Summit Street Traffic Study

September 1990

JCCOG

Johnson County Council of Governments
410 E. Washington St. Iowa City, Iowa 52240

Date: October 8, 1990

To: Steve Atkins, City Manager, City of Iowa City

From: Jeff Davidson, Transportation Planner

Re: Summit Street Traffic Study

The following report has been produced by the JCCOG Transportation Planning Division and accomplishes two purposes:

1. It was requested by the Department of Public Works to address the Summit Street Bridge deterioration issue.

2. It was requested by the City Council to address the issue of traffic on Summit Street.

Both of these issues can be resolved if the City Council is able to reach a decision on replacing or relocating the Summit Street Bridge. This will be difficult, since the neighbors along whichever arterial street alignment is selected will not be pleased. This is a familiar dilemma when we are dealing with arterial streets in older neighborhoods. Arterial streets are right up there with landfills and sewer plants as being critically important to the community, but something no one wants in their front yard.

This report has been approved for distribution to the City Council by the following City of Iowa City staff persons: the Director of Planning and Program Development, the Director of Public Works, the City Engineer, the Traffic Engineer, the Coordinator of Neighborhood Services, and the staff person to the Historic Preservation Commission. Please contact me if JCCOG can be of further assistance.

jccogtp\trafstdy.mmo

Summit Street Traffic Study

Prepared by the
Johnson County Council of Governments
Transportation Planning Division

Jeff Davidson, Transportation Planner
Kevin L. Doyle, Asst. Transportation Planner
Dennis McKim, Graphics

September 1990

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Introduction

The City of Iowa City requested a study of traffic issues in the Summit Street area of east central Iowa City. This includes the Summit Street Historic District between Burlington Street and the main line of the Iowa Interstate Railroad. A study area was designated (Figure 1) by Burlington and Court Streets on the north, Dodge Street on the west, Highway 6 on the south, and First Avenue on the east.

As with any traffic study, factors influencing traffic characteristics in the study area will be generated from throughout the community. This will necessarily cause the traffic analysis to extend beyond the study area. However, it is the impact of traffic *on the study area* which is the focus of this report.

Issues

Three interrelated traffic issues have been identified within the study area:

1. ***Traffic Volume on Summit Street.*** The Iowa City Historic Preservation Commission and a Summit Street neighborhood group have formally requested the City Council address traffic issues on Summit Street. These groups have suggested that the function of Summit Street in the City's arterial-collector street system is inhibiting further improvement of the Historic Preservation District. These groups desire Summit Street to have lower traffic volumes. It is felt this will enhance the installation of amenities and protect the character of the Historic District.

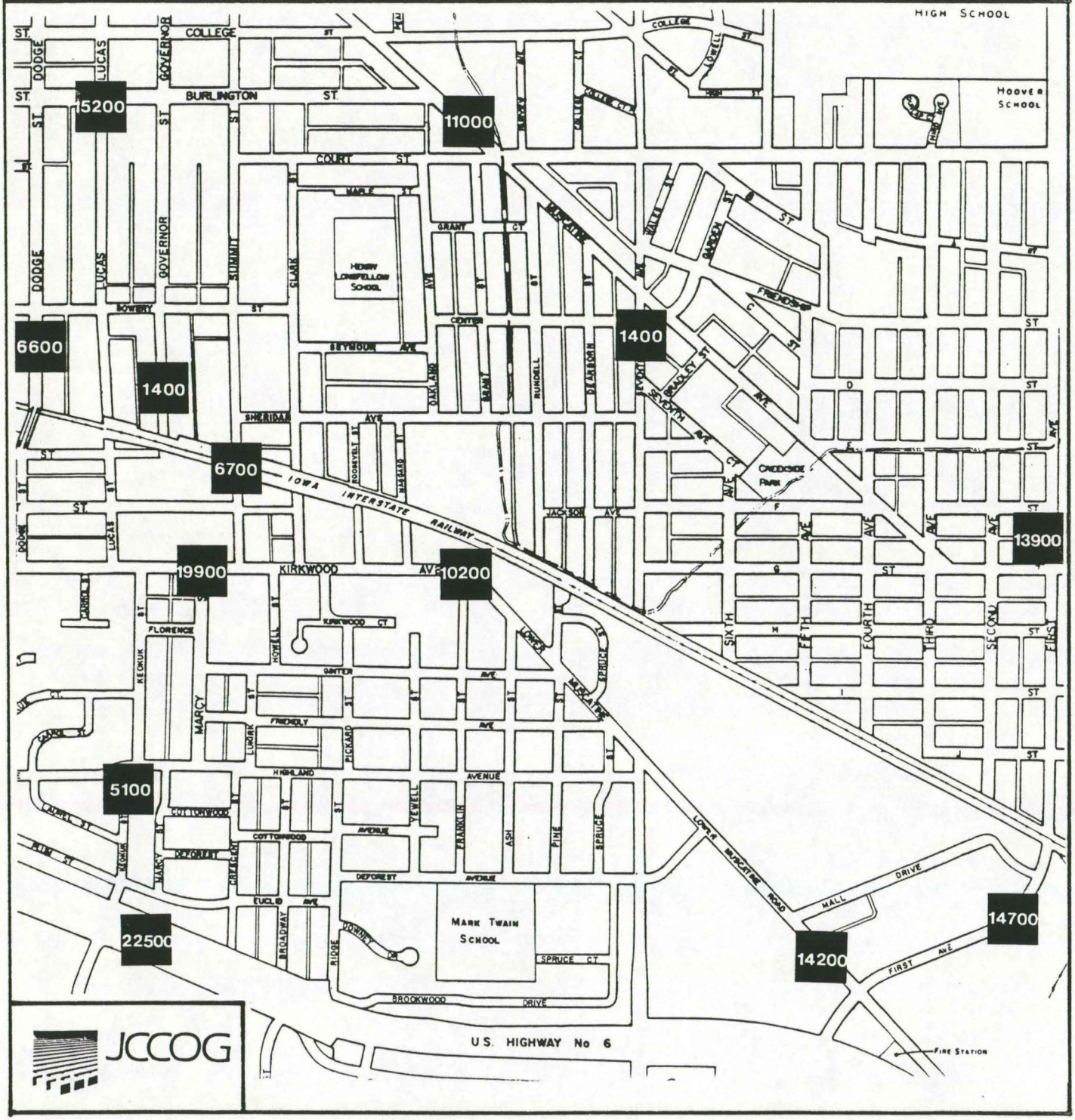
2. ***The Summit Street Bridge.*** The Summit Street Bridge over the Iowa Interstate Railroad is nearing the end of its useful service life. Load limits were imposed in 1985 because of deterioration to the bridge superstructure. Further deterioration could necessitate closing the bridge immediately.

   Summit Street Bridge is programmed for replacement by 1995. It is currently ranked 30th on Iowa DOT's state-wide candidate list for Federal bridge replacement funds, and should be eligible for funding by 1995.

3. ***Adequacy of Arterial Streets in the Study Area.*** An ongoing function of the Transportation Planning Division is to assess the adequacy of arterial streets in the Iowa City Urbanized Area. By forecasting the pattern and extent of property development, a determination can be made of when existing traffic facilities will no longer be adequate. This permits the programming of capital improvements which will alleviate potential traffic problems.

FIGURE 1

Summit Street Traffic Study Area
with 1985 Average Daily Traffic 000



The necessity of the arterial street system and its importance to the quality of life in the community cannot be overstated. Motor vehicles provide by far the majority of travel in the urbanized area. This trend is increasing with the approval of property developments in outlying areas which are oriented to the automobile. The arterial street system is a public service provided for the benefit of the ***entire community*** in the same way the library, the sewer plant, and the fire department are community-wide services. Efficient movement of traffic on the arterial street system discourages motorists from detouring through local neighborhood streets.

This report will address the negative impact of arterial streets on older neighborhoods, specifically the concerns of the Summit Street neighborhood. When making the difficult decision on how to proceed, the City Council must not lose sight of the significance of an efficient arterial street system. With respect to Summit Street, the critical issue is ***should Summit Street be on the arterial street system?***

If the answer is no, then measures can be taken to establish Summit Street as a local neighborhood street with low traffic volumes. Low traffic volume is a goal for all neighborhood streets. But, if the answer is yes, it is inappropriate to subsequently consider traffic control measures to reduce traffic on Summit Street. To do so would negatively impact a community facility for the benefit of a few.

Within the context of these issues, this report will evaluate existing traffic conditions, project the impact future property development and demographic changes will have on the community, and offer a series of alternatives to deal with projected traffic conditions.

Characteristics of the Study Area

The study area consists of an inner city section of Iowa City which is primarily residential in character. The entire study area is not a single cohesive neighborhood. Housing units in the study area are generally 30-70 years old, with newer units where old houses have been removed. Houses in the Summit Street Historic District range up to 130 years old. There is a great range of income levels represented in the study area. The study area does not include significant amounts of undeveloped property.

Development Issues.

The Iowa City Comprehensive Plan states that development issues in inner city areas differ from areas on the edge of the community. Because streets and utility infrastructure are in place, the timing of redevelopment is unconstrained. Development issues which prevail in inner city areas include maintenance and improvement of existing neighborhoods and housing stock, encroachment of commercial development into residential areas, on-street parking congestion, and the difficulty of redevelopment on small lots.

Historic Preservation.

Section 27-81 of the Code of Ordinances for the City of Iowa City establishes the City's priorities for historic preservation. It is stated that the City shall promote historic preservation to safeguard the City's historic, aesthetic, and cultural heritage; stabilize and improve property values by conservation of historic properties; and foster civic pride in the legacy of historic achievements.

The Summit Street Historic District was listed on the National Register of Historic Places on October 9, 1973. It was established as an Iowa City Historic Preservation District on February 28, 1984. The first homes were built on Summit Street in the 1860s and the street was incorporated into the city in 1880. Summit Street has many prime examples of nineteenth century domestic architecture, representing a wide variety of architectural styles. Three-quarters of the 50 residences within the historic district were built between 1860 and 1910.

Street System Evaluation

Techniques for Evaluation

The evaluation of roadway traffic conditions is performed by calculating ***delay***, as expressed by Level of Service, and ***congestion***, as expressed by volume/capacity or V/C ratio. These techniques may be used to evaluate existing traffic conditions as well as plan for future improvements. For example, if an analysis shows that existing or projected V/C on a street is approaching saturation, then a series of alternatives can be evaluated which will add capacity or reduce volume.

Level of Service. Level of Service (LOS) indicates delay and is expressed in values A through F. LOS A indicates free-flow, unconstrained traffic conditions. LOS F indicates complete congestion. LOS C is the typical design standard when assessing delay for a proposed facility. LOS D may be an acceptable design standard for central business district streets.

Level of Service is most commonly used to evaluate signalized intersections on arterial streets. Major intersections are the most critical elements of arterial streets. If the major intersections of an arterial street are functioning satisfactorily, it is likely the intervening street segments are also functioning satisfactorily.

Volume/Capacity Ratio. V/C is used for comprehensive assessments of street network capacity. For example, V/C can be used to determine whether or not a street should be reconstructed at two or four lanes. Capacity can be expressed within acceptable delay levels, e.g., capacity at Level of Service C.

A V/C ratio of 1.0 indicates traffic volume has saturated the capacity of the street. As V/C increases above 1.0 it reflects increasingly congested conditions, i.e. V/C of 1.7 indicates more congestion than 1.1.

Other criteria can be used to evaluate traffic operation. If a street is identified as a high accident location, then reducing the accident rate is an appropriate evaluation tool for a proposed improvement. Improvement in air quality or increased economic development activity are other measures for evaluating street improvements which may be appropriate, depending on local priorities.

Arterial Street Function

Arterial streets are the network of streets in a community which facilitate the major movement of traffic. Arterials connect the principal traffic generators within a city as well as rural routes feeding into a city. The design and function of arterial streets should facilitate the efficient movement of large amounts of traffic: capacity should be relatively high with the entire street width dedicated to traffic movement, vehicle design speed should be relatively high, and driveway access should be limited to the greatest extent possible.

The arterial street network is of primary importance in the promotion of commerce within a community. If designed properly, arterial streets can also serve the function of channeling traffic away from local residential streets.

Neighborhood Concerns

Because of their obtrusive character, arterial streets are frequently perceived negatively by individual neighborhoods, especially in older areas. Arterial streets are noisy, visually obtrusive, and barriers for pedestrians. The evaluation of arterial street improvements by persons living in inner city neighborhoods will generally relate solely to reducing perceived negative impacts.

In newly developing areas arterial streets can be designed to reduce negative impacts. They can be placed on the edge of neighborhoods to define boundaries, building setbacks can be increased and screening provided, and individual lot access provided through interior streets only. These design elements are not available in inner city areas where the arterial street network is superimposed on a street system which never envisioned the proliferation of the automobile.

The following analysis of traffic conditions will attempt to address both perspectives of arterial street function: the evaluation of delay and congestion from an engineering point of view, and the aesthetic concerns of adjacent neighborhoods.

Existing Traffic Conditions in the Study Area

Figure 2 shows existing V/C on the study area arterial-collector street system. Volumes are 1985 Average Daily Traffic (ADT) except for two links which have updated 1989 counts. Capacities are for Level of Service C operation (delay not excessive) and based on two criteria:

1. Number and type (through or turn) of lanes.
2. Access conditions (side friction).

The study area is characterized by very few four-lane arterial streets. Several links experience moderate congestion, however, most are significantly below capacity. The most serious congestion in the study area occurs on Muscatine Avenue between Court and Burlington Streets, and on First Avenue between D Street and Wayne Avenue. Based strictly on V/C, these segments have the highest priority for widening to four lanes.

All-way stops at Kirkwood/Dodge and Kirkwood/Summit intersections.

In the mid-1980's all-way stop control was installed at the intersections of Kirkwood/Dodge and Kirkwood/Summit. This was done at the City Council's direction to allow easier access to Kirkwood Avenue from Dodge and Summit Streets.

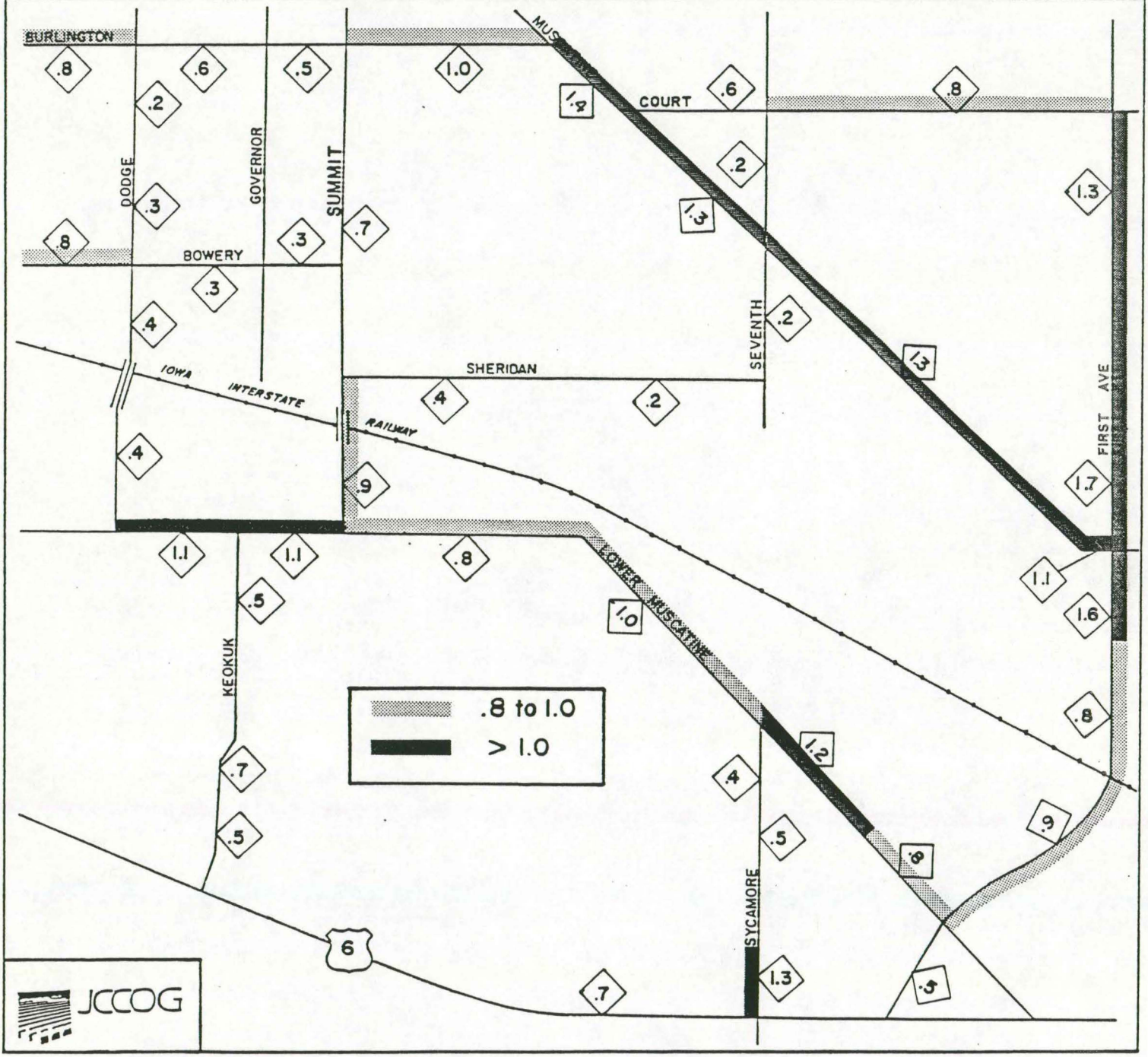
Prior to all-way stop installation, the City Traffic Engineer had recommended a traffic signal be installed at Kirkwood/Dodge, with the Kirkwood/Keokuk and Kirkwood/Summit intersections left unrestricted on Kirkwood. Kirkwood/Keokuk and Kirkwood/Summit were to be monitored for future traffic signal installation. It was felt this arrangement would channel traffic away from Summit Street to Dodge Street, where motorists could make the railroad crossing on a higher capacity, more structurally sound bridge than Summit Street. The Dodge Street Bridge was also considered a more natural extension of the Governor/Dodge one-way pair than Summit Street.

Installation of all-way stop control at the Kirkwood/Summit intersection has increased Summit Street traffic volume. Traffic volume on Summit Street has increased 29% since 1985, while Dodge Street traffic has grown 5%. Motorists

FIGURE 2

Summit Street Traffic Study Arterial-Collector System

Existing Volume / Capacity



perceive Summit Street as a more favorable intersection than Dodge for access to Kirkwood Avenue.

In spite of increased traffic, volumes through the Kirkwood/Dodge and Kirkwood/Summit intersections are still low enough that delay is not significant. A 1987 study showed average PM peak hour delay of 4 seconds per vehicle at Summit Street and 11 seconds per vehicle at Dodge Street. This is within the range of Level of Service A or B for signalized intersections.

Governor/Dodge one-way couplet.

Governor and Dodge Streets provide a north-south arterial one-way pair through Iowa City. They provide an arterial link to I-80 in north Iowa City, and also function as Iowa Highway 1 north of Burlington Street.

One-way pair streets can be used to increase capacity as much as 50% over two-way streets, without requiring widening. The capacity increase is principally from the absence of opposing left-turn movements. Other benefits of one-way couplets include:

- Savings in travel time.
- Accident reduction from less conflict points.
- Safer cross-street movements.
- It is more likely parking can be provided on street.

Because of development patterns which were established early in Iowa City's history, arterial street system continuity is not optimal in south Iowa City. Ideally, the Governor/Dodge one-way couplet should extend south to Highway 6. Because of the lack of a Governor Street railroad crossing, the one-way pair terminates at Bowery Street. Motorists must then proceed across the railway via Summit or Dodge, where they may proceed east or west on Kirkwood. They may proceed further south via Keokuk Street.

This non-continuous street network is inefficient from the perspective of optimal arterial street design. However, congestion and delay are moderate because volumes are relatively low. As shown in Figure 2, V/C in the vicinity of Summit, Dodge, and Keokuk is not significantly above 1.0 on any link.

Accident History.

Accident rate in the study area is low. No intersection in the study area is among the top 25 accident locations in the urbanized area. The Keokuk/Highway 6 intersection previously ranked in the top 10, but was recently reconstructed to a higher capacity with improved geometrics, had the posted speed limit lowered, and had an improved signal control system installed. These improvements should reduce accident frequency.

Summary of Existing Traffic Conditions.

- Street capacity is generally adequate. Delay is not excessive.
- Based strictly on V/C, 27 blocks in the study area are justified for widening to four lanes. The most critical needs are Muscatine Avenue between Court and Burlington, and First Avenue between D and Wayne.
- All-way stop control at the Summit/Kirkwood intersection has been the major contributing factor in the 29% increase in Summit Street traffic volume since 1985.
- The Governor/Dodge one-way couplet provides greater street capacity, safer operation, and travel time savings compared to two-way streets.
- There is a low traffic accident rate in the study area.

Development Forecast

The QRS-II street network modelling system was used to forecast arterial street traffic conditions in the study area. It has four data inputs per traffic zone:

- Number of dwelling units
- Number of retail employees
- Number of non-retail employees
- Auto ownership per dwelling unit

Through manipulation of the zone data, growth in residential, commercial, and industrial property can be simulated. The model uses estimates of property development to project future traffic volumes and show the effect on the street network. Forecast volumes can then be subjected to an analysis of alternative street network designs.

Short-Range and Long-Range Development Forecasts.

Short-range and long-range development forecasts were formulated for the traffic analysis model. The short-range horizon is ten years. A ten-year forecast permits reasonable projections of residential, commercial, and industrial development. The short-range forecast is most important with respect to the programming of capital improvements. Figure 3 shows the tracts of land in the community which have been identified for growth in the short-range. Not all of the areas shown in Figure 3 will be completely developed within the ten-year short-range period.

The long-range development horizon is approximately 25-30 years. It is much more generalized and much less accurate than short-range forecasting. Nevertheless, it is necessary to have a conception of long-range plans when planning capital facilities such as bridges which have a lifespan of 40 years or more. Transportation corridors will be established which will be in existence much longer than 40 years.

The long-range development forecast assumes full development of all identified growth areas within the existing corporate limits, as well as fringe areas which will likely be annexed within 25 years.

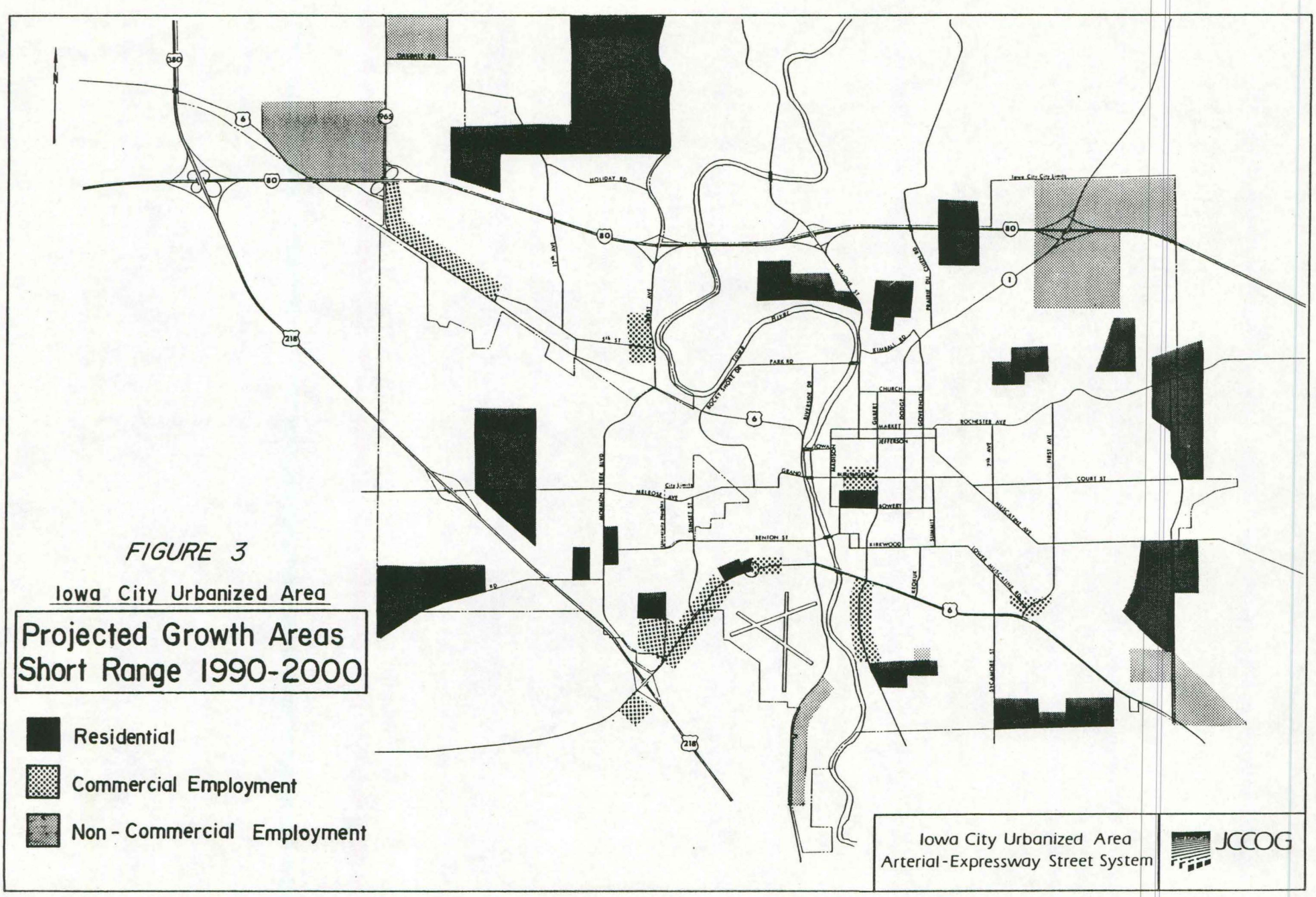


FIGURE 3
Iowa City Urbanized Area
Projected Growth Areas
Short Range 1990-2000
Residential
Commercial Employment
Non - Commercial Employment
Iowa City Urbanized Area
Arterial - Expressway Street System
JCCOG

Short-Range Development Forecast Assumptions.

The following assumptions have been made concerning growth in the community for the period 1991-2001. These assumptions have been formulated based on the following sources of information: the 1989 Iowa City Comprehensive Plan; the 1985 Coralville Community Study and Plan; 1980 U.S. Census data; current federal transportation policies; an examination of existing residential, commercial, and industrial growth areas in the community; and a trend analysis of Iowa City and Coralville building permits for the past five years. The assumptions include:

- Residential, commercial, and industrial growth will occur in identified growth areas of the community. Figure 3 shows the identified areas.

- The overall population growth rate has been modest: approximately 800 to 900 persons per year. Population may stabilize or decline if decreases in University of Iowa enrollment occur as projected.

- In spite of the modest population growth rate, residential construction will continue at the rate of approximately 400 dwelling units per year. This is a result of the overall strength of the Iowa City-area economy, and a decrease in average household size.

- Commercial and industrial growth is extremely hard to project. In spite of local marketing efforts and recent successes in attracting commercial and industrial development, the overall health of the state and national economy will be the largest factors in determining growth in these areas. It is also difficult to project if new commercial facilities will add to the existing activity base, or replace existing businesses.

- The service/retail sector of the economy is growing at a faster rate than the office/manufacturing sector. Therefore, a 7% growth in retail employees is projected for the 10 year period, and a 3% growth in non-retail employees. This is a total increase of 1,619 jobs for the period 1991-2001.

- The automobile will remain the predominant form of transportation in the community. Existing mode splits will not change significantly.

Long-range street plan.

System continuity is an important criterion for evaluating extensions to the arterial street system. It is necessary to have some understanding of long-range street plans in Iowa City when evaluating new alignment alternatives in the Summit Street area. Arterial streets in the Summit Street area should be established with continuous connections to existing arterial streets, and allow for incremental extensions into outlying areas as development occurs.

Figure 4 shows a long-range arterial street plan for south Iowa City. This plan was developed in conjunction with the siting of the Iowa City Pollution Control South Plant. Figure 4 illustrates the establishment of Gilbert Street, Sycamore Street, and Scott Boulevard as the major north-south arterials in south Iowa City. Sycamore's arterial function is shown terminating at the base of the "Sycamore L" because of its proximity to Gilbert Street as Gilbert Street bears to the east.

The east-west portion of Sycamore Street and Napoleon Street (existing County road) are projected as the primary east-west arterials in the area. These streets will likely include the relocation of Highway 6 and eventually a river crossing and interchange with Highway 218.

Keokuk Street, currently a major north-south arterial link between Kirkwood Avenue and Southgate Avenue, will change in function south of Southgate Avenue. This street will T into the collector system for the Weatherby Park neighborhood, and have a winding, discontinuous alignment.

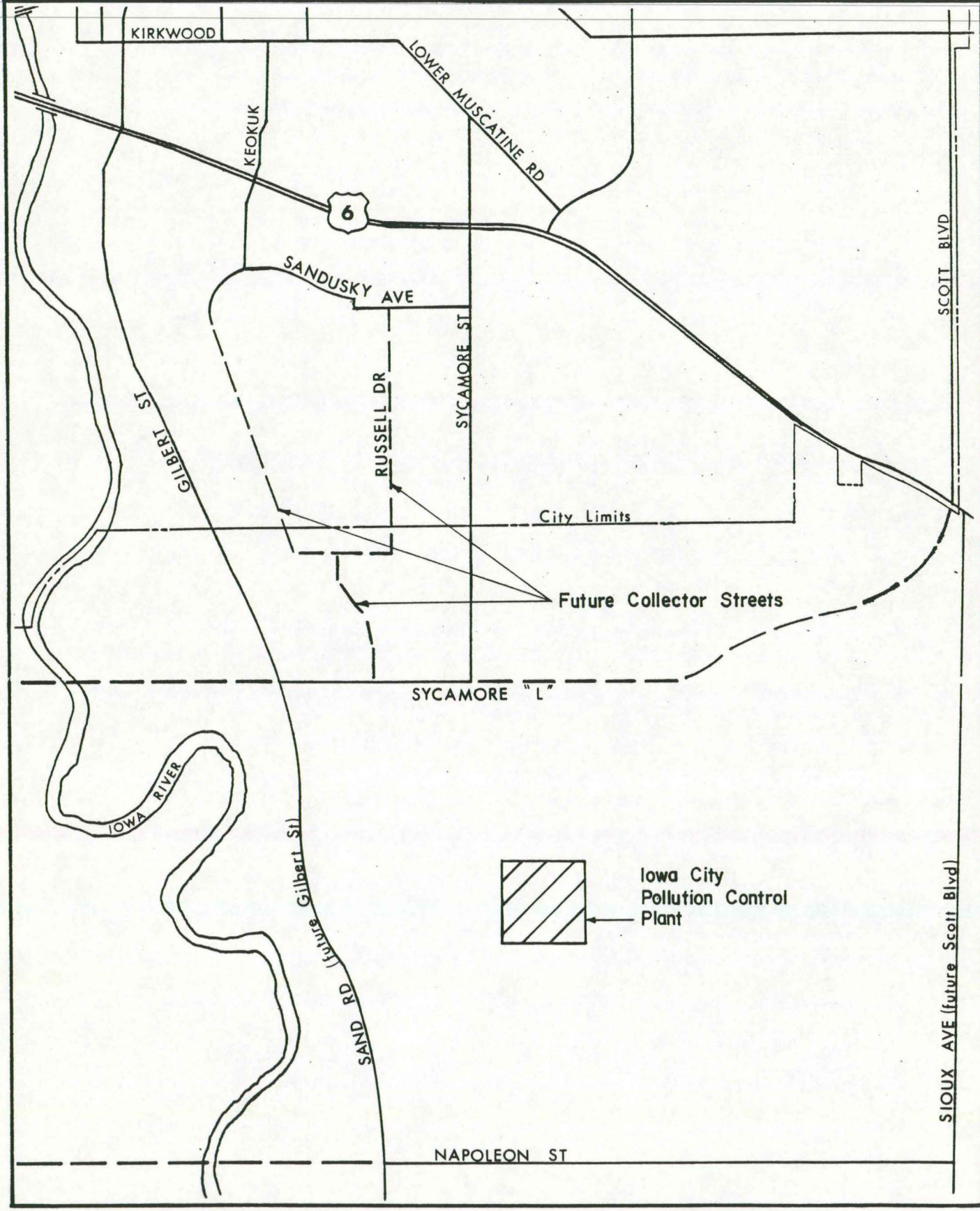
The Rail Corridor - Long Range Forecast

It has been suggested that the City may be misadvised in constructing a large capital improvement over the Iowa Interstate (IAIS) Railroad, as in future years it may no longer be operated as a rail corridor. Although IAIS is apparently operating successfully and has no plans to abandon the line, the fact remains that 3,814 miles of railroad were abandoned in the state of Iowa between 1980 and 1986. The IAIS corridor was abandoned by the Chicago, Rock Island, and Pacific Railroad in the early 1980's before being reopened. The IAIS has by far the lowest traffic density of existing east-west rail carriers across Iowa.

FIGURE 4

Summit Street Traffic Study

Long Range Arterial Street Plan - South Iowa City



If abandoned, it is quite likely that the IAIS corridor would revert to some type of use as a linear park. Abandoned railroad rights-of-way, with gentle grades and vegetated railbeds, are easily readapted to this type of use. This also preserves the corridor for future transportation use.

Summary of Development Forecast

- Growth will occur in identified areas of the community.
- The growth will occur at a modest rate in the short-range.
- Mode split will not change significantly in the short-range.
- Long-range plans indicate Gilbert, Sycamore, and Scott will be the primary north-south arterial streets south of Highway 6.
- There is no indication the Iowa Interstate Railroad will be abandoned, but future economic conditions could cause this to occur. If abandoned the corridor will likely be preserved as a linear park.

Analysis of Alternative Street Alignments

Four alternative street networks have been developed for the Summit Street traffic study area. The four alternatives are:

A. Replace Summit Street Bridge at its existing location.

B. Eliminate the Summit Street Bridge and construct a new railroad crossing along the Governor Street-Keokuk Street alignment.

C. Eliminate the Summit Street Bridge and construct a new railroad crossing along the Seventh Avenue-Sycamore Street alignment.

D. Eliminate the Summit Street Bridge with no new railroad crossing.

The construction of a new arterial street alignment in a built-up area of the city will reduce disruption in some neighborhoods while increasing disruption in others. The arterial street network is a ***system*** and a solution which improves conditions (i.e. reduces traffic) in one neighborhood will simply add the traffic somewhere else. Traffic will continue to seek the most convenient route available through the arterial street system.

The presentation of alternative street alignments will summarize the positive and negative aspects of each. The "best" alternative will depend on one's perspective: depending on whether or not the goal is to maximize traffic function, minimize disruption to existing neighborhoods, reduce traffic on Summit Street, minimize overall capital investment, or maintain consistency with long-range planning goals, one alternative will be more appropriate than another.

Site-specific traffic control measures (all-way stops, signalization, one-way operation, etc.) are not evaluated in detail, as they can be manipulated with any of the alignment alternatives. A particular type of traffic control should not be a primary determinant in the selection of a street alignment, since it can be easily changed by future city councils.

Arterial Street Capacity in the Study Area

Based on the traffic analysis model's calculation of V/C, there are arterial streets in the study area which are justified for capacity expansion within ten years under all four alignment alternatives (Figure 5). Other streets are justified for expansion under at least one alternative, but not all four. Some streets are not justified for capacity expansion under any of the alternative alignments.

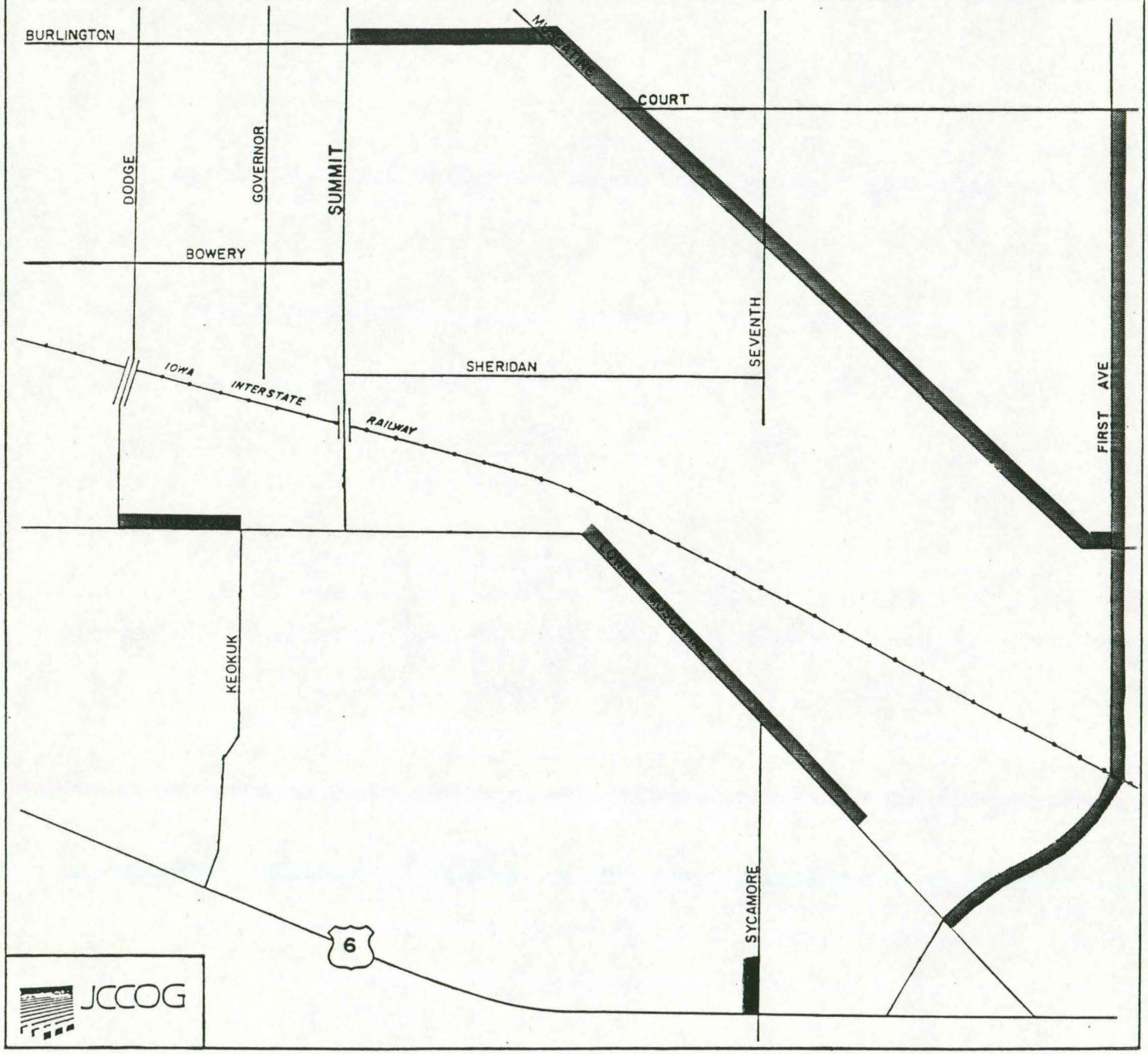
Listed for each of the alignment alternatives is the number of blocks of arterial street in the study area justified for widening within ten years. The range is 32.5 blocks for Alternative B to 38 blocks for Alternative A. At an approximate cost of $194,000 per block to widen a two lane street to four lanes, this is a potential difference of $1.1 million.

It is of great importance, however, to correctly understand what is meant by "justified for expansion." ***It is a purely technical evaluation of V/C, and does not imply that streets must be widened in conjunction with the alternative selected.*** Arterial streets are no different from any other public capital improvement, in that the decision to spend public funds is made by elected officials who consider much more than the technical evaluation in their decision. A street with a V/C of 1.4 may or may not be deemed necessary for widening by a city council,depending on numerous other factors besides V/C.

FIGURE 5

Summit Street Traffic Study Arterial - Collector System

Streets Justified for Capacity Expansion Under All Four Alignment Alternatives



Alternative A
Replace Summit Street Bridge at Its Existing Location

This alternative provides complete removal of the existing Summit Street Bridge structure. A new two-lane bridge would be constructed with 31 foot wide pavement and four foot sidewalks on each side. All pavement on Summit Street would be replaced between Sheridan Avenue and Walnut Street.

Compared to the other alternatives, this alternative emphasizes Summit Street and the Kirkwood Avenue-Lower Muscatine Road Corridor for traffic movement, with less emphasis on the First Avenue Corridor. Alternative A is the only alternative for which a capacity expansion is justified for the entire Kirkwood Avenue-Lower Muscatine Corridor, based on ten-year forecast volumes.

Positive Impacts

Since this alternative preserves the status quo, it provides the least disruption to existing neighborhoods. No dwelling units or businesses are displaced and there is no further encroachment into existing neighborhoods.

Negative Impacts

This alternative preserves the existing discontinuous north-south arterial street alignment between Bowery Street and Highway 6. Arterial-level traffic volumes will remain on Summit Street, which will be perceived negatively by the neighborhood.

Estimated Expense

The projected capital expense for the Summit Street Bridge replacement is $1.2 million. Approximately $650,000 in Federal Bridge Replacement Program funds will be available for this project.

The QRS-II traffic analysis model shows Alternative A to result in 38 blocks in the study area which are justified for capacity expansion by the year 2001, highest of the four alternatives. For comparison, the lowest of the four alternatives is alternative B, with 32.5 blocks justified for capacity expansion. The current expense to widen a single block of two-lane pavement with adequate right-of-way to four-lanes is estimated at $194,000.

Figures 6 and 7 show short- and long-range V/C projections for Alternative A.

FIGURE 6

Summit Street Traffic Study Arterial - Collector System

Alternative A: 10 Year Forecast Volume / Capacity

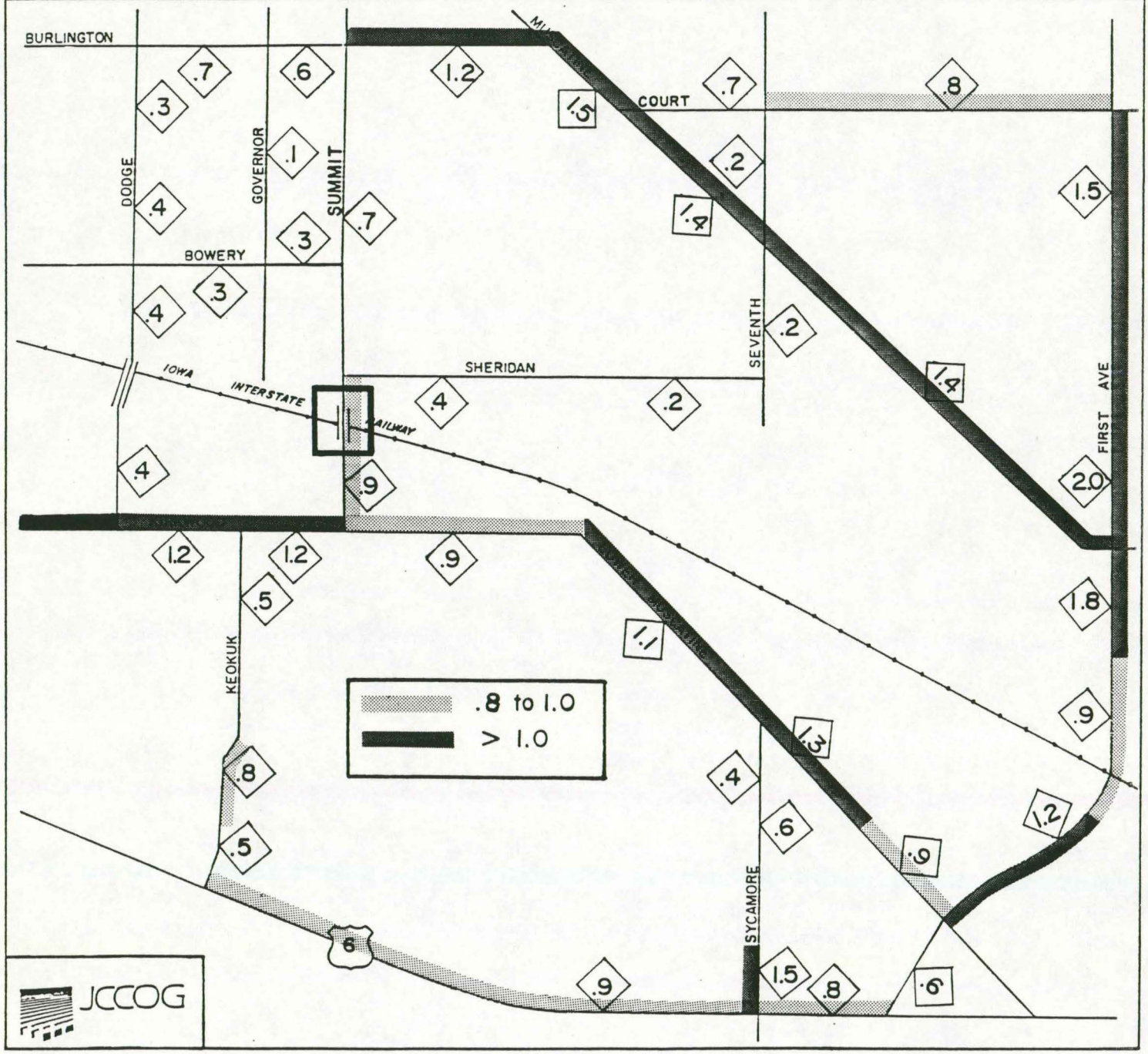
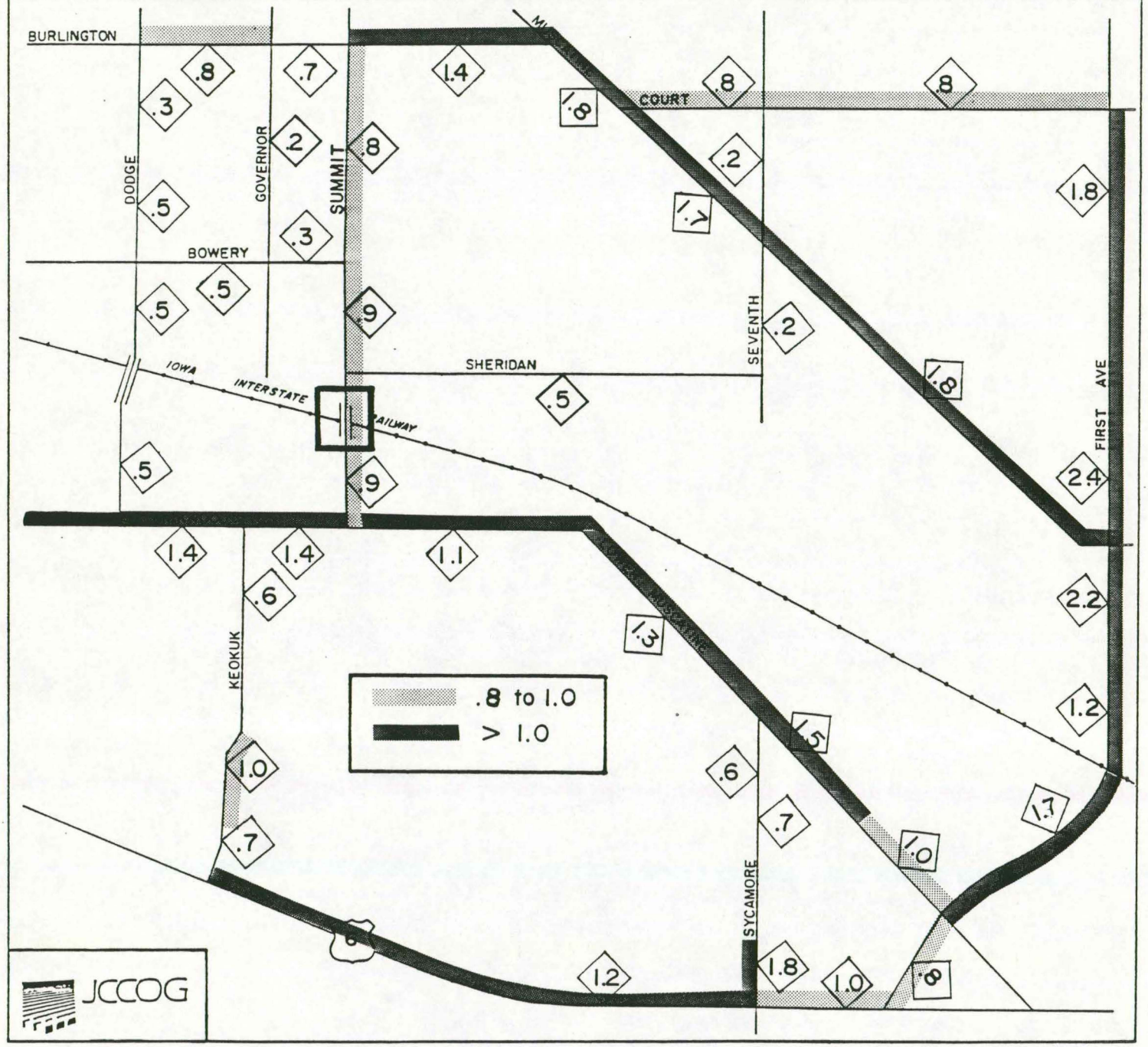


FIGURE 7

Summit Street Traffic Study Arterial-Collector System

Alternative A: 30 Year Forecast Volume/Capacity



Alternative B
Eliminate the Summit Street Bridge
Construct a New Bridge on the Governor Street-Keokuk Street Alignment

This alternative provides removal of the Summit Street Bridge and elimination of access across the railroad at Summit Street. A new bridge would be constructed across the railroad on the alignment of Governor Street. Continuing south, the new street would angle slightly to the west and form a 90° intersection with Keokuk Street and Kirkwood Avenue. The new street would be 31 feet wide with four-foot sidewalks on each side.

Positive Impacts

This alternative increases traffic flow efficiency by reducing travel time in the study area. It permits extension of the Governor/Dodge one-way couplet to Kirkwood Avenue, and eliminates the Summit Street railroad crossing offset. The traffic analysis model shows enough traffic diversion east and west at Kirkwood Avenue that the widening of Keokuk Street is not justified.

Traffic is significantly reduced on Summit Street, as arterial street function is eliminated. Through traffic function would not be totally eliminated on Summit Street due to the terminus of the Court Street and Sheridan Avenue collectors at Summit Street. Traffic volume is minimized on Kirkwood Avenue and Lower Muscatine Road. Ten year forecast modeling does not show justification for widening this corridor between Keokuk Street and Sycamore Street.

Negative Impacts

This alternative would bring arterial street impacts to the neighborhood along Governor Street south of Bowery, as well as to the new alignment between the railroad and Kirkwood Avenue. An estimated 11 residential dwelling units would be displaced between the railroad and Kirkwood Avenue.

Estimated Expense

The estimated capital expense for the new bridge and new street alignment is $2.3 million in FY91 dollars, including property acquisition. Up to $650,000 in Federal Bridge Replacement Program funds would likely be available for Alternative B. The traffic analysis model shows this alternative to result in the fewest number of blocks in the study area for which capacity expansion is justified by the year 2001: 32.5. This is a potential savings of $1.1 million over Alternative A.

Figures 8 and 9 show short- and long-range V/C projections for Alternative B.

FIGURE 8

Summit Street Traffic Study Arterial-Collector System

Alternative B: 10 Year Forecast Volume / Capacity

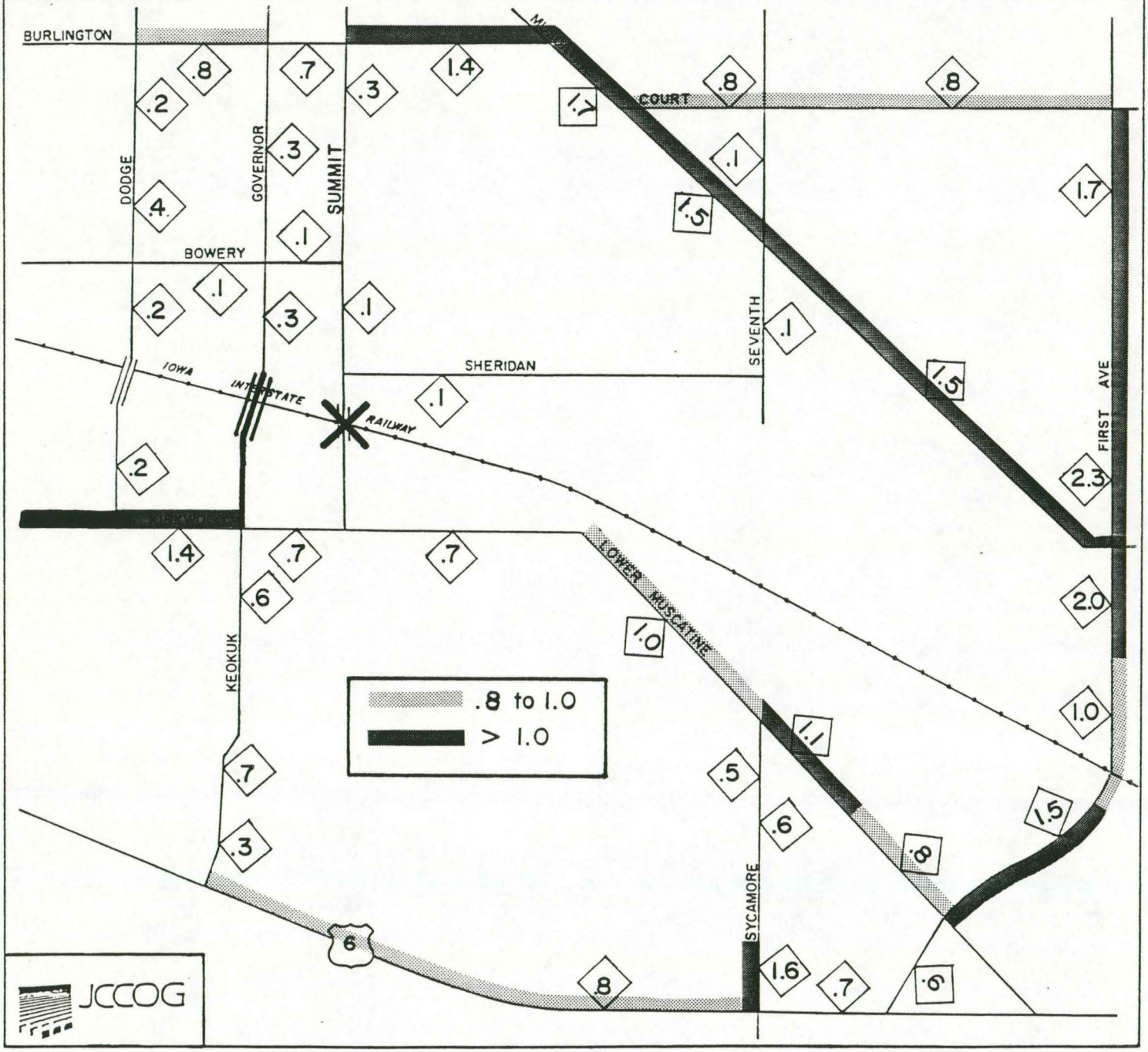
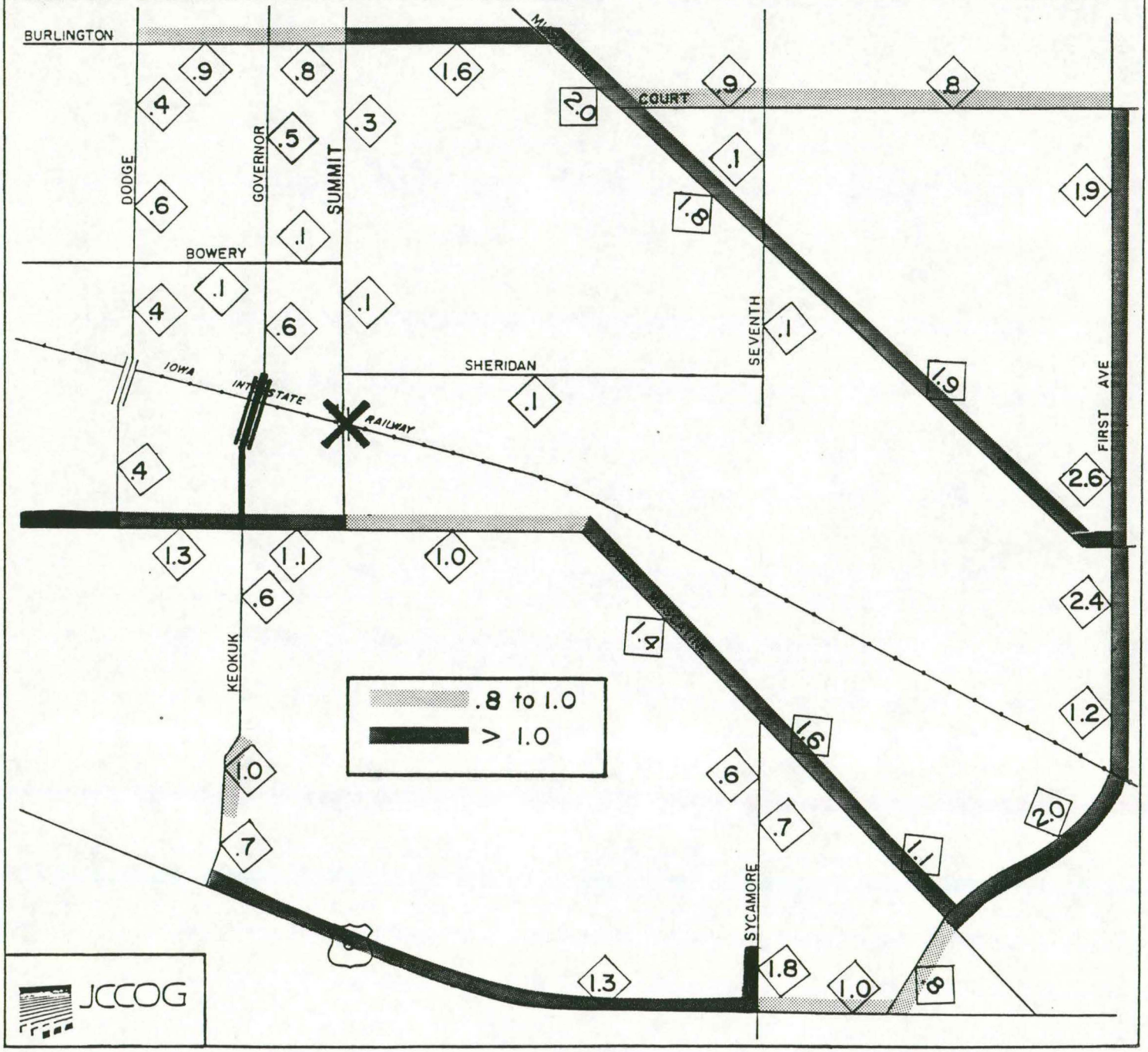


FIGURE 9

Summit Street Traffic Study Arterial - Collector System

Alternative B: 30 Year Forecast Volume / Capacity



Alternative C
Eliminate the Summit Street Bridge
Construct New Railroad Crossing on Seventh Avenue-Sycamore Street Alignment.

This alternative removes the existing Summit Street Bridge and eliminates access across the railroad at Summit Street. A new railroad crossing would be constructed on the alignment of Seventh Avenue and Sycamore Street. The new street would be 31 feet wide with 4-foot sidewalks. A major intersection would be constructed where the new alignment meets Lower Muscatine Road.

Positive Impacts

This alternative provides better arterial street spacing between First Avenue and Dodge Street than either the Summit Street or Governor Street bridges. Traffic is reduced significantly on Summit Street. This alternative also minimizes traffic on Kirkwood Avenue and Lower Muscatine Road. Ten year forecast modelling of Alternative C does not show justification for widening the Kirkwood Avenue corridor between Keokuk Street and Sycamore Street.

It is unlikely there would be dwelling units displaced by this alignment, although right-of-way acquisition is likely.

Negative Impacts

There are several engineering difficulties which would have to be overcome if this alternative is selected. The railroad is elevated 17 feet above the grade of Seventh Avenue. This would normally provide an excellent opportunity for grade separation by putting the road underneath the railroad. However, the location of Ralston Creek parallel to the north side of the railroad precludes this possibility. The only alternatives are to have the street meet the railroad at grade, or to elevate the street above the railroad.

Elevating the street above the railroad would entail a large structure several blocks long, which would disrupt the front yards of houses on Seventh Avenue. Right-of-way does not exist across Iowa-Illinois property between the railroad and Lower Muscatine Road. Although no dwelling units are displaced, this alignment would displace power transmission equipment which exists on the Iowa-Illinois property, and create double frontage lots on Spruce Street.

The neighborhood along Seventh Avenue would receive the impact of arterial street traffic which is currently using Summit Street. Sycamore Street between Lower Muscatine Road and Highway 6 would become a very heavily used corridor with major signalized intersections at Lower Muscatine Road and the Sycamore Mall entrance drive.

Although Alternative C maximizes arterial street system continuity in south Iowa City, this is not the case to the north. North of Muscatine Avenue Seventh Avenue is designed to local residential street standards. North of Rochester Avenue, horizontal and vertical curves on Seventh Avenue are inadequate for arterial street operation.

Estimated Expense

Capital expense for this alternative is unknown, but expected to be greater than $1 million under any circumstances. Federal bridge replacement funds are not available for this alternative. Alternative C results in 35.5 blocks of the study area justified for widening to four lanes within 10 years.

Figures 10 and 11 show short- and long-range V/C projections for Alternative C.

FIGURE 10

Summit Street Traffic Study Arterial-Collector System

Alternative C: 10 Year Forecast Volume/Capacity

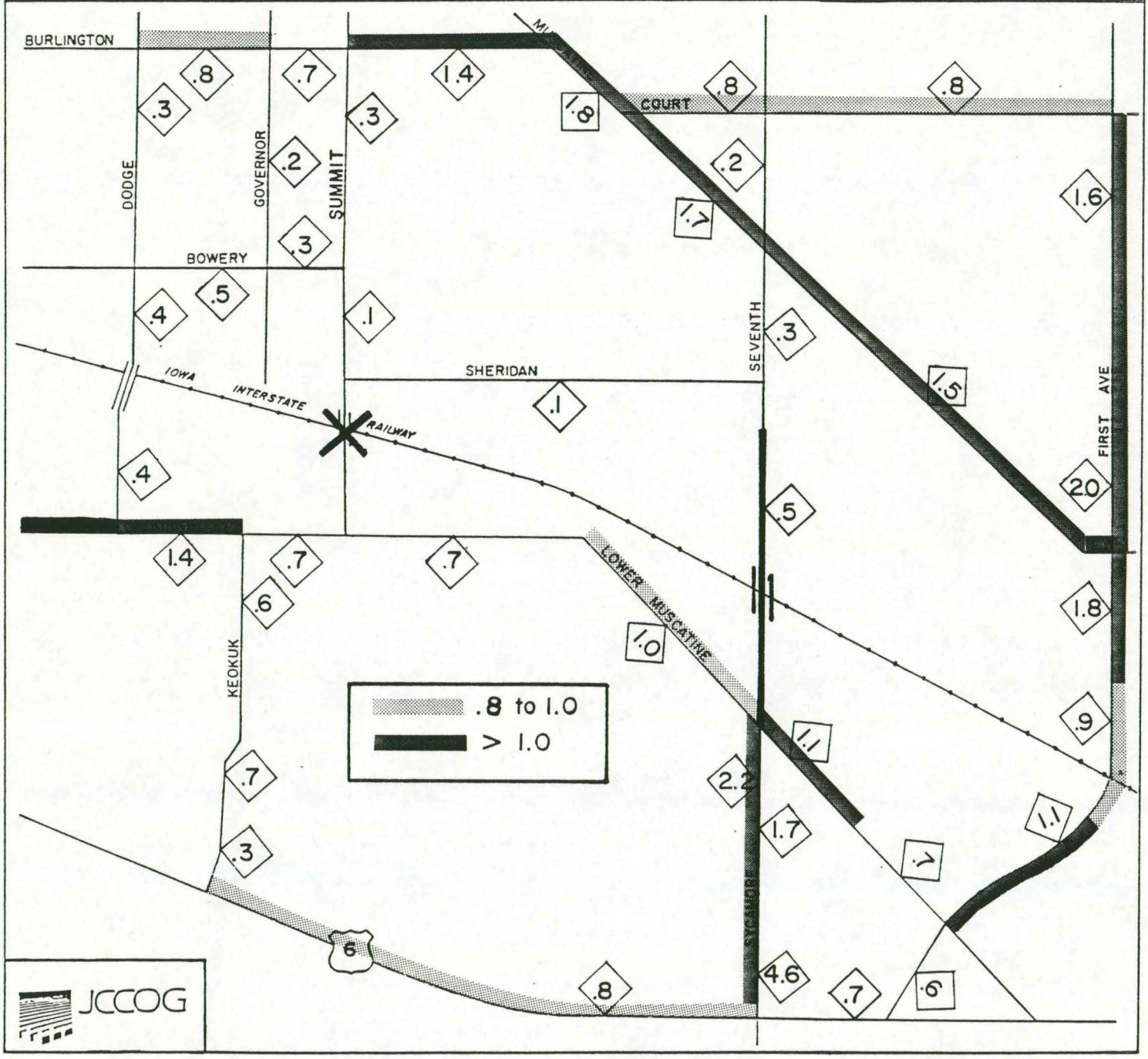
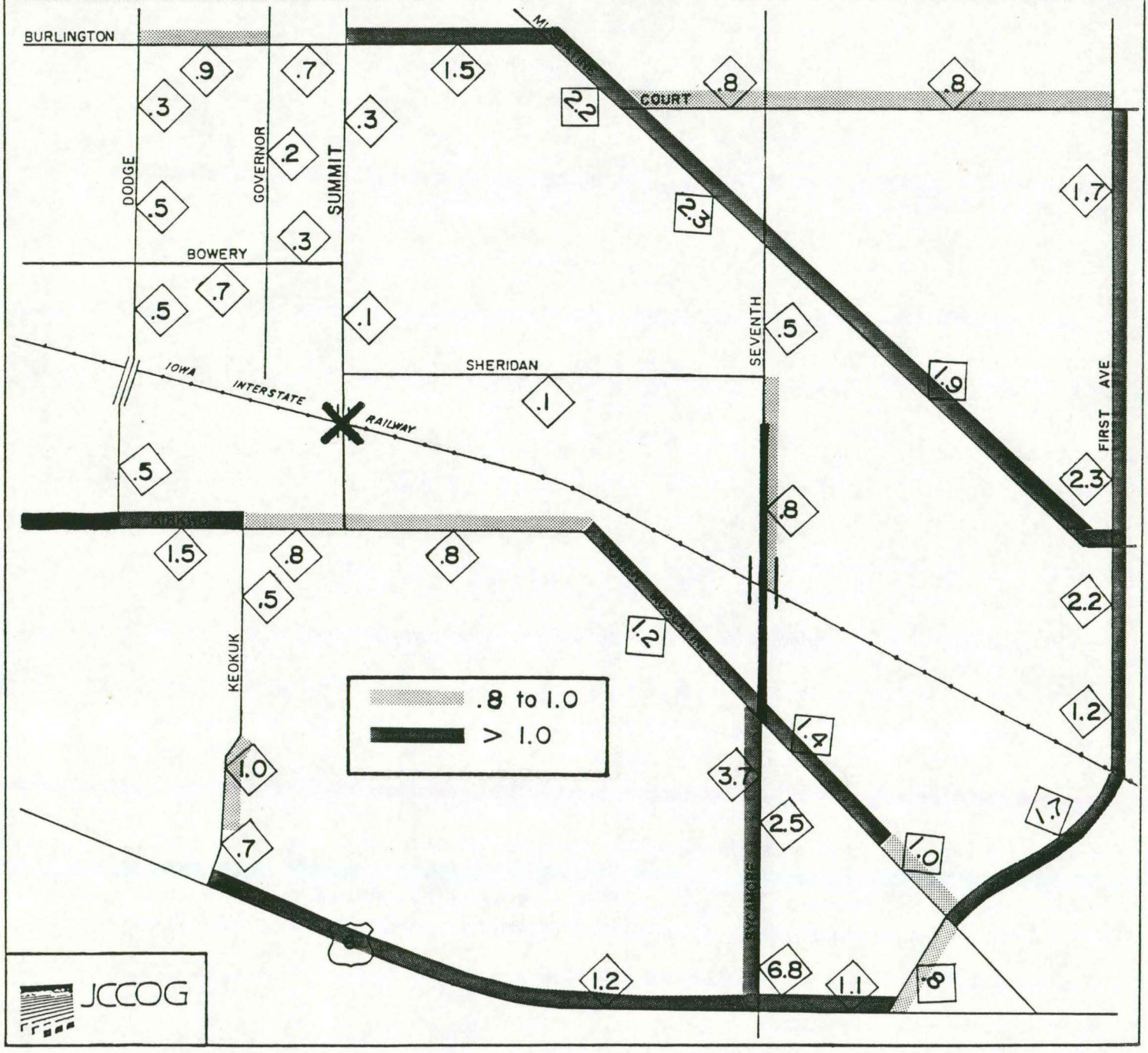


FIGURE 11

Summit Street Traffic Study Arterial-Collector System

Alternative C: 30 Year Forecast Volume/Capacity



Alternative D
Eliminate the Summit Street Bridge
No New Railroad Crossing

This alternative eliminates the existing Summit Street bridge and does not replace it with another railroad crossing. No access across the railroad is provided in the 16 blocks between Dodge Street and First Avenue.

To maximize street capacity and minimize delay, the following traffic control measures should be evaluated in conjunction with this alternative: removal of on-street parking on Dodge Street and Keokuk Street, signalization of the Dodge/Bowery, Dodge/Kirkwood and Keokuk/Kirkwood intersections; and geometric improvements to Keokuk Street south of Highland Avenue.

Positive Impacts

This alternative minimizes disruption to existing neighborhoods. Traffic would be reduced significantly on Summit Street. Utilization of the Dodge Street Bridge would increase. The Dodge Street Bridge is presently underutilized.

Since Alternative D does not involve constructing a structure, it appears to be the lowest capital expense of the four alternatives. The traffic control measures to be evaluated in conjunction with this alternative range from virtually no expense to remove on-street parking, to approximately $35,000 to signalize an intersection, to under $200,000 (estimate) to reconstruct Keokuk Street south of Highland Avenue. However, Alternative D will hasten the need to widen First Avenue between D and Bradford Streets, an expense approximately equal to constructing a new Summit Street Bridge.

This alternative can be considered a temporary option.

Negative Impacts

This alternative would result in inefficient traffic flow due to inadequate arterial street spacing between Dodge Street and First Avenue. It would worsen overcapacity conditions which already exist in the in First Avenue corridor. There would be increased reliance on the at-grade railroad crossing at First Avenue. An accident or derailment at First Avenue would create a situation of no access across the railroad between Scott Boulevard and Dodge Street, a distance of 2.3 miles.

There is the potential for an emergency vehicle access crisis if First Avenue were closed, due to Fire Station 3 being located south of the railroad. Most of Iowa City east of Seventh Avenue is part of the Fire Station 3 "first due area." If First Avenue were closed, it would cause fire trucks to have to detour west to Dodge Street or east to Scott Boulevard in order to access east Iowa City north of the railroad. The Fire Chief has indicated this is unacceptable emergency vehicle access.

Alternative D continues the existing discontinuity in the arterial street system between Bowery Street and Highway 6.

Estimated Expense

See "Positive Impacts" section.

The traffic analysis model shows Alternative D to result in 36.5 blocks of the study area which are justified for expansion from two lanes to four lanes by the year 2001. Figures 12 and 13 show short- and long-range V/C projections for Alternative D.

FIGURE 12

Summit Street Traffic Study Arterial-Collector System

Alternative D: 10 Year Forecast Volume/Capacity

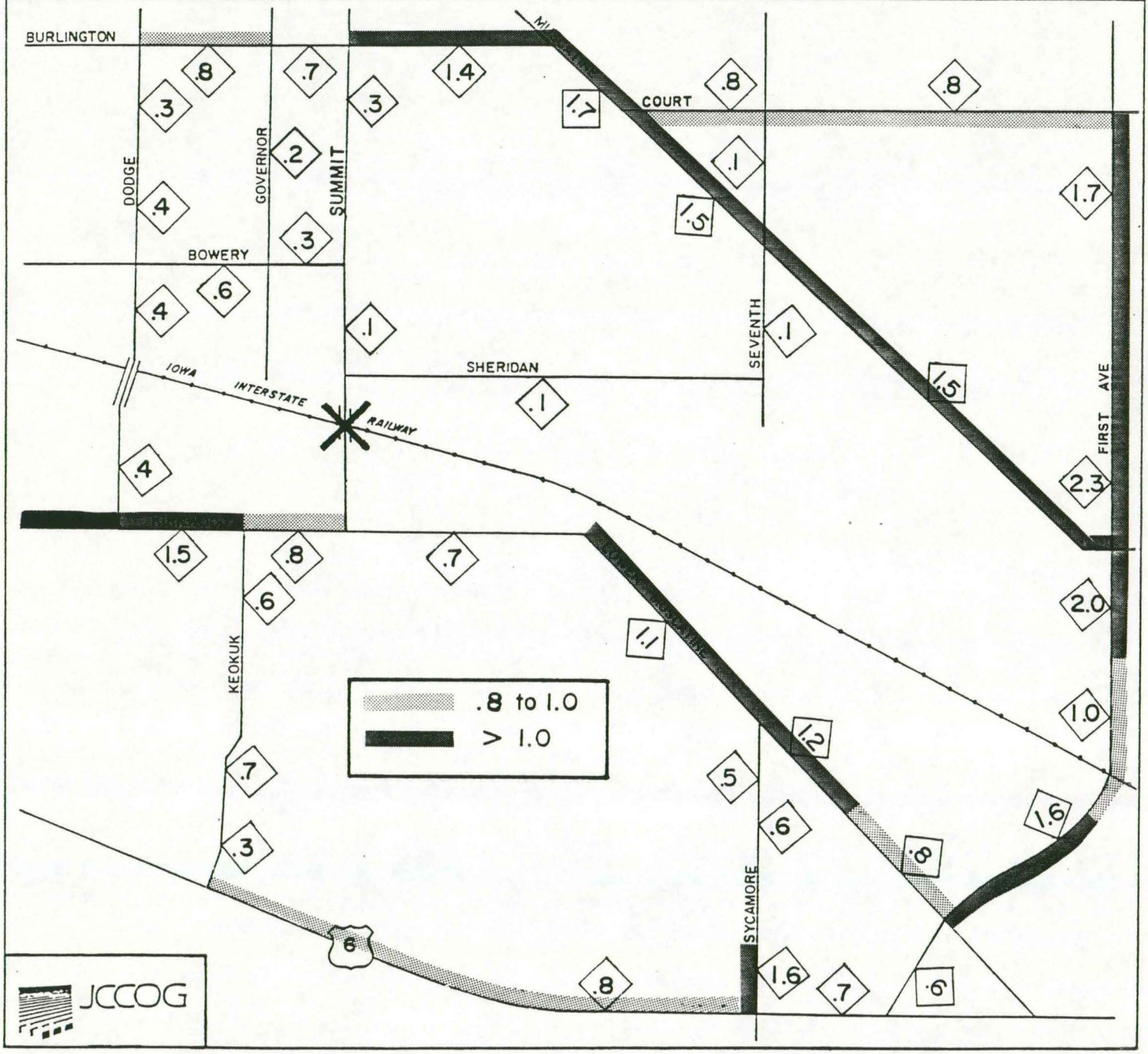
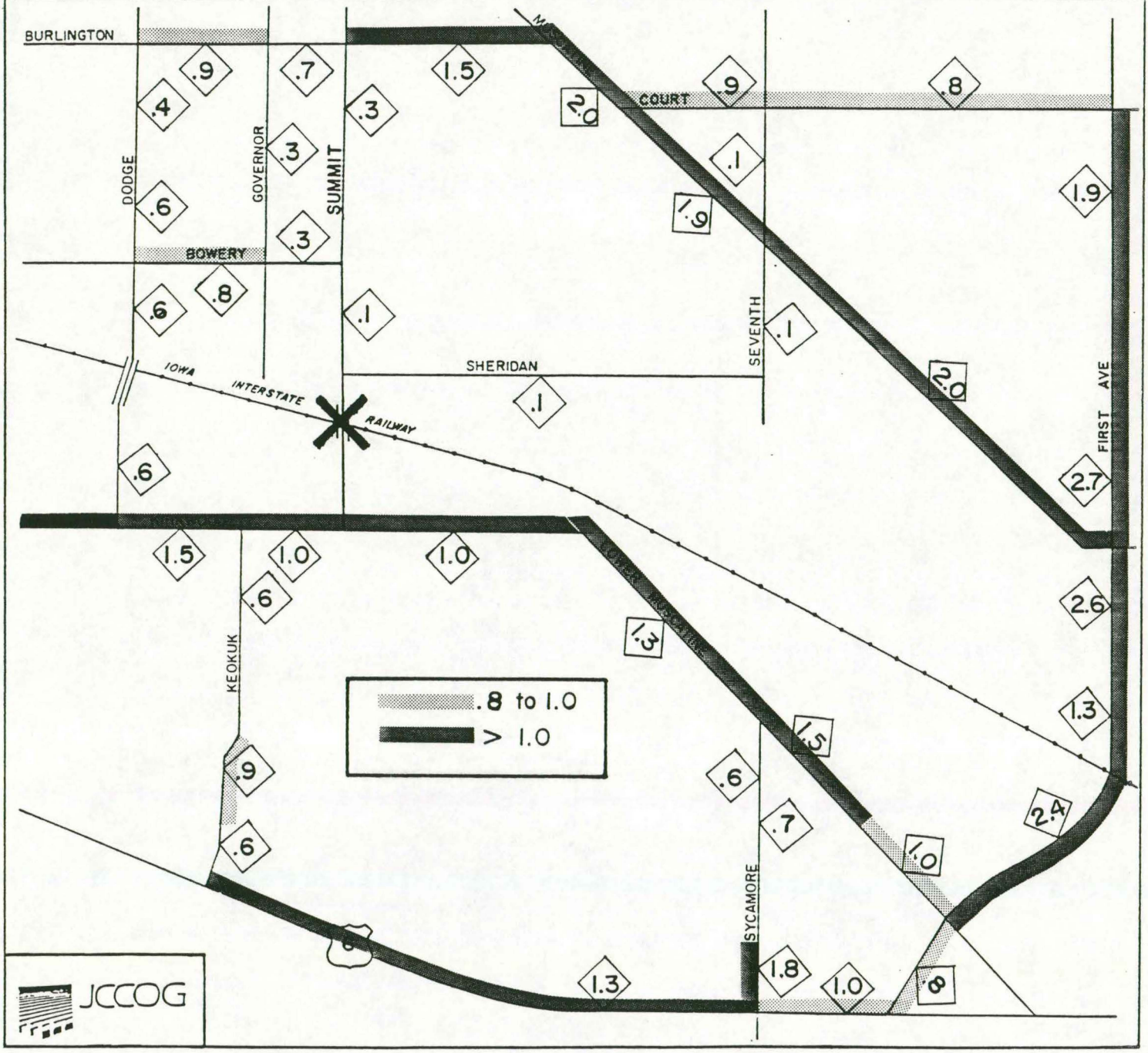


FIGURE 13

Summit Street Traffic Study Arterial-Collector System

Alternative D: 30 Year Forecast Volume/Capacity



Summary Table
Analysis of Alternative Street Alignments

Issue	Alt. A Replace Bridge - Existing Alignment	Alt. B New Bridge. Governor-Keokuk Alignment	Alt. C New RR Crossing. 7th Ave.-Sycamore Alignment	Alt. D Eliminate Bridge - Do Not Replace
Improve overall traffic flow?	No	Yes	Yes	No
Adequate arterial street spacing?	Yes	Yes	Yes	No
Adequate emergency vehicle access?	Yes	Yes	Yes	No
Capital expense > $1 million for structure?	Yes	Yes	Yes	No
$650,000 available in Federal funds?	Yes	Yes	No	No
Reduction in Summit Street traffic?	No	Yes	Yes	Yes
Increased traffic on existing non-arterial streets?	No	Yes	Yes	No
Dwelling units or businesses displaced?	No	Yes	Yes	No
# of blocks in study area justified for widening by 2001?	38	32.5	35.5	36.5
Tie with Sycamore or Keokuk?	Keokuk	Keokuk	Sycamore	Keokuk