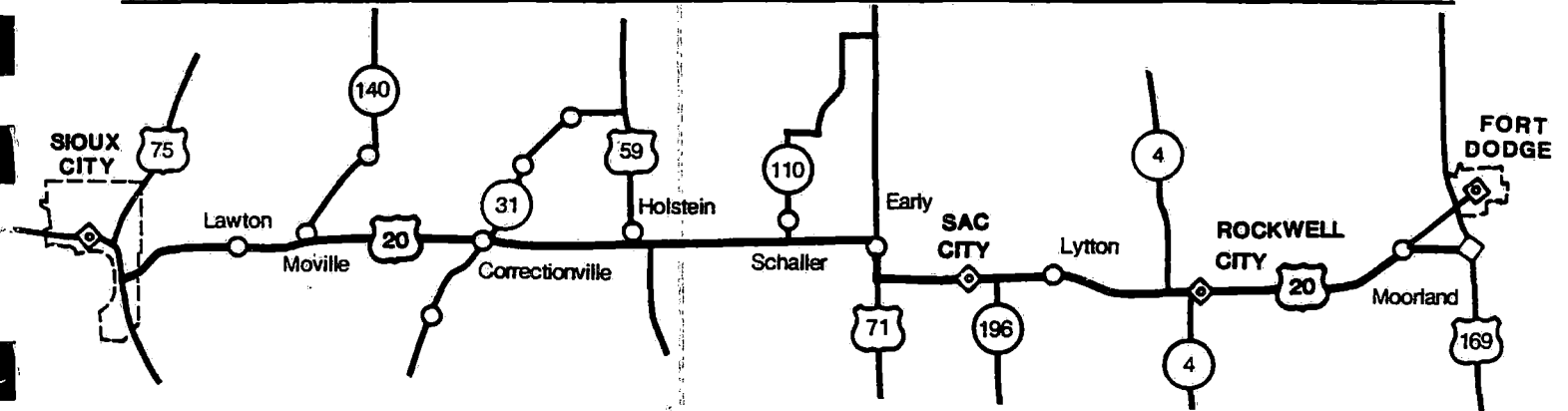

REPORT C: FINAL SCREENING OF ALTERNATIVE CANDIDATE IMPROVEMENTS



U.S. HIGHWAY 20
CORRIDOR DEVELOPMENT STUDY

Submitted to:

**Iowa Department of Transportation
in cooperation with
Federal Highway Administration
Region XII Council of Governments
Mid-Iowa Development Association
Sioux Land Interstate Metropolitan
Planning Council**

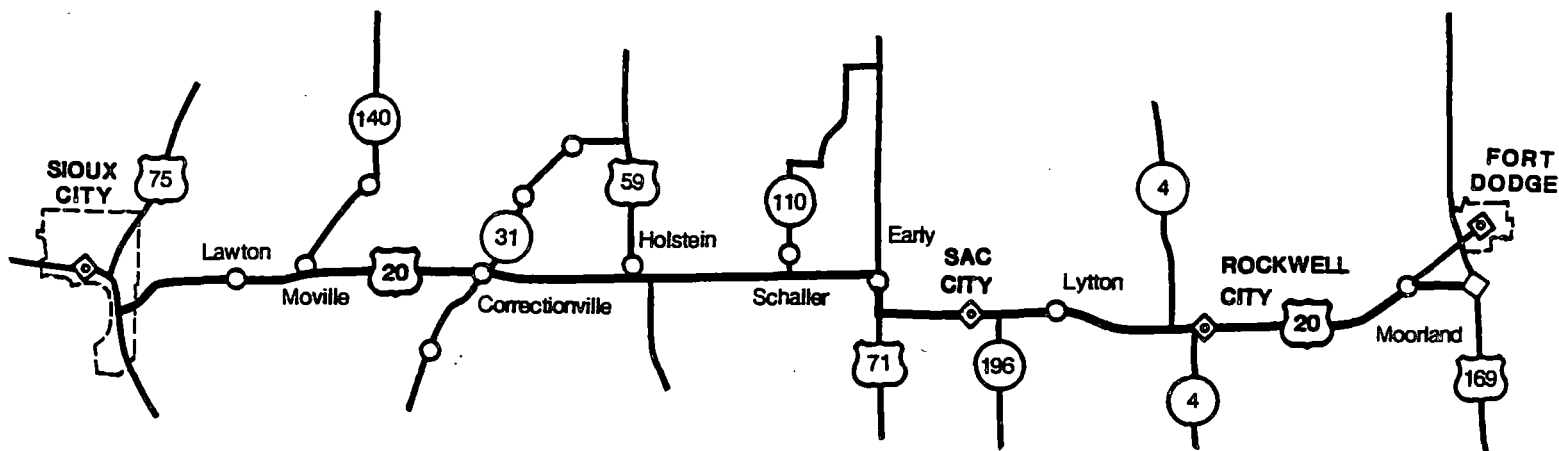
Submitted by:

**Wilbur Smith Associates
and
Brice, Petrides-Donohue**

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REPORT C



REPORT C: FINAL SCREENING OF ALTERNATIVE CANDIDATE IMPROVEMENTS

This is the third in a series of interim working papers which are intended to document work conducted to date. Because it is a "working paper," its statistics and analyses should be viewed as preliminary, subject to modification as the work progresses. The entire study is scheduled for completion in September, 1992.

WILBUR
SMITH
ASSOCIATES

ENGINEERS • ARCHITECTS • ECONOMISTS • PLANNERS

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May 26, 1992

Mr. Martin Sankey
Iowa Department of Transportation
800 Lincoln Way
Ames, IA 50010

**RE: U.S. 20 Corridor Development Study
Final Report C**

Dear Mr. Sankey:

Wilbur Smith Associates is pleased to submit its final version of Report C relative to the U.S. 20 Corridor Development Study. This report briefly compares the alternative improvement options using analyses conducted to date, and is intended to identify the alternatives which should be carried forward into the study's economic evaluation phase.

The previous Report C, dated May 8, was reviewed by the Study Committee and several modifications were made, e.g., the treatment of Alternative 6B as a sensitivity test. This final Report C therefore supercedes the May 8 version.

This report contains the Consultant's suggestions concerning which alternatives should be eliminated from further consideration. These suggestions are for Steering Committee consideration. As is the case with all interim documents, this report is intended for review and comment only. As the study proceeds, changes and deletions may be made to the information contained herein.

Respectfully submitted,

WILBUR SMITH ASSOCIATES



Robert J. Zuelsdorf
Senior Vice President

RJZ/mr

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Chapter 1 INTRODUCTION

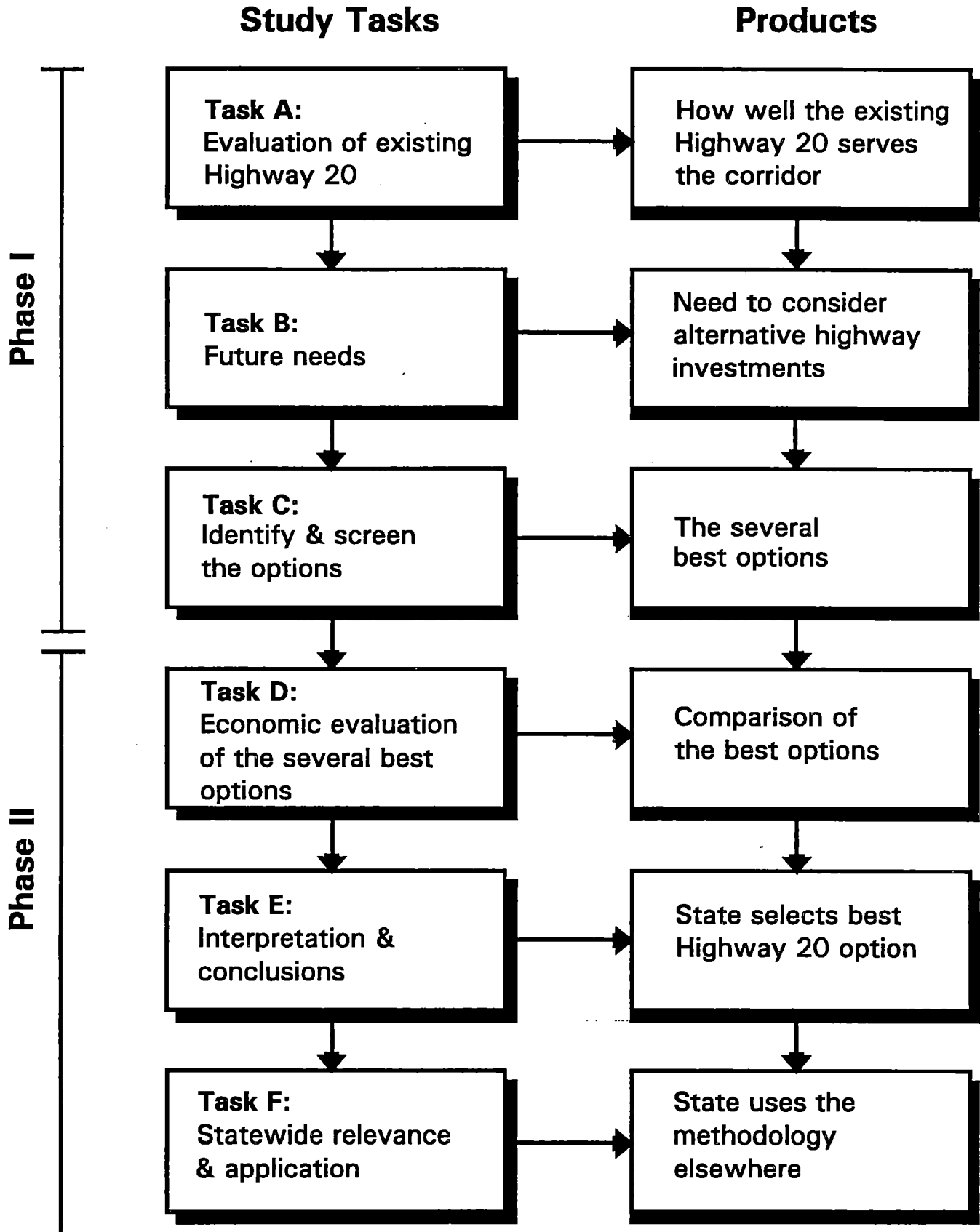
On April 13 the U.S. 20 Corridor Development Study's Steering Committee met to review Report B. At that meeting the Committee suggested five things:

1. In addition to the 55 mph Expressway (Alternative 6) the Consultant should evaluate the economic benefits of a 65 mph Expressway as a sensitivity test.
2. The Consultant should refine the capital cost estimates to recognize some Base Case cost savings that would occur if certain improvement alternatives are built.
3. The Consultant should reexamine the traffic forecasts, to see why certain segment variations occur, and to incorporate the concept of both a 55 mph and a 65 mph expressway (as a sensitivity test).
4. The expressway option should assume expressway standards in Illinois and Iowa except in Dubuque and Nebraska where the planned/existing highways should remain.
5. The Consultant should apply the alternatives "screening process" based on analyses to date and should recommend, in Report C, which alternatives should be carried forward into the next phase of the analysis.

This brief report responds to those suggestions. Chapter 2 presents the alternatives, Chapter 3 evaluates the alternatives utilizing analyses to date, and Chapter 4 presents the Consultant's recommendations. The refined capital cost and traffic estimates are utilized in this Report C.

Exhibit 1-1 presents the overall study phases and tasks. This Report C summarizes Task C and suggests which several alternatives should be carried forward. If the Steering Committee agrees, the Consultant will then conduct the economic evaluation and other more detailed analyses as Task D is initiated.

Two Phase, Six Task Study Approach



Chapter 2

U.S. 20 IMPROVEMENT ALTERNATIVES

Seven improvement alternatives were selected prior to Report B. The idea was to evaluate these in Report B in terms of traffic and cost and, based on those analyses, to eliminate several of these alternatives prior to the economic analyses.

CANDIDATE IMPROVEMENT ALTERNATIVES

The seven improvement alternatives were identified and described in Report B. Exhibit 2-1 summarizes these alternatives. Exhibits 2-2 and 2-3 depict these alternatives on conceptual maps of the corridor. These maps indicate those segments expected to be located on the existing U.S. 20 alignment as well as which segments involve new alignment. It should be emphasized that these maps are conceptual; they are not intended to depict specific alignments for either new highway locations or for community bypass locations. For example, it is not known whether a specific community bypass would pass south or north of any community. Once an improvement option is selected, the State will then likely conduct alignment studies.

ALTERNATIVE 6: EXPRESSWAY

Only Alternative 6 has been revised since Report B. Discussions with the Nebraska Department of Roads suggest that Alternative 6 should not assume an expressway in Nebraska. Furthermore, Alternative 6 has been subdivided into two alternatives - - one at 55 mph, the other at 65 mph. The 65 mph option will be treated as a sensitivity test.

Alternative 6A: 55 mph Expressway - This alternative assumes that a 4-lane expressway standard highway is built in Illinois to Dubuque, and in Iowa from Dubuque to Sioux City. In Dubuque it is assumed that U.S. 20 will be 4-lane, but with at-grade crossings with traffic signals and a 45 mph speed limit. The segments

U.S. 20 ALTERNATIVES

HIGHWAY 20 ALTERNATIVE

DESCRIPTION

1. BASE CASE

- a. U.S. 20 resurfaced Early to Moorland
- b. U.S. 20 minor improvements (lighting, drains, etc.)
- c. U.S. 20 2-lanes Iowa Falls to Waterloo, new alignment
- d. Existing posted speed limits on U.S. 20
- e. Several improvements to U.S. 30

2. IMPROVED TWO-LANE

- a. "Base Case #1," plus such U.S. 20 improvements as:
- b. Build passing lanes and spot reconstruction
- c. Left turn lanes, at every state highway and some paved county roads
- d. Widened granular shoulders (10 ft.)
- e. Improvements through communities
- f. Acceptable value "Arterial B," access "Priority 3"

3. IMPROVED TWO-LANE WITH BYPASSES

- a. "Improved Two-Lane #2" plus Two-Lane Bypasses on Four-Lane right-of-way around:
- b. Correctionville
- c. Early
- d. Sac City
- e. Rockwell City

4. NEW ALIGNMENT TWO-LANE

- a. "Improved Two-Lane with Town Bypasses #3" west of Early, plus
- b. New two-lane highway built on new four-lane alignment between Early and Fort Dodge
- c. 55 mph speed on new segment, access control Priority 2"

5. FOUR-LANE ARTERIAL HIGHWAY

- a. New four-lane highway built on new alignment between Early and Fort Dodge
- b. Existing U.S. 20 between Early and Sioux City widened to four-lanes, on existing alignment
- c. 55 mph on both sections
- d. Both sections built at-grade. Access control "Priority 3" on old sections, "Priority 3" on new sections (O interchanges)

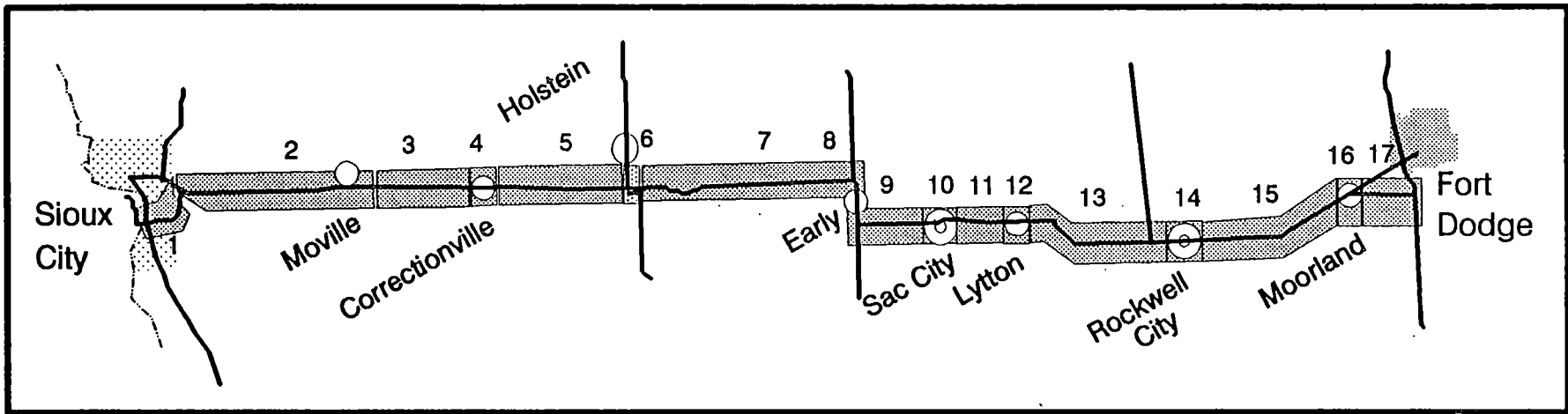
6. EXPRESSWAY (55 mph)

- a. "Four-Lane Arterial Highway #5," plus
- b. Partial access control "Priority 2" (5 interchanges)
- c. 55 mph speed limit
- d. "Expressway B" acceptable value
- e. Expressway built across Illinois and Iowa except in Dubuque. No Nebraska improvements.

7. FREEWAY

- a. Four-Lane on new alignment entire length
- b. Full access control
- c. 16 grade separated interchanges
- d. 65 mph speed limit
- e. "Expressway B" acceptable value
- f. Design exceptions, e.g., 4+% grades
- g. Freeway across Illinois, Iowa and Nebraska

Alternative 1 and 2 Alignment



2-3

Alternative 3 Alignment

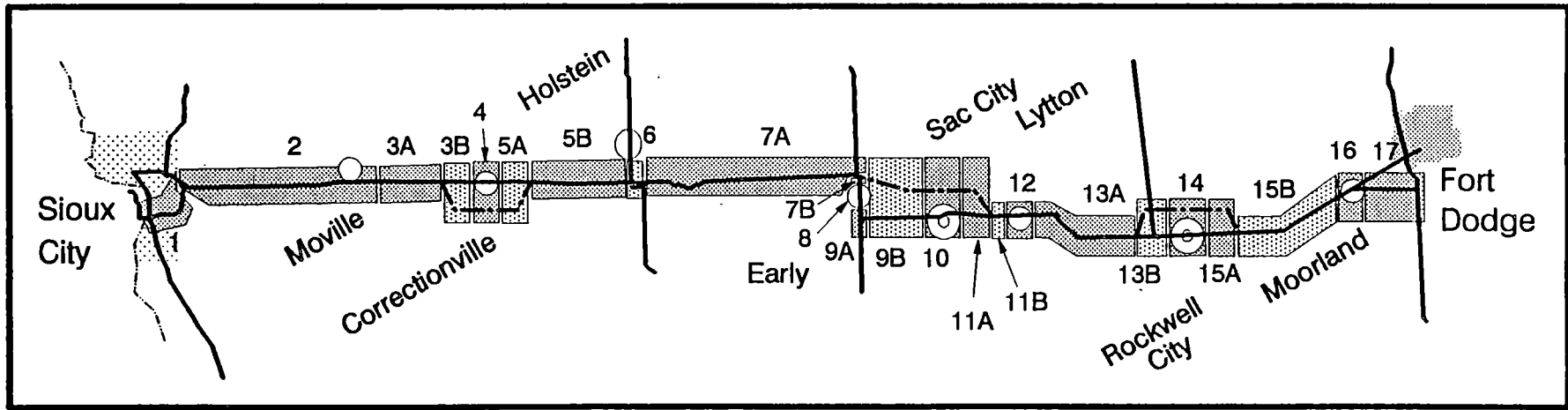
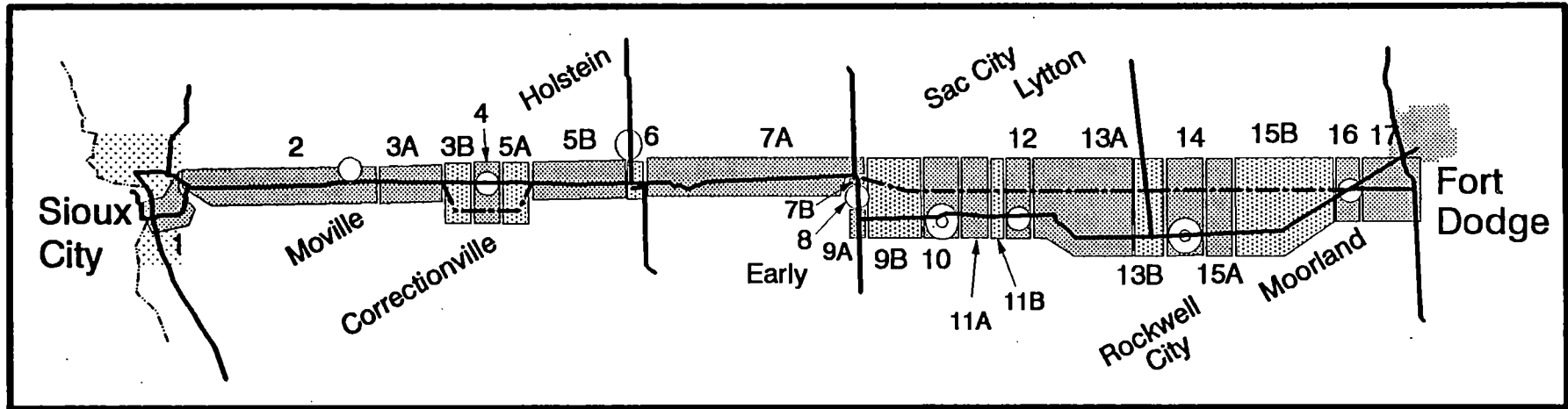


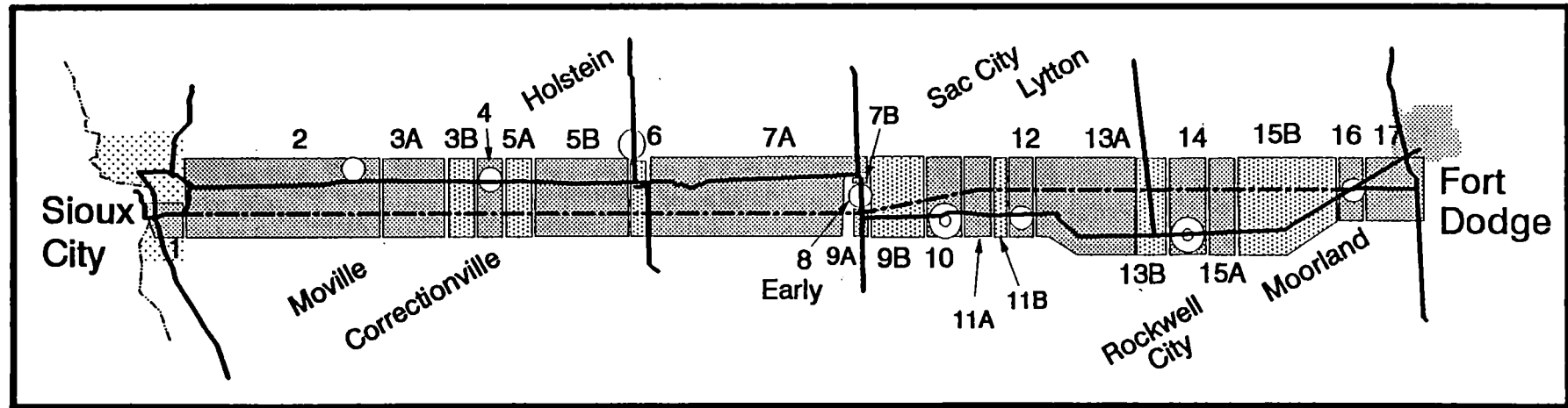
Exhibit 2-2

Alternative 4,5 & 6 Alignment



24

Alternative 7 Alignment



in Iowa that are currently 65 mph would remain 65 mph. In Nebraska it is assumed that the existing highway between Sioux City and Grand Island would remain as is, without an expressway being built. These revised assumptions concerning Alternative 6A have necessitated revised traffic estimates.

Alternative 6B: 65 mph Expressway - Under current law, highways built to expressway standards cannot have posted speed limits in excess of 55 mph. The 65 mph Expressway alternative is not currently a viable option due to federal law; it will therefore be treated as a sensitivity test. However, it is likely that a 65 mph expressway would yield economic benefits in excess of those associated with a 55 mph expressway. To gauge whether this is true, the Alternative 6A expressway will also be evaluated as if it could have a posted speed limit of 65 mph. The economic benefits of a 65 mph expressway would then be attributable to the expressway design standard. However, it likely would be necessary to improve existing U.S. 20 to enable 65 mph vehicle operations and to meet AASHTO standards for that speed. Therefore, an additional cost is estimated for Alternative 6B.

Chapter 3

SCREENING CRITERIA AND OVERVIEW

The intent of Report C is to compare and contrast the various improvement alternatives and, on that basis, to eliminate one or more of the alternatives from further evaluation. This elimination is useful because it will allow remaining study resources to be devoted to only the most feasible, most realistic improvement alternatives.

SCREENING CRITERIA

At this stage in the study the screening of the alternatives must be based only on evidence and analyses compiled to date, as contained in Reports A and B. Because the study has not yet compiled the economic feasibility statistics, the economics criteria cannot yet be applied. The criteria available to date include the following:

Screening Criteria

- Miles of new highway involved
- Construction cost
- Average traffic density
- Capacity compared with estimated traffic use
- Average travel speed
- Cost effectiveness
- Safety
- Environmental issues
- Agricultural issues
- Other states implications
- Four-lane phasing opportunity

As the study proceeds, additional analyses will yield additional insights regarding a number of these criteria, e.g., safety, environmental, agricultural, etc.

SCREENING CRITERIA COMPARISONS

Application of these screening criteria to the set of improvement alternatives suggests the following comparisons:

Miles of New Highway - The various alternatives involve a range of new construction, from no new highway (only passing and turning lanes in Alternative 2) to an entirely new highway (Alternative 7 freeway). The estimated lane miles associated with each alternative are summarized in Exhibit 3-1.

Exhibit 3-1
NEW LANE MILES OF HIGHWAY CONSTRUCTION

| <u>ALTERNATIVE</u> | <u>PAVED</u> | <u>OTHER^(a)</u> |
|---------------------|--------------|----------------------------|
| 2 Improved 2-Lane | 11.4 | 0 |
| 3 With Bypasses | 70.2 | 0 |
| 4 New 2-Lane | 114.0 | 0 |
| 5 4-Lane Arterial | 284.3 | 0 |
| 6 55 mph Expressway | 296.8 | 30 |
| 7 Freeway | 471.8 | 218 |

(a) Frontage roads, etc. Estimates are approximate.

More lane-miles are not necessarily better or worse than fewer new lane-miles, except that more lane-miles will increase annual road maintenance costs to the highway agency.

Construction Cost - The Alternative #1: Base Case is, in this study's terms, a given. Alternatives 2-7 are then compared with this Base Case. The refined capital cost estimates are summarized in Exhibit 3-2. Alternatives 3-6 are most efficient in terms of cost per new paved lane-mile.

Exhibit 3-2
CONSTRUCTION COST ESTIMATES

| <u>ALTERNATIVE</u> | <u>CONSTRUCTION COST</u> (\$ Million) | <u>COST PER LANE-MILE</u> (\$Million) |
|---------------------|--|--|
| 2 Improved 2-Lane | \$12.15 | \$1.07 |
| 3 With Bypasses | 45.59 | .65 |
| 4 New 2-Lane | 68.19 | .60 |
| 5 4-Lane Arterial | 159.82 | .56 |
| 6 55 mph Expressway | 175.99 | .59 |
| 7 Freeway | 341.27 | .72 |

Average Traffic Density - The refined traffic forecasts for each alternative indicate the amount of traffic that is expected to use each U.S. 20 alternative. From that, daily vehicle miles of travel (VMT), average daily traffic (ADT), and the daily number of vehicles diverted (trucks and cars) are calculated.

Exhibit 3-3
ESTIMATED TRAFFIC DENSITY
(Year 2010)

| <u>ALTERNATIVE(000)</u> | <u>DAILY VMT(000)</u> | <u>AVERAGE ADT</u> | | <u>AVERAGE VEHICLES DIVERTED</u> |
|-------------------------|-----------------------|-------------------------------|-----------------------------|----------------------------------|
| | | <u>Corridor^(a)</u> | <u>U.S.20^(b)</u> | |
| 1 Base Case | 465 | 3,918 | 3,918 | 0 |
| 2 Improved 2-Lane | 467 | 3,935 | 3,935 | 17 |
| 3 With Bypasses | 557 | 4,318 | 4,037 | 400 |
| 4 New 2-Lane | 566 | 4,697 | 4,232 | 779 |
| 5 4-Lane Arterial | 660 | 5,464 | 4,999 | 1,546 |
| 6 55 mph Expressway | 699 | 5,791 | 5,348 | 1,873 |
| 7 Freeway | 1,171 | 10,340 | 8,862 | 6,422 |

(a) On existing U.S. 20 plus on new alignment segment of each improvement alternative

(b) On the single highway comprising each improvement alternative (excludes the existing U.S. 20 segments where the improvement alternative is on new alignment)

Traffic Capacity - Traffic capacity is a measure of the ability of a highway to accommodate travel volumes. As indicated in the Task A Report, existing U.S. 20, from a capacity standpoint provides an adequate level of service throughout the length of the section being studied (Sioux City to Ft. Dodge). None of the study sections fall below Level of Service C; of the 17 highway segments, 6 currently have Level of Service "A", 10 have Level of Service "B", and one has Level of Service "C". This is indicative of reasonably high quality traffic conditions, and no significant congestion problems.

For purposes of these evaluations, the impact on capacity of the different alternatives is judged to be as follows:

Alternative

- 2: Improved Existing Facility** - Widening of shoulders and the addition of passing lanes will only modestly increase capacity. Provision of turning lanes at major intersections would add capacity at these locations but these intersections do not, at present, constitute a capacity problem.
- 3: Improved Existing Facility with Bypasses** - Traffic and traffic signals in the communities along U.S. 20 constitute a constriction of capacity. Bypasses would eliminate these constrictions so long as U.S. 20 traffic is given priority at intersections with other highways.
- 4: New 2-Lane** - A new alignment east from Early would create a second parallel highway on the east end of the corridor which would more than double the capacity on the east end by adding the ability of the two parallel highways combined to handle a total of 12,000 vehicles per day.
- 5: 4-Lane Arterial** - A 4-lane highway, even at-grade, would create a great deal of traffic capacity in the corridor. With a capacity of 20,000 and average ADT of about 4,300 in the year 2010, excess capacity would exist (volume/capacity ratio of .21).
- 6: 55 mph Expressway** - Construction of a standard expressway would create a capacity of 25,000 vehicles per day, and estimated year 2010 ADT of more than 5,300. Excess capacity would exist (volume/capacity ratio in year 2010 of .21).
- 7: Freeway** - With a capacity of 50,000 to 75,000, and estimated ADT of about 9,000, the freeway alternative has even more excess capacity (year 2010 volume/capacity ratio of .12-.18) and therefore, would not be a cost effective solution in this corridor.

Average Travel Speeds - Speeds on highways are influenced by a number of factors, including posted speed limits, alignment constrictions, passing opportunities, traffic, and other factors. The quality of travel is influenced by both the average overall speed and the extent to which changes in speed are imposed upon the road user. The improvement alternatives would affect estimated travel speeds as follows:

Alternative

- 2: Improved Existing Facility** - Provision of passing lanes and turning lanes would improve speeds and would reduce driver frustration. Passing lanes break up platoons of vehicles caused by slow-moving vehicles and these benefits can extend 2 to 5 miles downstream. Average corridor speed for this option is estimated to increase less than 1 mph (.2 mph) compared with the Base Case.
- 3: Improved Existing Facility with Bypasses** - Improvements in travel speed would result from the elimination of conflicts with traffic inside communities and the reduction or elimination of traffic signals and stop signs. Average speed in the corridor is estimated to only increase by 1.3 mph compared with the Base Case.
- 4: New 2-Lane** - A new 2-lane highway east from Early would both reduce trip distance and increase average speed, by 5.1 mph compared with the Base Case.
- 5-7: 4-Lane Alternatives** - Each 4-lane option would create "free flow" speeds, with resultant speeds inhibited principally by the posted speed limits. Compared with the Base Case, the following average increases in speed are estimated for the 4-lane alternatives: Alt. 5: 8.9 mph; Alt. 6: 11 mph; Alt. 7: 16 mph.

**Exhibit 3-4
ESTIMATED TRAVEL TIME
End to End Sioux City to Moorland**

| <u>ALTERNATIVE</u> | <u>TRAVEL TIME</u> (Hours.Hundredths) |
|---------------------------|--|
| 1 Base Case | 2.43 |
| 2 Improved 2-Lane | 2.42 |
| 3 With Bypasses | 2.35 |
| 4 New 2-Lane | 2.13 |
| 5 4-Lane Arterial | 1.99 |
| 6 55 mph Expressway | 1.92 |
| 7 Freeway | 1.74 |

Cost Effectiveness - The total economic costs or benefits associated with the improvement alternatives are not yet known. What is known, is how much the improvements will cost, and how much traffic is estimated to use each alternative. Comparing these statistics, the Exhibit 3-5 cost effectiveness indicators are estimated.

**Exhibit 3-5
CAPITAL COST EFFECTIVENESS**

| <u>ALTERNATIVE</u> | <u>COST PER PAVED LANE-MILE</u> (\$ Million) | <u>COST PER 2010 DAILY DIVERTED VEHICLE</u> (\$ Million) | <u>COST PER 2010 ADT</u> (\$ Thousand) |
|---------------------|---|---|---|
| 2 Improved 2-Lane | \$1.07 | \$.71 | \$3.09 |
| 3 With Bypasses | .65 | .11 | 10.56 |
| 4 New 2-Lane | .60 | .09 | 14.52 |
| 5 4-Lane Arterial | .56 | .10 | 29.25 |
| 6 55 mph Expressway | .59 | .09 | 30.39 |
| 7 Freeway | .72 | .05 | 33.00 |

Safety - Safety is a matter of considerable concern to people who live in the corridor and those who use U.S. 20. The Task A Report found that, on three segments, accident rates on U.S. 20 exceeded the average rate for Iowa's Commercial and Industrial Network. One potential benefit of an improved U.S. 20 would be to create a safer facility and reduce the potential for accidents. With regard to the various alternative improvements, the following points are relevant to this screening process:

Alternative

- 2: Improved Existing Facility** - Widening of shoulders would reduce the potential for accidents. Provision of passing lanes would reduce driver frustration which results in risk-taking when following slow-moving vehicles. Passing lanes would provide for safer passing operations by reducing the threat of meeting an oncoming vehicle. Only periodic passing and turning lanes, however, would not totally alleviate the problem.
- 3: Improved Existing Facility with Bypasses** - Through traffic, particularly large trucks, are of concern within towns. By putting through traffic on a bypass, travel within towns in the corridor would be safer.
- 4: New 2-Lane** - A new alignment east of Early would in effect accomplish the same thing as the town bypasses.

- 5: **4-Lane Arterial** - Four-lane highways tend to be safer than two-lane highways. This is due in part to passing opportunities which do not require entering the opposing traffic lane plus the wider maneuvering area on four-lane facilities.
- 6: **55 mph Expressway** - The addition of interchanges would reduce the amount of at-grade cross traffic, which should result in a safer highway.
- 7: **Freeway** - Control of access eliminates the potential for accidents caused by vehicles entering or leaving a roadway from driveways, access roads or other places. The freeway alternative is the safest of the alternatives being considered.

As the study moves into Task D, the accident rates and accident savings will be estimated. At this stage in the screening process, only more generalized statements such as those stated above can be made about safety.

Environmental Issues - This Study does not include site specific environmental assessments. Instead, the analysis is concerned with broad environmental issues and the impacts that different improvement alternatives might have. These are summarized as follows:

Alternative

- 2: **Improved Existing Facility** - Very little environmental impact is anticipated due to the provision of passing lanes and turning lanes.
- 3: **Improved Existing Facility with Bypasses** - Bypasses of the communities could encounter some environmentally sensitive areas. This is especially true at Correctionville and Sac City where the bypasses could encounter greenbelts, woodlands and wetlands. Indications are, however, that these can be overcome as long as care is taken in the alignment process.
- 4: **New 2-Lane** - All of the alternatives that involve new alignment east of Early will have to be planned to avoid the wetlands and other sensitive areas. The Kiowa Marsh area and associated wetlands are a particular constraint, and the alignment will need to be carefully selected to minimize the impact to this area.
- 5 and 6: **Four Lane Options** - These 4-lane alternatives make use of the existing U.S. 20 west of Early. Widening of that portion will require care, but is possible. East of Early it must avoid the wetlands and other sensitive places described above for Alternative 4.

7: Freeway - This alternative is entirely on new alignment. It is the most environmentally sensitive of all of the alternatives and the impact on natural resources, including wetlands, prairie, woodlands, greenbelts and agricultural land, may be significant.

Agricultural Issues - The most potentially disruptive option for farms is Alternative 7: Freeway. This is because the freeway would cut through existing farmlands, taking an average width of 300 feet of right-of-way plus an additional 40 acres at interchanges, from agriculture, totalling approximately 4,700 acres of farm land. Areas requiring wider right-of-way were considered to offset areas where some right-of-way is already owned.

Other States Implications - The less costly alternatives (Alternatives 2, 3, 4 and perhaps 5) could be built without significant consideration being given to impacts or projects in Illinois or Nebraska. The expressway alternative, to be effective, would need a similar highway standard in Illinois, and the freeway alternative (7) would need a 65 mph Freeway across Illinois, Iowa and Nebraska, to be effective.

Four-Lane Phasing Opportunities - Of long-range importance is the ultimate ability of any of the alternatives to be built to 4-lane standards in the future. All of the four-lane alternatives fit this goal (Alternatives 5, 6, 7) since they would be 4-lane. Alternative 4 involves a 2-lane highway, on 4-lane right-of-way, east from Early. Therefore, this Alternative is adaptable to the 4-lane phasing criterion. Alternative 2 (passing lanes, turning lanes) would have modest phasing opportunity, and Alternative 3 (bypasses) would not be helpful in this regard because the circuitous nature of this Alternative east of Early would not be readily adaptable to ultimate widening to 4-lane.

Chapter 4 SCREENING OF ALTERNATIVES

Thus far in the study, the Base Case plus seven improvement alternatives have been considered. Analyses to date have developed a variety of statistics and insights for each. Based on these analyses, certain things are now known which the Consultant believes are sufficient to enable the elimination of three alternatives from further consideration.

ALTERNATIVES RECOMMENDED FOR ELIMINATION

The Consultant recommends that three of the alternatives be eliminated from further study:

| | |
|----------------|----------------------------|
| Alternative 2: | Improved Two-Lane Highway |
| Alternative 5: | Four-Lane Arterial Highway |
| Alternative 7: | Freeway |

These are recommended for elimination because they do not meet the corridor's objectives as well as do those alternatives which are retained for further analyses.

Alternative 2: Improved Two-Lane Highway - This alternative involves only the construction of passing lanes, turning lanes, widened shoulders in places and minor improvements through the towns. It is recommended that this alternative be deleted from further analysis because:

- Such modest changes costing only \$12.15 million do not attain the intent of the corridor project. Such changes, while appropriate if nothing else is done, are too modest.
- Almost no traffic would divert due to these improvements, indicating poor cost effectiveness.
- Such modest changes are somewhat beyond the ability of the economic models to develop credible or significant economic development benefits. If this option were selected, it would be for traffic flow reasons, not economic reasons.

- This alternative does not facilitate future upgrading to 4-lane as well as Alternative 4.
- This alternative retains U.S. 20 through the communities. This prevents it from alleviating the route's traffic flow goals.
- Overall it is believed that the other 2-lane alternatives are superior to this more limited 2-lane option.

Alternative 5: 4-Lane Arterial Highway - This option involves the construction of a new 4-lane highway east of Early, and the widening of existing U.S. 20 to 4-lanes west of Early. Both sections would be at-grade, with no grade-separated interchanges. This alternative is recommended for deletion because:

- Much of U.S. 20 is already built to a combination of 4-lane expressway and 4-lane freeway standards. Yet another 4-lane standard introduced in the corridor would be inappropriate.
- Lack of interchanges would require stop signs at other primary highways, thereby continuing inefficiencies on those highways.
- If this Alternative were constructed, it would be difficult to upgrade the design to an expressway in the future, due to the need for additional right-of-way acquisition and construction of frontage roads and interchanges.
- A 4-lane arterial highway without good access control may encourage development which is detrimental to traffic flow, such as frequent commercial entrances and uncontrolled turning movements.
- Construction of Alternative 6, with 5 interchanges, would only cost an additional \$16.17 million which would be cost effective.
- Overall, it is believed that Alternative 6 is superior to Alternative 5.

Alternative 7: Freeway - This option is to build a continuous 65 mph 4-lane freeway of Interstate Highway standards entirely on new alignment. This alternative is recommended for deletion, for the following reasons:

- The traffic estimates find that, to be effective, a comparable level highway would also have to be built in Illinois between Dubuque and Chicago, across Iowa from Dubuque to Sioux City, and through Nebraska from Sioux City to the environs of Grand Island.

- A 65 mph freeway is not currently contemplated in either Illinois or Nebraska, and the State of Iowa is not a major player in causing serious consideration of the freeway alternative in the adjoining states.
- A freeway between Sioux City and Ft. Dodge would cost an estimated \$364.47 million. Given the estimated traffic, this is not a cost-effective solution.
- A freeway across Illinois-Iowa-Nebraska would cost billions of dollars. Funding for such a monumental undertaking is, at best, unlikely.
- The construction would involve considerably more right-of-way, including an estimated 4,700 acres of farm land taken out of production.
- This alternative would substantially increase the total mileage of roadway on the public road system, increasing future maintenance costs for Iowa DOT, and the counties and cities along the route.
- The traffic estimates suggest that such an investment is not needed. The less expensive expressway option is capable of carrying such volumes, and there is not a significant reason to alleviate traffic on I-90 or I-80 in Iowa. A freeway with a 50,000 ADT capacity carrying only 9,000 ADT is not cost effective. Therefore, need for a freeway alternative cannot be credibly demonstrated in this corridor.

ALTERNATIVES RECOMMENDED FOR FURTHER STUDY

If the Steering Committee concurs with the elimination of those three alternatives, three improvement alternatives, plus the Base Case, would be scrutinized further in the economic analyses.

Alternative 1: Base Case - It is the Base Case which will be compared with each improvement alternative. Consequently this alternative must be carried forward.

Alternative 3: Improved Two-Lane with Bypasses - This 2-lane option would build the passing lanes and turning lanes and would also bypass all communities (except Lytton) along the route. While costing \$45.59 million, it is the single remaining improvement option which makes extensive use of the existing U.S. 20

Alternative 4: New 2-Lane - This option involves the construction of a new 2-lane U.S. 20, on 4-lane alignment, between Early and Moorland. In addition, it includes passing lanes, turning lanes, shoulder improvements and a bypass of Correctionville. All communities would therefore be bypassed.

Alternative 6: 55 mph Expressway - This alternative would have a continuous 4-lane highway from Sioux City to Ft. Dodge, on a reasonably direct alignment, with interchanges built at five primary highways. In addition, a sensitivity test at 65 mph will also be conducted.