

Arizona Trade Corridor Study

Study Summary

Prepared for
Governor Fife Symington
and the
Arizona Summit Six

August 16, 1993

ARIZONA TRADE CORRIDOR STUDY

STUDY SUMMARY

prepared for

GOVERNOR FIFE SYMINGTON

and the

ARIZONA SUMMIT SIX

August 16, 1993

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Appendix A Glossary of Terms

ATTACHED REPORTS:

Component 1A TRADE BETWEEN ARIZONA, MEXICO AND CANADA: CURRENT PATTERNS AND LIKELY IMPACTS OF NAFTA

University of Arizona, Office of Community Public Service
Tucson, AZ

Component 1B TRADE FLOWS IN THE CANAMEX CORRIDOR: IMPACTS OF GROWTH AND TRANSPORTATION POLICY

University of Arizona, Office of Community Public Service
Tucson, AZ

Component 2A INTERSTATE 17 EXTENSION FEASIBILITY STUDY

Arizona Department of Transportation, Planning Division
Phoenix, AZ

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- Component 2B US 93 DEVELOPMENT STUDY
- Arizona Department of Transportation, Planning Division
Phoenix, AZ
- Component 2C ECONOMIC EVALUATION OF HIGHWAY ALTERNATIVES
- Hickling Corporation
Silver Spring, MD
- Component 3A THE ARIZONA BORDER INFRASTRUCTURE NEEDS ASSESSMENT
- Arizona Department of Transportation, Planning Division
Phoenix, AZ
- Component 3B ARIZONA-SONORA BORDER PORTS OF ENTRY: TRAFFIC FLOW,
FACILITY DESCRIPTION AND INSTITUTIONAL PROFILE
- University of Arizona, Office of Community Public Service
Tucson, AZ
- Component 3C ECONOMIC EVALUATION OF BORDER TRANSPORTATION PROJECTS
- Hickling Corporation
Silver Spring, MD
- Component 4 EVALUATION OF RAIL, INTERMODAL AND AVIATION
TRANSPORTATION DEVELOPMENT
- Hickling Corporation
Silver Spring, MD
- Component 5 INTERNATIONAL BUSINESS SERVICES: ARIZONA'S CONNECTION TO
TRADE WITH NORTH AMERICA
- Arizona State University, Morrison Institute for Public Policy
Tempe, AZ

Component 6 STRATEGIC INFORMATION AND TELECOMMUNICATION SERVICES
IN ARIZONA

Northern Arizona University, College of Business Administration
Flagstaff, AZ

Component 7 DATALINK: ASSESSMENT OF DATA, DATA COLLECTION AND DATA
NETWORKING

University of Arizona, Office of Community Public Service
Tucson, AZ

1.

Overview of the Arizona Trade Corridor Study

1.1 Introduction

The evolving nature of the global economy has resulted in many changes in the United States economy. American producers are looking at a global, rather than a domestic marketplace. To date, coastal states and cities with port facilities have been in the forefront of international business opportunities--primarily because of their natural resources and geographic proximity to Europe or Asia. The most successful trading regions have had geographic advantages that have been enhanced by well-developed infrastructure, human resources, and public policies that encourage trade.

Increases in North American trade, spurred in part by the possibility of a North American Free Trade Agreement, are providing a new way of looking at international business. In addition to the traditional east-west orientation, business is looking north-south. The states on the border of Mexico and Canada are now potential gateways for international trade. Accordingly, Arizona has the opportunity to be at the center of international trade activity and to enjoy economic benefits based, in part, on its geographic proximity to Mexico.

With or without the North American Free Trade Agreement, there is little doubt that Arizona's trade with Mexico and Canada will continue to expand. Between 1989 and 1992, the state's exports to Mexico doubled, and now total approximately \$1.8 billion. Arizona is now the

country's third largest exporter to Mexico, trailing only Texas and California. The revenues and jobs resulting from this increase in exports serve as an engine of growth for Arizona's economy.

One of the most interesting and comprehensive trade-related opportunities involves Arizona's participation in the development of an international trade corridor. A trade corridor is not limited to roadways. A trade corridor is a geographically designated area that facilitates the national and transnational movement of goods, services, people and information. If successfully developed and implemented, such a corridor would activate and accelerate economic activity throughout the corridor and surrounding areas.

Increased trade with Mexico and Canada provides the opportunity for interconnections between north-south and east-west trade and traffic. Physical infrastructure is currently geared toward east-west trade in the United States, but the development of north-south linkages increases opportunities for efficient trade moving in all directions to keep pace with the shifting demographics of North American trade. The corridor is a defined series of connections, providing continuous and efficient means for trade to move smoothly from north-south to east-west.

Key components of a viable trade corridor include: (1) a well developed physical infrastructure, including highways, rail, air and sea linkages, and ports of entry; (2) an established commercial infrastructure and appropriate trade incentives, including distribution and warehousing facilities, foreign trade zones, and a harmonized regulatory environment; (3) a regionally integrated technological infrastructure, including corridor-wide trade databases and electronic bulletin boards; (4) business and professional expertise, including customs brokers, freight forwarders, and internationally sophisticated accountants, attorneys, consultants, and academicians; and (5) well developed social, political, and business linkages throughout the trade corridor.

This Study was commissioned to determine the merit of the trade corridor opportunity, and to develop strategic recommendations that would enable Arizona to participate in the creation of a regional business environment that is economically vibrant, technologically well-equipped and capable of providing efficient access to multiple markets.

A TRADE CORRIDOR IS ONLY ONE OF MANY ELEMENTS TO BE CONSIDERED IN PREPARING ARIZONA FOR THE BENEFITS OF INCREASED INTERNATIONAL TRADE. ARIZONA IS IN THE PROCESS OF DEVELOPING A STATEWIDE STRATEGIC PLAN FOR FREE TRADE. THE TRADE CORRIDOR STUDY IS ONLY ONE ELEMENT OF THE STATE'S STRATEGIC PLAN. THE STUDY DOES NOT ADDRESS SEVERAL VERY IMPORTANT ISSUES RELATING TO THE ENVIRONMENT, PUBLIC HEALTH, TOURISM, HOUSING, ETC. EFFORTS AND PROPOSALS PUT FORTH BY OTHER ENTITIES SUCH AS THE BORDER HEALTH FOUNDATION, THE BORDER TRADE ALLIANCE AND THOSE SUBMITTED DURING THE RIO RICO CONFERENCE WILL ALL BE CONSIDERED IN THE STATE'S BROADER STRATEGIC PLAN. FURTHER ANALYSIS OF THE ECONOMIC IMPACT OF A TRADE CORRIDOR AT THE COUNTY AND LOCAL LEVEL IS ENCOURAGED.

1.2 Purpose of the Study

The Federal government has recognized the changing nature of trade and the importance of trade corridors. As part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), the federal government commissioned a national study of emerging trade corridors. Arizona's study was commissioned at the same time, and thus has an opportunity to be in the forefront of the national trade corridor debate. Arizona is the only state thus far to take a comprehensive look at a state's role in a trade corridor, how establishment of a corridor might benefit a state, and how investments throughout Arizona might benefit the entire trade corridor and the nation as a whole.

The purpose of the Arizona Trade Corridor Study is to gather and analyze available information concerning trade-related opportunities, and to identify those opportunities that merit development. A strategy worth pursuing must yield benefits for the State, the region and for U.S. economy as a whole. Therefore, this Study focuses on statewide, regional, national and international considerations.

The Study Team's recommendations represent a portfolio of investment options relating to: (1) border developments, including port of entry facilities and the connecting transportation infrastructure that eases the flow of goods and services through the border region; (2) telecommunication linkages that facilitate the timely dissemination of trade-related information and enhance the region's ability to satisfy education and worker retraining needs, thus creating a better informed business community with a regional concentration of "knowledge workers" capable of attracting and supporting high-wage, high-skill industry; (3) north-south highway improvements that upgrade Arizona's existing connection to Interstate 15, thus creating a strategic north-south linkage capable of connecting to the existing east-west highway system and providing direct and efficient access from Canada, through the Rocky Mountain region, the Desert Southwest and the Pacific Northwest to Mexico; and (4) business services enhancements that build on Arizona's existing strengths in the area of international trade, and encourage continued development and promotion of export assistance programs, international banking programs and a variety of other necessary business services.

The Study Team's recommendations are intended to support the development of a dynamic trading system that benefits both Arizona and the broader Western region.

The Study is divided into six components: Highway Investments; Border Development; Rail and Intermodal Transportation; Aviation; Communications & Information; and Business Services. Transportation improvements, the foundation of any corridor strategy for Arizona, are expensive and the availability of worthwhile projects will exceed the availability of capital dollars. Even where the federal matching ratios are high, the commitment to a major north-south link and complementary investments in border area development would limit the range of opportunities to pursue other projects. The Study Team's recommendations for the first two components were subject to rigorous cost-benefit analysis. Only those projects that generated a favorable rate of return on investment are included in the Study Team's recommendations. The recommendations generated by the remaining Study components have not been subjected to similar levels of economic analysis due to time and budgetary constraints. It is suggested, however, that any

necessary analysis be performed as soon as possible, in order to appropriately prioritize investment decisions in those areas.

The recommendations are based on current trade flows between the United States, Mexico and Canada. The data used in the analyses are very conservative in nature and conform to guidelines established by the Federal Office of Management and Budget.

SOME OF THE RECOMMENDATIONS, PARTICULARLY THOSE RELATING TO BORDER DEVELOPMENT AND HIGHWAY INVESTMENTS, ENTAIL POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS. THE STUDY TEAM RECOGNIZES THE IMPORTANCE OF THESE CONSIDERATIONS AND NOTES THAT SUCH RECOMMENDATIONS ARE SUBJECT TO THE OUTCOME OF THOROUGH ENVIRONMENTAL ASSESSMENTS.

1.3 North-South Corridor and Arizona's Role

One of the questions addressed in this Study is whether a north-south trade corridor strategy is worth pursuing. A trade corridor with a north-south orientation would strengthen links and trade with Sonora, the northeastern corner of Baja California and other parts of Mexico while improving access between Arizona, the Desert Southwest, the Rocky Mountain States, the Pacific Northwest and Canada. At the same time, improved north south linkages would also increase the efficiency of east-wide trade, providing more and better opportunities for trade through North America.

NAFTA holds the promise of improved access to the growing Mexican market of approximately 80 million people. However, the existing infrastructure in Mexico does not permit the direct, low cost movement of goods to major Mexican population centers. Expanding access to Mexico through well defined and developed trade corridors will fuel additional economic activity along the border and throughout the region. Increased Arizona-Mexico trade would realize benefits through greater export activity and such trade has the potential to spur economic growth and job creation.

The link to the North would stimulate several sources of gain for Arizona. First, in the area of international trade it would facilitate movements of goods between Arizona and Canada. Second, a corridor from Mexico through Arizona to northern states would greatly benefit the regional economy with likely spillovers for Arizona as a center of trade. Third, better access between Arizona and the Mountain States would foster interstate commerce benefitting all of the states in the region. Fourth, improved north-south connections would also enhance the efficient movement of goods and services between Arizona, Mexico and points east and west. Finally, the local economy would directly benefit from improved transportation services with its positive impacts on productivity and development.

Taken as a whole, the vision of a north-south corridor strategy that is integrated into the State's existing east-west transportation system could provide the impetus for state and regional development with substantial benefits to the Arizona, regional and national economies.

CANAMEX



1.4 Project Funding and Coordination

The Arizona Trade Corridor Study was commissioned by Governor Fife Symington as part of an on-going effort to develop a comprehensive state plan for free trade. The Study was funded by the Arizona Department of Transportation, the Arizona Department of Commerce, the Federal Highway Administration\ Center for the New West and the Arizona University Consortium. In addition, generous private sector contributions were received from Swift Transportation, Lewis & Roca, Arizona Public Service, Arizona Automobile Association, Tucson Electric Power Company and Pima County Department of Community Services.

Ms. Carol Colombo, an attorney with the law firm of Colombo & Bonacci, and chair of the Arizona Mexico Commission's Committee on Physical Infrastructure, has served as the Study Coordinator and has been assisted in managing the Study by the Hickling Corporation, an international consulting firm with expertise in transportation planning and economic forecasting. The Study is being conducted by a research and study team composed of the Arizona Department of Transportation, Hickling Corporation and members of the Arizona University Consortium, an organization composed of the American Graduate School of International Management, Arizona State University, Northern Arizona University and the University of Arizona.

Results of the Arizona Trade Corridor Study will be forwarded to the Federal Highway Administration as part of a national study on trade and transportation corridors being conducted under Section 6015 of the Intermodal Surface Transportation Efficiency Act (ISTEA). The results will also be used by Governor Symington, the Arizona Legislature, the Arizona Congressional Delegation and state and local planners in setting priorities for trade-related transportation, technology and border infrastructure improvements, as well as by economic development organizations in preparing Arizona businesses to capitalize on the opportunities for increased trade with Mexico and Canada.

The Trade Corridor Study will be integrated into the State's emerging free trade plan. The State's free trade plan will deal with other important issues including public health, environmental concerns, tourism, housing and various economic development issues. The State's plan will also integrate the findings of the Border Trade Alliance and the Rio Rico Conference. The State planning process began in 1991 in response to a report from the Morrison Institute that found Arizona falling well behind the other border states of California, New Mexico and Texas in preparing for free trade. This report sparked a concerted effort to position Arizona more favorably for free trade. Two statewide summit meetings were held in July of 1992 and April of 1993 to develop a list of priority free trade initiatives. The Governor designated a working group of six organizations (now known as the Summit Six) -- the Arizona Department of Commerce, the Arizona Hispanic Chamber of Commerce, the Arizona-Mexico Commission, the Arizona University Consortium, the Governor's Strategic Partnership for Economic Development and the Organization for Free Trade and Development -- to integrate the summit initiatives into a strategic plan for free trade. Input from the border communities was solicited through a conference in Rio Rico in January. Tucson and Pima County presented proposals for inclusion in the state plan through the work of the Tucson/Pima County Free Trade Coordinating Council.

With the assistance of Revive Arizona and Arizona State University, similar proposals are being developed by Phoenix/Maricopa County and the northern Arizona communities.

Complementing the efforts of the Summit Six has been an ambitious effort on the part of the Arizona-Mexico Commission and the Comisión Sonora-Arizona to develop a joint regional economic development plan for the states of Sonora and Arizona.

1.5 Strategic Principles Guiding Study

The Study Team endeavored to address a variety of issues, including such questions as:

- Is a north-south trade corridor strategy worth pursuing?
- What are Arizona's and the region's relative strengths and weaknesses with respect to infrastructure, border development, telecommunications and business services?
- Will the state, regional and national benefits generated by the necessary infrastructure improvements be significantly greater than the costs of developing such improvements?
- Will the rates of return on investment justify the state's application of limited financial resources?
- Is it possible to create a viable package of investment options that collectively support the development of a trade corridor?
- How does Mexico's infrastructure impact trade-related activity throughout the corridor and how would certain proposed Mexican infrastructure improvements impact the trade corridor?
- How does the availability of telecommunications technology impact the development of trading systems?

The answers to these questions, and other questions addressed in this Study, were developed in accordance with the following strategic principles:

- **Corridor development strategy should promote a broad range of economic activities, not only those associated with trade.** Today, trade accounts for a relatively small share of state output and income. Investments that rest primarily on growth in trade activity would direct a large volume of state economic resources to a relatively small sector of the state's economy. However, investments that foster trade as well as other growth-enhancing activities that collectively yield high returns, would help ensure the state's access to the rapidly growing trade based opportunities and contemporaneously promote development in other sectors of the state's economy.

- **A corridor development strategy should create net economic gains for the regional and national economy, as well as, serve the broad development objectives of the state.** A corridor that serves narrow goals -- such as serving a region within the state or a particular sector -- does not necessarily result in optimal utilization of the state's resources. Likewise, there is no long-run gain if one state draws economic activity away from its neighbor only to diminish the size of the regional economy as a whole. In order to determine whether Arizona's corridor strategy enhances the region's competitive position, the Study must measure the projected benefits of proposed infrastructure investments against the cost to the region of achieving such benefits. The development of an intelligent and coordinated response to trade-related opportunities is facilitated by the ranking of various investment scenarios according to their economic rate of return.
- **The corridor development strategy should follow a systemic approach. Elements of the strategy should be viewed in their overall context as they contribute to the development of the trade corridor.** Different policy instruments need to be employed in order to influence development in highways, railroads, intermodal facilities and aviation. Together with business services and telecommunications, the strategy should seek a modal mix that best promotes statewide development. Policies should be reviewed for their impact on the entire trade corridor, not simply the individual sector(s) they might impact most directly.
- **The corridor development strategy should be flexible. It should respond to shifts in market conditions and other developments.** Successful infrastructure projects are those that anticipate and respond to market needs.

1.6 Summary of Key Elements

The investigation presented here indicates that it is in the interest of the state of Arizona, the broader regional economies and the economy of the United States to develop Arizona as part of a trade corridor. The existing east-west, inter-regional transportation network, which is considered largely in place and mature, would be enhanced as economic development occurs throughout the state. The evolving north-south corridor as well as the existing east-west transportation system would be supported through highway investments and border development projects at key crossings points along the Arizona-Sonora border. The trade corridor focus, along with the goal of statewide economic development, would be supported with programs and policies designed to cultivate a favorable international business environment through enhanced business services and improvements in the state's telecommunications and information infrastructure. Arizona trade would also be strengthened by policies to promote rail and intermodal transportation links and the economic development that is associated with these activities. The optimum corridor strategy would yield both trade and non-trade-related benefits

to Arizona and provide a long-term basis for statewide, regional and national growth and development.

This study was separated into six key elements. Guided by the strategic principles discussed earlier, policy initiatives were developed for each element. These initiatives include infrastructure investment, policy formation and program development. To be recommended, an initiative had to provide net benefits (benefits in excess of costs) to the nation, the region and the State. Those initiatives that required substantial investments were also required to meet stringent financial standards that ensure sensible allocations of resources. Table 1 presents a summary of the key Study recommendations, along with the primary policy initiatives. Net benefits associated with each initiative are also summarized.

Table 1. Key Elements of the Arizona Trade Corridor Study		
Strategic Elements	Key Policy Initiatives	Nature of Net Benefits to Arizona
Border Development	Improvements to access roads serving Nogales and San Luis Improvements to Port facilities and operating procedures	Major transportation efficiencies Facilitation of increased commercial activity
Highway Investment	Development of US-93 as a 4 lane divided highway	Major efficiencies for trade and non-trade activities, stimulus for economic development
Rail and Intermodal Transportation	Steps to encourage investments in intermodal facilities	Productivity gains for goods movement, complementary economic development
Aviation Development	Flexibility to adjust to future needs	Ability to respond to future opportunities
Development of Business Services	Policies and programs to enhance provision of trade-orientated business services	Formation of a favorable international business environment, creation of efficiencies for trade-related activities

Development of Communications and Information Systems	Statewide enhancement and accessibility to telecommunication and information infrastructure	Availability of services for education, training and trade-related activities
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2.

Overview of Economic Criteria

2.1 Overview

A variety of corridor alternatives were analyzed, yielding a broad corridor development strategy for Arizona. The strategy is a mix of policy measures and new programs that are designed to maximize benefits to Arizona within the context of broader regional and national interests. All of the alternatives selected contribute to a sound and integrated state economic development strategy.

This chapter provides an overview of the economic criteria used to provide a systemic framework for the evaluation of specific alternatives. The next chapter details the findings from the trade flow modeling efforts. The remaining six chapters are summaries of the policy areas examined in this Study. Each of these sections provide a strategic overview, followed by a summary of key findings and a list of recommendations.

2.2 Decision Criteria

A "decision criterion" is a yardstick against which to gauge the performance of policies and investments (whether proposed or existing) in achieving their objectives. Whether benefits are defined in terms of productivity, gross output or economic welfare and living standards, an initiative can be justified on the grounds of economic efficiency only if the incremental benefits it produces are greater than the value of the economic resources used up in its implementation. Only by assessing policies and investments in this way can their overall economic implications be properly discerned.

The benefits and costs associated with a given initiative typically extend over many years. A procedure called "discounting" is therefore used to put all anticipated future costs and benefits

on a common basis of comparison. In this procedure, some minimum required rate of return -- such as the opportunity cost of capital -- is used to compute the equivalent present-day values of future benefits and costs. Subtracting the present value of the costs from the corresponding present value of social benefits produces a measure known as the *net present value (NPV)*. This is an appropriate yardstick for comparing the economic merits of proposals in absolute terms. In particular, if the net present value of a prospective policy or investment is greater than zero it may be considered a worthwhile contribution and is, on this count, worth funding (since the gains thus achieved will exceed the opportunity value of the resources absorbed).

Traditional economic thinking counsels that any project with a positive net present value should be undertaken. This reasoning assumes, however, unlimited capital resources and complete freedom to transfer resources between sectors. Where projects with positive NPVs must be rejected or delayed for budgetary rather than economic reasons, the task of policy is to find those investments that yield the greatest productive value per dollar of resources invested. The internal rate of return (ROR) can usefully supplement NPV in these cases. It is defined as the value of the discount rate at which the present value of an initiative's benefits exactly equal its costs.¹ The ROR provides a measure of "bang for the buck" that can be used to rank alternatives yielding positive NPVs according to the net benefit they promise per dollar of resources invested.

The ROR can also be taken to indicate the extent to which the expected return on investment exceeds or falls short of a minimum-required rate of return. Interpreted in this way, the ROR is sometimes used instead of the NPV to assess whether a given proposal is worthwhile in absolute terms. Due to mathematical peculiarities that sometimes arise in the calculation of the ROR, this practice should be avoided.

1

Typically, costs are concentrated among the early years of a project's life (defining this to be the period between first and last benefits and/or costs.) For this reason, NPV will usually fall as the discount rate increases, all other things being the same.

3.

Trade Flows: Key Findings

3.1 Overview

The trade flow segment of the Study sought to obtain estimates regarding the flows of trade between the U.S., Mexico and Canada. Assessing the directions and magnitudes of trade is crucial for determining infrastructure and other development needs of the State. However, trade flows -- exports and imports -- are not a direct indicator of economic performance. The relationship between trade and job creation is unclear. The extent to which the increase in export activity stimulates economic growth in Arizona is a subject for further study.

Imports and exports among the three NAFTA countries were examined in the context of trade corridors -- east-west and north-south. In the trade flow segment of the Study, special attention was given to the north-south component which is being referred to as the CANAMEX corridor. As currently defined, the CANAMEX corridor includes the states of Montana, Idaho, Wyoming, Utah, Arizona, Nevada, Oregon, Washington, the three western Canadian provinces of British Columbia, Alberta and Saskatchewan in the north and the state of Sonora, Mexico in the south. It is recommended that future studies relating to the CANAMEX Corridor include the following additional areas: the northeastern corner of Baja California and the state of Sinaloa in Mexico and the southeastern portion of California. The interrelationship of the subregional economies of southeastern Arizona, southwestern New Mexico and the Mexican state of Chihuahua should also be evaluated to determine their impact on the corridor.

The Study Team compiled a 1987-1992 database to model these trade flows. Data was sought from all available U.S., Mexican and Canadian sources. The trade flow model produced estimates of shipments by land transport modes (truck or, if data is limited, truck plus rail), by state of origin and commodity group. The model serves as a forecasting tool and as an estimator of changes in international trade movements following changes in the transportation network.

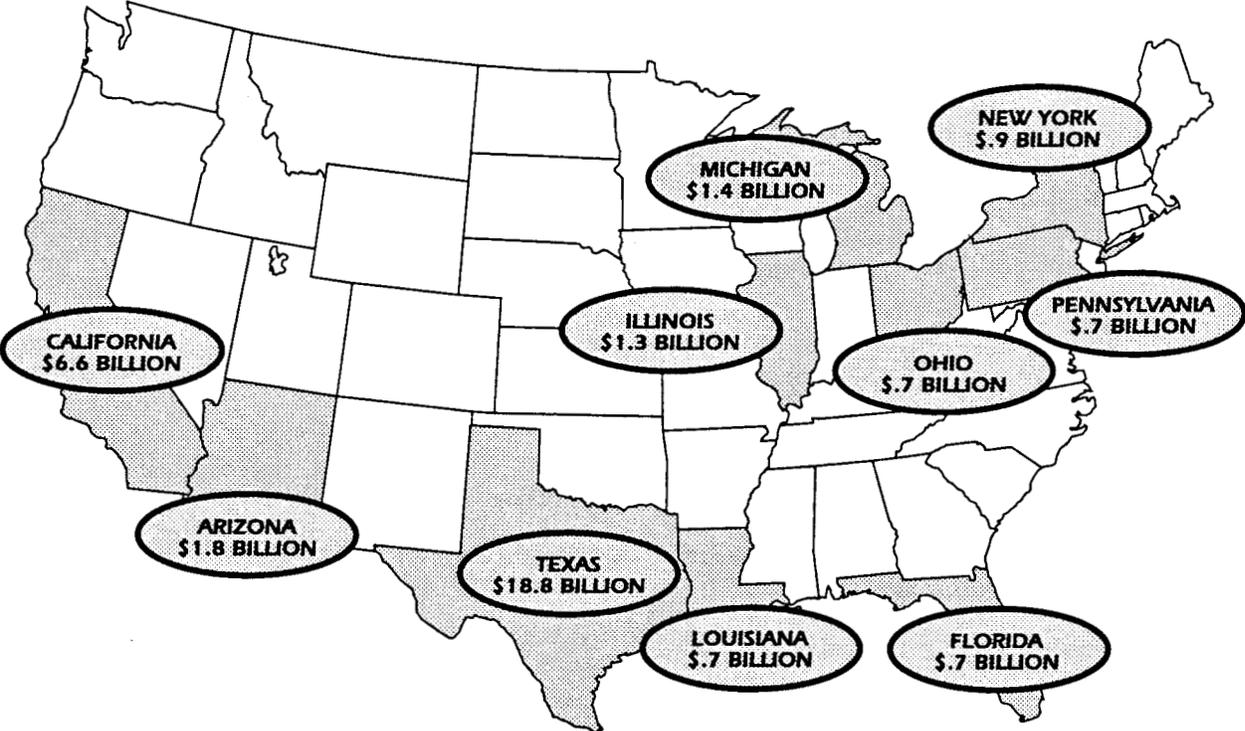
3.2 Summary of Findings

Current Patterns of Trade

Current patterns of Arizona's trade with Mexico include:

- Arizona is the third largest U.S. exporter to Mexico, after Texas and California. Until 1992, Arizona ranked 5th among 50 states (see figure).
- With \$1.8 billion worth of exports, Arizona accounts for 4.5 percent of the total U.S. exports to Mexico (1992).
- During the years 1990-92, exports from Arizona to Mexico increased by 112 percent, compared to a 12 percent increase from 1988 to 1990.
- The top five export classifications from Arizona to Mexico are:
 - Electric and electronic components
 - Transportation equipment
 - Computers and industrial machinery
 - Fabricated metal products
 - Rubber and plastic products.
- The fastest growing export classifications from Arizona to Mexico during 1991-92 are:
 - Textile products
 - Livestock
 - Fabricated metal products
 - Stone, clay, glass and cement
 - Rubber and plastic products
 - Transportation equipment.
- The majority (73%) of exports from Arizona were shipped to Mexico through the following border crossings: Nogales, Douglas, San Luis, Lukeville, Sasabe and Naco.
- Approximately one fourth of all exports from Arizona were shipped to Mexico through the Texas border ports of entry.

Top Ten States Exporting to Mexico-1992



Current patterns of Arizona's trade with Canada include:

- Canada is Arizona's fourth largest trading partner, accounting for about 8 percent of all exports from Arizona to foreign markets.
- Arizona exported \$514 million worth of manufacturing and agricultural products to Canada in 1992.
- Arizona's exports to Canada in 1992 were 6 percent lower than in 1990, although a slight increase (less than 1 percent) was noticed during the last year.
- The top five commodities exported from Arizona to Canada accounted for 73 percent of such trade. The commodity industry classifications are:
 - Electric and electronic equipment
 - Computers and industrial machinery
 - Transportation equipment
 - Scientific instruments
 - Agricultural products.
- Arizona imported \$282.2 million worth of merchandise from Canada in 1992, an 84 percent increase from 1990.

NAFTA Impact on U.S. Trade

Findings concerning NAFTA's impact on U.S. trade include:

- Specific provisions that are expected to increase trade are:
 - Removal of quotas
 - Imposition of rules of origin
 - Limitations on duty drawback
 - Changes in Mexican restriction on foreign direct investment
 - Intellectual property protection
 - Government procurement process for foreign firms in Mexico.
 - Tariff elimination
- U.S.-Mexico tariffs decreased significantly during last five years to an average 3 percent on Mexican goods imported to U.S. and 10 percent on U.S. goods imported to Mexico; further tariff elimination under NAFTA will have only a minor effect on trade.
- The national economy will benefit from a continued and enhanced trade surplus with Mexico.
- If NAFTA is implemented, U.S. exports to Mexico may increase by a range of from 4 percent to 35 percent over 1990 trade levels.

-
- NAFTA is likely to increase U.S. imports from Mexico by a range of from 4 percent to 22 percent over 1990 trade levels.
 - NAFTA is expected to increase export opportunities for the following industries in the U.S.:
 - Apparel
 - Primary metal products
 - Fabricated metal products
 - Industrial machinery
 - Transportation equipment (automotive parts)
 - Electric and electronic equipment
 - Textiles
 - Chemicals (pharmaceutical)
 - Major household appliances
 - Stone, clay and glass.
 - As a result of NAFTA, the largest increases in imports from Mexico to U.S. are expected in:
 - Apparel
 - Textiles
 - Major household appliances
 - Electrical and electronic equipment
 - Transportation equipment.
 - The net impacts of NAFTA on U.S. production and employment, and the distribution of these impacts across industries is the subject of much debate. Most modeling studies of NAFTA estimate that the effect on U.S. Gross Domestic Product would range from no effect to a 0.23 percent increase in the long run.

CANAMEX Corridor Trade

Trade within the CANAMEX Corridor has grown significantly from 1989 to 1992. Exports to Canada and Mexico showed strong increases for the corridor as a whole. Arizona has primarily contributed to the growth in U.S-Mexico trade, while maintaining a small but growing share of the Canadian market.

For the CANAMEX corridor and trade with Mexico, the main picture that emerges is one of the developing linkages between the Arizona and Sonora economies. According to estimates from the model, in 1992, \$1.4 billion of exports that originated in the CANAMEX states crossed to Mexico through the Nogales customs district. Roughly 95 percent of these exports were from Arizona and the great majority were bound for the state of Sonora.

Most exports from the other CANAMEX states follow the main national flow of goods to the population centers of Mexico through Texas. In 1992, it is estimated that CANAMEX states exported \$1.04 billion through Texas with Arizona's share of these exports being 37.5 percent.

A forecast of trade shows CANAMEX exports to Mexico through Nogales growing at a 20 percent rate of annual increase, reaching \$3.6 billion in 1997 from the estimated 1992 level of \$1.4 billion. This forecasted growth of Arizona exports to Sonora through Nogales follows the unprecedented average annual growth of 35 percent estimated for the period 1989 to 1992. It should be noted that this growth occurred concurrently with the longest sustained recession in the postwar period when wage and salary jobs in Arizona grew by a mere one percent per annum.

These findings lead to two main conclusions:

- The developing linkages between the Arizona and Sonora economies are not currently shared with the other CANAMEX states.
- These linkages need to be better understood in order to develop policies that maximize the growth and job-creating potential of Arizona's export activities.

Impacts of New Highways on Trade Flows

New highway investments in Northern Arizona, completing the north-south highway link from Canada to Mexico through the Rocky Mountains and the Southwest, would improve the access to Mexico for states located north of Arizona. This would result in a reduction of freight transport costs for these states and, consequently, the model predicts that exports would be reallocated with some significant increases in exports to Mexico from states to the North and a slight decline in Arizona's exports to Mexico. The CANAMEX region as a whole, however, will show significantly stronger exports to Mexico.

By the same token, Arizona's cost of transportation to points north would be reduced. As a result, the forecast includes an increase in Arizona exports to Canada by \$2.05 million (with I-17) and \$1.3 million (with U.S. 93).

The model was used to predict the changes in truck-based exports from CANAMEX states to Mexico and Canada for the two proposed alternatives: I-17 Extension and US-93. The proposed new highways would have a direct impact on exports from Arizona to Mexico resulting in declines of 0.3 percent (\$14.4 million) and 0.1 percent (\$5.4 million) for the I-17 Extension and US-93, respectively. This very slight decline in export activity for Arizona follows from the effect of improving highway access between Mexico and the other CANAMEX states: Arizona's transportation cost of exporting to Mexico would basically remain unchanged while that of the CANAMEX states to the north would be reduced. Consequently, the change in Arizona's competitiveness relative to its northern neighbors would result in an increase in export sales for the states to the north and a slight decline for Arizona.

Both the I-17 Extension and US-93 would yield export growth in other CANAMEX states equal to more than double the decline in Arizona's exports and representing much larger shares of trade between these states and Mexico. Overall, the proposed highway investments would increase total export activity for the CANAMEX region by \$16.1 million (I-17 Extension) and \$30.1 million (U.S. 93).

THESE RESULTS REPRESENT THE DIRECT IMPACT ON TRADE FLOWS OF REDUCED TRANSPORTATION COSTS ALONE. THE STUDY DOES NOT EVALUATE ANY PARALLEL IMPACT ON EMPLOYMENT OR INCOME. THE HIGHWAY LINK BETWEEN ARIZONA AND THE CANAMEX STATES WOULD YIELD REGIONAL AND INTERSTATE BENEFITS THAT WERE NOT THE SUBJECT OF THE TRADE FLOW SEGMENT OF THE STUDY. HOWEVER, THE FINDINGS DEMONSTRATE THE NET IMPACT OF THE PROPOSED ROUTES STRENGTHEN THE CANAMEX STATES AS AN INTEGRATED ECONOMIC REGION.

Impacts of Mexican Infrastructure Projects

As detailed above, the increased infrastructure investments in Arizona would lead to trade gains for the northern U.S. states. Primarily these gains are realized because of better access to the regional market that exists between Arizona and Sonora. Likewise, Arizona would see improvements to its exporting ability if Mexican infrastructure developments provided better access to the lucrative market in Mexico City and the emerging markets of Latin America. Two projects in Mexico, a highway upgrade from Mexico City to Nogales and a deep water port in Guaymas, Sonora, could supply such access.

A highway upgrade between the growing areas of northwest Mexico and the major markets of Mexico City would supply a less costly route for Arizona's exports. An improvement such as this could radically alter the flows of trade in the region and provide a strengthening affect to the entire CANAMEX Corridor.

The existence of a deep water port in Guaymas, Sonora would spur additional rail and truck traffic through Arizona's border points. This port, which is closer to the New York City market than Los Angeles, could draw Japanese and South American freight because of reduced inland freight costs. This project could also radically alter trade flows within the corridor.

3.3 Recommendations for Trade Flow Model

Improvements in Mexico's infrastructure -- highways, rail, airports, seaports, business services and information technology -- will result in significant increases in trade through Arizona, the U.S. southwest and the CANAMEX corridor. Ideally, infrastructure improvements in Canada, the United States and Mexico would be coordinated as part of a seamless integrated system.

Mexico infrastructure improvements will allow Arizona to expand its trade with Mexico from a regional market -- Sonora, Sinaloa and Baja California Norte -- to a national market. Currently the states of Arizona and Sonora are engaged in a joint regional economic development planning process. This planning effort provides an excellent opportunity to ensure that trade related improvements and investments are coordinated and complimentary.

- The Arizona Congressional Delegation should seek legislative approval and funding for a study of planned and proposed trade related infrastructure improvements in the state of Sonora. This study would serve as a pilot project for a larger national study of Mexican infrastructure needs and improvements. The study could be conducted by the Arizona Department of Transportation and the Arizona University Consortium in conjunction with the governments of Sonora and Arizona and several Mexican universities. The study would coincide with the joint Arizona/Sonora regional economic development planning process.
- The Governor of Arizona should support funding, through federal or state sources, for a study that assesses the viability of the port of Guaymas, Mexico as a deep water seaport serving the CANAMEX trade corridor. This study should include the potential increase in international freight and the potential flows of additional freight and rail traffic through Arizona ports-of-entry.
- The Arizona Legislature should fund the establishment of the DataLink system. This system would inventory and link existing trade and business databases and make them available to government, business, and educational institutions.
- The Governor should play a leadership role in establishing the CANAMEX Multi-State Trade Coalition. The Coalition should include representation from state governments, including the departments of transportation, commerce, tourism and agriculture, as well as colleges and universities, business, labor, trade, and environmental groups. Funding should be provided for staff and related expenses as part of Arizona's participation in this effort.

4.

Border Development: Key Findings and Recommendations

4.1 Overview

Arizona and the Mexican state of Sonora share a 361 mile long border. More than 1.3 million people live in counties and cities adjacent to this border. The border area is becoming increasingly important to the economy of Arizona. Most exports and imports between Mexico and Arizona are accomplished by land via truck or rail transportation. Trade between Arizona and Mexico has flourished with the establishment of maquiladora industries south of the border. In addition to the commercial traffic, the border area supports substantial daily pedestrian traffic between the adjacent border cities. The heavy volume of cross border pedestrian traffic is a sign of the growing economic interdependence among the border communities. The close economic ties between the border populations has been a catalyst for growing political ties between Sonora and Arizona.

Cross border commissions, planning groups and committees are being formed to promote cooperation between the residents of the border area and to leverage their efforts to advance their economic, social and cultural goals. Currently, the Arizona-Mexico Commission and its counterpart, the Comisión Sonora-Arizona, reviewed the existing state economic plans in order to identify common, cross-cutting objectives and to incorporate them into a regional, binational planning process. These efforts are a resource for the development of a strategic plan for Arizona.

4.2 Findings for Border Crossings

- From west to east, there are six ports of entry along the Arizona-Sonora border (see figure):
 - San Luis, Arizona/San Luis Río Colorado, Sonora;
 - Lukeville, Arizona/Sonoyta, Sonora;
 - Sasabe, Arizona/Sasabe, Sonora;
 - Nogales, Arizona/Nogales, Sonora (East and West Gate);
 - Naco, Arizona/Naco, Sonora; and
 - Douglas, Arizona/Agua Prieta, Sonora.
- During fiscal year, 1991-92 northbound traffic from Mexico through Arizona-Sonora border ports of entry included:
 - 233,000 commercial vehicles;
 - More than 8 million passenger cars; and
 - more than 9 million pedestrians.
- During the period from 1987 to 1992:
 - Northbound commercial traffic increased by 58 percent;
 - Noncommercial traffic increased by 25 percent; and
 - Number of pedestrians crossing from Sonora to Arizona's border towns increased by 57 percent.

Commercial Traffic:

- Nogales accounts for more than two-thirds (67.7 percent) of all commercial traffic entering Arizona from Mexico.
- Second ranking San Luis accounts for 15 percent of all commercial traffic entering Arizona from Mexico.
- 13 percent of all commercial traffic comes through Douglas.
- The ports of Naco, Lukeville and Sasabe together account for the remaining 4 percent of commercial traffic from Mexico.

From 1987 to 1992, both the San Luis and the Douglas ports of entry increased their relative share of commercial traffic, while Nogales' share decreased from 73 percent in 1987 to approximately 68 percent in 1992.

Ports of Entry

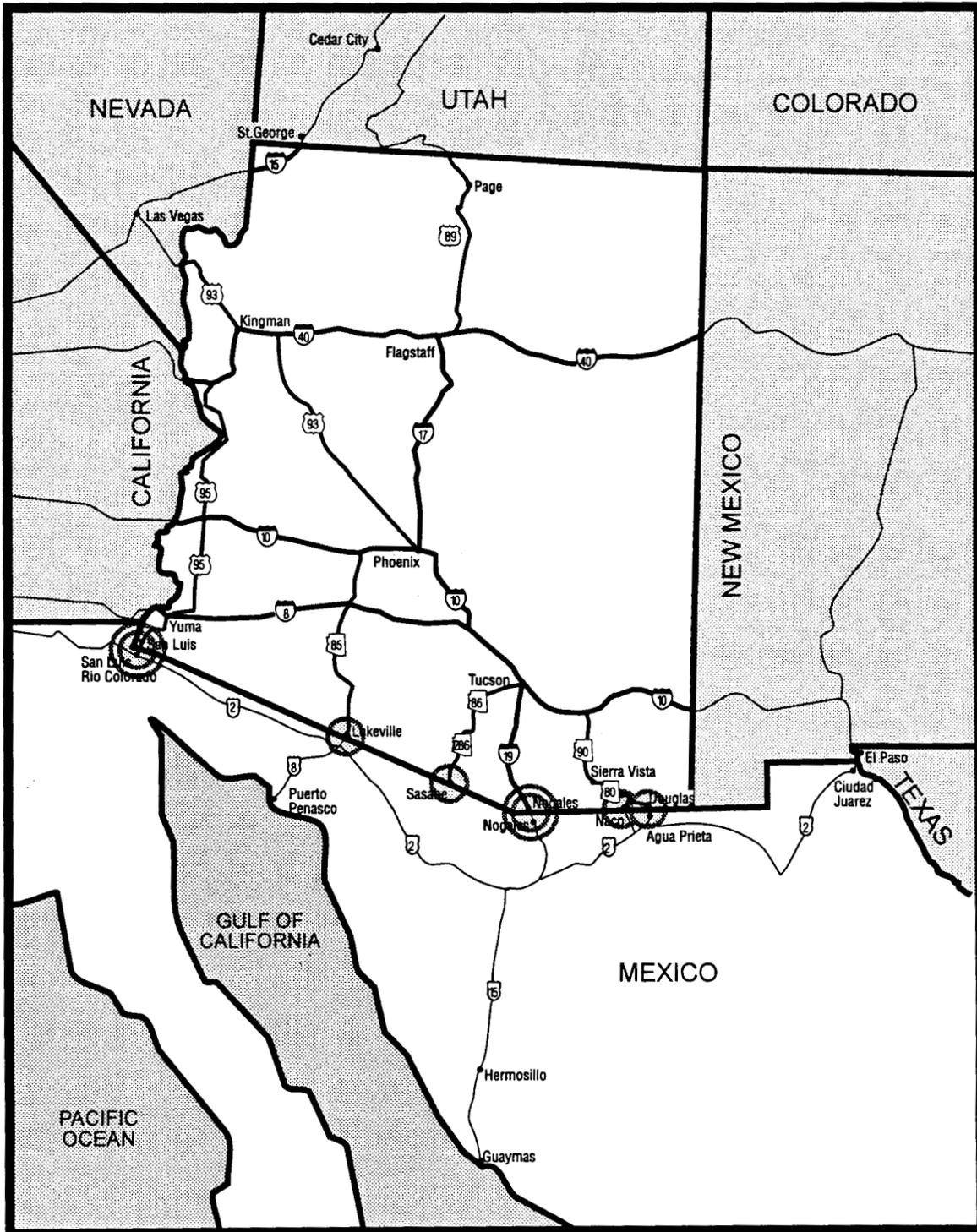


TABLE 2
ARIZONA BORDER PORTS OF ENTRY:
PROJECTED COMMERCIAL TRAFFIC BY 2000
 (NAFTA Impact Not Included)

BORDER PORT OF ENTRY	1995	1997	2000	PROJECTED % SHARE 2000
Douglas	42,272	51,339	64,641	14.0
Lukeville	2,493	2,919	3,557	0.8
Naco	11,724	14,379	18,360	4.0
Nogales	202,795	232,780	277,758	60.2
Sasabe*	1,667	1,760	1,899	0.4
San Luis	57,400	72,413	94,932	20.6
TOTAL	318,351	375,589	461,147	100.00

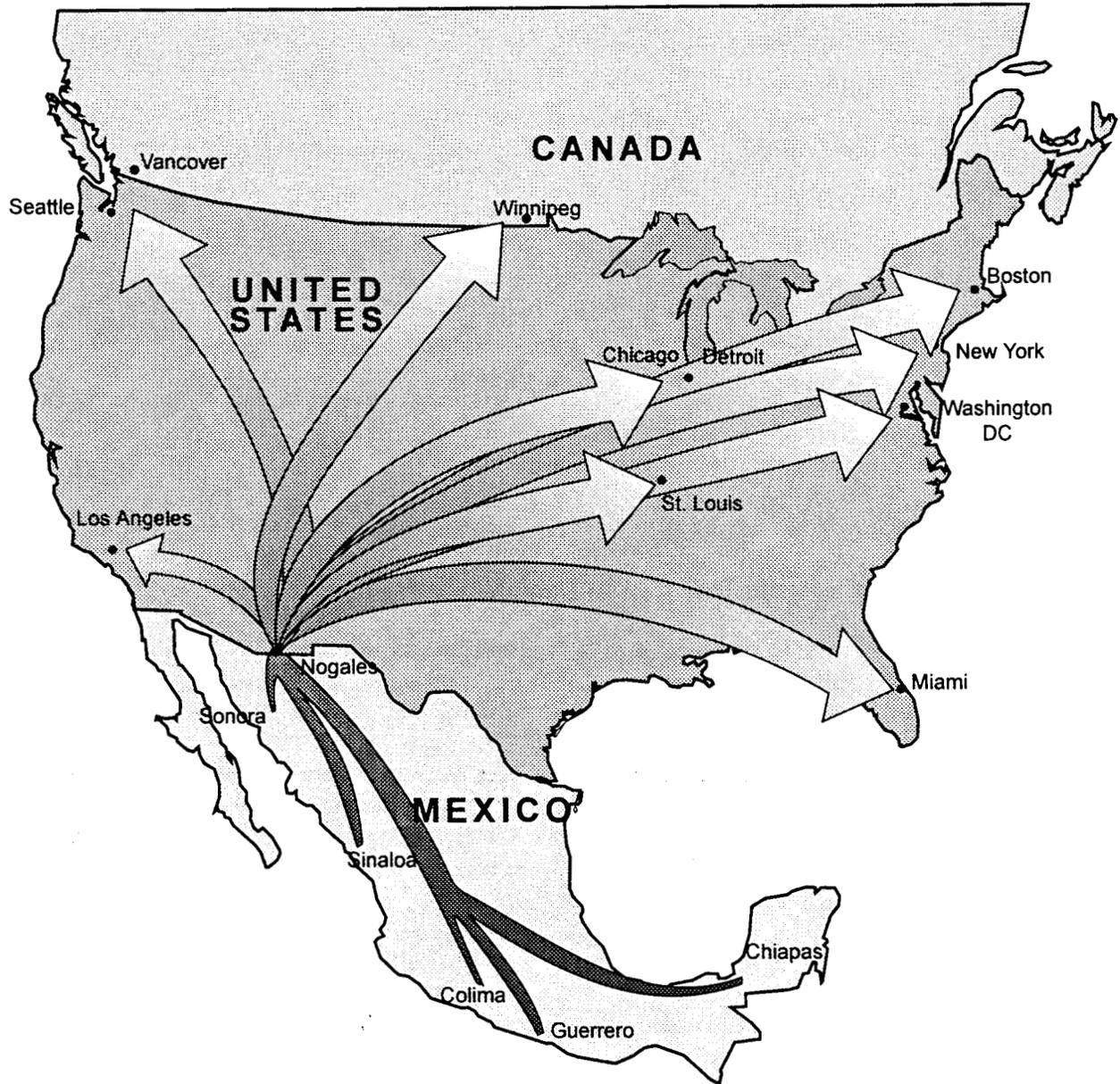
Source: OCPS based on average annual growth 1987-92.

* Based on 1989-92 annual growth rate

Non-Commercial Traffic:

- Nogales accounts for 44 percent of non-commercial vehicle traffic entering Arizona from Mexico.
- San Luis accounts for 29 percent of all non-commercial traffic, while the third ranking Douglas port of entry accounts for a little more than 20 percent of the total non-commercial traffic.
- Remaining three border ports -- Naco, Lukeville and Sasabe -- account for the remaining 7 percent of non-commercial traffic from Mexico to Arizona.

North American Produce Distribution Through Nogales



- 63 percent of all pedestrians entering from Sonora use the Nogales port, followed by San Luis (29 percent of incoming pedestrians) and Douglas (7 percent).

Non-commercial vehicle traffic was variable, reflecting to some extent the impact of the Mexican peso devaluations, but overall it grew from 1987 to 1992.

Existing Port Facilities

Four out of six border ports of entry have facilities for commercial inspection (primary and secondary):

- Nogales-West Gate (Mariposa Road), Arizona, has 4 primary and 92 secondary inspection points (spaces) for an average of 424 commercial vehicles entering from Mexico daily; its counterpart, Nogales-West Gate, Sonora, has 2 primary and 15 secondary commercial points.
- San Luis, Arizona, has 1 primary and 14 secondary inspection points for an average of 95 commercial vehicles entering daily from Mexico; San Luis Río Colorado, Sonora, has 1 primary and 15 secondary inspection points.
- Douglas, Arizona, has 2 primary and 20 secondary inspection points for an average of 80 commercial vehicles entering daily from Mexico; Agua Prieta, Sonora, has 2 primary and 30 secondary inspection points (spaces).
- Lukeville, Arizona operates 1 primary and 4 secondary inspection points with an average of 5 commercial vehicles entering daily from Mexico; the Sonoyta, Sonora port has only one primary inspection point for commercial vehicles entering from Arizona.

Because of the seasonal character of agricultural exports from Sonora and Sinaloa, the average number of trucks crossing through the Nogales-West Gate (Mariposa Road) port of entry from November through March may reach between 600 and 800 trucks daily.

Ongoing and Planned Improvements of Port Facilities

- The Southern Border Capital Improvement Program was authorized by Congress, to implement improvement projects at port facilities. In Arizona, during fiscal years 1993 and 1994 improvements are expected to include: new buildings at Nogales-East Gate (Grand Avenue), Sasabe and Naco; construction of new inspection points (spaces) for passenger traffic at the Nogales-East Gate (Grand Avenue), Douglas and Sasabe; and new commercial inspection points at the Naco and Sasabe ports of entry.
- Planned improvements to the Mexican border port facilities in Sonora include:
 - Nogales-West Gate (Mariposa Road): construction of a new commercial port, most likely to be located west of the present facility;

- Nogales-East Gate (Grand Avenue): remodeling of the office building following the completion of the Nogales, Arizona, facility;
- San Luis Río Colorado: remodeling of the main building and the addition of one passenger inspection line; the addition of a new ramp, dock and forklift; construction of a new commercial port east of the present facility; and
- Sonoyta: relocation of the bus inspection site from the present location near the main building to a new location outside the city.

Other Planned (Proposed) Border Developments

- Presented at the Binational Conference on Bridges and Border Crossings
 - Proposed cattle crossing at Agua-Prieta: proposed by the International Livestock Exchange, this crossing would be located just east of the airport near Douglas.
 - Nogales East Project: privately funded rail line; proposed as an alternative relocation for rail line through Nogales. Proposal made jointly with Mexican counterpart.
- Planned development at San Luis Rio Colorado by the Mathews Group (a Major Canadian development group) includes 8500 acres of residential-commercial construction.

The above-referenced Nogales East Project and San Luis Rio Colorado Project are large, privately funded endeavors that, if successfully developed and implemented, should have significant positive effects on the local and state economies.

Ownership and Operation of Border Ports of Entry

Arizona: Facilities at the U.S. border ports of entry are owned by the General Services Administration (GSA). The principal federal agencies that oversee border crossings of goods and people are:

- **U.S. Customs** -- responsible for processing entry documents, collecting duties, inspecting illegal substances, and enforcing laws pertaining to cargo, pedestrians and passenger vehicles entering the United States.
- **U.S. Immigration and Naturalization Service (INS)** -- responsible for inspecting passenger vehicles and pedestrian traffic, and issuing permits to enter the U.S.
- **U.S. Department of Agriculture (USDA)** -- responsible for inspecting plants and animals entering the U.S.

Three state agencies represented at selected border ports of entry include:

- **Arizona Department of Transportation (ADOT).**
- **Arizona Department of Agriculture (ADA).**

- **Arizona Department of Public Safety (ADPS).**

Nogales is the only port with all four federal agencies and three state agencies represented at its border facility. U.S. Customs and INS are represented at each port in Arizona, while USDA is located only at Nogales and San Luis. An inspection station for livestock entering from Mexico is located at the Douglas port.

Sonora: Eight federal government agencies are in charge of transborder transactions; with the exception of the Sasabe port, all are represented at each port of entry:

- **Secretaria Hacienda y Crédito Público (SHCP)** -- responsible for regulating and monitoring all aspects of importation and exportation of commodities.
- **Aduana** -- a counterpart to the U.S. Customs Service, in charge of import and export activities.
- **Policía Fiscal** -- in charge of physical inspection of cargo.
- **Secretaria de Gobernación** -- responsible for immigration issues.
- **Secretaria de Agricultura y Recursos Hidraulicos (SARH)** -- responsible for inspection of produce and animal products.
- **Controlaría de la Federación** -- in charge of complaints regarding border-crossing procedures.
- **Secretaria de Turismo** -- in charge of dissemination of tourism related information to visitors entering Mexico.
- **Banjercito** -- the official military bank authorized to accept cash transactions.

A private agency, **Integradora de Servicios S.A. (ISSA)**, is in charge of record keeping on traffic and commodities crossing the border.

Existing Problems at Border Crossings

According to federal, state and local government officials and representatives of the private sector. The following are major problems that hinder efficient passage of goods and people through Arizona-Sonora border ports of entry:

- **Staffing** is generally perceived as being inadequate to handle current traffic flows. This is of particular concern to U.S. officials with their overall emphasis on drug traffic control which consumes manpower and prolongs the inspection process.

- **Coordination** among various government agencies is inadequate for an efficient and smooth crossing of goods and people, as priorities and jurisdictions differ from agency to agency.
- **Crossborder coordination** among government agencies is limited or nonexistent. Generally a "reactive" mode prevails instead of a binational planning process. This is especially critical as the Mexican federal government plans to improve its border port facilities, including moving existing facilities to new locations.
- **Processing of commercial traffic** continues to be slow despite new, automated procedures introduced by both U.S. and Mexican Customs. Yet, these procedures implemented remain different and delays still occur.
- **Lack of binational harmonization of regulations and crossborder processing** is perceived by users as one of the major impediments to crossborder trade.
- **Inadequacy of port facilities** on both sides of the border contribute to traffic delays. Specifically, Mexican port facilities in Nogales and San Luis Río Colorado are inadequate for current traffic flows which causes congestion in the border area; this is especially critical during the winter produce season.
- **Transportation infrastructure (access to port facilities)** is seen by users of ports of entry and border community representatives as one of the most critical factors in coping with increasing trade and other anticipated impacts of NAFTA. In most cases crossborder commercial traffic intermingles with local traffic, causing congestion, delays and general safety problems.

4.3 Findings for Border Transportation Projects

The flow of imports and exports through Arizona's border crossings would be enhanced with a well developed transportation network along the border. In addition to the facilitation of trade flows, transportation investments would also promote economic development in the region. Improvements in the border transportation infrastructure were compiled through projects presented at the Rio Rico Conference on border needs convened by Governor Symington, and ADOT planning documents that assess the needs of the border over a ten year planning period. The planning process included transportation officials representing the State, four counties (Cochise, Pima, Santa Cruz and Yuma) and seven border cities located within 15 miles of the border (Bisbee, Douglas, Nogales, San Luis, Sierra Vista, Somerton, and Yuma).

Compilation of the costs of the border transportation projects was accomplished by asking county and local officials to report roadway deficiencies, corrective actions required and their costs. State highway costs were derived by first evaluating the cross-section of each route compared with its assigned Level Development standard. The costs of bringing a State Route up to its standard was added to the costs of repairing bridges and culverts on each route and the highway maintenance and pavement preservation costs.

Benefits were calculated by estimating the improved traffic flows for commercial and passenger traffic. The distances to the Interstate System were estimated and vehicle time savings were allocated to the commercial traffic, as well as the passenger traffic. The vehicle traffic segments were estimated based on the actual border crossings from 1987 to 1992 as projected to increase during 1993-2012.

The following table presents the rate-of-return (ROR) and the net present value (NPV) calculations for the certain state highway investments in Arizona's border region. The net present value (NPV) is the discounted sum of future costs and benefits associated with the project. Discounting accounts for the time-value of money and transforms the benefits and costs across all years of the analysis to a common measure which can be summed. Projects with a positive NPV can generally be justified on economic grounds. ROR is the internal rate of return on the project's costs and benefits. The ROR is that discount rate which yields a net present value of zero for the project's future costs and benefits. A project with an ROR over an appropriate threshold value of seven percent can be justified on economic grounds.

Border transportation projects were grouped by their proximity to one of the six Arizona border crossings. Each segment or segments identified in the table were evaluated based on the described economic criteria. Segments described as "Total Area" include the state routes identified for the particular crossing plus required improvement costs for county and local roads, as estimated by planning officials. The ROR results can be used to identify the projects that are economically worthwhile. However, the routes were evaluated in isolation, as if the particular route would be the only project undertaken. If all routes that are worthwhile were completed, some traffic substitution between routes would occur and benefits on some segments would be reduced. To prioritize the worthwhile projects, the NPV of each investment was analyzed. Those projects with high NPV's should be undertaken first because they return the most net benefits.

Table 3 Border Transportation Projects Organized by Border Crossing				
Port of Entry	Segment	Mileage	ROR	NPV @ 7% (000s)
San Luis	US95 N of I-8	81 ¹	1%	(\$44,520)
	US95 S of I-8	24	26%	\$88,234
	Total Area ²	105	9%	\$33,240
Lukeville	SR85 N of I-8+Spur	36	14%	\$17,353
	SR85 S of I-8	80	15%	\$3,669
	Total Area	116	13%	\$16,260
Sasabe	Total Area	67	17%	\$10,004
Nogales	I-19	63	51%	\$368,293
	SR82/SR83/SR189	122	7%	(\$665)
	Total Area	185	29%	\$415,247
Naco	SR90/SR92	81	24%	\$32,169
	Total Area	81	11%	\$25,926
Douglas	SR80 NW of Douglas	71	28%	\$37,199
	SR80 NE of Douglas	50	13%	\$6,928
	SR191 S of I-10	68	16%	\$14,811
	Total Area	189	12%	\$49,850

4.4 Recommendations for Border Development

The Study recommends the following border development activities:

- As part of the joint Arizona/Sonora planning process the states of Arizona and Sonora should establish a unified Arizona/Sonora Transportation Working Group. This working

² The total area analysis for the San Luis port of entry does not include a proposed limited access highway from the San Luis border to I-8. This proposed project is the subject of local analysis.

group should include representation from the border communities and should coordinate the planning process for border infrastructure projects.

- It is proposed that the Nogales and San Luis border ports-of-entry be pilot project sites for implementation of the new procedures. The Arizona Congressional Delegation should present a proposal to the Departments of Justice, Commerce and Treasury to enter into a federal interagency memorandum of understanding designating these ports as pilot projects for unified port management. Federal officials should develop a border procedures model for Arizona-Sonora, similar to the one that exists for the U.S.-Canada border crossing. This model should include the coordination of new technologies, including Intelligent Vehicle Highway Systems, to enhance the automated processing of commercial traffic.
- The Federal government should provide for adequate staffing at Arizona's border crossings. The Arizona Congressional Delegation should support current or proposed legislation to adequately staff Arizona's border crossings to allow 24 hour entry.
- The Arizona legislature should enact legislation creating a border development authority with financing capabilities for binational projects.
- This Study recommends that border infrastructure projects in Nogales and San Luis be given federal priority as part of the Arizona trade corridor development. Based on ROR and NPV calculations, I-19 from Nogales and US-95 south of Interstate 8 should be viewed as priorities.
- Based upon ROR and NPV calculations, border developments in Douglas, Naco, Sasabe and Lukeville show positive net benefits and healthy rates of return. These projects, particularly those in Douglas and Naco, should receive state and federal funding.
- The Federal governments of the United States and Mexico should harmonize border crossing procedures and adopt common inspection criteria.
- The State Legislature should continue the funding program for border area transportation projects as identified in Laws 1993, Chapter 249, §5.

5.

Highway Investments: Key Findings and Recommendations

5.1 Overview

At present there is no continuous highway link from Canada to Mexico through the Rockies and the Southwest states that is built for carrying large volumes of commercial traffic. Interstate 15 runs South from Canada through Montana, Idaho and Utah before veering westerly through Nevada to terminate in California near Los Angeles. The Interstate system in Arizona and the Class I railroads primarily have an east-west orientation.

Increased trade between Mexico and the U.S. provides added impetus for the consideration of additional links between Arizona and states to the North. Current roadway facilities consist of two-lane undivided highways with some indirect routings to serve communities or avoid physical features. An improved facility serving north-south traffic would simultaneously address several issues:

- Complete a continuous interstate commerce and trade route from Canada to Mexico through the Great Basin and Southwest states.
- Provide increased north-south mobility on a high-level facility through Arizona.
- Improve access between remote areas and the center of Arizona's economic activity.
- Enhance access to the national parks region, particularly Grand Canyon, Zion and Bryce.

Completion of a four-lane highway from Mexico City to Nogales is also of critical importance to Arizona and the CANAMEX corridor states. Such a highway would link the CANAMEX states to the government, population and business centers of Mexico. Completion of linkages throughout the U.S. and Canada, without extension all the way to Mexico City, will prevent full benefits from being realized throughout the corridor. Because of the location of the highway in Mexico, however, a full economic analysis of this facility was not conducted.

An improved north-south facility would yield additional benefits, including:

- Vehicle operating cost savings, time savings, and a reduction in the number and severity of highway accidents.
- Land use changes, business relocation and economic development in remote areas of the state.
- Increased interstate commerce resulting in growth and job creation.
- Increased north-south trade activity with spillover benefits for Arizona.
- Linking Arizona's economy with the economies of the northern CANAMEX states to create a more powerful economic trading region.

In considering the viability of a north-south corridor strategy, a main concern of this Study was to determine whether improvements to the state highway system were justified. To this end, two routes for the completion of the north-south trade route were studied: US-93 and the I-17 Extension. Both of these routes have undergone detailed preliminary engineering and costing studies. The design concept is a four-lane divided highway capable of supporting truck weight and traffic volumes in accordance with the new NAFTA guidelines. Controlled access to these highways is to be considered at a later phase of development.

The evaluation of the viability of a north-south route considered two primary alternatives. The first alternative stresses the early development of US-93 joining Phoenix with I-15 in Las Vegas, Nevada. The proposed route would constitute an upgrade of the existing facility which runs primarily northwest from Phoenix crossing Yavapai and Mohave Counties.

The second alternative is the early development of a continuation of I-17 from its terminus in Flagstaff to a point on I-15 south of the junction with I-70 in Utah. This route would pass North from Flagstaff, through Page and would be an upgrade to US-89. The continuation in southern Utah would consist of both facility upgrades and new alignments.

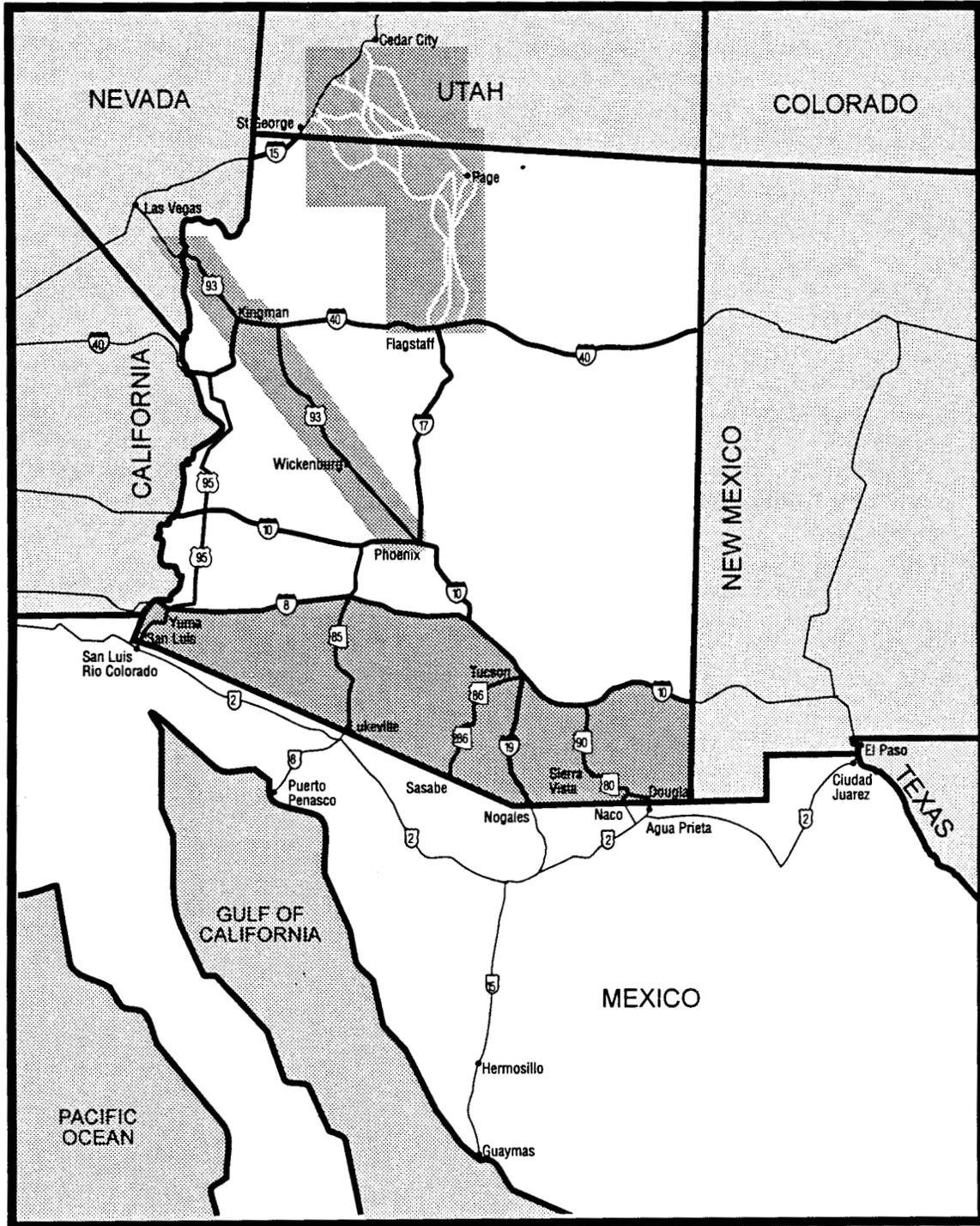
A third route, US-95, was also examined. US-95 is a north-south roadway connecting three major U.S. Interstates, namely Interstate 8, Interstate 10 and Interstate 40. While US-95 may improve access between the Yuma border crossing and Los Angeles, it does not facilitate a significant portion of the flow of goods in the CANAMEX trade corridor. Consequently, the needs along US-95 were examined in more detail in the Border Needs Assessment section of this Study (see figure).

Both US-93 and the I-17 Extension have strong implications for the affected communities -- improved accessibility to the locales along the proposed routes will serve as a stimulus to the development of those regions. In this sense, the two routes are separate elements of Arizona's statewide transportation program.

While from the local perspective each of the highways serves the distinct needs of each region, the two routes represent alternatives for trade-related traffic. Traffic on the north-south corridor between points in Central and Western Canada and the Pacific and Mountain states, and points in Mexico would choose either of the two routes, if constructed. In this sense, the two routes vie for the same trade-related traffic and this forms the basis for considering both routes in a joint evaluation.

We also considered the accelerated simultaneous development of both routes. This alternative would serve the development aims of both regions, while maximizing the benefits from trade-related traffic.

Transportation Study Areas



5.2 Evaluation Method

The alternatives were evaluated solely from the perspective of economic worth: do the prospective flows of benefits justify the investment? The method of evaluation considers only the direct transportation benefits from each of the investment alternatives, and these are: savings in vehicle operating costs, time savings and safety (the reduced incidence and cost of accidents). Traditional measures of economic impacts such as multiplier effects and employment impacts were not considered. Given their importance, we would encourage the investigation and further study of these impacts at the regional and subregional levels. While the latter benefits are no less real or legitimate, we have performed a deliberately conservative evaluation, consistent with the traditional framework for the evaluation of transportation projects. The additional benefits will be addressed in the findings below.

We examine the alternatives for the forecast period which assumes accelerated construction schedules. Benefit flows were considered for the twenty-five year period ending in 2022. A constant dollar discount rate of seven percent was used to calculate present values. This rate is consistent with the U.S. Office of Management and Budget guidelines. Many economists, however, are of the opinion that the seven percent rate is too high; it exceeds both historical values for the real cost of capital and is greater than Arizona's nominal cost of capital less inflation. If a lower discount rate were used, the net present value associated with each alternative would be higher than the values shown below. The economic rates of return, however, are invariant for different rates of discount.

5.3 Summary of Findings

All figures are in constant dollars or present value terms:

- The estimated scheduled cost (outlays in constant dollars) to bring US-93 and the I-17 Extension to the design specifications cited above are \$835.5 million and \$1,043.5 million, respectively.
- Of the three alternatives, the measures of economic worth and timing indicate that accelerated construction of US-93 is warranted, while the other two alternatives cannot be justified on the basis of their rate of return and benefit-cost. (see Table 4)
- The benefits from US-93 in the first year following the completion of construction would exceed the hurdle rate (total capital and other costs during construction times the discount rate). This indicates that the timing of the investment is overdue.
- The estimated economic rates of return for US-93 is 7.6 percent and for the I-17 Extension is 1.2 percent.
- The net present value (i.e., the sum of net benefits discounted at 7 percent per annum) of US-93 is \$49.8 million dollars and of the I-17 Extension is \$567.3 million dollars.

- The alternative of constructing both routes has a rate of return of 3.2 percent and net present value of -\$576.6 million.

TABLE 4
RATE OF RETURN AND BENEFIT-COST FROM
ALTERNATIVE HIGHWAY INVESTMENTS IN THE NORTH-SOUTH CORRIDOR
(MILLIONS 1992 \$)

	ALTERNATIVES		
	PRIORITY U.S.93	PRIORITY I-17	BOTH ROUTES
Scheduled Cost (Sum of Outlays in 1992 Dollars)	835.5	1,043.5	1,879.0
Present Value Cost	661.2	825.8	1,487.0
Present Value Benefits	711.0	258.5	910.5
Net Present Value	49.7	-567.3	-576.6
Benefit-Cost Ratio	1.08	0.31	0.61
Rate of Return (Percent Yield on Investment)	7.62%	-1.18%	3.19%

- Direct transportation benefits from trade-related traffic alone account for only 4.4 percent of total benefits for US-93 and 15.2 percent of total benefits for I-17. Our evaluation incorporates the findings of the trade flow segment of the Study which indicates that only a small component of the total exports by land from the CANAMEX states north of Arizona (including the Pacific Northwest) enter Mexico through Arizona ports of entry. If, however, larger shares of trade from these states were to use Arizona ports in the future, reflecting linkages between the Mountain State economies and the state of Sonora, there would be significantly larger trade-related benefits from the proposed highways.
- Most of the direct transportation benefits from trade-related traffic would accrue to firms shipping freight through Arizona and not to firms based or operating in Arizona.
- Non-trade-related traffic benefits are estimated at \$691 million for US-93 as opposed to \$199 million for the I-17 Extension. Most of these benefits will accrue to Arizona firms and residents.
- The findings relate to direct transportation benefits only. Interstate commerce and activity, improved accessibility of Arizona to other regions, the stimulus to development

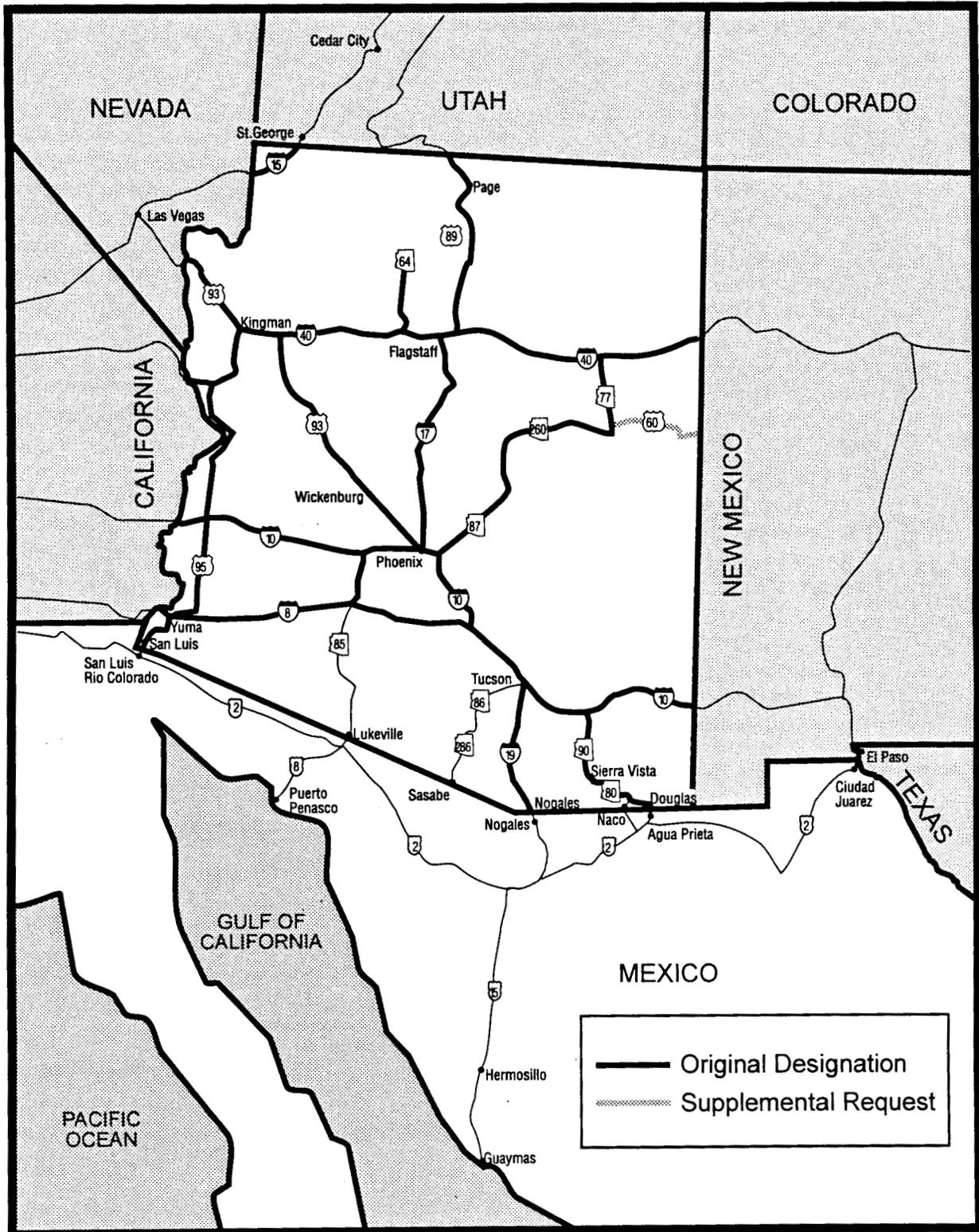
from the new highway -- these would generate additional benefits which may be quite large in comparison to the transportation benefits. Further study would be needed to estimate the magnitude of these benefits.

5.4 Highway Recommendations

Study recommendations concerning highway investment include:

- This Study recommends the accelerated upgrade of US-93, from Phoenix to the Colorado River, to a 4-lane divided highway. This route would complete the highway link in the CANAMEX trade corridor through the Rocky Mountains and the Southwest. Consequently, the Arizona congressional delegation is urged to support the allocation of additional federal funds to accelerate the development of this strategic highway linkage, as the route would facilitate North American trade and promote national, regional and state economic development.
- US-93, State Route 89, and US-95 have been classified as principal arterials and are candidates for inclusion in the National Highway System. The Study recommends that the Arizona Congressional delegation support their inclusion in the National Highway System.
- This Study recognizes the importance of all three routes as critical north-south links in the transportation network. The Study supports the continued development of all three routes as detailed in the Arizona Department of Transportation Five Year Construction Program.
- The Study recommends that an Arizona-Sonora Joint Transportation Planning Group develop support from both sides of the border for completing the critically important four-lane highway from Mexico City to Nogales, linking the CANAMEX states and provinces with the government, business and population center of Mexico.

National Highway System



6.

Rail and Intermodal Transportation: Key Findings and Recommendations

6.1 Overview

Increased trade between the U.S. and Mexico will lead to greater usage of all modes of transportation. Viable rail and intermodal facilities are essential to a well developed trade corridor. Arizona is fortunate to have modern facilities in close proximity to the border. Running east-west across the state are transcontinental rail lines. Some of the nation's heaviest rail traffic is carried across the southern tier of the nation on these lines. Two gateways that link or potentially link the transcontinental rail system to the Mexican rail lines are also located in Arizona.

The move to intermodal services is altering the entire structure of the industry. This concept allows customer to receive full service, customized door-to-door delivery of freight via truck to rail to truck transfer of goods. Intermodal service typically includes integrated billing, communication and customer service.

Both Class-One railroads that operate in Arizona (the Atchinson, Topeka & Santa Fe and the Southern Pacific) are active in intermodal trade. The Santa Fe operates its own intermodal facility in Arizona located in the Grand Avenue yard in Phoenix. The facility generally serves the Phoenix metropolitan area and allows the movement of freight north to Santa Fe's main line. This main line connects Los Angeles and Chicago and is the principle east-west route for the railroad. The Southern Pacific owns two intermodal facilities in Arizona. There is a medium size facility in Phoenix and a smaller intermodal yard near Tucson. Both facilities are equipped with an automotive component. This allows the yards to off-load autos carried on railcars from

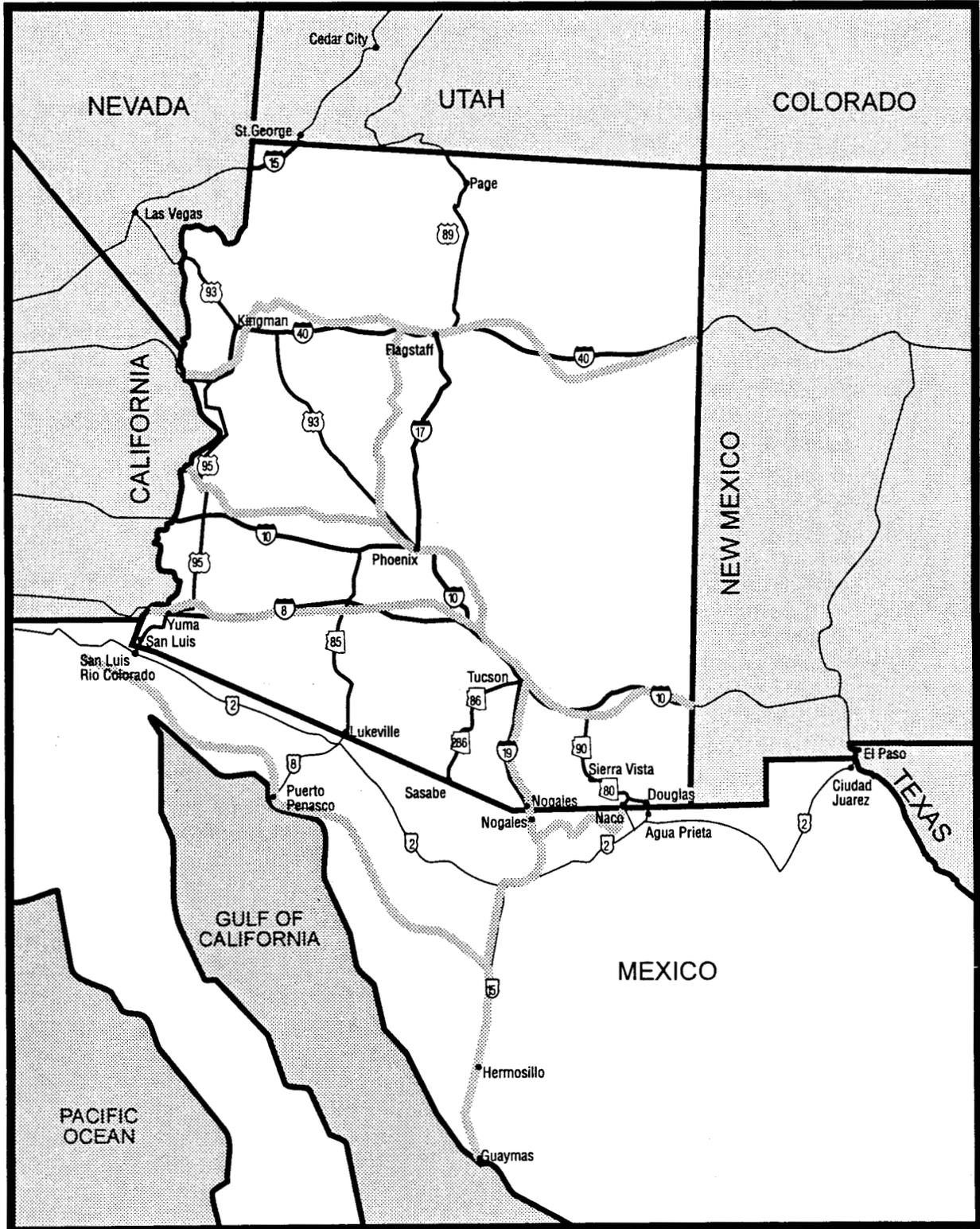
the Ford facility in Hermosillo, and hold them for eventual loading onto trucks outfitted for auto transport. The Phoenix yard can also handle double-stacked container traffic.

Five alternatives were examined regarding rail and intermodal facilities. Three of the initiatives are strictly rail-related. The other two are intermodal facilities that contain a rail component. The first alternative involves the relocation of rail lines at Nogales. Although no time table has been established, the Southern Pacific has been actively exploring the possibility of relocating the tracks from within the city of Nogales to a more favorable location away from the central business district. Numerous studies, hearings and planning sessions have been held and a number of options regarding this alternative are being contemplated. A private entity, the Nogales East Project, would like to relocate the tracks to private land just east of the city and operate the line as a short line railroad.

The other two "rail only" alternatives involve short line railroads. The San Pedro and Southwestern Railroad operates a local operation in close proximity to the border in the Douglas/Naco area. This railway has nonoperative border gateways in Naco and Douglas that represents two of only ten potential border gateways between Mexico and the United States. The alternative evaluated includes re-establishing the link with the Mexican rail system among other track upgrades. The other short line alternative examined is the extension of the Yuma Valley Railway south to connect with the border.

The intermodal alternatives analyzed are focused on expanding existing facilities within the State. There are a few options available to the State, including a package of tax incentives and a more aggressive approach, such as a joint venture. Some local governments are exploring possibilities that may generate private development in intermodal facilities. The feasibility of intermodal facilities depend upon the configuration of the rail lines with respect to other modes of transport, such as highways and airports. The following graphic shows the rail lines within Arizona.

Rail System



6.2 Summary of Findings

Decisions to proceed with infrastructure projects are based on complex issues of cash flow, rates of return, disruption of business and the corporations' own estimates of supply and demand. Because of this complicated procedure, the timing of projects is difficult to estimate precisely. Study findings in the area of rail and intermodal facilities include:

- Expansion of the Southern Pacific facility near Tucson would provide freight handling jobs in the area and induce additional support services such as freight consolidation and warehousing. A package of tax incentives to spur development of an expanded intermodal facility could pay immediate benefits to the state. A location near Tucson would expand a nationally significant trade crossroads. The area is currently the link between the north-south trade orientation of the Mexican rail system and a major transcontinental rail line that operates with an east-west orientation. An expanded intermodal facility in the area would create an important trade hub for the region.
- The transcontinental line in Yuma county is the closet the Southern Pacific comes to a connection with the Mexican rail system, besides Nogales. However, this short line alternative would require very aggressive actions by the state. Linking the Yuma Valley Railroad with the Mexican rail system would require substantial investment by the state and significant investment by the Mexican government.
- The San Pedro Railroad controls the Douglas and Naco gateways. These gateways could become attractive assets for the State if the Hermosillo-Guaymas area of Sonora develops significantly in the future. The San Pedro has extensive plans to develop intermodal facilities and an industrial park near Naco. The re-establishment of the crossing at Naco is a relatively inexpensive alternative. At the current time, business relationships between the San Pedro and customers in the area are in their infancy. As additional trade develops, this rail port-of-entry may become significantly more valuable. Additional study of rail linkages in this area is warranted.
- Rail relocation in Nogales would provide social benefits to the community such as relieving traffic congestion and reducing health risks. The Southern Pacific is still evaluating a number of options in the Nogales area, but the border gateway is far from operating at capacity. Until the border congestion becomes a financial drain on the Southern Pacific, the immediate actions by the railroad will likely include less costly switching and railcar handling changes.

Although the Southern Pacific is unlikely to move quickly on any rail relocation effort in Nogales, other alternatives are being advanced. The Nogales East Project has accumulated support from planning authorities on both sides of the border. The cost of this alternative seems reasonable as does the proposed route with respect to topography. The feasibility of private ownership of the bypass is unclear without detailed financial study and the additional commitments of Mexican rail authorities. This and other alternatives for Nogales rail relocation warrant further study.

- Although the Santa Fe intermodal facility in Phoenix is not operating at full capacity, the railroad has made initial inquiries regarding expansion to a second facility in El Mirage. If trade flows continued to increase at the current rates, expansion plans may be warranted. Because of the constraints imposed by other commercial properties around the facility and by Grand Avenue itself, expansion to the Phoenix facility could only occur through the acquisition of already developed real estate at considerable expense to the company. A second facility at another location may be the only financially feasible alternative for the Santa Fe.
- The primary border crossing for the Santa Fe is El Paso and, due to the configuration of their rail lines, the border gateway of Nogales is not a significant destination for the Santa Fe. What little traffic bound for Sonora, Mexico on the Santa Fe is either crossed in Texas or handed off to the Southern Pacific in Phoenix or in Deming, NM.
- The major rail carriers are actively pursuing strategies that will increase their volumes of U.S.-Mexican freight. These plans include alliances with trucking companies, intermodal facilities, and improved train configurations and freight handling to speed border crossings. Other international plans call for joint development of facilities in Mexico to create door-to-door service for companies with holdings on both sides of the border.
- Currently there is a Joint Legislative Study Committee tasked to explore the feasibility of establishing a passenger rail system in Arizona. The study is due to the Governor by the end of 1993 and will likely focus on the following goals:
 - Increase Arizona's statewide mobility;
 - stimulate Arizona's economy and tourism;
 - contribute to the conservation of Arizona's environment, natural resources and historic heritage;
 - Ensure the cost-effectiveness of a statewide passenger rail system.

6.3 Rail Recommendations

The Study makes the following recommendations in the area of rail and intermodal facilities:

- The Pima County Coordinating Council should move forward on the development of a truck-rail transfer (intermodal) facility in the Tucson metropolitan area.
- The relocation of rail lines within Ambos Nogales should be examined by the joint Arizona-Sonora Transportation Working Group. The group should make every effort to seek input and participation from the railroads in both countries and should explore federal funding opportunities.
- The relocation and connection of rail lines within the cities of Naco, Douglas, and Yuma should be examined by the Joint Arizona-Sonora Transportation Working Group. The

Working Group should consider performing rate-of-return and net present value analyses with respect to the various rail proposals.

7.

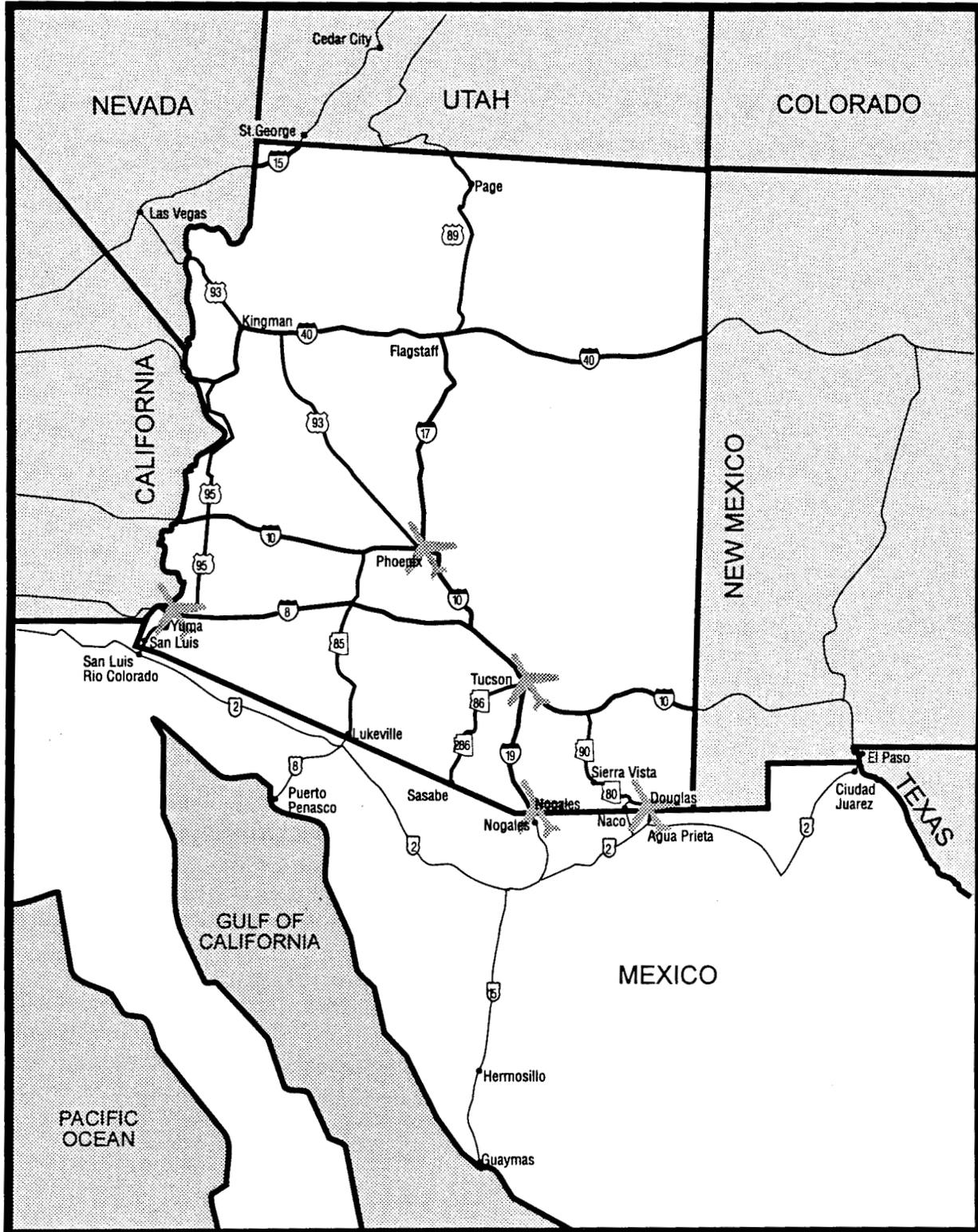
Aviation Development: Key Findings and Recommendations

7.1 Overview

Aviation services are an important part of an integrated statewide strategic plan for both freight and passenger movement. Air services in the Arizona border area consists of three international airports and a number of county and municipal airports. International movements of high value freight and passengers between Mexico and the United States will increase as trade liberalization occurs.

The aviation infrastructure was evaluated based on current levels of service and the potential for increasing services within a framework of expanded trade and economic development. Passenger services were evaluated based on access to growing markets in Mexico. Current levels of domestic growth were also analyzed. Cargo traffic was analyzed based on the overall level of cargo traffic and anticipated increases brought on by more liberalized trade.

International Airports



7.2 Summary of Findings

Study findings in the area of aviation services include:

- Currently, aviation accounts for a negligible amount of traffic between the United States and Mexico. In 1990, only 0.3 percent of about 530 million tons of trade cargo moved through via air transport. For passenger movements, air lines carried only 1.1 percent of approximately 2 billion passengers, while road transport moved 98 percent of total passengers.
- Passenger service to Mexico is available from most of the major U.S. airlines. However, Mexico City operates as the national hub with most international flights arriving there first. Although direct service is available from many U.S. origins, the Mexican destinations are generally resort areas. Most Mexican destinations can be reached from the international airports in Arizona. The routes are, at times, circuitous and not intended for business travel. However, America West is now providing non-stop flights from Phoenix to Mexico City, and AeroMexico is providing direct flights from Tucson to Mexico City.
- Only \$22 million of \$1.8 billion of Arizona exports were carried by air. The market is not demanding the full range of cargo services that could develop from Phoenix's Sky Harbor Airport. At present, Arizona businesses usually fly or truck their cargo primarily to Los Angeles, where they are consolidated and shipped to international destinations. Nevertheless, direct passenger flights that connect Arizona with Mexico offer limited air freight capabilities. Those flights include service from Phoenix or Tucson to such cities as Hermosillo, Guaymas, Mazatlan, Los Cabos and Mexico City.
- The level of passenger service from airports in the Arizona border region to Mexico destinations was particularly light except for Tucson International. There is direct service from Tucson to Hermosillo, Guaymas, Mexico City, and Monterrey. Although this traffic may indeed increase in the future, currently, the Tucson airport has excess passenger capacity. Improvements to the Tucson cargo facility are now being implemented

7.3 Aviation Recommendations

The Study makes the following recommendations concerning aviation:

- Although the trade-related benefits do not support a major infrastructure investment in new airport facilities, any transportation investment for the State should be sensitive to other factors that may justify additional investment.
- Convene a task force to analyze the needs of the State's air freight users with the intent of developing a state strategy regarding issues identified.

8.

Business Services: Key Findings and Recommendations

8.1 Overview

A trade corridor is comprised of several key components, including the availability of commercial and professional services that contribute to a "good international business climate." In Arizona, the full spectrum of such services can be found.

The availability of those services may well be related to the state's long history of ties beyond its 361-mile border with Mexico. The southern part of Arizona was once Mexican territory, and family relations between Arizona and Sonora are long-standing. In addition, the state's large Hispanic population and border location have contributed to a familiarity with, and sensitivity to, the language, history, culture and practices of Mexico.

More recently, Mexico has emerged prominently as a business partner for Arizona, and key players in state government, the educational establishment, and economic development organizations have worked to improve the Arizona-Mexico business climate. Significant accomplishments have included:

- The creation of the National Law Center for Inter-American Free Trade, affiliated with the University of Arizona, which assists in establishing the U.S. national position on harmonizing laws and regulations which potentially restrict North American trade;
- The Mexico Consensus Forecast, the first bilingual forecast of the Mexican economy, published by Arizona State University;

- Arizona University Resources on Latin America, a directory that details faculty resources and coursework related to Mexico and Latin America at Arizona's three state universities and the American Graduate School of International Management;
- A regional economic development strategic plan being undertaken by the Arizona-Mexico Commission and its Mexican counterpart, the Comisión Sonora-Arizona, as the first cross-border economic plan anywhere along the border;
- The City of Tucson's International Programs Office, a recognized model municipal international economic development effort; and,
- The Center for International Business Education and Research, a federally-funded project recently initiated by the American Graduate School of International Management, which will specialize in studying the impacts of the proposed North American Free Trade Agreement.

All of these ventures, combined with Arizona's geographic and historical ties to Mexico, have contributed to a supportive economic climate for Arizona-Mexico business. However, the specifics of doing business internationally (i.e., adequate financing, product representation and sales in foreign markets, legal and technical translation, and one-on-one business counselling) continue to present difficulties for Arizona businesses, especially small and medium-sized firms. In general, the level of international business services in Arizona is adequate for current volumes of trade, but a wider scope and sophistication of services is required to grow and stimulate the export base in the state.

8.2 Summary of Findings

Study findings in the area of business services include:

- Successful centers of international business generally appear to have the following characteristics: strong public sector-private sector cooperation; a favorable business climate which includes government policies in support of trade and economic development; modern transportation and telecommunications infrastructure; and a wide range of financial and business support services. In varying degrees, Arizona has each of these elements.
- With the exception of international air freight services and loan financing products for export transactions, the array of international business services available in Arizona adequately supports the level of trade occurring in the state.
- No evaluation effort has been undertaken to assess the professionalism or competency of private sector export assistance providers, nor has there been an assessment of the comprehensiveness of services offered. Nevertheless, concerns exist regarding the uniformity of expertise present among private consultants advertising market research capabilities, matchmaking contacts, and general knowledge of the exporting process.

- Positive features cited by exporters regarding international business services in Arizona were:
 - the overall quality and quantity of services are consistently improving over time;
 - federal, state and local trade specialists are knowledgeable and helpful;
 - the World Trade Center-Arizona has emerged as an important asset to the state's business community;
 - the Arizona Department of Commerce has steadily increased the scope and caliber of its services, particularly in the areas of staff expansion, a new export loan guarantee program, and trade offices in Mexico City, Hermosillo, and Japan and Taiwan; and,
 - the work of the National Law Center for Inter-American Free Trade (affiliated with the University of Arizona) will have international, as well as statewide, benefits for improving the flow of goods and services between the U.S. and Mexico.

- The leading concerns expressed by potential exporters to Mexico were:
 - lack of financial assistance from local banks;
 - delays and congestion at border crossings;
 - inability to identify reliable/capable product representatives in Mexico; and,
 - unfamiliarity with the export process, and with the various assistance programs designed to introduce businesses to the export arena.

- The leading concerns expressed by businesses currently exporting to Mexico were:
 - although numerous and varied, public and private trade assistance services lack coordination and cohesion among providers, and are not successfully marketed among the small business community;
 - local banks offer insufficient loan products to support export transactions;
 - resources are inadequate to identify reliable/capable product representatives, or to assist with product distribution, in Mexico;
 - inconsistencies exist among private consultants offering expertise in foreign market analyses, direct networking with Mexican businesses, and translation services for legal and other technical documents;
 - limited international air freight services;

- Arizona State Bar restrictions regarding foreign legal consultants which have resulted in a lack of reciprocity for Arizona lawyers wishing to assist clients in Mexico; and,
- Arizona's public and non-profit economic development efforts have not formally recognized the significance of international trade to the state's economy.

8.3 Business Service Recommendations

The Study makes the following recommendations to enhance **trade promotion and assistance** activities:

- The Arizona Department of Commerce should create a strategic plan designed to improve outreach and education within the business community regarding international trade and the exporting process. In doing so, it should recognize the capacity of Small Business Development Centers to assist in the implementation of the plan throughout the state.
- Public and private trade assistance providers should improve the scope of trade assistance services by: concentrating additional resources in the area of identifying product distribution systems and representatives; creating a mentoring program pairing successful exporters with similar businesses interested in international markets; and, continuing to develop and make available for public use business-oriented databases containing information relating to trade with Mexico.
- A system of interactive computerized kiosks offering export and other trade related data could provide an efficient mechanism for information dissemination. It is recommended that such a system be analyzed further.
- It is recommended that additional economic study be undertaken to analyze the feasibility of a full service International Business Center/World Trade Center. The facility would house a concentration of trade-related businesses and services, and serve as a visible resource center for potential traders interested in international markets.
- Economic development organizations need to formally recognize the value of international, as well as domestic, trade and devise promotion efforts to increase export and import activity within Arizona's business community.

The study makes the following recommendations for **export service firms and consultants**:

- Trade consultants and service providers are encouraged to form a professional association in which membership is contingent upon a demonstrated measure of competency.
- Future editions of the Arizona Department of Commerce's *International Trade Services Directory* should be revised to include descriptive information indicating each firm's

educational or professional development background, areas of expertise, and representative clients. Further, ADOC should ensure distribution of future directories to the 23 Economic Development Information Centers located in public and community college libraries throughout Arizona.

The study makes the following recommendations for **legal services**:

- The Arizona Bar Association is encouraged to act swiftly in removing prohibitions pertaining to legal consultants.
- The Arizona Congressional delegation, the state legislature, and the Arizona-Mexico Commission should continue to support and seek funding for the work of the National Law Center for Inter-American Free Trade.
- The World Trade Center-Arizona is encouraged to compile and distribute a directory of Arizona-based translators with expertise in technical documents and legal language.

The Study makes the following recommendation for **financial services**:

- It is recommended that the Arizona Bankers Association, and its member banks, investigate the adequacy of the full range of international banking services in Arizona. Emphasis should focus on the availability of working capital loan products and staff training in federal loan guarantee programs, as well as the accessibility of small business loans for telecommunications development.

9.

Communications and Information Systems: Key Findings and Recommendations

9.1 Overview

Expansion of trade between the United States, Mexico and Canada has occurred as a result of the increasing globalization of business as much as a pending NAFTA agreement. This evolution has created a growing dependence on high quality telecommunications and accelerated information services. As trade liberalization creates more integration among the economies of North America, the need for an advanced telecommunication infrastructure will be apparent.

Currently, telecommunication services in Mexico lag behind both the United States and Canada. Arizona's proximity to Mexico offers many opportunities for economic and business development in communication and information. Arizona possesses a cross-border link in Nogales with the Mexican telecommunication system. This interface is one of only five locations along the U.S.-Mexican border where terrestrial communications move between the two countries. As the economy in Mexico grows, the market will demand increased services. Much of the telecommunication service and equipment will be provided by international vendors and partners. By including these services and industries in an overall trade corridor strategy, Arizona will be positioned to capitalize on cross-border communication developments.

The Strategic Information and Communication component of the Arizona Trade Corridor Study assesses Arizona's information and communications environment and provides recommendations to strategically position Arizona on the international information superhighway. The assessment shows that several basic enhancements in Arizona's telecommunications environment are necessary before the state can become a strategic location for information and communications applications. These needed enhancements are targeted by the recommendations.

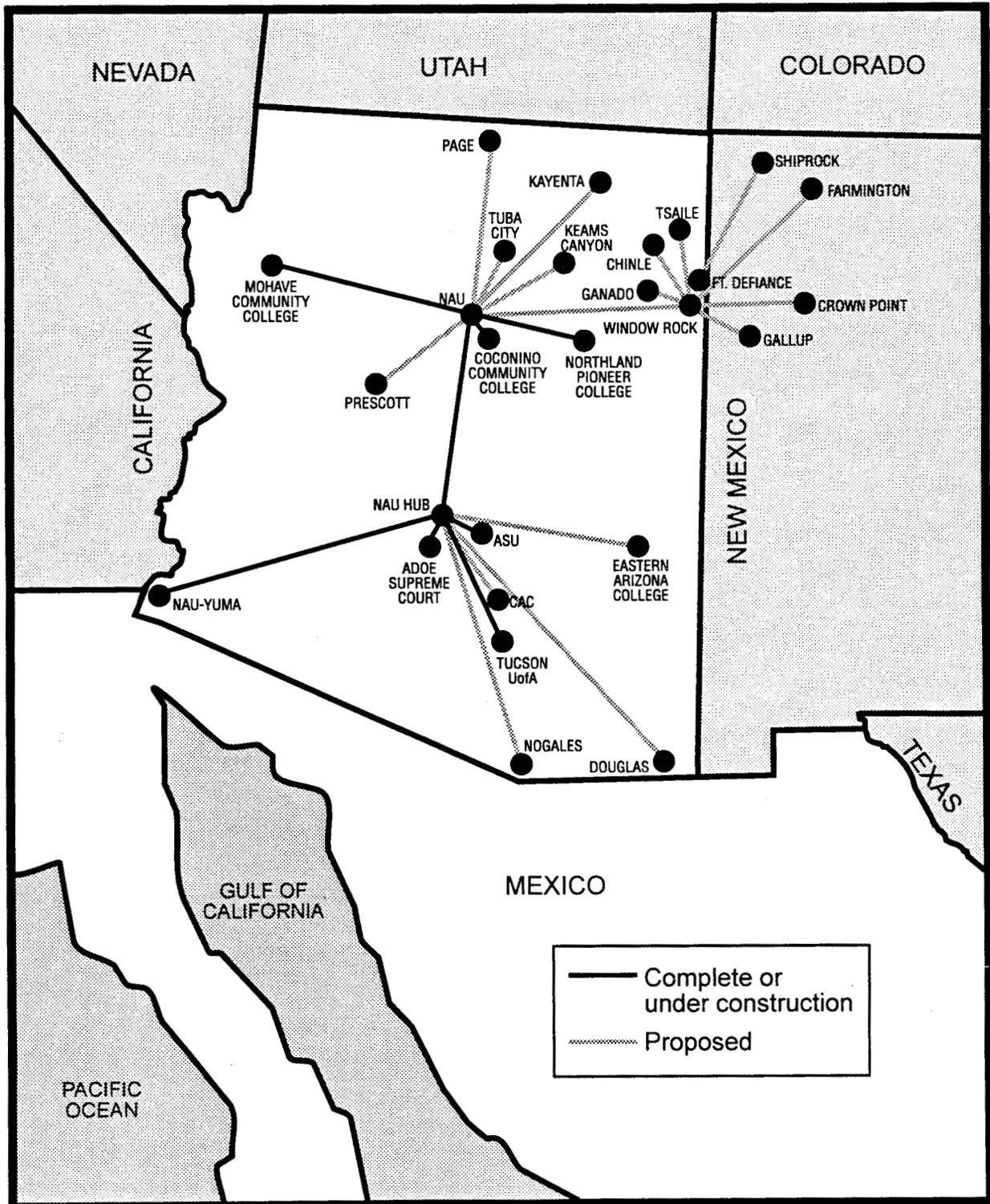
The Study's assessment of Arizona's telecommunications environment was provided by a literature review, meetings with business and governmental experts, and a survey of rural users.

9.2 Summary of Findings

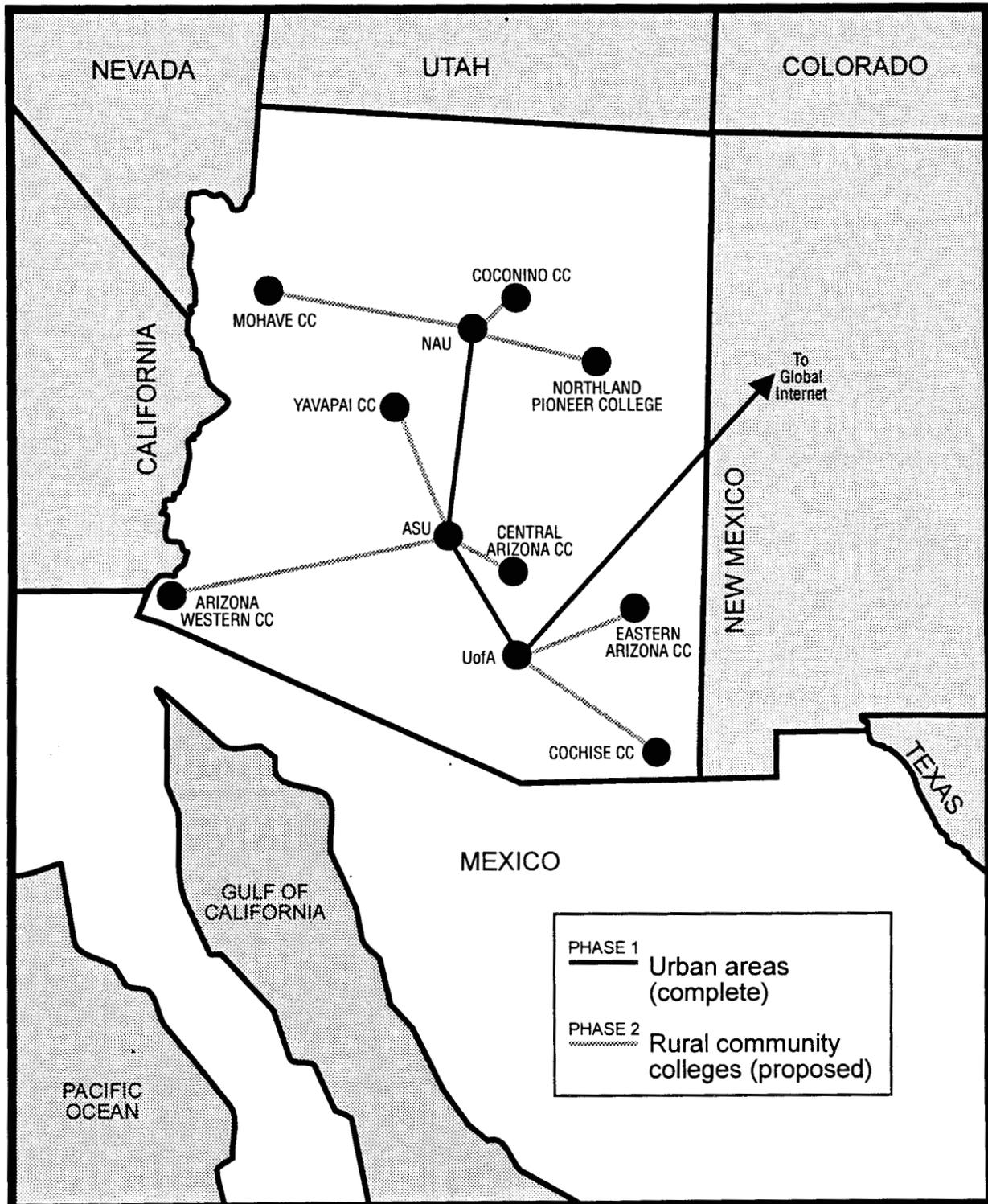
Study findings in the area of communications and information include:

- Hundreds of communications and information companies compete to provide communications equipment and services to Arizona customers. Communications companies not only produce equipment and services, but also build the infrastructure to convey those products. To a large extent, infrastructure development in Arizona, as in any other state, is market-driven and, as in most states, is determined by the national agenda of parent companies that are probably not headquartered in the state. Generally, these companies serve the state by developing infrastructure such as statewide fiber optic networks and providing services such as voice messaging and video conferencing, and international service where possible.
- Two statewide public communications networks are in place in Arizona. Both have their roots in the educational system, but expansion through equipment or promotion could increase access to business users and to facilities in Mexico. NAUNet is a television network built by Northern Arizona University to offer two-way educational services throughout the state. NAUNet may eventually provide access to videoconferencing, job training, and similar activities for business users. The **Arizona State Public Information Network (ASPIN)** is an electronic network connecting the state's universities and community colleges. ASPIN supports business development through access to Bitnet, Internet, and other global networks and services. These systems could be used to broaden the educational opportunities throughout the state and create a better educated labor force.
- The **Arizona Corporation Commission** has the power to enhance or limit the state's telecommunication infrastructure development. It grants the right to operate and sets fees for companies to supply communications services to all users at established and stated prices. Arizona is one of twelve states with elected rather than appointed Commissioners. The three Commissioners are elected for six-year terms and are responsible for deciding rate adjustments, enforcing safety and public service requirements, and approving securities matters.

NAUNet Video, Voice & Data System



Arizona State Public Information Network



- In comparison to Arizona, several other states have formally organized statewide network consortiums and companion facilities for education, research and economic growth. Some states, such as Texas, have included important state government administrative transactions on their public statewide networks, along with education, industry, libraries, and health centers.
- According to a project focus group of business users of telecommunications, Arizona should strengthen cross-border linkages with the Mexican state of Sonora, facilitate Arizona-Mexico business trade fairs, utilize interactive television or other appropriate technologies to provide information programming, networking and bilingual communications for small businesses in Mexico, and fund an initiative to identify, categorize and make available practical information to support trade activities.
- According to a project survey of rural users of telecommunications, the state's rural areas are underserved by existing technologies. The area north of Flagstaff particularly lacks communications capabilities. It is difficult for companies with global markets in at least one part of rural Arizona to obtain telecommunications services. Respondents indicated capabilities must be enhanced if rural Arizona is to compete in the global marketplace.
- Fort Huachuca, located in southern Cochise County, is the national home for Army Information Systems Command. It is also a worldwide regimental headquarters for the Intelligence Corps of the U.S. Army, including a school for Army Intelligence officers, warrant officers, and enlisted soldiers. The surrounding area is home to a concentration of highly skilled communications professionals, including Fort staff, contractors, and retired military personnel. Also in the area, the University of Arizona's extension campus in Sierra Vista and Cochise County Community College offer many technical courses.
- Mexico is positioned to leapfrog into modern communications technology, particularly because of the aggressive initiatives undertaken by its largest phone company, Telefonos de Mexico (Telmex).

9.3 Communications and Information Recommendations

The Study makes the following recommendations in the area of communications and information:

- Leaders in government, business, and education should establish a public-private commission on state telecommunications and economic development under the Governor's leadership. An interim planning board, such as the Governor's Task Force on Telecommunications, can be formed with the objective of establishing a long-term commission. Targeted initiatives of the commission should include:
 - Evaluate the feasibility of a plan to merge the major publicly-funded statewide enhanced networks;

- Estimate the economic cost and return impacts of expanding the NAUNet multi-city microwave TV trunk system, especially to increase coverage to rural Arizona and Mexico. If warranted, support statewide communications through the television network provided by NAUNet;
 - Support statewide communications through the public information network provided by ASPIN. Evaluate the economic cost and return impacts of expanding ASPIN to connect the network to rural schools, businesses, libraries and others; and
 - Implement a process to measure Arizona's economic development progress resulting from telecommunications infrastructure development. Provide an annual report on the state's progress, including an explanation of the linkage between infrastructure development and statewide economic development.
 - Study the viability of developing strategic communications resources located in Cochise County to provide communications facilities for the entire United States-Mexico border region.
- Hold a Joint Arizona-Sonora Conference on Telecommunications for Business and Education in November 1994. The conference could be held jointly across the border, i.e. in Tucson and Hermosillo. It should include a trade show. The Arizona Department of Commerce and the Governor's Strategic Partnership for Economic Development ("GSPED") should lead the planning effort.
 - Hold video-programmed cross-border business information exchanges. The universities in conjunction with ADOC should develop and implement a series of video-programmed cross-border business exchanges in late 1993 and throughout 1994. The exchanges should include subjects such as "doing business in Mexico/Arizona." The project should be content-driven rather than technically-driven in order to reach the business audience. NAUNet could be the delivery mechanism.
 - GSPED and the Arizona Corporation Commission should form a committee to exchange expertise and information on economic development and technological opportunities for Arizona. The committee should meet informally at least twice a year.
 - The Arizona Legislature should jointly form a committee with the Arizona Corporation Commission to study the telecommunications industry. Specifically, the committee should study constitutional constraints and enhancements which impact telecommunications infrastructure development in Arizona. The committee's reviews should include development in rural Arizona.
 - The Arizona-Mexico Commission's Telecommunications Committee should develop and promote a strategic plan for using telecommunications technology to support cross-border business development, for example in cross-border banking activities. The Committee should lead field trips of Arizonan and Mexican business people to examine telecommunications utilization by businesses on both sides of the border.

- The Arizona Legislature should allocate additional funds for the Arizona Department of Commerce to fund a GSPED program providing assistance to telecommunications companies seeking business development in Mexico and Latin America. This initiative targets business growth as a strategy in establishing Arizona as a Telecommunications "Entrance/Exit Ramp" with Mexico and Latin America.
 - GSPED should examine the merits of an industrial extension service, including a focus on telecommunications support. The service would provide for staff to be placed in each county to serve small businesses with technological assistance.
-

APPENDIX A

Glossary of Terms

Arizona Corporation Commission - Arizona's public utility commission which sets rates for and regulates telecommunication services.

Arizona University Consortium - a working consortium of Arizona's four major universities, Arizona State University, Northern Arizona University, The American Graduate School for International Management and the University of Arizona.

ASPIN - Arizona State Public Information Network; an electronic network linking the three state universities.

benefit-cost ratio - Present value of benefits divided by present value of costs. Indicates dollars of benefits per \$1.00 of cost.

CANAMEX corridor - currently defined as a geographic corridor of states extending from Sonora, Mexico in the south, through the U.S. states of Arizona, Nevada, Utah, Wyoming, Idaho, Oregon, Washington and Montana, to the three western Canadian provinces of British Columbia, Alberta and Saskatchewan in the north.

class one railroads - are those carriers that operate interstate rail lines on a regional or national basis.

custom's districts - are geographical areas defined by the Department of Commerce for statistical collection purposes. The customs districts adjacent to the Mexican border include: Laredo, El Paso, Nogales, and San Diego.

discount factor - the factor applied to each benefit and cost in order to convert it to its present value.

fiber optics cable - glass strands that transmit light waves for communication.

hurdle rate - is the minimum rate of return deemed acceptable for a project, usually set equal to the discount rate or the long term cost of capital.

intermodal - the combination of one or more forms of transportation, such as rail-truck or rail-air, intermodal facilities refer to loading areas, specially designed or equipped to handle different modes of freight carriers.

NAFTA - the North American Free Trade Agreement is a proposed agreement between the countries of Canada, Mexico and the United States, the purpose of which is to reduce or eliminate tariff and non-tariff barriers in the areas of trade, investment and services within North America.

net present value (NPV) - Present day value of benefits minus present-day value of costs. NPV greater than zero means project is economically efficient.

Nogales Custom District - Department of Commerce designation for the border crossings located within the borders of Arizona.

non-trade-related traffic benefits - include those vehicle operating costs, time savings and safety related benefits associated with interstate and interregional commercial and non-commercial traffic.

rate of return (ROR) - ROR refers to the percentage of total investment costs recovered in the form of economic benefits on an annual basis. The discount rate at which the NPV is equal to zero. ROR should exceed pre-set hurdle rate to qualify for consideration.

Summit Six - the six Arizona organizations responsible for coordinating the state's plan for free trade. The six organizations are the Arizona Department of Commerce, the Governor's Strategic Partnership for Economic Development, the Arizona/Mexico Commission, the Organization for Free Trade and Development, the Arizona Hispanic Chamber of Commerce and the Arizona University Consortium.

Telefonos de Mexico - Telemex; Mexico's largest and dominate telephone company.

trade flow - movement of commodities from place of origin to place of destination regardless of mode of transportation, commonly expressed in dollar value or tonnage.

trade-related traffic benefits - include those vehicle operating cost and time savings associated with international trade freight hauling by truck.

traffic flow - movement of transport units between lace of origin and place of destination, commonly expressed as number of units by mode of transportation (trucks, rail cars, passenger cars, airplanes and ships).

trunk - the main cable or circuit in a telecommunications system.

