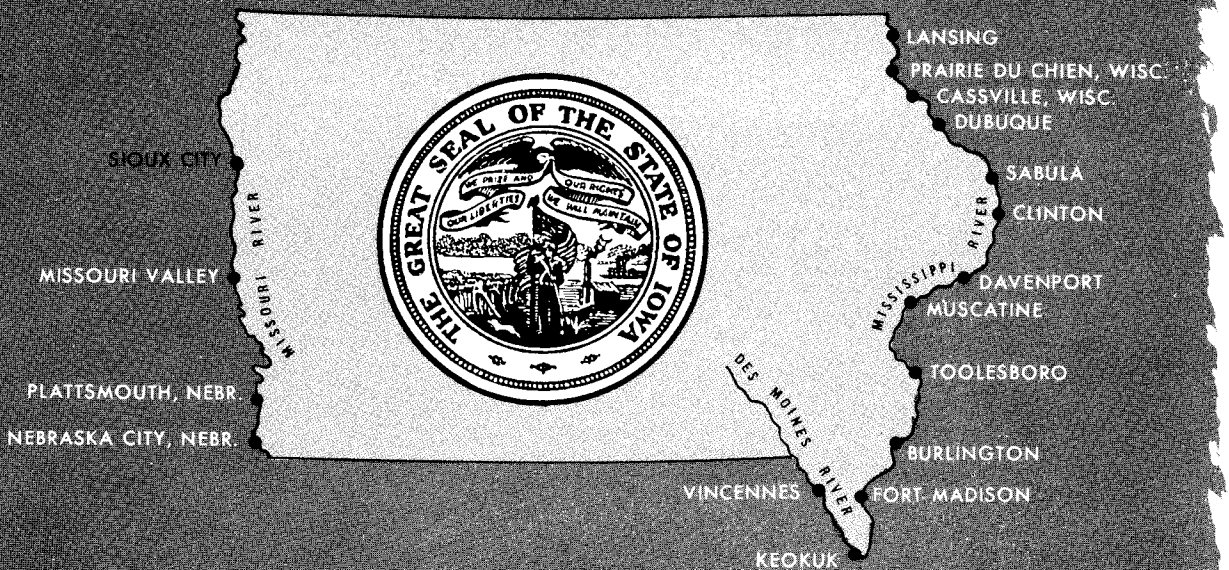
AUGUST 1968

IOWA STATE HIGHWAY COMMISSION



Bridge Location, Revenue and Traffic Studies

AT

SIOUX CITY, IOWA

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

WILBUR SMITH & ASSOCIATES
traffic consultants
NEW HAVEN, CONN.

MISSOURI RIVER TOLL BRIDGE

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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TRANSPORTATION CONSULTANTS
155 WHITNEY AVENUE • P. O. BOX 993
New Haven, Conn. 06510

August 6, 1968

Mr. Joseph 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 new Missouri River bridges at Sioux City.

The report includes an analyses 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 the proposed Industrial Interchange Bridge would have a considerably higher feasibility level than the proposed Wall Street Bridge. However, the feasibility values for both facilities are considerably below the levels normally considered indicative of financial feasibility. During the course of this study, the proposed Isabella Street Bridge was dropped from further consideration due to the significantly lower traffic levels estimated for this crossing as opposed to the Wall Street and Industrial Interchange Bridges.

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

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

August 6, 1968

Paul L. Heineman, P.E. Iowa Reg. No. 5156

REGISTERED PROFESSIONAL ENGINEER 5156 PAUL L. HEINEMAN

Signed

Wilbur S. Smith, P.E. Iowa Reg. No. 4007

WILBUR S. SMITH REGISTERED Date 4007 August 6, 1968 PROFESSIONAL ENGINEER

WILBUR SMITH & ASSOCIATES, INC. N.E.

Wilbur S. Smith

SIOUX CITY, IOWA

MISSOURI RIVER TOLL BRIDGE

AUGUST

1968

PRELIMINARY ENGINEERING REPORT

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

HOWARD, NEEDLES, TAMMEN & BERGENDOFF
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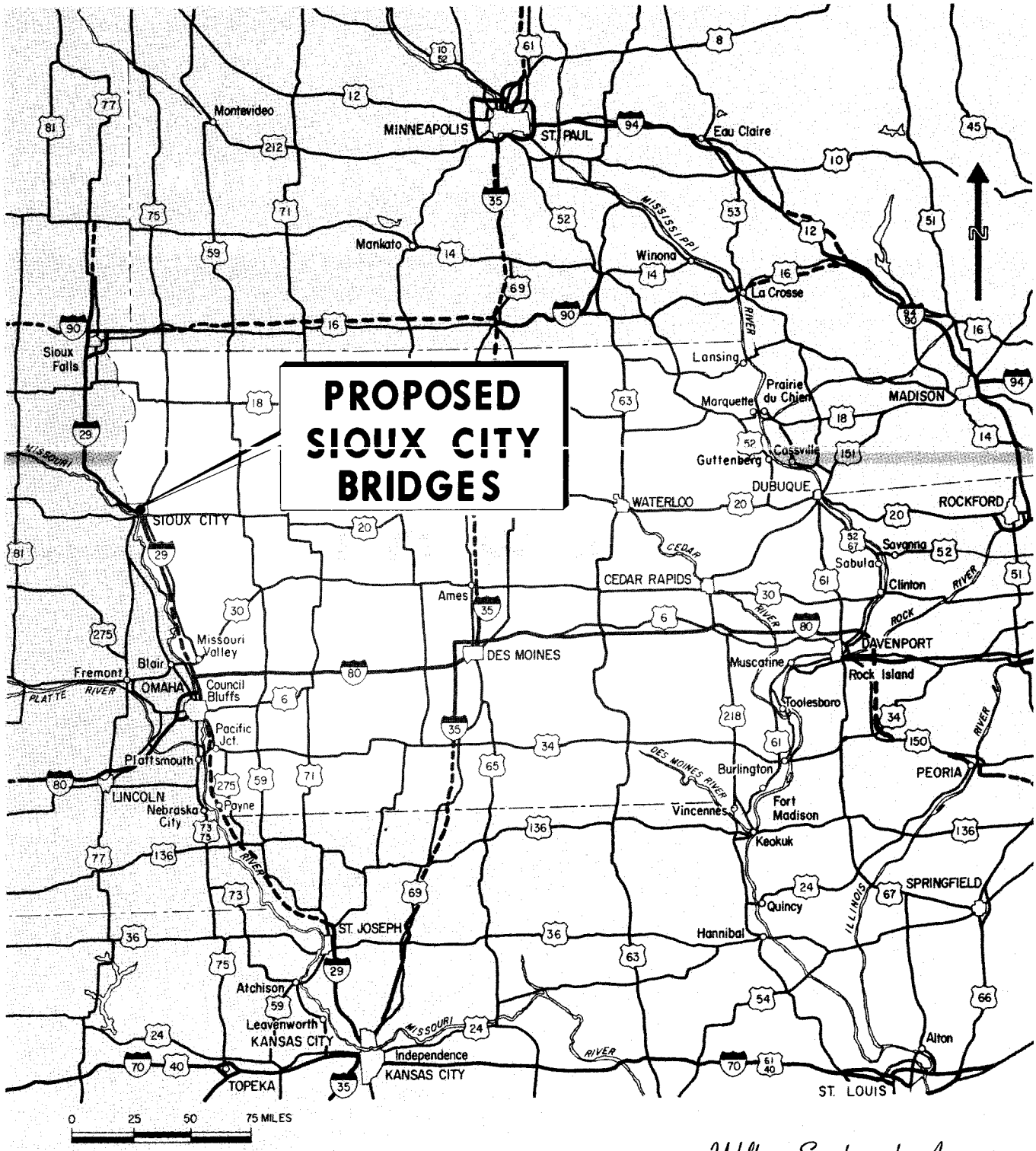

Wilbur Smith and Associates

Exhibit 1

REGIONAL MAP

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LIST OF ILLUSTRATIONS

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SUMMARY OF FINDINGS

The present Combination Bridge at Sioux City is inadequate to meet desirable traffic service levels in the Sioux City metropolitan area. While numerous alternate toll bridge locations, including a crossing at Isabella Street, were studied, only two bridge alignments warranted detailed analysis, the Wall Street and the Industrial Interchange crossings.

Assuming both bridges were operated as toll facilities, annual revenues on the Wall Street crossing would range from $240,000 in the first full year of operation to $435,000 in 1985. Toll collections on the Industrial Interchange Bridge would yield an estimated $186,000 in the first year increasing to $444,000 in 1985.

A bond issue of $21,150,000 would be required to finance the proposed Wall Street Bridge. Assuming a 5.5 per cent interest rate and a 30-year bond term, annual payments to service the bond issue would be approximately $1,498,000. Deducting annual maintenance and operation expenses, net toll revenues would average $258,000 over the 28-year earning period providing a 0.17 coverage of level debt service.

The Industrial Interchange Bridge would require an estimated bond issue of $4,962,000. Annual payments to service a 30-year bond issue at a 5.5 per cent interest rate would be approximately $351,000. Deducting annual maintenance and operation expenses, net revenues would average $297,000 over the 28-year earning period, providing a level debt service coverage of 0.85. Both coverage values are considerably below those normally considered indicative of financial feasibility.

Consideration was also given to possible construction of an Interstate Spur Bridge, located just north of the proposed Industrial Interchange Bridge, in lieu of providing new toll crossings in the Sioux City Area. The estimated 1985 average daily traffic for a toll-free bridge at this location was 20,460. The estimated project cost for the bridge and limited approaches was $12,520,000.

INTRODUCTION

Sioux City, Iowa, as shown in Exhibit 1, is located on the Missouri River in northwestern Iowa. It is the largest population concentration in Iowa along the Missouri River with South Sioux City, immediately cross-river, an important population center in Nebraska. There are several smaller communities in the Sioux City area including Sergeant Bluff, Lawton and Hinton in Iowa; North Sioux City in South Dakota; and Jackson and Dakota City in Nebraska.

There is presently only one Missouri River crossing serving the Sioux City metropolitan area — the Combination Bridge. The closest highway bridge to the north is at Yankton, South Dakota, 60 miles away. The nearest crossing to the south is the Decatur Bridge at Onawa, Iowa, some 41 miles downstream.

Authority and Purpose of Report

In December, 1967, the Iowa State Highway Commission authorized preparation of a preliminary feasibility report for possible new toll crossings in the Sioux City area. 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 along the Missouri River to be studied under this program are shown in Exhibit 2. A copy of the General Bridge Act of 1946, the federal law permitting operation of Interstate toll bridges is also included in the Appendix. Consideration of a possible free Interstate Route 29 Spur Bridge was also included in the study.

Scope of Services

This report summarizes the preliminary engineering, traffic and revenues and feasibility studies for proposed toll crossings and engineering and traffic studies of a possible Interstate Spur crossing of the Missouri River in the Sioux City area. 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 alternate 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 bridges, 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 for the toll-free Interstate crossing and annual traffic and revenues for the recommended toll bridge locations.

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

The engineering, location and cost studies relating to the proposed bridges 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 crossings and project feasibility calculations.

Present Highway System

Several important highways converge on Sioux City, including Interstate Route 29 which follows a north-south orientation generally parallel to the Missouri River. U. S. Route 75 is another north-south facility serving northwestern Iowa and is located east of the Big Sioux River, while Interstate Route 29, north of Sioux City, serves eastern South Dakota to the west of the Big Sioux.

South of Sioux City, Interstate Route 29 and U. S. Route 75 generally follow the east or Iowa bank of the Missouri River to points south. U. S. Routes 77 and 73 in Nebraska and U. S. Route 77 in South Dakota are also important north-south facilities serving the Sioux City metropolitan area. The most important east-west highway in the Sioux City area is U. S. Route 20. The Combination Bridge in Sioux City carries both a U. S. Route 77 and U. S. Route 20 designation.

Planned Highway Improvements

The Iowa State Highway Commission has developed long-range plans of corridor locations for freeways and expressways in the Sioux City area. These include a proposed expressway paralleling U. S. Route 75 from Sioux City northward to Merrill; a freeway along U. S. Route 20 from the east and a partial circumferential bypass (Outer Belt Drive) around Sioux City. The southern terminus of the Outer Belt Drive is presently proposed to interchange with Interstate Route 29 at the Industrial Interchange, with the possibility of continuing across the Missouri River and connecting with the proposed relocation of U. S. Route 20 in Nebraska. The Iowa State Highway Commission's Five Year Primary Road Construction Program, 1968 through 1972, proposes the partial purchase of right-of-way for the Outer Belt Drive and the reconstruction of U. S. Route 75 from a point north of the Industrial Interchange northward to 12th Street.

The State of Nebraska has plans to construct U. S. Route 20 relocations to the north and south of South Sioux City. The northern relocation will have its eastern terminal at Dakota Avenue and Ninth Street, one-half mile south of the Combination Bridge. The southern relocation will have its eastern terminus at Dakota Avenue, approximately one mile south of the present intersection of U. S. Route 20 and Dakota Avenue.

Present Combination Bridge

The present bridge at Sioux City was constructed in 1896 to serve as a rail crossing between Sioux City, Iowa and South Sioux City, Nebraska. It was subsequently converted to accommodate vehicular traffic. In 1960, two

additional cantilevered traffic lanes were added. The roadway width of the two original travel lanes is 20 feet; each outside lane is 12 feet wide. The bridge originally incorporated two swing spans but the northern span was de-activated in 1958 during construction of Interstate Route 29. The south swing span continues to serve the Missouri River navigational channel, located adjacent to the Nebraska river bank. Barge operations on the river require numerous bridge openings, a condition which will become even more serious in terms of interruption of trans-river traffic service, as river traffic grows.

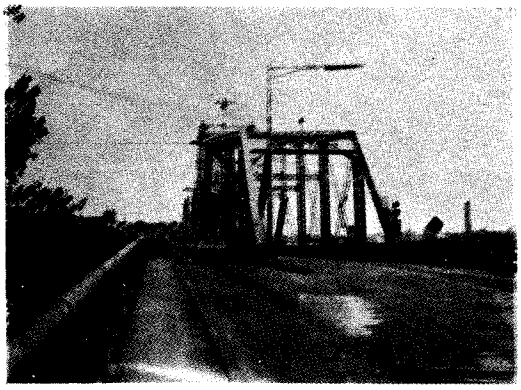
When the two additional traffic lanes were added to the outside of the Combination Bridge's main trusses in 1960, several poor weaving movements were introduced at the north end of the crossing, at the interchange with Interstate Route 29, resulting in high accident incidence on the bridge approach. Relatively high traffic volumes seriously complicate traffic flow at this point. The approach on the Nebraska or South Sioux City side of the bridge is generally adequate. Several views of the present bridge and its approaches are depicted in Exhibit 3.

The bridge was originally operated as a toll facility; tolls were removed on February 8, 1951. A dramatic increase in traffic resulted when bridge use became toll-free.

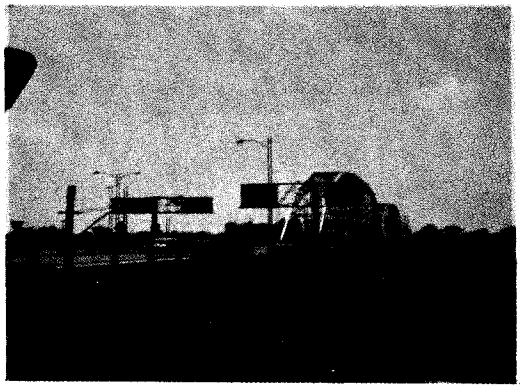
Alternate River Crossings

The nearest alternate river crossing to the south is the Decatur Bridge at Decatur, Nebraska-Onawa, Iowa. This facility, constructed in 1952, was opened to traffic in 1956 after relocation of the Missouri River was accomplished. The bridge is operated by the Burt County Bridge Commission. The present toll schedule, shown in Table 1, assesses passenger car drivers and operators of larger vehicles, $0.50. Additional vehicle occupants each pay a $0.05 toll.

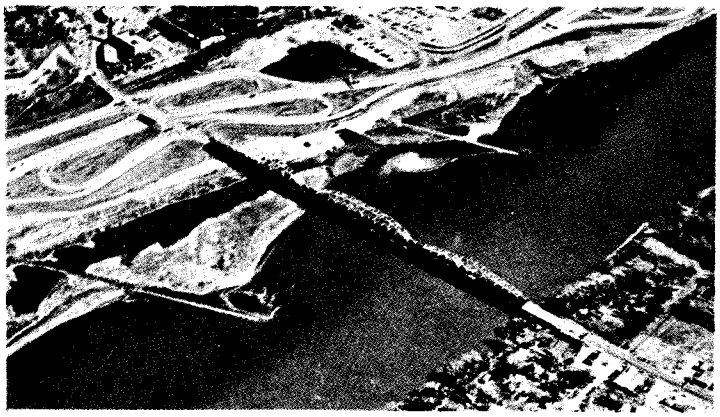
The nearest river crossing to the northwest of Sioux City along the Missouri River is at Yankton, South Dakota. This bridge is operated as a free facility and serves as a link in U. S. Route 81.



SOUTH SIOUX CITY BRIDGE HEAD



VIEW OF BRIDGE FROM SIOUX CITY SIDE



AERIAL VIEW

SOUTH SIOUX CITY APPROACH

SIOUX CITY APPROACH

PRESENT COMBINATION BRIDGE

TABLE 1

PRESENT TOLL SCHEDULE

Decatur Bridge

TOLL CLASS	TOLL
Car and Driver	$0.50
Passengers (each)	0.05
Truck and Driver	0.50
Trailers	0.50
Bus and Driver	0.50
Motorcycle	0.25
Horse and Wagon	0.25
Livestock	0.10
Farm Equipment	$0.50 to 2.50
Construction Equipment	Special Rates

SOURCE: Burt County Bridge Commission.

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 Nebraska Highway Commissions, other state agencies, and numerous county, municipal and other contacts. Valuable information relating to economic and travel growth trends in the Sioux City-South Sioux City area was obtained from the Comprehensive Origin and Destination Studies undertaken by the Iowa State Highway Commission in 1955 and from the comprehensive planning studies now underway.

PART I

LOCATION AND COST STUDIES

BASIC DATA

Considerable information regarding existing conditions and proposed improvements must be procured and analyzed in conjunction with the preparation of bridge studies for a project of this magnitude. The general features of the study area are as shown on Exhibit I-1. The following are items of data pertinent to a Missouri River crossing at Sioux City.

Geology

The study site is in the Dissected Till Plains Section of the Central Lowlands Physiographic Province. The immediate site lies wholly within the broad flood plain of the Missouri River. The high plains immediately east of the flood plain exist at Elevation 1200± and are composed of a mantle of loess overlying glacial drift and Upper Cretaceous bedrock. The west plains exist to Elevation 1100± and consist mainly of loessial deposits.

The Missouri River presently occupies the central portion of the flood plain. Well logs indicate up to 100 feet of alluvium consisting of sand, silt, gravel, overlying a slightly southeasterly dipping bedrock of Benton Shale and Dakota Sandstone.

Substructures for the proposed bridge should be founded on bearing piles driven through the flood plain alluvial material to bedrock. Approach embankments in the flood plain should present no special problems. Prior to final design, foundation borings and laboratory soil tests will be required for determining the need for and extent of any special embankment treatment required for stability and settlement purposes, and to establish the top of bedrock for pile foundations.

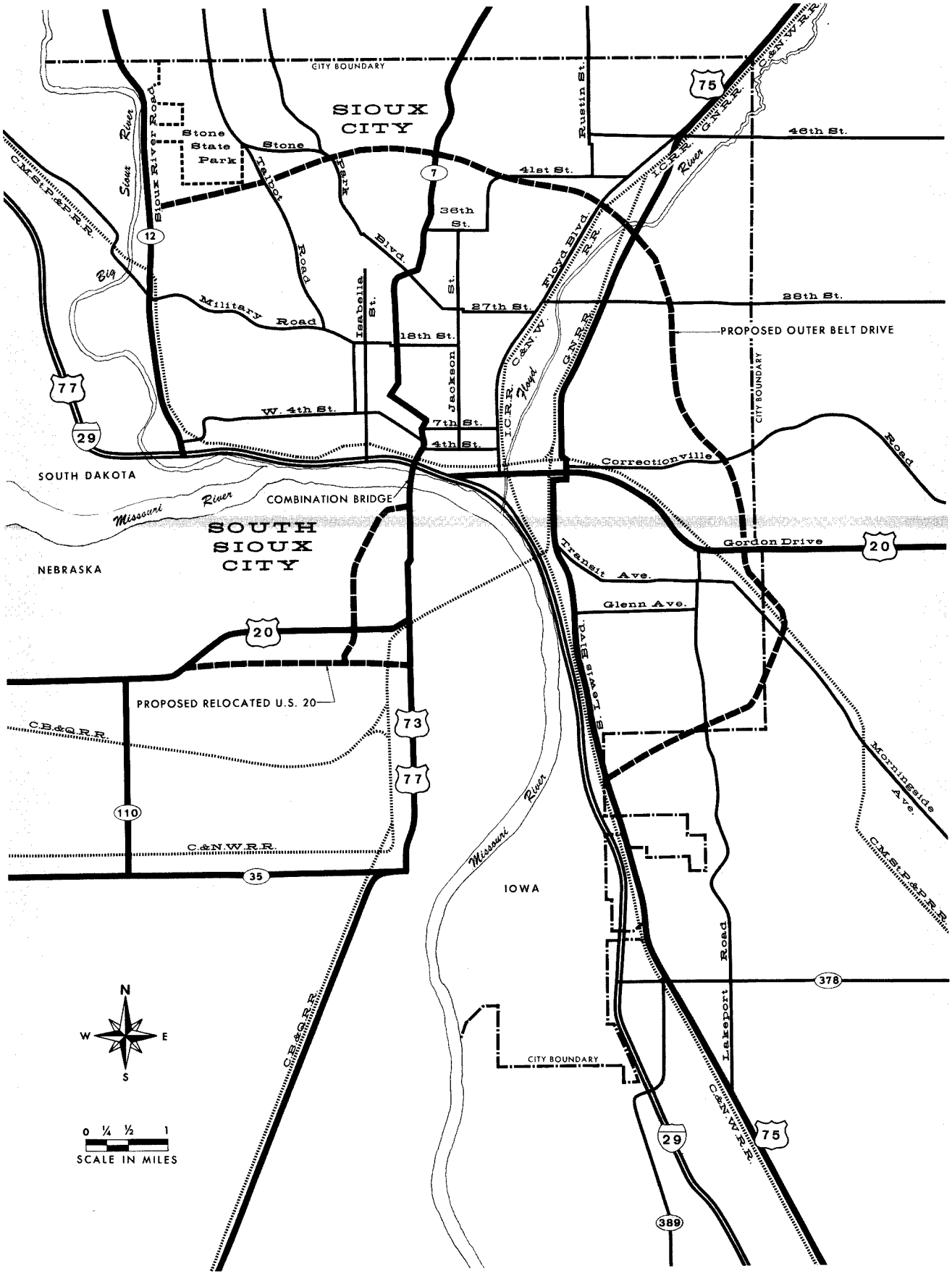


Exhibit I-1

SIOUX CITY STUDY AREA

River Conditions

The Missouri River and the Big Sioux River converge approximately two miles west of the Combination Bridge. From the convergence, the Missouri River flows eastward three miles where it converges with the Floyd River. From this point, the river flows southward. The navigation channel throughout the Sioux City area follows the outside limits of the the river curves. The depth of the channel varies between 10 and 27 feet, with the average depth of about 15 feet.

Since completion of the Missouri River reservoirs in 1956, there has not been a threat of flooding in the Sioux City area. The highest elevation that the water has reached since 1956 is 1087.5 at the gage on the Combination Bridge. Before the completion of the reservoirs, the highest elevation was 1101.3 in April 1952.

At the present time, river traffic above the Combination Bridge is infrequent. The clearance above the 2 per cent line is 24.5 feet for the Combination Bridge, a swing span structure, and 55.1 feet for the Chicago and North Western Railway bridge (a high level fixed structure), 1.8 miles below the Combination Bridge.

Existing Railroads

The many railroads that serve the Sioux City area include the Chicago, Milwaukee, St. Paul and Pacific Railroad, the Chicago and North Western Railroad, the Great Northern Railroad, and the Chicago, Burlington & Quincy Railroad. A spur track of the Chicago and North Western Railroad serves the area in the vicinity of the I-29 Industrial Interchange, an area of rapid industrial development in the southern part of Sioux City.

Navigation Clearances

Criteria for navigation clearances have been tentatively established by the Omaha 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.

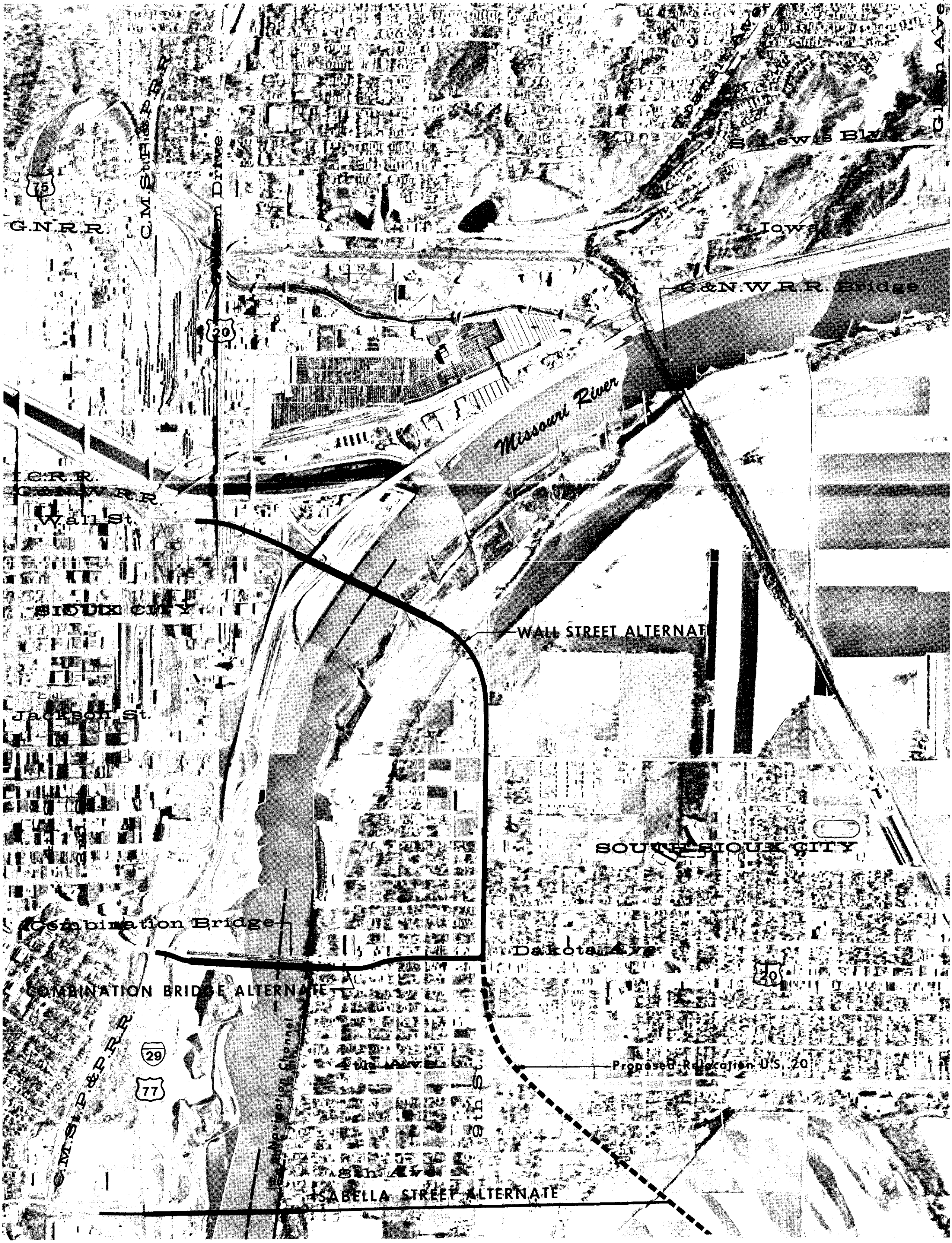
Contact with the Coast Guard has confirmed the validity of this assumption for an exploratory study of alternative locations. It should be noted, however, that the particular river conditions existing at each site should be reviewed with the Coast Guard prior to the preparation of a definite project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

The minimum permissible navigation channel on the Missouri River is 400 feet. This 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 theoretical navigational profile line of the river. The 2 per cent profile line is a plane of reference for vertical clearance which normally may be expected to be equaled or exceeded not more than 2 per

cent of the time during the normal navigational season. This elevation is 1085.2 Mean Sea Level at River Mile 732.3, the location of the existing Combination Bridge. Therefore, the low steel elevation of the proposed bridge, in the navigation channel span, must be not less than 1137.2.


G.N.R.R.
C.M.St.P.&P.R.R.
75
20
C.&N.W.R.R. Bridge
Missouri River
I.C.R.R.
C.&N.W.R.R.
Wall St.
SIOUX CITY
WALL STREET ALTERNATE
Jackson St.
SOUTH SIOUX CITY
Combination Bridge
Dakota Ave
20
COMBINATION BRIDGE ALTERNATE
C.M.St.P.&P.R.R.
29
77
Navigation Channel
4th Ave
9th St.
Proposed Relocation U.S. 20
5th Ave
ISABELLA STREET ALTERNATE

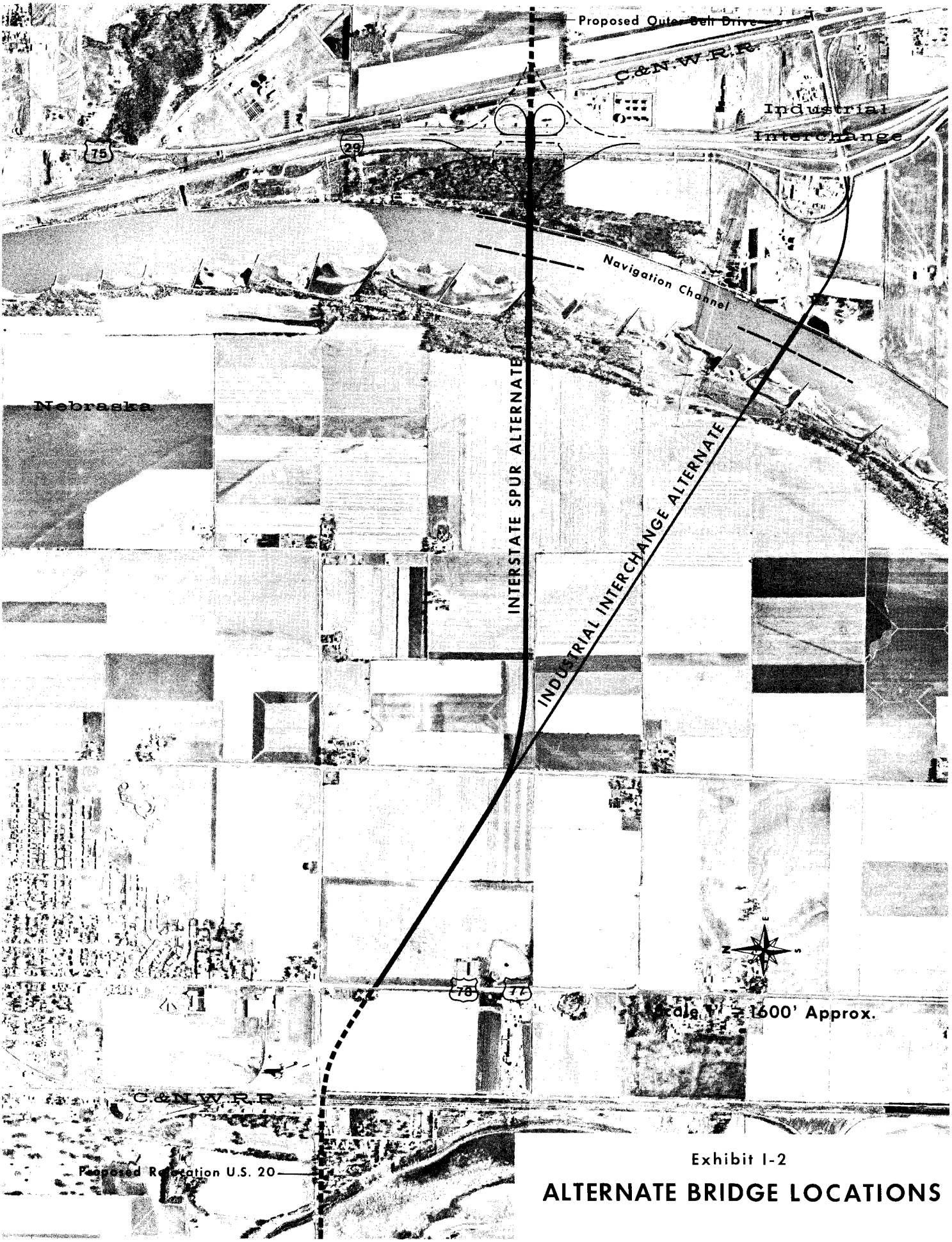


Exhibit I-2

ALTERNATE BRIDGE LOCATIONS

ALTERNATE LOCATIONS

General

Five alternative bridge sites, as shown on Exhibit I-2, were studied and evaluated for an additional Missouri River crossing at Sioux City.

Two general situations are considered in this study. The first is the financing of a crossing as a toll bridge. The second is the construction of a bridge as an extension of the Interstate System, providing a connection between I-29 in Iowa, and U.S. Route 20 in South Sioux City, Nebraska.

Industrial Interchange Alternate

The existing I-29 Industrial Interchange, shown on Exhibits I-2 and I-3, provides an excellent opportunity for a connection between I-29, the proposed U.S. Route 520 (Outer Belt Drive), and a new two lane toll crossing. Although relocation of the spur track of the Chicago and North Western Railroad is necessary to allow a 3 per cent grade for the river crossing, the simplicity of the necessary construction, the nominal right-of-way costs, and minimum disruption to traffic during construction all result in a minimum cost design for the Iowa approach to a new Missouri River Bridge.

Isabella Street Alternate

This alignment for a two lane facility is an extension of Isabella Street in the northern part of Sioux City and would necessitate extensive reconstruction in the area of the interchange with Interstate Route 29. If the minimum vertical navigational clearance is to be maintained, Isabella Street must be elevated over I-29, resulting in a 4 per cent approach grade. The Nebraska approach would be located west of 8th Avenue in South Sioux City and would require approximately 1 mile of new roadway in order to connect with the proposed relocation of U.S. Route 20. Traffic

between the Central Business District of Sioux City, Iowa, and South Sioux City, Nebraska, would not be substantially benefited by this alignment. Due to the high construction cost of the I-29 Interchange and poor traffic service, this alternate is not recommended.

Combination Bridge Alternate

This alternate is located immediately upstream from the existing Combination Bridge. Service to traffic now using this four lane facility would be improved upon replacement of the existing bridge, which would require reconstruction of one-third mile of Dakota Avenue from the proposed relocation of U.S. Route 20 at 9th Street to the bridgehead. Traffic service between the southern part of Sioux City, Iowa, and South Sioux City, Nebraska, would not benefit by this improvement. The major disadvantages of this alignment are the extensive relocation of I-29, the problem of maintaining traffic during construction, and the substantial costs of construction and right-of-way for the bridge approach in Nebraska.

Wall Street Alternate

A crossing located between Wall Street in Sioux City and 9th Street in South Sioux City would relieve traffic congestion on the Combination Bridge. Although excellent traffic service would result between South Sioux City and the Floyd River Valley and the stockyards, substantial reconstruction of I-29 would be required to provide suitable interchange facilities between I-29 and the bridge approach.

The extensive land development in this area for industrial use imposes significant control over a practical location for a bridge approach in Sioux City. Although U.S. Route 20 through traffic would be efficiently served by this location, the advantages of this alternate are not sufficient to offset the costs of the extensive reconstruction in the area necessary to provide adequate approach facilities.

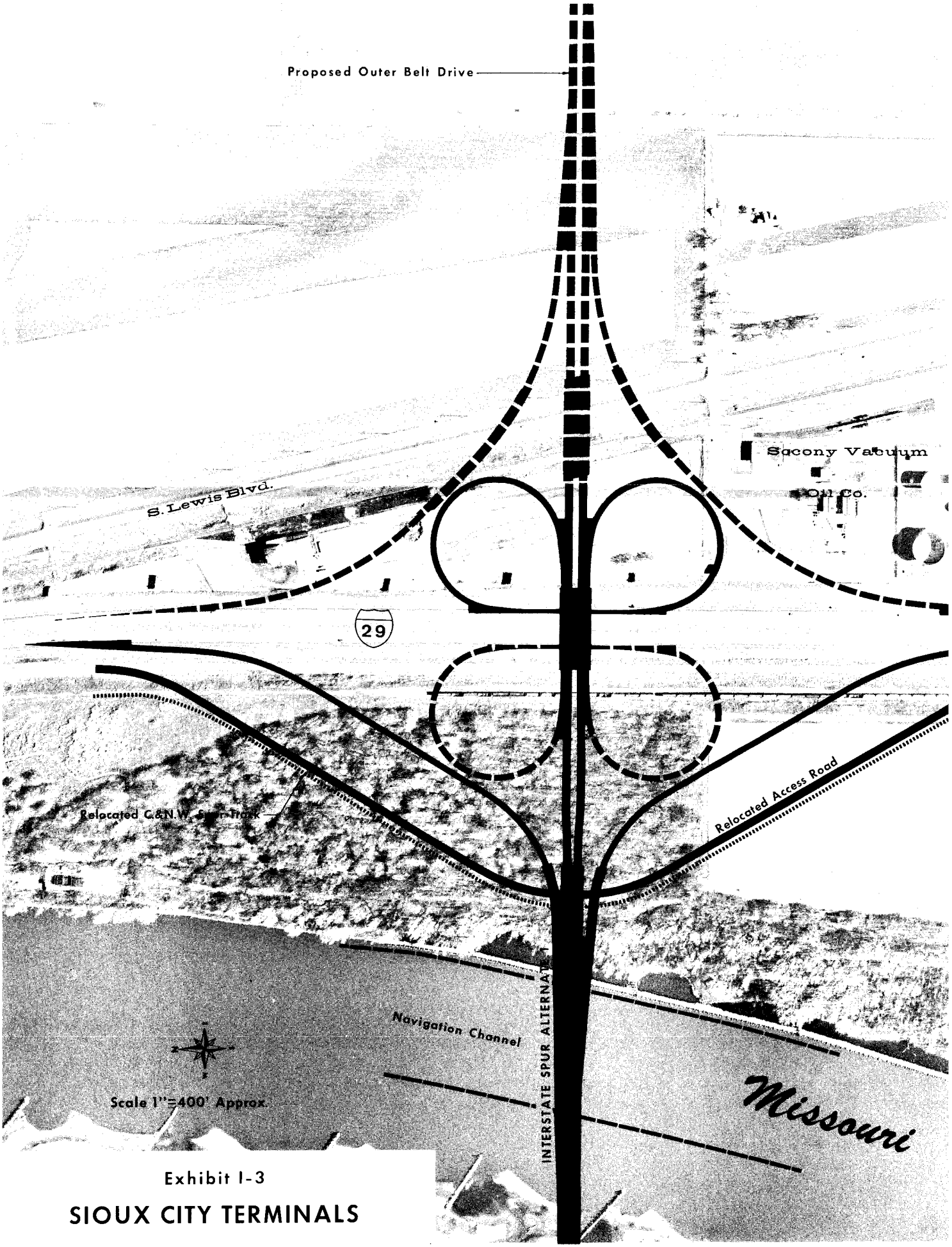
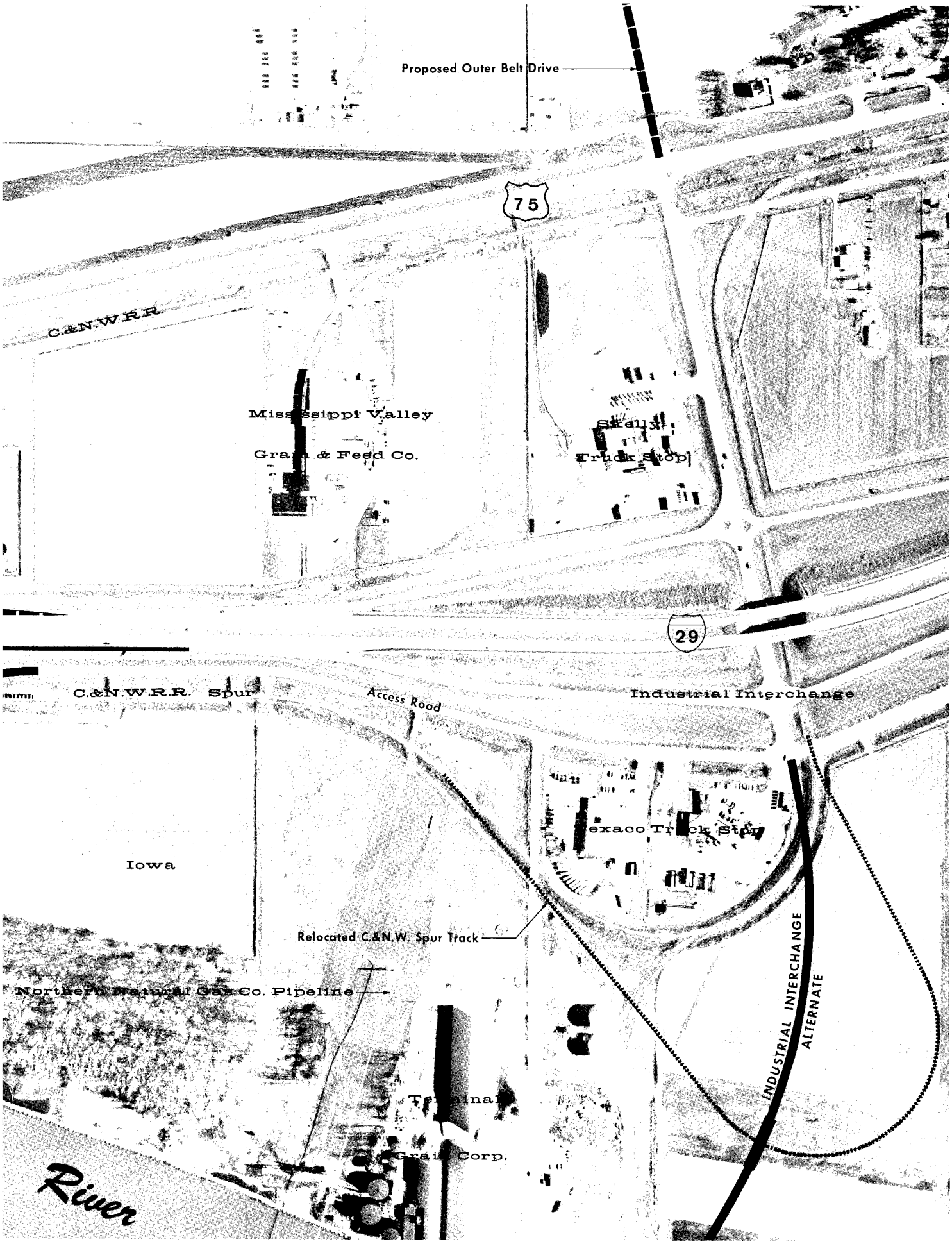


Exhibit I-3

SIOUX CITY TERMINALS


Proposed Outer Belt Drive
75
C.&N.W.R.R.
Mississippi Valley
Grain & Feed Co.
Skelly
Truck Stop
29
C.&N.W.R.R. Spur
Access Road
Industrial Interchange
Texaco Truck Stop
Iowa
Relocated C.&N.W. Spur Track
Northern Natural Gas Co. Pipeline
INDUSTRIAL INTERCHANGE
ALTERNATE
Terminal
Grain Corp.
River

The traffic volumes assigned to the multiple toll bridge conditions assumed in the traffic assignments presented in Part II do not warrant a four lane bridge at the Wall Street location during the 30-year term for financing a toll bridge. However, the proximity of this location to the Sioux City CBD, its junction with I-29, and its potential service to the industrial area along Floyd River, all appear to indicate that provision of a two lane facility would be short sighted and could conceivably hinder the growth of the two metropolitan areas which it would join.

Interstate Spur Alternates

Substantial growth of the Sioux City area is occurring in the southern part of Sioux City. The Interstate Spur Alternate alignment would provide excellent traffic service between Nebraska and the industrial area near the I-29 Industrial Interchange. The primary disadvantage of this location is its proximity to the Industrial Interchange; a major advantage would be the ease of connection to the proposed east–west Bypass Route 520. Although it would not serve traffic between Nebraska and the Sioux City Central Business District, it would relieve congestion on the Combination Bridge of a significant portion of the east–west traffic passing through the Sioux City area.

Several freeway-to-freeway interchanges in this general area were studied. All are four-lane, grade separated, limited access interchanges.

Interstate Spur Alternate 1 is a basic cloverleaf, as shown on Exhibits I-2 and I-3. Right-of-way costs would be minimal. Structures would be required over the Chicago and North Western's main track and the spur track, over U.S. Route 75, the relocated Access Road, I-29, and the Missouri River. Provision of collector–distributor lanes to and from I-29 would be in accordance with highest design practice, but will substantially increase the cost of this interchange inasmuch as the ramp terminals would have to be moved farther to the west, resulting in additional widening on the structure.

Grades on the east approach to the river structure would be 4.0 per cent, which is above the desirable maximum of 3 per cent, but less than the absolute maximum of 5 per cent.

Interstate Spur Alternate 2, shown on Exhibit I-4, provides loop ramps in the east quadrants, and directional lanes in the west quadrants. The purpose of this configuration is the reduction of bridge widening on the main channel span. However, additional structures are required to grade separate the turning lanes and relocation of approximately one mile of the southbound lane of I-29, the Access Road, and the railroad spur track would be necessary. Right-of-way costs would be increased due to the relocation of the southbound lane of I-29.

Bridge widening over the main channel span has been reduced to a minimum on Interstate Spur Alternate 3, as shown on Exhibit I-4. In order to accomplish this and still provide a full cloverleaf interchange, the location must be closer to the Industrial Interchange. As a result, the existing Industrial Interchange and the I-29 bridge over the existing industrial road and the railroad spur track must be reconstructed; the Access Road west of the Industrial Interchange and railroad spur track must also be relocated.

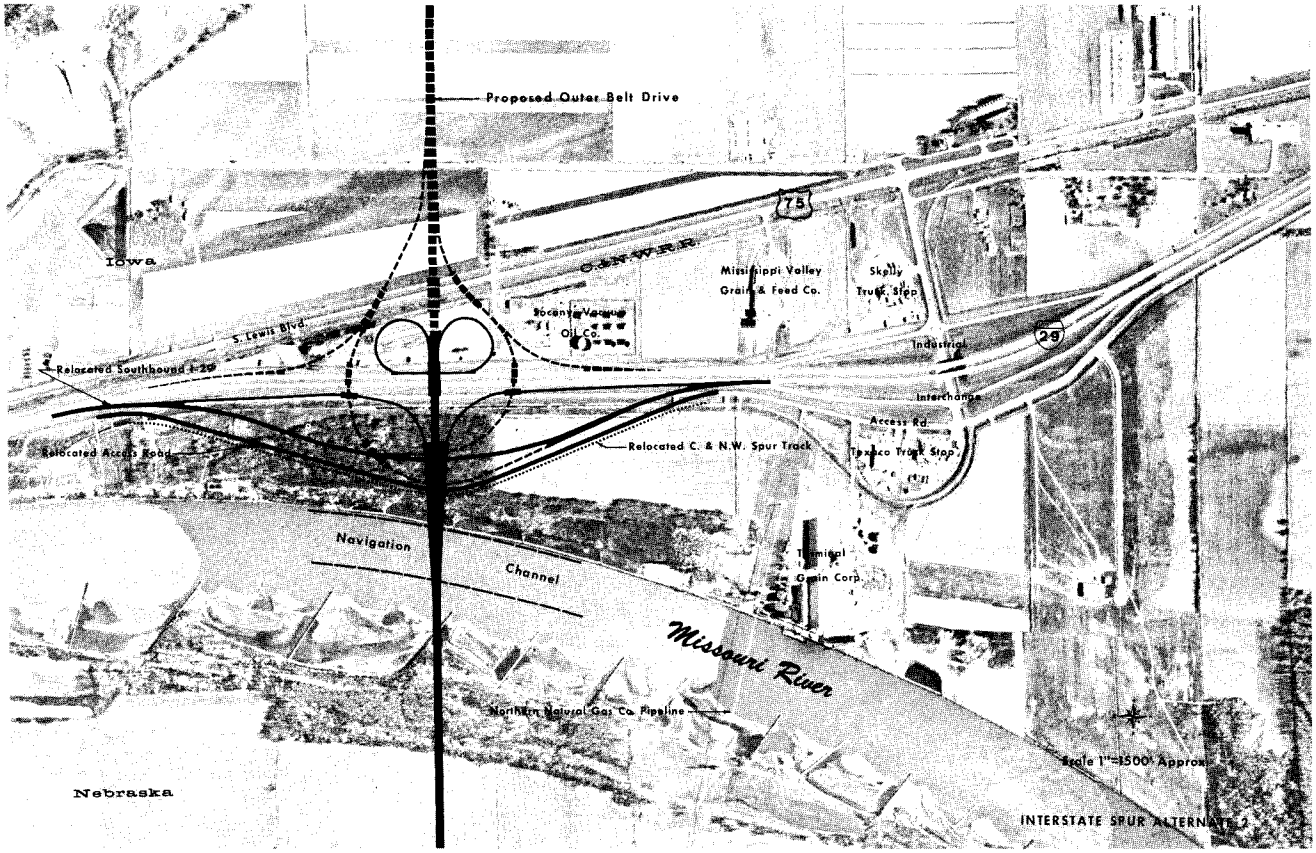
Recommended Location

Interstate Spur

The studies presented in this report indicate that the alignment and interchange configuration of Interstate Spur Alternate 1, as shown on Exhibit I-3, connecting the Sioux City Outer Belt Drive (Bypass Route 520) with U.S. Route 20 in Nebraska, is three-fourths of a mile north of the existing I-29 Industrial Interchange and is the most economical and efficient location of the alternates considered. Further study of alignment and interchange configuration, which would be conducted for a definite project report, may result in some deviation from the scheme of Alternate 1.

Toll Crossing

The Industrial Interchange Alternate is the most economical location for a Missouri River toll crossing in the Sioux City area. The project cost for this alternate is utilized in the project feasibility studies developed in Part II of this report.



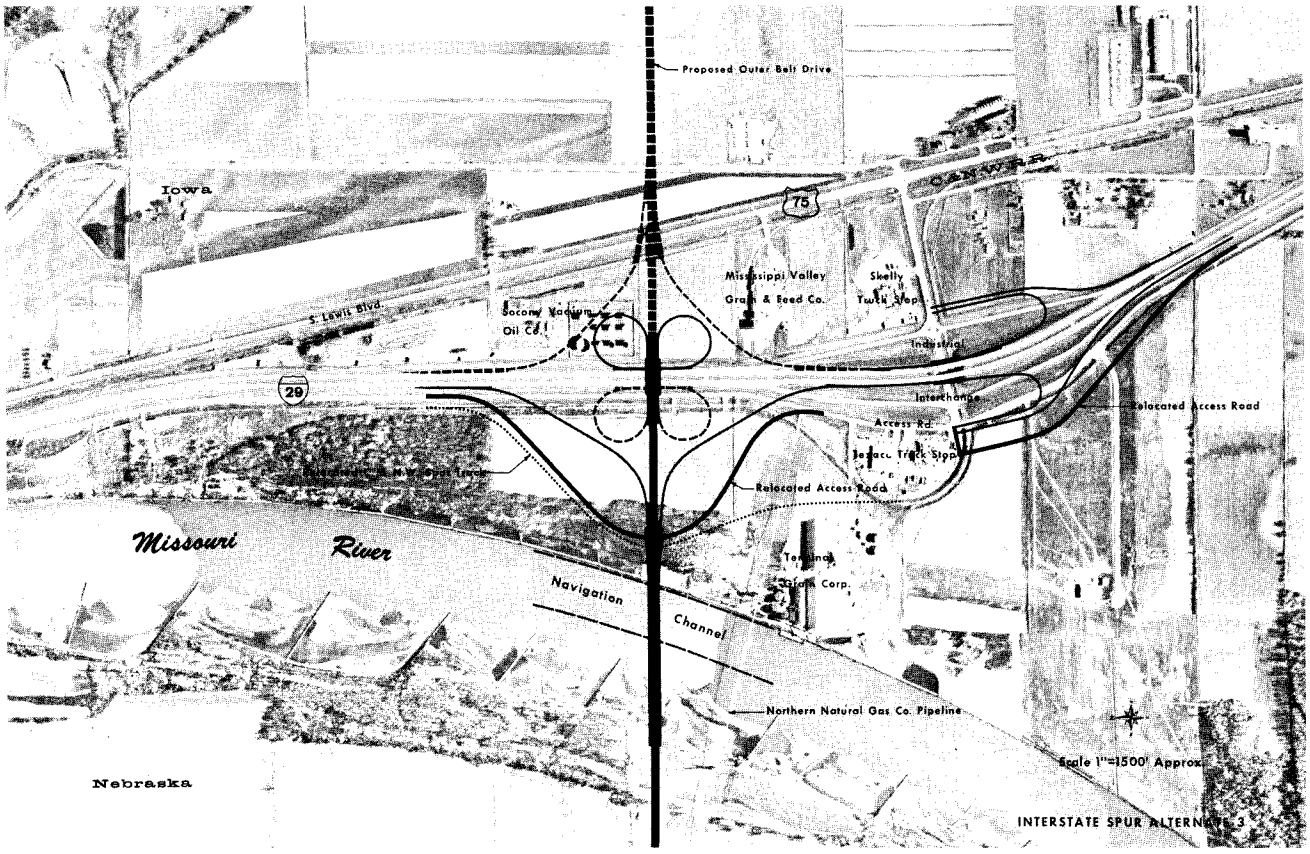


Exhibit I-4

INTERSTATE SPUR ALTERNATES 2 AND 3 TERMINALS

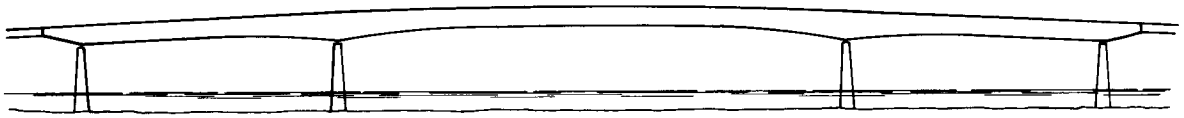
STRUCTURE TYPE STUDIES FOR NAVIGATION SPANS

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.

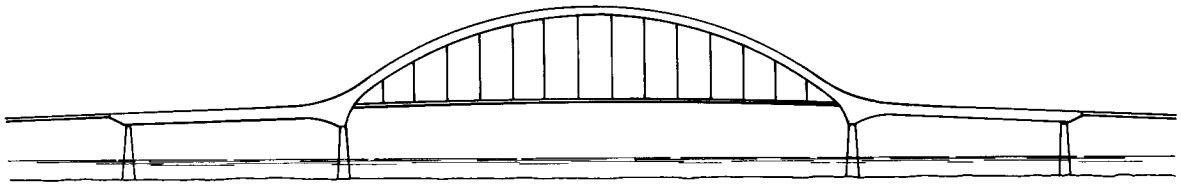
Six types of navigation spans are shown on Exhibit I-5. Type I is a Continuous Girder Span. These contemporary structures are popular because of economics, pleasing appearance and the elimination of obstructions above the roadway. Economic considerations usually limit spans to less than 450 feet, but 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-5 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 Missouri 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.

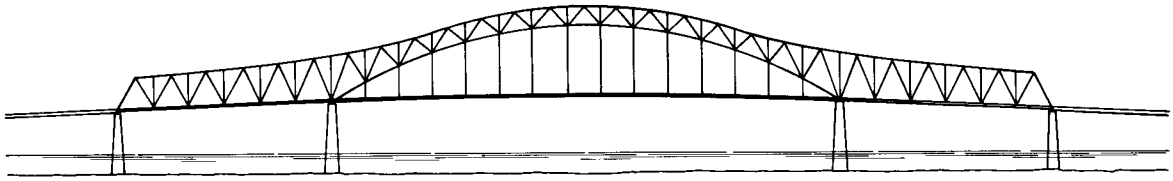
Type III navigation span is the Continuous Truss Tied Arch Span. This type of bridge is similar in structural function to Type II, the box girder arch. The difference being that a steel truss system is used for the arch rib and approach spans instead of box girder sections. This type of struc-



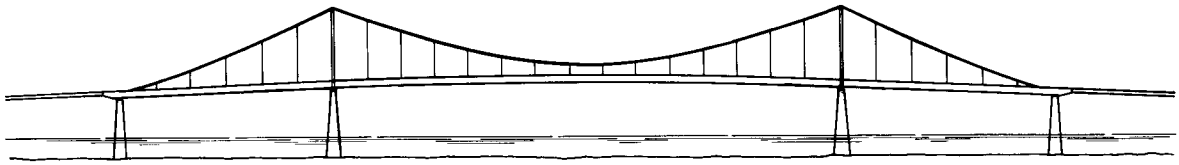
CONTINUOUS GIRDER SPAN — TYPE I



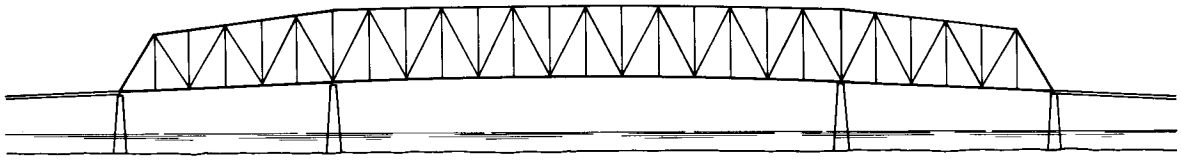
CONTINUOUS BOX GIRDER TIED ARCH SPAN — TYPE II



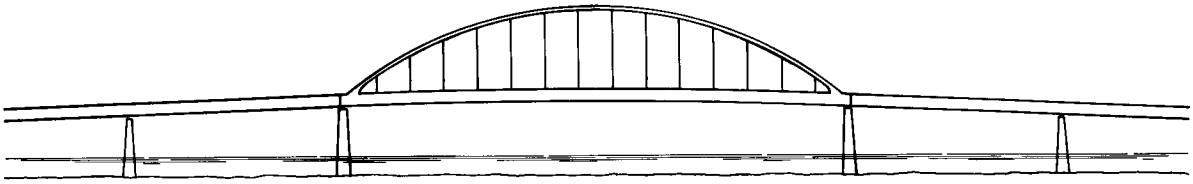
CONTINUOUS TRUSS TIED ARCH SPAN — TYPE III



SELF ANCHORED SUSPENSION SPAN — TYPE IV



CONTINUOUS TRUSS SPAN — TYPE V



BOX GIRDER TIED ARCH SPAN — TYPE VI

Exhibit I-5

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 Continuous Girder Span Type I, also shown in a general setting on Exhibit I-6, should be given thorough consideration in future engineering studies for a highway crossing at Sioux City, Iowa.

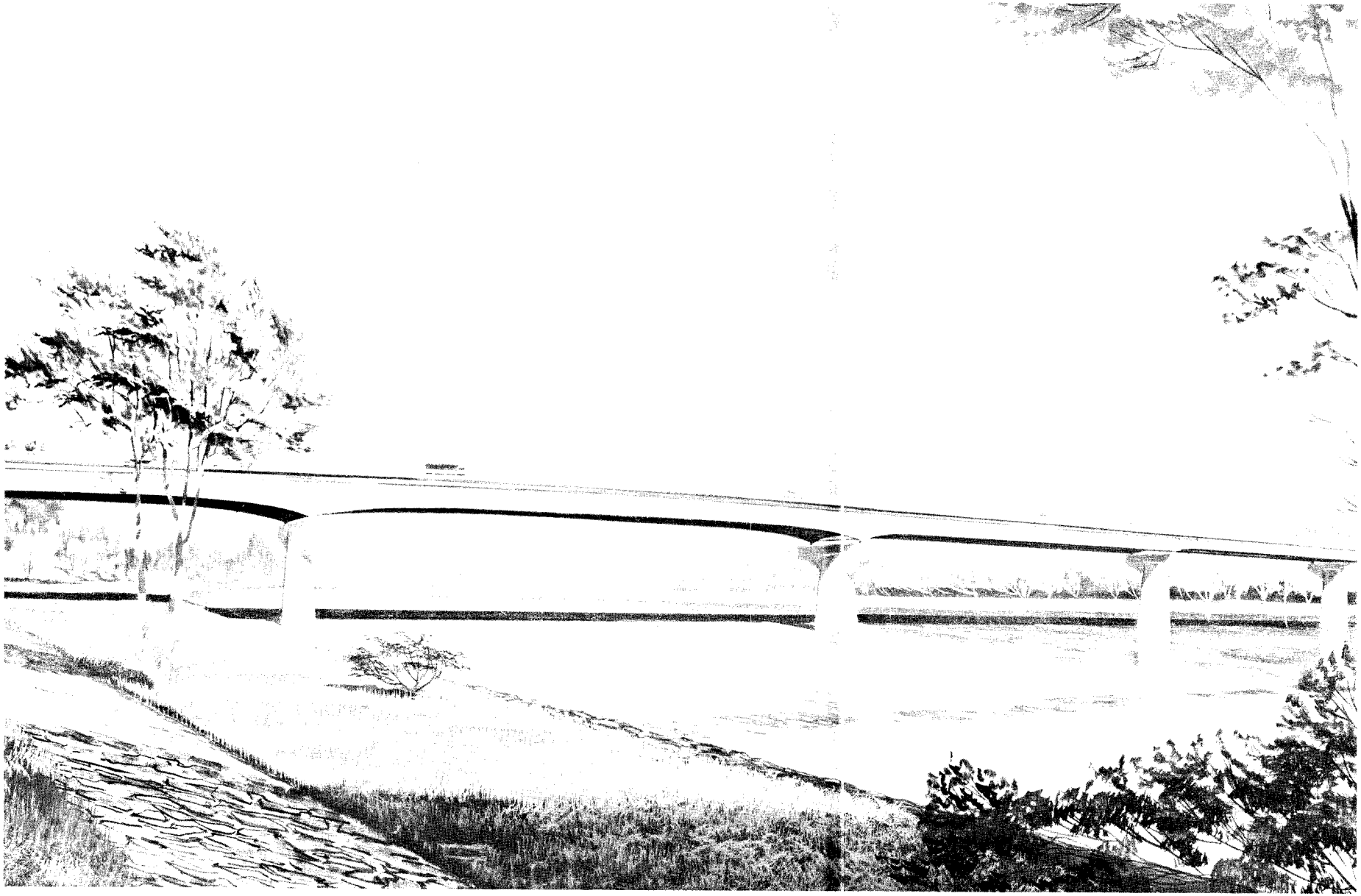


Exhibit 1-6

CONTINUOUS GIRDER 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.

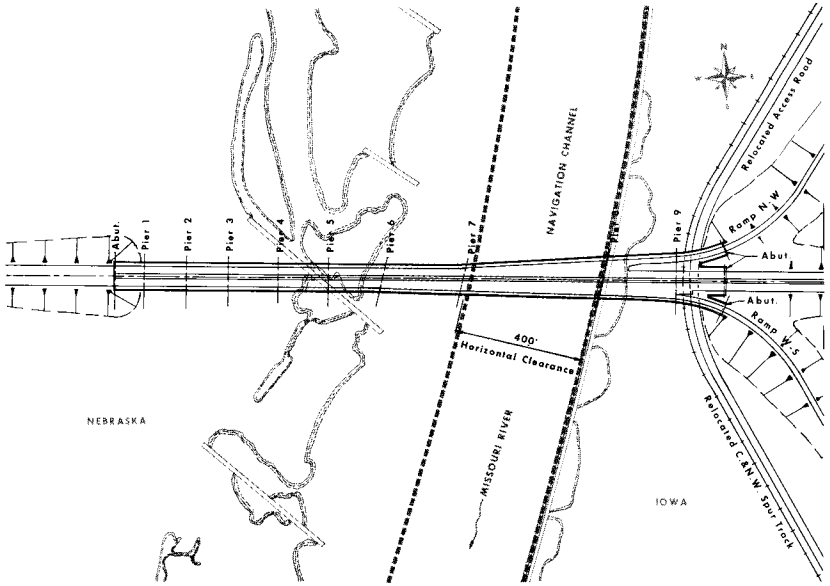
Right-of-way cost estimates were based upon fair market valuations of all real property involved. Allowances have been included for damages, severance losses and acquisition expenses.

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 design and economical span lengths. Main river unit studies will include economic comparisons of several types of construction.

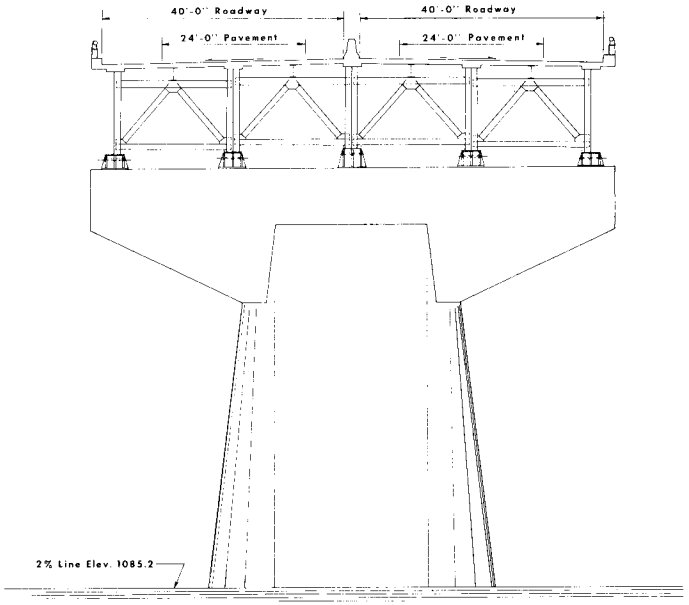
Interstate Spur Alternate

A plan, elevation and typical section for the navigation channel span of the Interstate Spur Alternate 1 Missouri River crossing is shown on Exhibit I-7. The twin 42 foot roadways provide 10 feet 6 inches of lateral clearance between the right edge of the right lane and the barrier rail, and 6 feet 0 inches lateral clearance between the left edge of the inside lane and the 2 foot wide barrier median separating the two roadways. These clearances conform 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.

Since the alignment of this alternate is nearly normal to the navigation channel and the channel is generally straight, a navigation span of



PLAN

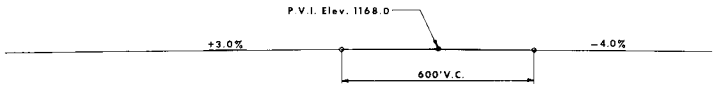


SECTION THRU PLATE GIRDER SPAN

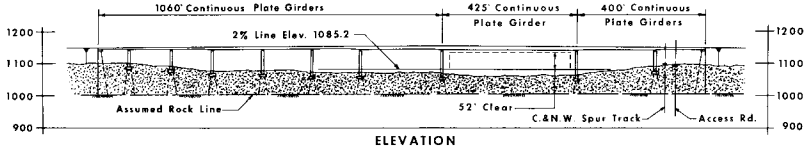
NEAR CHANNEL PIER

10 5 0 10 20 30 40

SCALE IN FEET



PROFILE GRADE



ELEVATION

100 0 100 200 300 400

SCALE IN FEET

Exhibit 1-7

INTERSTATE SPUR ALTERNATE 1

GENERAL PLAN AND ELEVATION

TABLE I-1

ESTIMATE OF BRIDGE CONSTRUCTION COST
INTERSTATE SPUR ALTERNATE 1

Sioux City, Iowa, Bridge

Continuous Girder Spans	1885 ft.	
Continuous Girder - Ramp N-W		150 ft.
Continuous Girder - Ramp W-S		150 ft.
	1885 ft.	300 ft.

Roadway Width - 40'-0" Curb-to-Curb in each direction (normal)
24'-0" Curb-to-Curb for Ramps

ITEM	QUANTITY	UNIT PRICE	COST
Superstructure:			
Bridge Railing	4,450 L.F.	$12.00	$ 53,400
Concrete	5,830 C.Y.	90.00	524,700
Reinforcing Steel	1,750,000 Lbs.	0.14	245,000
Girder Steel A-36	3,330,000 Lbs.	0.29	965,700
Girder Steel A-441	11,390,000 Lbs.	0.32	3,644,800
Cast Steel and Misc. Metal	360,000 Lbs.	0.70	252,000
Navigation Lighting	—	Lump Sum	20,000
	SUBTOTAL		$5,705,600
Substructure:			
Concrete	12,810 C.Y.	$65.00	$ 832,600
Reinforcing Steel	1,281,000 Lbs.	0.14	179,300
Steel Bearing Piles (12BP53)	39,650 L.F.	8.00	317,200
Steel Bearing Piles (14BP73)	15,130 L.F.	10.00	151,300
Steel Pile Cofferdams	73,050 S.F.	5.00	365,200
Excavation	15,080 C.Y.	10.00	150,800
	SUBTOTAL		$1,996,400
	TOTAL BRIDGE COST		$7,702,000

400 feet was used for developing project costs. A Continuous Girder Span structure was estimated for this alternate. The cost of this aesthetically pleasing structure should compare favorably with other types of spans.

The estimated construction cost of the river bridge at the Interstate Spur Alternate 1 location is $7,702,000. A detailed breakdown of this cost is shown in Table I-1. Quantities shown in this and all the Bridge Construction Cost Estimate Tables 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 the Interstate Spur Alternate 1 is shown in Table I-3.

Toll Crossings

A plan, elevation, and typical section for the navigation channel span of the Industrial Interchange Alternate Missouri River crossing is shown on Exhibit I-8. The 32 foot roadway width provides 4 feet 6 inches of lateral clearance between the right hand 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 400 feet measured face to face between piers on a line normal to the channel was used for developing project costs at this location. A Continuous Girder Span structure was estimated for this alternate.

The estimated construction cost of the river bridge at the Industrial Interchange Alternate location is $2,090,000 A detailed breakdown of this cost is shown in Table I-2.

TABLE I-2

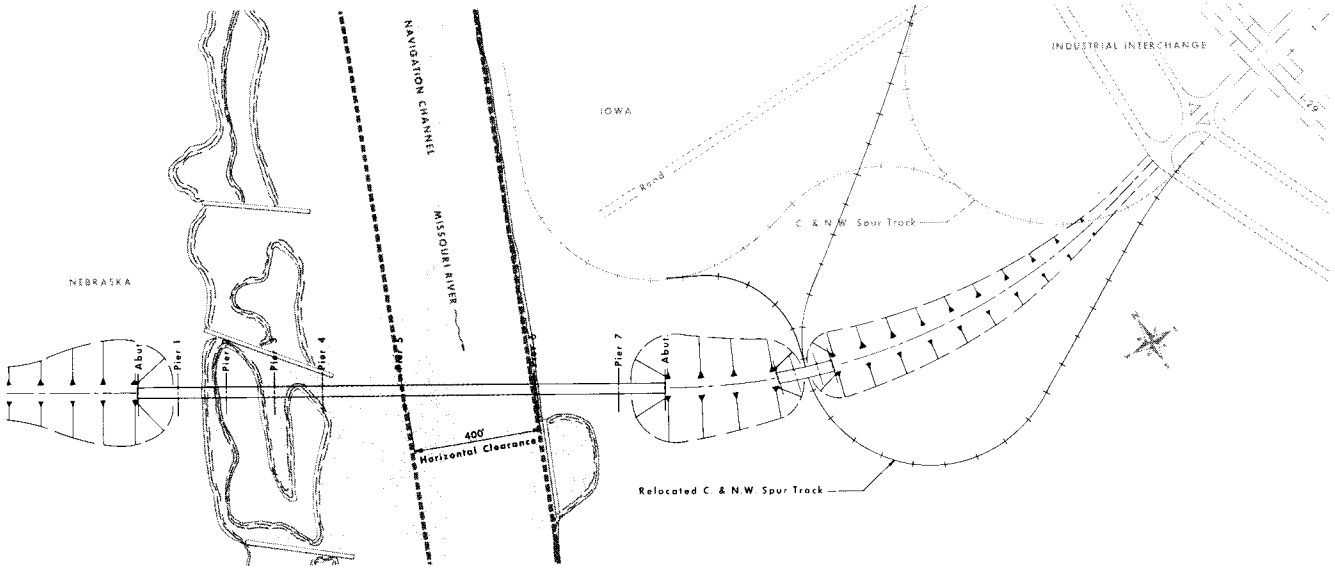
ESTIMATE OF BRIDGE CONSTRUCTION COST
INDUSTRIAL INTERCHANGE ALTERNATE

Sioux City, Iowa, Bridge

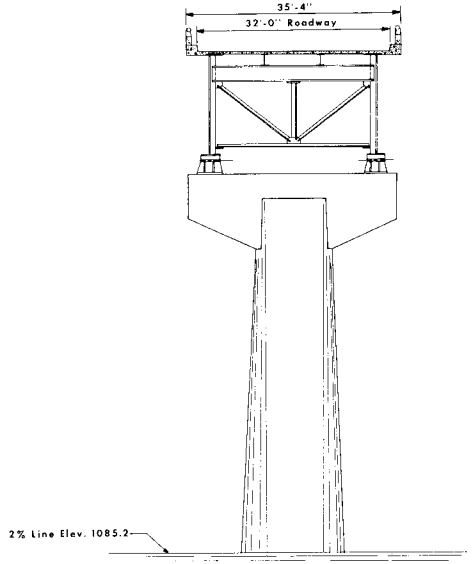
Continuous Girder Spans 1655 ft.

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

ITEM	QUANTITY	UNIT PRICE	COST
Superstructure:			
Bridge Railing	3,350 L.F.	$12.00	$ 40,200
Concrete	1,560 C.Y.	90.00	140,400
Reinforcing Steel	467,000 Lbs.	0.14	65,400
Girder Steel A36	1,185,000 Lbs.	0.29	343,600
Girder Steel A441	2,386,000 Lbs.	0.32	763,500
Cast Steel and Misc. Metal	80,000 Lbs.	0.70	56,000
Navigation Lighting	——	Lump Sum	20,000
		SUBTOTAL	$1,429,100
Substructure:			
Concrete	4,200 C.Y.	$65.00	$ 273,000
Reinforcing Steel	495,000 Lbs.	0.14	69,300
Steel Bearing Piles (12BP53)	9,930 L.F.	8.00	79,400
Steel Bearing Piles (14BP73)	3,500 L.F.	10.00	35,000
Steel Pile Cofferdams	26,580 S.F.	5.00	152,900
Excavation	5,130 C.Y.	10.00	51,300
		SUBTOTAL	660,900
		TOTAL BRIDGE COST	$2,090,000



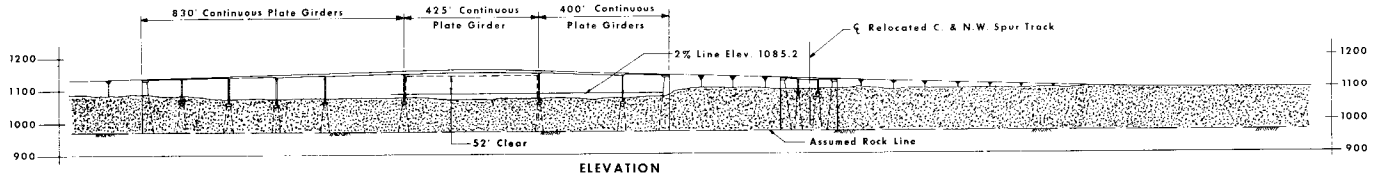
PLAN



SECTION THRU PLATE GIRDER
SPAN NEAR CHANNEL PIER

10 5 0 10 20
SCALE IN FEET

PROFILE GRADE



ELEVATION

100 0 100 200 300 400
SCALE IN FEET

Exhibit I-8

INDUSTRIAL INTERCHANGE ALTERNATE

GENERAL PLAN AND ELEVATION

A typical toll booth is shown on Exhibit I-9. The exact location of this facility on the bridge approach will be established during subsequent study phases.

The total estimated project cost for the Industrial Interchange Alternate is shown in Table I-3.

A plan, elevation and typical section for the navigation channel span of the Wall Street Alternate Missouri River crossing is not included in this report, however, a similar cross section to the Interstate Spur Alternate was used for estimating purposes.

A navigation span of 400 feet measured face to face between piers on a line normal to the channel was also used over the navigation channel for this alternate. A Continuous Girder Span structure was estimated for this alternate.

The total estimated project cost for the Wall Street Alternate is shown in Table I-3.

TABLE I-3

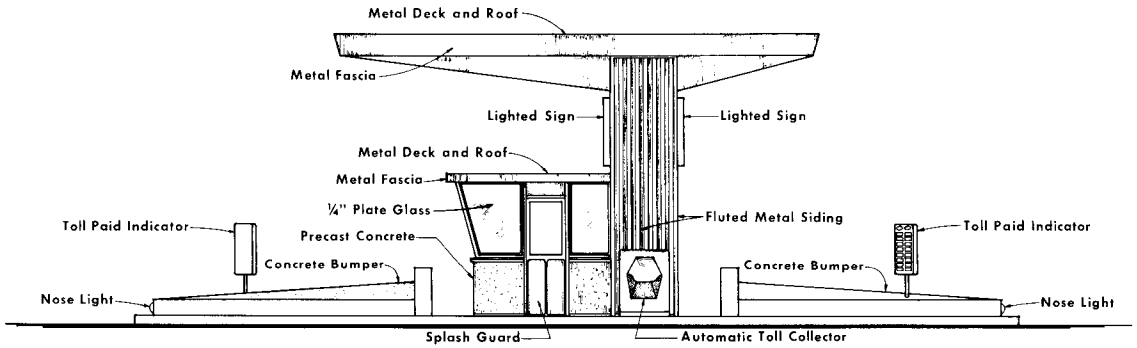
SUMMARY OF ESTIMATED PROJECT COSTS

Sioux City, Iowa, Bridges

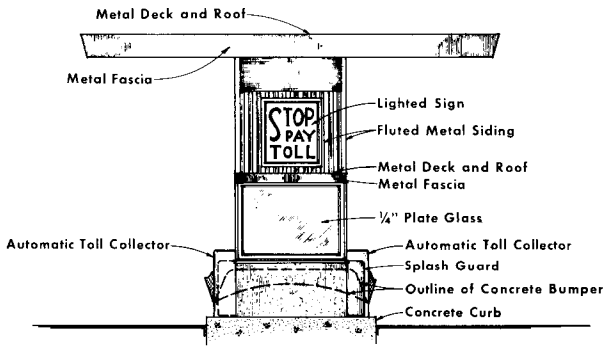
	INTERSTATE SPUR ALTERNATE 1		INDUSTRIAL INTERCHANGE ALTERNATE		WALL STREET ALTERNATE	
Roadway	$1,013,500*	$1,396,500	$ 312,400*	$753,600	$ 2,211,500*	$1,787,500
Structures	7,702,000	——	2,174,000	——	6,987,500	612,500
Retaining Walls	27,500	——	——	——	——	——
Subtotal	8,743,000	1,396,500	2,486,400	753,600	9,199,000	2,400,000
Toll Booth Complex	126,000	——	85,000	——	126,000	——
Engineering and Contingencies	1,774,000	279,000	514,300	150,000	1,865,000	480,000
Total Construction	10,643,000	1,675,500	3,085,700	903,600	11,190,000	2,880,000
Right-of-Way	105,000	53,000	55,600	53,400	1,937,500	975,000
Acquisitions and Contingencies	20,000	10,000	12,000	12,000	387,500	195,000
Administration and Legal	9,000	4,500	6,700	6,000	40,000	20,000
Total	10,777,000**	1,743,000	3,160,000**	975,000	13,555,000**	4,070,000
Total Project Cost	$12,520,000		$4,135,000		$17,625,000	

* Includes R.R. Relocation Costs

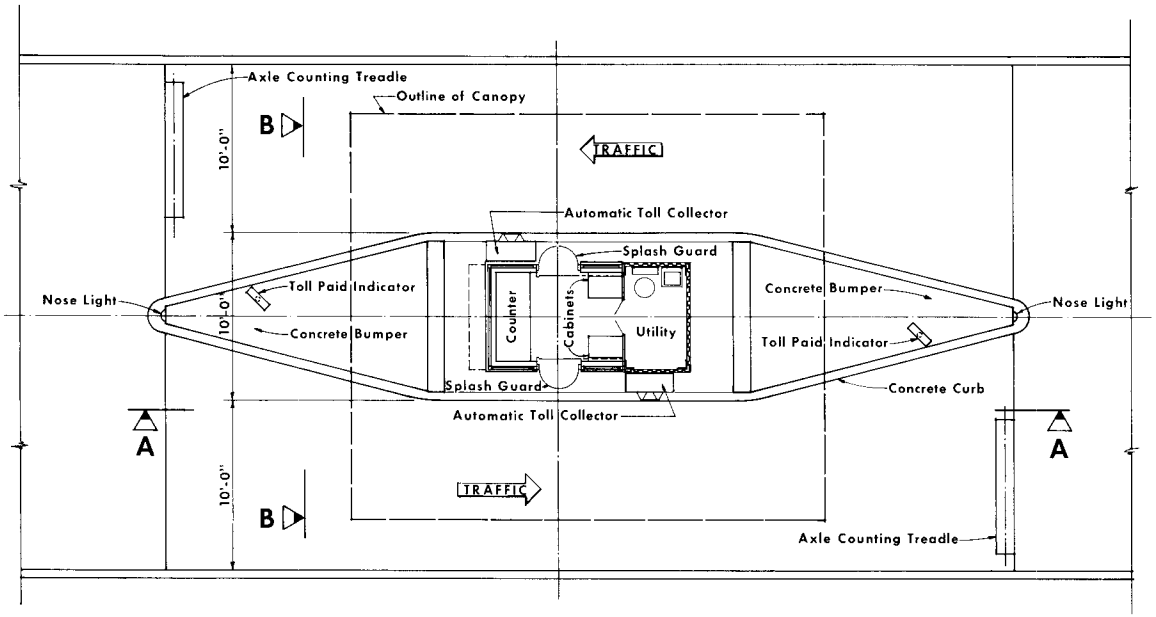
**Iowa costs include all costs of the river structure up to and including Nebraska Abutment.



ELEVATION A-A



ELEVATION B-B



PLAN

5 0 5 10 15

SCALE IN FEET

Exhibit I-9

GENERAL PLAN AND ELEVATION
TOLL BOOTH

TABLE I-4

ESTIMATE OF FIRST YEAR EXPENSES
FOR
OPERATION AND MAINTENANCE
Sioux City, Iowa, (Interstate Spur Alternate 1) Bridge

ADMINISTRATION		
Toll Sergeant	$7,280	
Travel and Car Expenses	1,000	
Consulting Engineers	4,800	
Miscellaneous	920	
Total Administration		$14,000
OPERATION		
Toll Collectors	$34,000	
Utilities	2,000	
Supplies and Postage	2,000	
Employee Benefits	3,000	
Total Operation		41,000
REPAIRS AND MAINTENANCE*		7,500
INSURANCE		11,500
MAINTENANCE RESERVE		11,000
Total Operation and Maintenance		$85,000

*By District maintenance forces on force account cost basis.

Operation and Maintenance

The estimate of first year expenses for operation and maintenance for the Interstate Spur Alternate 1 is shown in Table I-4; for the Industrial Interchange in Table I-5; and the Wall Street Alternate in Table I-6. Inasmuch as operation of the bridges 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 those provided by a private operation. Since the proposed bridges 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-5

ESTIMATE OF FIRST YEAR EXPENSES
FOR
OPERATION AND MAINTENANCE

Sioux City, Iowa, (Industrial Interchange Alternate) 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	$24,000	
Utilities	2,000	
Supplies and Postage	2,000	
Employee Benefits	3,000	
Total Operation		$31,000
REPAIRS AND MAINTENANCE*		5,000
INSURANCE		6,000
MAINTENANCE RESERVE		6,000
Total Operation and Maintenance		$60,000

*By District maintenance forces on force account cost basis.

TABLE I-6

ESTIMATE OF FIRST YEAR EXPENSES
FOR
OPERATION AND MAINTENANCE

Sioux City, Iowa, (Wall Street Alternate) Bridge

ADMINISTRATION		
Toll Sergeant	$ 7,280	
Travel and Car Expense	1,000	
Consulting Engineers	4,800	
Miscellaneous	920	
Total Administration		$14,000
OPERATION		
Toll Collectors	$34,000	
Utilities	2,000	
Supplies and Postage	2,000	
Employee Benefits	3,000	
Total Operation		41,000
REPAIRS AND MAINTENANCE*		7,500
INSURANCE		11,500
MAINTENANCE RESERVE		11,000
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

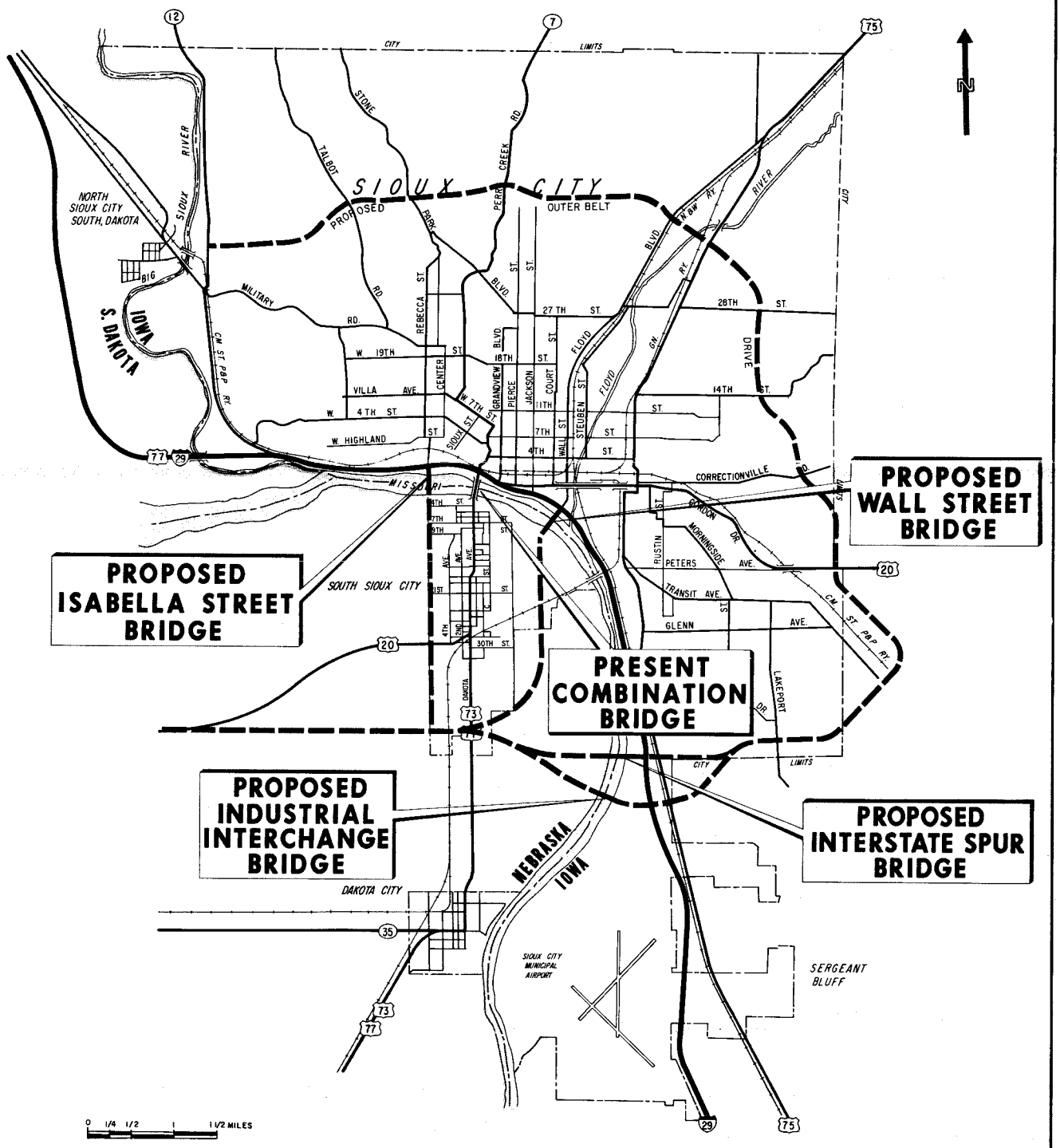
A general economic evaluation was made of the Sioux City area, as a guide in projecting future trans-river traffic growth. Route reconnaissance investigations were conducted to inventory present traffic facilities and to determine average operating speeds and other traffic service characteristics. All available trans-river travel patterns and traffic trend data for the Combination Bridge as well as the Decatur Bridge, to the south, were assembled and reviewed.

Using the travel pattern information, travel speed, route inventory data, and empirical diversion curves developed from studies of similar facilities, traffic assignments were made assuming modern toll crossings were available in the Sioux City area. 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.

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

Proposed Sioux City Bridges

Several locations for new toll bridges in the Sioux City area were given preliminary study. The bridge alignments which were selected for more detailed studies are depicted in Exhibit II-1.



LOCATION MAP

Wilbur Smith and Associates

EXHIBIT II-1

It was assumed that the present Combination Bridge would remain as a free crossing and that as many as three toll bridges might be constructed to serve trans-river traffic. One of the alternate bridge locations studied was at Isabella Street, west of the present bridge. On the Nebraska side, this alignment would be west of 8th Avenue in South Sioux City.

Another alternate crossing would be located at Wall Street in Sioux City and connect with 9th Street in South Sioux City. This alignment would provide good access to the stockyard area and also open up the area east of South Sioux City for residential and commercial development.

The third alternate bridge location studied was in the Industrial Interchange area to the south of Sioux City. In addition to providing direct access to the prime industrial sites available, some of which are now being developed, the bridge would also serve to connect South Sioux City with the Municipal Airport complex.

In addition to the toll crossing analysis, studies were made of a free Interstate Spur Bridge which would serve as an alternate crossing in the Industrial Interchange crossing corridor.

AREA GROWTH ANALYSIS

Several economic parameters were evaluated to determine levels of activity and recent growth trends in the area which would be directly served by the proposed bridges. 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 indicators of travel growth, were analyzed.

Local field reconnaissance was conducted in Sioux City and the surrounding metropolitan area. Contact was made with various city officials and others to obtain information regarding trends and characteristics of residential, commercial and industrial land use. Available current data and growth forecasts for the bridge study area were assembled and reviewed.

Study Area Characteristics

Sioux City, located at the confluence of the Missouri, Floyd, and Big Sioux Rivers, is the largest municipality in northwestern Iowa and serves a three-state trade area of over 500,000 persons. It is an important center for retail shopping, material distribution, medical care, cultural, and educational facilities. Agriculture and the processing of agricultural products, including the stockyard operation, has historically been a dominant factor in its economy. Industry is also an important economic factor, producing such diverse products as radios, portable generators, micro-wave towers, electric and air-powered tools, fishing tackle, truck bodies, hydraulic cylinders, work clothing, etc.

Sioux City is an important transportation center. Five major railroads serve the city providing both passenger and freight operations. Numerous truck lines furnish fast transportation for long and short haul distribution of both finished goods and raw materials. Barge lines operate between Sioux City and numerous points along the Missouri and Big Sioux Rivers. Three airlines serve the city. Good highway transportation is available; four U. S.-designated highways, one Interstate Highway and four State highways converge on the city.

South Sioux City, Nebraska is a rapidly-expanding community with a tax structure attractive to new industrial development. At the present time, it serves largely as a residential community, or satellite to Sioux City. This is also true of the numerous smaller municipalities in the metropolitan area including Sergeant Bluff in Iowa and North Sioux City in South Dakota.

Population Trends

In 1950, Sioux City had a population of 83,991. By 1960, the population had increased to 89,159, an average annual growth of 0.6 per cent per year over the ten-year period. As shown in Table II-1, a population growth averaging 0.5 per cent occurred between 1960 and 1966, to an estimated population in the latter year of 92,100.

In 1960, South Sioux City had a population of 7,200. This represented an average annual growth of 2.6 per cent from the 5,557 persons recorded in 1950. Population increases also occurred for the smaller communities in the Sioux City area, shown in Table II-1, between 1950 and 1960 and for those municipalities where statistics were available, between 1960 and 1966.

A four-county area, comprised of those counties which would be most advantageously served by new river crossings in the Sioux City area, was defined for study purposes. The study area included Plymouth and Woodbury Counties in Iowa, Dakota County in Nebraska and Union County in South Dakota.

Between 1950 and 1960, the combined population of the four-county study area increased slightly from 148,362 to 154,120. This represented an average annual growth of 0.4 per cent. Over the past six years, 1960-1966, a smaller increase occurred—0.2 per cent per year to a population of 156,300 in 1966.

The population trend in the four-county study area over the past six years was below the 0.3 per cent average annual growth recorded statewide

TABLE II-1

POPULATION TRENDS

AREA	1950	AVERAGE ANNUAL PER CENT CHANGE	1960	AVERAGE ANNUAL PER CENT CHANGE	1966
Municipalities					
Dakota City	622	4.1	928	—	N.A.
Hinton	345	1.6	403	2.6	471
Jackson	200	1.1	224	—	N.A.
Lawton	254	2.5	324	—	N.A.
North Sioux City	N.A.	—	736	—	N.A.
Sergeant Bluff	569	3.6	813	4.5	1,107 (1)
Sioux City	83,991	0.6	89,159	0.5	92,100
South Sioux City	5,557	2.6	7,200	—	N.A.
Counties					
Dakota	10,401	1.6	12,168	— 0.4	11,900
Plymouth	23,252	0.3	23,906	0.7	25,000
Union	10,792	— 0.6	10,197	— 0.1	10,100
Woodbury	103,917	0.4	107,849	0.2	109,300
Four-County Total	148,362	0.4	154,120	0.2	156,300
States					
Iowa	2,621,073	0.5	2,757,537	0.3	2,813,600
Nebraska	1,325,510	0.6	1,411,330	0.7	1,473,900
South Dakota	652,740	0.4	680,514	0.6	706,400
United States (2)	150,697,361	1.7	178,464,236	1.6	196,208,200

N.A. = Not available.

(1) 1967 special census.

(2) Does not include Alaska and Hawaii.

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

in Iowa, the 0.7 per cent realized in Nebraska and the 0.6 per cent experienced in South Dakota. The average annual growth recorded nationwide during this same period was 1.6 per cent.

Trends in Retail Sales

After a nominal growth of 1.3 per cent per year between 1956 and 1961, retail sales in the four-county study area increased an average of 3.7 per cent between 1961 and 1966. Total sales in the latter year amounted to $256,328,000. The average annual growth recorded during the last five years, while good, was somewhat below the statewide growths realized in Iowa, Nebraska and South Dakota and also the national trend.

Average Effective Buying Income Per Family Trends

In 1956, average effective buying income per family in the four-county study area was $5,332. By 1961, this had increased to $6,048; the 1966 level was $8,323. This represents average annual growths of 2.5 per cent between 1956 and 1961, and 6.6 per cent between 1961 and 1966. The growth during the last five years was slightly below that recorded statewide in Iowa and South Dakota but substantially higher than that realized in Nebraska and for the nation.

Trends in Motor Vehicle Registrations

Motor vehicle registrations in the four-county study area in 1956 amounted to 63,519. By 1966, this had increased to 81,075, representing average annual growths of 2.0 per cent between 1956 and 1961 and 3.0 per cent between 1961 and 1966. The growth recorded in the four-county study area during the past five years exceeded that experienced statewide in Iowa, Nebraska and South Dakota, but was somewhat below the national trend.

Motor Fuel Consumption Trends

Reflecting the growths in personal income and motor vehicle registrations in the last decade, personal travel, as measured by motor fuel consumption, has also increased substantially. Motor fuel consumption in Iowa increased an average of 2.0 per cent per year between 1956 and 1961 increasing to 2.5 per cent annually between 1961 and 1966. Over the last five years, growth in motor fuel consumption in Iowa exceeded that recorded in Nebraska and South Dakota. The national growth trend was somewhat higher.

Future Growth

The population of Sioux City is estimated to increase from the 1960 level of 89,159 to 100,144 in 1980. As shown in Table II-2, this represents

TABLE II-2

POPULATION PROJECTIONS

AREA	ACTUAL 1960	AVERAGE ANNUAL PER CENT CHANGE	ESTIMATED 1980
Municipalities			
Hinton	403	— 1.2	293
Lawton	324	2.0	478
Sergeant Bluff	813	2.6	1,353
Sioux City	89,159	0.6	100,144
Counties			
Plymouth	23,906	0.2	24,950
Woodbury	107,849	0.4	115,960
State			
Iowa	2,757,537	0.8	3,192,000

SOURCE: Iowa State Highway Commission.

an average annual growth of 0.6 per cent. The communities of Lawton and Sergeant Bluff are expected to experience even higher growths during the same projection period while the population of Hinton is projected to decrease. The two Iowa counties, Plymouth and Woodbury, are estimated to record average annual population increases of 0.2 and 0.4 per cent, respectively, between 1960 and 1980. The growth rates estimated for Sioux City and the two counties are slightly below the average annual increase of 0.8 per cent projected statewide in Iowa.

Growth projections for the Sioux City metropolitan area prepared by the Siouxland Interstate Metropolitan Planning Council are available for the period 1967 through 1990. As shown in Table II-3, the number of dwelling units is expected to increase from 32,834 in 1967 to 67,214 in 1990, a growth rate of double that anticipated for population in the metropolitan area. Good growths are also anticipated in labor force, employment and

TABLE II-3

GROWTH PROJECTIONS

Sioux City Metropolitan Area[1]

ITEM	1967	AVERAGE ANNUAL PER CENT CHANGE	1990
Dwelling Units	32,834	3.2	67,214
Population	105,000	1.6	152,500
Labor Force	39,111	2.6	70,892
Employment	36,912	1.7	54,430
Retail Sales	$226,072,000	1.5	$316,500,000
Cars Owned	39,933	1.0	49,827

[1] Study area includes Sioux City and Sergeant Bluff in Iowa, South Sioux City and Dakota City in Nebraska, and North Sioux City in South Dakota.

SOURCE: Siouxland Interstate Metropolitan Planning Council.

retail sales. The number of cars owned in the metropolitan area is expected to grow from 39,933 in 1967 to 49,827 in 1990, an average annual increase of 1.0 per cent.

Good growths in commercial and industrial activities have occurred in the Sioux City area over the past several years. It is anticipated that these will increase at an even higher rate into the foreseeable future, particularly in the vicinity of the industrial area near the Sioux City Airport. Industrial growth in this area, in large measure, is related to completion of Interstate Route 29.

South Sioux City, which now is largely residentially-oriented, is expected to achieve higher rates of commercial and industrial growth as improved access is provided to industrial sites along the Missouri River. Implementation of the Wall Street and Industrial Interchange Bridges would contribute greatly to development of the immediate areas these facilities would serve. As shown in Exhibit II-1, existing development in South Sioux City is largely oriented to the area immediately adjacent to the present Combination Bridge. The area immediately east of the city is good, developable land which would be attractive to residential use if convenient access were provided to the sources of employment in Sioux City.

TRAFFIC STUDIES

Preliminary studies were made to evaluate the traffic potential of additional river crossings in the Sioux City area. These studies included analysis of the magnitude and composition of present trans-river traffic, travel patterns and the quality of traffic service provided by the existing bridge in Sioux City and the closest crossing to the south, the Decatur Bridge.

Route Reconnaissance

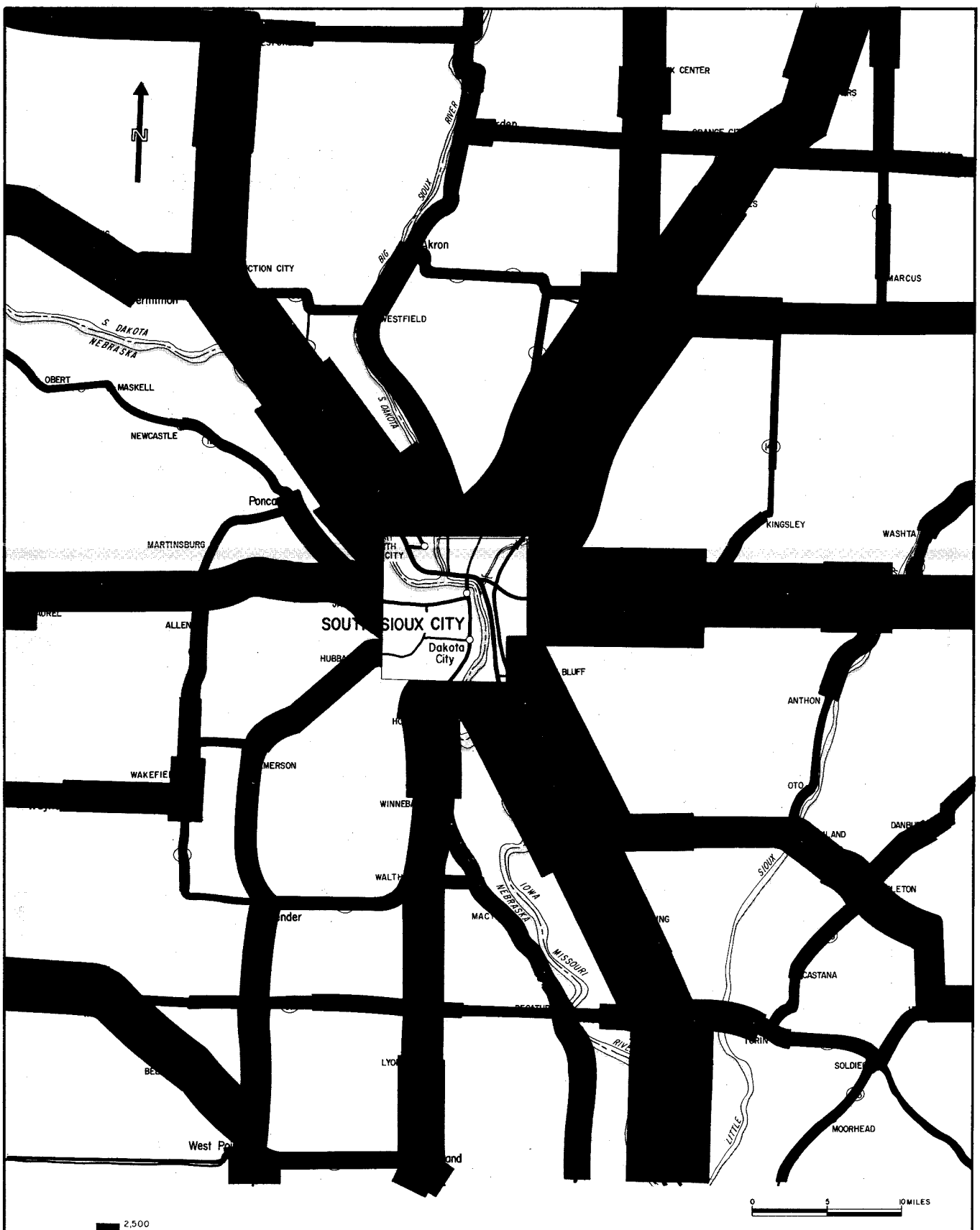
Interstate Route 29 is a four-lane, grade-separated, limited-access highway located along the Missouri River through the Sioux City area. Having recently been opened, it is in excellent condition and the posted speed limit of 75 mph can readily be maintained. U. S. Route 20, from the east city limits of Sioux City to Iowa Route 140, has a 48-foot pavement and is in good condition; to the east, the route is rated "tolerable". U. S. Route 75, in the area to the north and south of Sioux City, has pavement widths ranging from 44 to 48 feet and carries a "good" rating. Iowa Route 7, from Sioux City north to Iowa Route 3, has a 24-foot pavement and is in critical condition.

The remaining highways in the study area for the most part, two-lane facilities traversing rural areas devoted to agricultural use. Many of the routes serve as the "main street" of the smaller communities through which they pass. The highways range widely in roadway condition and traffic capacity characteristics, with sufficiency ratings varying from good to critical.

Posted speed limits in the project study area range downward from the daytime limit of 75 mph for automobiles on Interstate Route 29 to less than 20 mph on urban streets. Speed-delay surveys revealed generally good travel conditions on highways beyond the downtown area of Sioux City, with no difficulty in maintaining speeds close to the posted limits.

Present Traffic Volumes

The importance of study area highways in terms of relative traffic volumes, is depicted in Exhibit II-2. Interstate Route 29 and U. S. Route 75



TRAFFIC FLOW MAP

1965 AVERAGE DAILY TRAFFIC

Wilbur Smith and Associates

EXHIBIT II-2

carry the bulk of the north-south through traffic moving in the Sioux City area. U. S. Route 20 serves substantially lower volumes but is the most important east-west facility. The importance of Sioux City and smaller urban areas on traffic generation is shown by the increases in traffic volumes as these highways approach and/or pass through the urban areas.

Annual Traffic Trends

Good traffic growths have occurred on the Combination Bridge over the last several years. As shown in Table II-4, average daily usage has increased from 16,665 vehicles in 1957 to 22,700 in 1967. This represents an average annual growth, over the ten-year period, of 3.1 per cent. An even higher average annual growth was recorded over the last four years, 1963-1967, of 5.1 per cent. Average weekday traffic is also indicated in Table II-4. Between 1963 and 1967, average weekday usage increased 6.5 per cent annually.

Since construction of a new toll bridge east or south of the present Combination Bridge would necessarily affect, to some extent, present usage of the closest existing bridge to the south, annual trends on the Decatur Bridge were also studied. As shown in Table II-4, traffic on this facility has increased from an average of 285 vehicles per day in 1957 to 726 in 1967, indicating an average annual growth of 9.8 per cent over this period.

Monthly Traffic Variations

Monthly traffic variations are not available for the Combination Bridge. However, monthly trends at several count locations on important arterial streets in Sioux City and at a permanent traffic recorder on U. S. Route 20, west of South Sioux City were studied. The heavily local or short distance-oriented trips measured at the arterial street locations in Sioux City reflected a relatively narrow range of variation by month from about seven per cent below the average month in February, April and December to eight per cent above average in October. On U. S. Route 20, monthly fluctuations ranged from 23 per cent below the average month in January, to 18 per cent above average in August.

TABLE II-4

ANNUAL TRAFFIC TRENDS

Trans-River Crossings

YEAR	COMBINATION BRIDGE		DECATUR BRIDGE
	Average Weekday Traffic	Average Daily Traffic	Average Daily Traffic
1957	N.A.	16,665	285
1958	N.A.	17,300	320
1959	19,887	17,575	315
1960	N.A.	17,700	320
1961	N.A.	18,000	350
1962	N.A.	18,200	450
1963	19,050	18,590	N.A.
1964	19,310	19,150	400
1965	21,520	19,581	558
1966	21,650	20,400	788
1967	24,516	22,700	726
1968	26,480	N.A.	N.A.
AVERAGE ANNUAL GROWTH			
1957-1967	—	3.1	9.8
1963-1967	6.5	5.1	—

N.A. = Not Available.

SOURCE: Iowa State Highway Commission, Nebraska Department of Roads, and Sioux City Traffic Engineering Department.

Origin and Destination Studies

In 1965, the Iowa State Highway Commission conducted a comprehensive origin and destination traffic study of the Sioux City metropolitan area. The trans-river travel patterns developed from the interview surveys were used as the basis for determining a redistribution of trans-river trips, assuming new toll facilities were constructed. In addition to the Sioux City origin and destination traffic study, use was also made of an origin and destination study conducted on the Decatur Bridge in 1959.

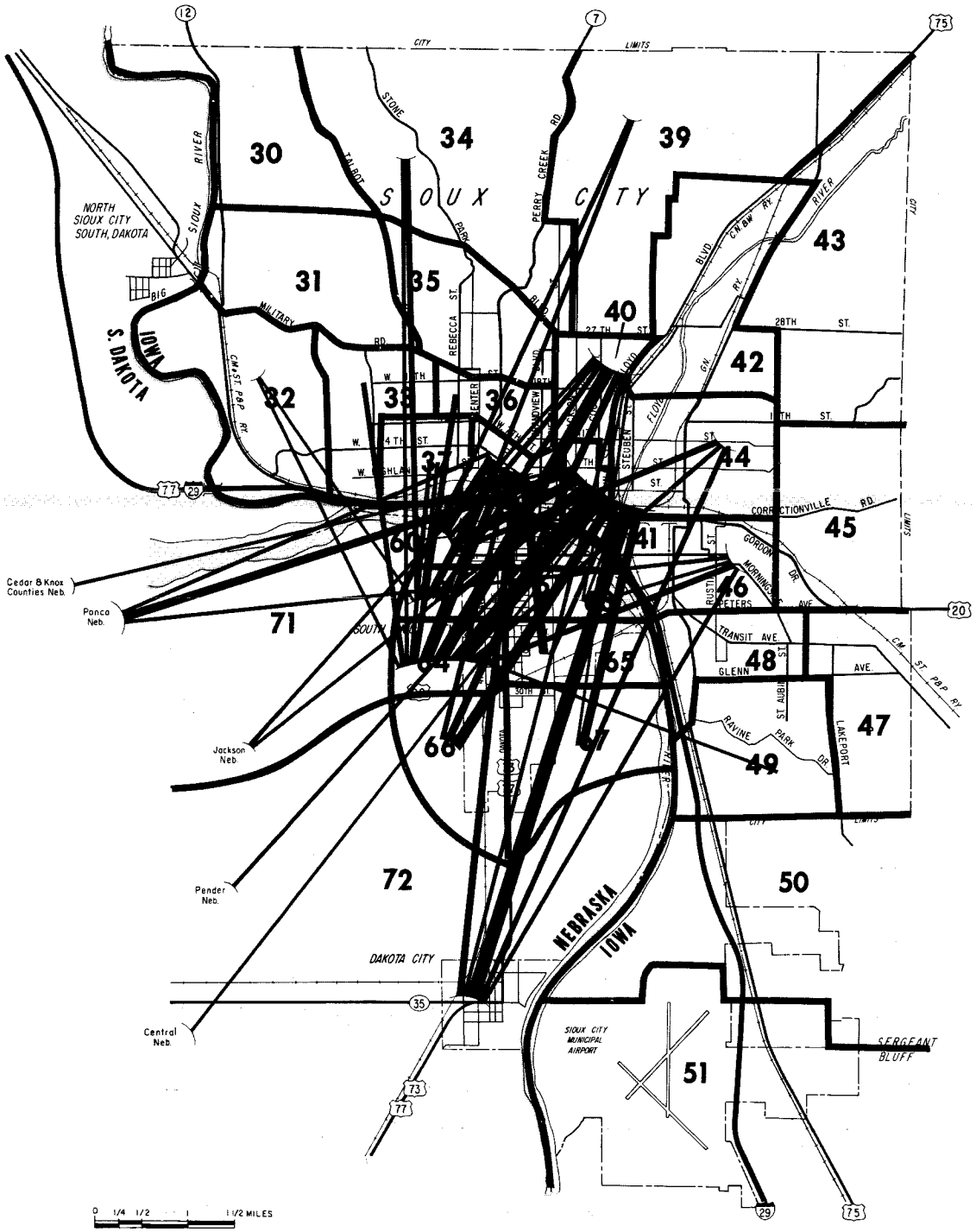
Vehicle Classification Counts

Over 96 per cent of the vehicles using the present Combination Bridge are two-axle passenger cars or trucks. As shown in Table II-5, the next largest axle category is five-axle vehicles, accounting for 2.3 per cent of all traffic followed by three-axle vehicles — 1.0 per cent and four-axle vehicles — 0.6 per cent. A substantially higher percentage of trucks was recorded at several count locations on U. S. Route 20, Interstate Route 29 and U. S. Route 75 in the Sioux City metropolitan area. The highest percentage of five-axle or over-the-road trucks occurred on Interstate Route 29 at the Iowa-South Dakota line, 5.1 per cent.

Travel Desires

The origin and destination data collected during the 1965 traffic study were coded to the geographic traffic zone pattern partially shown in Exhibit II-3. The illustration also depicts the travel desires which were considered wholly or partially potential to the proposed bridges in the Sioux City area. The width of the flow bands shown in the illustration are proportional to the number of trips moving between each zone pair on an average day in 1965.

Downtown Sioux City is, by far, the heaviest generator of trans-river traffic. A total of 659 trips per day were measured between downtown Sioux



TRAVEL DESIRES

PRESENT COMBINATION BRIDGE

1965 AVERAGE DAILY TRAFFIC

Wilbur Smith and Associates

EXHIBIT II-3

TABLE II-5

VEHICLE CLASSIFICATION COUNTS AT SELECTED LOCATIONS

Per Cent of Total Traffic

1965

LOCATION	PASSENGER CARS	TRUCKS				TOTAL
		Two-Axle	Three-Axle	Four-Axle	Five Axle	
Combination Bridge	78.4	17.7	1.0	0.6	2.3	100.0
U. S. Route 20 — West of South Sioux City[1]	75.3	16.6	2.5	2.7	2.9	100.0
U. S. Route 20 — East of Sioux City	78.7	16.8	0.9	1.4	2.2	100.0
Interstate Route 29 — Iowa — South Dakota Line	75.6	16.8	1.2	1.3	5.1	100.0
Interstate Route 29 — West of Wall St.	77.0	17.7	1.2	0.8	3.3	100.0
Interstate Route 29 — South of Sioux City	76.6	16.3	1.0	1.3	4.8	100.0
U. S. Route 75 — North of Sioux City	79.3	14.2	1.0	3.0	2.5	100.0

[1] 1967 Percentages obtained from the Nebraska Department of Roads.

SOURCE: Iowa State Highway Commission, Nebraska Department of Roads.

City and the business district of South Sioux City. An additional 526 trips per day were recorded between the area just north of downtown Sioux City and downtown South Sioux City.

Dakota City, to the south of Sioux City, is also an important generator of trips now using the Combination Bridge. Several longer-distance trips were recorded between Sioux City and several points in Nebraska. To the east, none of the individual zone-to-zone through trip movements exceeded 100 vehicles per day.

Typical Time-Distance Relationships

Representative time-distance relationships for several movements which would have a choice of alternate bridge routings within the Sioux City area are shown in Table II-6. The travel times and distances indicated were developed from the route reconnaissance studies conducted on all pertinent highways serving the alternate river bridges. The driving times represent average speeds rather than the fastest driving time that could be achieved between the various trip termini indicated.

On a trip between the junction of U. S. Route 77 and Interstate Route 29, west of Sioux City and the intersection of Dakota Avenue and 17th Street in South Sioux City, use of the proposed Isabella Street Bridge versus the Combination Bridge would involve the same distance but would be 0.3 minutes shorter in travel time. On a movement between Sergeant Bluff and the Dakota Avenue — 17th Street intersection in South Sioux City, use of the proposed Industrial Interchange Bridge would be approximately 1.4 miles and 1.4 minutes shorter than a routing via the Combination Bridge. On other sample trip movements between Sioux City and South Sioux City, trip mileages would be either slightly shorter or longer via the proposed bridges rather than the existing bridge; however, the proposed crossings would save travel time in each instance.

TABLE II-6

TYPICAL TIME-DISTANCE RELATIONSHIPS

BETWEEN	VIA	DISTANCE (miles)	TRAVEL TIME (min.)	AVERAGE SPEED (mph)	SAVINGS VIA PROPOSED BRIDGES (miles)	SAVINGS VIA PROPOSED BRIDGES (min.)
Junction U. S. 77 — I-29 West of Sioux City and Dakota Ave. — 17th St. in South Sioux City	Combination Bridge	3.5	5.4	39		
					—	0.3
	Isabella St. Bridge	3.5	5.1	41		
Hamilton Blvd — 14th St. in Sioux City and Dakota Ave. — U. S. 20 in South Sioux City	Combination Bridge	3.3	7.9	25		
					— 0.3	0.9
	Isabella St. Bridge	3.6	7.0	31		
Jackson St. — 5th St. in Sioux City and Dakota Ave. — Lakeway in South Sioux City	Combination Bridge	3.6	8.7	25		
					— 0.8	1.1
	Wall St. Bridge	4.4	7.6	35		
Plymouth St. — Gordon Drive in Sioux City and Dakota Ave. — U. S. 20 in South Sioux City	Combination Bridge	3.9	7.9	30		
					0.4	1.8
	Wall St. Bridge	3.5	6.1	34		
Gordon Drive — Proposed Outer Belt in Sioux City and Dakota Ave. — U. S. 20 in South Sioux City	Combination Bridge	6.7	12.4	32		
					— 0.4	4.1
	Industrial Interchange Bridge	7.1	8.3	51		
Sergeant Bluff and Dakota Ave. — 17th St. in South Sioux City	Combination Bridge	8.6	10.5	49		
					1.4	1.4
	Industrial Interchange Bridge	7.2	9.1	47		

ESTIMATED TRAFFIC AND REVENUES

Estimated traffic and revenues for the proposed Sioux City bridges are based upon the number of motorists who will be diverted from the present Combination Bridge and, to a much lesser extent, the Decatur Bridge. In addition, the new facilities are expected to generate additional usage of an induced nature.

Basic Assumptions

Estimates of traffic and revenues for the proposed Sioux City bridges are predicated on the following assumptions:

1. The facilities will be open to traffic on July 1, 1971.

2. The bridges will be constructed on the alignments and with the approaches discussed in this report.

3. No additional river crossings will be constructed in the reach of the Missouri River between Yankton and Decatur.

4. The present Combination Bridge will remain a free facility.

5. The toll schedule recommended in this report will be implemented.

6. The bridges 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 assumptions could materially affect estimated usage and revenues for the proposed bridges.

Recommended Method of Toll Collection

It is recommended that appropriate toll collection facilities be located on the Sioux City approaches of each of the three proposed facilities. The Isabella Street toll collection plaza could be limited to a single toll booth located between the two travel lanes. The booth should be designed and constructed to provide for two toll attendants, one collecting from each direction of travel. It is anticipated that initially, two attendants would be needed during daylight hours of operation, while one attendant could readily collect tolls from both directions of travel during night hours.

On the Wall Street and Industrial Interchange Bridges, multilane toll plazas would be required. The number of toll lanes and "mix" between attended and automatic lanes could only be determined after more detailed traffic and revenue analysis.

Recommended Toll Schedule

Several toll rates were analyzed to determine the best toll structure for the proposed Sioux City bridges. To maintain the current balance of development in the metropolitan area, a similar toll rate was assumed for each proposed bridge. The toll rate studies indicated that the preliminary toll structure shown in Table II-7 would produce optimum revenues for the proposed facilities

TABLE II-7

RECOMMENDED TOLL SCHEDULE

VEHICLE TOLL CLASS	DESCRIPTION	TOLL
1	Two-axle vehicles	$0.20
2	Three-axle vehicles and vehicle combinations	0.30
3	Four-axle vehicles and vehicle combinations	0.40
4	Five-axle vehicles and vehicle combinations	0.50
	Each additional axle	0.10

while maintaining a relatively high level of traffic service. A higher toll would discourage usage to the point where total revenues would be less than those estimated under the recommended schedule. Conversely, a lower toll would increase usage but not sufficiently to produce higher revenues than those projected.

The recommended toll schedule is based upon a per-axle toll of $0.10 which will provide maximum control and auditing benefits as well as being easily understood by bridge users. Under the proposed schedule, a two-axle vehicle would pay $0.20 for each crossing, a three-axle vehicle or vehicle combination would be assessed $0.30, a four-axle vehicle — $0.40 and a five-axle vehicle — $0.50.

Estimated Base Year, 1965, Traffic Assignments

The number of motorists that would use the proposed Sioux City bridges at 1965, base year, traffic levels was estimated based upon relative trip costs via the present Combination Bridge, the Decatur Bridge to the south and the proposed new bridges.

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

The travel patterns determined from the 1965 origin and destination studies and the travel time and distance surveys made during the field phases of this project were used to determine a redistribution of trans-river trips assuming construction of the proposed crossings. Each travel movement, considered in

some measure potential to the proposed toll bridges, was independently analyzed to determine relative trip times, distances and total costs via the best new bridge versus the closest available crossing. Using empirical diversion curves developed for similar studies, a redistribution of present trans-river travel patterns was determined assuming construction of three new bridges in the Sioux City area and that the Combination Bridge would remain free. In addition, since the origin and destination data were taken in 1965, before completion of Interstate Route 29 to Council Bluffs, analyses were made to determine the impact of this Interstate completion on trans-river movements.

As shown in Table II-8, the 1965 average daily traffic on the Combination Bridge was 19,581 vehicles. Assignments indicated that an estimated 1,005 vehicles would have been lost to the bridge, at 1965 levels, if Interstate Route 29 had been completed at that time. The resulting adjusted 1965 average daily traffic level on the Combination Bridge was estimated at 18,576 vehicles.

Assuming the condition whereby all of the proposed three bridges were constructed as toll facilities, the 1965 average daily traffic on the present Combination Bridge was estimated at 14,741. A total of 771 vehicles per day was assigned to the proposed Isabella Street Bridge and 1,875 to the proposed Wall Street Bridge. The new Industrial Interchange Bridge would have accommodated approximately 1,258 vehicles, including 69 vehicles diverted from the Decatur Bridge.

Due to the relatively low volumes assigned to the proposed Isabella Street Bridge, in relation to the Wall Street and Industrial Interchange Bridges and based on the fact that a bridge at this location would be at least as costly as the proposed Industrial Interchange location, this crossing was dropped from further consideration in the toll bridge construction program. Construction of the Isabella Street crossing would act to dilute the relative feasibility of construction of the remaining proposed bridges.

Trans-River Traffic Distribution Assuming Free Interstate Spur Bridge — For comparison purposes, traffic assignments were also made assuming construction of the Isabella Street and Wall Street crossings plus a new, free Interstate Spur Bridge. As illustrated in Exhibit II-1, the Interstate crossing would be

TABLE II-8

ESTIMATED BASE YEAR, 1965, DIVERTED TRAFFIC ASSIGNMENTS

		PROPOSED				
	PRESENT COMBINATION BRIDGE	Isabella Street Bridge	Wall Street Bridge	Industrial Interchange Bridge	Interstate Spur Bridge	TOTAL TRANS-RIVER
1965 Average Daily Traffic:	19,581	—	—	—	—	19,581
A. Estimated Loss Due to Assumed I-29 Completion	1,005	—	—	—	—	1,005
B. Adjusted 1965 ADT	18,576	—	—	—	—	18,576
1965 ADT Assignments Assuming all Proposed Crossings Toll:	14,741	771	1,875	1,189	—	18,576
A. Traffic Diverted from Decatur Bridge	—	—	—	69	—	69
B. Total Assignment	14,741	771	1,875	1,258	—	18,645
1965 ADT Assignments Assuming only Isabella and Wall Street Bridges Toll and a free Interstate Spur Bridge:	13,379	771	768	—	3,658	18,576
A. Traffic Diverted from Decatur Bridge	—	—	—	—	77	77
B. Total Assignment	13,379	771	768	—	3,735	18,653

located just north of the proposed alignment of the Industrial Interchange Bridge.

The changes in relative usage of the various bridges would be dramatic. As shown in Table II-8, estimated daily usage of the present Combination Bridge would decrease to 13,379. The proposed Isabella Street Bridge would maintain a daily traffic level of 771 vehicles while the proposed Wall Street Bridge would decrease substantially to 768 vehicles. The proposed Interstate Spur Bridge, as a free facility, would carry an estimated 3,735 vehicles per day, at 1965 levels, about three times as much traffic as was assigned to the Industrial Interchange Bridge under toll conditions.

Estimated 1967 Diverted Traffic-Toll Facilities

The 1967 traffic assignments, given in Table II-9, for the proposed Wall Street and Industrial Interchange Bridges, were estimated by expanding the 1965 assignments in proportion to the growth that occurred on the Combination

TABLE II-9

ESTIMATED 1967 DIVERTED TRAFFIC
Proposed Toll Facilities

VEHICLE TOLL CLASS	DESCRIPTION	WALL STREET BRIDGE	INDUSTRIAL INTERCHANGE BRIDGE
1	Two-axle vehicles	2,032	1,355
2	Three-axle vehicles and vehicle combinations	36	20
3	Four-axle vehicles and vehicle combinations	22	17
4	Five-axle vehicles and vehicle combinations	83	76
	TOTAL	2,173	1,468

Bridge between 1965 and 1967. The Wall Street Bridge would carry an estimated 2,173 vehicles per day, at 1967 levels, of which two-axle vehicles would account for 2,032. An estimated 36 — three-axle vehicles and vehicle combinations; 22 — four-axle vehicles; and 83 — five-axle vehicles were also estimated.

The proposed Industrial Interchange Bridge would serve an estimated 1,468 motorists per day at 1967 levels. Two-axle vehicles would account for 1,355 trips while three, four and five-axle vehicles would represent an additional 20, 17 and 76 daily trips, respectively.

Estimated Annual Traffic and Revenues

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

Normal growth was based upon trends in use of the present Combination Bridge and to a lesser extent, the Decatur Bridge. In addition, trends and projected changes in population and other economic parameters in the Sioux City area were considered.

It is estimated that traffic on the proposed Wall Street Bridge will increase an average of 4.0 per cent per year between 1967 and 1971, decreasing to 3.5 per cent annually from 1971 to 1975, to 3.0 per cent per year from 1975 to 1980 and to 2.5 per cent from 1980 through 1985. Normal traffic growths on the Industrial Interchange Bridge were estimated at 5.0 per cent per year between 1967 and 1971, decreasing to 4.5 per cent annually between 1971 and 1975, to 4.0 per cent per year between 1975 and 1980 and to 3.5 per cent annually thereafter through 1985. For purposes of conservatism,

no traffic growth was projected beyond 1985 for either bridge although some increase in usage is anticipated.

Induced or generated and development growth was estimated based on experience during the early years of operation of similar facilities and on the relative development potential of the areas the bridges would directly serve. A first-year induced growth of 20 per cent was estimated for the Wall Street Bridge, decreasing to 15 per cent during the second year of operation and to five per cent in the third year. Because of the higher potential for industrial development in the industrial area located along Interstate Route 29 and the role the proposed bridge would play as a link in the proposed highway circumferential route in the Sioux City area, higher inducements were estimated for the proposed Industrial Interchange Bridge. The first-year inducement was estimated at 30 per cent, decreasing to 20 per cent in the second year of operation, to 10 per cent in the third year and to five per cent in the fourth year.

Estimated average daily traffic on the two proposed bridges is shown in Table II-10. In fiscal 1971, the assumed first full year of operation, the Wall Street Bridge would carry an estimated 3,050 vehicles daily increasing to 5,550 in 1985, the fifteenth year of operation. Use of the proposed Industrial Interchange Bridge would increase from an estimated 2,320 vehicles daily in 1971 to 5,550 in 1985. While the latter bridge would carry substantially fewer vehicles during the first year of operation than the Wall Street Bridge, the higher inducements and normal growth projected for this facility would act to balance the traffic flows on both bridges by 1985.

During the first year of operation, gross annual revenues on the Wall Street Bridge are estimated at $240,000. As shown in Table II-10, average annual revenues over the first five years of operation are estimated at $298,000, increasing to an average of 394,000 over the 28-year earning period assumed. Gross revenues, during the first year, of $186,000 are estimated for the proposed Industrial Interchange Bridge. This would increase to an average of $258,000 over the first five years of operation and to $388,000 over the 28-year earning period.

TABLE II-10

ESTIMATED ANNUAL TRAFFIC AND REVENUES

FISCAL YEAR[1]	WALL STREET BRIDGE		INDUSTRIAL INTERCHANGE BRIDGE	
	Average Daily Traffic	Gross Revenues	Average Daily Traffic	Gross Revenues
1971	3,050	$240,000	2,320	$186,000
1972	3,630	285,000	2,910	233,000
1973	3,950	310,000	3,350	268,000
1974	4,090	321,000	3,670	294,000
1975	4,230	332,000	3,840	307,000
1976	4,360	342,000	3,990	319,000
1977	4,490	352,000	4,150	332,000
1978	4,620	363,000	4,320	345,000
1979	4,760	374,000	4,490	359,000
1980	4,900	385,000	4,670	374,000
1981	5,030	394,000	4,830	387,000
1982	5,150	404,000	5,000	400,000
1983	5,280	414,000	5,180	414,000
1984	5,410	425,000	5,360	429,000
1985	5,550	435,000	5,550	444,000
Next 13 Years Annually		$435,000		$444,000
AVERAGE ANNUAL REVENUES				
First Five Years		$298,000		$258,000
First Ten Years		$330,000		$302,000
Twenty-Eight Years		$394,000		$388,000

[1] Twelve-month period beginning July 1.

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

Estimated Annual Traffic — Interstate Spur Bridge

If only a free Interstate Spur Bridge were constructed to complement the present Combination Bridge, trans-river traffic in the Industrial Interchange — Interstate Spur corridor would be significantly increased. Industrial and commercial expansion in the Industrial Interchange area would be more rapid with a free crossing as opposed to a toll facility. This higher growth potential was recognized by increasing the amount of induced traffic potential to an Interstate Spur Bridge compared to that estimated for the Industrial Interchange crossing. A first year inducement of 35 per cent was estimated; decreasing to 25 per cent in the second year of operation and to 15, 10 and 5 per cent, respectively, in the next three years. The same normal corridor traffic growth was assumed for both the Interstate Spur and Industrial Interchange crossing alternates.

As shown in Table II-11, an estimated 7,150 vehicles per day would use the proposed Interstate Spur Bridge in fiscal 1971. The assumed first full year of operation. This would increase to an estimated 17,230 vehicles daily in 1980 and to 20,460 vehicles per day in 1985.

TABLE II-11

ESTIMATED ANNUAL TRAFFIC

Proposed Interstate Spur Bridge

FISCAL[1] YEAR	AVERAGE DAILY TRAFFIC
1971	7,150
1972	9,340
1973	11,220
1974	12,910
1975	14,160
1976	14,720
1977	15,310
1978	15,930
1979	16,560
1980	17,230
1981	17,830
1982	18,450
1983	19,100
1984	19,770
1985	20,460

[1] Twelve-month period beginning July 1.

PRELIMINARY PROJECT FEASIBILITY

Net toll revenues derived from the proposed Sioux City bridges were determined by deducting the estimated annual maintenance and operation costs developed by Howard, Needles, Tammen & Bergendoff from gross revenues anticipated from the projects. Preliminary project feasibilty computations were then made by relating estimated net revenues to the maximum interest and level debt service requirements of a bond issue sufficient to meet the estimated capital costs of the proposed bridges.

Estimated Annual Net Revenues

Estimated annual net revenues for the proposed Wall Street Bridge are presented in Table II-11. In the first year of operation, net revenues of $155,000 are estimated increasing to $280,000 in 1985, the fifteenth year of operation. Average annual net revenues over the first five years of operation are estimated at $203,000, increasing to $223,000 over the first ten years. During the 28-year earning period, net revenues would average $258,000 annually.

Estimated annual net revenues for the proposed Industrial Interchange Bridge are given in Table II-12. In the first year of operation, net revenues of $126,000 are estimated increasing to $342,000 in 1985, the fifteenth year of operation. Average annual net revenues over the first five years of operation are estimated at $192,000 increasing to $228,000 over the first ten years. During the 28-year earning period, net revenues would average an estimated $297,000 annually.

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 test is the coverage of maximum or first year interest by first year net revenues; the second test is the coverage of level debt service by average annual net revenues over the earning period of an assumed bond issue.

TABLE II-12

ESTIMATED ANNUAL NET REVENUES

Wall Street Bridge

FISCAL YEAR[1]	GROSS TOLL REVENUES	MAINTENANCE AND OPERATION COSTS[2]	NET REVENUES
1971	$240,000	$ 85,000	$155,000
1972	285,000	90,000	195,000
1973	310,000	95,000	215,000
1974	321,000	100,000	221,000
1975	332,000	105,000	227,000
1976	342,000	110,000	232,000
1977	352,000	115,000	237,000
1978	363,000	120,000	243,000
1979	374,000	125,000	249,000
1980	385,000	130,000	255,000
1981	394,000	135,000	259,000
1982	404,000	140,000	264,000
1983	414,000	145,000	269,000
1984	425,000	150,000	275,000
1985	435,000	155,000	280,000
Next 13 Years Annually	$435,000	$155,000	$280,000
AVERAGE ANNUAL REVENUES			
First Five Years			$203,000
First Ten Years			$223,000
Twenty-Eight Years			$258,000

[1] Twelve-month period beginning July 1.

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

TABLE II-13

ESTIMATED ANNUAL NET REVENUES

Industrial Interchange Bridge

FISCAL YEAR[1]	GROSS TOLL REVENUES	MAINTENANCE AND OPERATION COSTS[2]	NET REVENUES
1971	$186,000	$ 60,000	$126,000
1972	233,000	63,000	170,000
1973	268,000	66,000	202,000
1974	294,000	69,000	225,000
1975	307,000	72,000	235,000
1976	319,000	75,000	244,000
1977	332,000	78,000	254,000
1978	345,000	81,000	264,000
1979	359,000	84,000	275,000
1980	374,000	87,000	287,000
1981	387,000	90,000	297,000
1982	400,000	93,000	307,000
1983	414,000	96,000	318,000
1984	429,000	99,000	330,000
1985	444,000	102,000	342,000
Next 13 Years Annually	$444,000	$102,000	$342,000
AVERAGE ANNUAL REVENUES			
First Five Years			$192,000
First Ten Years			$228,000
Twenty-Eight Years			$297,000

[1] Twelve-month period beginning July 1.

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

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

The feasibility computations shown in Table II-14 were developed assuming a bond interest rate of 5.5 per cent and a bond term of 30 years.

TABLE II-14

PRELIMINARY PROJECT FEASIBILITY

ITEM	WALL STREET BRIDGE	INDUSTRIAL INTERCHANGE BRIDGE
Bond Term	30 Years	
Bond Earning Period	28 Years	
Bond Interest Rate	5.5 Per Cent	
Preliminary Project Costs[1]	$17,625,000	$4,135,000
Estimated Bond Issue[2]	21,150,000	4,962,000
First Year Interest	1,163,000	273,000
Level Debt Service 28 Years	1,498,000	351,000
Estimated First Year Net Revenues	155,000	126,000
Estimated Average Annual Net Revenues 28 Years	258,000	297,000
Coverages		
First Year Interest by: First Year Net Revenues	0.13	0.46
Level Debt Service by: Average Annual Net Revenues 28 Years	0.17	0.85

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

[2] Assumes ratio of project cost to bond issue of 1.0 to 1.2.

Based on project costs developed by Howard, Needles, Tammen & Bergendoff, it is estimated that a bond issue of $21,150,000 would be required for the proposed Wall Street Bridge and $4,962,000 for the proposed Industrial Interchange Bridge. The escalation from project cost to bond issue includes such financing items as bond discount, legal and financial fees, capitalized interest during construction, etc. Based upon the relationship of project cost to bond issue size of several comparable projects which have been financed, a factor of 1.2 was applied to project cost to determine a preliminary bond issue.

As shown in Table II-14, first-year net revenues for the proposed Wall Street Bridge would cover first-year or maximum interest 0.13 times. Average annual net revenues would cover 28-year level debt service, 0.17 times. First-year net revenues for the proposed Industrial Interchange Bridge would provide a 0.46 coverage of first-year interest. Average annual net revenues would cover 28-year level debt service 0.85 times.

The coverage values for both of these projects are considerably below the levels normally assumed as indicative of financial feasibility, although the Industrial Interchange Bridge shows a substantially higher feasibility level than the more costly Wall Street project.

It should be emphasized, however, that the above computations were developed only as a guide and that a final determination of project feasibility should be made by financial advisors selected for this purpose. The coverages indicate that very substantial subsidies would be required to finance the proposed Wall Street Bridge while lesser subsidies would be needed to meet financing requirements for the Industrial Interchange Bridge.

Relationship Between Level Debt Service and Net Revenues

As shown in Table II-15, total subsidies of $34,728,000 would be required for the Wall Street Bridge based on a calculation of the relationship between annual net revenues and level debt service.

Relating annual net revenues to level debt service, for the Industrial Interchange Bridge project, a total subsidy of $1,506,000 would be required. As given in Table II-16, this would range from $225,000 in the first year of operation to $9,000 in 1985 and for the next 13 years.

TABLE II-15

RELATIONSHIP BETWEEN LEVEL DEBT SERVICE AND NET REVENUES
Wall Street Bridge

FISCAL YEAR[1]	NET REVENUES	LEVEL DEBT SERVICE	NET REVENUES TO LEVEL DEBT SERVICE DEFICIT
1971	$155,000	$1,498,000	$1,343,000
1972	195,000	1,498,000	1,303,000
1973	215,000	1,498,000	1,283,000
1974	221,000	1,498,000	1,277,000
1975	227,000	1,498,000	1,271,000
1976	232,000	1,498,000	1,266,000
1977	237,000	1,498,000	1,261,000
1978	243,000	1,498,000	1,255,000
1979	249,000	1,498,000	1,249,000
1980	255,000	1,498,000	1,243,000
1981	259,000	1,498,000	1,239,000
1982	264,000	1,498,000	1,234,000
1983	269,000	1,498,000	1,229,000
1984	275,000	1,498,000	1,223,000
1985	280,000	1,498,000	1,218,000
1986	280,000	1,498,000	1,218,000
1987	280,000	1,498,000	1,218,000
1988	280,000	1,498,000	1,218,000
1989	280,000	1,498,000	1,218,000
1990	280,000	1,498,000	1,218,000
1991	280,000	1,498,000	1,218,000
1992	280,000	1,498,000	1,218,000
1993	280,000	1,498,000	1,218,000
1994	280,000	1,498,000	1,218,000
1995	280,000	1,498,000	1,218,000
1996	280,000	1,498,000	1,218,000
1997	280,000	1,498,000	1,218,000
1998	280,000	1,498,000	1,218,000
TOTAL			$34,728,000

[1] Twelve-month period beginning July 1.

TABLE II-16

RELATIONSHIP BETWEEN LEVEL DEBT SERVICE AND NET REVENUES

Industrial Interchange Bridge

FISCAL YEAR[1]	NET REVENUES	LEVEL DEBT SERVICE	NET REVENUES TO LEVEL DEBT SERVICE DEFICIT
1971	$126,000	$351,000	$225,000
1972	170,000	351,000	181,000
1973	202,000	351,000	149,000
1974	225,000	351,000	126,000
1975	235,000	351,000	116,000
1976	244,000	351,000	107,000
1977	254,000	351,000	97,000
1978	264,000	351,000	87,000
1979	275,000	351,000	76,000
1980	287,000	351,000	64,000
1981	297,000	351,000	54,000
1982	307,000	351,000	44,000
1983	318,000	351,000	33,000
1984	330,000	351,000	21,000
1985	342,000	351,000	9,000
1986	342,000	351,000	9,000
1987	342,000	351,000	9,000
1988	342,000	351,000	9,000
1989	342,000	351,000	9,000
1990	342,000	351,000	9,000
1991	342,000	351,000	9,000
1992	342,000	351,000	9,000
1993	342,000	351,000	9,000
1994	342,000	351,000	9,000
1995	342,000	351,000	9,000
1996	342,000	351,000	9,000
1997	342,000	351,000	9,000
1998	342,000	351,000	9,000
TOTAL			$1,506,000

[1] Twelve-month period beginning July 1.

APPENDIX

Iowa Senate File 131

The General Bridge Act

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.