonough County.

In summary, highway improvements scheduled for the Keokuk study area will upgrade the highway network and improve its ability to serve anticipated traffic growth through the early 1970's without causing any radical change in present trans-river travel patterns.

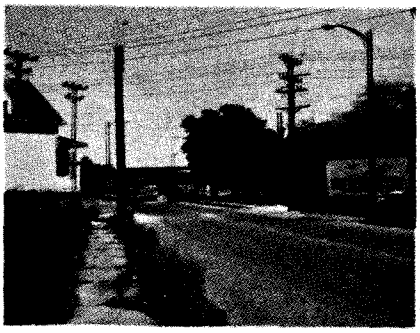
## Present Keokuk Municipal Bridge

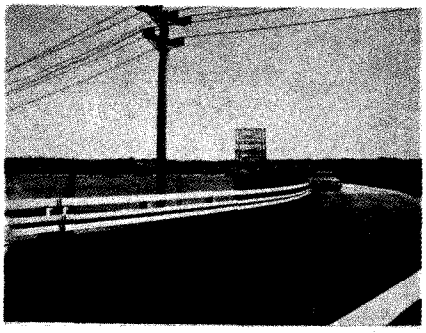
U. S. Route 136 is carried across the Mississippi River at Keokuk on the upper level of a combined railroad-highway swing-span bridge. Several views of the Keokuk Municipal Bridge are shown in Exhibit 3.

The original bridge was constructed in 1869 by the Keokuk and Hamilton Bridge Company. In 1871, the swing-span was rebuilt, and in 1881, one of the fixed spans was reconstructed after being damaged by a steamer. In 1915, the superstructure was dismantled, removed and replaced by new trusses which allowed separation of the highway and railway levels. The highway deck has been replaced a number of times, the latest in 1956 when a 5-inch steel grid deck was installed. At that time, structural revisions were also made to achieve a H-20 structural classification.

The structure, which was purchased by the City of Keokuk in 1941, consists of eight simple truss spans of varying lengths, ranging from 151 feet 5 inches to 165 feet 2 inches; two simple truss spans, each approximately 257 feet in length and a 380-foot truss swing-span. The swing-span provides twin 158-foot navigation openings.

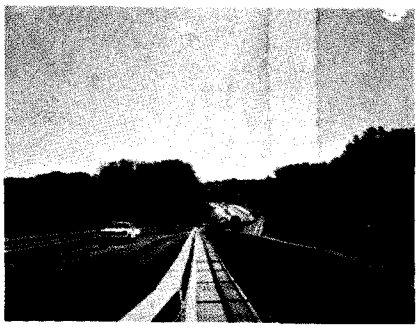
At the Iowa bridgehead, the approach roadway is awkward due to a fairly sharp reverse-curve alignment, complicated by the location of the toll booth on the curve. The Illinois approach roadway is relatively straight and rises on a gentle grade. The bridge roadway width of 17 feet 3 inches curb-to-curb is uncomfortably narrow. Two large vehicles can barely pass between the large trusses of the swing-span. The present speed limit on the bridge is 20 miles per hour.





IOWA APPROACH

BRIDGE ELEVATION



ILLINOIS APPROACH

# PRESENT KEOKUK BRIDGE

Rail traffic is light, amounting to approximately four trains per day. Mississippi River navigation at Keokuk shows considerable seasonal variation; observers report that river traffic activity has been tending to continue later into the winter season each year. The 1967 record of bridge openings at Keokuk was very similar to that recorded at Fort Madison, where roughly 2,690 bridge openings occurred in 1967. This was an increase of about 3.5 per cent over the number of openings in 1966. Monthly bridge openings ranged from a low of fewer than 10 in January to a high of more than 335 during July. Each opening cycle takes approximately fifteen minutes, creating significant delays to traffic.

The present toll structure on the Keokuk Municipal Bridge is based on a rate of $0.10 for a passenger car with driver. As shown in Table 1, trucks pay a generally higher toll, ranging from $0.10 for a pick-up truck to a maximum of $1.50 for heavy truck vehicle combinations.

TABLE 1

PRESENT TOLL SCHEDULE

Keokuk Municipal Bridge

| TOLL CLASS | TOLL |
|---|---|
| Passenger Cars | $0.10 |
| Trucks: | |
| Pickups | 0.10 |
| Two-axle | 0.25 |
| Tandem-axle | 1.50 |
| Semi-trailers | 1.50 |
| Full trailers | 1.50 |
| House Trailers (plus towing unit) | 0.25 |
| Buses | 0.25 |
| Tractors | 0.25 |
| Farm Machinery | 0.50 |

SOURCE: Keokuk Bridge Commission.

## Alternative River Crossings

The closest river crossing to Keokuk is the combination railway-highway bridge at Fort Madison, about 25 miles to the north. The bridge is similar to the Keokuk structure, being a low-level crossing with a swing-span which opens for river navigation. Highway traffic is carried on an upper level. The present bridge was constructed in 1926. The roadway has a minimum width of 20 feet with a bituminous surface on a portland cement concrete slab. Load sizes are limited to 14.5-foot maximum height, adequate for all classes of conventional highway traffic. The bridge is operated as a toll facility with passenger car drivers charged $0.25. As shown in Table 2, each additional vehicle passenger is assessed $0.05; trucks pay a toll based on vehicle weight.

TABLE 2

PRESENT TOLL SCHEDULE

Fort Madison Bridge

| TOLL CLASS | TOLL |
|---|---|
| Pedestrian | $0.05 |
| Motorcycle | 0.15 |
| Passenger car and driver | 0.25 |
| Each additional passenger | 0.05 |
| Bus, including driver and not exceeding 35 passengers | 1.00 |
| Trucks | |
| Weight 4,000 lbs. or less | 0.25 |
| Weight 4,000 lbs. to 5,000 lbs. | 0.35 |
| Weight 5,000 lbs. to 6,000 lbs. | 0.40 |
| Weight 6,000 lbs. to 7,000 lbs. | 0.45 |
| Weight 7,000 lbs. to 10,000 lbs. | 0.80 |
| Charge will be $1.00 plus an additional $0.20 for each 2,000 lbs. or fraction thereof in excess of 10,000 lbs. | |
| Special Classifications | Special rates |

Note: Passenger car round trip with 3 passengers $0.50.

SOURCE: Atchison, Topeka and Santa Fe Railway Company.

The nearest river crossing of the Mississippi to the south is the toll-free bridge at Quincy, Illinois, approximately 40 miles downstream. The Quincy bridge was found to be too distant to permit it to serve as a convenient alternative to the Keokuk crossing, for all but a very few travel movements.

## Previous Studies

All available pertinent data and reports relating to this project were assembled and reviewed. This material included information obtained from the Iowa and Illinois Highway Departments, other state agencies and numerous county, municipal and other contacts.

# PART I

# LOCATION AND COST STUDIES

## BASIC DATA

Considerable data pertaining to the existing bridge and the surrounding area must be procured and analyzed in the preparation of bridge studies for a project of this magnitude. General features of the study area are shown on Exhibit I-1. The following are items of data pertinent to a Mississippi River crossing at Keokuk.

### Geology

The study area lies within the Dissected Till Plains Section of the Central Lowland Physiographic Province. The Keokuk vicinity was covered by glaciation during the Pleistocene Epoch and then mantled with a deposit of loess.

Concretionary and brecciated limestone of the St. Louis Stage, Carboniferous System, outcrops in the bluffs on the Iowa side.

Corps of Engineers' borings at Lock No. 19 on the Iowa side show only shallow deposits of alluvial silt, sand and gravel over limestone. Bedrock beneath the river is the limestone and shale of the Carboniferous System.

Substructure units for the proposed bridge may be founded on bearing piles driven through the alluvium and/or on caissons taken to bedrock. Prior to final design, foundation borings and laboratory soil tests will be required for evaluation of the proper foundation type and any special treatment necessary for embankment-foundation stability and settlement at the approaches.

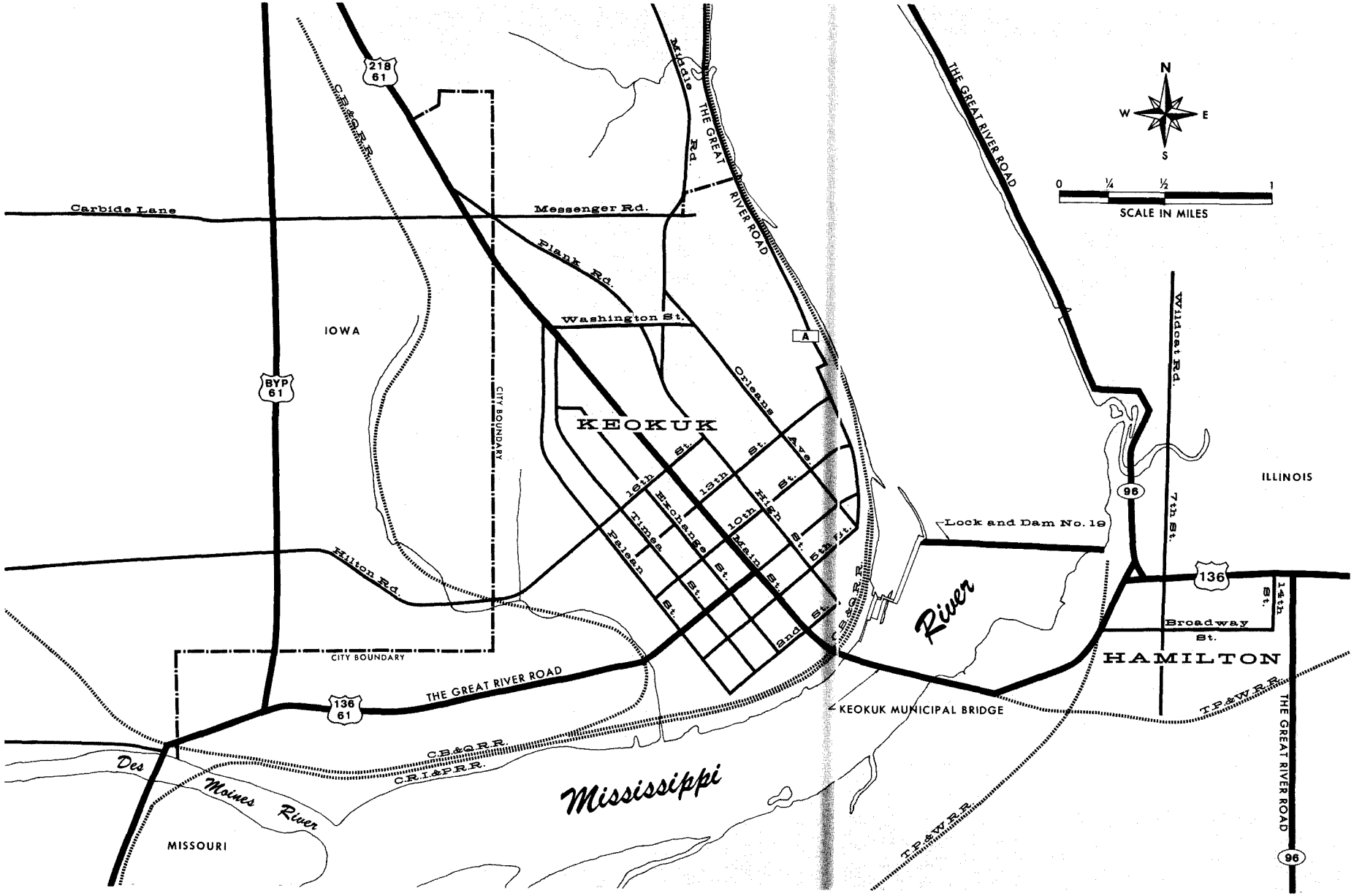



Exhibit I-1

## KEOKUK STUDY AREA

## River Conditions

The navigation channel of the upper Mississippi River near Keokuk is defined by the position of U.S. Lock and Dam No. 19 which is adjacent to the Iowa bank and immediately upstream from the existing Keokuk Municipal Bridge. Approximately one mile upstream from the locks, the channel is located about 1,000 feet from the Iowa bank and its location one mile downstream is similar. The alignment of the channel in this two mile stretch approximates a one degree curve, with a tangent section in the vicinity of the locks. In conjunction with the dam is an electric power generating station with the main power house located alongside and between the two locks.

Normal river stages are at Elevation 480.0 Mean Sea Level below and Elevation 518.2 Mean Sea Level above the dam with a record flood stage at Elevation 500.0 Mean Sea Level downstream. Generally, both sides of the river are bounded by bluffs or cliffs approximately 100 feet in height. Width of the river varies from more than a mile above the dam to less than a half mile downstream.

## Existing Railroads

The city of Keokuk is served by four railroads. The Chicago, Burlington & Quincy Railroad is joined by the Chicago, Rock Island and Pacific Railroad south of Keokuk and their tracks parallel the Iowa bank of the Mississippi River through the city. The Toledo, Peoria & Western, and the Wabash Railroads are located on the Illinois side of the river and have access to the city over the existing river bridge. The C.B.&Q. Railroad also operates two spur lines into the city; the first of these follows Soap Creek to the northwest while the second serves the Central Business District.

## Navigation Clearances

Criteria for navigation clearances have been tentatively established by the Rock Island District of the U. S. Army Corps of Engineers.

Upon establishment of the Department of Transportation under the Act of 15 October 1966, PL 89-670, the Secretary of Transportation was given responsibility for certain functions, powers, and duties previously vested in the Secretary of the Army and other offices of the Department of the Army, including those with respect to drawbridge operating regulations (Section 5 of the Act of 18 August 1894 as amended), obstructive bridges (the Act of 21 June 1940 as amended), and location and clearances of bridges and causeways in navigable waters (Section 9 of the Act of 3 March 1879, the Act of 23 March 1906 as amended, and the General Bridge Act of 1946 as amended, except Section 503).

The criteria cited herein is in conformance with the requirements and past practices of the U. S. Army Corps of Engineers. The assumption has been made, for this exploratory report, that the criteria to be established by the U. S. Coast Guard, the agency delegated by the Secretary of Transportation to assume the responsibility for the functions listed above, will be similar to those of the Corps of Engineers.

Contact with the Coast Guard has confirmed the validity of this assumption for an exploratory study of alternative locations. It should be noted, however, that the particular river conditions existing at each site should be reviewed with the Coast Guard prior to the preparation of a definite project report to establish the navigation requirements.

Although the minimum permissible navigation channel on the Mississippi River is 400 feet, a horizontal clearance of 430 feet is proposed for a new highway bridge at this site. The 400 foot minimum clearance is permitted only when the alignment of the river channel is straight. The opening must be greater where the alignment of the channel is curved under or upstream from the bridge.

Final approval of clearances can be determined only after formal application has been filed and public hearings conducted.

The minimum vertical clearance for a bridge structure is 52 feet above the 2 per cent waterline elevation, or 60 feet above flat pool, whichever is higher. The 2 per cent waterline is that elevation of the river which will be exceeded only 2 per cent of the time. In the Keokuk area, downstream of the dam, low steel elevation required by the flat pool waterline elevation specification is 540.0 Mean Sea Level, which is exceeded by the 547.0 Mean Sea Level required by the 2 per cent specification.

## ALTERNATE LOCATIONS

### General

Five alternative bridge locations, as shown on Exhibit I-2, were studied and evaluated for a new Mississippi River bridge crossing at Keokuk. Two sites at Main Street, Alternates A and B, were subsequently studied in detail for presentation in this report. The principal features and relative merits of all considered alternatives are summarized in the following paragraphs.

### Main Street Alternate A

The alignment of this alternate originates at Main and Second Streets, parallels the existing Keokuk Municipal Bridge, as shown on Exhibit I-2, approximately 350 feet downstream from the existing structure, and connects Main Street to the Illinois approach of the existing bridge. This location offers the primary advantage of direct alignment to both Main Street in the Keokuk Central Business District and U.S. Route 136 in Hamilton, Illinois.

Traffic on Main Street from Second Street to the riverfront would be divided and pass to either side of the new bridge approach. At Second Street, use of the two center lanes would be limited to bridge traffic while the two outside lanes would continue to serve local traffic. The Illinois approach to this alternate may be developed in either of two ways: (1) Utilizing an at grade crossing of the Toledo, Peoria, & Western Railroad tracks leading to the existing bridge; (2) incorporating a grade separation structure to span the tracks at this location.

### Main Street Alternate B

This alternate follows a parallel alignment approximately 200 feet upstream from the present bridge, as shown in Exhibit I-2. The alignment

also originating at Main and Second Streets, curves over northbound Main Street traffic, passes over the U.S. Lock immediately upstream from the present bridge, and terminates with an intersection with the existing bridge approach in Illinois.

Elimination of the railroad-highway intersection on the Illinois approach and a short main channel span length are the primary advantages of this alternate. Major disadvantages, in comparison with Alternate A, are the more complex Iowa approach design, higher right-of-way costs, and and a longer overall structure length.

**Other Alternates**

Sixth Street Alternate – This alignment typifies the problems encountered in sites located upstream from the Lock and Dam. Both the width and depth of the river are greatly increased, thereby appreciably increasing structure costs. Terminating in a residential area, bridge traffic would be routed over city streets which would require major improvements to connect with the area highway system.

Timea Street Alternate – This alignment would extend from Timea Street at First Street in Keokuk to the Illinois County Road directly across the river. This alignment would allow traffic to bypass the Central Business District while still providing easy access to it. A longer navigational span and increased total structure length would be required at this site. Improvement of Timea Street from First to Seventh Streets would be needed to provide a connection with the major highways. Approximately one mile of Illinois County Road would require improvements to connect the bridge approach to U.S. Route 136.

U.S. Route 61 Alternate – Originating at the junction of U.S. Route 61–136 and U.S. Route 61 Bypass, this alignment nearly parallels the Des Moines River at its confluence with the Mississippi River, crosses over Mud Island and terminates at the county road connecting Warsaw and Hamilton, Illinois. Principal disadvantages of this location are: (1) Substantial ad-


BYP 61
Iowa
U.S. ROUTE 61 AND 67
C.R.I.&P.R.R.
C.B.&Q.R.R.
136
61
Missouri
Channel
Navigation
Mississippi River
Navigation
Illinois
I.C.R.R.
T.&W.R.R.

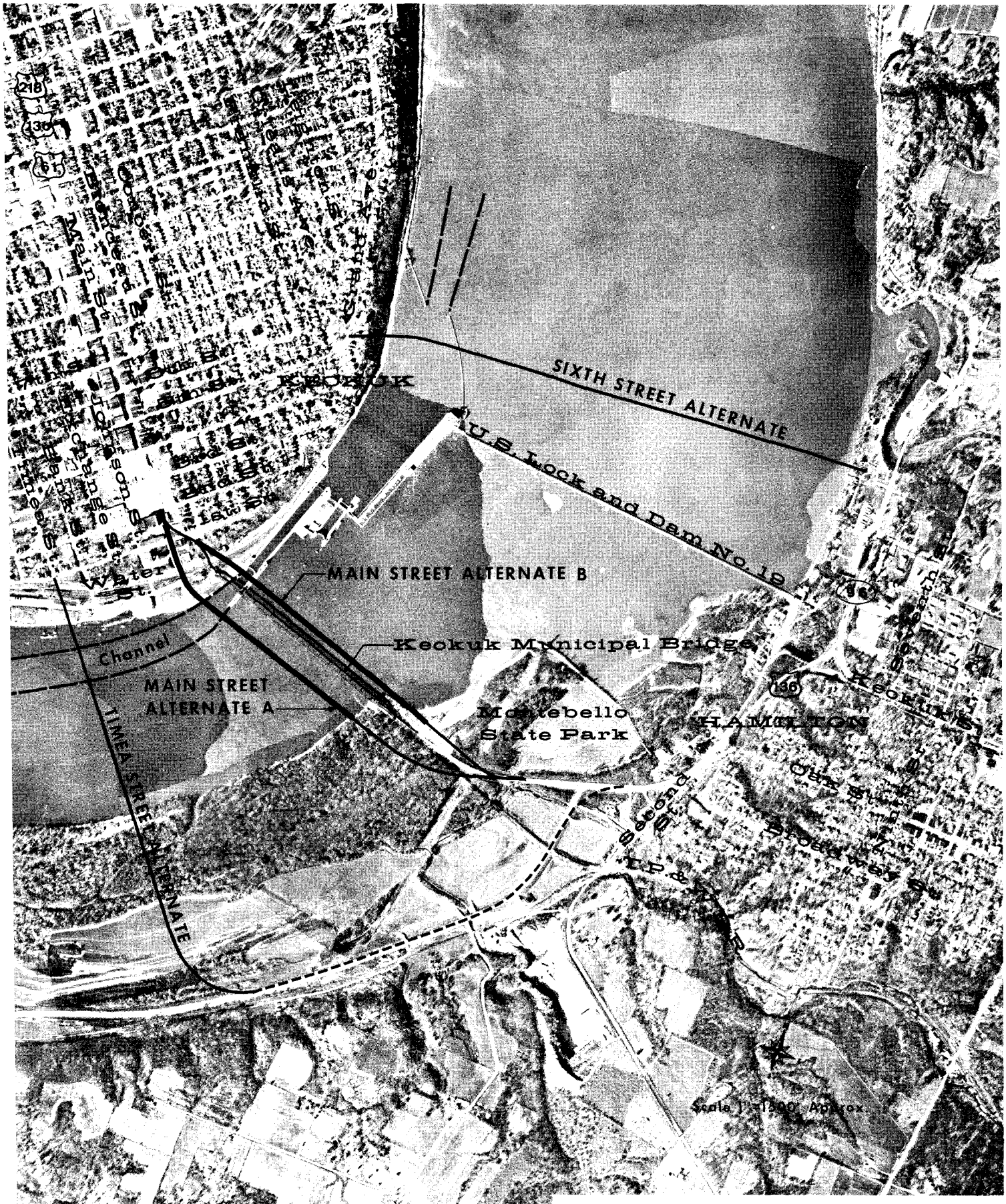



Exhibit I-2

## ALTERNATE BRIDGE LOCATIONS

verse travel distance for traffic between Illinois and the Keokuk Central Business District; (2) increased roadway costs on the Iowa approach; (3) increased costs necessary to improve approximately five miles of county road between the bridge terminal and U.S. Route 136 in Hamilton, Illinois.

**Recommended Location**

Main Street Alternate A is the best and most economical location for a replacement of the highway portion of the Keokuk Municipal Bridge. The project cost for a crossing on this location is utilized in the project feasibility studies developed in Part II of this report.

## STRUCTURE TYPE STUDIES FOR NAVIGATION SPANS

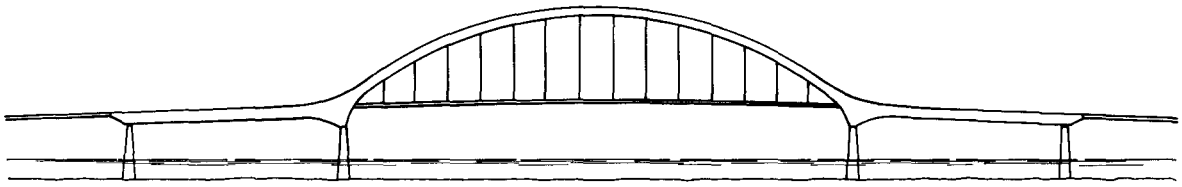
The primary intent of structure type studies as a part of this exploration study is to determine the approximate cost of a river crossing. A final recommendation for a specific type of structure cannot be made at this stage of investigations and design. The final selection of a structure type will be contingent upon economics, aesthetic factors, structural considerations, navigational clearance requirements, foundation conditions, highway alignment and vertical controls. All of these control factors would be studied in detail after a preliminary selection of bridge location has been made, based on the general considerations outlined and discussed in this report.

Six types of navigation spans are shown on Exhibit I-3. Type I is a Continuous Girder Span. These contemporary structures are popular because of economics, pleasing appearance and the elimination of obstructions above the roadway. Economic considerations usually limit spans to less than 450 feet, but with increased usage of newer high-strength steels current maximum span lengths may be economically increased. Since structure depths of the girder span are relatively greater than of other structure types, the practicality of the girder span will be dependent upon navigational clearances, existing topography, and approach grades.

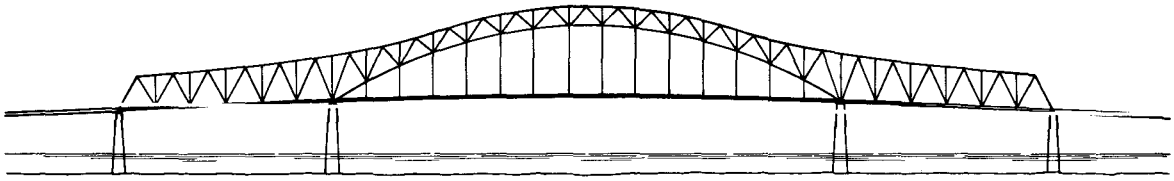
Type II navigation span of Exhibit I-3 is a Continuous Box Girder Tied Arch Span with flexible tie. The tie resists only the thrust of the arch. Without a tie the resistance would have to be provided by river piers. This type of span is considered very practical construction for bridges over the Mississippi River if navigation clearance requirements are limited to a single opening. This type of structure has a very limited depth between the low steel and roadway deck and will, therefore, permit flatter approach grades than a continuous girder design.

Type III navigation span is the Continuous Truss Tied Arch Span. This type of bridge is similar in structural function to Type II, the box girder arch. The difference being that a steel truss system is used for the arch rib and approach spans instead of box girder sections. This type of struc-

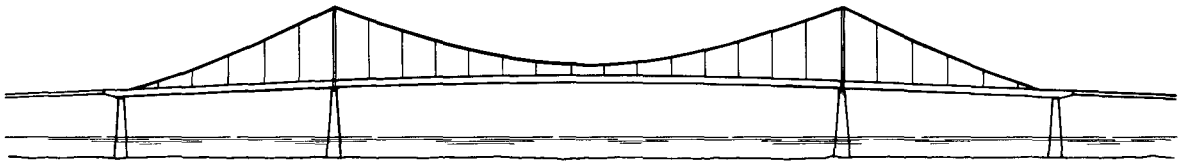
CONTINUOUS GIRDER SPAN — TYPE I



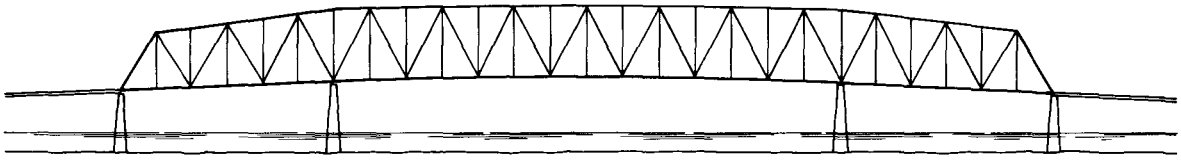
CONTINUOUS BOX GIRDER TIED ARCH SPAN — TYPE II



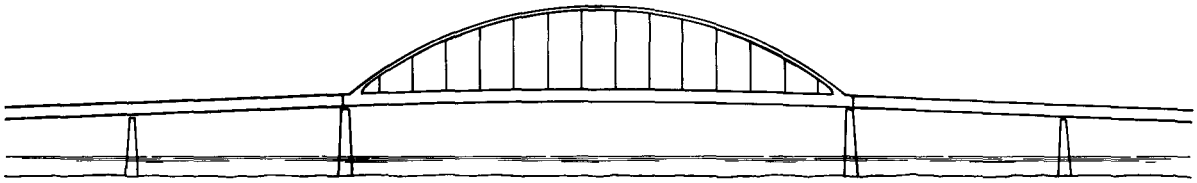
CONTINUOUS TRUSS TIED ARCH SPAN — TYPE III



SELF ANCHORED SUSPENSION SPAN — TYPE IV



CONTINUOUS TRUSS SPAN — TYPE V



BOX GIRDER TIED ARCH SPAN — TYPE VI

Exhibit I-3

## NAVIGATION SPAN STRUCTURE TYPES

ture will be economical for longer spans than the box girder and, with proper proportions, can be aesthetically pleasing.

The suspension bridge is considered one of the most graceful of all bridge structures. The Self Anchored Suspension Span is shown as Type IV. This type of structure generally costs more, up to 20 per cent, than other considered types when the maximum span required is in the 500 to 600 foot range. It offers advantages of pleasing appearance, flatter approach grades and nearly equal vertical clearance in the side spans.

A Continuous Truss Span is shown as Type V. This is a common and economical type of structure. In the past it was particularly popular because of economy in total metal required, its truss members being fabricated from many small pieces of structural steel with rivets. Modern steel technology, by providing larger sizes of structural steel plates, has permitted the designer to develop other types of structures that are aesthetically pleasing and yet are competitive in cost with the continuous truss.

The navigation span identified as Type VI is the Box Girder Tied Arch Span. Side spans will be of continuous girder construction but will function independently of the center span. The tie in the center span is more rigid in comparison with the arch than the flexible tie of Type II. The depth of the tie girder is shallower than the depth of the Continuous Girder Span, Type I. Thus, if vertical clearance requirements would cause excessive approach grades to a Continuous Girder Span, the Box Girder Tied Arch Span offers an advantage. This type of structure is aesthetically pleasing and economical for two-lane roadways for a navigational span greater than 400 feet.

It appears that there would be little, if any, significant difference between the combined costs of fabrication and erection of a tied arch span and a continuous truss span. Decreased erection costs favor the truss span; however, this advantage is offset by lower fabrication costs for the arch. The latter has fewer members since the bridge steel is concentrated in the arch rib and tie. In summary, the continuous girder bridge is suitable when length of approaches allow desirable grades to be used; its

cost is comparable with several other bridge designs. The continuous girder bridge with tied arch main span and box girder bridge with tied arch main span combine a pleasing appearance with economy of construction for the length of span required for a bridge at this site. The continuous truss bridge and continuous truss bridge with tied arch main span, while competitive in construction cost with the girder bridges, are not as attractive. The self anchored suspension span is uneconomical for the span lengths being considered for this project.

Inasmuch as more detailed estimates of construction cost would be developed in subsequent phases of design, a structure type other than the type recommended herein may prove to be more economical upon subsequent refinements in design. The probable variation in costs among the various structure types considered herein is within the accuracy of estimating at this stage of design.

The Box Girder Tied Arch Span Type VI, also shown in a general setting on Exhibit I-4, should be given thorough consideration in future engineering studies for a highway crossing at Keokuk, Iowa.

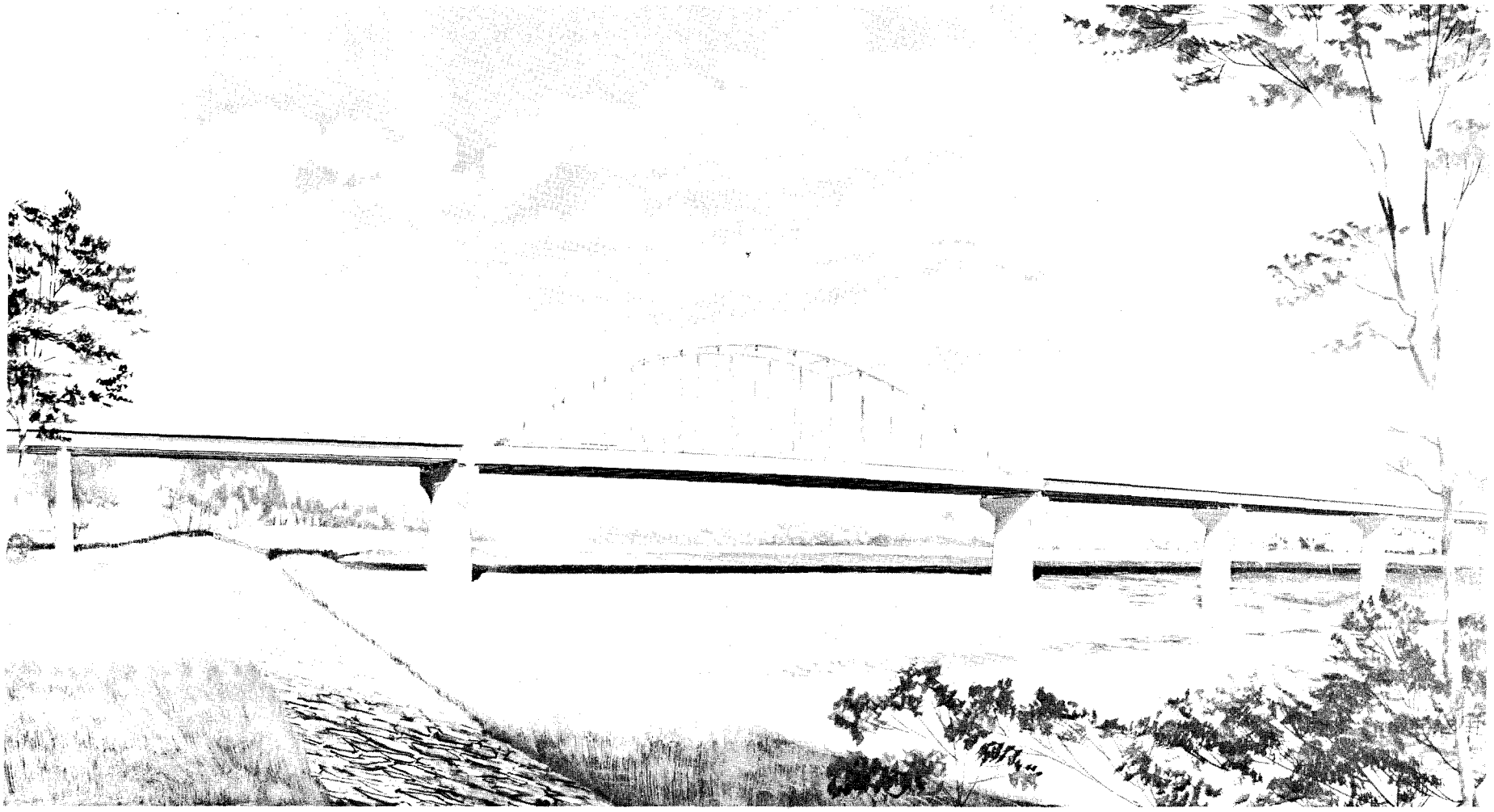


Exhibit I-4

## BOX GIRDER TIED ARCH SPAN

## STRUCTURE TYPE STUDIES FOR APPROACH SPANS

Economy is a primary consideration for the approach spans which extend from the bridge abutments to the main river unit. Many types of approach span construction can be blended with the main span design to achieve a pleasing appearance. However, a final layout of the most economical span lengths cannot be determined until subsurface investigations have been completed. Prestressed concrete beam spans utilizing Iowa standard design beams would offer economical construction in the river bottoms where pier foundations would not be subject to scour action of the river. These beams are usually limited in length to 80 feet. As the bridge extends into the river, the cost of piers becomes greater. To offset the increased pier cost, longer spans would be used. Steel girders with floorbeams and intermediate stringers offer the greatest economy of construction for spans greater than 80 feet.

## COST ESTIMATES

### General

The preliminary roadway costs were determined by applying current unit prices to preliminary quantity estimates of the principal roadway construction items. Allowances have been included for modest escalations of unit costs during the one year that will elapse before construction could begin.

Right-of-way cost estimates were based upon fair market valuations of all real property involved. Allowances have been included for damages, severance losses and acquisition expenses.

A typical toll booth installation is shown on Exhibit I-5. The exact location of this facility on the bridge approach will be established during subsequent study phases.

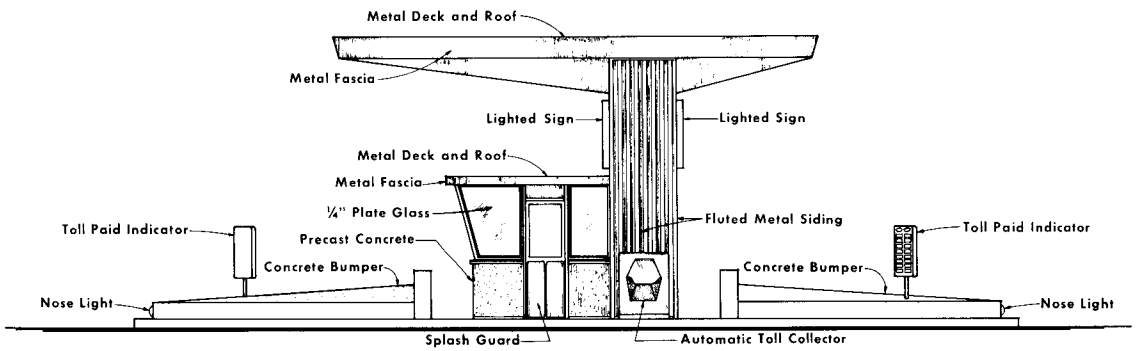
Prior to preparation of final design plans, additional engineering studies will be required. A complete subsurface investigation will be necessary to provide a firm basis for the determination of substructure type, substructure designs and economical span lengths. Main river unit studies will include economic comparisons of several types of construction.

The total project cost does not include any allowance for acquisition of any franchise rights or property now vested in the private toll bridge company.

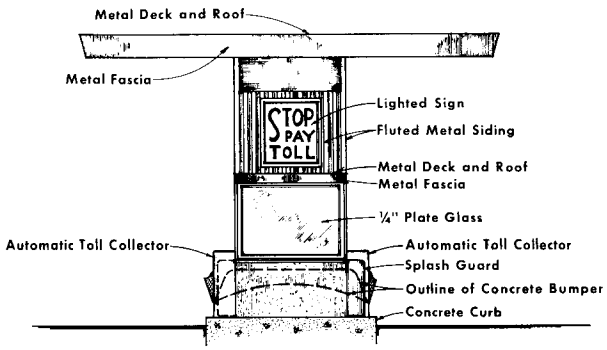
### Main Street Alternate A

A plan, elevation and typical section for the Main Street Alternate A is shown on Exhibit I-6.

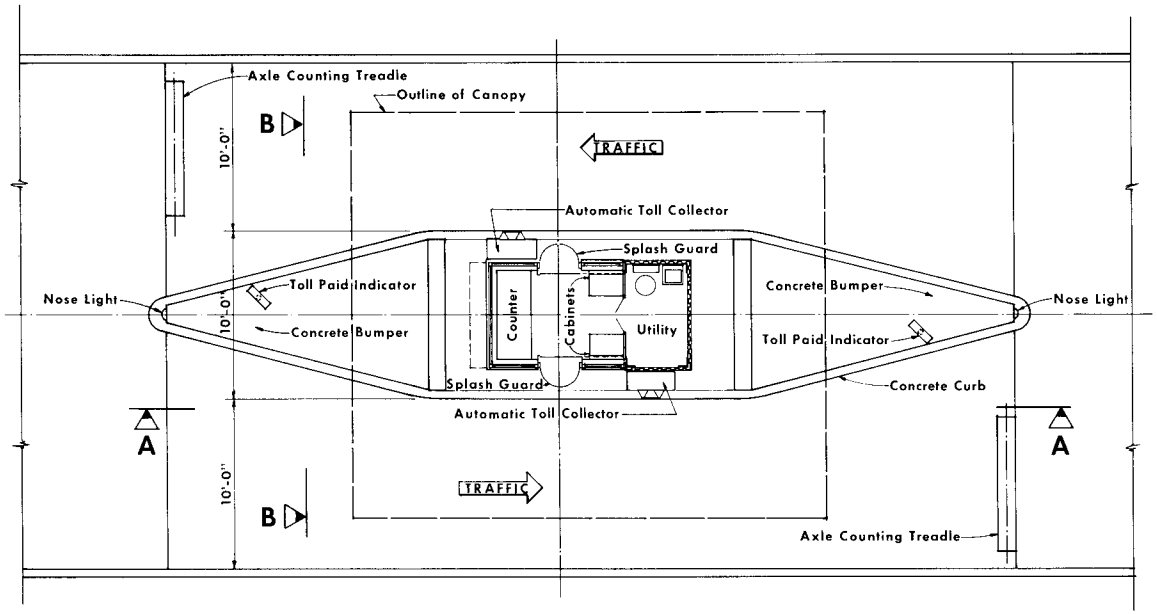
A two lane facility is assumed for purposes of estimating the project cost inasmuch as no highway or street improvements are planned in the Keokuk area which would require a four lane bridge.




## ELEVATION A-A




## ELEVATION B-B




## PLAN

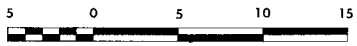



Exhibit 1-5

# GENERAL PLAN AND ELEVATION
# TOLL BOOTH

TABLE I-1

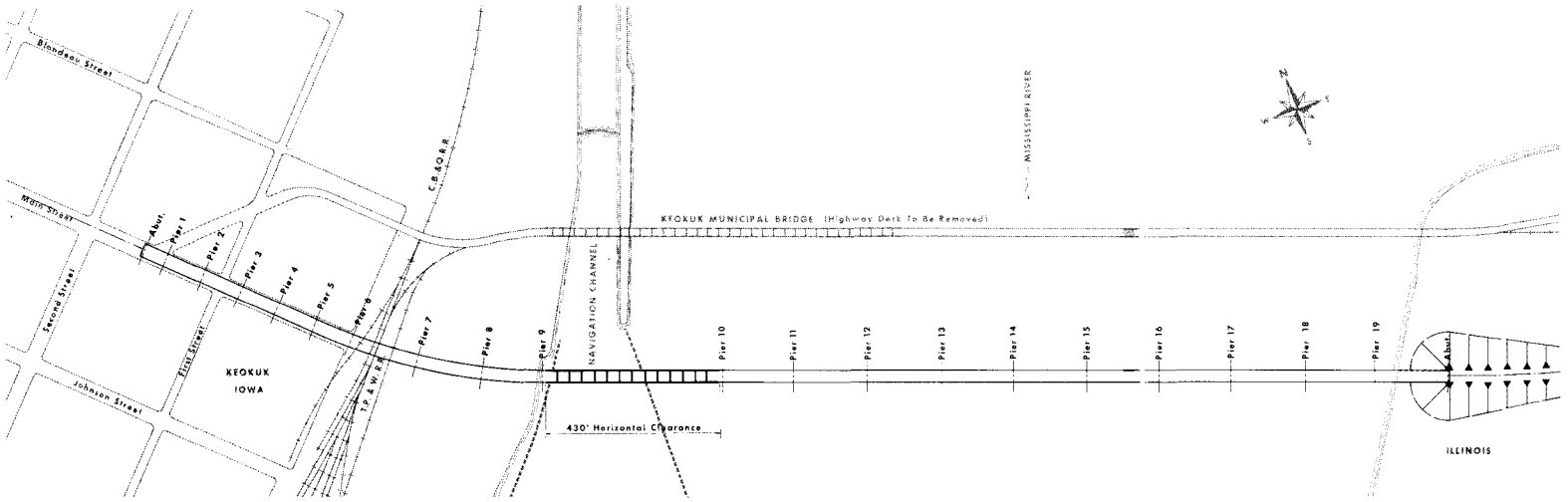
ESTIMATE OF BRIDGE CONSTRUCTION COST
MAIN STREET ALTERNATE A

Keokuk, Iowa, Bridge

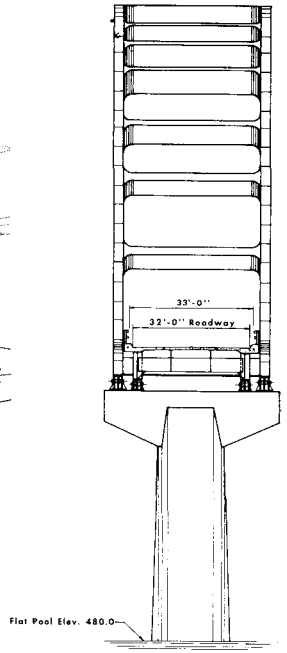
| | |
|---|---|
| Continuous Girder Spans | 1,050 ft. |
| Box Girder Tied Arch Span | 450 ft. |
| Continuous Girder Spans | 1,880 ft. |
| | 3,380 ft. |

Roadway Width - 32'-0" Curb-to-Curb

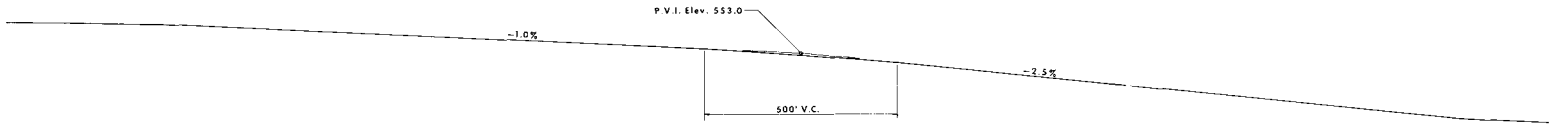
| ITEM | QUANTITY | UNIT PRICE | COST |
|---|---|---|---|
| Superstructure: | | | |
| Bridge Railing | 6,815 L.F. | $12.00 | $ 81,800 |
| Concrete | 3,180 C.Y. | 90.00 | 286,200 |
| Reinforcing Steel | 950,000 Lbs. | 0.14 | 133,000 |
| Tied Arch Steel A36 | 920,000 Lbs. | 0.34 | 312,800 |
| Tied Arch Steel A441 | 1,015,000 Lbs. | 0.38 | 385,700 |
| Girder Steel A36 | 1,430,000 Lbs. | 0.29 | 414,700 |
| Girder Steel A441 | 2,612,000 Lbs. | 0.32 | 835,800 |
| Cast Steel and Misc. Metal | 124,000 Lbs. | 0.70 | 86,800 |
| Navigation Lighting | | Lump Sum | 20,000 |
| | SUBTOTAL | | $2,556,800 |
| Substructure: | | | |
| Concrete | 8,545 C.Y. | $65.00 | $ 555,400 |
| Reinforcing Steel | 854,000 Lbs. | 0.14 | 119,600 |
| Steel Bearing Piles (12BP53) | 28,000 L.F. | 8.00 | 224,000 |
| Steel Pile Cofferdams | 43,820 S.F. | 5.00 | 219,100 |
| Excavation | 7,510 C.Y. | 10.00 | 75,100 |
| | SUBTOTAL | | $1,193,200 |
| | TOTAL BRIDGE COST | | $3,750,000 |




PLAN

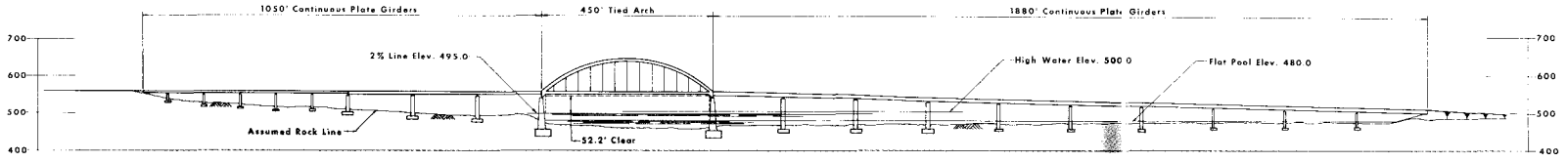



SECTION THRU PLATE GIRDER
SPAN NEAR CHANNEL PIER




PROFILE GRADE

10 5 0 10 20
SCALE IN FEET




ELEVATION

100 0 100 200 300 400
SCALE IN FEET

## Exhibit I-6

**MAIN STREET ALTERNATE A LOCATION**

**GENERAL PLAN AND ELEVATION**

The 32 foot roadway width provides 4 feet 6 inches of lateral clearance between the righthand edge of a typical 12 foot traffic lane and the barrier rail. This clearance from the normal edge of the lane conforms to the modern safety requirements of the American Association of State Highway Officials and the Bureau of Public Roads. There are few pedestrians crossing the river, therefore, sidewalks will not be necessary and have not been provided.

A navigation span of 450 feet permits a 430 foot navigation channel as will probably be required at this site. A Box Girder Tied Arch Span is shown on Exhibits I-3 and I-4. This aesthetically pleasing structure allows desirable approach grades and its cost will compare favorably with other types of spans.

The estimated construction cost of the bridge for Main Street Alternate A is $3,750,000. A detailed breakdown of this cost is shown in Table I-1. Quantities shown are based on a preliminary design of all structural components. Unit prices are based on a review of current construction prices of similar items with modest escalation to reflect the elapse of at least one year before bids could be received for construction contracts.

The total estimated project cost for Main Street Alternate A is shown in Table I-2.

TABLE I-2

SUMMARY OF ESTIMATED PROJECT COSTS

Keokuk, Iowa, Bridges

| | ALTERNATE A | | ALTERNATE B | |
|---|---|---|---|---|
| | Iowa | Illinois | Iowa | Illinois |
| Roadway | $ 11,300 | $250,000 | $ 12,000 | $146,100 |
| Structures | 3,750,000 | — | 4,085,000 | — |
| Retaining Walls | 24,000 | — | 30,000 | — |
| Subtotal | $3,785,300 | $250,000 | $4,127,000 | $146,100 |
| Toll Booth Complex | 85,000 | — | 85,000 | — |
| Engineering and Contingencies | 834,000 | 50,000 | 902,400 | 29,200 |
| Total Construction | $4,704,300 | $300,000 | $5,114,400 | $175,300 |
| Right-of-Way | 16,600 | — | 50,000 | — |
| Acquisitions and Contingencies | 2,500 | — | 10,300 | — |
| Administration and Legal | 1,600 | — | 5,000 | — |
| Total | $4,725,000* | $300,000 | $5,179,700* | $175,300 |
| Total Project Cost | | $5,025,000 | | $5,355,000 |

* Iowa costs include all costs of the river structure up to and including the east abutment.

## Operation and Maintenance

The estimate of first year expenses for operation and maintenance for the Main Street Alternate A location is shown in Table I-3. Inasmuch as operation of the bridge by the Iowa State Highway Commission will be somewhat different than that of a private operator, several cost assumptions have been made: (1) No per diem for commissioners or pro rata cost for central administration by the Iowa State Highway Commission; (2) the nominal administrative duties performed by the toll sergeant will require no separate administration facilities; and (3) employee fringe benefits will be similar to existing private operation. Since the proposed bridge will be owned by a public agency, it has been assumed that it will not be subject to property or other local taxes.

TABLE I-3

ESTIMATE OF FIRST YEAR EXPENSES
FOR
OPERATION AND MAINTENANCE

Keokuk, Iowa, Bridge

| | | |
|---|---|---|
| ADMINISTRATION | | |
| Toll Sergeant | $ 6,600 | |
| Travel and Car Expense | 1,000 | |
| Consulting Engineers | 3,600 | |
| Miscellaneous | 800 | |
| Total Administration | | $12,000 |
| OPERATION | | |
| Toll Collectors | $45,400 | |
| Utilities | 2,600 | |
| Supplies and Postage | 2,500 | |
| Employee Benefits | 5,500 | |
| Total Operation | | $56,000 |
| REPAIRS AND MAINTENANCE* | | 5,000 |
| INSURANCE | | 6,000 |
| MAINTENANCE RESERVE | | 6,000 |
| Total Operation and Maintenance | | $85,000 |

* By District maintenance forces on force account cost basis.

# PART II

# ESTIMATED PRELIMINARY TRAFFIC AND REVENUES AND PROJECT FEASIBILITY

## INTRODUCTION

A general economic evaluation was made of the area served by the present Keokuk Municipal Bridge, as a guide in projecting future trans-river traffic growth. Route reconnaissance investigations were conducted to inventory present traffic facilities and to determine average operating speeds and other traffic service characteristics. All available trans-river travel pattern and traffic trend data for the present bridge and alternative river crossings were assembled and reviewed.

Using the travel pattern information, travel speed and route inventory data and empirical diversion curves developed from studies of similar facilities, traffic assignments were made assuming replacement of the present Keokuk highway crossing with a new, modern toll crossing. Preliminary assignments were made at several toll rates to determine the rate structure which would optimize toll revenues while still providing a high level of traffic service in the travel corridor.

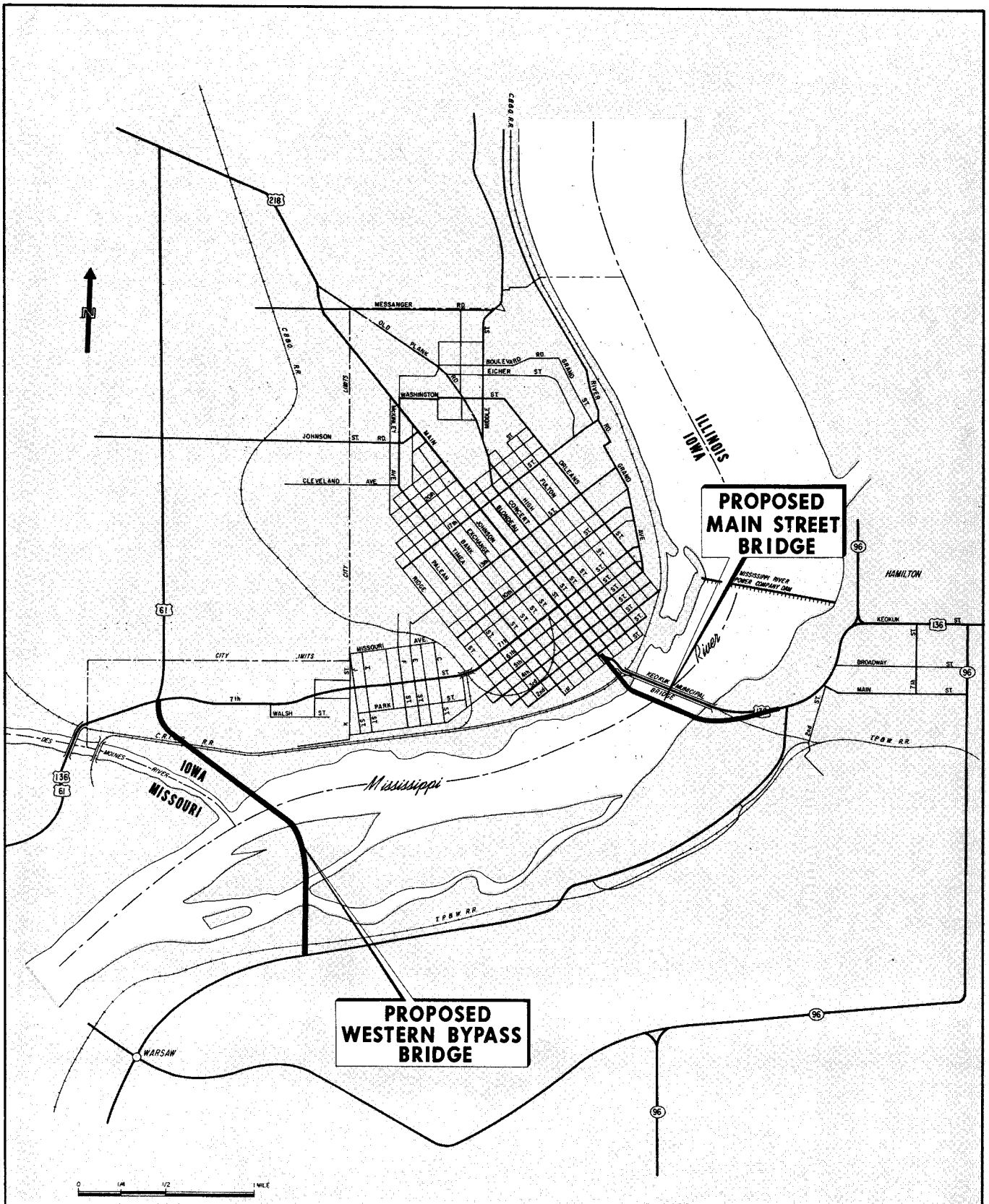
Preliminary estimates of annual toll revenues were then developed based on the economic and traffic studies and forecasts of future growth in the area. Using the project cost and annual maintenance and operating expense estimates prepared by Howard, Needles, Tammen & Bergendoff, a preliminary indication of project feasibility was determined.

### Proposed Keokuk Bridge

The proposed Keokuk Bridge would be constructed as a modern, two-lane facility with minimum approach grades and adequate lane widths. The

bridge would have a 32-foot curb-to-curb section to enable smooth, efficient and safe passage for all vehicle types. The proposed crossing would operate as a toll bridge.

Several alternative bridge alignments were given preliminary study. The two alignments which were selected for more detailed study are illustrated in Exhibit II-1. One alternate crossing would connect with Main Street in Keokuk and the other would serve as a western bypass of the city for U. S. Route 61-Illinois Route 96 traffic.




# LOCATION MAP

*Wilbur Smith and Associates*

**EXHIBIT II-1**

## AREA GROWTH ANALYSES

Several economic parameters were evaluated to determine relative levels of activity and recent growth trends in the Keokuk area. These indices included population, retail sales and average effective buying income per family. In addition, trends in motor vehicle registrations and motor fuel consumption, both excellent measures of highway travel were analyzed. For study purposes, a bridge influence area was defined which included Lee County in Iowa, Hancock County, Illinois and Clark County, Missouri.

Local field reconnaissance was conducted in the bridge study area and contact made with various officials and others to obtain information regarding trends and characteristics of land use and economic activity. Available current data and forecasts for the bridge study area were assembled and reviewed.

### Study Area Characteristics

Keokuk, the largest city in Lee County, had a 1960 population of 16,316. Occupying the high land at the confluence of the Des Moines and Mississippi Rivers, Keokuk is the county seat of Lee County, Iowa and the southernmost of Iowa's eastern river cities. Its location at the junction of the two rivers was an early factor in encouraging trade activity. Today, Keokuk serves a trade area extending into southern Lee County, southern and central Hancock County, Illinois and portions of Clark County in Missouri.

Keokuk's employment profile reveals a relatively heavy emphasis on manufacturing, which accounted for approximately 37 per cent of total employment in 1960. Major employers include producers of sponge and plastic products, iron and steel alloys and castings, food processors and fabricators of corrugated paper containers. Wholesale and retail trade accounts for another important segment of the urban area's employment.

Beyond the city, the bulk of the study area in all three states is predominantly rural, with the exception of Hamilton, the community at the Illinois bridgehead, which is experiencing rapid suburban-type residential growth, oriented primarily to the Keokuk urban area.

## Population Trends

Keokuk's 1960 population was slightly larger than that of Fort Madison, its neighboring city to the north. Together they accounted for more than 71 per cent of the population of Lee County and were by far the largest cities in the three-county study area. As shown in Table II-1, Keokuk had a 1960 population of 16,316 while the population of Carthage was 3,325. Hamilton and Warsaw in Illinois, immediately across the river, had 1960 populations of 2,228 and 1,938, respectively. Other study area communities are Nauvoo, Donnellson, Alexandria and Wayland with populations ranging from 1,039 to 384.

With the exception of Hamilton and Donnellson, which grew at average annual rates of about two per cent, most study area communities recorded little population change between 1950 and 1960. The population of the three-county study area has declined over the past 16 years with average annual decreases of 0.1 per cent recorded between 1950 and 1960 and 0.4 per cent between 1960 and 1966. Although Lee County recorded a slight increase in population during the period, this was offset by declines in both Hancock and Clark Counties.

Statewide trends in Iowa, Illinois and Missouri reflected population increases over the same period. Over the last six years, the average annual increase in Iowa's population was 0.3 per cent, the growth rate in Missouri averaged 0.8 per cent and the growth in Illinois was 1.1 per cent. The national average annual increase was 1.6 per cent.

## Trends in Retail Sales

Retail sales in the three-county study area increased from $75,030,000 in 1956 to $115,682,000 in 1966. The annual growth averaged 1.6 per cent between 1956 and 1961, accelerating to 7.2 per cent between 1961 and 1966. During the past five years, retail sales in the study area increased faster than did the averages for adjacent states and the nation.

TABLE II-1

POPULATION TRENDS

| AREA | 1950 | AVERAGE ANNUAL PER CENT CHANGE | 1960 | AVERAGE ANNUAL PER CENT CHANGE | 1966 |
|---|---|---|---|---|---|
| *Cities:* | | | | | |
| Alexandria | 465 | — 0.3 | 452 | — — | N.A. |
| Carthage | 3,214 | 0.3 | 3,325 | — — | N.A. |
| Donnellson | 589 | 1.9 | 709 | — — | N.A. |
| Fort Madison | 14,954 | 0.2 | 15,247 | — — | N.A. |
| Hamilton | 1,776 | 2.3 | 2,228 | — — | N.A. |
| Keokuk | 16,144 | 0.1 | 16,316 | — 1.5 | 14,700 |
| Nauvoo | 1,242 | — 1.8 | 1,039 | — — | N.A. |
| Warsaw | 2,002 | — 0.3 | 1,938 | — — | N.A. |
| Wayland | 350 | 0.9 | 384 | — — | N.A. |
| *Counties:* | | | | | |
| Clark | 9,003 | — 0.3 | 8,725 | — 1.3 | 8,100 |
| Hancock | 25,790 | — 0.5 | 24,574 | — 0.2 | 24,200 |
| Lee | 43,102 | 0.3 | 44,207 | 0.2 | 44,800 |
| Three-County Total | 77,895 | — 0.1 | 77,506 | — 0.4 | 77,100 |
| *States:* | | | | | |
| Illinois | 8,712,176 | 1.5 | 10,081,158 | 1.1 | 10,775,300 |
| Iowa | 2,621,073 | 0.5 | 2,757,537 | 0.3 | 2,813,600 |
| Missouri | 3,954,653 | 0.9 | 4,319,813 | 0.8 | 4,516,000 |
| United States[1] | 150,697,361 | 1.7 | 178,464,236 | 1.6 | 196,208,200 |

N.A. = Not Available.

[1] Does not include Alaska and Hawaii.

SOURCE: U. S. Department of Commerce, Bureau of the Census; "Survey of Buying Power," Sales Management.

## Average Effective Buying Income Per Family Trends

Between 1956 and 1966, effective buying income of the average study area family was about 10 to 20 per cent lower than averages for Iowa, Illinois and the nation. However, buying income increased at a faster rate during this period than did the statewide and national averages. Between 1956 and 1961, study area family incomes increased at an average rate of 4.1 per cent per year, accelerating to 6.7 per cent annually between 1961 and 1966. In 1966, average effective buying income per family in the three-county study area was $7,572, considerably below the statewide averages of $8,416 in Iowa and $9,998 in Illinois. The national average was $8,522.

## Trends in Motor Vehicle Registration

Between 1956 and 1961, automobile registrations in Hancock and Lee Counties combined grew at an average annual rate of 1.4 per cent. During the next five years, growth in registration accelerated to an average of 3.4 per cent per year. The study area growth pattern generally followed statewide trends in Iowa, Illinois and Missouri and the national growth trend.

## Motor Fuel Consumption Trends

Reflecting the increases in personal income and motor vehicle registrations over the last decade, personal travel, as measured by motor fuel consumption, also increased. In Iowa, motor fuel consumption increased an average of 2.0 per cent per year between 1956 and 1961 and 2.5 per cent annually between 1961 and 1966. During the same periods, motor fuel consumption in Illinois increased 2.4 and 3.6 per cent per year, respectively; in Missouri the comparable growth rates were 2.3 and 3.1 per cent. The national growth trend was somewhat higher.

## Future Growth

Population projections for the bridge study area indicate that a continuation of the generally stable population trend experienced in recent years is anticipated. As shown in Table II-2, it is estimated that the 1960 population of the three-county study area of 77,506 will increase to 81,240 by 1980, an

TABLE II-2

POPULATION PROJECTIONS

| AREA | 1960 | AVERAGE ANNUAL PER CENT CHANGE | 1980 |
|---|---|---|---|
| *Cities:* | | | |
| Donnellson | 709 | 1.3 | 921 |
| Keokuk | 16,316 | — — | 16,367 |
| *Counties:* | | | |
| Clark | 8,725 | — 0.8 | 7,090[1] |
| Hancock | 24,574 | 0.7 | 28,450 |
| Lee | 44,207 | 0.1 | 45,700 |
| Three-County Total | 77,506 | 0.2 | 81,240 |
| *States:* | | | |
| Illinois | 10,081,158 | 1.5 | 13,337,150 |
| Iowa | 2,757,537 | 0.7 | 3,192,000 |
| Missouri | 4,319,813 | 1.3 | 5,647,200[1] |

[1] Interpolated from 1970-1990 projections prepared by the Missouri Highway Department.

SOURCE: Iowa data from Iowa State Highway Commission, Bureau of Planning; Illinois data from Illinois Department of Business and Economic Development; Missouri data from Division of Highway Planning, Missouri Highway Department.

average annual increase of 0.2 per cent. The population of Keokuk is expected to remain virtually constant over the forecast period while Donnellson will experience a projected annual increase averaging 1.3 per cent per year. Growth in the study area is estimated to be somewhat lower than average annual increases projected for Iowa (0.7 per cent), Illinois (1.5 per cent), and Missouri (1.3 per cent).

As leisure time and general prosperity increase, recreational travel will become a more important component of total future trip-making. State parks and state forests are located on both sides of the river in or adjacent to the study area. These include Nauvoo and Argyle Lake State Parks in Illinois as well as Geode State Park and Shimek State Forest in Iowa. Pleasure driving and recreational travel is also expected to increase in importance as additional recreational facilities are developed, such as the "Great River Road" project on both sides of the Mississippi River. These factors can be expected to encourage trans-river travel movements potential to the proposed Keokuk Bridge.

Continued expansion of suburban development on the Illinois side of the river in Hamilton, which is presently heavily oriented toward industrial and service employment opportunities in Keokuk, is another factor which will act to increase future trans-river travel.

## TRAFFIC STUDIES

Preliminary studies were made to evaluate the traffic potential of the proposed Keokuk Bridge. These studies included route reconnaissance investigations to evaluate the quality of traffic service provided by alternative trans-river crossings, as well as essembly and analysis of data relating to magnitude and composition of traffic and present trans-river travel patterns.

### Route Reconnaissance

U. S. Route 136 approaches Keokuk from the east, through Hancock County, Illinois. In the study area, it is a two-lane paved road with generally good alignment. It is carried across the Mississippi River via the Keokuk Municipal Bridge and then proceeds generally westerly through Keokuk to a junction with U. S. Routes 61 and 218 just north of the Des Moines River crossing into Missouri. Through Keokuk, U. S. Route 136, as a city street, has a pavement width varying from 30 to 36 feet. This urban section of the route has a sufficiency rating which is below satisfactory standards and reconstruction is scheduled in the current Five-Year Iowa Construction Program.

U. S. Routes 61 and 218 proceed generally northerly out of Keokuk. Beyond the city line the routes follow a common alignment with a 24-foot pavement width. This section has a "critical" sufficiency rating and is scheduled for early improvement. From the U. S. 218 junction northward to Iowa Route 2, west of Fort Madison, U. S. Route 61 has an "excellent" sufficiency rating. U. S. Route 218 northward from its junction with U. S. Route 61, north of Keokuk, has a pavement width varying from 18 to 20 feet, to a point beyond the Henry County line. This section has an "unsatisfactory" sufficiency rating and is also scheduled for early improvement. The portion of Iowa Route 2, west of U. S. Route 218, has a 24-foot pavement width and an "excellent" sufficiency rating in Lee County. Illinois Route 96 which serves the study area as a generally north-south facility, has a two-lane paved surface. There are also numerous county roads which serve as feeder routes to the U. S. and State Highways in Illinois. These are generally in good to poor condition.

Posted speed limits in the bridge study area range downward from the daytime limit of 70 miles per hour for automobiles on rural sections of the principal Iowa routes, to less than 30 miles per hour in built-up areas. Speed and delay surveys revealed generally good travel conditions with no difficulty in maintaining speeds close to posted limits.

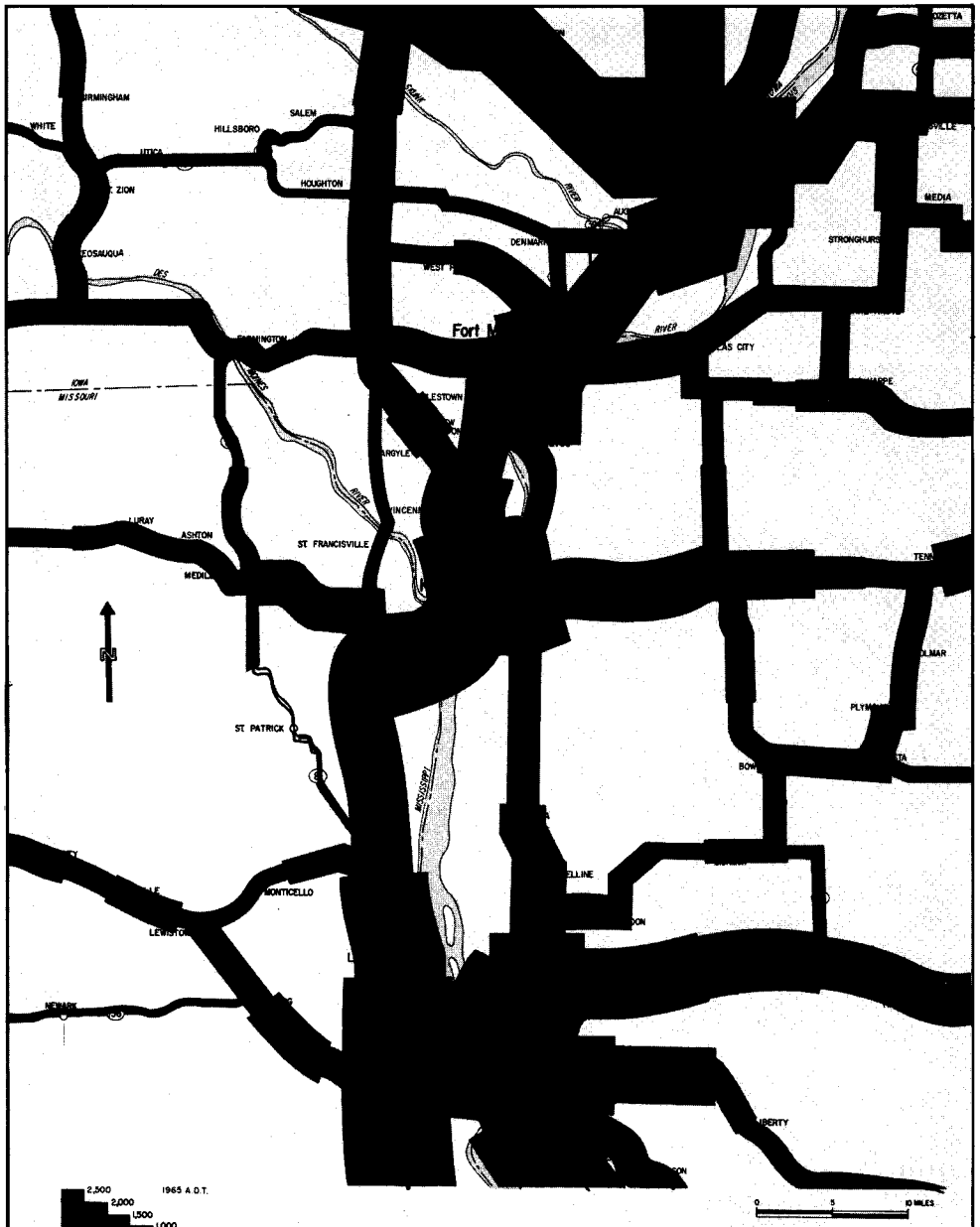
## Present Traffic Volumes

The importance of study area highways, in terms of relative traffic volumes, is depicted in Exhibit II-2. U. S. Route 136 is the principal east-west traffic artery through the study area in Illinois. West or north of the river, U. S. Routes 136 and 218 which link Keokuk with Iowa Route 2, carry moderate traffic volumes. U. S. Route 61 is an important north-south travel route in the Iowa and Missouri portions of the study area. Illinois Routes 96 and 94 carry relatively light traffic volumes compared to U. S. Route 61.

Within Keokuk, U. S. Route 218 (Main Street) carries the heaviest traffic in the city with volumes ranging from a high of around 10,000 vehicles per day in the central business district to between 5,000-6,000 vehicles per day near the northern city limits. U. S. Route 136 accommodates considerably lower traffic volumes through the urban area. U. S. Route 61, which serves as a western bypass of the city, also carries relatively light traffic within the confines of the urban area.

## Annual Traffic Trends

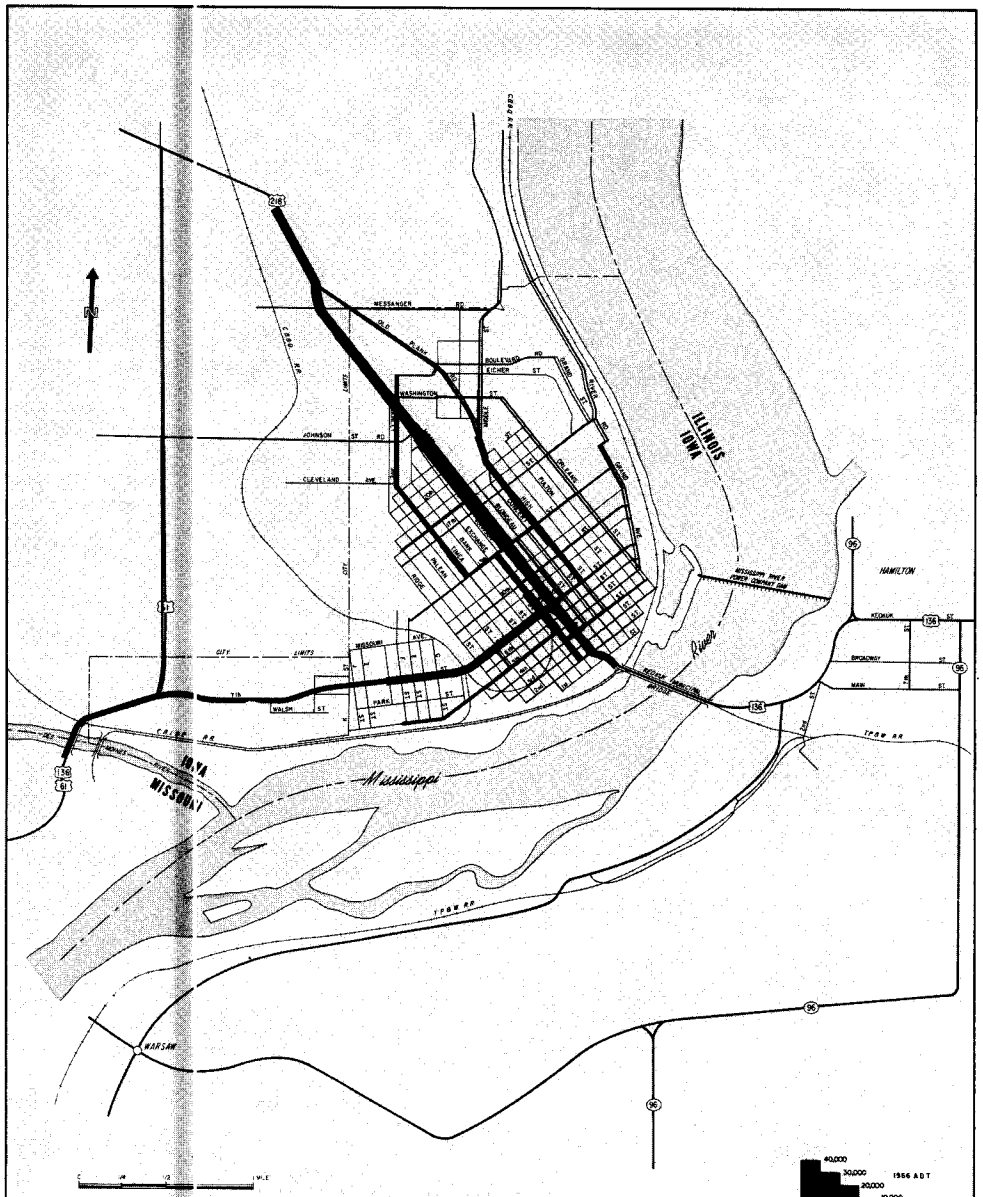
Annual traffic and revenue trends for the Keokuk Municipal Bridge were assembled and reviewed. In addition, annual average daily traffic on the closest alternative crossing, the Fort Madison Bridge was also reviewed and evaluated.




# REGIONAL TRAFFIC FLOW MAP

1965 AVERAGE DAILY TRAFFIC

*Wilbur Smith and Associates*




# TRAFFIC FLOW MAP

KEOKUK AREA

1966 AVERAGE DAILY TRAFFIC

**EXHIBIT II-2**

*Keokuk Municipal Bridge* — As shown in Table II-3, a total of 1,906,158 vehicles used the Keokuk Municipal Bridge during 1967, producing annual revenues of $255,624. However, 1967 traffic was somewhat influenced by street construction work in the downtown area; this is reflected by the 3.0 per cent decrease realized below 1966 levels. Traffic growth over the three-year period, 1963-1966, increased 4.6 per cent annually while revenues increased an average of 2.2 per cent per year.

TABLE II-3

ANNUAL TRAFFIC AND REVENUE TRENDS

Keokuk Municipal Bridge

| YEAR | ANNUAL TRAFFIC | PER CENT CHANGE | ANNUAL REVENUE | PER CENT CHANGE |
|---|---|---|---|---|
| 1963 | 1,706,585 | | $244,139 | |
| | | 2.9 | | — 0.1 |
| 1964 | 1,756,426 | | 243,959 | |
| | | 5.5 | | 9.3 |
| 1965 | 1,852,680 | | 266,673 | |
| | | 5.4 | | 1.4 |
| 1966 | 1,953,190 | | 270,473 | |
| | | — 3.0 | | — 5.5 |
| 1967[1] | 1,906,158 | | 255,624 | |
| *AVERAGE ANNUAL PER CENT CHANGE* | | | | |
| 1963-1966 | | 4.6 | | 2.2 |

[1] Street construction work in downtown Keokuk affected bridge usage.

SOURCE: Keokuk Bridge Commission.

As shown in Table II-4, daily traffic on the Keokuk Bridge in 1966 averaged 5,400 vehicles. This represented an average annual growth of 3.6 per cent over the 3,800 daily crossings recorded in 1956.

TABLE II-4

ANNUAL TRAFFIC TRENDS

Trans-River Crossings

| YEAR | KEOKUK MUNICIPAL BRIDGE | FORT MADISON BRIDGE |
|---|---|---|
| | (Annual Average Daily Traffic) | |
| 1956 | 3,800 | 1,850 |
| 1959 | 4,300 | 1,850 |
| 1962 | 4,500 | 1,950 |
| 1965 | 5,100 | 2,395[1] |
| 1966 | 5,400 | 2,050 |
| *AVERAGE ANNUAL PER CENT CHANGE* | | |
| 1956-1966 | 3.6 | 1.0 |

[1] Spring flood closed several bridges to the north and resulted in abnormally high traffic volumes.

SOURCE: State of Illinois, Department of Public Works, Division of Highways.

*Fort Madison Bridge* — Average daily traffic on the Fort Madison Bridge increased from 1,850 vehicles in 1956 to 2,050 in 1966, an average annual growth of 1.0 per cent. In 1965, spring floods closed several bridges to the north, temporarily resulting in abnormally high traffic at the Fort Madison crossing.

## Monthly Traffic Variations

Monthly traffic variations at the Keokuk Municipal Bridge have remained relatively stable over the past several years. Traffic is at minimum levels during winter months, close to average annual levels during spring and fall and reaches a peak in summer. In 1967, variations from the average month ranged from 21 per cent below average in February to 13 per cent above in July.

## Origin and Destination Studies

During the summer of 1966, the Iowa State Highway Commission conducted an origin and destination traffic survey in Keokuk. As part of this survey, roadside interviews were conducted on typical summer weekdays with motorists using the Keokuk Municipal Bridge. Information from this survey formed the basis for the travel patterns used in this study.

## Vehicle Classification Counts

A summary of recent vehicle classification counts at the Keokuk Municipal Bridge, made by the Iowa State Highway Commission, is shown in Table II-5.

TABLE II-5

VEHICLE CLASSIFICATION COUNT SUMMARY
Keokuk Municipal Bridge

| VEHICLE CLASSIFICATION | 1965 AVERAGE DAILY TRAFFIC | PER CENT OF TOTAL |
|---|---|---|
| Passenger Cars | 4,713 | 83.4 |
| Trucks: | | |
| Two-Axle | 767 | 13.6 |
| Three-Axle | 42 | 0.7 |
| Four-Axle | 55 | 1.0 |
| Five-Axle | 73 | 1.3 |
| TOTAL | 5,650 | 100.0 |

SOURCE: Iowa State Highway Commission.

Passenger cars represented 83.4 per cent of all vehicles using the bridge and combined with two-axle trucks to account for 97 per cent of total traffic. In the heavy truck categories, three-axle vehicles amounted to 0.7 per cent of all traffic; four-axle vehicles made up 1.0 per cent and five-or-more axle vehicles — 1.3 per cent.

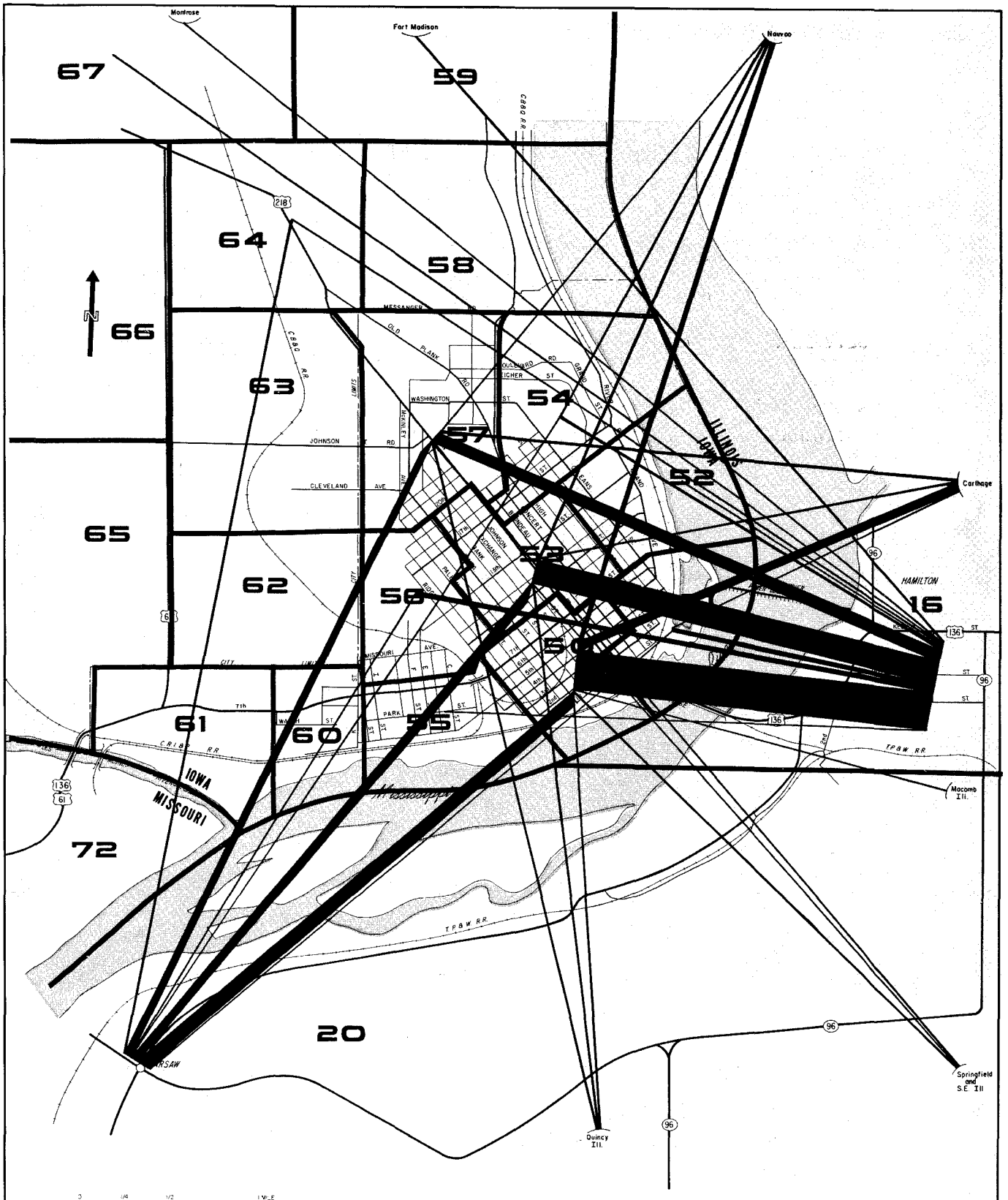
## Travel Desires

The traffic movements crossing the Keokuk Municipal Bridge during the 1966 origin and destination survey were coded, for analysis purposes, to the geographic traffic zone pattern partially shown in Exhibit II-3. The resulting zone-to-zone movements were then adjusted to represent an average day in 1966 and the travel desire lines, also shown in Exhibit II-3, prepared. The width of the traffic flow bands illustrated are proportional to the number of trips between each zone pair.

The bulk of the traffic found using the Keokuk Bridge was local in nature, involving trips moving between the Keokuk urban area and the nearby municipalities of Hamilton and Warsaw in Illinois. Relatively little long-distance or through trips were measured. Keokuk also exchanged significant movements with the Illinois communities of Nauvoo, Carthage and Quincy. Within Keokuk, the downtown area was, by far, the heaviest generator or attractor of trans-river trips.

## Typical Time and Distance Relationships

Representative time and distance relationships for several movements which could use either the proposed Keokuk Bridge, or the closest crossing to the north, are shown in Table II-6. The travel distances and times indicated were developed from the route reconnaissance studies conducted on pertinent roadways in the study area. The driving times shown represent average speeds rather than the fastest time that can be achieved between the various trip termini indicated.




# TRAVEL DESIRES

## PRESENT KEOKUK BRIDGE

### 1966 AVERAGE DAILY TRAFFIC

*Wilbur Smith and Associates*

**EXHIBIT II-3**

## ESTIMATED TRAFFIC AND REVENUES

Estimated traffic and revenues for the proposed Keokuk Bridge are based upon the number of motorists now using the present Keokuk Municipal Bridge who would continue to make trans-river trips via an improved facility, under revised toll conditions. In addition, possible diversion of some motorists to the new bridge from the closest alternative crossing to the north as well as possible diversion from the Keokuk crossing to the northern bridge, was studied.

### Basic Assumptions

Estimates of traffic and revenues for the proposed Keokuk Bridge are predicated on the following assumptions:

1. The facility will be opened to traffic on July 1, 1971.
2. The bridge and approaches will be constructed on one of the alignments discussed in this report.
3. The recommended toll schedule will be implemented.
4. The present Keokuk Municipal Bridge will be closed to highway traffic upon opening of the new facility.
5. No new river crossings will be constructed in the reach of the Mississippi River between Keokuk and Quincy or on the Des Moines River between Keokuk and Vincennes.
6. The new bridge will be adequately maintained, efficiently operated, and effectively signed to encourage maximum usage.
7. The present general trend in economic activity in the bridge study area will continue and no national emergency will arise which would abnormally restrict the use of motor vehicles.

Any departure from the above conditions could materially affect estimated traffic and revenues for the proposed bridge.

## Recommended Method of Toll Collection

It is recommended that tolls be collected from all motorists using the proposed bridge at a toll plaza located on or near the western approach of the facility. The number of toll lanes required and "mix" between attended and automatic lanes would be determined after more detailed traffic and revenue analysis. However, it appears that initially more than two toll lanes would be required and that consideration should be given in the initial design for future expansion beyond perhaps four lanes. The proposed toll schedule would lend itself to the use of automatic lanes as well as manual, or attended lanes.

## Recommended Toll Schedule

Several toll rates were analyzed to determine the optimum toll structure for the proposed Keokuk Bridge. These studies indicated that the preliminary toll schedule, shown in Table II-7, would produce maximum revenues for the proposed facility while still maintaining a reasonable level of traffic service. A higher toll would tend to discourage usage and would also place an unreasonable financial burden on those persons dependent on the facility for work trips

TABLE II-7

RECOMMENDED TOLL SCHEDULE

| VEHICLE CLASS | DESCRIPTION | TOLL |
|---|---|---|
| 1 | Two-Axle Vehicles (cash) | $0.60 |
| 2 | Two-Axle Vehicles (ticket) | 0.30 |
| 3 | Three-Axle Vehicles and Vehicle Combinations | 0.90 |
| 4 | Four-Axle Vehicles and Vehicle Combinations | 1.20 |
| 5 | Five-Axle Vehicles and Vehicle Combinations | 1.50 |
| | Each Additional Axle | 0.30 |

or other necessary trans-river movements. As indicated previously, a high percentage of local traffic now crossing at Keokuk has no real alternative trans-river travel route. Conversely, a lower toll would tend to increase usage, but not sufficiently to produce higher toll revenues than those projected.

Under the recommended toll schedule, drivers of two-axle vehicles would pay a cash toll of $0.60 for each crossing. A commutation, or ticket toll, would be available to two-axle vehicle patrons who use the bridge frequently. The commutation rate would be $0.30 per crossing and could take the form of a ten or twenty-trip ticket book costing $3.00 or $6.00 with an appropriate time limit. Upon surrendering a ticket, the commuting motorists would also have to show the toll ticket book to the attendant. Larger vehicles would be charged a toll based on a rate of $0.30 per axle. For example, three-axle vehicles and vehicle combinations would pay a $0.90 toll while four-axle vehicles and vehicle combinations would pay a toll of $1.20. The recommended per-axle toll would provide maximum control and auditing benefits as well as being easily understood by bridge users.

While two-axle vehicle motorists would be charged a considerably higher toll than now charged on the Keokuk Municipal Bridge, they would be provided with a much superior facility. Delays for river traffic openings would be eliminated. Truck tolls for vehicles with four-or-more axles would be equal to or lower than those now assessed.

## Estimated Base Year (1966) Traffic Assignments

The number of motorists who would use the proposed Keokuk Bridge at base year (1966) traffic levels, under the proposed toll schedule, was estimated based upon relative trip costs via the closest river crossing to the north versus the proposed new facility. An analysis of trans-river trip patterns on the Keokuk Municipal Bridge and evaluation of travel-time studies indicated the proposed new bridge would not attract trips presently using the Quincy Bridge, some 40 miles south of Keokuk.

Previous studies indicate a good correlation between the ratio of road-user cost and the proportion of vehicles that will use alternative routes available. In general, equal costs for alternate routes indicates an equal division of a traffic movement. A high ratio of trip costs for use of a new bridge to costs via the most competitive present routing, indicates a low percentage of traffic assignable to the proposed facility. Conversely, a low ratio of road-user costs via the new facility to costs via the most competitive alternative routing, indicates that a high percentage of traffic is divertible.

The route reconnaissance studies made during the field phases of this project were used as the basis for assigning trip times and distances via alternative crossings. In addition to mileage and time costs, tolls were also added to arrive at total estimated trip cost. The travel patterns determined from the origin and destination studies conducted in 1966 by the Iowa State Highway Commission were used to determine a redistribution of trans-river trips assuming the proposed Keokuk Bridge was constructed.

Since the recommended tolls for the proposed facility are somewhat higher than those in effect on the present Keokuk Municipal Bridge, it was estimated that some motorists would divert to the Fort Madison Bridge. In addition, the higher toll is expected to result in a decrease in overall trip production through some "car-pooling" of work trips and fewer trans-river shopping and social trips. A determination of the magnitude of this decrease in travel due to toll impact was based on trip purpose data obtained from the Comprehensive Study surveys conducted in Keokuk and on experience on comparable facilities elsewhere.

Independent assignments were made for two separate bridge construction conditions in Keokuk. A third condition was also studied whereby only a Western Bypass Bridge would be constructed — but traffic assigned to this alignment alone was somewhat less than assignments for a Main Street location. This, together with the resulting inconvenience and excessive travel and travel time for the primary traffic movement between downtown Keokuk and Hamilton, served to eliminate construction of a Western Bypass Bridge alone, from further consideration. The two primary bridge study conditions were for a Main

Street bridge alignment alone and for a combination Main Street and Western Bypass crossing program.

Analysis of the two-bridge condition indicated that only 988 vehicles per day, at 1966 base-year levels, would use the Western Bypass crossing with another 3,280 vehicles assigned to the Main Street location. Assuming equal development or construction costs at both bridge sites, the Western Bypass location would be far less feasible than the Main Street alternate. In addition, since all of the 988 vehicles assigned to the Western Bypass would transfer or be assignable to a Main Street facility (if only the latter were constructed) implementation of a two-bridge construction program would dilute the feasibility of constructing new crossings in the Keokuk area. On this basis, continued study was given only to consideration of constructing a new bridge at Keokuk on the proposed Main Street alignment shown in Exhibit II-1.

The traffic assignments to the Main Street location do not reflect any diversion of motorists to the new facility from the present bridges at Quincy or Fort Madison. Both of these crossings provide reasonable levels of traffic service, with no weight limitations on truck use. In addition, the two bridges are a considerable distance from Keokuk and the toll at Fort Madison is lower than that recommended for the proposed Keokuk Bridge while the Quincy facility is toll-free.

As shown in Table II-8, an estimated 4,268 vehicles, at 1966 traffic levels, were assigned to the proposed Keokuk Bridge (Main Street location) at

TABLE II-8

ESTIMATED BASE-YEAR (1966) DIVERTED TRAFFIC

| VEHICLE CLASS | DESCRIPTION | AVERAGE DAILY TRAFFIC |
|---|---|---|
| 1 | Two-Axle Vehicles | 1,785 |
| 2 | Two-Axle Vehicles (ticket) | 2,307 |
| 3 | Three-Axle Vehicles and Vehicle Combinations | 41 |
| 4 | Four-Axle Vehicles and Vehicle Combinations | 59 |
| 5 | Five-or-More Axle Vehicles and Vehicle Combinations | 76 |
| | TOTAL | 4,268 |

the recommended toll rate. Of the total 1,785 were two-axle vehicle motorists who would pay the cash toll and 2,307 two-axle vehicle motorists who would avail themselves of the commutation rate. An additional 41 — three-axle vehicles, 59 — four-axle vehicles and 76 — five-or-more axle vehicles were assigned to the bridge.

## Estimated Annual Traffic and Toll Revenues

Annual growth in usage of the proposed Keokuk Bridge was estimated based upon normal increases in trans-river traffic which might be anticipated over the next several years in the bridge travel corridor, and also on generated and development traffic. Generated traffic consists of additional trips made by motorists now moving in the bridge travel corridor, solely due to the convenience and the attractiveness of the new facility. Development traffic is caused by growth in residential, commercial and industrial activity resulting from location and access advantages afforded by and directly attributed to the proposed bridge.

Estimates of normal growth in the travel corridor were based upon trends in actual use of the present Keokuk Municipal Bridge as well as the Fort Madison crossing to the north. In addition, trends and projected increases in population and other economic parameters in the bridge study area were considered.

It is estimated that a normal corridor traffic growth of 4.0 per cent per year will occur on the proposed Keokuk Bridge between 1966 and 1974. This is estimated to decrease to 3.5 per cent annually between 1974 and 1977, to 3.0 per cent per year between 1977 and 1981, and to 2.5 per cent per year thereafter through 1985. For purposes of conservatism, no normal traffic growth was projected beyond 1985, although some increase in usage is anticipated.

The estimate of induced, or generated and development growth, was based on experience during the early years of operation of similar facilities, consideration of operating characteristics of the existing bridge and the development potential of the study area. The present Keokuk Municipal Bridge has

narrow lane widths, less-desirable approaches than the proposed crossing and periodic delays for river traffic. While truck movements are not restricted by weight limitations, lateral clearances for large vehicles are uncomfortable. The proposed bridge would be a high-level structure, eliminating the interruptions to trans-river traffic service now resulting from openings of the swing-span on the present Combination Bridge to permit passage of river navigation. In addition, it would be designed as a modern facility with ample lane width and good approaches. Therefore, a traffic inducement of 5.0 per cent was estimated during the first full year of operation of the proposed crossing.

As shown in Table II-9, it is estimated that an average of 5,450 vehicles per day will use the proposed Keokuk Bridge during its first full year of operation, beginning July 1, 1971, producing gross toll revenues of $925,000. By 1985, the fifteenth year of operation, an estimated 8,450 vehicles per day will use the crossing, resulting in gross annual revenues of $1,434,000.

Average annual toll revenues over the first five years of operation are estimated at $1,001,000. Over the 28-year earning period of the assumed bond issue, average annual gross revenues are estimated at $1,301,000.

These estimates are preliminary and intended to show the earning trend over a period of years rather than the exact earnings for any particular year. There could, of course, be years in which growth in traffic and revenues might be higher or lower than indicated, depending upon economic conditions and other local factors that might affect bridge usage at that time.

TABLE II-9

ESTIMATED ANNUAL TRAFFIC AND REVENUES

| FISCAL YEAR[1] | AVERAGE DAILY TRAFFIC | GROSS REVENUES |
|---|---|---|
| 1971 | 5,450 | $ 925,000 |
| 1972 | 5,670 | 963,000 |
| 1973 | 5,900 | 1,001,000 |
| 1974 | 6,130 | 1,041,000 |
| 1975 | 6,350 | 1,077,000 |
| 1976 | 6,570 | 1,115,000 |
| 1977 | 6,800 | 1,154,000 |
| 1978 | 7,000 | 1,189,000 |
| 1979 | 7,210 | 1,225,000 |
| 1980 | 7,430 | 1,261,000 |
| 1981 | 7,650 | 1,299,000 |
| 1982 | 7,850 | 1,332,000 |
| 1983 | 8,040 | 1,365,000 |
| 1984 | 8,240 | 1,399,000 |
| 1985 | 8,450 | 1,434,000 |
| Next 13 Years Annually | 8,450 | $1,434,000 |
| *AVERAGE ANNUAL GROSS REVENUES* | | |
| First Five Years | | $1,001,000 |
| First Ten Years | | $1,095,000 |
| Twenty-eight Years | | $1,301,000 |

[1] Twelve-month period beginning July1.

## PRELIMINARY PROJECT FEASIBILITY

Annual net revenues to be derived from the proposed Keokuk Bridge were determined by deducting annual maintenance and operating costs, developed by Howard, Needles, Tammen & Bergendoff, from gross revenues anticipated from the project. Preliminary project feasibility computations were then made by relating estimated annual net revenues to the maximum interest and level debt service requirements of an assumed bond issue sufficient to meet estimated capital costs of the proposed bridge.

### Estimated Annual Net Revenues

Estimated annual net revenues for the proposed Keokuk Bridge are shown in Table II-10. In the first full year of operation, net revenues of $840,000 are estimated, increasing to $1,279,000 by 1985. Over the first five years of operation, average annual net revenues are estimated at $906,000. Average annual net revenues over the 28-year earning period of the assumed bond issue are estimated at $1,165,000.

### Preliminary Project Feasibility

There are two "tests" which financial advisors normally employ to determine the relative range of feasibility of a toll project. The first is the coverage of first-year (maximum) interest by first-year net revenues. The second is the coverage of level debt service by average annual net revenues over the earning period of the assumed bond issue.

As a measure of feasibility, financial interests normally regard a first-year coverage of maximum interest of 1.20 to be satisfactory. An average annual net revenue coverage of level debt service in excess of 1.50 is usually considered indicative of financial feasibility.

TABLE II-10

ESTIMATED ANNUAL NET REVENUES

| FISCAL[1] YEAR | GROSS REVENUES | MAINTENANCE AND[2] OPERATING COSTS | NET REVENUES |
|---|---|---|---|
| 1971 | $ 925,000 | $ 85,000 | $ 840,000 |
| 1972 | 963,000 | 90,000 | 873,000 |
| 1973 | 1,001,000 | 95,000 | 906,000 |
| 1974 | 1,041,000 | 100,000 | 941,000 |
| 1975 | 1,077,000 | 105,000 | 972,000 |
| 1976 | 1,115,000 | 110,000 | 1,005,000 |
| 1977 | 1,154,000 | 115,000 | 1,039,000 |
| 1978 | 1,189,000 | 120,000 | 1,069,000 |
| 1979 | 1,225,000 | 125,000 | 1,100,000 |
| 1980 | 1,261,000 | 130,000 | 1,131,000 |
| 1981 | 1,299,000 | 135,000 | 1,164,000 |
| 1982 | 1,332,000 | 140,000 | 1,192,000 |
| 1983 | 1,365,000 | 145,000 | 1,220,000 |
| 1984 | 1,399,000 | 150,000 | 1,249,000 |
| 1985 | 1,434,000 | 155,000 | 1,279,000 |
| Next 13 Years Annually | $1,434,000 | $155,000 | $1,279,000 |

*AVERAGE ANNUAL NET REVENUES*

| | |
|---|---|
| First Five Years | $ 906,000 |
| First Ten Years | $ 988,000 |
| Twenty-eight Years | $1,165,000 |

[1] Twelve-month period beginning July 1.

[2] Estimated by Howard, Needles, Tammen & Bergendoff.

The feasibility computations shown in Table II-11 were developed assuming a bond interest rate of 5.5 per cent and a bond term of 30 years. Based on project costs developed by Howard, Needles, Tammen & Bergendoff, it is estimated that a bond issue of $6,030,000 would be required to construct the bridge on the proposed Main Street alignment. The escalation from estimated project costs to bond issue size includes such financing items as bond discount, legal and financial fees and capitalized interest during construction. Based upon the relationship between project costs and bond issue size for several comparable projects which have been successfully financed, a factor of 1.2 was applied to project cost to determine a preliminary bond issue.

TABLE II-11

PRELIMINARY PROJECT FEASIBILITY

| ITEM | DESCRIPTION |
|---|---|
| Bond Term | 30 Years |
| Bond Earning Period | 28 Years |
| Bond Interest Rate | 5.5 Per Cent |
| Preliminary Project Cost[1] | $5,025,000 |
| Estimated Bond Issue[2] | 6,030,000 |
| First Year Interest | 332,000 |
| Level Debt Service over 28 Years | 427,000 |
| Estimated First-Year Net Revenues | 840,000 |
| Estimated Average Annual Net Revenues over 28 Years | 1,165,000 |
| *COVERAGES* | |
| First-Year Interest by First-Year Net Revenues | 2.53 |
| Level Debt Service by Average Annual Net Revenue over 28 Years | 2.73 |

(1) Estimated by Howard, Needles, Tammen & Bergendoff.

(2) Assumes ratio of project cost to bond issue of 1.0 to 1.2.

As shown in Table II-11, estimated first-year net revenues for the proposed Keokuk Bridge would cover first-year interest 2.53 times. Average annual net revenues would provide a 2.73 coverage of level debt service. Both coverage values are substantially above the minimum levels usually considered adequate for revenue financing.

It should be emphasized, however, that the above computations were developed only as a general guide and a final determination of feasibility should be made by financial advisors selected for this purpose.

## Relationship Between Level Debt Service and Net Revenues

An indication of amount of surplus funds which would be accumulated during the earning period of the bond issue or the difference between annual net revenues and annual level debt service payments is shown in Table II-12.

It is estimated that the proposed Keokuk Bridge would incur an annual surplus of $431,000 in the first full year of operation. This would increase to an estimated $852,000 annually by 1985. The total surplus is estimated at $20,651,000.

TABLE II-12

RELATIONSHIP BETWEEN LEVEL DEBT SERVICE AND NET REVENUES

| YEAR[1] | NET REVENUES | LEVEL DEBT SERVICE | NET REVENUES TO LEVEL DEBT SERVICE Surplus |
|---|---|---|---|
| 1971 | $ 840,000 | $427,000 | $ 413,000 |
| 1972 | 873,000 | 427,000 | 446,000 |
| 1973 | 906,000 | 427,000 | 479,000 |
| 1974 | 941,000 | 427,000 | 514,000 |
| 1975 | 972,000 | 427,000 | 545,000 |
| 1976 | 1,005,000 | 427,000 | 578,000 |
| 1977 | 1,039,000 | 427,000 | 612,000 |
| 1978 | 1,069,000 | 427,000 | 642,000 |
| 1979 | 1,100,000 | 427,000 | 673,000 |
| 1980 | 1,131,000 | 427,000 | 704,000 |
| 1981 | 1,164,000 | 427,000 | 737,000 |
| 1982 | 1,192,000 | 427,000 | 765,000 |
| 1983 | 1,220,000 | 427,000 | 793,000 |
| 1984 | 1,249,000 | 427,000 | 822,000 |
| 1985 | 1,279,000 | 427,000 | 852,000 |
| 1986 | 1,279,000 | 427,000 | 852,000 |
| 1987 | 1,279,000 | 427,000 | 852,000 |
| 1988 | 1,279,000 | 427,000 | 852,000 |
| 1989 | 1,279,000 | 427,000 | 852,000 |
| 1990 | 1,279,000 | 427,000 | 852,000 |
| 1991 | 1,279,000 | 427,000 | 852,000 |
| 1992 | 1,279,000 | 427,000 | 852,000 |
| 1993 | 1,279,000 | 427,000 | 852,000 |
| 1994 | 1,279,000 | 427,000 | 852,000 |
| 1995 | 1,279,000 | 427,000 | 852,000 |
| 1996 | 1,279,000 | 427,000 | 852,000 |
| 1997 | 1,279,000 | 427,000 | 852,000 |
| 1998 | 1,279,000 | 427,000 | 852,000 |
| | | TOTAL | $20,651,000 |

[1] Twelve-month period beginning July 1.

# APPENDIX

Iowa Senate File 131

The General Bridge Act

Chap. CCXLVI - 39th Congress

STATE HIGHWAY COMMISSION – INTERSTATE BRIDGES
SENATE FILE 131

AN ACT AUTHORIZING THE STATE HIGHWAY COMMISSION TO ACQUIRE, PURCHASE AND CONSTRUCT INTERSTATE BRIDGES, APPROACHES THERETO AND SITES THEREFOR, TO RECONSTRUCT, COMPLETE, IMPROVE, REPAIR, REMODEL, CONTROL, MAINTAIN, AND OPERATE INTERSTATE BRIDGES, TO ESTABLISH TOLLS AND CHARGES FOR THE USE OF INTERSTATE BRIDGES, TO BORROW MONEY AND ISSUE BONDS PAYABLE SOLELY FROM THE REVENUES DERIVED FROM THE OPERATION OF INTERSTATE BRIDGES, AND TO REFUND BONDS PAYABLE FROM SUCH REVENUES.

BE IT ENACTED BY THE GENERAL ASSEMBLY OF THE STATE OF IOWA:

Section 1. The following words or terms, as used in this Act, shall have the respective meanings as stated:

"Toll bridge" shall mean an interstate bridge constructed, purchased or acquired under the provisions of this Act, upon which tolls are charged, together with all appurtenances, additions, alterations, improvements, and replacements thereof, and the approaches thereto, and all lands and interests therein used therefor, and buildings and improvements thereon.

"Commission" shall mean the state highway commission, the agency of the state of Iowa created and provided for under the provisions of chapter three hundred seven (307) of the Code.

"Construct, constructing, construction or constructed" shall include the reconstruction, remodeling, repair, or improvement of any existing toll bridge as well as the construction of any new toll bridge.

"Acquisition by purchase, gift, or condemnation" as used in this Act shall mean acquisition by the state highway commission, whether such terms "purchase, gift, or condemnation" are used singularly or in sequence.

Section 2. The state highway commission shall have full charge of the construction and acquisition of all toll bridges constructed or acquired under the provisions of this Act, the operation and maintenance thereof and the imposition and collection of tolls and charges for the use thereof. The commission shall have full charge of the design of all toll bridges constructed under the provisions of this Act. The commission shall proceed with the construction of such toll bridges and other facilities and the approaches thereto by contract immediately upon there being made available funds for such work and shall prosecute such work to completion as rapidly as practicable. The commission shall advertise for bids for the construction, reconstruction, improvement, repair or remodeling of any toll bridge by publication of a notice once each week for at least two (2) consecutive weeks in a newspaper published and having a general circulation throughout the state of Iowa, the first publication to appear at least fifteen (15) days prior to the date set for receiving bids. The commission shall have the power to accept such offer or offers, propositions or bids, and enter into such contract or contracts as it shall deem to be to the best interest of the state.

Section 3. The commission is hereby authorized to establish and construct toll bridges upon any public highway, together with approaches thereto, wherever it is considered necessary or advantageous and practical for crossing any navigable river between this state and an adjoining state. The necessity or advantage and practicality of any toll bridge shall be determined by the commission. To obtain information for the consideration of the commission upon the construction of any toll bridge or any other matter pertaining thereto, any officer or employee of the state, upon the request of the commission, shall make reasonable examination, investigation, survey, or reconnaissance to determine material facts pertaining thereto and shall report such findings to the commission. The cost thereof shall be borne by the department or office conducting it from funds provided for its functions.

Section 4. The commission is hereby authorized to enter into agreements with any federal bridge commission or any county, city, or town of this state, and with an adjoining state or county, city, or town thereof, for the purpose of implementing an investigation of the feasibility of any toll bridge project for the bridging of a navigable river forming a portion of the boundary of this state and such adjoining state. The commission may use any funds available for the purposes of this section. Such agreements may provide that in the event any such project is determined to be feasible and adopted, any advancement of funds by any state, county, city, or town may be reimbursed out of any proceeds derived from the sale of bonds or out of tolls and revenues to be derived from such project.

Section 5. Whenever the commission deems it necessary or advantageous and practical, it may acquire by gift, purchase, or condemnation any interstate bridge which connects with or may be connected with the public highways and the approaches thereto, except that the commission may not condemn an existing interstate bridge used for interstate highway traffic and combined highway and railway traffic and presently owned by a municipality, or a person, firm, or corporation engaged in interstate commerce. In connection with the acquisition of any such bridge, the commission and any federal bridge commission or any city, town, county, or other political subdivision of the state are authorized to do all acts and things as in this Act are provided for the establishing and constructing of toll bridges and operating, financing, and maintaining such bridges insofar as such powers and requirements are applicable to the acquisition of any toll bridge and its operation, financing, and maintenance. In so doing, they shall act in the same manner and under the same procedures as provided for establishing, constructing, operating, financing, and maintaining toll bridges insofar as such manner and procedures are applicable. Without limiting the generality of the above provisions, the commission is hereby authorized to cause surveys to be made to determine the propriety of acquiring any such bridge and the rights-of-way necessary therefor, and other facilities necessary to carry out the provisions hereof; to issue, sell, redeem bonds or issue and exchange bonds with present holders of outstanding bonds of bridges being acquired under the provisions of this Act and deposit and pay out of the proceeds of the bonds for the financing thereof; to impose, collect, deposit, and expend tolls therefrom; to secure and remit financial and other assistance in connection with the purchase thereof, and to carry insurance thereon.

Section 6. The commission, its officials, and all state officials are hereby authorized to perform such acts and make such agreements consistent with the law which are necessary and desirable in connection with the duties and powers conferred upon them regarding the construction, maintenance, and operation and insurance of toll bridges or the safeguarding of the funds and revenues required for such construction and the payment of the indebtedness incurred therefor. The commission shall adopt such rules and regulations in accordance with the provisions of chapter seventeen A (17A) of the Code as it may deem necessary for the administration and exercise of its powers and duties granted by this Act, and shall prepare annual financial statements regarding the operation of such toll bridges which shall be made available for inspection by the public and by the holders of revenue bonds issued by the commission under the provisions of this Act at all reasonable times.

Section 7. Whenever the commission deems it to be in the best interest of the primary highway system that any new toll bridge be constructed upon any public highway and across any navigable river between this state and an adjoining state, the commission shall adopt a resolution declaring that the public interest and necessity require the construction of such toll bridge and authorizing the issuance of revenue bonds in an amount sufficient for the purpose of obtaining funds for such construction. The issuance of bonds as provided in this Act for the construction, purchase, or acquisition of more than one (1) toll ridge may, at the discretion of the commission, be included in the same authority and issue or issues of bonds, and the commission is hereby authorized to pledge the gross revenues derived from the operation of any such toll bridge under its control and jurisdiction to pay the principal of and interest on bonds issued to pay the cost of purchasing, acquiring, or constructing any such toll bridge financed under the provisions of this Act. The commission is hereby granted wide discretion, in connection with the financing of the cost of any toll bridge, to pledge the gross revenues of a single toll bridge for the payment of bonds and interest thereon issued to pay the cost of such bridge and to pledge the gross revenues of two (2) or more toll bridges to pay bonds issued to pay the cost of one (1) or more toll bridges and interest thereon as long as the several bridges included herein are not more than ten (10) miles apart.

In addition, if the commission in its discretion determines that the construction of a toll bridge cannot be financed entirely through revenue bonds and that the construction of such toll bridge is necessary, the commission may advance funds from the primary highway fund to pay for that part of the construction cost, including the cost of approaches and all incidental costs, which is not paid out of the proceeds of revenue bonds. After all revenue bonds and interest thereon issued and sold pursuant to this Act and payable from the tolls and revenues of said bridge have been fully paid and redeemed or funds sufficient to pay said bonds and interest, including premium, if any, have been set aside and pledged for that purpose, then such amount advanced from the primary road fund shall be repaid to the primary road fund from the tolls and revenues of said bridge before said bridge is made a toll free bridge under the provisions of this Act.

Section 8. Whenever the commission shall authorize the construction of any toll bridge, the commission is empowered to secure rights-of-way therefor and for approaches thereto by gift or purchase or by condemnation in the manner provided by law for the taking of private property for public purposes.

Section 9. The right-of-way is hereby given, dedicated, and set apart upon which to locate, construct, and maintain toll bridges or approaches thereto or other highway crossings, and transportation facilities thereof or thereto, through, over or across any of the lands which are now or may be the property of this state, including highways; and through, over, or across the streets, alleys, lanes, and roads within any city, town, county, or other political subdivision of the state. If any property belonging to any city, town, county or other political subdivision of the state is required to be taken for the construction of any such bridge or approach thereto or should any such property be injured or damaged by such construction, such compensation therefor as may be proper or necessary and as shall be agreed upon may be paid by the commission to the particular county, city, town, or other political subdivision of the state owning such property, or condemnation proceedings may be brought for the determination of such compensation.

Section 10. Before the commission shall proceed with any action to secure right-of-way or with the construction of any toll bridge under the provisions of this Act, it shall first pass a resolution finding that public interest and necessity require the acquisition of right-of-way for and the construction of such toll bridge. Such resolution shall be conclusive evidence of the public necessity of such construction and that such property is necessary therefor. To aid the commission in determining the public interest, a public hearing shall be held in the county or counties of this state in which any portion of a bridge is proposed to be located. Notice of such hearing shall be published at least once in a newspaper published and having a general circulation in the county or counties where such bridge is proposed to be located, not less than twenty (20) days prior to the date of the hearing. When it becomes necessary for the commission to condemn any real estate to be used in connection with any such bridge, or to condemn any existing bridge, such condemnation shall be carried out in **a manner consistent with the provisions of chapters four hundred seventy-one (471)** and four hundred seventy-two (472) of the Code. In eminent domain proceedings to acquire property for any of the purposes of this Act, any bridge, real property, personal property, franchises, rights, easements, or other property or privileges appurtenant thereto appropriated or dedicated to a public use or purpose by any person, firm, private, public or municipal corporation, county, city or town, district, or any political subdivision of the state, may be condemned and taken, and the acquisition and use thereof as herein provided for the same public use or purpose to which such property has been so appropriated or dedicated, or for any other public use or purpose, shall be deemed a superior and permanent right and necessity, and a more necessary use and purpose than the public use or purpose to which such property has already been appropriated or dedicated, and any condemnation award may be paid from the proceeds of revenue bonds issued under the provisions of this Act.

Section 11. If the commission determines that any toll bridge should be constructed or acquired under its authority, all costs thereof, including land, right-of-way, surveying, engineering, construction, legal and administrative expenses, and fees of any fiscal adviser, shall be paid out of any funds available for payment of the cost of the bridge.

Section 12. The commission is hereby authorized and empowered to issue revenue bonds for the acquisition, purchase or construction of any interstate bridge. Any and all bonds issued by the commission for the acquisition, purchase, or construction of any interstate bridge under the authority of this Act shall be issued in the name of the Iowa highway commission and shall constitute obligations only of the commission, shall be identified by some appropriate name, and shall contain a recital on the face thereof that the payment or redemption of said bonds and the payment of the interest thereon are secured by a direct charge and lien upon the tolls and other revenues of any nature whatever received from the operation of the particular bridge for the acquisition, purchase, or construction of which the bonds are issued and of such other bridge or bridges as may have been pledged therefor, and that neither the payment of the principal or any part thereof nor of the interest thereon or any part thereof constitutes a debt, liability, or obligation of the state of Iowa. When it is determined by the commission to be in the best public interest, any bonds issued under the provisions of this Act may be refunded and refinanced at a lower rate, the same rate or a higher rate or rates of interest and from time to time as often as the commission shall find it to be advisable and necessary so to do. Bonds issued to refund other bonds theretofore issued by the commission under the provisions of this Act may either be sold in the manner hereinafter provided and the proceeds thereof applied to the payment of the bonds being refunded, or the refunding bonds may be exchanged for and in payment and discharge of the bonds being refunded. The refunding bonds may be sold or exchanged in installments at different times or an entire issue or series may be sold or exchanged at one (1) time. Any issue or series or refunding bonds may be exchanged in part or sold in part in installments at different times or at one (1) time. The refunding bonds may be sold at any time on, before, or after the maturity of any of the outstanding bonds to be refinanced thereby and may be issued for the purpose of refunding a like or greater principal amount of bonds, except that the principal amount of the refunding bonds may exceed the principal amount of the bonds to be refunded to the extent necessary to pay any premium due on the call of the bonds to be refunded or to fund interest in arrears or about to become due. The gross revenues of any toll bridge pledged to the payment of the bonds being refunded, together with the unpledged gross revenues of any other toll bridges located within ten (10) miles of said bridge, may be pledged by the commission to pay the principal of and interest on the refunding bonds and to create and maintain reserves therefor.

The commission is empowered to receive and accept funds from the state of Iowa or the federal government or any other state upon a cooperative or other basis for the acquisition, purchase, or construction of any interstate bridge authorized under the provisions of this Act and is empowered to enter into such agreements with the state of Iowa or any other state or the federal government as may be required for the securing of such funds.

The commission is authorized and empowered to spend from annual primary road fund receipts sufficient moneys to pay the cost of operation, maintenance, insurance, collection of tolls and accounting therefor and all other charges incidental to the operation and maintenance of any toll bridge administered under the provisions of this Act.

Section 13. The revenue bonds may be issued and sold or exchanged by the commission from time to time and in such amounts as it deems necessary to provide sufficient funds for the acquisition, purchase, or construction of any such bridge and to pay interest on bonds issued for the construction of any toll bridge during the period of actual construction and for six (6) months after completion thereof. The commission is hereby authorized to adopt all necessary resolutions prescribing the form, conditions, **and denominations of the bonds, the maturity dates therefor, and the interest** rate or rates which the bonds shall bear. All bonds of the same issue need not bear the same interest rate. Principal and interest of the bonds shall be payable at such place or places within or without the state of Iowa as determined by the commission, and the bonds may contain provisions for registration as to principal or interest, or both. Interest shall be payable at such times as determined by the commission and the bonds shall mature at such times and in such amounts as the commission prescribes. The commission may provide for the retirement of the bonds at any time prior to maturity, and in such manner and upon payment of such premiums as it may determine in the resolution providing for the issuance of the bonds. All such bonds and any coupons attached thereto shall be signed by such officials of the commission as the commission may direct. Successive issues of such bonds within the limits of the original authorization shall have equal preference with respect to the payment of the principal thereof and the payment of interest thereon. The commission may fix different maturity dates, serially or otherwise, for successive issues under any one (1) original authorization. All bonds issued under the provisions of this Act shall have all the qualities of negotiable instruments under the laws of the state of Iowa. All bonds issued and sold hereunder shall be sold to the highest and best bidder on the basis of sealed proposals received pursuant to a notice specifying the time and place of sale and the amount of bonds to be sold which shall be published at least once not less than seven (7) days prior to the sale in a newspaper published in the state of Iowa and having a general circulation in said state. None of the provisions of chapter seventy-five (75) of the Code shall apply to bonds issued under the provisions of this Act but such bonds shall be sold upon terms of not less than par plus accrued interest. The commission may reject any or all bids received at the public sale and may thereafter sell the bonds at private sale on such terms and conditions as it deems most advantageous to its own interests, but not at a price below that of the best bid received at the advertised sale. The commission may enter into contracts and borrow money through the sale of bonds of the same character as those herein authorized, from the United States or any agency thereof, upon such conditions and terms as may be agreed to and the bonds shall be subject to all the provisions of this Act, except that any bonds issued hereunder to the United States or any agency thereof need not first be offered at public sale. The commission may also provide for the private sale of bonds issued under the provisions of this Act to the state treasurer of Iowa upon such terms and conditions as may be agreed upon, and in such event said bonds need not first be offered at public sale. Temporary or interim bonds, certificates, or receipts, of any denomination, and with or without coupons attached, signed by such official as the commission may direct, may be issued and delivered until the definitive bonds are executed and available for delivery.

Section 14. The proceeds from the sale of all bonds authorized and issued under the provisions of this Act shall be deposited by the commission in a fund designated as the construction fund of the particular interestate bridge or bridges for which such bonds were issued and sold, which fund shall not be a state fund and shall at all times be kept segregated and set apart from all other funds and in trust for the purposes herein set out. Such proceeds shall be paid out or disbursed solely for the acquisition, purchase, or construction of such interstate bridge or bridges and expenses incident thereto, the acquisition of the necessary lands and easements there-

for and the payment of interest on such bonds during the period of actual construction and for a period of six (6) months thereafter, only as the need therefor shall arise and the commission may agree with the purchaser of said bonds upon any conditions or limitations restricting the disbursement of such funds that may be deemed advisable, for the purpose of assuring the proper application of such funds. All moneys in such fund and not required to meet current construction costs of the interstate bridge or bridges for which such bonds were issued and sold, and all funds constituting surplus revenues which are not immediately needed for the particular object or purpose to which they must be applied or are pledged may be invested in obligations issued or guaranteed by the United States or by any person controlled by or supervised by and acting as an instrumentality of the United States pursuant to authority granted by the congress of the United States; provided, however, that the commission may provide in the proceedings authorizing the issuance of said bonds that the investment of such moneys shall be made only in particular bonds and obligations within the classifications eligible for such investment and such provisions shall thereupon be binding upon the commission and all officials having anything to do with such investment. Any surplus which may exist in said construction fund shall be applied to the retirement of bonds issued for the acquisition, purchase, or construction of any such interstate bridge by purchase or call and, in the event such bonds cannot be purchased at a price satisfactory to the commission and are not by their terms callable prior to maturity, such surplus shall be paid into the fund applicable to the payment of principal and interest of said bonds and shall be used for that purpose. The proceedings authorizing the issuance of bonds may provide limitations and conditions upon the time and manner of applying such surplus to the purchase and call of outstanding bonds and the terms upon which they shall be purchased or called and such limitations and conditions shall be followed and observed in the application and use of such surplus. All bonds so retired by purchase or call shall be immediately canceled.

Section 15. All tolls or other revenues received from the operation of any toll bridge acquired, purchased, or constructed with the proceeds of bonds issued and sold hereunder shall be deposited by the commission to the credit of a special trust fund to be designated as the toll revenue fund of the particular toll bridge or toll bridges producing such tolls or revenue, which fund shall be a trust fund and shall at all times be kept segregated and set apart from all other funds.

Section 16. From the money so deposited in each separate construction fund as hereinabove provided, at the direction of the commission there shall be transferred to the place or places of payment named in said bonds such sums as may be required to pay the interest as it becomes due on all bonds issued and outstanding for the construction of such particular toll bridge or toll bridges during the period of actual construction and during the period of six (6) months immediately thereafter. The commission shall thereafter transfer from each separate toll revenue fund to the place or places of payment named in the bonds for which said revenues have been pledged such sums as may be required to pay the interest on said bonds and redeem the principal thereof as such interest and principal become due. All funds so transferred for the payment of principal of or interest on bonds issued for any particular toll bridge or toll bridges shall be segregated and applied solely for the payment of said principal or interest. The proceedings authorizing the issuance of the bonds may provide for the setting up of a reserve fund or funds out of the tolls and other revenues not needed for the payment of principal and interest, as the same currently matures and for the preservation and continuance of such fund in a manner to be provided therein, and such proceedings may also require the immediate application of all surplus moneys in such toll revenue fund to the retirement of such bonds prior to maturity, by call or purchase, in such manner and upon such terms and the payment of such premiums as may be deemed advisable in the judgment of the commission. The moneys remaining in each separate toll revenue fund after providing the amount required for the payment of principal of and interest on bonds as hereinabove provided, shall be held and applied as provided in the proceedings authorizing the issuance of said bonds. In the event the proceedings authorizing the issuance of said bonds do not require surplus revenues to be held or applied in any particular manner, they shall be allocated and used for such other purposes incidental to the construction, operation, and maintenance of any toll bridge as the commission may determine and as permitted under sections seven (7) and twelve (12) of this Act.

Section 17. Warrants for payments to be made on account of such bonds shall be drawn by the commission on duly approved vouchers. Moneys required to meet the costs of purchase or construction and all expenses and costs incidental to the acquisition, purchase, or construction of any particular interstate bridge or to meet the costs of operating, maintaining, and repairing the same, shall be paid by the commission from the proper fund therefor upon duly approved vouchers. All interest received or earned on money deposited in each and every fund herein provided for shall be credited to and become a part of the particular fund upon which said interest accrues.

Section 18. The commission may provide in the proceedings authorizing the issuance of bonds or may otherwise agree with the purchasers of bonds regarding the deposit of all moneys constituting the construction fund and the toll revenue fund and provide for the deposit of such money at such times and with such depositaries or paying agents and upon the furnishing of such security as may meet with the approval of the purchasers of such bonds.

Section 19. Notwithstanding any provision contained in this Act, the proceeds received from the sale of bonds and the tolls or other revenues received from the operation of any toll bridge may be used to defray any expenses incurred by the commission in connection with and incidental to the issuance and sale of bonds for the acquisition, purchase, or construction of any such toll bridge including expenses for the preparation of surveys and estimates, legal, fiscal and administrative expenses, and the making of such inspections and examinations as may be required by the the purchasers of such bonds; provided, that the proceedings authorizing the issuance of such bonds may contain appropriate provisions governing the use and application of said bond proceeds and toll or other revenues for the purposes herein specified.

Section 20. While any bonds issued by the commission remain outstanding, the powers, duties or existence of the commission or of any other official or agency of the state shall not be diminished or impaired in any manner that will affect adversely the interests and rights of the holders of such bonds. The holder of any bond may by mandamus or other appropriate proceeding require and compel the performance of any of the duites imposed upon any state department, official, or employee or imposed upon the commission or its officers, agents, and employees in connection with the acquisition, purchase, construction, maintenance, operation, and insurance of any bridge and in connection with the collection, deposit, investment, application, and disbursement of all tolls and other revenues derived from the operation and use of any bridge and in connection with the deposit, investment, and disbursement of the proceeds received from the issuance of bonds; provided, that the enumeration of such rights and remedies herein shall not be deemed to exclude the exercise or prosecution of any other rights or remedies by the holders of such bonds.

Section 21. When any toll bridge authorized hereunder is being built by the commission it may carry or cause to be carried such an amount of insurance or imdemnity bond or bonds as protection against loss or damage as it may deem proper. The commission is hereby further empowered to carry such an amount of insurance to cover any accident or destruction in part or in whole to any toll bridge. All moneys collected on any indemnity bond or insurance policy as the result of any damage or injury to any such toll bridge shall be used for the purpose of repairing or rebuilding of any such toll bridge as long as there are revenue bonds against any such structure outstanding and unredeemed. The commission is also empowered to carry insurance or indemnity bonds insuring against the loss of tolls or other revenues to be derived from any such toll bridge by reason of any interruption in the use of such toll bridge from any cause whatever, and the proceeds of such insurance or indemnity bonds shall be paid into the fund into which the tolls and other revenues of the bridge thus insured are required to be paid and shall be applied to the same purposes and in the same manner as other moneys in the said fund. Such insurance or indemnity bonds may be in an amount equal to the probable tolls and other revenues to be received from the operation of such toll bridge during any period of time that may be determined upon by the commission and fixed in its discretion, and be paid for out of the toll revenue fund as may be specified in said proceedings. The commission may provide in the proceedings authorizing the issuance of bonds for the carrying of insurance as authorized by this Act and the purchase and carrying of insurance as authorized by this Act shall thereupon be obligatory upon the commission and be paid for out of the toll revenue fund as may be specified in said proceedings.

Section 22. The commission is hereby empowered to fix the rates of toll and other charges for all interstate bridges acquired, purchased, or constructed under the terms of this Act. Toll charges so fixed may be changed from time to time as conditions may warrant. The commission in establishing toll charges shall give due consideration to the amount required annually to pay the principal of and interest on bonds payable from the revenues thereof. The tolls and charges shall be at all times fixed at rates sufficient to pay the bonds and interest as they mature, together with the creation and maintenance of bond reserve funds and other funds as established in the proceedings authorizing the issuance of the bonds, for any particular toll bridge. The amounts required to pay the principal of and interest on bonds shall constitute a charge and lien on all such tolls and other revenues and interest thereon and sinking funds created therefrom received from the use and operation of said toll bridge, and the commission is hereby authorized to pledge a sufficient amount of said tolls and revenues for the payment of bonds issued under the provisions of this Act and interest thereon and to create and maintain a reserve therefor. Such tolls and revenues, together with the interest earned thereon, shall constitute a trust fund for the security and payment of such bonds and shall not be used or pledged for any other purpose as long as such bonds or any of them are outstanding and unpaid.

Section 23. Whenever a proposed interstate bridge is to be acquired, purchased or constructed, any city, town, county, or other political subdivision located in relation to such facility so as to benefit directly or indirectly thereby, may, either jointly or separately, at the request of the commission advance or contribute money, rights-of-way, labor, materials, and other property toward the expense of acquiring, purchasing or constructing the bridge, and for preliminary surveys and the preparation of plans and estimates of cost therefor and other preliminary expenses. Any such city, town, county, or other political subdivision may, either jointly or separately, at the request of the commission advance or contribute money for the purpose of guaranteeing the payment of interest or principal on the bonds issued by the commission to finance the bridge. Appropriations for such purposes may be made from any funds available, including county road funds received from or credited by the state, or funds obtained by excess tax levies made pursuant to law or the issuance of general obligation bonds for this purpose. Money or property so advanced or contributed may be immediately transferred or delivered to the commission to be used for the purpose for which contribution was made. The commission may enter into an agreement with a city, town, county, or other political subdivision to repay any money or the value of a right-of-way, labor, materials or other property so advanced or contributed. The commission may make such repayment to a city, town, county, or other political subdivision and reimburse the state for any expenditures made by it in connection with the bridge out of tolls and other revenues for the use of the bridge.

Section 24. If the commission deems that any land, including improvements thereon, is no longer required for toll bridge purposes and that it is in the public interest, it may negotiate for the sale of such land to the state or to any city, town, county, or other political subdivision or municipal corporation of the state. The commission shall certify the agreement for the sale to the state executive council, with a description of the land and the terms of the sale and the state executive council may **execute the deed and deliver it to the grantee.**

Section 25. If the commission is of the opinion that any land, including improvements thereon, is no longer required for toll bridge purposes, it may be offered for sale upon publication of a notice once each week for two (2) consecutive weeks in a newspaper published and having a general circulation throughout the state of Iowa, specifying the time and place fixed for the receipt of bids.

Section 26. The commission may reject all such bids if the highest bid does not equal the reasonable fair market value of the real property, plus the value of the improvements thereon, computed on the basis of the reproduction value less depreciation. The commission may accept the highest and best bid, and certify the agreement for the sale to the state executive council, with a description of the land and the terms of the sale and the state executive council shall execute the deed and deliver it to the grantee.

Section 27. If the commission deems it consistent with the use and operation of any toll bridge, the commission may grant franchises to persons, firms, associations, private or municipal corporations, the United States government or any agency thereof, to use any portion of the property of any toll bridge, including approaches thereto, for the construction and maintenance of water pipes, flumes, gas pipes, telephone, telegraph and electric light and power lines and conduits, trams or railways, and any other such facilities in the manner of granting franchises on state highways.

Section 28. Any moneys received pursuant to the provisions of sections twenty-four (24) through twenty-seven (27) of this Act shall be deposited by the commission into the separate and proper trust fund established for the bridge.

Section 29. The commission shall have the right to impose and reimpose tolls for pedestrian or vehicular traffic over any interstate bridges under its control and jurisdiction for the purpose of paying the cost of reconstructing and improving existing bridges and their approaches, purchasing existing bridges, and constructing new bridges and approaches, provided that any such existing bridge or new bridge is located within ten miles of the bridge on which tolls are so imposed or reimposed, to pay interest on and create a sinking fund for the retirement of revenue bonds issued for the account of such projects and to pay any and all costs and expenses incurred by the commission in connection with and incidental to the issuance and sale of bonds and for the preparation of surveys and estimates and to establish the required interest reserves for and during the estimated construction period and for six (6) months thereafter.

Section 30. The bridges herein provided for may be incorporated into the primary road system as toll free bridges whenever the costs of the construction of the bridges and the approaches thereto and the reconstruction and improvement of existing bridges and approaches thereto, including all incidental costs, have been paid and when all revenue bonds and interest thereon issued and sold pursuant to this Act and payable from the tolls and revenues thereof shall have been fully paid and redeemed or funds sufficient to pay said bonds and interest, including premium, if any, have been set aside and pledged for that purpose. However, tolls may again be imposed as provided in section twenty-nine (29) of this Act.

Section 31. The commission shall have the power and is hereby authorized by resolution to issue, sell, or pledge its revenue bonds in an amount sufficient to provide funds to pay all or any part of the costs of construction of a new bridge and approaches thereto and the reconstruction, improvement, and maintaining of an existing bridge and approaches thereto, including all costs of survey, acquisition of right-of-way, engineering, legal, fiscal and incidental expenses, to pay the interest due thereon during the period beginning with the date of issue of the bonds and ending at the expiration of six (6) months after the first imposition and collection of tolls from the users of said bridges, and all costs incidental to the issuance and sale of the bonds.

Except as may be otherwise specifically provided by statute, all of the other provisions of this Act shall govern the issuance and sale of revenue bonds issued under this section, the execution thereof, the disbursement of the proceeds of issuance thereof, the interest rate or rates thereon, their form, terms, conditions, convenants, negotiability, denominations, maturity date or dates, the creation of special funds or accounts safeguarding and providing for the payment of the principal thereof and interest thereon, and their manner of redemption and retirement.

Such bonds shall include a covenant that the payment of the principal thereof and the interest thereon are secured by a first and direct charge and lien on all of the tolls and other gross revenues received from the operation of said toll bridges and from any interest which may be earned from the deposit or investment of any such revenues. The tolls and charges shall be at all times fixed at rates sufficient to **pay the bonds and interest as they mature, together with the creation and maintenance** of bond reserve funds and other funds as established in the proceedings authorizing the issuance of the bonds.

Section 32. The commission is hereby authorized to operate and to assume the full control of said toll bridges and each portion thereof whether within or without the borders of the state of Iowa, with full power to impose and collect tolls from the users of such bridges for the purpose of providing revenues at least sufficient to pay the cost and incidental expenses of construction and acquisition of said bridges and approaches in both states in which located and for the payment of the principal of and interest on its revenue bonds as authorized by this Act.

Section 33. Under no circumstances shall any bonds issued under the terms of this Act be or become or be construed to constitute a debt of or charge against the state of Iowa within the purview of any constitutional or statutory limitation or provision. No taxes, appropriations or other funds of the state of Iowa may be pledged for or used to pay such bonds or the interest thereon, but any such bonds shall be payable solely and only as to both principal and interest from the tolls and revenues derived from the operation of any toll bridge or toll bridges acquired, purchased, or constructed under this Act, and the sole remedy for any breach or default of the terms of any such bonds or proceedings for their issuance shall be a proceeding either in law or in equity by suit, action or mandamus to enforce and compel performance of the duties required by this Act and the terms of the resolution under which such bonds are issued.

Section 34. The commission is authorized to enter into such agreement or agreements with other state highway commissions and the governmental agencies or subdivisions of the state of Iowa or other states and with federal bridge commissions as they shall find necessary or convenient to carry out the purposes of this Act, and is authorized to do any and all acts contained in such agreement or agreements that are necessary or convenient to carry out the purposes of this Act. Such agreements may include, but shall not be restricted to, the following provisions:

1. A provision that the commission shall assume and have complete responsibility for the operation of such bridges and approaches thereto, and with full power to impose and collect all toll charges from the users of such bridges and to disburse the revenue derived therefrom for the payment of principal and interest on any revenue bonds herein provided for and to carry out the purposes of this Act.

2. A provision that the commission shall provide for the issuance, sale, exchange or pledge, and payment of revenue bonds payable solely from the revenues derived from the imposition and collection of tolls upon such toll bridges.

3. A provision that the commission, after consultation with the other governmental agencies or subdivisions who are parties to such agreements, shall fix and revise the classifications and amounts of tolls to be charged and collected from the users of the toll bridges, with the further provision that such toll charges shall be

removed after all costs of planning, designing, and construction of such toll bridges and approaches thereto and all incidental costs shall have been paid, and all of said revenue bonds, and interest thereon, issued pursuant to this Act shall have been fully paid and redeemed or funds sufficient therefor have been set aside and pledged for that purpose.

4. A provision that all acts pertaining to the design and construction of such toll bridges may be done and performed by the commission and that any and all contracts for the construction of such toll bridges shall be awarded in the name of the commission.

5. A provision that the state of Iowa and adjoining state and all governmental agencies or subdivisions party to such agreement shall be reimbursed out of the proceeds of the sale of such bonds or out of tolls and revenues as herein allowed for any advances they may have made or expenses they may have incurred for any of the purposes for which said revenue bonds may be issued, after duly verified itemized statements of such advances and expenses have been approved by all parties to such agreement.

6. A provision that when all outstanding indebtedness or other obligations payable from the revenues of such bridges have been paid the adjoining state agrees to accept ownership of that portion of the bridge within such state and agrees to pay the cost of maintaining such portions of the bridge or proportionate share of the total cost of maintaining the bridge.

Section 35. Counties are hereby authorized to issue general obligation bonds for the purpose of contributing money to the commission to help finance the construction of toll bridges across navigable rivers constituting boundaries between the county and an adjoining state. Prior to the issuance of such bonds the board of supervisors shall call and hold an election in said county at which the proposition shall be submitted to the voters of the county in the following form:

Shall the county of _____ issue its bonds in the amount of $_____ for the purpose of _____?

Notice of such election, stating the date of the election, the hours of opening and closing the polls, the precints and polling places therefor, and the question to be submitted shall be published once each week for three (3) consecutive weeks in at least one (1) newspaper published and having a general circulation in the county. The election shall be held on a day not less than five (5) nor more than twenty (20) days after the last publication of such notice. The proposition shall not be deemed carried or adopted unless the vote in favor thereof is equal to at least sixty (60) per cent of the total vote cast for and against said proposition at said election.

Section 36. The exercise of the powers granted by this Act will be in all respects for the benefit of the people of the state of Iowa, for the increase of their commerce and prosperity and for the improvement of their health and living conditions, and as the acquisition, construction, operation, and maintenance by the commission of the projects herein defined will constitute the performance of essential governmental functions, the commission shall not be required to pay any taxes or assessments upon such projects or upon any property acquired or used by the commission under the provisions of this Act or upon the income from such projects, and the bonds issued under the provisions of this Act, their transfer and the income therefrom including any profit made on the sale thereof shall at all times be free from taxation by or within the state of Iowa.

Section 37. Any person who uses any toll bridge and fails or refuses to pay the toll provided therefor shall be punished by a fine of not more than one hundred (100) dollars or by imprisonment for not more than thirty (30) days, or both.

Section 38. This Act shall be construed as providing an alternative and independent method for the acquisition, purchase, or construction of interstate bridges, for the issuance and sale or exchange of bonds in connection therewith and for refunding bonds pertinent thereto, and for the imposition, collection, and application of the proceeds of tolls and charges for the use of interstate bridges, without reference to any other statute, and shall not be construed as an amendment of or subject to the provisions of any other law, and no publication of any notice, and no other or further proceeding in respect to the issuance or sale or exchange of bonds under this Act shall be required except such as are prescribed by this Act, any provisions of other statutes of the state to the contrary notwithstanding.

Section 39. This Act, being necessary for the public safety and welfare, shall be liberally construed to effectuate the purposes thereof. If any provision of this Act or the application thereof to any person or circumstances is held to be invalid, such invalidity shall not affect other provisions or applications of the Act which can be given effect without the invalid provisions or application, and to this end the provisions of this Act are declared to be severable.

Approved June 22, 1967.

*Section 525. Construction and operation of bridges; consent of Congress; approval of plans; private highway toll bridges.*

(a) The consent of Congress is granted for the construction, maintenance, and operation of bridges and approaches thereto over the navigable waters of the United States, in accordance with the provisions of sections 525–533 of this title.

(b) The location and plans for such bridges shall be approved by the Chief of Engineers and the Secretary of the Army before construction is commenced, and, in approving the location and plans of any bridge, they may impose any specific conditions relating to the maintenance and operation of the structure which they may deem necessary in the interest of public navigation, and the conditions so imposed shall have the force of law.

(c) Notwithstanding the provisions of subsections (a) and (b) of this section, it shall be unlawful to construct or commence the construction of any privately owned highway toll bridge until the location and plans thereof shall also have been submitted to and approved by the highway department or departments of the State or States in which the bridge and its approaches are situated; and where such bridge shall be between two or more States and the highway departments thereof shall be unable to agree upon the location and plans therefor, or if they, or either of them, shall fail or refuse to act upon the location and plans submitted, such location and plans then shall be submitted to the Bureau of Public Roads and, if approved by the Bureau of Public Roads, approval by the highway departments shall not be required. (Aug. 2, 1946, ch. 753, title V, Section 502, 60 Stat. 847; June 30, 1949, ch. 288, title I, Section 103 (a), 63 Stat. 380; 1949 Reorg. Plan No. 7, Section 1, eff. Aug. 19, 1949, 14 F. R. 5288, 63Stat. 1070.)

CODIFICATION

The Department of War was designated the Department of the Army and the title of the Secretary of War was changed to Secretary of the Army by section 205 (a) of act July 26, 1947, ch. 343, title II, 61 Stat. 501. Section 205 (a) of act July 26, 1947, was repealed by section 53 of act Aug. 10, 1956, ch. 1041, 70A Stat. 641. Section 1 of act Aug. 10, 1956, enacted "Title 10, Armed Forces", which in sections 3011–3013 continued the military Department of the Army under the administrative supervision of a Secretary of the Army.

SHORT TITLE

Congress in enacting sections 525–533 of this title provided by section 501 of act Aug. 2, 1946 that they should be popularly known as the "General Bridge Act of 1946".

TRANSFER OF FUNCTIONS

The functions of all other officers of the Department of Commerce and the functions of all agencies and employees of such Department were, with a few exceptions, transferred to the Secretary of Commerce, with power vested in him to authorize their performance or the performance of any of his functions by any of such officers, agencies, and employees, by 1950 Reorg. Plan No. 5, Sections 1, 2, eff. May 24, 1950, 15 F.R. 3174, 64 Stat. 1263, set out in note under Section 591 of Title 5, Executive Departments and Government Officers and Employees.

The Public Roads Administration, which was transferred to the Bureau of Public Roads within the General Services Administration, was transferred to the Department of Commerce by 1949 Reorg. Plan No. 7.

All functions of the Public Roads Administration were transferred to the Bureau of Public Roads within the General Services Administration by section 103 (a) of Act June 30, 1949. Section 103 (a) is set out as section 630b (a) of Title 5, Executive Departments and Government Officers and Employees.

RESERVATION OF RIGHT TO ALTER, AMEND, OR REPEAL

Section 511 of act Aug. 2, 1946, provided: "The right to alter, amend, or repeal this title (sections 525–533 of this title) is hereby expressly reserved as to any and all bridges which may be built under authority hereof (said sections)."

*Section 526. Amount of tolls.*

If tolls shall be charged for the transit over any interstate bridge of engines, cars, street cars, wagons, carriages, vehicles, animals, foot passengers, or other passengers, such tolls shall be reasonable and just, and the Secretary of the Army may, at any time, and from time to time, prescribe the reasonable rates of toll for such transit over such bridge, and the rates so prescribed shall be the legal rates and shall be the rates demanded and received for such transit. (Aug. 2, 1946, ch. 753, title V, Section 503, 60 Stat. 847.)

*Section 527. Acquisition of interstate bridges by public agencies; amount of damages.*

After the completion of any interstate toll bridge constructed by an individual, firm, or corporation, as determined by the Secretary of the Army, either of the States in which the bridge is located, or any public agency or political subdivision of either of such States, within or adjoining which any part of such bridge is located, or any two or more of them jointly, may at any time acquire and take over all right, title, and interest in such bridge and its approaches, and any interest in real property for public purposes by condemnation or expropriation. If at any time after the expiration of five years after the completion of such bridge the same is acquired by condemnation or expropriation, the amount of damages or compensation to be allowed shall not include good will, going value, or prospective revenues or profits, but shall be limited to the sum of (1) the actual cost of constructing such bridge and its approaches, less a reasonable deduction for actual depreciation in value; (2) the actual costs of acquiring such interests in real property; (3) actual financing and promotion costs, not to exceed 10 per centum of the sum of the cost of constructing the bridge and its approaches and acquiring such interests in real property; and (4) actual expenditures for necessary improvements. (Aug. 2, 1946, ch. 753, title V, Section 504, 60 Stat. 848.)

*Section 528. Statement of construction costs of privately owned interstate bridges; investigation of costs; conclusiveness of findings; review.*

Within ninety days after the completion of a privately owned interstate toll bridge, the owner shall file with the Secretary of the Army and with the highway departments of the States in which the bridge is located, a sworn itemized statement showing the actual original cost of constructing the bridge and its approaches, the actual cost of acquiring any interest in real property necessary therefor, and the actual financing and promotion costs. The Secretary of the Army may, and upon request of a highway department shall, at any time within three years after the completion of such bridge, investigate such costs and determine the accuracy and the reasonableness of the costs alleged in the statement of costs so filed, and shall make a finding of the actual and reasonable costs of constructing, financing, and promoting such bridge. For the purpose of such investigation the said individual, firm, or corporation, its successors and assigns, shall make available all of its records in connection with the construction, financing, and promotion thereof. The findings of the Secretary of the Army as to the reasonable costs of the construction, financing, and promotion of the bridge shall be conclusive for the purposes mentioned in section 527 of this title subject only to review in a court of equity for fraud or gross mistake. (Aug. 2, 1946, ch. 753, title V, Section 505, 60 Stat. 848.)

*Section 529. Sinking funds; rate of tolls, cancellation of tolls.*

If tolls are charged for the use of an interstate bridge constructed or taken over or acquired by a State or States or by any municipality or other political subdivision or public agency thereof, under the provisions of sections 525–533 of this title, the rates of toll shall be so adjusted as to provide a fund sufficient to pay for the reasonable cost of maintaining, repairing, and operating the bridge and its approaches under economical management, and to provide a sinking fund sufficient to amortize the amount paid therefor, including reasonable interest and financing cost, as soon as possible under reasonable charges, but within a period of not to exceed thirty years from the date of completing or acquiring the same. After a sinking fund sufficient for such amortization shall have been so provided, such bridge shall thereafter be maintained and operated free of tolls. An accurate record of the amount paid for acquiring the bridge and its approaches, the actual expenditures for maintaining, repairing, and operating the same, and of the daily tolls collected, shall be kept and shall be available for the information of all persons interested. (Aug. 2, 1946, ch. 753, title V, Section 506, 60 Stat. 848; May 25, 1948, ch. 336, 62 Stat. 267.)

AMENDMENTS

1948–Act May 25, 1948, extended the amortization period from 20 to 30 years.

*Section 530. Bridges included and excluded.*

The provisions of sections 525–533 of this title shall apply only to bridges over navigable waters of the United States, the construction of which is approved after August 2, 1946, under the provisions of said sections; and the provisions of the first proviso of section 401 of this title, and the provisions of sections 491–498 of this title, shall not apply to such bridges. (Aug. 2, 1946, ch. 753, title V, Section 507, 60 Stat. 849.)

*Section 531. International bridges.*

Sections 525–533 of this title shall not be construed to authorize the construction of any bridge which will connect the United States, or any Territory or possession of the United States, with any foreign country. (Aug. 2, 1946, ch. 753, title V, Section 508, 60 Stat. 849.)

*Section 532. Eminent domain.*

There are conferred upon any individual, his heirs, legal representatives, or assigns, any firm or corporation, its successors or assigns, or any State, political subdivision, or municipality authorized in accordance with the provisions of sections 525–533 of this title to build a bridge between two or more States, all such rights and powers to enter upon lands and acquire, condemn, occupy, possess, and use real estate and other property in the respective States needed for the location, construction, operation, and maintenance of such bridge and its approaches, as are possessed by railroad corporations for railroad purposes or by bridge corporations for bridge purposes in the State in which such real estate or other property is situated, upon making just compensation therefore to be ascertained and paid according to the laws of such State, and the proceedings therefor shall be the same as in the condemnation or expropriation of property for public purposes in such State. (Aug. 2, 1946, ch. 753, title V, Section 509, 60 Stat. 849.)

*Section 533. Penalties.*

Any person who fails or refuses to comply with any lawful order of the Secretary of the Army or the Chief of Engineers issued under the provisions of sections 525–533 of this title, or who fails to comply with any specific condition imposed by the Chief of Engineers and the Secretary of the Army relating to the maintenance and operation of bridges, or who refuses to produce books, papers, or documents in obedience to a subpena or other lawful requirement under said sections, or who otherwise violates any provisions of said sections, shall, upon conviction thereof, be punished by a fine of not to exceed $5,000 or by imprisonment for not more than one year, or by both such fine and imprisonment. (Aug. 2, 1946, ch. 753, title V, Section 510, 60 Stat. 849.)

*Section 534. Conveyance of right, title, and interest of United States in bridges transferred to States or political subdivisions; terms and conditions.*

The Secretary of the Army is authorized to transfer or convey to State authorities or political subdivisions thereof all right, title, and interest of the United States, in and to any and all bridges heretofore or hereafter constructed or acquired in connection with the improvement of canals, rivers and harbors, or works of flood control, together with the necessary lands, easements, or rights-of-way, upon such terms and conditions and with or without consideration, as may be determined to be in the best interest of the United States by the Chief of Engineers: Provided, That such transferred bridges shall be toll-free. (May 17, 1950, ch. 188, title I, Section 109, 64 Stat. 168.)

CODIFICATION

**Section was not enacted as a part of the General Bridge Act of 1946** which comprises sections 525–533 of this title.

## THIRTY-NINTH CONGRESS

## CHAP. CCXLVI

## SESSION I

**An Act to authorize the Construction of certain Bridges, and to establish them as Post Roads.**

**Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,**

That it shall be lawful for any person or persons, company or corporation, having authority from the States of Illinois and Missouri for such purpose, to build a bridge across the Mississippi River at Quincy, Illinois, and to lay on and over said bridge railway tracks, for the more perfect connection of any railroads that are or shall be constructed to the said river at or opposite said point, and that when constructed all trains of all roads terminating at said river, at or opposite said point, shall be allowed to cross said bridge for reasonable compensation, to be made to the owners of said bridge, under the limitations and conditions hereinafter provided. And in case of any litigation arising from any obstruction or alleged obstruction to the free navigation of said river, the cause may be tried before the district court of the United States of any State in which any portion of said obstruction or bridge touches.

Sec. 2. **And be it further enacted,** That any bridge built under the provisions of this act, at the option of the company building the same, be built as a drawbridge, with a pivot or other form of draw, or with unbroken or continuous spans: **Provided,** That if the said bridge shall be made with unbroken and continuous spans, it shall not be of less elevation in any case than fifty feet above extreme high-water mark, as understood at the point of location, to the bottom chord of the bridge, nor shall the spans of said bridge be less than two hundred and fifty feet in length, and the piers of said bridge shall be parallel with the current of the river, and the main span shall be over the main channel of the river and not less than three hundred feet in length: **And provided also,** That if any bridge built under this act shall be constructed as a drawbridge, the same

shall be constructed as a pivot drawbridge with a draw over the main channel of the river at an accessible and navigable point, and with spans of not less than one hundred and sixty feet in length in the clear on each side of the central or pivot pier of the draw, and the next adjoining spans to the draw shall not be less than two hundred and fifty feet; and said spans shall not be less than thirty feet above low-water mark, and not less than ten above extreme high-water mark, measuring to the bottom chord of the bridge, and the piers of said bridge shall be parallel with the current of the river: **And provided also,** That said draw shall be opened promptly upon reasonable signal for the passage of boats, whose construction shall not be such as to admit of their passage under the permanent spans of said bridge, except when trains are passing over the same; but in no case shall unnecessary delay occur in opening the said draw during or after the passage of trains.

Sec. 3. **And be it further enacted,** That any bridge constructed under this act, and according to its limitations, shall be a lawful structure, and shall be recognized and known as a post route; upon which, also, no higher charge shall be made for the transmission over the same of the mails, the troops, and the munitions of war of the United States, than the rate per mile paid for their transportation over the railroads or public highways leading to the said bridge.

Sec. 4. **And be it further enacted,** That it shall be lawful for the Chicago, Burlington, and Quincy Railroad Company, a corporation whose road has been completed to the Mississippi River, and connects with a railroad on the opposite side thereof, having first obtained authority therefor from the States of Illinois and Iowa, to construct a railroad bridge across said river, upon the same terms, in the same manner, under the same restrictions, and with the same privileges, as is provided for in this act in relation to the bridge at Quincy, Illinois.

Sec. 5. **And be it further enacted,** That a bridge may be constructed at the town of Hannibal, in the State of Missouri, across the Mississippi River, so as to connect the Hannibal and Saint Joseph Railroad with the Pike County and Great Western railroads of Illinois, on the same terms and subject to the same restrictions as contained in this act for the construction of the bridge at Quincy, Illinois.

Sec. 6. **And be it further enacted,** That a bridge may be constructed across the Mississippi River between Prairie du Chien, in the State of Wisconsin, and North McGregor, in the State of Iowa, with the consent of the legislatures of Wisconsin and Iowa, on the same terms and subject to the same restrictions as are contained in this act for the construction of the bridge at Quincy, Illinois.

Sec. 7. **And be it further enacted,** That the Keokuk and Hamilton Mississippi Bridge Company, a corporation existing under the laws of the State of Iowa, and the Hancock County Bridge Company, a corporation existing under the laws of the State of Illinois, be and are hereby authorized to construct and maintain a bridge over the Mississippi River between Keokuk, Iowa, and Hamilton, Illinois, of the same character, description, and construction as provided in this act for the bridges at Quincy and Burlington; and the said bridge, in its use and operation, shall be subject to the same restrictions that apply to said bridges at Quincy and Burlington by the terms of this act.

Sec. 8. **And be it further enacted,** That the Winona and Saint Peter Railroad Company, a corporation existing under the laws of the State of Minnesota, is hereby authorized to construct and operate a railroad bridge across the Mississippi River between the City of Winona, in the State of Minnesota, and the opposite bank of the said river, in the State of Wisconsin, with the consent of the legislatures of the States of Minnesota and Wisconsin; and said bridge by this section authorized is hereby declared a post route, and subject to all the terms, restrictions, and requirements contained in the foregoing sections of this act.

Sec. 9. **And be it further enacted,** That a bridge may be constructed and maintained across the Mississippi River, between Dunleith, in the State of Illinois, and Dubuque, in the State of Iowa, with the consent of said States previously given or hereafter acquired, with the same privileges, upon the same terms, and under the same restrictions as are contained in this act for the construction of a bridge at Quincy, Illinois.

Sec. 10. **And be it further enacted,** That any company authorized by the legislature of Missouri may construct a bridge across the Missouri River, at the city of Kansas, upon the same terms and conditions provided for in this act.

Sec. 11. **And be it further enacted,** That the "Saint Louis and Illinois Bridge Company," a corporation organized under an act of the general assembly of the State of Missouri, approved February fifth, eighteen hundred and sixty-four, and an act amendatory of the same, approved February twentieth, eighteen hundred and sixty-five, and also confirmed in its corporate powers under an act of the legislature of the State of Illinois, approved eighteen hundred and sixty-four, or any other bridge company organized under the laws of Missouri and Illinois, be, and the same is hereby, empowered to erect, maintain, and operate a bridge across the Mississippi River, between the city of Saint Louis, in the State of Missouri, and the city of East Saint Louis, in the State of Illinois, subject to all the conditions contained in said act of incorporation and amendments thereto, and not inconsistent with the following terms and provisions contained in this act. And in case of any litigation arising from any obstruction or alleged obstruction to the free navigation of said waters, the cause may be tried before the district court of the United States of any State in which any portion of said obstruction or bridge touches.

Sec. 12. **And be it further enacted,** That the bridge authorized by the preceeding section to be built shall not be a suspension bridge or drawbridge, with pivot or other form of draw, but shall be constructed with continuous or unbroken spans, and subject to these conditions: First, that the lowest part of the bridge or bottom chord shall not be less than fifty feet above the city directrix at its greatest span. Second, that it shall have at least one span five hundred feet in the clear, or two spans of three hundred and fifty feet in the clear of abutments. If the two latter spans be used, the one over the main steamboat channel shall be fifty feet above the city directrix, measured to the lowest part of the bridge at the centre of the span. Third, no span over the water at low-water mark, shall be less than two hundred feet in the clear of abutments.

Sec. 13. **And be it further enacted,** That the right to alter or amend this act, so as to prevent or remove all material obstructions to the navigation of said river by the construction of bridges, is hereby expressly reserved.

Approved, July 25, 1866.