



U.S. Department
of Transportation

**Federal Highway
Administration**

*Intermodal Surface Transportation Efficiency Act:
Section 1089 and Section 6015*

Assessment of Border Crossings and Transportation Corridors for North American Trade Report to Congress



**ASSESSMENT OF BORDER CROSSINGS AND TRANSPORTATION CORRIDORS
FOR NORTH AMERICAN TRADE**

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**REPORT TO CONGRESS PURSUANT TO
INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991
PUBLIC LAW 102-240
SECTIONS 1089 AND 6015**

AUTHORITY

Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), Public Law 102-240.

ISTEA Section 1089: Feasibility of International Border Highway Infrastructure Discretionary Program

(a) The Secretary shall conduct a study of the advisability and feasibility of establishing an international border highway infrastructure discretionary program. The purpose of such a program would be to enable States and Federal agencies to construct, replace, and rehabilitate highway infrastructure facilities at international borders when such States, agencies, and the Secretary find that an international bridge or a reasonable segment of a major highway providing access to such a bridge

(1) is important;

(2) is unsafe because of structural deficiencies, physical deterioration, or functional obsolescence;

(3) poses a safety hazard to highway users;

(4) by its construction, replacement, or rehabilitation, would minimize disruptions, delays, and costs to users; or

(5) by its construction, replacement, or rehabilitation, would provide more efficient routes for international trade and commerce.

(b) Report.- Not later than September 30, 1993, the Secretary shall transmit to Congress a report on the results of the study conducted under this section, together with any recommendations to the Secretary.

ISTEA Section 6015. Border Crossings

(a) Identification.-The Secretary, in cooperation with other appropriate Federal agencies, shall identify existing and emerging trade corridors and transportation subsystems that facilitate trade between the United States, Canada, and Mexico.

(b) Priorities and Recommendations.-The Secretary shall investigate and develop priorities and recommendations for rail, highway, water, and air freight centers and all highway border crossings for States adjoining Canada and Mexico, including the Gulf of Mexico States and other States whose transportation subsystems affect the trade corridors. The recommendations shall provide for improvement and integration of transportation corridor subsystems, methods for achieving the optimum yield from such subsystems, methods for increasing productivity, methods for increasing the use of advanced technologies, and methods to encourage the use of innovative marketing techniques, such as just-in-time deliveries.

(c) Minimum Elements.-The highway border crossing assessment under this section shall at a minimum-

(1) determine whether or not the border crossings are in compliance with current Federal highway regulations and adequately designed for future growth and expansion;

(2) assess their ability to accommodate increased commerce due to the United States-Canada Free Trade Agreement and increased trade between the United States and Mexico; and

(3) assess their ability to accommodate increasing tourism-related traffic between the United States, Canada, and Mexico.

The review shall specifically address issues related to the alignment of United States and adjoining Canadian and Mexican highways at the border crossings, the development of bicycle paths and pedestrian walkways, and potential energy savings to be realized by decreasing truck delays at the border crossings and related parking improvements.

(d) Consultation.-In carrying out this section, the Secretary shall consult with appropriate Governors and representatives of the Republic of Mexico and Canada.

(e) Report.-Not later than 18 months after the date of the enactment of this Act, the Secretary shall report to Congress and border State Governors on transportation infrastructure needs, associated costs, and economic impacts identified and propose an agenda to develop systemwide integration of services for national benefits.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
CHAPTER 1: OVERVIEW	11
INTRODUCTION	11
Mandates	11
North American Free Trade Agreement (NAFTA) Context of the Study	11
Border Crossings	12
Inspections	15
Data	18
SECTION 1089 STUDY	19
SECTION 6015 STUDY	20
Report Organization	20
Existing Patterns	21
Existing and Planned Status	22
Future Trends	23
Perceptions of Existing and Future Needs and Conditions	24
Findings and Recommendations	26
Coordination	26
CHAPTER 2: PATTERNS OF TRADE AND TRANSPORTATION	29
NATIONAL PATTERNS OF TRADE	30
U.S.-Canadian Merchandise Trade	30
U.S.-Mexican Merchandise Trade	30
Nonmerchandise Trade	33
REGIONAL TRADE FLOW PATTERNS	33
U.S.-Canadian Regional Trade Flow	34
Eastern U.S.-Canadian Regional Trade Flow	39
Western U.S.-Canadian Regional Trade Flow	49
U.S.-Mexican Regional	50
PATTERNS OF TRANSPORTATION MODES RELATED TO TRADE	53
U.S.-Canadian Transportation Modes	55
Eastern U.S.-Canadian Transportation Modes	58
Western U.S.-Canadian Transportation Modes	65
U.S.-Mexican Transportation Modes	69
TRADE FLOW TRANSPORTATION PATTERNS	75
Eastern U.S.-Canadian Trade Flow Transportation Patterns	76
Western U.S.-Canadian Trade Flow Transportation Patterns	79
U.S.-Mexican Trade Flow Transportation Patterns	79
CHAPTER 3: STATUS--BORDER INFRASTRUCTURE/INSTITUTIONAL SYSTEMS	81
INFRASTRUCTURE SYSTEMS	82
Eastern U.S.-Canadian Infrastructure Systems	82
Highway Mode	83
Rail Mode	84
Water Mode	84
Intermodal Transportation	84
Western U.S.-Canadian Infrastructure Systems	85
Access Roads	85
Joint Facilities	85
Low-risk, Low Volume Crossings	86
Differences in Highway Standards	86
Rail Potential	86
Capital Improvement Program	86
Intermodal Services and Facilities	87
U.S.-Mexican Infrastructure Systems	87
Border Crossing Infrastructure--Existing	88
Border Crossing Infrastructure--Improvements	89
Border Crossing Infrastructure--Funding	90
Airport Infrastructure	91
Pipeline Infrastructure--Existing	91

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Pipeline Infrastructure--Improvements	91
Intermodal Services and Facilities	92
Intermodal Services and Facilities--Existing	92
Intermodal Services and Facilities--Improvements	93
INSTITUTIONAL SYSTEMS	95
Eastern U.S.-Canadian Institutional Issues	96
Federal Inspection Services	96
Coordination Among Federal Agencies	96
Lack of Consistent Policies by Inspection Agencies	96
Intermodal Issues	97
Western U.S.-Canadian Institutional Issues	98
Joint Facilities Planning	98
Border Management	99
Cross Border Shopping	99
Air Service	100
Rail Service	100
Planning Data and Information	101
U.S.-Mexican Institutional Issues	101
Air Quality Issues	102
Regulation of Motor Carriers	102
Regulation of Animals and Plant Products	103
Local and Regional Economic Development	103
Intermodal Standards	103
Intermodal Information Systems	103
Intermodal and Multimodal Border Clearance Process	104
Marine Ports	104
CHAPTER 4: FUTURE TRADE AND TRAFFIC FLOW TRENDS	105
U.S.-CANADIAN FUTURE TRENDS	106
Eastern U.S.-Canadian Future Trends	107
Trends in Trade	108
Trends in Traffic	110
Impacts on Current Trade and Traffic Patterns	111
Western U.S.-Canadian Future Trends	112
U.S.-MEXICO FUTURE TRENDS	117
The Forecast Model	117
All Modes	118
Maritime	120
CHAPTER 5: VIEWS FROM THE REGIONS	123
SUMMARY OF ROUNDTABLE VIEWS	125
Eastern Views	125
Northwestern Views	129
Southwestern Views	137
FUTURE CONSENSUS VIEWS	148
Futures Assessments	148
National Consensus	149
Regional Consensus	150
Eastern Consensus	150
Western Consensus	151
ROUNDTABLES--FUTURE PERSPECTIVES	152
Buffalo, New York, Roundtable--Future Perspectives	152
St. Louis, Missouri, Roundtable--Future Perspectives	152
Norfolk, Virginia, Roundtable--Future Perspectives	153
CHAPTER 6: DISCRETIONARY PROGRAM FOR HIGHWAY INFRASTRUCTURE	155
OPERATIONAL DEFINITION OF DISCRETIONARY HIGHWAY PROGRAMS	155
FUNDAMENTAL ISSUE	156
PROGRAM DESIGN	156
PROGRAM FUNDING	157

CHAPTER 7: POLICY IMPLICATIONS	159
PRINCIPAL FINDINGS	159
RECOMMENDATIONS	162
APPENDIX A: FINAL REPORTS	A-1
APPENDIX B: BIBLIOGRAPHY	B-1
SELECTED BIBLIOGRAPHY BY SUBJECT MATTER	B-1
SELECTED BIBLIOGRAPHY ON CANADA	B-17
SELECTED BIBLIOGRAPHY ON MEXICO	B-21
APPENDIX C: LIST OF BORDER AND CORRIDOR GROUPS	C-1

LIST OF FIGURES

AUTHORITY	ii
FIGURE 2-2 NORTHEASTERN U.S.-CANADIAN FRONTIERS AND PORTS OF	36
FIGURE 2-3 WESTERN U.S.-CANADIAN BORDER GATEWAY SUBREGIONS	37
FIGURE 2-4 SOUTH TEXAS-LAREDO GATEWAY	40
FIGURE 2-5 SOUTH TEXAS-LOWER RIO GRANDE GATEWAY	41
FIGURE 2-6 WEST TEXAS-NEW MEXICO GATEWAY	42
FIGURE 2-7 ARIZONA GATEWAY	43
FIGURE 2-8 CALIFORNIA GATEWAY	44
FIGURE 2-9 1992 TOTAL U.S. EXPORTS TO CANADA BY STATE	45
FIGURE 2-10 1992 TOTAL U.S. IMPORTS FROM CANADA BY STATE	46
FIGURE 2-11 1992 TOTAL U.S. EXPORTS TO CANADA BY PROVINCE	47
FIGURE 2-12 1992 TOTAL U.S. IMPORTS FROM CANADA BY PROVINCE	48
FIGURE 2-13 1992 TOTAL EXPORTS TO MEXICO BY U.S. AND MEXICAN STATES	51
FIGURE 2-14 1992 TOTAL IMPORTS FROM MEXICO BY U.S. AND MEXICAN STATES	52
FIGURE 4-1 U.S.-CANADIAN TRADE IN THE WEST STRAIGHT LINE TRENDS TO 2002	114

LIST OF TABLES

TABLE 2-1 TOTAL LAND TRADE LEVELS THROUGH FRONTIERS OR GATEWAYS	35
TABLE 2-2 KEY TO NUMBERED BORDER CROSSINGS IN FIGURE 2-3	38
TABLE 2-3 TOTAL U.S. EXPORTS TO CANADA BY MODE	56
TABLE 2-4 TOTAL U.S. IMPORTS FROM CANADA BY MODE	57
TABLE 2-5 PRINCIPAL FRONTIERS, EASTERN U.S. CANADA BORDER	61
TABLE 2-6 MAJOR GATEWAYS FOR WESTERN U.S.-CANADIAN TRAFFIC	67
TABLE 2-7 TOTAL U.S. EXPORTS TO MEXICO BY MODE	72
TABLE 2-8 TOTAL U.S. IMPORTS FROM TO MEXICO BY MODE	73
TABLE 3-1 CAPACITY OF MAJOR GULF PORTS, 1991	94

ASSESSMENT OF BORDER CROSSINGS AND TRANSPORTATION CORRIDORS FOR NORTH AMERICAN TRADE

ISTEA SECTION 1089 AND SECTION 6015 REPORT TO CONGRESS

EXECUTIVE SUMMARY

Congressional Mandate

The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991, Public Law 102-240, directs the Secretary of Transportation to conduct two studies relating to the movement of international trade.

Section 1089 calls for a study of the "advisability and feasibility of an international border highway infrastructure discretionary program."

Section 6015 calls for the Department of Transportation (Department) to conduct an assessment of existing and emerging international trade corridors between the United States, Mexico, and Canada, and to make recommendations on how to improve the integration and operation of trade-related transportation subsystems. Section 6015 requires that Mexico and Canada be consulted; both countries have cooperated in the study effort.

While the Congressional mandate does not specifically mention the North American Free Trade Agreement (NAFTA), Section 6015 stipulates that the "review shall specifically address issues related to the alignment of United States and adjoining Canadian and Mexican highways at the border crossings." The legislation also requires an assessment of the ability of highway border crossings to "accommodate increased commerce due to the United States-Canada Free Trade Agreement and increased trade between the United States and Mexico."

Much of the motivation for the study stems from long-standing complaints of lengthy delays and backups of trucks and cars at international border crossings. There is a concern that trade among the three North American nations, which has increased significantly over the past seven years, may outstrip the ability of the nations' transportation systems to handle additional traffic, further exacerbating border congestion. The study team concluded that there are several factors involved in border congestion, and a number of difficulties in assessing the condition and future of trade corridors.

Study Approach and Methodology

The study team examined the border crossings and the access channels leading to them. The team visited most of crossings on both the northern and southern borders and drove over and observed traffic on many of the access roads. With assistance from the U.S. Customs, the team observed cargo and passenger clearance operations and transportation operations at the border crossings.

In addition, the team conducted a series of public outreach and information gathering meetings at locations throughout the United States. Participants at these meetings included shippers, carriers, customs brokers, and officials from concerned Federal, state, provincial, and local governments. Much of the information gathered in these sessions was anecdotal in nature, and reflective of local perspectives. However, there was value in learning the views of border communities and understanding the effects they perceive their proximity to heavily travelled border crossings have on local and regional transportation systems. Following completion of these studies and at the invitation of the Federal governments of Canada and Mexico, meetings were also held in Canada and Mexico to gain the perspectives of interested parties in those countries. Results of these meetings will be reported separately.

Statistical data on cross-border trade gathered from sources in all three countries were also used to the extent possible in assessing trade patterns and conditions at the borders. The statistical data, however, suffer from a number of shortcomings. The U.S. Census Bureau, for example, has not historically classified cross-border transits by mode of transportation. Ideally, transportation statistics are compiled in terms of ton miles or numbers of vehicles, but data were not readily available in that form. Furthermore, the three countries involved do not compile data in a standard way.

Current U.S. Trade with Canada and Mexico

Canada is the United States' largest trading partner. In 1992, merchandise trade between the two countries totaled \$189 billion, with U.S. imports exceeding exports by about 9 percent. Trade between the United States and Canada is growing. Between 1985 and 1992, the value of U.S.-Canadian trade increased by about \$33 billion, or 21 percent. Trade with Canada currently accounts for about 20 percent of U.S. total merchandise trade with the world.

Total trade with Mexico has even stronger growth, fueled by Mexico's liberalization of tariff and trade restrictions in 1986. From 1986 through 1992, total trade grew from approximately \$30 billion to \$76 billion, an increase of 153 percent. Mexico is now the United States' third largest export market; U.S. exports increased from \$12.4 billion in 1986 to \$40.6 billion in 1992.

North American Free Trade Agreement

The United States, Canada, and Mexico signed the North American Free Trade Agreement (NAFTA) on December 17, 1992. The NAFTA will create the largest free trade zone in the world, comprising over 360 million consumers with a combined annual output of \$6 trillion. Through progressive reductions, the NAFTA eliminates all tariffs on industrial and agricultural goods produced by the three countries. Approximately 50 percent of U.S. exports to Mexico will enter Mexico completely duty-free on the day the agreement enters into force. Mexican tariffs on all remaining industrial products and most agricultural items will be phased out over 5 to 10 years. Reductions in tariffs on trade between the United States and Canada were negotiated in 1987 and incorporated into a U.S.-Canada Free Trade Agreement. This agreement remains in effect, augmented by additional changes included in the NAFTA.

Judging from recent experience, the NAFTA should result in further increases in U.S. trade with Mexico. For example, the U.S. Department of Commerce estimates that the NAFTA will result in increases in U.S. automotive exports to Mexico of up to \$1 billion in the NAFTA's first year alone due to the lowering of various Mexican tariff and non-tariff barriers.

The dramatically increased trade with Mexico over the past seven years has aggravated conditions at an already congested U.S.-Mexican land border. Similar problems exist on the U.S.-Canadian border as well. While the NAFTA would help boost trade among the three countries, the degree to which it would increase border congestion is unclear. The NAFTA will eliminate a number of transportation practices and restrictions currently in place that contribute significantly to congestion at land border crossings. At some crossings, as many as 20 percent of commercial vehicles cross empty because of current limitations on access in both countries. Thus, while the NAFTA's tariff reduction provisions will tend to boost trade and vehicle traffic across the southern border, the NAFTA's provisions will also tend to reduce the number of empty commercial vehicles crossing the border.

Both Mexico and the United States restrict access for motor carriers from the other country. U.S. trucks are prohibited from crossing the border into Mexico, for example, while Mexican trucks are permitted in the United States only as far as the commercial zones along the border which are designated by the Interstate Commerce Commission.

The NAFTA creates a timetable for the removal of barriers to the provision of cross-border motor carrier services, thereby permitting international passengers and cargo to be transported more efficiently. The NAFTA's transportation provisions will eliminate the need to transfer cargoes and trailers at the border, thereby reducing the number of trucks that cross the border empty and eliminating a significant cause of congestion at border ports of entry.

Patterns of Trade

Canada

The largest concentration of trade with Canada, both to and from a single region of the United States, is in the Great Lakes area, including Wisconsin, Michigan, Ohio, Indiana, and Illinois. In 1992, this region alone accounted for 39 percent of the value of U.S. imports from Canada and 36 percent of the value of U.S. exports. Much of this is accounted for by the high value automobile trade focused between Michigan and Ontario.

The second largest regional concentration of trade is in the mid-Atlantic area, which includes New York, New Jersey, and Pennsylvania. The third largest is in the New England states. Together, states in the three eastern regions account for 65 percent of Canada's exports to the United States and 60 percent of U.S. exports to Canada when measured as value of trade.

Mexico

The largest concentration of trade with Mexico to date has been in the southern border region. Texas dominates U.S. export trade with Mexico, with over \$17 billion in 1992. California is second, followed by Arizona, Michigan, and Illinois. The principal destinations in the United States for imports from Mexico are Texas, California, and Michigan.

Transportation Patterns

In terms of value, most cargo transported between the United States and Canada and the United States and Mexico travels by highway or rail--80.2 percent of total U.S.-Canadian trade in

1992; 86 percent of total U.S.-Mexican trade in 1992. Between the United States and Canada, movements by air account for about 10 percent of cargo transported. Between the United States and Mexico, water transportation accounts for a 10 percent share of total cargo transported in terms of value.

On the northern border, the eastern ports of entry in Michigan, New York, and New England handle more than 80 percent of cross-border traffic. Of the remaining traffic, the Washington ports of entry handle about 70 percent of northwestern cross-border trade and highway traffic volume.

Along the U.S.-Mexico border trade flow is heavily concentrated at seven major border ports of entry--El Paso, Otay Mesa, Laredo, Brownsville, Calexico, Nogales, and Hidalgo. The busiest port of entry for commercial trucks is at El Paso; the busiest port of entry for rail traffic is Laredo.

Trade Flow Transportation Patterns

The report addresses trade flow patterns rather than trade corridors for the major areas of North America. The study team did not find a firm definition of what constitutes a trade corridor for all modes of transportation.

Most trade flow patterns between the United States and Mexico and the United States and Canada can best be described as intraregional in nature. The communities on both sides of the northern and southern borders have developed regional economies that are truly binational. There are high levels of cross-border commuting, shopping, and movement of goods and services to support these binational regional economies. These movements are best accommodated by regional transportation systems.

In addition, there are trade movements between production regions and between production and consumption regions. Often, these areas are far apart; occasionally, the trade is between contiguous regions, such as between the densely populated manufacturing sections of the eastern United States and Canada.

Eastern U.S.-Canadian Trade Flow Transportation Patterns

Groups of individual land border crossings are called frontiers or gateways in this report. The Niagara and Michigan frontiers are at the center of the major trade between the United States and Canada. In addition, these frontiers account for the largest portion of U.S.-Mexican trade that does not originate in Texas or California. While the largest portion of freight to and from Mexico crosses the Texas border at Laredo, it is carried on

transportation routes originating in Montreal, Toronto, Buffalo, southeast Michigan, and Chicago. These routes are critical to an integrated North American market.

Western U.S.-Canadian Trade Flow Transportation Patterns

The pattern of U.S.-Canadian trade in the west tends to be organized into three somewhat distinct cross-border trading subregions: the Pacific Northwest, the Rocky Mountains, and the Upper Plains. The flow of trade at the border is focused through relatively few major crossings. While some dominant interregional flows are associated with trade to and from these border gateways, trade flows beyond the border are highly diffuse, with as many east-west flows as north-south flows to and from the border.

U.S.-Mexican Trade Flow Transportation Patterns

Three existing and two emerging trade areas, linked to major border ports of entry, were identified: South Texas, West Texas, New Mexico, Arizona, and California. These are not broad continental corridors in the sense that they connect regions of the United States with regions in Mexico or regions in Mexico with regions in Canada. Rather, they tend to be the funnels through which trade and people pass. Beyond the border region, trade flows in a more diffuse pattern. In addition to serving as convenient crossing points for binational trade, these areas also serve local economies of integrated services, industries, and trade.

PRINCIPAL FINDINGS

- Volumes of trade and traffic will continue to increase among the three North American countries. The traffic growth rate at both the U.S.-Canadian and U.S.-Mexican borders has been increasing at rates significantly higher than average national growth rates, particularly at the southern border.
 - Passenger traffic through U.S.-Canadian ports of entry in the eastern region is projected to increase at a rate of 6.2 percent a year through 1997. Total trade through eastern ports of entry is projected to reach \$160 billion by 1997, resulting in an increase in commercial traffic to between 8 and 9 million vehicles or an average annual growth rate of between 5 and 7 percent through 1997.
 - U.S.-Canadian trade processed through border ports of entry in the western region is also expected to increase. U.S. exports to Canada are projected to increase by 16 to 24

percent in the next ten years. Canada exports to the United States are projected to increase 24 to 34 percent over the same period.

- With ratification of the NAFTA, the projected increase in trade between the United States and Mexico will be much larger. U.S. exports to Mexico are projected to increase between 65 and 70 percent by 2000. Mexican exports to the United States through the South Texas ports of entry are projected to increase 120 percent; exports through the West Texas-New Mexico ports of entry should increase by 110 percent; exports through Arizona are projected to grow by 85 percent; and exports through California are projected to increase by over 200 percent.
- The facilities immediately at the border crossings, principally bridges and tunnels plus facilities housing Federal inspection agencies (the U.S. Customs Service, the U.S. Immigration and Naturalization Service, the U.S. Department of Agriculture and their Mexican and Canadian counterparts), are adequate and will remain so for the foreseeable future, even with the anticipated increased in trade. The General Services Administration (GSA) is completing a \$364.5 million Southwest Border Capital Improvement Program that will enable southern border crossing facilities to accommodate 8.4 million trucks annually. Approximately 2.3 million trucks entered the United States from Mexico during Fiscal Year 1992.
- Arterials leading to and from border crossing sites are part of the border approach infrastructure. Today they are under stress and will be hard pressed to handle significantly greater amounts of cross-border traffic. The GSA improvements cited above are confined to facilities at border crossings which handle traffic and inspection. The GSA improvements do not extend beyond the immediate crossing area to roads and other transportation channels. These arterials connect border crossings to the main interstate and interregional transportation system within the United States. They are badly in need of repair and upgrading.
- In addition to needed improvements in access to the border crossing points, some incremental improvements to transportation systems in the United States may be necessary to handle increases in both domestic and international trade. These include improvements in access to inland ports, seaports, airports, and intermodal transfer facilities.

- Communities that adjoin busy international border crossings face special problems resulting from the concentration of trade-related traffic, including congestion of local arterials with accompanying delays in travel times for local residents and deterioration of air quality, safety risks associated with heavy vehicle traffic, and increased deterioration of highway infrastructure.
- Border states, in distributing Federal highway funds, seem not to have allotted sufficient funds to border communities for improvements to border crossing approaches. The reason, in some cases, is because of competing priorities within states and in other cases because of legal limitations prior to ISTEA on the use of such funds for access roads to certain crossings (e.g. toll bridges). New sources of infrastructure funding and improved methods for its allocation appear necessary.
- A significant proportion of the delays at border crossings are not due to a lack of adequate infrastructure, but is caused by volume of trade, by complexities of inspection requirements, and by less than optimal traffic management and cargo clearance procedures. The responsibilities of the inspection agencies require that many vehicles undergo lengthy, thorough inspections. Inadequate or incomplete paperwork accompanying cross-border shipments is common and constitutes another source of delay. Improvements appear to be needed in a combination of partnerships and technology applications to resolve some delay problems.
- Inspection agency staffing shortages can lead to excessive waiting time at border crossings. Traffic at most crossings is typically concentrated during peak hours, and border facilities often are idle for long periods during off-peak hours. More efficient use of border facilities could spread traffic over a longer period during the day, and thus alleviate some congestion.
- Policies and practices of foreign governments often contribute to congestion at the border. For example, inspection agencies on both sides of the border work different hours.
- Infrastructure and facilitation planning for major border crossings is fragmented and inadequate. The Federal government maintains an interagency group that coordinates review of proposals for additional crossings on the southwest border, but it does not deal with border communities or with planning of ancillary roadway or other needs beyond the crossings themselves. Adequate planning will require improved coordination among public and private entities, and among

Federal, state, and local governments. Such planning should be binational and applied to both the northern and southern borders. The Federal Government should have the lead role as regards the involvement of foreign government entities. The Federal Government should also take on a leadership role as facilitator and convener of the mix of domestic government entities.

- There is insufficient linkage between available data on trade and transportation to permit the establishment of a firm definition of what constitutes an existing or emerging international trade corridors for all modes of transportation.

PRINCIPAL RECOMMENDATIONS

Transportation Infrastructure Investment—Section 1089 of the ISTEA directs the Department to evaluate the feasibility and advisability of establishing a discretionary border infrastructure investment program. While the Department is certainly capable of implementing such a program if it were established by the Congress, we do not believe it to be an advisable course of action. Even though the Department finds that investment is needed to address deficiencies in highway approaches to ports of entry and intermodal facilities, a number of alternative actions to the discretionary program are recommended:

- Fully fund the ISTEA to provide additional resources for states to allocate to trade-related and other high priority projects.
- With state and local governments, private financial institutions, carriers, and other private interests, develop a range of funding options for infrastructure improvements, emphasizing existing Federal, non-Federal, and potential private sources. Identify, and eliminate wherever possible, impediments in Federal programs to innovative public/private collaborative efforts.
- As part of a future surface transportation authorization bill, develop Federal-aid program options to improve transportation infrastructure related to international trade, including border approach roads and connections to port, airport, and other intermodal facilities.

Border Station Congestion—The Department will support a task force or multi-task forces composed of Federal, state and local government agencies, and the private sector to address congestion at border crossings in general or at specific gateways or

crossings. The purpose of the task force(s) is to identify critical border initiatives and to aggressively promote the use of new technologies and other non-capital intensive methods of facilitating the movement of people, cargo, and vehicles through major border crossings. Any initiatives should be closely coordinated with the Mexican and Canadian governments. A limited number of pilot projects could be undertaken through a competitive process to address congestion at various gateways. Funding for these projects could include a variety of Federal, state, local or private resources.

Transportation Planning and Data Needs—To assure that planning for future border trade-related infrastructure and technology requirements for all modes is included in state and national planning processes, the Department of Transportation and other Federal agencies should establish binational planning zones to engage in an integrated binational planning process. Planning for infrastructure and technology improvements in these zones would be coordinated with Federal, state, local, and private sector organizations that would identify improvement priorities. Cross-border consultation and coordination would be an integral part of the overall process.

To further assist in future border region and trade corridor transportation system planning, it is advisable to develop and implement a program for improving methods of collecting and analyzing data on cross-border trade and traffic flows.

CHAPTER 1: OVERVIEW

INTRODUCTION

Mandates

Section 1089 of the ISTEA requires the Department to conduct a study of the need for and feasibility of a program for border crossings that is discretionary and that streamlines infrastructure improvements. While not a part of the Section 6015 study, it uses some of the data and information acquired for that study. A report of the results and recommendations to the Congress is also required for this study. Chapter 6 provides a summary of the details of this study.

Section 6015 of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 directed the Department of Transportation (DOT) to perform an international transportation trade route study. It requires a multimodal assessment of existing and emerging trade routes and transportation subsystems that ease trade between Canada, the United States, and Mexico. The study addresses the borders and their approaches that connect the United States with Canada and Mexico. Also addressed are corridors through the United States that connect to Mexico and Canada. The scope includes each transportation mode, intermodal and multimodal transportation methods, and associated issues. Also included are economic development and transportation improvements needed to support economic growth. This report to the U.S. Congress documents specific multimodal transportation actions to simplify commerce between the countries. Recommendations include efficiency improvements to transportation subsystems, methods for increasing transport productivity, and the use of advanced technology to facilitate trade. Lastly, the report describes new institutional arrangements for planning, designing, and implementing the recommended improvements. Chapters 2 through 5 provide a summary of the details of this study.

Under departmental delegation, the Federal Highway Administration's (FHWA) Office of Policy directed these studies. Chapter 7 provides the findings and recommendations resulting from these studies.

North American Free Trade Agreement (NAFTA) Context of the Study

These studies were conceived by the Congress as a necessity before the North American Free Trade Agreement (NAFTA) came into being. However, they were conducted during the emergence of and activities related to NAFTA in all three countries. The importance of these studies has increased because they have been completed and the reports prepared at the same time that NAFTA is being debated in the United States. The studies provide

information and insight into the ways the efficiency of transportation can be increased under NAFTA conditions and other assumptions about trade development.

The NAFTA would join the United States, Canada, and Mexico into the world's largest free-trade bloc with a combined population of 370 million and combined gross domestic products of \$6.45 trillion. NAFTA and the side agreements address six important areas: market access, trade rules, services, investment rules, intellectual property, and dispute settlement. Many issues will be left for harmonization negotiations that take place after the adoption of the agreement. Harmonization negotiations will include many important transportation issues such as land transportation safety and truck size and weight limits. Major provisions of the agreement include motor vehicles and parts, auto rule of origin, telecommunications, textiles and apparel, financial services, investment, agriculture, truck transportation, intellectual property rights, and environment.

Border Crossings

The requirement for these studies in the ISTEA recognizes that border crossings are a problem that could get worse. Among the findings of the public outreach efforts discussed below are that there is considerable local concern regarding traffic resulting from trade. There are backups at some crossings which cause congestion beyond the crossing. Based on the public outreach efforts and discussions with shippers, carriers, and brokers during visits to some of the crossings, we found frustration about these conditions. Conclusions we have reached about the reasons for these conditions relate to improvements needed in physical infrastructures, practices and staffing by inspection agencies, and shortcomings in international, state, and local planning.

The focus of the study is on border crossings and other ports of entry that link the United States with Canada and Mexico. Generically, there are three broad physical areas at border crossings which are dedicated to international trade: facilities for approaching the inspection facility; facilities to accommodate Federal enforcement, regulatory and inspection functions; and facilities for leaving the inspection facility (egress). Transportation facilities beyond these approaches and egresses are not dedicated to international trade and transportation, per se. They serve the domestic and international trade needs for transportation services. However, they also serve as the transportation links that provide access to the border crossings.

Border crossing facilities are the physical structures at or in the vicinity of a border that are dedicated to enforcement of Federal Government laws and regulations related to the inspection processes by which people enter the country, and by which goods are imported and exported. Broker services, i.e., the preparation of documents and coordinations between shippers, carriers, and receivers of goods, and collection of tolls may also be accommodated in border crossing facilities.

Federal inspection agencies are responsible for the inspection processes and the enforcement of laws and regulations. The specifics about the Federal inspection agencies are detailed below. These agencies include the U.S. Customs Service (Customs), U.S. Immigration and Naturalization Service (INS), U.S. Department of Agriculture, Plants and Animal Products, (USDA/APHIS), Food and Drug Administration (FDA), and Border Patrol. Each agency is responsible for different aspects of the immigration and import-export laws and regulations. For example, while U.S. Customs has the responsibility for enforcement of laws covering inspection of most manufactured products, certain drugs are the responsibility of the FDA, and certain agricultural and live animal products are the responsibility of the Department of Agriculture. On the other hand, the Border Patrol mission focuses on enforcing immigration laws along the border. All of these agencies are collectively known as the Federal inspection services.

Border crossing facilities are located at land (rail, highway) crossings and other ports of entry which service persons and goods transported by marine, air and intermodal modes of travel. The facilities include the border crossing station, accommodations for inspection of immigration and cargo documentation, in-depth inspection of cargoes, collection of tolls and tariffs, and other enforcement needs.

The following facts give an idea of the magnitude of the border crossing and port of entry challenge in the United States.

- The total length of the U.S.-Canadian boundary is 5,525 miles. There are 28 major land entry ports at the border, 13 in the northwestern United States and 15 in the northeast at which bulk commodities are processed. In total, there are about 130 land ports of entry on the U.S.-Canadian border.
- The total length of the U.S.-Mexican boundary is 1,933 miles. There are 16 land crossings, 23 bridge crossings (22 entry points) into Mexico. Of these, seven are major land entry ports at which bulk commodities are processed.

- The total length of the Gulf of Mexico coastline is 1,631 miles. There are 51 U.S. marine ports in the east which handle trade with Mexico. Of these, 14 are major ports 9 of which are in the Gulf of Mexico.
- All the Federal inspection services--U.S. Customs, INS, USDA, and FDA, are located at the 35 major land ports of entry. At other land ports, the capability to perform the inspection functions is present, but not necessarily by personnel from each agency.

Decisions about the location of international bridges and land crossings to Canada and Mexico are governed by an approval process which is under the jurisdiction of the Department of State by the authority of the International Bridges Act of 1972. Presidential Permits are permission to build international bridges and land crossings. They are required to be approved by the Secretary of State for international bridges and land crossings as stated in the International Bridges Act of 1972. The approval of Presidential Permits for proposed bridges and land crossings at the U.S.-Canadian border is handled through the Office of Maritime and Land Transport. U.S.-Mexican proposals are handled by an interagency committee chaired by the U.S.-Mexico Border Affairs Coordinator. The Interagency Committee on Bridges and Bridge Crossings has representatives from 10 Federal agencies who participate in the decision process. These agencies are the General Services Administration (GSA), Customs, INS, FHWA, Federal Railroad Administration, Coast Guard, International Boundary and Water Commission, FDA, the Department of Commerce, and the USDA. Sponsors of proposals apply for permission to build international bridges and land crossings. Permission is granted through the issuance of a Presidential Permit by the Department of State. The interagency committee reviews applications for Presidential Permits for international bridges and international land crossings and provides its views to sponsors of the bridge and crossing projects and the Department of State. When the interagency committee meets with its counterparts in Mexico, the entity is known as the Binational Committee on Bridges and Border Crossings. State and local agencies and private sector entities participate, as they are typically the proposers of bridges and land crossings. The process for approvals of Canadian bridges and land crossings is not as detailed as that for those at the Mexican border.

Funding for construction and maintenance of border crossing stations are provided by the GSA, state or local government agencies, or private entities. At some ports of entry, three or more entities may be responsible for the property or the

facilities. However, responsibility for the border crossing inspection processes remains with the Federal inspection agencies.

Decisions about Federal investments in border crossing stations are based on the annual identification of the top ten border station priorities made by the Federal inspection agencies. The construction of the actual inspection facilities at border stations are the responsibility of the GSA. There are regularly scheduled meetings between GSA, its counterpart agencies in Canada and Mexico, and the Federal inspection agencies.

Construction of roads, highways or bridges, that span the border may be funded through and built by other Federal, state or local government sources or private entities. These approaches and egresses of the border crossing inspection facilities are part of border crossings and are of key importance to their efficient functioning.

Inspections

When persons are entering the country and when goods are being imported or exported, laws of the United States require inspection of documents pertaining to the persons' nationality and the vehicles and goods that accompany them. Inspection of documents only is considered a primary inspection and is done at the primary inspection facility. For example, for highway crossings, these primary inspections occur at the booths which are staffed by inspection personnel. Inspection of goods, i.e., a person's belongings or a vehicle's cargo, is a secondary inspection. Persons, vehicles, and the goods they carry may be subject to both primary and secondary inspection. For commercial cargos, a broker is involved in facilitating the documentation process and communications between the shipper, carrier, and the recipient of the goods. Brokers are private sector businesses providing services to shippers, carriers, and recipients of commercial goods. They are usually located at or near border facilities. If the documentation of the cargo is not in order, the Federal inspection agencies may not release the cargo and there is delay. The Federal inspection agencies apply laws and regulations to determine whether a more detailed or secondary inspection is needed. This decision may be based on the type of cargo or a random selection of cargos to be inspected in-depth.

Line release is a program that applies to specific commodities from specific shippers who have demonstrated reliability in their shipments and documentation. The shipper's broker preclears the qualifying shipment, for all practical purposes eliminating the need for inspection at the border.

Inspections do not always occur at the border, per se. Sometimes the actual physical border is located in the middle of a bridge or in a tunnel on the access to the physical location where inspections occur and tariffs are collected. In this example, the enforcement functions associated with crossing a border are conducted beyond the physical point of a border crossing. One alternative plan calls for placing the border station facility on the approach to the physical border crossing in the other country. An example of such a plan is at Peace Bridge in Buffalo, N.Y.

There are four major U.S. agencies with on-border inspection responsibilities. These are Department of Treasury, Customs; Department of Justice, INS; Department of Agriculture (USDA), APHIS and Meat and Animal Products Import Inspections; and FDA.

Following is a summary of the border responsibilities and staffing of each agency.

The mission of the U.S. Customs is to administer and enforce laws and rules for certificates of the origin regarding importation of legal substances. At the border, Customs makes determinations about certificates of origin, i.e., inspects certificates of origin issued by every manufacturer which exports to the United States to assure original signatures, denies preferential admittance whenever there are violations, assures that U.S. importers file certificates of origin with other entry documents and certifications; and conducts verification visits to the manufacturers and exporters in other countries to assure product origin. Most importantly, Customs acts as a border control mechanism, or check point, and provides referrals to USDA, FDA and INS. Further, Customs represents 40-60 other Federal agencies to carry out their border inspection missions. Customs develops automated systems to improve its targeting and enforcement mechanisms. There are more than 2,500 uniformed agents--1,573 for the 7 major U.S.-Mexican ports of entry and 960 for the U.S.-Canadian 28 major ports of entry which handle bulk commodities.

The mission of INS related to ports of entry is to administer the immigration and naturalization laws relating to the admission, exclusion, deportation, and naturalization of aliens; inspect aliens to determine their admissibility to the United States; adjudicate requests of aliens for benefits under the law; guard against illegal entry into the United States; investigate, apprehend, and remove aliens in this country in violation of the law; and examine alien applicants wishing to become citizens.

At the border, INS inspects persons arriving at the United States ports of entry to determine admissibility; inspects requests for admission to an immigration status according to immigration law; supervises refugee and parole programs including processing persons for conditional entry, and humanitarian parole requests for aliens outside the United States; and examines applicants for naturalization. At airports, there may be one-stop inspection where persons are inspected for immigration and customs at the same time. The Border Patrol is the field law enforcement arm of the INS.

The USDA's meat and poultry import mission is to develop and enforce import inspection standards that assure that meat and poultry products are safe, wholesome, and properly labeled. Its authority is the Meat Service and Poultry Products Inspection Acts. The agency develops import inspection standards to assure that exporting countries have proper operating controls to be eligible to export to the United States; conducts inspections in importing countries; reinspects each lot to ascertain the condition of the products and proper labeling; maintains an electronic history by country to detect patterns for specific meat and poultry plants; and issues a certificate stating that the lots meet U.S. inspection requirements. The agency devotes one staff year at the U.S.-Mexican border, at which there is a lower meat and poultry import activity than at the Canadian border.

The USDA/APHIS mission is to protect U.S. agriculture from pests and diseases that could affect the production and distribution of agricultural goods in interstate and international commerce. APHIS works with international standards organizations to harmonize standards, develops and maintains surveillance and monitoring systems, enforces rules of origin on growers and processors of crops and livestock, and inspects and verifies certificates of origin and sanitation (along with invoices and bills of lading) from shippers. There are 26 laws which give the authority to protect the U.S. animal and plant health (livestock and crops). There are a total of 15,000 inspectors, 316 of which are located at the 7 major ports that process imports at the U.S.-Mexican border.

The FDA ensures food safety by the enforcement of the Food, Drug and Cosmetics Act regarding pesticides, laboratory testing and, working with the EPA's Pesticides and Toxic Substances Unit, enforces the levels of pesticide tolerances for produce. The agency establishes systems, criteria and enforcement procedures, provides automatic detention lists for Customs controls, and

develops and implements enforcement procedures at the border. There are 15 inspectors at the 7 major ports of entry on the U.S.-Mexican border.

Congestion may occur on the approaches to the inspection facility because of imbalances between the number of vehicles and persons to be served and the number of personnel on duty or primary inspection facilities open, inadequate paperwork from brokers, or limited storage space for vehicles with cargos that are awaiting inspection. Such delays may cause congestion if the access facility is not able to accommodate the number of vehicles awaiting service. Procedures have been instituted in some cases to speed up the release of vehicles and cargos upon their arrival at the inspection point. However, if there are already delays on the access facility, the vehicle that has an expedited release process still must wait to get to the inspection point. One option often suggested for reducing the number of vehicles awaiting secondary inspection is to locate secondary inspection facilities away from the border crossing station facility; however, the use of off-site facilities is viewed by Customs as a risk to effective law enforcement.

There are Federal and state requirements for ensuring the safety of commercial vehicles in the United States. The Federal responsibility is vested in the FHWA's Office of Motor Carriers. Commercial vehicles are selected from the highway vehicle stream and inspected on a systematic basis throughout the state. At border crossings, there is usually no provision for Federal and state agencies to work in the same space. To fulfill their responsibilities, state agencies provide facilities beyond the egress areas to inspect trucks coming into the country.

Data

The data used for this analysis are primarily from those Federal agencies in the three nations charged with maintaining trade statistics and those collecting data for operating purposes. The primary sources for trade data were Statistics Canada, the Foreign Trade Division of the U.S. Bureau of the Census, and the Mexican Secretaria de Comercio y Fomento Industrial (SECOFI). Additional data sources include U.S. Customs Service, U.S. INS, U.S. Travel and Tourism Administration, and various bridge and tunnel facility owners and operators.

Data were collected in terms of value, reported in U.S. currency; weight, where available; and vehicle counts. Unfortunately for this analysis, weight measures are not consistently available for all modes. They were available for air and marine shipments only. In addition, data for vehicle counts at crossings are not

directly linked to commodity flows within the other data sets. Therefore, the trade patterns described below are in terms of value.

Detailed analyses were performed for trade and traffic flows between the United States and Canada across the eastern and western borders. Detailed reports, listed in Appendix A, which address the data used in the analysis are:

Regional Data Base and Working Paper on Regional Computerized Data Base.

Inventory of Existing Trade, Traffic and Visitor Flow Data Sources.

Working Paper on Data Requirements for Intermodal Planning and Analysis.

U.S. and Canadian data provide an estimate of the state or province of origin for each country's exports. The data also provide an estimate of the state of destination for U.S. imports. These estimates are not precise for a variety of reasons discussed in the studies underlying this report. However, the level of accuracy is considered adequate for the current analyses. For Canadian imports, the data only permit a calculation of the province for the port of entry.

U.S. data permit the estimate of the state of origin of exports to Mexico and the Mexican port of entry and the state of destination of imports from Mexico and the Mexican port of exit. Mexican data permit comparable information, i.e., Mexican state of origin and port of exit and Mexican state of destination and port of entry.

SECTION 1089 STUDY

During the time that the Section 6015 study was conducted, the DOT's Volpe National Transportation Systems Center (Volpe) led the Section 1089 study. Meetings were held with selected highway agencies of major import and export states to discuss the feasibility of a discretionary highway program specifically directed at border crossings. A one-day session was held in Cambridge, Massachusetts, to gather views on the feasibility of a discretionary infrastructure program. This outreach meeting on discretionary infrastructure involved a panel of experts from state transportation agencies. The study team structured their exploration of the feasibility and advisability of a highway infrastructure program directed to border areas in terms of project selection criteria, implementation, relationship to

ISTEA, funding sources, and roles. They also examined data and information on trade and highway transportation patterns. The study is summarized in Chapter 6. In part, the program initiative, the International Trade and Intermodal Transportation Program described in Chapter 7, is an outcome of the examination of the data collected for the Section 6015 data, discussions with key highway transportation providers, and the outreach effort. The detailed report of the Section 1089 study is listed in Appendix A, Final Reports, and is titled *Feasibility Study for an International Border Highway Infrastructure Discretionary Program*.

SECTION 6015 STUDY

While the requirement for the study was defined in ISTEA in December 1991, delegation and funding earmarked to conduct the study became available in October of 1992. Initially, the FHWA proceeded with a modest plan to produce the study and report through existing staff and an interagency agreement with the Department's Volpe National Transportation Systems Center and with the Center for the New West. With the 1992 DOT Appropriation, the original plan was expanded to incorporate a more detailed study analysis over a 10-month period.

The study permitted separate treatment of the eastern and the western sectors of the United States. The study components for the United States and Canada were completed for the northwestern and northeastern United States and the adjacent Canadian provinces. Similarly, for the United States and Mexico, the study addressed the southwestern states and southeastern Gulf and inland waterway ports. The treatment of trade in geographical segments was done to assure that the issues unique to each were identified and addressed.

Report Organization

The FHWA study plan was developed to define the scope of the Section 6015 study beyond the minimal requirements of the congressional direction. The organization of this report follows the key parts of this study plan--existing patterns of trade and transportation, existing and planned status of physical and institutional infrastructure at the borders, projections of future trade and traffic trends, and perceptions of the existing and future conditions by the public and private sectors. The report presents information about each key part of the expanded study plan for the U.S.-Canadian border areas, i.e., the northwestern and northeastern U.S. states that border Canada; and the U.S.-Mexican land and water border areas.

Existing Patterns

Patterns of trade, and the transportation modes used for that trade, were established through analysis of data about trade and transportation gathered from databases in the United States, Canada, and Mexico. The purpose is to describe the existing amount and content of trade and extent of the use of transportation modes. A delegation met with transportation officials in Canada and Mexico to develop agreements on the collection of data from these governments.

Chapter 2 describes current conditions in terms of trade flows, border traffic flows, and existing and emerging transportation patterns for trade flows on a national and regional basis. All modes and intermodal facilities are included as well as identification of and maps depicting existing trade and traffic flows among the North American trading partners. The chapter also presents estimates of the patterns of current trade and traffic flows. The identification of trade corridors per se is limited by the absence of data about interstate origin and destination traffic data and lack of precise shipping documents indicating the U.S., Mexican and Canadian destinations of cargos. One example of the latter is the use of corporate headquarters' addresses in one state or province as the destination of cargo when in fact the actual destination is a branch of that corporation in another state or province.

Reports listed in Appendix A which address current conditions of trade and transportation in detail are:

An Assessment of the Adequacy of East Coast and Gulf Port Infrastructure to Accommodate Trade with Mexico.

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 2: Transportation and Trade Expansion in Western U.S. and Canada and Volume 3: Transportation and Trade Expansion between the U.S. and Mexico

There are additional working papers listed in Appendix A which address the data used in the analysis:

Regional Data Base and Working Paper on Regional Computerized Data Base.

Inventory of Existing Trade, Traffic and Visitor Flow Data Sources.

Working Paper on Data Requirements for Intermodal Planning and Analysis.

Existing and Planned Status

The existing and planned status of physical border infrastructure and institutional border infrastructure systems were determined through direct observations of and conferences with staffs and users at border crossings and ports of entry. The purpose is to develop a factual basis for perceived conditions by collecting and analyzing specific data and information about operations and conditions at borders and ports of entry.

Chapter 3 provides data on the capacity for anticipated growth and any known problems with the ability of the existing physical facility and institutional arrangements to handle trade and traffic flows. Institutional factors are those which relate to the missions, policies, responsibilities, and actions of various public, quasi-public, or private entities who have an interest in or in some way affect or are affected by regional transborder trade and transportation. These institutions include Federal, state, provincial, county, local, and private sector groups on both sides of the border. This discussion covers air, land (rail and highway), pipeline, marine and intermodal transportation. The DOT's Maritime Administration (MARAD) database is the primary source for the inventory of port facilities.

Detailed reports listed in Appendix A which provide profiles of border crossings are:

An Assessment of the Adequacy of East Coast and Gulf Port Infrastructure to Accommodate Trade with Mexico.

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings, Appendices 1. Descriptive Profiles of Maine Frontier; 2. Descriptive Profiles of Montreal South Frontier; 3. Descriptive Profiles of Eastern New York Frontier; 4. Descriptive Profiles of Niagara Frontier; and 5. Descriptive Profiles of Michigan Frontier.

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 4: Profiles of Western U.S. Canada Border Crossings, and Volume 5: Profiles of U.S. Mexico Border Crossings.

Institutional Profile Data Base and Working Paper on Institutional Profiles for Continental Trade and Transportation in the Western United States.

Future Trends

Projections of future trade and traffic trends were made using appropriate models to ascertain the direction of growth and use of transportation systems. The purpose is to quantify to the extent possible the adequacy of transportation systems to accommodate expected changes in patterns of trade.

Chapter 4 presents projection methods and the resulting baseline projections of trade and traffic patterns and estimates of potential patterns of trade and traffic flows. Because the potential for growth in maritime trade is a significant factor for U.S.-Mexican trade, its projections are discussed separately under that region. This potential is indicated by Mexico's recognition of the unused capacity and its planned investments in maritime port facilities and access roads. Major factors influencing past, current, and future flows are identified to assist in establishing likely patterns and ranges of uncertainty associated with these patterns. The factors include the economy of the regions, technology applications, intermodal trends, planned infrastructure, and institutional arrangements.

Recent historical trends in trade are reasonable indicators of where trade may go in the future when there is historical data covering a long period. This is the case for U.S.-Canadian trade, even taking into account recent events and conditions which have impacted U.S.-Canadian trade levels.

This is not the case for historical data about U.S.-Mexican trade. For this reason, a more structured model was used to forecast trade flows for the U.S.-Mexican border region. The forecasts are segmented by all transportation modes. The chapter includes the methodology used for the forecast, an explanation of the economywide forecast, future trade flows through the border gateways, and the growth of traffic at each gateway.

Detailed reports which describe the procedures for projecting future trade and traffic trends are:

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 2: Transportation and Trade Expansion in Western U.S. and Mexico; Volume 3: Transportation and Trade Expansion between the U.S. and Mexico.

Working Summary of Key Methods of Forecasting Trade and Traffic Patterns.

Perceptions of Existing and Future Needs and Conditions

The perceptions of the adequacy of physical and institutional infrastructure issues were examined through public outreach meetings involving private sector border users, facility owners and public sector transportation planners and implementers at the national, state/province, and local levels. The purpose of the meetings was to identify areas of concern and priorities of these concerns by subregion and region. Very often, perceptions of persons who have direct experience can increase the value of findings of data analysis and direct observations. Further, inclusion of persons in the public and private sector is a part of the National Transportation Policy which states that "all those who have a stake in efficient transportation must participate--Federal, State, and local governments, private businesses, academic institutions, transportation interest groups, communities, and individuals. The measure of our Federal policies will lie in their success at unleashing private resources and at using public resources most efficiently to meet the Nation's transportation needs."

In reporting the outcomes of these meetings, no attempt was made to filter or provide commentary about the perceptions of meeting participants. However, in formulating the findings and conclusions, these perceptions were analyzed and either supported or refuted by using the factual information found in the literature and collected from databases and visits to border crossings and other ports of entry. The outcomes are reflected in the conclusions detailed in Chapter 7. Literature sources used by the study teams and referenced in their reports are listed in Appendix B, Bibliography.

Participants at these meetings provided information and input into the findings and recommendations of this report. Nearly 1,000 persons representing the different transportation modes and state, local, and private sector trade and transportation interests participated in 13 formal meetings in the United States and one in Canada. About 40 percent of the participants were from the private sector. Air transportation was represented in only one of the meetings in the northwest. Nearly 400 participants were from public sector agencies in the United States, Canada, and Mexico. There were 63 participants from Canada and Mexico.

Some states presented formal documents at the meetings. Among the invitees to the roundtables and workshops were all known coalitions, associations and other groups representing communities that either border Canada or Mexico or share existing or emerging corridor alignments.

There were nine subregional one-day roundtables to discuss trade and traffic flow issues, and four two-day regional workshops to obtain reactions and develop future action agendas for facilitating international trade. At the invitation of the governments of Mexico and Canada, two additional meetings are planned for the last quarter of 1993. As part of the public outreach effort, the FHWA policy study representatives also addressed a variety of modal associations, other groups, and Governors at their invitation.

The eastern roundtable meetings were held in Buffalo, New York; St. Louis, Missouri; and Norfolk, Virginia. The northwestern roundtable meetings were held in Winnipeg, Manitoba; Billings, Montana; and Tacoma, Washington. The southwestern roundtable meetings were held in San Diego, California; Las Cruces, New Mexico; and Laredo, Texas. The futures assessment workshops were held in Whitefish, Montana; Detroit, Michigan; New Orleans, Louisiana; and Tucson, Arizona. As part of the public outreach effort, the FHWA policy study representatives have also addressed a variety of modal associations, other groups, and Governors at their invitation.

Chapter 5, *Views from the Regions*, summarizes the perceptions of the participants during these meetings. The titles of reports listed in Appendix A in which more detailed information about the public perspectives may be found are:

Summary of International Border Crossings Round Table Meeting Held in Buffalo, New York, June 7, 1993,

Summary of International Border Crossings Round Table Meeting Held in St. Louis, Missouri, June 9, 1993,

Summary of International Border Crossings Round Table Meeting Held in Norfolk, Virginia, June 11, 1993,

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 6, Reaching Out: A Compendium of Stakeholder Views, and

Results of the Futures Assessment Process.

Findings and Recommendations

Study conclusions and recommendations are based on all of these study components.

The last chapter, Chapter 7, develops conclusions, recommendations and program initiatives as to the issue of an discretionary highway infrastructure program and the ability of the border crossings and related transportation subsystems to handle current and likely future levels of demand.

Coordination

The study plan included recognition of the complexity of the subject (especially in light of the current status of the NAFTA), the variety of agencies involved in the establishment and operation of border crossing stations, and the requirement for government-to-government communications. Further, there is the valid interest of a diverse group of Federal, state, and local government agencies and private sector industry and interests to be kept informed in a timely manner.

The FHWA established a DOT-wide coordinating group for this study. The coordinating group includes representation from the Office of the Secretary of Transportation, other FHWA offices, Federal Aviation Administration, Federal Railroad Administration, Maritime Administration, Bureau of Transportation Statistics, and offices involved in international matters, intermodalism, policy, and budget. Working through the FHWA field offices and other entities, the FHWA identified and arranged for incorporation of the products of other relevant activities in the study. Further, the FHWA established continuing communications with U.S. governmental agencies--Customs, GSA, INS, and the Departments of State, Commerce, and Agriculture. These coordinating activities within and outside the Department resulted in continuing dialogue and provision of resources during the formal public outreach meetings.

The FHWA has met with the other agencies within the Department and with the Governors and legislative leaders of several southwestern states to provide information about the study. As a result, state and local officials and organizations interested in becoming involved in the study process as well as expert sources were identified.

Coalitions and associations representing communities that either border Canada or Mexico or share a corridor alignment have been established through local initiatives. Eastern and southwestern border groups are currently communicating and working together

for national efficiencies in North American trade and transportation. These groups have also established communications with their neighboring country's border communities. The FHWA encourages these groups, coalitions, and associations by acting as a broker, providing for the exchange of information and presentations of the specifics of the studies' requirements. All were invited to participate in meetings and workshops. All known groups, coalitions and associations, their missions, and addresses are listed in Appendix C.

CHAPTER 2: PATTERNS OF TRADE AND TRANSPORTATION

Patterns of trade and transportation modes used for trade were established through analysis of data about trade and transportation gathered from data bases in the United States, Canada, and Mexico. The purpose is to describe the existing amount and content of trade and the extent of use of transportation modes.

This chapter summarizes current conditions in terms of trade flows, border traffic flows, and existing and emerging trade flow patterns on a national and regional basis. All modes and intermodal facilities are included as well as identification of and maps depicting existing trade and traffic flows among the North American trading partners.

Also presented are estimates of the patterns of current trade and traffic flows and the identification of trade flow patterns. The precision of these tasks is limited by geographical distortions in foreign trade data and by the absence of data on the origins and destinations of passengers and vehicles. Reasons for these distortions include the use of shipper and consignee headquarters office addresses for origins and destinations of foreign trade rather than end points of the physical movement. U.S. and Canadian data provide an estimate of the state or province of origin for each country's exports. For Canadian imports, the data only permit a calculation of the province for the port of entry. U.S. data permit estimates of the points of origin and destination. One may estimate the state of origin for exports to Mexico and the Mexican port of entry. Also, one may estimate the state of destination for imports from Mexico and the Mexican port of exit. Mexican data, on the other hand, permit comparable information, i.e., Mexican state of origin and port of exit and the Mexican state of destination and port of entry.

The data used for this analysis are primarily from those Federal agencies in the three nations charged with maintaining trade statistics and those collecting data for operating purposes. The primary sources for trade data were Statistics Canada, the Foreign Trade Division of the U.S. Bureau of the Census, and the Mexican Secretaria de Comercio y Fomento Industrial, (SECOFI). Additional data sources include U.S. Customs Service, U.S. Immigration and Naturalization Service, U.S. Travel and Tourism Administration, and various bridge and tunnel facility owners and operators. A delegation met with transportation officials in Canada and Mexico to develop agreements on the collection of data from these governments.

Data were collected in terms of value, reported in U.S. currency; weight, where available; and vehicle counts. Unfortunately for this analysis, weight measures are not consistently available for all modes. They were available for air and marine shipments only. In addition, data for vehicle counts at crossings are not

directly linked to commodity flows within the other data sets. Therefore, the trade patterns described below are in terms of value.

Detailed analyses were performed for trade and traffic flows between the United States and Canada across the eastern and western borders and between the United States and Mexico.

NATIONAL PATTERNS OF TRADE

Trade involves merchandise and nonmerchandise trade. Merchandise trade involves the shipment of commodities. Nonmerchandise trade include services, such as travel services, passenger fares, and private business services. Trade flows are important to the development of transportation policy because commodity shipments and some services require efficient transportation infrastructure.

Statistics demonstrate that no trading relationship in the world is larger than the one between Canada and the United States. In addition, the United States' major trading partners, measured by the total value of two-way merchandise trade in 1992, include Japan and Mexico.

U.S.-Canadian Merchandise Trade

In 1992, merchandise trade between the United States and Canada totaled \$189 billion, with United States imports exceeding exports by about 9 percent, according to International Trade Administration figures. It is nearly two and a half times greater than trade between the United States and Mexico.

U.S.-Canadian trade is not only large, but growing. During the recent 7-year period, the value of U.S.-Canadian trade grew by about \$33 billion, an increase of 21 percent. These are gains of \$67 billion, a 55-percent increase, measured in current dollars or dollars unadjusted for inflation. United States trade with Canada currently accounts for about 20 percent of the United States' total merchandise trade with the world.

U.S.-Mexican Merchandise Trade

Total trade between the United States and Mexico over the 4-year period 1989-1992 showed a consistent growth. The growth began in earnest upon the acceptance by Mexico of the GATT in 1986. In recent years, the liberalization of Mexico's tariff and trade restrictions has proven to be advantageous to the United States. Total trade has grown from \$52.2 billion to \$75.8 billion, an

increase of 45 percent. During this period, imports from Mexico grew an annual rate of 8.9 percent; exports, however, grew at an annual rate of 17.6 percent. The higher rate of growth in exports led to having a positive balance of trade with Mexico in 1991 and thereafter.

Maquiladora (or maquila) trade has become a substantial portion of the trade growth between the United States and Mexico. U.S.-Mexican maquiladora trade is concentrated between the United States and Mexican border states and between the Mexico border states and the United States industrial northeast. Figure 2-1 shows the historical trends in the trade within Mexico for each type.

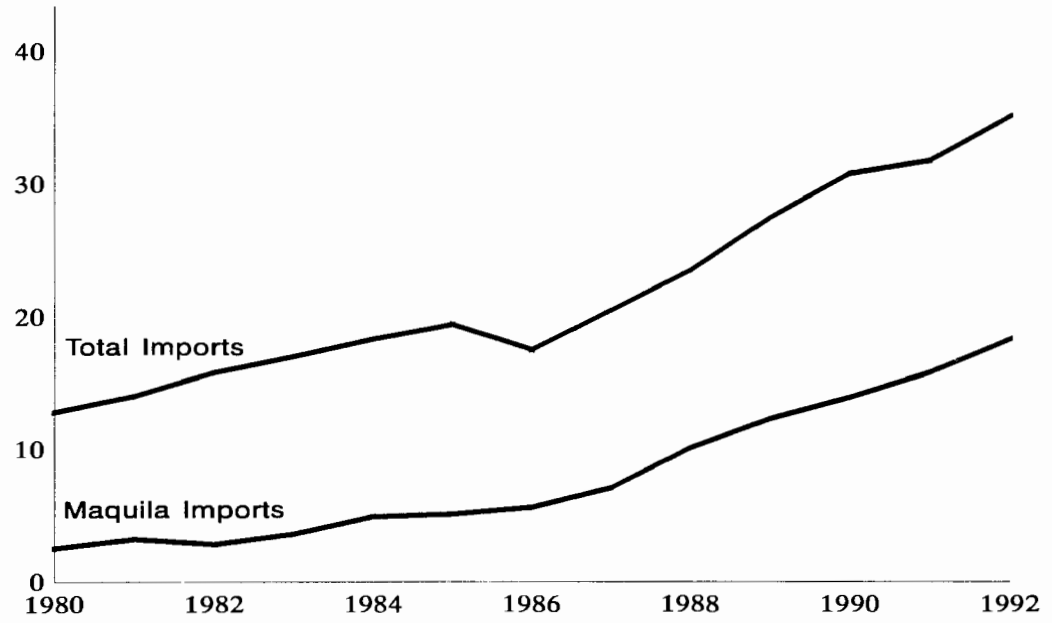
Maquiladora trade is composed of U.S. exports sent to and imports from maquiladora factories in Mexico. Maquiladora factories are manufacturing plants located in Mexico which manufacture products primarily with United States components. The products of these maquiladora factories are produced primarily for the United States market and become United States imports. A large percentage of these products are automotive, electrical component, and consumer goods. Maquiladora trade has become a substantial portion of the trade growth between the United States and Mexico. U.S.-Mexican maquiladora trade is concentrated between the United States and Mexican border states and between the Mexico border states and the United States industrial northeast. The maquiladora program emerged in the mid 1960s through an informal agreement between two Mexican Cabinet officials to relax Mexico's strict foreign investment, customs, and immigration laws in 1966. In 1971, it was formalized into law as the Border Industrialization Program.

In 1992, maquiladora trade represented \$16.6 billion compared to \$23.9 billion in traditional trade exports. For imports, the maquiladora trade represented \$18.2 billion compared to \$16.9 billion in traditional trade.

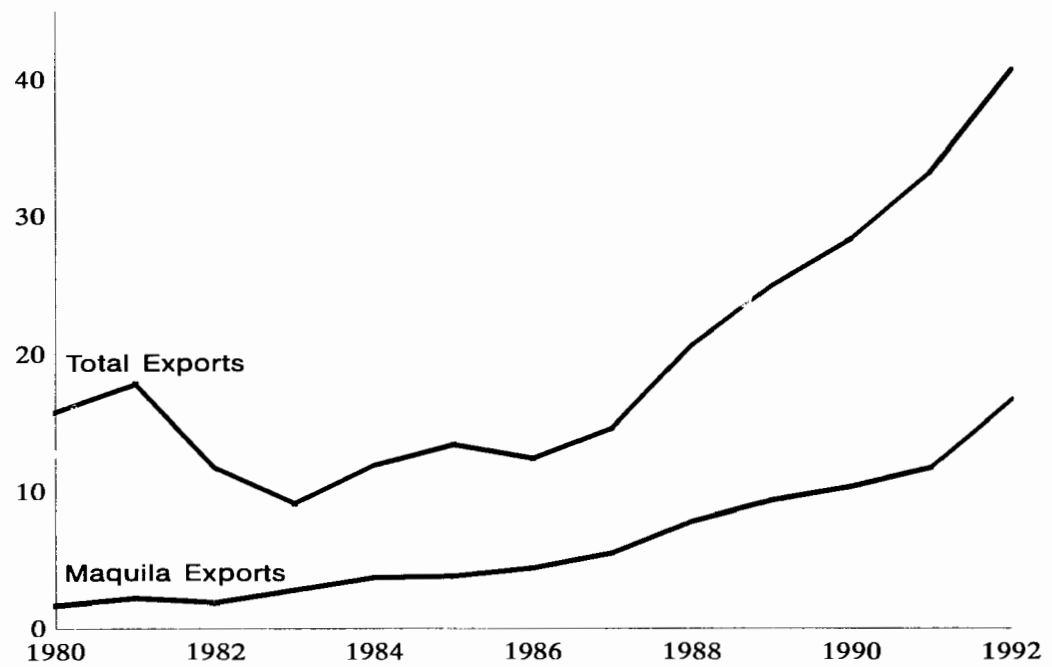
The percentage of maquiladora exports from the United States has grown from 12 percent of the export trade in 1980 to 37 percent in 1989 and 41 percent in 1992. Maquiladora imports to the United States have grown from 20 percent of the import trade in 1980 to 45 percent in 1989 and 52 percent in 1992. Maquiladora trade flows account for the majority of U.S.-Mexican trade flow increases in recent years.

By contrast, traditional trade has more diverse origins and destinations and is shipped further into Mexico. Traditional trade consists of products for Mexican consumers and input

FIGURE 2-1
HISTORICAL TRENDS IN IMPORTS AND EXPORTS



billions of dollars



components for Mexican manufacturers. The percentage of total import value which is traditional has declined in value from 80 percent in 1980 to 48 percent in 1992. Exports as a percent of total trade value has also declined from 88 percent to 59 percent.

Nonmerchandise Trade

The Bureau of Economic Analysis (BEA) estimates international investment trade and trade-in-services, nonmerchandise trade, as part of its International Transactions accounting system. The BEA estimates investment trade between the United States and Canada at \$9.9 billion in 1992, with \$8.7 billion of this accounted for by United States investments in Canada. By comparison, investment trade between the United States and Mexico is estimated at \$5.3 billion with \$3.9 billion of this accounted for by United States investments in Mexico.

According to BEA estimates, services trade between the United States and Canada totaled \$26.3 billion in 1992, up from \$23.9 billion in 1990. Exports by United States service providers in 1992 totaled \$17.7 billion. For Mexico, the services trade estimate totaled \$17.1 billion, up from \$14.9 billion in 1990, with export by United States service providers totalling \$8.9 billion in 1992.

REGIONAL TRADE FLOW PATTERNS

Regional patterns of trade are measured by the origins and destinations of shipments that cross the border. The headquarters office addresses of the shipper and consignee are typically identified in foreign trade data rather than the end points of the shipment's physical movement. Therefore, origins and destinations are imprecise estimates.

U.S. and Canadian data provide an estimate of the state or province of origin for each country's exports. The data also provide an estimate of the state of destination for U.S. imports. These estimates are not precise for a variety of reasons discussed in the studies underlying this report. However, the level of accuracy is considered adequate for the current analyses. For Canadian imports, the data only permit a calculation of the province for the port of entry. Since province-of-destination information is unavailable, province-of-clearance data are used to show destinations for U.S. exports to Canada.

U.S. data permit the estimate of the state of origin for exports to Mexico and the Mexican port of entry and the state of destination for imports from Mexico and the Mexican port of exit. Mexican data permit comparable information, i.e., Mexican state of origin and port of exit and Mexican state of destination and port of entry.

Groups of individual land border crossings are called frontiers or gateways in this report. The definitions of groups are based upon proximity and similarity in land traffic of the border crossings. This grouping permits a summary of the description of flow patterns for 13 frontiers or gateways rather than the 133 border crossings between the United States and Canada and the 37 crossings between the United States and Mexico. Table 2-1 shows the total land trade levels through the 13 frontiers or gateways.

There are five specific frontiers within the East that have been identified for analysis of cross-border traffic levels and border-related transportation needs. The five frontiers, as defined for this study, are: Maine, Montreal South, Eastern New York, Niagara, and Michigan. These are shown in figure 2-2. Figure 2-3 and table 2-2 identify four frontiers or gateways on the western U.S.-Canadian border and the principal U.S. ports of entry within the frontiers/gateways. These frontiers or gateways are Upper Plains, Central Plains, Eastern Washington/Rocky Mountain and Pacific Coast.

In the southwest, there are four principal frontier or gateways. These are South Texas--Laredo and Lower Rio Grande Valley, West Texas-New Mexico, Arizona, and California. These are shown in figures 2-4 through 2-8.

U.S.-Canadian Regional Trade Flow

Detailed analysis and discussion of U.S.-Canadian trade flows are provided in the supporting studies cited above. This section summarizes the flows by commodity groups for the East and the West, separately. For this study, the eastern region of the United States bordering Canada goes from and includes Sault Ste. Marie, Michigan to Calais, Maine. East is defined as any ports of entry to the east of Minnesota. The western U.S. Canada border region, from Lake Superior westward to the Pacific Ocean, encompasses 5 states, 5 provinces, and more than 50 land ports of entry along an estimated 1,360-mile border. Maps showing the estimated origin and destination states and provinces in the U.S.-Canadian trade, are shown in figures 2-9 through 2-12.

TABLE 2-1
TOTAL LAND TRADE LEVELS THROUGH FRONTIERS OR GATEWAYS
(1992 TWO-WAY TRADE VALUE IN BILLIONS)

FRONTIER OR GATEWAY	TWO-WAY TRADE VALUE (BILLIONS)*	PERCENT OF NORTH AMERICAN TRADE
Northern Border		
Maine	3.0	1.4
Montreal South	17.3	8.2
Eastern New York	7.7	3.6
Niagara	35.8	16.9
Michigan	60.9	28.7
Upper Plains	8.4	4.0
Central Plains	3.1	1.5
Eastern Washington/Rocky Mountains	6.5	3.1
Pacific Coast	8.6	4.0
Total Northern Border	150.3	71.4**
Southern Border		
South Texas	33.7	15.9
West Texas	12.8	6.0
Arizona	6.1	2.9
California	9.2	4.3
Total Southern Border	61.8	29.1**
Total North American	212.1	100.5**

* Data only for those shipments citing the port of exit and entry.

** Total does not add due to rounding.

FIGURE 2-2 NORTHEASTERN U.S.-CANADIAN FRONTIERS AND PORTS OF ENTRY

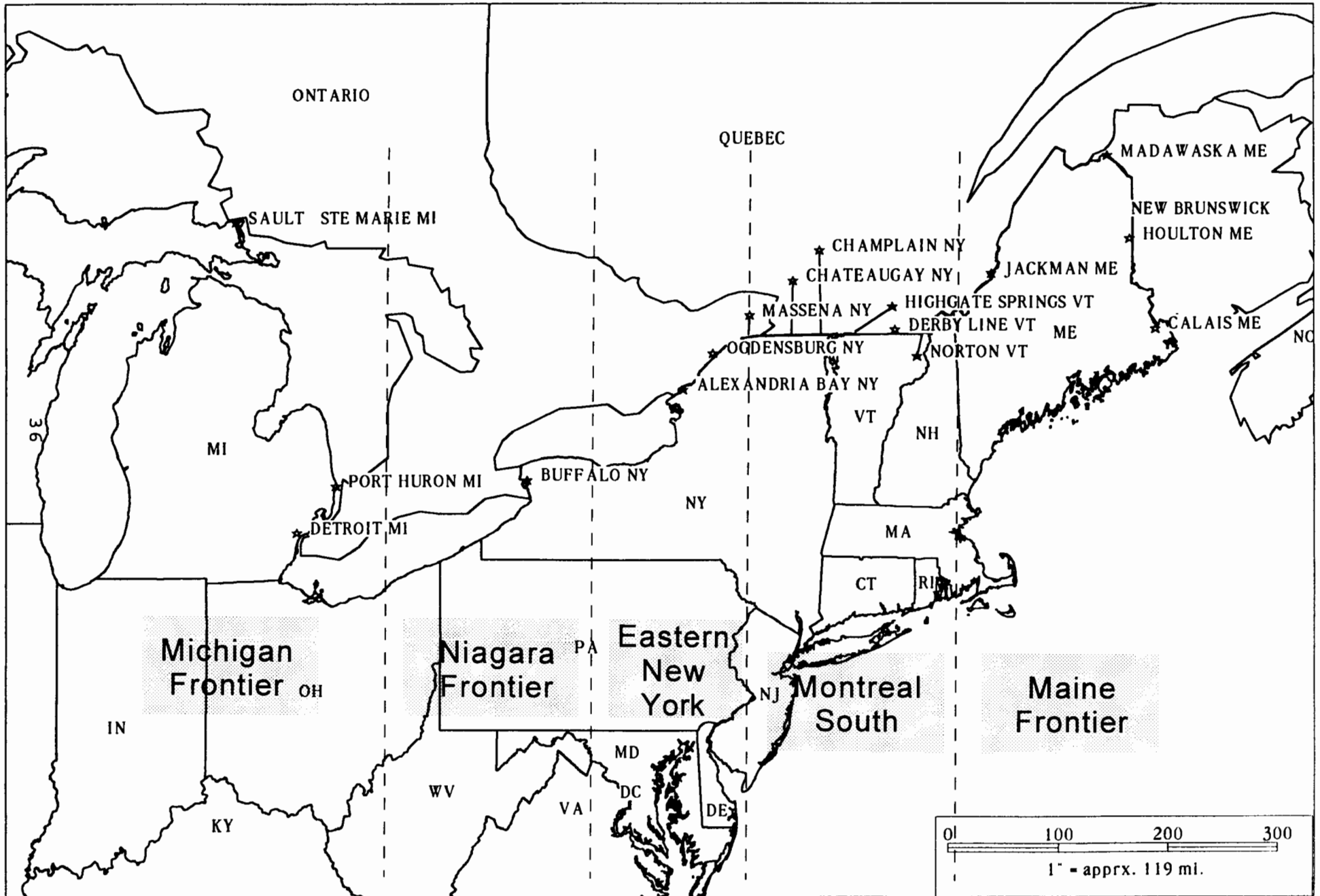


FIGURE 2-3 WESTERN U.S.-CANADIAN BORDER GATEWAY SUBREGIONS

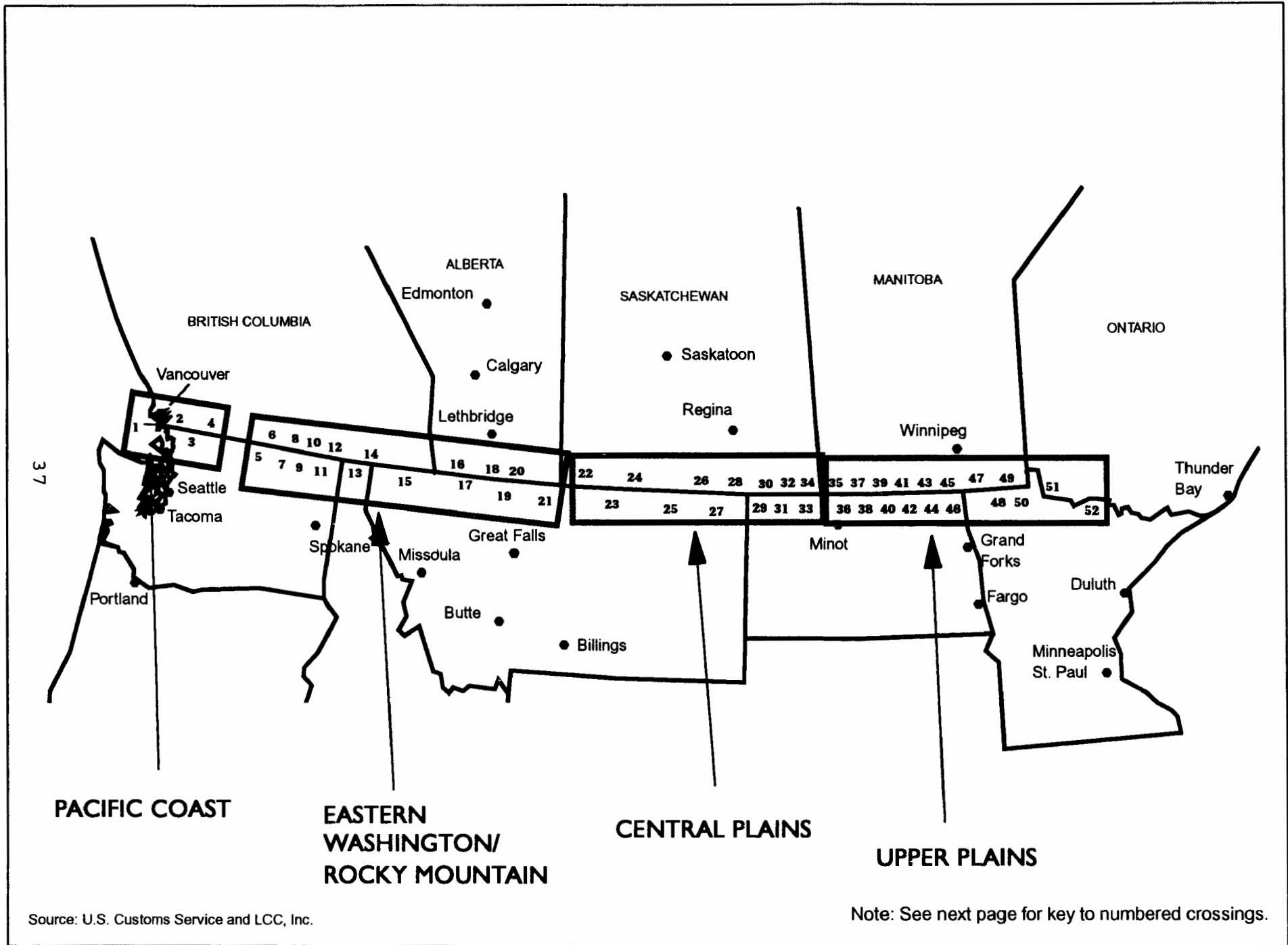


TABLE 2-2 KEY TO NUMBERED BORDER CROSSINGS IN FIGURE 2-3

	U.S.	CANADA
1	Point Roberts	Boundary Bay
2	Blaine	Douglas
3	Lynden	Aldergrove
4	Sumas	Huntington
5	Nighthawk	Chopaka
6	Oroville	Osoyoos
7	Ferry	Midway
8	Danville	Carson
9	Laurier	Cascade
10	Frontier	Paterson
11	Boundary	Waneta
12	Metaline Falls	Nelway
13	Porthill	Rykerts
14	Eastport	Kingsgate
15	Roosville	Grasmere
16	Chief Mountain	Chief Mountain
17	Plegan	Carway
18	Del Bonita	Del Bonita
19	Sweetgrass	Coutts
20	Whitlash	Aden
21	Wildhorse	Wildhorse
22	Willow Creek	Willow Creek
23	Turner	Climax
24	Morgan	Monchy
25	Opheim	West Poplar
26	Scobey	Coronach

	U.S.	CANADA
27	Whitetail	Big Beaver
28	Raymond	Regway
29	Fortuna	Oungre
30	Ambrose	Torquay
31	Noonan	Estevan
32	Portal	North Portal
33	Northgate	Northgate
34	Sherwood	Carlevale
35	Antler	Lyleton
36	Westhope	Coulter
37	Carbury	Goodlands
38	Dunseith	Boissevain
39	St. John	Lena
40	Hansboro	Cartwright
41	Sarles	Crystal City
42	Hannah	Snowflake
43	Malda	Windygate
44	Walhalla	Winkler
45	Neché	Gretna
46	Pembina	Emerson
47	Noyes	Emerson (East)
48	Pinécreek	Pinéy
49	Roseau	South Junction
50	Warroad	Sprague
51	Baudette	Rainy River
52	Intl. Falls	Fort Frances

Eastern U.S.-Canadian Regional Trade Flow

The largest concentration of trade, both to and from a single region of the United States, is in the Great Lakes area which includes Wisconsin, Michigan, Ohio, Indiana, and Illinois. In 1992, this region alone accounted for 39 percent of the value of imports from Canada and 36 percent of the value of all exports to Canada by the United States. Much of this is accounted for by Michigan, the center of the United States automobile manufacturing industry, representing trade fostered by the U.S.-Canadian Auto Pact in the 1960's. It is focused between Michigan and Ontario. Trade in this relatively high-valued area alone accounts for 35 percent of the value of Canada's exports to the United States and over 30 percent of the value of U.S. exports.

The second largest regional concentration of trade is in the Middle Atlantic area which includes New Jersey, New York and Pennsylvania. Much of this accounted for by two-way trade by the state of New York. The third largest is in the New England states which are Maine, New Hampshire, and Vermont. Together, states in these three regions serve as destinations for about 65 percent of Canada's exports to the United States and are origins for 60 percent of U.S. exports to Canada, both measured as value of trade. Export trade by Canadian provinces is heavily concentrated in the East. Ontario alone accounted for 58 percent of the value of exports in 1992. Quebec, including some trade from Newfoundland, accounted for 17 percent.

The eastern frontiers differ in terms of the types of commodities passing through them. In terms of exports, the Michigan frontier is the major gateway to Canada for agricultural goods from the Midwest. In terms of imports, the Maine frontier ranks quite high based on the amount of imports from the Maritime Provinces, a large portion of which is sea foods. This is the major import group for the Maine frontier.

The U.S. imports about twice the value of minerals and metals as it exports through the Eastern frontiers. The Eastern New York frontier imports a larger share of this commodity group. This is the major import group for the Eastern New York frontier.

Each of the border frontiers runs a positive trade balance with Canada in chemical and plastics, except for Maine. On the other hand, the United States is a net importer of wood, paper and pulp through each of the border frontiers. In both cases the pattern of trade flow in these commodities is generally consistent with the pattern of total trade flow through the frontiers, the most active frontiers in terms of total trade account for most of the trade in chemical and plastics and in wood, paper, and pulp.

FIGURE 2-4 SOUTH TEXAS-LAREDO GATEWAY

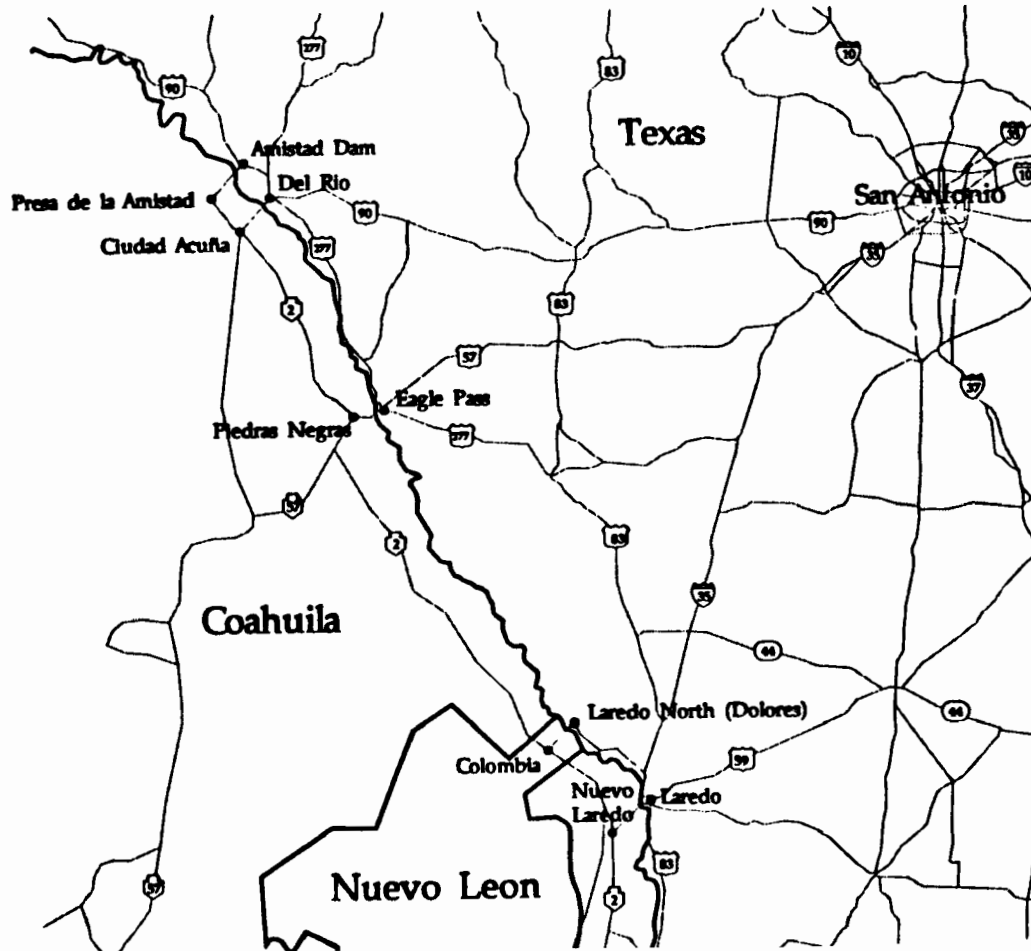


FIGURE 2-5 SOUTH TEXAS-LOWER RIO GRANDE GATEWAY

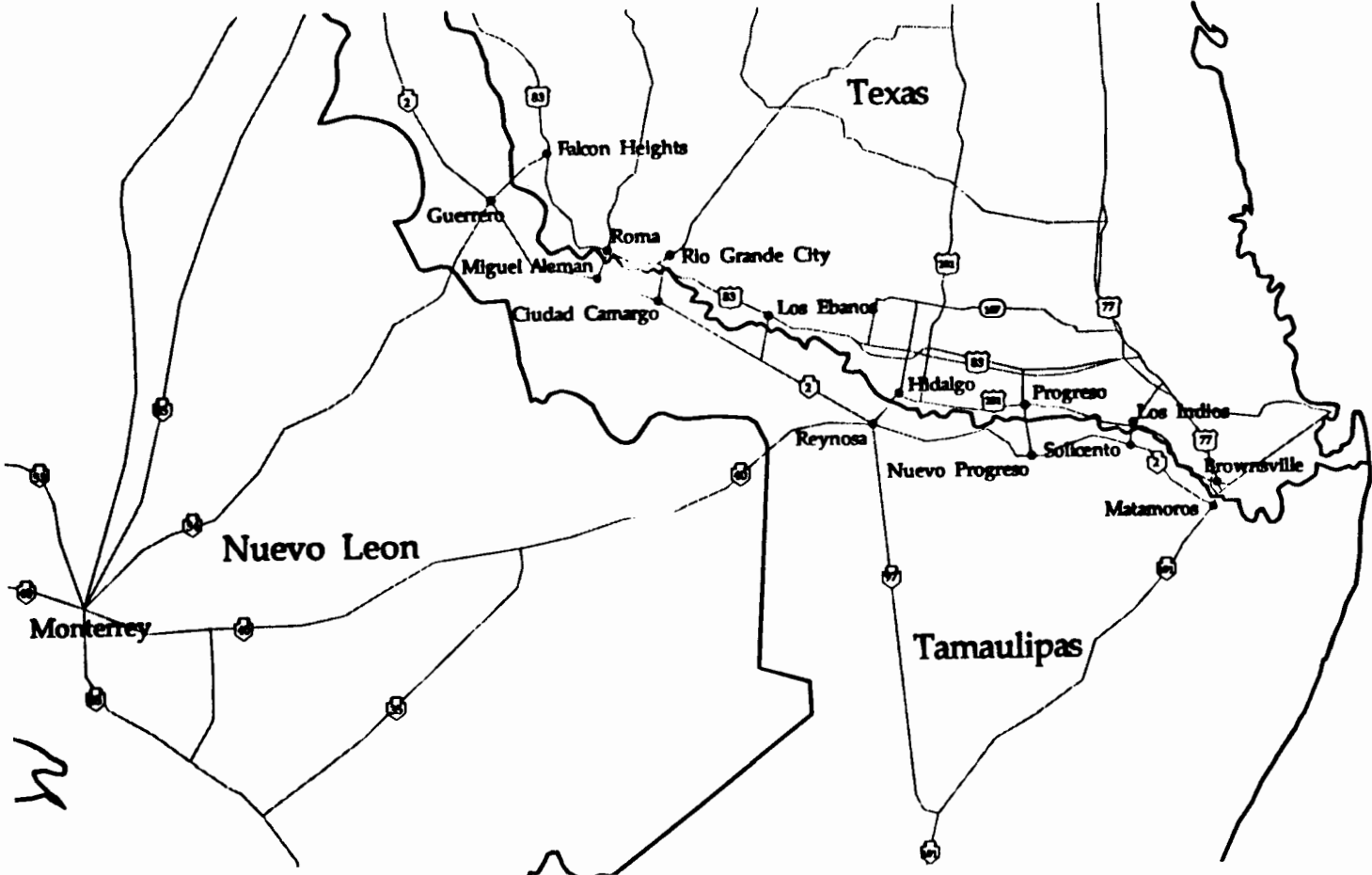


FIGURE 2-6 WEST TEXAS-NEW MEXICO GATEWAY

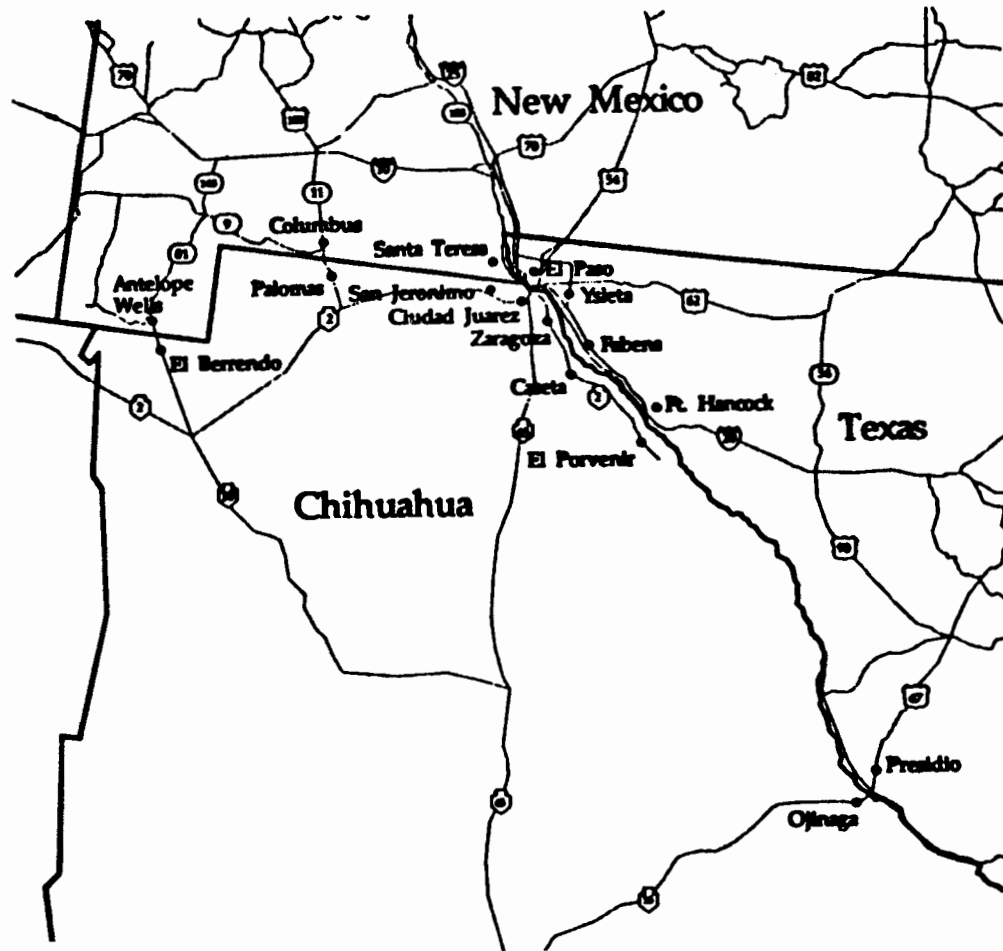


FIGURE 2-8 CALIFORNIA GATEWAY

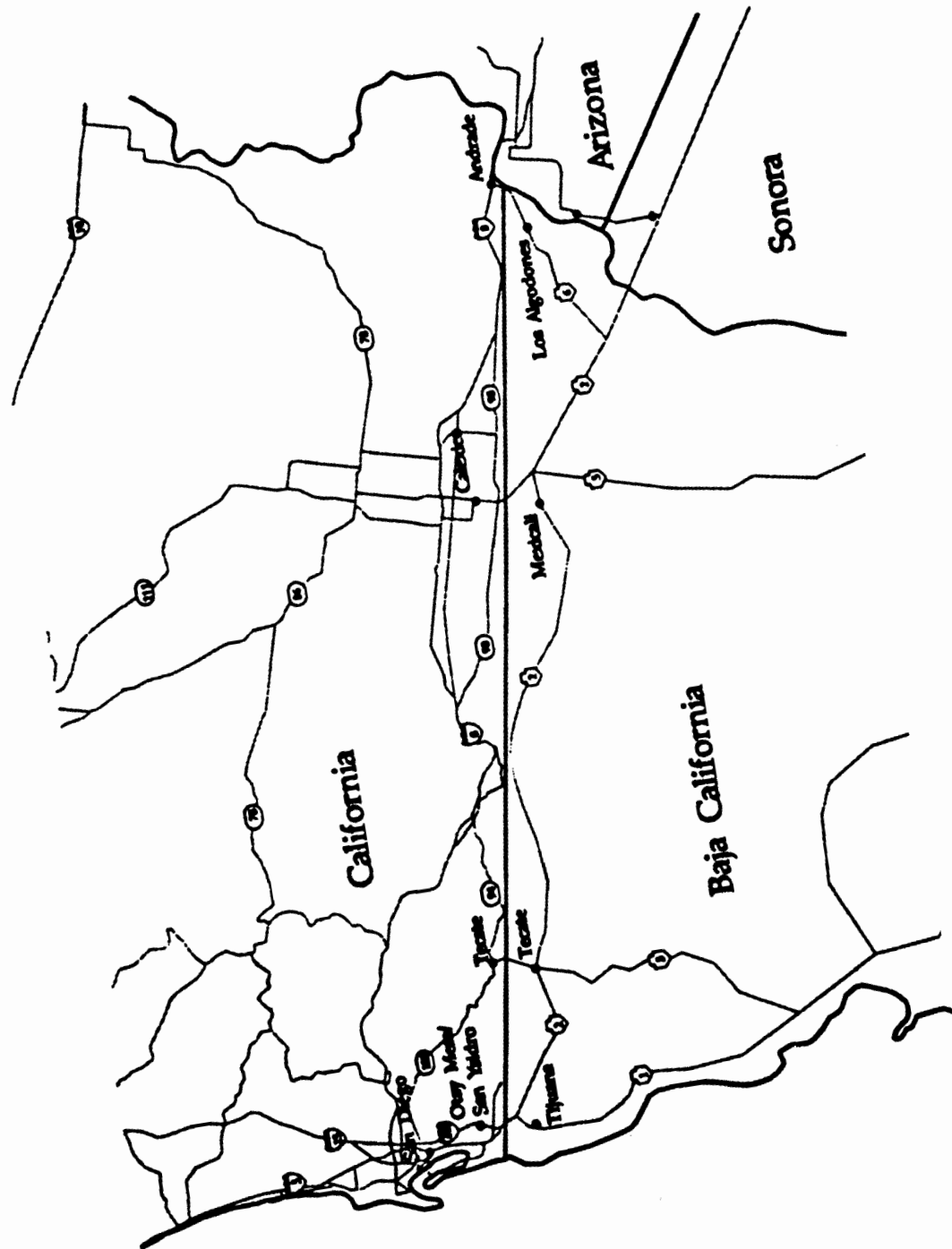


FIGURE 2-10 1992 U.S. IMPORTS FROM CANADA BY STATE (\$000)

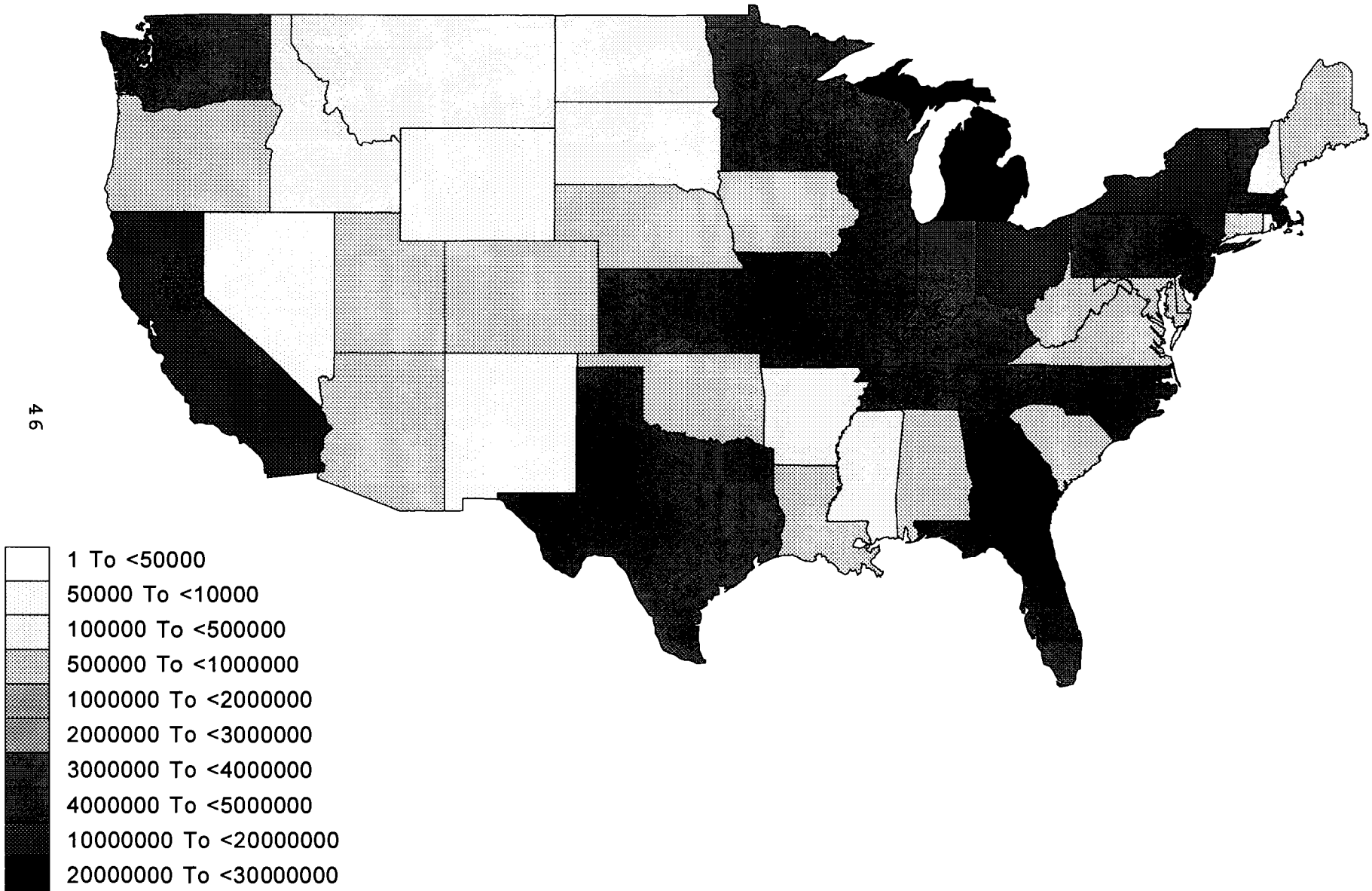


FIGURE 2-11 TOTAL U.S. EXPORTS TO CANADA BY PROVINCE (\$M)

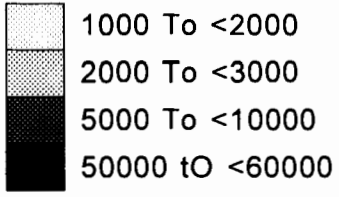
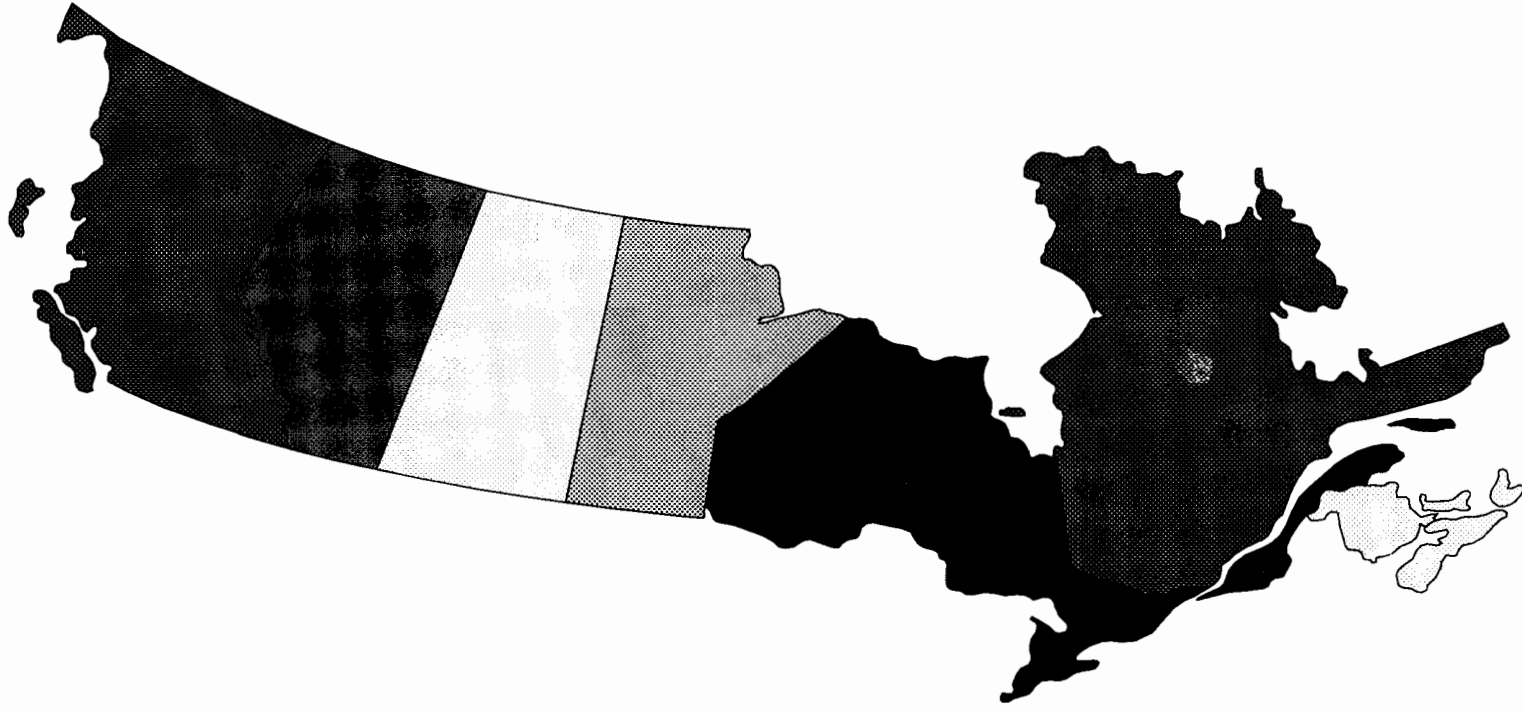
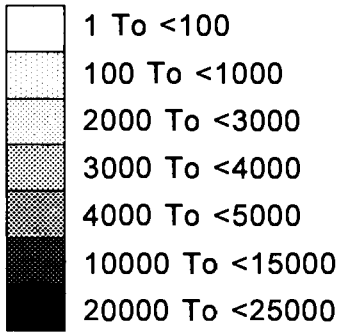
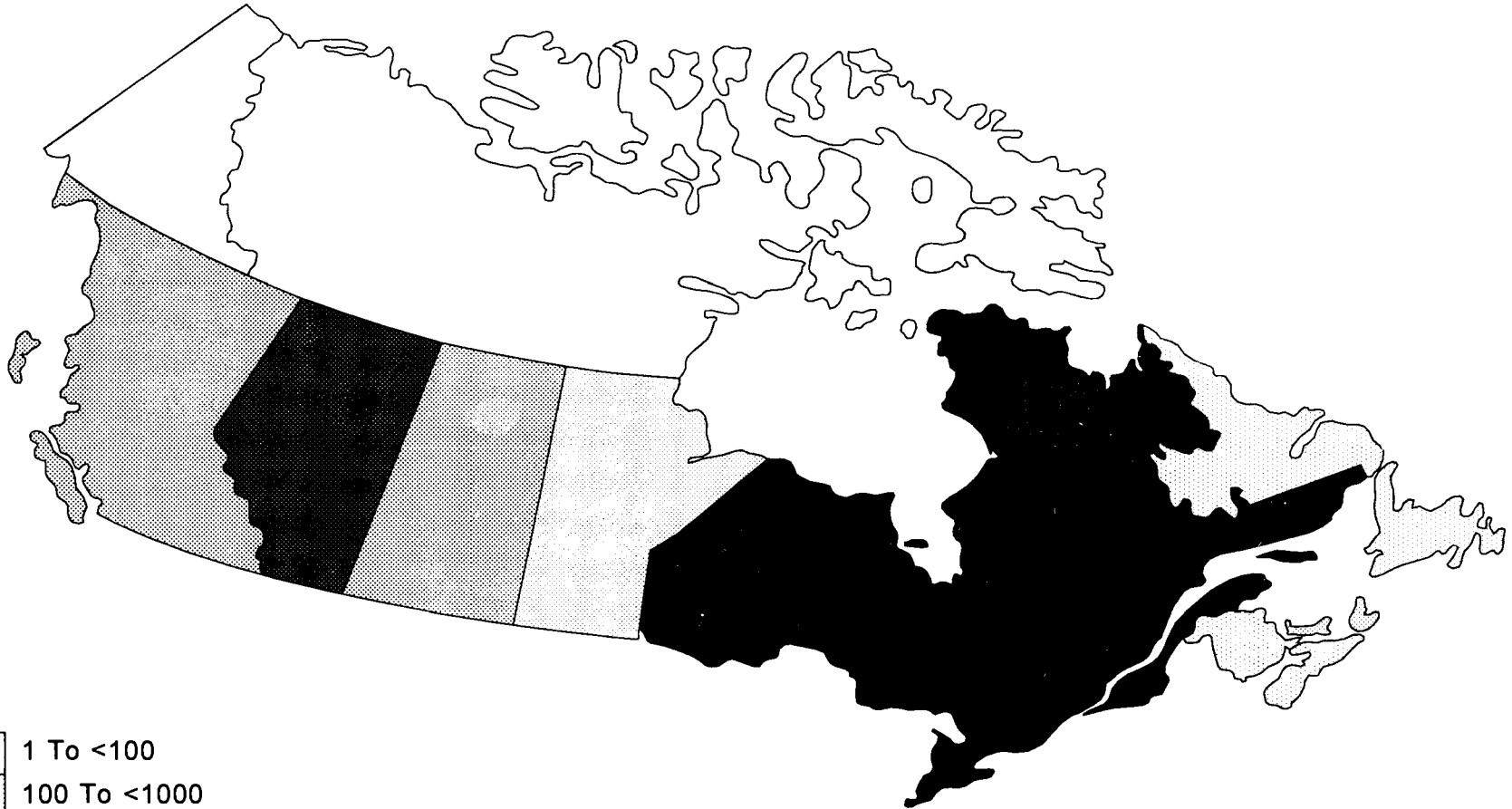


FIGURE 2-12 TOTAL U.S. IMPORTS FROM CANADA BY PROVINCE (\$M)



The machinery and appliances commodity group is the dominant commodity flow between the United States and Canada. To a great extent it represents an integrated economy with parts and vehicles flowing between automobile plants on either side of the border. Previous to the Free Trade Agreement, tariff agreements such as the U.S. Auto Pact, eliminated trade restrictions. This aided the development of a truly binational automobile industry.

The Michigan frontier is the largest gateway for all commodity groups, but the two groups of manufactured goods, i.e., machinery and appliances, are the most important. The trade is generally balanced, with exports and imports in each commodity group of the same order of magnitude.

The Niagara frontier is generally the second largest gateway for the various commodity groups. As in Michigan, manufactured commodities dominate and the trade is usually balanced.

Montreal South is an important gateway into the United States from Canada for two commodity groups--minerals and metals, and wood, paper and pulp--although two-way traffic is dominated by the flows of machinery and appliances.

The Eastern New York frontier is an important gateway to the United States for minerals and metals and, to a lesser extent, wood, paper, and pulp.

The Maine frontier is primarily a gateway to the United States for nonmanufactured commodities, especially agricultural products and foodstuffs. It is a minor export gateway for manufactured commodities.

Western U.S.-Canadian Regional Trade Flow

The western frontier areas of the U.S.-Canadian border accounted for 22 percent of United States imports from, and 24 percent of U.S. exports to, Canada. The greatest concentrations of U.S.-Canadian trade in the West are the Far West which includes California and Nevada, with trade valued over \$10 billion in 1992. Also, the Pacific Northwest, including Washington and Oregon, with trade of about \$8 billion. Two-way trade by states in other western areas include: \$6.7 billion by the Upper Plains which includes Minnesota, Iowa, North Dakota, and South Dakota; \$6.2 billion by the areas of Texas and Louisiana on the Gulf of Mexico area; and \$5.7 billion by the Central Plains which includes Kansas, Missouri, Arkansas, and Oklahoma.

Western provinces--including provinces in the Pacific, Rockies, and Plains areas--received 22 percent of the export value. About

half of this value originates in Alberta. In turn, a large share of Alberta's exports is accounted for by energy exports to the United States, primarily crude oil and natural gas. Alberta possesses about 80 percent of all Canada's fossil fuel resources. Substantial trade also originated in British Columbia, one of Canada's fastest growing areas. In 1992, the value of its trade with the United States was \$6.6 billion.

With trade by pipelines and transmission lines excluded, U.S. exports in western border areas totaled \$12.6 billion in 1992; up by \$2.1 billion or 21 percent from 1988. U.S. exports entering Canada in British Columbia saw the biggest gain in the West; up 32 percent. Trade into Manitoba also increased substantially; up 24 percent in value.

Canadian exports in the West totaled \$10.5 billion in 1992; up 4 percent from 4 years earlier. The greatest relative gain in Canadian export trade occurred across the Alberta border; up 74 percent.

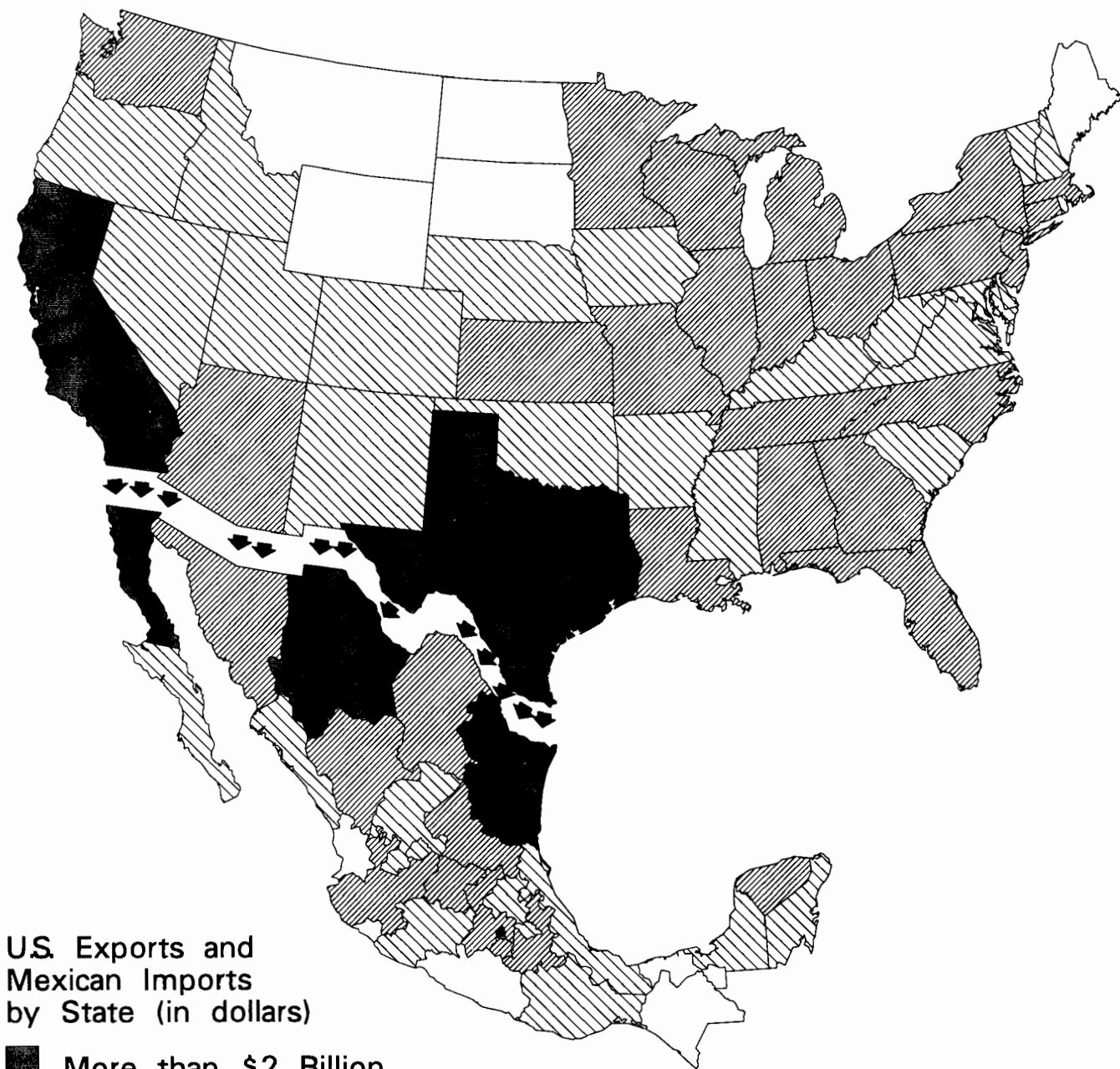
U.S.-Mexican Regional

Measured in absolute increases in trade or percentage increases in trade, the recent rapid growth in trade with Mexico has benefitted the border states more than the eastern states. Trade from states east of the Mississippi has risen but at rates below the national average. Eastern exports increased at an annual rate of approximately 14 percent while the national increase was nearly 18 percent per year. Eastern imports increased over the first years of the study period but then fell to nearly the 1989 levels. Nationally, imports grew at about 9 percent per year.

The eastern trade with Mexico is dominated by a relatively few Midwestern and Middle Atlantic states, especially Michigan. These states have good highway and rail connections to Mexico and the vast majority of the trade, in value terms, moves by highway or rail. Maps showing origin and destination estimates in the United States and Mexico for exports and imports are shown in figures 2-13 and 2-14, respectively.

Texas is the dominant United States origin of exports to Mexico, with over \$17 billion in 1992. California is second, followed by Arizona, Michigan, and Illinois. The dominant Mexican destination states are the Distrito Federal and the border states of Baja California Norte, Chihuahua, Nuevo Leon, and Tamaulipas.

FIGURE 2-13 TOTAL EXPORTS TO MEXICO BY U.S. AND MEXICAN STATES



U.S. Exports and Mexican Imports by State (in dollars)

- More than \$2 Billion
- ▨ \$200 Million - \$2 Billion
- ▧ \$20 - \$200 Million
- Less than \$20 Million

Note: Does not include \$4.39 billion of trade for which origin or destination state were not given.

Sources: U.S. Department of Commerce and Secretaria de Comercio y Fomento Industrial (SECOFI).

Approximately 90 percent of the maquiladora manufacturing and trade movements are concentrated in the southwest border region of the United States and the border region of Mexico.

The principal destinations in the United States for imports from Mexico are Texas, California, and Michigan. This trade primarily flows from the Distrito Federal and from the Mexican border states of Baja California Norte, Chihuahua, and Tamaulipas.

PATTERNS OF TRANSPORTATION MODES RELATED TO TRADE

International trade moves by land, air, and sea. These modes of transportation may be singular or in combination. When modes are used in combination the transportation is called intermodal. There is a change of mode--from one form of transport to another--takes place. For this study, trade by pipelines and transmission lines has limited applicability. While energy trade by pipelines and transmission lines is significant, this trade has little consequence for border crossings and the types of transportation infrastructure issues underlying Section 6015 of the Intermodal Surface Transportation Efficiency Act.

Of note is the limited amount of transit serving border communities; however, interest in this area has been growing. Examples of transit services on the U.S.-Canadian and U.S.-Mexican border are given later in this chapter. With the current emphasis on air quality mitigation, the expectation is a rise in interest in mass transit efforts especially in areas where reducing the number of motor vehicles using the land border crossings involved in daily crossings by individuals is a goal. This rise in interest should come from transportation planning activities in the local area.

The distribution of trade shows a different picture when weight rather than value of trade is used. For example, high volume shipments with low value are relatively undercounted when dollars are used as the measure of flow. This makes it appear that the modes favored by the bulk commodities carry little of the trade. In fact, the amount of commodities carried by water and pipelines is quite large. Unfortunately, the data sources used for this analysis do not have tonnage measures for the motor carriers and rail modes.

Examining state and province origin and destination data and province of clearance information provide useful insights into regional patterns of trade. But movements of goods from region to region and from origins to border crossing locations and to destinations cannot be identified by examining data on origins,

clearance locations, and destinations separately. This information must be linked in tracing actual movements of goods in international trade.

The highway mode of land transportation is segmented by car and commercial vehicles (CV) in the data collected at the U.S. Customs Service border stations. However, commercial vehicles in that data base include trucks, as well as other motor vehicles engaged in commercial trade. These other motor vehicles may include vans, station wagons, and passenger automobiles. For consistency, the term commercial vehicles is used throughout to include any vehicle, truck or other, used in trade. The term car is used to designate noncommercial vehicles, which may include automobiles, vans, and trucks not engaged in commercial trade.

U.S. Customs reports data at the port level which, for many ports, includes jurisdiction over multiple border crossing stations. As such, detailed customs traffic data are not always available at the individual crossing level. Data provided by individual private crossing operators must be used to evaluate traffic levels at these individual crossings. Private sector data also vary in terms of how autos and trucks are classified. For instance, prior to 1991, the Niagara Falls Bridge Commission (NFBC) reported pickup trucks as trucks while most other crossings and the NFBC now consider pickups to be autos.

Using U.S. Customs data, the number of merchandise releases and merchandise inspections are provided for 1992; using INS data, the number of persons entering at each port level is provided. Rail traffic data for entry to Canada are not yet available, but U.S. entry data are available for 1989 to 1992.

The traffic flows are shown in the detailed profiles for each crossing in the following documents which are listed in Appendix A.

An Assessment of the Adequacy of East Coast and Gulf Port Infrastructure to Accommodate Trade with Mexico.

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings, Appendices 1. Descriptive Profiles of Maine Frontier; 2. Descriptive Profiles of Montreal South Frontier; 3. Descriptive Profiles of Eastern New York Frontier; 4. Descriptive Profiles of Niagara Frontier; and 5. Descriptive Profiles of Michigan Frontier.

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 4: Profiles of Western U.S. Canada

Border Crossings, and Volume 5: Profiles of U.S. Mexico Border Crossings.

U.S.-Canadian Transportation Modes

This study discusses the regional trade flow in the eastern and western areas that border Canada. The eastern region follows the border roughly from Michigan eastward to the Gulf of St. Lawrence. The western border region is defined as from Lake Superior westward to the Pacific Ocean.

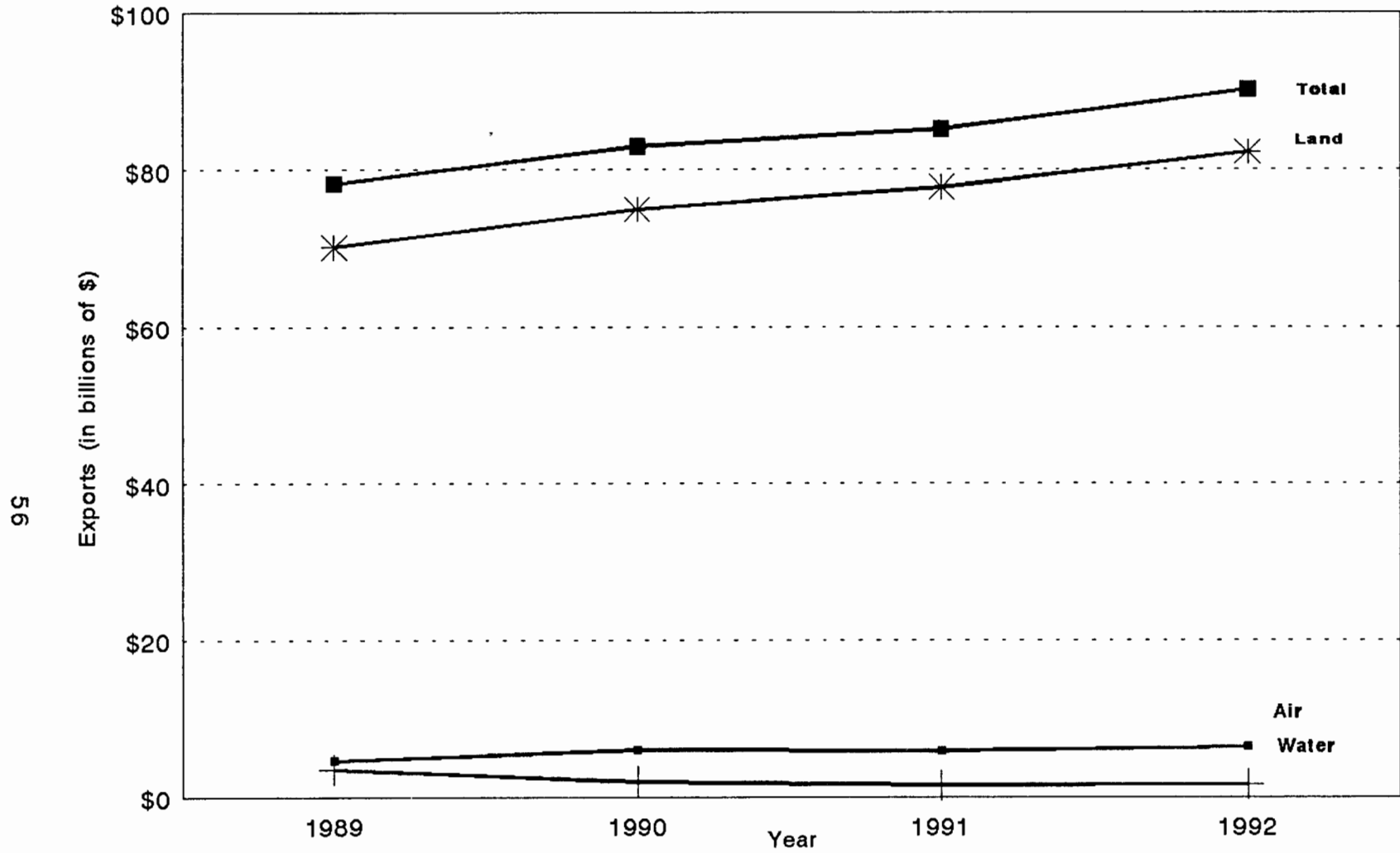
Modal shares for U.S. exports to Canada in the East and the West are very similar. About 80 percent is transported by highway and 9 percent by rail. Air transport accounts for 10 percent of the value of U.S. exports. These are largely high value goods that can be economically transported by air, but are relatively low in volume. Water transport accounts for only 2 percent of United States export value in both the East and West. Tables 2-3 and 2-4 show the transportation modes for U.S. exports and imports with Canada, respectively.

Some amount of goods being transported between the United States and Canada that have origins or destinations in a third country. These transhipped goods are not accounted for in the data sets used for this analysis. However, they also place demands upon the highway, rail, and water transportation systems.

For Canadian exports, modal shares vary considerably between the East and the West. Because of the large energy trade from Alberta, 38 percent of the value of Canadian exports in the West is exported by pipelines and transmission lines. This compares with only 5 percent in the East. Exports by highway are a much smaller modal share in the West; 37 percent versus over 60 percent of value in the East. This reflects not only the large energy trade in the West, but also the relatively small trade in manufactured and industrial goods from western Canada.

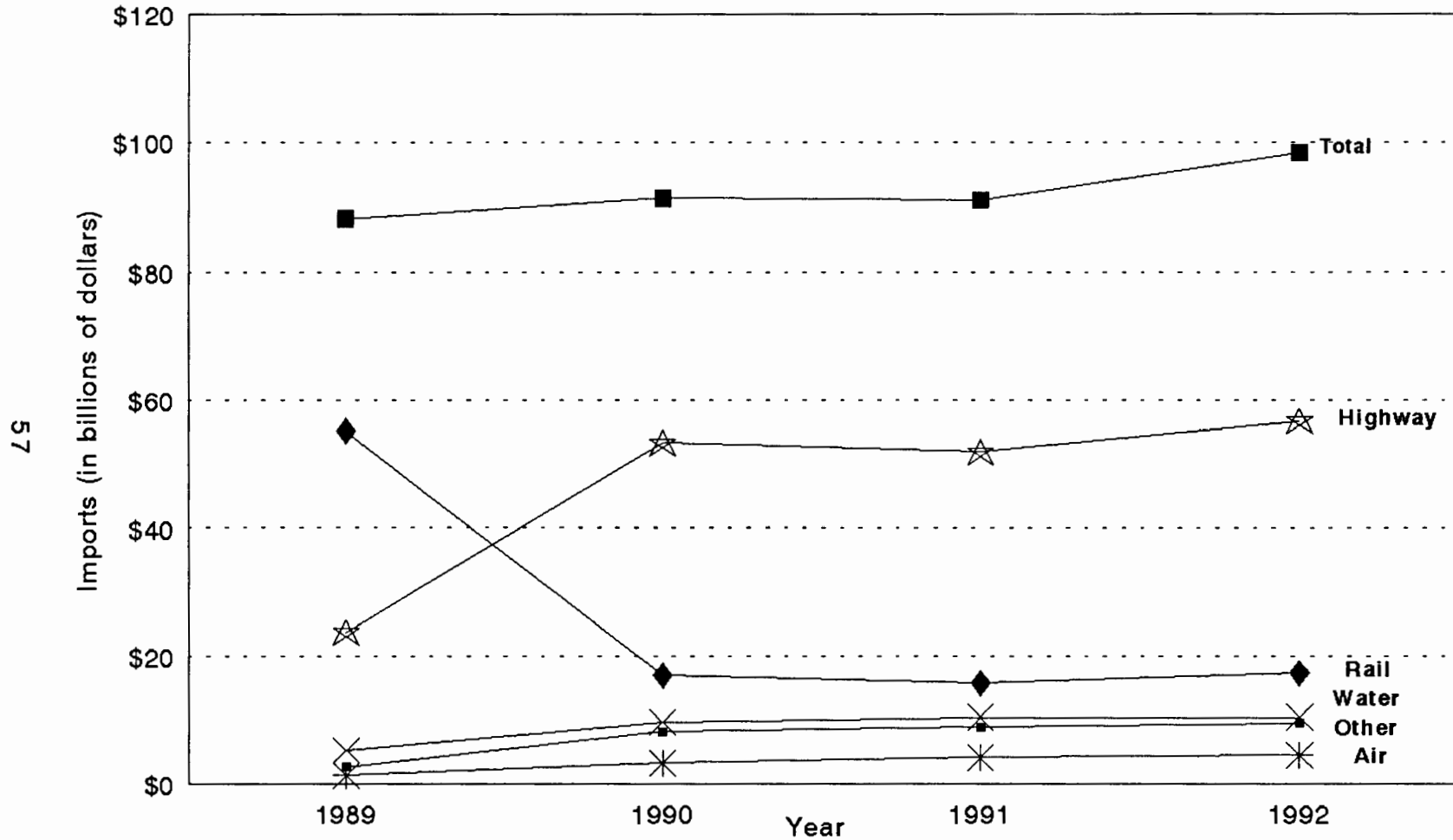
For southbound traffic flows, personnel at United States border stations provided monthly and/or fiscal year basis traffic statistics. In most cases, these data were provided in terms of passenger cars, commercial vehicles, busses, trains, and rail cars both empty and loaded, aircraft, or vessels. In some cases, counts of passengers and pedestrians were also provided. For smaller ports of entry, only the total number of vehicles was recorded. The years for which data were available varied; however, most furnished data for the period 1987 through 1992.

TABLE 2-3 TOTAL U.S. EXPORTS TO CANADA BY MODE



	1989	1990	1991	1992
Air ■	\$4.615748	\$6.036123	\$5.861456	\$6.394212
Water +	\$3.482357	\$1.937988	\$1.490262	\$1.545203
Land *	\$70.16806	\$74.99243	\$77.79458	\$82.21509
Total ■	\$78.26616	\$82.96654	\$85.1463	\$90.15451

TABLE 2-4 TOTAL U.S. IMPORTS FROM CANADA BY MODE



Air	*	\$1.353158	\$3.315354	\$4.142178	\$4.543617
Water	×	\$5.309356	\$9.674929	\$10.40611	\$10.41383
Highway	☆	\$23.64845	\$53.25723	\$51.89109	\$56.67289
Rail	◆	\$55.17574	\$16.91371	\$15.71034	\$17.30989
Other	■	\$2.723281	\$8.210802	\$8.914397	\$9.556964
Total	■	\$88.20998	\$91.37202	\$91.06411	\$98.49719

For northbound traffic flows, Canadian Customs provided annual counts on a calendar year basis by border crossing for 1989 through 1992. Data were classified as car, bus, commercial vehicle, scheduled/charter aircraft, private aircraft, cargo vessel, pleasure craft, ferry, and pedestrian. No rail traffic statistics were provided. Other secondary traffic data sources were also available, including the annual workload summaries and rail statistics reported by the U.S. Customs Service, Interstate Commerce Commission (ICC) Waybill public use tapes, and data provided in selected research reports. The team also estimated truck and rail volumes (by weight) of western U.S.-Canadian trade flows for principal ports of entry.

There is a limited amount of transit serving border communities, however, interest in this area has been growing. For example, on the U.S.-Canadian border, busses provide frequent service between Detroit and Windsor by way of the tunnel, and there is also ferry service between the two cities. Although there is no light rail service across the northern border, the feasibility of a tramway across the Soo Locks at Sault Ste. Marie is about to be studied.

Eastern U.S.-Canadian Transportation Modes

The United States and Canada have maintained the largest bilateral trading relationship in the world for a number of years, with total merchandise trade reaching \$189 billion in 1992. Trade with Canada is up by about 9 percent since 1990.

Trade by highway and rail accounted for 80.2 percent of the total U.S.-Canadian trade in 1992, with sea and air movements accounting for the balance. For the land mode, which is most easily categorized in terms of geographic regions, 82.4 percent, or \$124.7 million, of the trade occurred at eastern ports of entry. Traffic patterns are concentrated through relatively few border crossings. The most significant border crossings are in the East, with the exception of the western Washington crossings. U.S. Bureau of Census record counts are used as proxies for the actual number of shipments.

On the northeastern border, the Michigan, Niagara, Eastern New York, and Maine frontiers all involve water crossings. Often the waters are navigable, and this necessitates the construction and maintenance of costly bridges having sufficient clearance to accommodate waterborne vessels. This is in contrast to the land crossings or bridges over nonnavigable waters typical of the

western and southwestern borders. Table 2-1 presented earlier in this chapter shows the crossing or ports of entry groups for each frontier and the type of traffic at each.

The Michigan frontier accounts for the largest portion of the dollar value of eastern trade. The Niagara frontier is second and Montreal South is the third most active frontier, followed by Eastern New York and Maine. In comparison, the busiest frontier area in the northwest was in Washington.

The principal Michigan crossings are at Detroit-Windsor and Port Huron-Sarnia, although a fairly large volume of traffic also crosses at Sault Ste. Marie. For the highway mode, there is a privately owned four-lane bridge at Detroit called the Ambassador Bridge. It is the busiest total traffic and commercial crossing on the U.S.-Canadian border, with 8.2 million bidirectional vehicles in 1992, including 1.7 million trucks. Detroit also has a two-lane auto and truck tunnel. The tunnel carried 7.5 million vehicles bidirectionally in 1992, including 300,000 trucks. The tunnel clientele is oriented more to shoppers and commuters than the Ambassador Bridge, and is located in the immediate center of Windsor's and Detroit's downtown business district. The Ambassador Bridge, just a few miles away from the center of downtown, carries more interregional traffic than does the tunnel.

Detroit also features a major railroad tunnel owned by the Canadian Pacific and Canadian National railroads. There is also a railroad barge ferry at Detroit-Windsor. Following completion of the partial deepening of the rail tunnel, the ferry will be terminated. A truck ferry for hazardous goods also operates at Detroit-Windsor.

The Blue Water Bridge, at Port Huron-Sarnia, crosses the St. Clair River, a navigable waterway on the St. Lawrence Seaway system. The Blue Water Bridge carried 6.1 million vehicles in 1992, including 825,000 trucks. Port Huron also has a major rail tunnel.

The International Bridge at Sault Ste. Marie, Michigan, and Ontario carried 3.5 million vehicles in 1992, including 72,000 trucks. The clientele is primarily local traffic between the two isolated sister cities. The Sault also has a railroad bridge and the Soo Locks on the Great Lakes St. Lawrence Seaway system. Table 2-5 shows the principal frontiers and ports on the eastern border of the United States with Canada, and the type of traffic.

The Niagara frontier consists of the Peace Bridge at Buffalo and a major rail bridge, three highway bridges, and one rail bridge

at Niagara Falls. All of these facilities are within 20 miles of each other. The Peace Bridge, in 1992, carried 8.1 million vehicles, including 950,000 trucks. The three highway bridges, Rainbow, Whirlpool Rapids, and Lewiston-Queenston, at Niagara Falls carried more than 25 million vehicle including nearly 3 million trucks.

The eastern New York frontier consists of four commercial ports of entry. Three are highway bridge crossings at Thousand Islands (or Alexandria Bay), Ogdensburg, and Massena. The other commercial port is a relatively small land crossing in Chateaugay. The Thousand Islands facility carried 1.9 million vehicles, including 291,000 trucks, in 1992. Auto traffic is primarily interregional.

Ogdensburg-Prescott International Bridge traffic totaled 797,000 vehicles in 1992, including 49,000 trucks. The Seaway International Bridge at Massena is considered the economic lifeline of northern New York, serving the region between New York State's North Country and Ontario, Canada. In 1992, the bridge carried 2.8 million vehicles, almost half of which crossed free of charge under rights of the Akwesasne Indian Reservation through which the bridge passes.

Four principal commercial land ports of entry and 14 smaller crossings extend east to west from Pittsburgh, New Hampshire, to Champlain, New York, comprising the Montreal South frontier. Two commercial ports of entry, Champlain and Highgate Springs, are located adjacent to the New York and Vermont sides of Lake Champlain. The station at Alburg, Vermont/Noyan, Quebec, is one of the few jointly owned U.S.-Canadian border facilities. The ports of Derby Line and Norton, also designated commercial ports, are located in the central to eastern region of Vermont.

During 1992, 9.2 million vehicles crossed through the Montreal South ports of entry. This represents 12.5 percent of the 74 million vehicles that crossed through the eastern region. The port of Champlain serviced 44 percent of this traffic while the ports of Derby Line and Highgate each serviced about 25 percent or 2.2 million vehicles. Norton handled less than 7 percent of this traffic. On average, passenger vehicles constitute 92 percent of total vehicular traffic through the Montreal South frontier.

TABLE 2-5
PRINCIPAL FRONTIERS, EASTERN U.S. CANADA BORDER

FRONTIERS	PORT GROUPS	TYPE OF TRAFFIC
Maine	Calais	Car, CV, Rail*
	Jackman	Car, CV, Rail*
	Houlton	Car, CV, Rail*
	Madawaska	Car, Rail
	Other-Unstaffed	Car, CV
Montreal South	Highgate Springs	Car, CV, Rail
	Derby Line	Car, CV, Rail
	Norton	Car, CV,
	Champlain	Car, CV, Rail
East New York	Ogdensburg	Car, CV, Ferry
	Massena	Car, CV, Rail
	Alexandria Bay	Car, CV
	Chateaugay	Car, CV
Buffalo/Niagara	Niagara	Car, CV, Rail
Michigan	Detroit	Car, CV, Rail, Rail Barge Ferry
	Port Huron	Car, CV, Rail
	Sault Ste. Marie	Car, CV, Rail, Locks

Car - noncommercial vehicle CV - commercial vehicle
* Rail border crossing is proposed for abandonment.

The Maine frontier consists of 3 land commercial ports of entry and 19 noncommercial, staffed crossings throughout the state of Maine. In addition, there are hundreds of unstaffed crossings monitored by the Border Patrol, a division of the INS. From east to west, the commercial ports are: Ferry Point, the easternmost land crossing located in Calais; Houlton, midway along the Maine-New Brunswick border; and Jackman, the only major crossing along the Quebec border.

The Maine frontier handled 17.64 percent of the 1992 international traffic through the eastern region or 13.1 million vehicles in 1992. Approximately 4 million vehicles or 30.5 percent of traffic through the Maine frontier crossed through the easternmost port of Calais-St. Stephen. The port of Houlton-Woodstock, located about half-way up the Maine-New

Brunswick border, handled 2.8 million vehicles, 21.6 percent of the two-way traffic through the Maine frontier. Two-way traffic through the northern ports of Madawaska and Van Buren is in excess of 5.3 million vehicles annually, approximately 41.2 percent of this frontier's traffic. Passenger traffic constitutes 98 percent of total traffic through these two stations. The port of Jackman-Armstrong, the only commercial port on the Maine-Quebec border, handled 789,000 vehicles in 1992. Overall, the percent of passenger traffic through the Maine frontier was 95.2 percent.

For the eastern region, there were a total of 74.1 million vehicle crossings in 1992. Cars accounted for 67.6 million of this traffic and commercial vehicles accounted for the remaining 6.4 million vehicles. Total traffic levels in the east increased by 33.9 percent between 1989 and 1992. Car traffic increased 35.0 percent during this time period, and truck traffic increased 24.2 percent. However, car traffic declined at many U.S.-Canadian border crossings in both the East and West during 1992. This decline has continued into 1993.

Border area highway needs are considerably dependent upon the volume of traffic crossing through the area ports. The traffic data indicate that automobiles account for over 91 percent of the total traffic regionwide and in all cases, accounts for more than 75 percent of any individual crossing's traffic levels. These data emphasize the need to weigh the effect of automobile traffic on total traffic levels. Automobile traffic is far more volatile than truck traffic, with several large fluctuations over the last 15 years.

As with trade levels, vehicle traffic is highly concentrated at several frontiers and at specific crossings within those frontiers. The Michigan frontier accounts for 25.3 million of the total vehicles, or 34.1 percent of the eastern total. Michigan accounts for 44.5 percent of the total truck traffic in the East, or 2.8 million vehicles. Auto traffic at the Michigan frontier increased by 35.3 percent between 1989 and 1992, and truck traffic increased 23.2 percent. Niagara is the second busiest crossing with 20.3 million vehicles in 1992, 27.4 percent of the total. Truck traffic in Niagara totaled 1.6 million vehicles, 25.7 percent of the eastern total. Niagara auto traffic increased 26.4 percent from 1989 to 1992, and truck traffic was up 14.6 percent. The Michigan and Niagara frontiers together account for 61.5 percent of total eastern traffic and 70.2 percent of eastern truck traffic. The Maine frontier accounts for an additional 12.4 million autos and 627,000 trucks.

Operator data indicate that the Ambassador Bridge in Detroit is the busiest crossing on the U.S.-Canadian border. Total traffic at the Ambassador in 1992 was 8.2 million vehicles, with commercial vehicle traffic of 1.7 million vehicles representing 20.7 percent of the bridge's total traffic. Truck traffic at the Ambassador Bridge is almost double that of any other crossing on the U.S.-Canadian border. All motor vehicle traffic at the Ambassador has increased steadily since 1987, with a total traffic increase of 27.6 percent. Traffic was up 8.5 percent between 1991 and 1992. The Peace Bridge at Buffalo is the second busiest crossing on the U.S.-Canadian border, with total 1992 traffic of 8.1 million vehicles including 950,000 commercial vehicles. Car traffic volume at the Peace Bridge was down slightly in 1992; however, total traffic growth since 1987 is 15.4 percent. The Blue Water Bridge at Port Huron has experienced the fastest growth for a major crossing. Car traffic is up 55.0 percent since 1987 and commercial vehicle traffic is up 49.5 percent, for a 1992 total of 6.05 million vehicles. However, car traffic slackened in 1992. Many other crossings in the East also experienced rapid growth between 1987 and 1991, followed by some declines in 1992 and 1993.

The declines in auto traffic are related to a decline in Canadian shopping activity in the United States. This decline, following several years of major increases, is due to a decline in the value of the Canadian dollar, improvements in Canadian retail competitiveness, Sunday shopping in Ontario, an effort by the Canadian Government to discourage U.S. shopping trips, and the Canadian recession. At the same time, increases in truck traffic are thought to be due to continuing specialization, rationalization, and integration of the U.S. and Canadian economies with resulting increases in the demand for small and frequent just-in-time deliveries of production inputs and finished goods.

Railroad border crossing traffic has been relatively stable over the last four years. This traffic relates not only to U.S.-Canadian trade, but U.S. and Canadian trade with offshore trading partners that include intermodal rail links across the border. Key movements include Asian goods bound for Montreal and Toronto markets via U.S. West Coast ports and U.S. cross-country rail and U.S. Midwest exports that move across the border with Mexico via Montreal/Halifax ports and rail.

In 1992, a total of 15,472 trains entered the United States from Canada, including 610,221 rail cars. In 1989, a total of 652,750 rail cars entered the United States from Canada. In 1992, the Michigan frontier accounted for 319,826 rail cars, or 52.4 percent of the total, while the Niagara frontier accounted for

131,114 rail cars, or 21.5 percent of the total. Traffic at the Niagara frontier was down 14.3 percent from 1989, while traffic at the Michigan frontier was down 6.2 percent. This decline is related to the general economic recession in North America and Europe.

Rail barges have traditionally been used to cross the Detroit and St. Clair Rivers at Detroit and Port Huron, Michigan, due to insufficient clearance for trilevels (auto carriers), high cube box cars, and traditional trailers on flatcar equipment. These rail barges add 12 to 24 hours and \$300 to \$400 per rail car to cross-border trips. They also result in the 12/100th's of 1 percent U.S. harbor maintenance fee that is applied to the value of any cargo on the rail cars. The tunnel restrictions and rail barge inefficiencies have also precluded the introduction of double stack rail service at these crossings. These crossings are on the most direct routes between Chicago and Montreal and are critical to the efficient movement of Midwest goods between Europe and the United States via the Port of Montreal. The Montreal trade route is the least expensive and fastest route between the U.S. Midwest and Europe and is critical to export competitiveness.

In eastern New York, rail bridges do not have clearance problems. However, potential increases in rail traffic at the Niagara crossings are leading to interest in grade separations to expedite local traffic.

The Great Lakes and St. Lawrence Seaway system is a critical transportation link between the U.S. and Canadian hinterlands and the rest of the world. The physical international boundary line between Canada and the United State bisects most of the system, which handles commerce between the United States and Canada, domestic coastal traffic for each nation, and overseas traffic for both countries. Seaway system lock facilities located between Montreal and Lake Ontario and the Welland Canal are jointly operated, through international agreement, by the U.S. St. Lawrence Seaway Development Corporation and the Canadian St. Lawrence Seaway Authority. In addition to maintaining and improving the physical infrastructure, the Seaway entities work directly with the maritime industry on development efforts. The Soo locks connecting Lake Superior with the lower lakes are operated by the U.S. Army Corps of Engineers. Participants at the Detroit Futures Assessment meeting expressed some concern with the adequacy of these facilities.

Intermodal transportation across the U.S.-Canadian border is increasing rapidly. While the border crossing itself relates to one specific mode, usually rail, many freight and passenger

services across the border do utilize more than one mode of transportation. Examples of intermodal services include the use of double stack intermodal trains, the use of roadrailer services cross-border, and multimodal movements in which St. Lawrence Seaway or Great Lakes ships actually carry freight cross-border. Many of the intermodal freight movements across the border involve goods moving from Asia to Canada through U.S. ports, and from the U.S. Midwest to Europe through Canadian ports.

Regarding passenger rail, new high-speed trains which would tie in with highway and air services are being considered, and a number of air-bus combinations are possible. For instance, a high speed rail line is being considered between Chicago and Toronto via Detroit, and the Detroit and Windsor airports could be enhanced by cross-border bus movements between the two facilities.

Private bus companies service communities on both sides of the U.S.-Canadian border, but there is no municipal bus service. Exemptions may be required for a multitude of combined regulations of the U.S. Interstate Commerce Commission and the counterpart Canadian agency, National Transportation Agency, to encourage this activity. The only common carrier rail service for passengers in the Northeast is Amtrak and in Maine, Via Rail.

Western U.S.-Canadian Transportation Modes

Since province-of-destination information is unavailable, province-of-clearance data are used to show destinations for U.S. exports to Canada. For the western U.S.-Canadian border region, far less data were available on cross-border rail traffic than for highway traffic. The available data were primarily for southbound movements. The level of detail of the data varied between ports of entry and could not be aggregated for the border region as a whole. Table 2-6 shows the ports of entry for the five gateways of this border region.

There is U.S.-Canadian cross-border trade via pipeline, with locations primarily within the Great Falls Customs District. These include import natural gas lines at or near the ports of entry in Del Bonita, Piegan, Whitlash, Eastport, and Morgan, with an additional import line now being installed at Eastport and another planned near Sweetgrass over the next several years. There is also an export natural gas line near Chinook, Montana, which extends across the border just west of Turner and then re-enters the United States at Noyes, Minnesota. Five import oil pipelines in the Great Falls district are located at or near the ports of entry in Raymond, Del Bonita, Piegan, and Sweetgrass.

Trade by highway and rail accounts for about 90 percent of U.S. exports in the West and nearly 90 percent of Canadian

exports. Exports by rail are only 17 percent of the value of Canadian exports across the U.S.-Canadian border from Manitoba westward. However, when trade across the western Ontario-Minnesota border is considered, this share by rail increases 8 percent. U.S. exports by rail across western borders are relatively small and, where sizeable flows exist, involve trade across the western border originating in the same United States region: the Great Lakes. Canadian exports by rail in the West are greater, over \$5 billion, with the largest flows to the Great Lakes region in the East and to the Upper Plains and Pacific Northwest regions in the West.

Cross border rail movements are primarily low-risk, low-value, bulk type commodities on line release. Line release is a program that applies to specific commodities from specific shippers who have demonstrated reliability in their shipments and documentation. The shipper's broker preclears the qualifying shipment, for all practical purposes eliminating the need for inspection at the border. Many of the rail movements are between sources of supply and processing plants on opposite sides of the border or between United States and Canadian mills which are connected by cross-border rail and highway bridges. A large volume of Canadian export to the United States is bulk commodities and raw materials, placing greater reliance on rail for southbound flows. By contrast, U.S. exports to Canada are primarily manufactured and processed goods suitably carried by commercial vehicles.

A significant volume of in-transit, cross-border rail traffic, particularly along the Minnesota-Canadian border where rail shipments between western and eastern Canada use the United States as a shortcut around the Lake of the Woods region, presumably cancels itself out. Data for these rail movements are not included.

Rail trade in the west largely involves east-west movements of goods, rather than north-south. As with trade by highway, nearly 80 percent of the U.S.-Canadian trade by rail in the west largely moves through just four ports, three of which are located in the upper Plains region.

TABLE 2-6
MAJOR GATEWAYS FOR WESTERN U.S.-CANADIAN TRAFFIC

TRAFFIC GATEWAY	U.S.PORTS OF ENTRY	TYPE OF TRAFFIC
Pacific Coast	Blaine Lynden Sumas	Car, CV , Rail Car, CV (Permit Only) Car, CV, Rail
East Washington	Oroville	Car, CV
Rocky Mountain	Porthill Eastport Roosville Sweetgrass	Car, CV (Permit Only) Car, CV, Rail Car, CV Car, CV , Rail
Central Plains	Portal Northgate	Car, CV Car, CV
Upper Plains	Pembina/Noyes Baudette International Falls	Car, CV , Rail Car, CV Car, CV, Rail

Car - noncommercial vehicle CV - commercial vehicle
Principal gateway ports of entry and traffic types in bold.

These four ports are:

- International Falls, Minnesota, the third busiest rail port borderwide, as measured by trade value with \$2.8 billion (up from \$2.2 billion in 1988). Canadian exports accounted for most of this trade
- Portal, North Dakota, with \$1.1 billion in trade
- Pembina, North Dakota, with over \$900 million in trade
- Blaine, Washington, with nearly \$700 million in trade

In 1990, about \$9.5 billion in U.S. goods were exported to Canada in the west by highway, and \$6.5 billion in Canadian exports were shipped by highway in 1990.

From a traffic standpoint, data suggest four traffic gateways:

- Pacific Coast, the largest, accounted for 71 percent of total western U.S.-Canadian cross-border highway traffic volume in 1992.
- East Washington/Rocky Mountain handled approximately 13 percent of total western U.S.-Canadian highway traffic volume in 1992.

- Upper Plains accounted for 12.5 percent of total.
- Central Plains, smallest of the four in terms of traffic volume, accounted for less than 4 percent of the total 1992 traffic volume in the West.

In the whole region, noncommercial, cross-border highway traffic accounts for approximately 95 percent of total traffic volume. The remaining 5 percent is primarily commercial vehicle traffic. The noncommercial traffic volumes have grown at a faster rate than commercial traffic. In most cases, the volume of northbound commercial traffic has grown at a higher rate.

Commercial vehicles engaged in U.S.-Canadian trade in the West tend to organize into three general cross-border trading subregions: the Pacific region, with major flows concentrated between the Pacific Northwest and Far West regions of the United States and British Columbia in Canada; the Rocky Mountain region, with major flows concentrated between several western regions in the United States and Alberta in Canada; and the Upper Plains region, with major flows between the Great Lakes and Plains regions of the United States and the Prairie/Plains region of western Canada.

As Canadian exports move further and further away from the border in any particular subregion, they increasingly disperse to a variety of destinations. U.S. exports for any given subregion originate in many different regions of the United States but, as they increasingly near the border, tend to converge before crossing. As a result, more than 65 percent of the value of U.S. exports by highway and 75 percent of the value of Canadian exports move through a relatively few ports serving as regional gateways closest to major metropolitan centers in western Canada. The Pacific Coast, Upper Plains, and Rocky Mountain gateways rank fifth, ninth, and tenth in the Nation for cross-border trade by commercial vehicles. The major cross-border gateways are:

- Pacific Coast - Blaine, handles about 70 percent of all cross-border trade in the Pacific Northwest, valued at \$4.9 billion. Total commercial vehicle weight at the Pacific Highway crossing is 62 percent southbound and 38 percent northbound.
- Upper Plains - Pembina, south of Winnipeg, handles between 40 and 50 percent of the region's trade, \$2.5 billion. This figure is up 11 percent or \$238 million since 1988.
- Rocky Mountain - Sweetgrass, south of Calgary and Edmonton, handles between 60 to 70 percent of Canadian exports in the

region and over 55 percent of U.S. exports. This amounts to \$2 billion in two-way trade by commercial vehicles, up 38 percent or \$555 million since 1988.

Trade by commercial vehicle through three other ports is also significant:

- Central Plains - Portal, southeast of Regina, handles over 25 percent of the region's trade by commercial vehicle. This amounts to \$1.5 billion in two-way trade by commercial vehicles, up 27 percent or \$314 million since 1988.
- East Washington - Oroville, WA, handles \$800 million in trade by commercial vehicle, up from \$335 million in 1988.
- Rocky Mountain - Eastport, handles \$690 million in trade, up from \$510 million in 1988.

The largest U.S. travel flow for all modes to Alberta originates in the Far West, Gulf, and Great Lakes regions, while the largest Canadian travel flow from Alberta goes to Hawaii, the Far West, and the Central and Southern Rockies. In the Plains region, the largest U.S. travel flow is from the Upper Plains and Great Lakes regions. The largest Canadian travel flow is from Manitoba and Saskatchewan to the Upper Plains and Far West regions.

Exports by air from Canada in the west are relatively small, and exports by water account for only 6 percent of Canada's western exports. This percentage is even a smaller percentage when trade across the western Ontario-Minnesota border is included.

The volume of air and water traffic handled at the Western U.S.-Canadian ports of entry examined in this study is minimal and includes primarily private aircraft and recreational craft, with peak activity during the summer months. At the Point Roberts and Blaine ports of entry, most vessel reports are made through the small boat phone report system, with only occasional entries and clearances of commercial vessels.

U.S.-Mexican Transportation Modes

Distribution by major mode of transportation of U.S.-Mexican trade is about 4 percent by air, 10 percent by sea, and 86 percent by land, using dollar value. The estimates based on tonnage is 2 percent by air with the remainder evenly split between land and sea. The high dollar value of air freight overstates and the low value of waterborne commodities understates their respective shares of the actual physical quantity of goods moving. Table 2-7 shows the distribution of

export trade volume by mode. Comparable import data are shown in table 2-8.

There is a limited amount of transit serving border communities, however, interest in this area has been growing. On the U.S.-Mexican border, there is presently light rail service from San Diego to the border at Tijuana. El Paso-Cd. Juarez at one time had light rail service across the border but this has been discontinued. However, there are current plans to reinstitute such service using a new transit/HOV bridge sited near the Paso del Norte bridge.

Most of the air cargo to and from the border airports in El Paso, Laredo, and the Lower Rio Grand are shipments to and from maquiladora factories in Mexico. Although the principal movement of these products is by air, they are transported to and from Mexico by commercial vehicles. The movement of trade in tons, however, has a significantly different distribution because of the large volume of Mexican oil imported to the United States and because rail and sea vessels tend to carry commodities which are heavier than those transported by commercial vehicles or by air. The northbound split of land transportation is 75 percent highway and 25 percent rail by dollar value. The percentage of difference between the southbound rail and commercial vehicle movements could not be calculated because the data are not available. All modes of transportation carry both maquiladora and traditional merchandise trade, although a significant volume of trade may change mode at the border.

In terms of value, the dominant states-of-origin of air-transported exports to Mexico are California, Texas, New York and Florida. The dominant states in Mexico that receive these air-transported trade flows are the Distrito Federal, Jalisco, and the Estado de Mexico. The origins of northbound air trade flows are in the Distrito Federal and the State of Jalisco. In the United States, the destination states that dominate the air trade flows are California and Texas. Investment and service trades primarily use air transportation.

The concentration of waterborne trade activity with Mexico occurs through relatively few U.S. maritime ports. The highly concentrated pattern of trade activity through U.S. ports is obvious. More than 80 percent of the trade is accounted for by the top 10 ports, and the top 20 ports cover nearly 97 percent. The top 10 ports that are in the Gulf of Mexico and are involved in trade with Mexico are, in declining order, Ports of Houston, Pascaguola, Grammercy, Lake Charles, New Orleans, Texas City, Corpus Christi, Tampa, Baton Rouge, and Port Arthur.

Waterborne activity is also concentrated in terms of commodity type where petroleum and products account for approximately 75 percent of the trade volume. This factor alone can explain the degree of concentration since ports serving this trade need to be closely related to domestic refinery and distribution systems, which are themselves geographically concentrated.

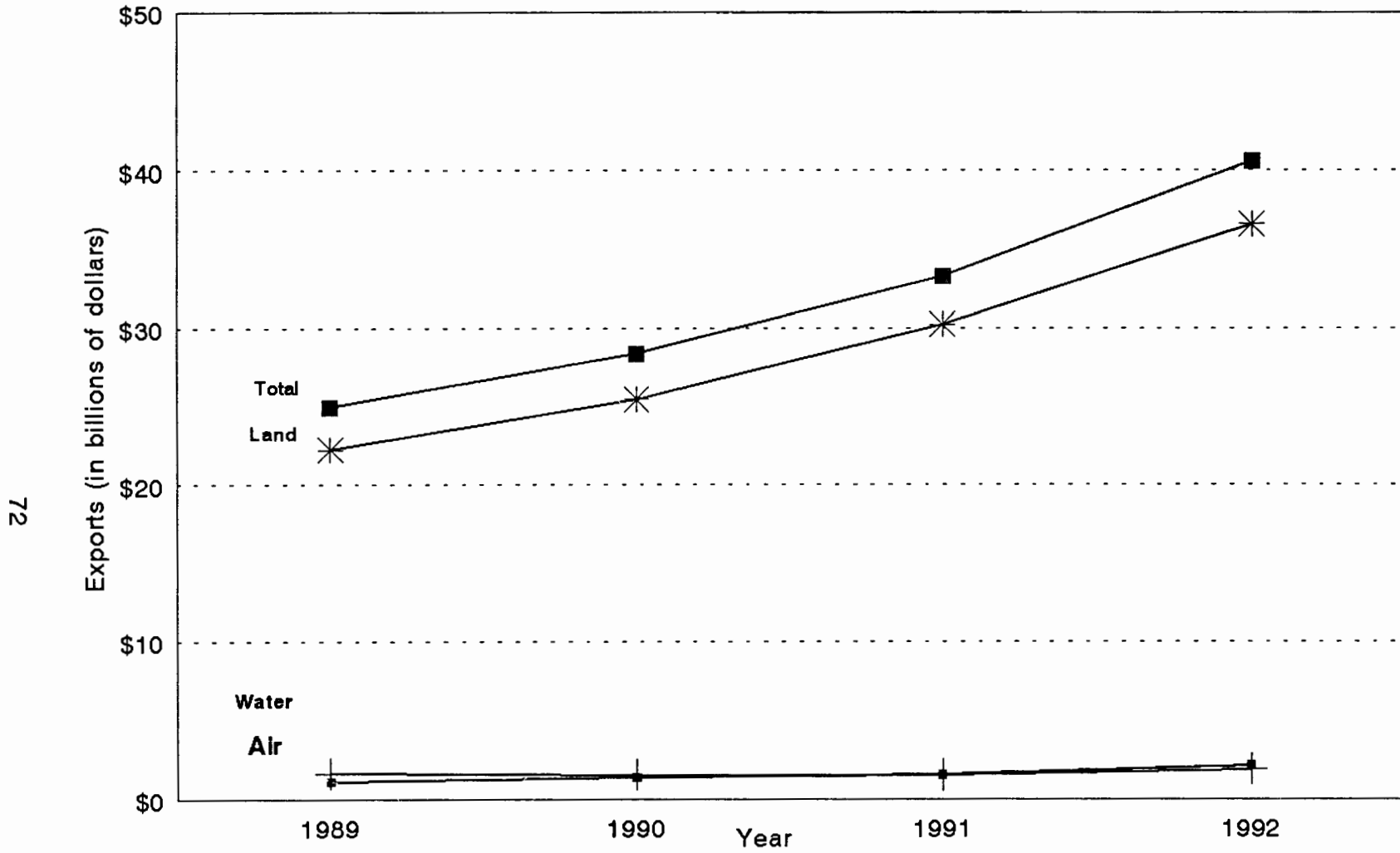
Although waterborne trade with Mexico is substantial in terms of total volume, it is still a relatively small portion of the activity for most U.S. ports. For the ports in the Gulf of Mexico, trade to and from Mexico accounts for more than 10 percent of total port activity. For the ports on the east coast and the Gulf of Mexico in aggregate, the Mexican trade amounts to about 7.5 percent of the total port throughput. For the east coast, imports from Mexico exceeded exports to Mexico by 72 percent of the total trade.

The flow of waterborne trade between the United States and Mexico is concentrated in the coastal states of the United States and Mexico. The principal origins of waterborne U.S. exports to Mexico are ports in Texas and Louisiana. Northbound waterborne U.S. imports from Mexico have their destinations in Texas, Louisiana, and Mississippi. This is primarily due to the large volume of oil exported from Mexico's coast facilities on the Gulf of Mexico.

The United States and Mexico have the longest land border between a developed and developing country in the world. Land transported export and import trade flows reflect 86 percent of U.S.-Mexican trade value and is shipped by highway and rail. Since maquiladoras in Mexico account for 52 percent of imports and 41 percent of exports, nearly half of all products transported to Mexico by all modes have an origin or destination in a maquiladora factory. Since 90 percent of maquiladora employment is concentrated in the Mexican border states, much of the flow of goods does not penetrate far into Mexico. This has reduced the constraining impact that inadequate transportation infrastructure might otherwise have upon the growth in maquila activity.

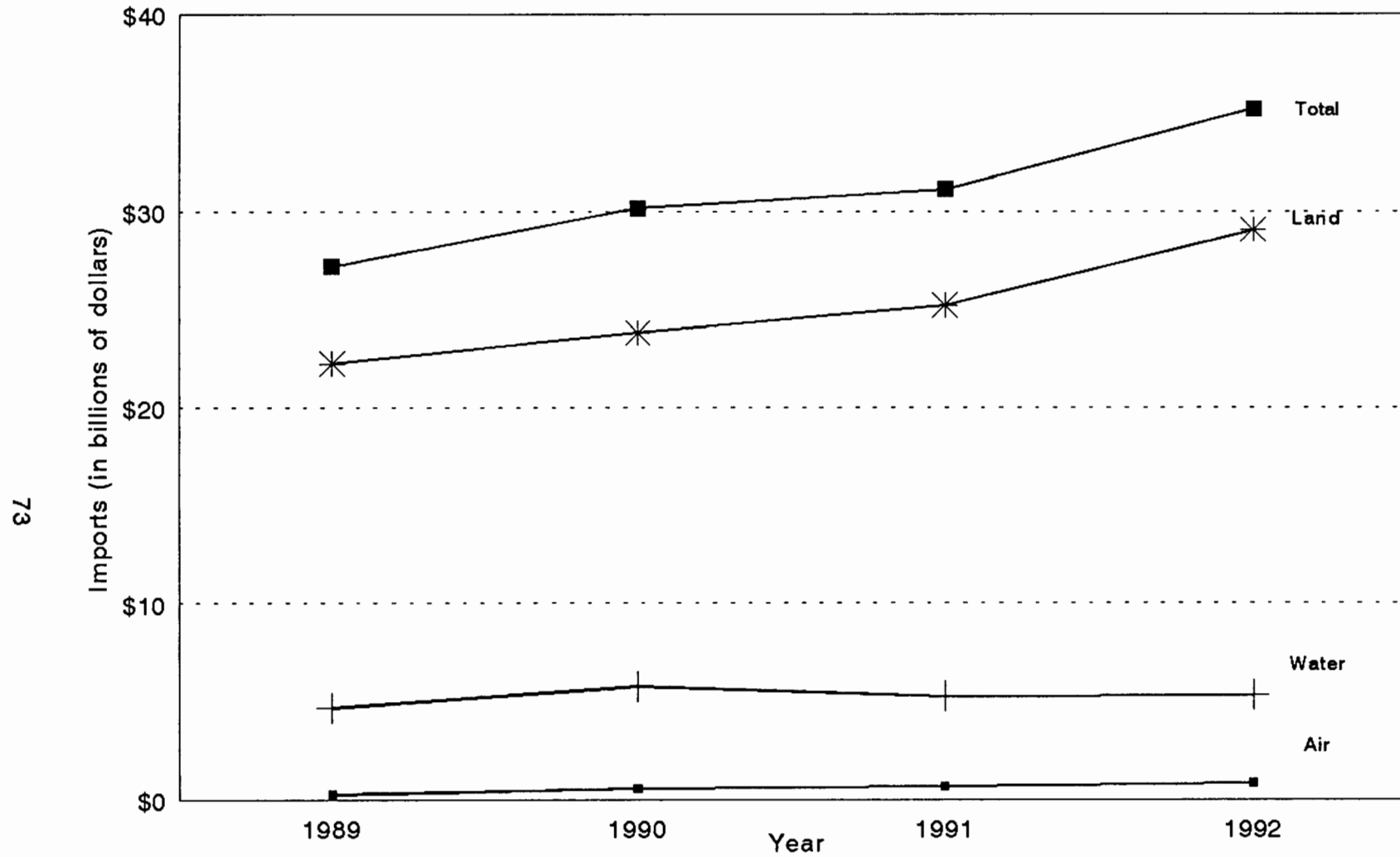
The Mexican destinations of principal U.S. exports by land are the Distrito Federal and the border states of Baja California

TABLE 2-7 TOTAL U.S. EXPORTS TO MEXICO BY MODE



Air	■	\$1.12147	\$1.377933	\$1.54305	\$2.147998
Water	+	\$1.61683	\$1.527408	\$1.509396	\$1.870646
Land	*	\$22.23052	\$25.47013	\$30.22333	\$36.57883
Total	■	\$24.96882	\$28.37547	\$33.27578	\$40.56748

TABLE 2-8 TOTAL U.S. IMPORTS FROM MEXICO BY MODE



Air	■	\$0.248165	\$0.572151	\$0.658528	\$0.805965
Water	+	\$4.670649	\$5.763776	\$5.26003	\$5.321835
Land	*	\$22.26744	\$23.83637	\$25.21	\$29.05635
Total	■	\$27.18626	\$30.17229	\$31.12956	\$35.18415

Norte, Chihuahua, Nuevo Leon, and Tamaulipas, respectively. The two dominant states of export origin in the United States are Texas and California. Other states which originate significant exports include Michigan and Illinois. Northbound land-transported imports originating in Mexico mirror the destinations of U.S. exports to Mexico. The primary destinations of these goods are Texas, California, and Michigan.

Rail and commercial vehicles are the primary carriers of this trade. Approximately 75 percent of the northbound land transported United States imports from Mexico are transported by commercial vehicles and 25 percent by rails. Michigan leads all United States sites as the destination for northbound rail shipments by value, followed by Texas. Northbound commercial-vehicle-transported imports from Mexico have their principal destinations in Texas, California, Arizona, and Michigan.

Northbound commercial vehicle crossings over the period 1989 to 1992 increased 12 percent, from 2 million to 2.3 million crossings. The ports of Otay Mesa and San Ysidro are grouped because commercial vehicle traffic is being diverted from San Ysidro to new facilities at Otay Mesa. El Paso experienced the strongest growth over this period, with a doubling of commercial vehicle traffic. Laredo continues to be a dominant port in land transport, growing at a rate of 57 percent over the same 4-year period.

Travel in cars, i.e., noncommercial vehicles, across the U.S.-Mexican border is heaviest in San Diego (including the ports of Otay Mesa and San Ysidro), El Paso, and Calexico. The average rate of growth in car traffic across the U.S.-Mexican border was 3 percent from 1989 to 1992. The Ports of Otay Mesa and San Ysidro accounted for 25 percent of all U.S.-Mexican car crossings in 1992. A decline of 14 percent in car traffic through El Paso from 1989 through 1991 skews the distribution; however, historical data from 1968 reveal a small average northbound car increase to the present.

Northbound pedestrian crossings are heaviest in California. However, some cities--San Ysidro and El Paso--actually experienced declines over the period 1989 to 1992. Over half of the ports experienced increases in excess of 10 percent over the same period, with Otay Mesa experiencing an increase in excess of 1,000 percent.

TRADE FLOW TRANSPORTATION PATTERNS

One of the primary objectives of this study was to identify existing and emerging trade corridors. Unfortunately we found no good definition of what constitutes a trade corridor for all modes of transportation. There is insufficient linkage between available data on trade and transportation to permit the establishment of a firm definition of what constitutes an existing or emerging international trade corridors for all modes of transportation. No existing or emerging trade corridors were identified in the study. The report addresses trade flow patterns rather than trade corridors for the major areas of North America. Because adequate data are at the heart of this problem, to assist in future border region and trade corridor transportation system planning the Department recommends the development and implementation of a program for improving methods of collecting and analyzing data on cross-border trade and traffic flows.

A recent study by the Arizona Department of Transportation (ADOT, 1993) identified the key attributes of a mature trading pattern, which would apply to trade corridors as well as diffused trading patterns. The key elements identified give insight into what is important in mature trading relationships. These items include:

- well-developed physical infrastructure, including highways, rail, air and sea linkages, and ports of entry
- established commercial infrastructure and appropriate trade incentives, including distribution and warehouse facilities, foreign trade zones, and a harmonized regulatory environment
- regionally integrated technological infrastructure
- business and professional expertise, including customs brokers, freight forwarders, and internationally sophisticated accountants, attorneys, and consultants
- well-developed social, political, and business linkages.

In the absence of any firm definition of a trade corridor, existing trading patterns were observed from the trade flow data. In addition, the public outreach activities generated information on traffic routes that are used heavily for intraregional or interregional trade flows.

Most of the trade flow patterns observed can be best described as intraregional flows. To a great extent, this can be accounted

for by the fact that the regional economies at the borders are truly binational. As a result, there are large volumes of cross-border commuting, cross border shopping, and cross-border movements of goods and services to support the regional economy. These movements are best accommodated by rich regional transportation systems.

There are, of course, trade movements between production regions and between production and consumption regions. Often these regions are far removed from one another with little intervening trade occurring. Occasionally, the trade is between contiguous regions, typically in the dense population and manufacturing sections of the eastern United States and Canada. A study has been proposed to develop strategies for capital investment in and operational improvements of a transportation corridor on the west coast.

The following sections describe observed trade flow patterns for the major areas of North America.

Eastern U.S.-Canadian Trade Flow Transportation Patterns

The Niagara and Michigan frontiers are at the center of the major trade flow patterns between the United States and Canada, and the upper Midwest is responsible for the largest portion of U.S.-Mexican trade, aside from that which originates in Texas and California. As such, the transportation flow patterns between Montreal, Toronto, Buffalo, southeast Michigan, Chicago, and Laredo--where most Mexican freight crosses the border--are critical to an integrated North American market. While infrastructure already exists for these trade flow patterns, some areas need more direct interstate routings, and other areas require various improvements to existing interstates.

Several trade flow patterns that are key from an industry standpoint are in the Michigan frontier. The flow from Toronto to Detroit to Tennessee and on to Florida--using Ontario 401 expressway and I-75--is one of the heaviest travelled truck routes in North America. It is also a critical just-in-time route for the auto industry and has been referred to as an "assembly line on wheels" because of the number of auto supplier shipments on this route. The biggest bottleneck of this flow pattern is near the border crossing itself. The highway is not limited access divided highway in Canada for about three miles. In the United States, the Interstate does not connect directly to the bridge access and egress plazas. In addition, various improvements in the Detroit metro area are required.

A second trade flow pattern from Toronto to the United States involves movements through Detroit or Port Huron and on to Chicago, the West, and/or south to Texas and Mexico. This flow pattern includes Ontario 401 expressway in Canada and I-94 between Detroit, Chicago, and points west.

Again, the principal bottlenecks are near the border crossing itself. The infrastructure for this trade flow pattern also requires major reconstruction in the Detroit area due to age and high volumes of international and domestic truck traffic. The optional route from Toronto to Chicago involves the 401 and 402 expressways in Canada, with a crossing at Port Huron and travel to Chicago via I-69. This route is far less congested, features newer infrastructure, and includes direct expressway access to both sides of the Blue Water Bridge. However, this I-69 trade flow does not continue on to the south and Laredo. Several interest groups are promoting the idea of extending this interstate through St. Louis, Little Rock, and Texas. In order to obtain a more direct interstate alignment between the Midwest and Texas, several hundred new miles of interstate would be necessary in the South.

Although, these routes carry some to the heaviest trade traffic between the United States and Canada, rail service through these trade flow areas is constrained by the absence of any double stack or high cube capacity due to clearance problems in the existing rail tunnels. Recently, a new rail tunnel begun at Port Huron-Sarnia would accommodate double stack container trains, and the rail tunnel at Detroit-Windsor may be reconstructed to accommodate high cube intermodal movements. This added capacity would accommodate not only U.S. to Canada trade, but trade bound for Europe and elsewhere out of east coast ports.

In the Niagara frontier area (shown in figure 2-2), a heavy flow of automobile industry and other traffic between Montreal/Toronto and the eastern United States creates another trade flow pattern. The Peace Bridge at Buffalo is at the center of this major transportation route, which includes the Queen Elizabeth Way (QEW) in Canada and several U.S. interstates, including the I-90 in the Buffalo area. The I-90 and I-190 in the Buffalo area will need to be expanded to six and eight lanes before 2020, according to the March 1993, Niagara frontier report. Buffalo area officials have also pointed out growing trade levels between Canada and the Washington, D.C.-Baltimore area and areas further south. They suggested that U.S. Route 219 from Buffalo, New York, southward to I-77 requires an upgrade to interstate standards. (Appendix C)

In eastern New York, upgrading Highway 37 to four lanes has been proposed for some time. This highway runs across the top of New York State, connecting to the Seaway International Bridge and to a smaller crossing at Fort Covington. Canada's attempt to upgrade Highway 16 between Ottawa and Prescott to a four-lane highway has been delayed for some time.

Other trade and transportation trade flow patterns in the East include those connecting Ottawa, Ontario, to lower New York, with a principal crossing at Ogdensburg. Further north along the border of New York, the Seaway International Bridge connection is critical to the economic vitality and prosperity of St. Lawrence County, New York, as well as to the North Country region of New York State. This international crossing has attracted industry to the rural region and has led to the creation of numerous jobs within the region. The two significant trade flow patterns in the Montreal South frontier linking Montreal, Quebec to the eastern United States via Vermont are Derby Line and Highgate Springs. Both of these crossings are interstate highways in the United States, I-91 and I-89, respectively, but only Derby Line connects to a major Canadian Highway, Route 55.

An important highway infrastructure issue in the Montreal South frontier is the inadequate transportation route serving traffic into Canada through the port of St. Armand-Phillipsburg, which is the Quebec side of Highgate Springs. At this crossing, 4-lane I-89 connects to rural two-lane Route 133, which has a third "suicide lane" in the middle. The third lane presents a safety concern as it serves northbound traffic in some sections and southbound traffic in others. The deficient highway structure and roadbed capacity of Route 133 in St. Armand-Phillipsburg causes commercial traffic to divert west to I-87, at Champlain, New York.

A highway transportation committee in Vermont is researching options and alternative funding methods to upgrade this trade flow infrastructure. Some commercial activity is being diverted to eastern New York through the Champlain port of entry, which is already busy and often congested, to avoid Route 133 through Highgate Springs.

In eastern Maine, the Houlton port of entry on Interstate 95 is a major trade flow pattern linking the Canadian Maritime Provinces with the northeastern United States. It connects to Canadian Route 2, known as the Trans Canada Highway. Advocates of developing this pattern envision it becoming an international expressway from Newfoundland to Miami, now calling it the Atlantic Expressway.

Western U.S.-Canadian Trade Flow Transportation Patterns

Emerging trade flow patterns are defined for this region in terms of regional gateways for land transportation. The pattern of U.S.-Canadian trade in the west tends to organize into three somewhat distinct cross-border trading subregions: the Pacific Northwest, the Rocky Mountains, and the Upper Plains. The flow of trade at the border is focused through relatively few major crossings. These crossings serve as regional gateways for U.S.-Canadian trade in the West.

While some dominant interregional flows are associated with trade to and from these border gateways, trade flows beyond the border are multidirectional, with many east-west flows as well as north-south flows to and from the border. The pattern of trade tends to steadily disperse in moving from the border into trading regions of the United States.

At the same time, the pattern of trade tends to steadily converge in moving toward the border into what may be construed as regional gateways. The subregional zones of western U.S.-Canadian trade convergence associated with these major gateways are depicted in figure 2-3, page 27. These zones are meant to reflect the directions of major interregional trade flows associated with cross-border trade in the three subregions.

The degree to which the gateways will emerge as regional trading corridors will be heavily influenced by one factor which influences patterns of transportation--future growth among the major metropolitan areas in western Canada. Since cross-border trade is largely between population and employment centers, growth in both Canadian and U.S. exports to these regions will closely follow future growth in these Canadian and U.S. population centers. Several groups of private citizens have organized to promote specific trade flow routes including U.S. routes 81 and 83 as well as routes in the High Plains and Red River regions connecting Canada and Mexico through the United States.

U.S.-Mexican Trade Flow Transportation Patterns

The study team did not find trade flow patterns that meet all of the Arizona Department of Transportation requirements. However three existing and two emerging gateway trade flow patterns were identified. These patterns are linked to import/export gateways described in the trade and transportation flow sections of this chapter. They are: South Texas, West Texas, New Mexico, Arizona, and California gateways. They are not broad continental corridors in the sense that they connect regions of the United

States with regions in Mexico, or regions in Mexico with regions in Canada. Rather, they tend to be the funnel or gateway through which trade and people pass. They do not merely serve as convenient crossing points for binational trade, but rather as a local economy of integrated services, industries, and trade. They are associated with the gateways shown in figures 2-4 through 2-8.

Maritime flows between the Gulf of Mexico ports and Mexico are concentrated in several sea trade flow patterns. The primary flows of exported petroleum products are almost entirely concentrated in the movement of the product from the refineries of Texas to Tuxpan. Nonpetroleum exports move from Houston to the nearby Tamaulipas and Veracruz coasts, while Mobile serves the Yucatan Peninsula. New Orleans and the Florida ports serve both the Mexican Gulf ports and those of the Yucatan.

U.S. imports of Mexican petroleum and products flow from the oil fields of the southern Veracruz to Campeche region to the refinery centers from Houston to Mobile (Pascagoula). Nonpetroleum imports flow to population or transshipment centers on the Gulf of Mexico and also to Atlantic Coast ports.

CHAPTER 3: STATUS--BORDER INFRASTRUCTURE/INSTITUTIONAL SYSTEMS

This chapter provides data on the capacity growth currently planned and any known problems with the ability of the existing physical and institutional system to handle trade and traffic flows. The purpose of this section is to establish likely physical infrastructure requirements to accommodate existing and anticipated highway system demands resulting from increased international trade. This must be established to determine the feasibility and advisability of different program delivery mechanisms, including a discretionary program as per ISTEA Section 1089.

Institutional factors are those which relate to the missions, policies, responsibilities, and actions of various public, quasi-public, or private entities who have an interest in or in some way affect or are affected by regional transborder trade and transportation. These institutions include Federal, state, provincial, county, local, and private sector groups on both sides of the border. This discussion covers air, land (rail and highway), pipeline, marine, and intermodal transportation.

The intermodal system in the United States is heavily oriented towards east-west movement, and was originally built to distribute marine cargo to and from the European and Far East markets. Intermodal connections are abundant along the U.S.-Canadian border, particularly in the East. By contrast, intermodalism has come even more recently to U.S.-Mexican trade, with facilities and services being added at a rapid pace.

Data for this assessment were assembled from a variety of sources. The GSA provided data on border crossing facilities, as did Customs and Excise, Revenue Canada. Private and public authorities that own or operate facilities also provided information. Staffing information was obtained from Customs, both U.S. and Canadian, and INS. The Department's Maritime Administration (MARAD) data base is the primary source for the inventory of port facilities. This data base provides information for all terminals in a given port district. Additional information was obtained directly from port authorities and terminal operators. The inventories of facilities cover both private and public facilities.

A great deal of information on current problems and improvements was developed from the outreach activities. One of the major purposes of the regional roundtable sessions was to have local and regional experts identify those border crossing issues and constraints that created the problems. This provided a basis for examining the problems more closely and identifying other solutions that could be employed.

Finally, much information and understanding of border issues was developed through on-site observations and discussions with field

officials in the regions and at the border. In the course of the investigation, all major land crossings were visited. Many of the smaller crossings were also visited. During these meetings, additional statistical data were obtained directly from the border crossing station staff. More importantly, they permitted the study team to discuss some of the problems identified elsewhere with operators and inspection agents for clarification, confirmation, or rebuttal.

INFRASTRUCTURE SYSTEMS

The transportation mission of moving goods and people efficiently and expeditiously from origin to destination fundamentally conflicts with border security and management objectives. This dichotomy further clouds infrastructure investment and planning strategies in the border region, particularly in urban areas where a large percentage of the cross-border demand is frequent crossers engaged in social or economic activities associated with normal daily life.

In addition, significant issues of public policy are to be addressed in the public and private funding of infrastructure associated with intermodal traffic flows. This rapidly evolving technology and expanding intermodal traffic volumes present both significant opportunities and potential difficulties for resolving cross-border transportation infrastructure needs.

The level of traffic volumes for border crossings is shown in the detailed reports listed in Appendix A which provide profiles for border crossings. Also, tables 2-3 through 2-6 provide indicators of the levels of trade by mode.

Eastern U.S.-Canadian Infrastructure Systems

This section addresses the northeast region of the United States from and including Sault Ste. Marie, Michigan to Calais, Maine. It covers five specific frontiers in the northeast that have been identified for analysis of cross-border traffic levels and border-related transportation needs. Figure 2-8 locates 16 major ports of entry in the northeastern United States. All but one of these ports, Madawaska, are commercial ports. The five frontiers, as defined in this study, are: Maine, Montreal South, Eastern New York, Niagara, and Michigan.

In terms of individual ports of entry, the busiest land port is Detroit, where 1992 trade totaled \$43.2 billion. While data are not available for land crossings alone, total trade at the Detroit Customs district, including Port Huron and Sault Ste. Marie, increased by 29.0 percent between 1987 and 1990. Within

the Detroit District, the Ambassador Bridge accounts for the great bulk of all trade. The second busiest port is Buffalo where, including Niagara Falls, trade totaled \$35.8 billion in 1992. Trade at the Buffalo District increased by 43.4 percent between 1987 and 1990. The Peace Bridge at Buffalo dominates trade in this port of entry. In terms of highway traffic, the Buffalo-Niagara crossings are the busiest.

Most border delays and inefficiencies are due to institutional issues, but several physical infrastructure needs will be discussed. These needs could be categorized in terms of actual physical capacity, inspection station capacity, connections to surrounding transportation infrastructure, and availability of major cross-continent transportation corridors. The following is a discussion of the key crossing elements and a summary of key physical infrastructure issues.

Highway Mode

While present crossings have adequate capacity at most locations, several crossings in each mode require additional physical capacity.

Many of the eastern crossings have major problems with plaza capacity for either primary or secondary inspections by the inspection services on one side and/or the other.

Perhaps the greatest unfunded need on the eastern border relates to connecting border crossings to area expressways and major roads and widening and improving area highways and city streets in the vicinity of the crossing. These needs are especially great at the Niagara and Michigan frontiers in the United States, where area highways require widening and crossings need better connections to area roads. In the Montreal South frontier, the highway connection problem exists on the Canadian side.

The Niagara and Michigan frontiers are at the center of the major trade flow transportation areas between the United States and Canada. The upper Midwest is responsible for the largest portion of U.S.-Mexican trade, aside from that which originates in Texas and California. As such, trade flow transportation patterns between Montreal, Toronto, Buffalo, southeast Michigan, Chicago, and Laredo, where most Mexican freight crosses the border, are critical to an integrated North American market. While infrastructure already exists for these transportation patterns, there are some areas where more direct Interstate routings are necessary, and other areas where various improvements to existing Interstates are required.

Rail Mode

Vertical clearance restrictions at the two rail tunnels between Michigan and Ontario are major infrastructure constraints. At present, there is no double stack or high-cube rail capability in the major U.S.-Canadian frontier.

Water Mode

The Great Lakes and St. Lawrence Seaway system are a critical transportation link between the U.S. and Canadian hinterlands and the rest of the world. The physical international boundary line between Canada and the United States bisects most of the system which handles commerce between the United States and Canada, domestic coastal traffic for each nation, and overseas traffic for both countries. Seaway system lock facilities located between Montreal and Lake Ontario and the Welland Canal are jointly operated, through international agreement, by the U.S. St. Lawrence Seaway Development Corporation and the Canadian St. Lawrence Seaway Authority. In addition to maintaining and improving the physical infrastructure, the Seaway entities work directly with the maritime industry on development efforts. The Soo locks connecting Lake Superior with the lower lakes are operated by the U.S. Army Corps of Engineers. Participants at the Detroit Futures Assessment meeting expressed some concern with the adequacy of these facilities.

On the other hand, the inland waterway system has the potential to provide a water bridge linking the Great lakes, the Mississippi River basin, and the Gulf of Mexico. Participants in St. Louis and New Orleans noted the proposal by proponents for greatly expanding the use of the inland systems through the use of existing vessels or new technology currently available for developing vessels better suited to serving the foreign trades.

Intermodal Transportation

Intermodal transportation across the U.S.-Canadian border is increasing rapidly. While the border crossing itself relates to one specific mode, usually rail, many freight and passenger services across the border do in fact use more than one mode of transportation.

The key infrastructure issue for intermodal movements cross-border involves the height restrictions at Michigan border tunnels. A second infrastructure issue related to increased intermodal rail traffic is the need for grade separations at the many highway crossings along these rail routes.

Western U.S.-Canadian Infrastructure Systems

The western U.S.-Canadian border region, from Lake Superior west to the Pacific Ocean, encompasses 5 states, 5 provinces, and more than 50 land ports of entry along an estimated 1,360-mile border. The research team made site visits to the majority of the ports of entry within the northwestern area and provided detailed individual profiles of each. Between the Pacific Coast and Lake Superior, 14 rail lines cross the U.S.-Canadian border. Eleven of these are actively engaged in transborder freight movements. Eight crossings are served by railroads owning assets on both sides of the border. These railroads are the Burlington Northern, Canadian Pacific/Soo, and Canadian National. The other rail lines are owned by the Union Pacific, Duluth Winnipeg & Pacific, and Minnesota Dakota & Western.

Following are the infrastructure system issues critical to this border area.

Access Roads

For several major crossings in the Northwest, local access road systems are a primary constraining factor to improved efficiency and safety on both sides of the border.

Joint Facilities

The majority of the smaller border crossings on the western U.S.-Canadian border operate with facilities built as early as the 1930s. Some structural renovations have been made, such as raising canopies, widening inspection lanes, and adding space for offices and rest rooms. However, efficiency of operation at many of these border stations is constrained by lack of modern-day communications such as on-line computer and electronic facsimile capabilities. The ability to carry out inspection activities is also limited by a lack of personnel since many of the facilities are staffed by one person. In many cases, the U.S. and Canadian border stations are only a few hundred yards apart.

At two locations on the border (Danville/Carson in Washington and Turner/Climax in Montana), joint U.S.-Canadian facilities have been constructed where the United States and Canadian officials operate from a single facility. This type of operation is cost-efficient with respect to maintenance and also provides better communication and mutual backup support for personnel assigned to these crossings. A number of the facilities which handle both commercial and personal auto traffic in the western U.S.-Canadian border region are potential candidates for joint facility development.

Low-risk, Low Volume Crossings

Several of the western U.S.-Canadian crossings have minimal traffic, primarily local residents crossing the border, often on a daily basis, for personal reasons. These ports of entry currently handle only low-risk commercial traffic on a primary basis and less than 75 automobiles per day. There are no provisions for facilitating this type of traffic without fully-staffed border stations. Such facilities are candidates for streamlining operations through technology-based border control systems.

Differences in Highway Standards

At selected northern border crossings, particularly those in Montana and North Dakota, different highway standards exist. These differences affect cross-border traffic flow and can impede the ability to make efficient intermodal connections for North American trade and traffic flows. This also affects traffic flows between states within the United States. There are neither continental highway standards nor individual agreements between jurisdictions to facilitate more efficient connections at or near these border crossings.

Rail Potential

The north-south railroad potential is underutilized and underdeveloped, particularly in the Rocky Mountain and Great Plains regions of the border. Moving freight across the border via rail is usually more efficient, since entire multiple car trains are processed and cleared simultaneously. A similar volume of freight moving by commercial vehicles would increase highway congestion and require individual processing of each truck trailer. There are no north-south rail systems linking Canada, the United States, and Mexico in a land bridge comparable to the east-west land bridges linking both coasts.

Capital Improvement Program

The GSA has an established process for identifying their top ten border station priorities on an annual basis. This list includes both northern and southern stations. A five-year border capital improvement program that has or will meet the southern border station needs exists for the Southwest. There is no comparable program for the northern border. Accordingly, the current top ten list developed by the Regional Customs commissioners contains mostly facilities in the north. There are no guarantees that these projects will be funded. Once on the list, GSA must develop a proposal and seek funding for the project. For

projects costing more than \$1.6 million, Congress must specifically authorize and fund the project. At several border stations along U.S.-Canadian border, plans have been developed for replacement or renovation of outdated facilities, and there are proposals for joint U.S.-Canadian border stations. Some of these plans have been unfunded, postponed or canceled. Even relatively minor improvements, such as installation of on-line computer capabilities, have been delayed for months and years at some stations. In some cases, the reason for the delay is that electrical wiring in the border stations is so old and outdated that it cannot accommodate computer systems.

Intermodal Services and Facilities

Intermodal services and infrastructure are well-developed in the Pacific Coast gateway subregion, with a variety of competitive rail-truck options available for cross-border movements. Additionally, sea-land and sea-air options are available at Puget Sound ports. Class I rail service and a large number of commercial vehicles offer state-of-the-art equipment, a range of services, and competitive rates for a broad spectrum of customers. However, the level and types of intermodal services and facilities are somewhat limited as one moves east of the Cascade Mountains. Within the immediate border area, these facilities are located at Eastport, Idaho; Eureka and Shelby, Montana; Northgate, North Dakota; Noyes and International Falls, Minnesota.

No intermodal hubs at or near the border encourage north-south shippers and truckers to follow the trend toward using rail intermodal service for long-haul movements. Local jurisdictions do not provide through highway access across the border to selected intermodal hubs.

U.S.-Mexican Infrastructure Systems

The physical infrastructure encompasses border crossing facilities and connecting roadways, rail and pipeline crossings, airports, and maritime ports located within the border region.

The U.S.-Mexican land border is approximately 2,000 miles long. It traverses four U.S. states and six in Mexico. There are 37 vehicular border crossings between the United States and Mexico: 5 in California, 7 in Arizona, 3 in New Mexico, and 22 in Texas.

A total of 53 airports are located within 50 miles of the border or serve the border region. Nine are located in California, 11 in Arizona, 2 in New Mexico, and 21 in Texas.

Six pipelines cross the U.S. and Mexico border, one in Arizona and five in Texas.

The top 10 maritime ports, based on volume, in the Gulf and involved in trade with Mexico are, in declining order: the Ports of Houston, Pascagoula, Grammercy, Lake Charles, New Orleans, Texas City, Corpus Christi, Tampa, Baton Rouge, and Port Arthur.

Eight active rail lines currently traverse the border, including two in California, one in Arizona, and five in Texas.

Border Crossing Infrastructure--Existing

The border infrastructure that exists today is a reflection of historical development patterns and emerging transportation demands. The border infrastructure implications are, therefore, quite different for each crossing, both in terms of activities served and the origins and destinations associated with cross-border demand. In this context, the transportation infrastructure which normally serves international trade and traffic flow extends beyond the immediate vicinity of the border crossing. It extends to the regional transportation systems on either side of the border. Since World War II, the development of infrastructure on the U.S. side of the border has greatly exceeded border area infrastructure investments in Mexico. A significant infrastructure investment program is underway within Mexico that will upgrade critical links to the border. However, additional investment in Mexican infrastructure will be required to establish a comparable regional transportation system.

Existing and planned infrastructure at the border crossings may largely be adequate to handle the forecast increases in trade. Many of the underused facilities and proposed improvements could provide the necessary capacity to handle increases in commercial traffic. In addition, most of these newer or proposed facilities are located outside of urban areas, which would be most conducive to rerouting commercial and potentially hazardous cargo traffic away from the congested urban centers.

In general, the major border crossings are situated within highly populated urban areas. These binational communities have developed into major metropolitan centers with longstanding cultural and economic ties. Local residents rely on the ability to cross the border for employment, shopping, visitation, cultural activities, recreation, health care, and commerce.

The population residing in the border region has increased from approximately 6 million in 1980 to 9.5 million in 1990. Most of this increase occurred within these metropolitan or urban

centers. As a result, border access routes and rail lines have become surrounded by residential and commercial activities. These factors contribute to a significant degree of traffic congestion at these urban crossings. Transport movements associated with international tourism, trade, and commerce must compete for access within a system that is already congested by local urban transportation demands. The presence of longer distance, nonlocal movements further exacerbates the existing problems at these major urban crossings.

At smaller crossing locations in rural areas, the dominant concerns are maintenance of the existing facilities and implementing strategies to improve connecting roadways. Some rural crossing facilities are beginning to experience unanticipated increases in traffic volumes, due either to their proximity to urban areas where larger facilities may be overburdened, or seasonal variations that create short-term periods of high demand exceeding a small facility's normal processing capacity.

Border Crossing Infrastructure--Improvements

To treat many of the concerns about the U.S.-Mexican border infrastructure, many improvements have been planned and proposed. The extensive list of projects is useful for developing a sense of the level of infrastructure improvement activity planned over the next several years in the border area. The list of projects was compiled from state and local transportation improvement programs (TIPs) and other documents related to border area improvements. It does not provide a comprehensive view of border infrastructure needs since most of the projects are based on assumed levels of funding. Further, projects which are scheduled for construction beyond the 1994 fiscal year can be modified, excluded, or delayed each time the TIPs are reviewed. In addition, projects may be added which are not reflected in current TIPs. Federal annual appropriations levels for transportation improvement programs authorized by ISTEA also affects whether these programmed improvements can be accomplished on their present schedules.

These improvements include the addition of several crossings and supporting facilities, reconstruction of many roadways which serve existing crossings, and improvements to the regional highway and railroad systems which traverse the border region. In many of the border urban areas, improvements are also slated for major arterials and transit systems which may improve urban traffic flows and indirectly or directly assist cross-border

flows. The obstacles to overcome before the improvements become a reality include funding and resolution of environmental and international issues.

In addition, population and economic growth within the border region may continue to outpace real-world improvement efforts despite the most ambitious infrastructure investment strategies. Cross-border planning may heighten regional competition for funding of improvements. Many proposed crossings that might help alleviate congested conditions in urban areas have been delayed for years due to disagreements or lack of consensus over location, need, and parallel infrastructure investments. Some of the newer border crossing facilities are greatly under-used despite heavily congested conditions at other crossings in the vicinity, often due to poor coordination in constructing the necessary transportation system linkages.

Many of these projects will translate into direct benefits for cross-border flows given existing conditions and historical and anticipated future demand. However, a true infrastructure needs assessment will require improved data on origins and destinations for commercial and noncommercial traffic in the region, a better understanding of the way different investment strategies or modal alternatives might affect the existing and future flows, and a comprehensive review of the institutional factors which currently affect cross-border flows. In highly urbanized areas, the matter of border infrastructure requirements is interwoven with the entire transportation system serving the region.

Resolution of many of these issues may be necessary before some of the fundamental transportation-related infrastructure problems can be adequately addressed. An integrated, multimodal cross-border planning process should be in place before major infrastructure investment strategies are instituted.

Border Crossing Infrastructure--Funding

A substantial number of planning efforts have been undertaken or completed by Government agencies and private interest groups to identify and refine transportation and infrastructure needs related to border crossings. Many planning efforts have resulted in specific infrastructure improvement proposals. Some proposals contain significant detail, while others have generated improvement concepts that are broader and more general in scope.

A common thread in these proposals involves issues of funding on both sides of the border. Funds may not be available in a timely manner. Disparate funding responsibilities may hinder coordination of intermodal or multimodal improvements. Funding

sources generated by the border crossing may not be plowed back into the station. Some cross-border jurisdictions have a perception of national inequities.

Funding is a key issue as it relates to border infrastructure. It is difficult to assess true infrastructure needs in an environment in which comprehensive regional or borderwide planning is absent. Provisions in the ISTEA call for more focused attention to border crossing issues. In addition, other provisions give added flexibility in the financing of needed infrastructure. It remains to be seen if this will be sufficient.

Airport Infrastructure

In 1990, airlines carried only 1.1 percent of approximately 2 billion passengers, and 0.3 percent of approximately 530 million tons of trade cargo through to the United States. Non-U.S. airlines carried almost two-thirds of this cargo.

California has 9 airports within 50 miles of the border area. Los Angeles International is the largest of these. Eleven airports in Arizona are within 50 miles of the border or serve the border region. Of the Arizona airports, Phoenix SkyHarbor International has the greatest passenger enplanements and the largest total revenue-ton enplanements. The majority of international air passenger activity is handled at Tucson. Two airports in the state of New Mexico lie within 50 miles of the international border--Las Cruces International and Santa Teresa Airport. Texas has 21 airports within 50 miles of the border. Houston Intercontinental has the highest number of passenger enplanements in the Texas border region.

Pipeline Infrastructure--Existing

Six pipelines, all of which convey natural gas, cross the U.S.-Mexican border. In Arizona, El Paso Natural Gas has one pipeline that crosses the Arizona-Mexico border between Naco and Douglas, and 5 pipelines cross the border in Texas: 2 owned by Texas Eastern Transmission Corporation and 3 by Valero Transmission Company, L.P.

Pipeline Infrastructure--Improvements

Three additional pipelines are proposed: two in California and one in Arizona. San Diego Gas and Electric Co. proposes a new line, and El Paso Natural Gas is proposing a new gas line in Yuma, Arizona, or in California to cross the Mexican border.

Intermodal Services and Facilities

Intermodal transportation is a broad term describing any transportation system that encompasses more than one mode of transportation and any form of cargo (freight). The study team located all intermodal facilities within 50 miles of the U.S.-Mexican border and services from anywhere within either country which cross the land bridge between the United States and Mexico. Railroad, trucking, and freight forwarding managers gave information about the extent of intermodal transportation along the U.S.-Mexican border. They gave their perceptions about changing market conditions that might affect the demand for intermodal services and requirements and opportunities for expanded service. Intermodalism is in its infancy along the U.S.-Mexican border.

Intermodal Services and Facilities--Existing

Intermodal capability is concentrated in seven locations along the border. All of these facilities are owned and operated by the railroad companies. Several of the international airports along the border have intermodal facilities, but only two (El Paso and San Diego) provide intermodal service to and from Mexico. Deficiencies in information systems exist in Mexico, and some users report considerable frustration with the customs service of both countries.

Four U.S. rail companies provide intermodal service to Mexico: the Union Pacific (UP); the Southern Pacific (SP); the Atchison, Topeka, and Santa Fe (AT&SF); and Burlington Northern (BN) railroads. Each company offers connections to the Ferrocarriles Nacionales de Mexico (FNM, the Mexican state-owned rail company) and countless trucking companies. The service connections are rail-rail (for shipments to the interior of Mexico) and rail-truck (for shipments to the maquiladoras in the northern states). There are two BN connections: rail-truck to the border and rail to rail barge at Galveston to rail again at Coatzacoalcos.

The vast majority of the southbound rail-rail movements serve the automotive industry. There is a well-documented imbalance between north and south movements, with most of the companies reporting a 3:1 imbalance in favor of southbound movements. Some manufactured products and automotive parts move north, but in smaller shipment sizes and to dispersed destinations which favor truck transport.

None of the airports within the 50-mile range of the border has facilities and carriers which offer intermodal container movements. Seamless intermodal movements of air cargo are offered at the Los Angeles International, San Francisco International, Phoenix SkyHarbor, Houston Intercontinental, and Dallas-Fort Worth Airports. Intermodal air service is available between each of these cities and Mexico City on a daily basis.

Air cargo is frequently flown from the border cities of El Paso and San Diego to several points in Mexico. Mexico City, Chihuahua, Guadalajara, and Hermosillo are the predominant destinations in Mexico. These airports handle customer-packaged boxes and crates on scheduled air service and primarily serve express package and just-in-time shipments. The freight is claimed by consignees and freight expeditors at the receiving end, and is typically transported to its final destination by passenger automobile or light truck.

Marine shipments, by their nature, are intermodal, and rail facilities are considered a part of the port. However, not all ports are equipped to participate in the competitive containerized trades. Industry officials providing input to the study did not indicate that U.S. container capacity was a problem. In fact, the assessment of marine infrastructure shows marine ports positioned to serve the most likely land bridges, i.e., to the midwest and west coast. An overview of the capacity of the major ports trading with Mexico is presented in table 3-1. The actual level of port throughput is compared to the estimated capacity levels for the individual ports. From this information, it is easy to see the degree of current excess capacity in the port system. Of the ports listed, none is operating at more than 90 percent capacity; most are far below this level.

Outreach efforts brought together shippers, carriers, and local Government officials to discuss issues of marine port capacity. These efforts resulted in a similar conclusion. This is not to imply that ports have no infrastructure improvement plans. Port improvements are needed to improve service for existing trade and to remain competitive with respect to other ports and other modes.

Intermodal Services and Facilities--Improvements

Four prominent themes emerged from the public outreach meetings with intermodal providers and users along the U.S.-Mexican border. One involved intermodal facility improvements and the other three are related to institutional improvements.

A strong need was voiced for improved intermodal facilities on both sides of the border, but the deficiencies are greatest in Mexico. The Union Pacific, Southern Pacific, and Santa Fe

PORT	TOTAL CARGO FLOWS	MEXICO FLOWS	CAPACITY	TOTAL FLOW TO CAPACITY (%)
Houston	60,974	7,039	97,672	62.4
New Orleans	42,570	4,076	64,630	65.9
Baton Rouge	34,211	1,799	55,679	61.4
Mobile	18,418	397	31,486	58.5
Pascagoula	17,335	5,861	21,843	79.4
Tampa	19,041	2,005	34,297	55.6
Jacksonville	7,232	428	9,070	79.7
Newport News	25,323	578	28,392	89.2
Baltimore	21,315	154	43,671	48.8

railroads are all providing technical assistance in intermodal facility planning, design, and construction in Mexico, but funding for improvements in the short-term remain uncertain. Seven new intermodal facilities are in various stages of development in Mexico; at least four of them are under construction. In addition, improvements are underway at the Pantaco Terminal in Mexico City, which is chronically congested.

With the exception of a planned intermodal facility in Santa Teresa, New Mexico, there are no present plans to construct new intermodal hubs in the border zone. Existing facilities in the United States are expected to be able to handle the increased demand for intermodal shipments into Mexico. The substantial infrastructure deficiency in Mexico is recognized and is being tackled in the larger cities, away from the border zone.

The future for intermodal transportation between the United States and Mexico looks bright. Intermodal traffic has been increasing between 20 and 50 percent over the past few years on all carriers, a trend which is widely expected to continue in the short run. Intermodal rail service competes with marine shipping, particularly ocean barges. While modernization of the

ports in Mexico is underway, it are not likely to be complete for several more years. In the meantime, intermodal land transportation is expected to dominate most markets. The increasing efficiency of intermodal transportation makes it an ideal solution to congestion at the border crossings. This will be especially true if recent trends towards customs clearance at the destination continue. This will allow a large number of containers which otherwise would be part of the border congestion to bypass it completely.

INSTITUTIONAL SYSTEMS

A large number of public and private institutions have a role in U.S. trade and transportation in North America. The groups range from Federal agencies with regulatory or law enforcement roles to lobbying organizations seeking to bolster cross-border trade. Often, different agencies have conflicting or duplicating missions, which fragments decisionmaking and frustrates persons traveling to and from Canada and Mexico.

Institutional issues were identified from previous studies and testimony. In addition, the public outreach sessions identified those issues of continuing concern and expanded upon the inventory of issues. On-site inspections and observations and discussions with inspection officials, facility operators, and shippers and carriers were used to evaluate the issues.

The most pressing institutional issue identified in our public outreach program and during discussions with shippers and carriers was the lack of a comprehensive Federal approach to border management. No single agency has overall responsibility for establishing policies along the border. The rivalry and lack of coordination between the U.S. Customs Service and the INS affect all persons and commerce crossing the border. This was often cited as the single most frustrating issue facing users. There are many Federal agencies with roles affecting U.S.-Mexican trade and transportation: U.S. Customs, INS, Border Patrol, GSA, Animal and Plant Health Inspection Service of the USDA, U.S. DOT, Interstate Commerce Commission (ICC), Binational Commission on International Bridges and Crossings, International Boundary and Waterway Commission, U.S. Small Business Administration, and several administrations within the U.S. Department of Commerce--International Trade Administration, U.S. & Foreign Commercial Service, and the Office of Trade Development.

Several other Federal agencies have roles in U.S.-Mexican and U.S.-Canadian trade and transportation, such as the U.S. Department of Energy, U.S. Travel and Tourism Administration,

U.S. Department of Labor, the Environmental Protection Agency, the International Trade Commission, and the Office of the U.S. Trade Representative.

Eastern U.S.-Canadian Institutional Issues

Federal Inspection Services

The level of staffing available for individual crossings is a growing concern on the U.S.-Canadian border. While both Customs and INS have significant budget constraints, new reductions are planned for both. Customs intends to reduce its overall headcount by about 1000 positions over the next two fiscal years. Because of reports about increases in staff for the Mexican border, and reports of requests for northern border staff to transfer to the Mexican border there is a growing awareness about potential cutbacks in staff for the U.S.-Canadian border. These staff reductions could seriously impede northern border operations unless procedures are changed radically.

Coordination Among Federal Agencies

In the United States, Customs and INS operate as separate organizations with each reporting to its own Federal department. Customs is a part of the Treasury Department and INS is part of the Justice Department. While agents are cross-designated annually to perform the functions of the other agency at primary inspection points, numerous studies have pointed out a lack of cooperation and coordination between these two agencies. Positive working relationships are also critical between these agencies and the GSA, Border Patrol, and USDA. This is especially true for GSA, which is the owner of many facilities.

One of the principal problems relates to the fact that both agencies staff primary inspection booths, usually on an alternating basis with one agency opening the first booth and the other opening the second and then alternating. Because INS has fewer people available at most crossings, Customs is obliged to provide additional staff, especially at primary and secondary inspection points.

Lack of Consistent Policies by Inspection Agencies

During the study, a number of policy inconsistencies by region were discovered. First, a wide variation exists in the determination of who is required to pay for new border facilities required by Customs and INS. A second inconsistency relates to the acceptance of off-site truck primary and secondary inspection facilities. Costs for on-plaza facilities are often much higher

because of a lack of space, while off-site facilities are far less expensive. However, in some areas, Customs and INS often demand that facilities be on-site regardless of the cost of construction. The Treasury Department has pointed to concern that off-site facilities would increase the risk of diversion of contraband, including drugs and illegal aliens. A third area of inconsistency relates to inspection procedures. Many crossings in Maine, for example, have no inspection facilities at all and travellers are instructed to check in at a facility elsewhere. At other crossings, commercial services are not available at night. Yet, every vehicle crossing the border in a major city is carefully analyzed. The ability to detain illegal border entrants is also minimal.

Intermodal Issues

On the freight side, federal regulations, union contracts, and firm operating practices have led to changing of equipment and crews at or near the borders. This limits the effective use of transportation resources. Recently, individual railroad operating organizations and trucking firms have begun to integrate some of their cross-border marketing and operations.

Immigration and Customs laws and regulations also impose a number of barriers to intermodal efficiency of freight movements. Immigration laws prevent rail crews from operating equipment in the domestic commerce of a country if they are not a resident of that country. Customs laws and regulations require payment of duties and or entry processing fees on any equipment which might be used in domestic commerce. This requirement results in railroads segregating operating stock for use in cross-border or domestic commerce only and thus decreases utilization rates. These issues would be diminished under the proposed NAFTA or by some of the provisions of the Customs Modernization and Informed Compliance Act, now pending before Congress.

Customs inspection requirements can also lead to problems. There have been instances where cranes have had to be rented and brought to the site in order to lift off upper containers and remove a lower container for inspection. Uniform procedures for inspection of such containers at destination terminals, a measure currently being pursued, would be helpful. Routine processing of container trains can result in unnecessary delays. Intermodal shipments are increasingly time sensitive, requiring expedited processing. Increased use of preclearance shipments should be an objective to ensure certainty of intermodal connections. Lack of sufficient staffing at highway crossings increases the difficulty in diverting staff to rail inspections, causing delays.

Regarding passenger intermodal transportation, the needs are also institutionally oriented. Until the 1960s, Federal inspection staff routinely rode the trains and conducted their business enroute. Not enough lines use this practice today. Another option is to implement preclearance procedures at terminals, much as is the case with U.S.-Canadian airline travel.

There is also an opportunity to better utilize airports on both sides of the border in metropolitan areas. At Detroit and Windsor, both airports offer flights to major Canadian cities. One airport or the other may have a better schedule on a given day, or a transfer between airports may be necessary. However, current bus and taxi services are not sufficient to promote better utilization of flights from each airport. In addition, uncertainty about inspections at the land-border can present additional problems.

Western U.S.-Canadian Institutional Issues

Joint Facilities Planning

In most cases, the planning for border crossings is done by the relevant national border crossing agencies concentrating on one side of the border or the other. This planning typically concentrates on the immediate requirements of the customs and immigration facilities and rarely considers the infrastructure impacts or requirements beyond the immediate border station or across the border.

Planning, ownership, management, and maintenance of border facilities and supporting infrastructure is often fragmented. For example, along the western U.S.-Canadian border, the GSA owns and maintains a large number of the U.S. border station facilities; however, GSA's authority does not extend to construction of roads, highways or bridges which span the border. These must be funded by other Federal, state, or local governments, or private entities. As a result at some ports of entry, three or more entities may own property or facilities.

During site visits to both large and small ports of entry, on-site personnel pointed out examples of how planners did not consider long-term traffic growth projections and/or failed to recognize or overlooked current day-to-day operational requirements when they designed or renovated border station facilities.

This fragmentation and the lack of coordination in facilities and infrastructure planning can result in inefficiency and contribute to, rather than alleviate, congestion and safety problems. In

addition, planners often fail to consider the impact on surrounding areas for services such as water and sewer.

Border Management

The mission of border management is changing with the gradual reduction and ultimate elimination of commodity tariffs in trade between the United States and Canada, and with the increasing emphasis on immigration, trade agreements, and enforcement of drug, weapons, hazardous materials, and agricultural regulations.

On the U.S. side, the current organization for planning for facilities, provision of facilities and border management involves complicated and blurred lines of responsibility and authority between the INS, Customs Service, Border Patrol, Coast Guard, Department of Agriculture, Department of Defense, Department of Commerce, Food and Drug Administration, GSA, Department of Transportation, and state highway and law enforcement officials. This plethora of agencies has in many cases resulted in poor systemwide planning, fragmented and inefficient application of assets and resources, and interagency disputes. Staffing abilities to cover these areas include skilled technicians and enforcement personnel who have access to state-of-the-art technology including information systems, detection equipment, and intelligence processes.

Cross Border Shopping

The intent of the U.S.-Canadian Free Trade Agreement was to eliminate barriers to the free flow of trade between the United States and Canada. The gradual elimination of commodity tariffs has been a positive step toward fulfillment of that goal. However, other factors play a role in the extent to which goods and services and move freely between the United States and Canada.

On the U.S.-Canadian border, the collection of Canadian goods and services tax (GST) and provincial sales taxes (PST) at border crossings has emerged as a significant constraint to cross border shopping. One transportation effect of the collection of these taxes at the border is increased congestion at many border crossings. Canadians returning to Canada with U.S. purchases (even if they are under their exempted level of purchases and have no duties to declare) must stop and pay GST and, where applicable, PST. As a result, automobiles and trucks back up on the Federal and state highways and on U.S.-owned property, often, resulting in congestion and delays to Canadian citizens. In some cases, fallout of the delays is directed at U.S. Customs and state highway officials for failing to enforce queues and orderly

processing. Accidents have resulted and a significant safety hazard exists for both automobiles and commercial vehicles.

On the U.S. side, similar congestion could develop if U.S. Customs agents should elect to collect Federal or state taxes at the border. Many states have programs in place and are making a concerted effort to collect sales tax from residents on their out-of-state and non-U.S. purchases. Such activities would cause returning U.S. citizens to queue on Canadian highways and access roads and create expensive facility and enforcement problems for the Canadians.

Air Service

Air service is a major issue in the northwest because of the distances one must travel to access air service for both personal travel and the shipment of goods. Changes in the aviation industry have altered service patterns. Hub and spoke operations and the deregulated industry have affected all markets, but the low density of many western markets and the long distances to hubs may have affected this area differently.

Lack of efficient and accessible cross-border air service between the United States and Canada is perceived as a key constraint to expanded growth in the services, tourism, and industrial sectors. For nearly four years, the United States and Canada have been negotiating revisions to their bilateral aviation accord. Growth in U.S.-Canadian air travel has stagnated over the past decade, growing at less than half the rate of total U.S.-Canadian trade. The scheduled capacity has increased very little since 1980 and, with few exceptions, U.S. hubs are not well-connected to many major Canadian cities, and nonhub cities generally have no direct connections at all. Long-term air travel growth is significantly higher than total economic growth; however, the opposite has been the case in the U.S.-Canadian transborder market.

Rail Service

Many institutional factors mitigate against the greater use of rail for transborder movements. In many cases, Canadian railroads attempt to direct Canadian originated movements on their own or affiliated rail lines, even if the routings are longer and less efficient than more direct routings involving immediate exchanges with U.S. railroads. By retaining a shipment on its own or an affiliated rail line, the originating carrier ensures it will retain a larger share of the total rate. This situation often results in shifts of traditional rail-oriented cargoes to commercial vehicles with resultant unnecessary congestion on U.S. highways.

Planning Data and Information

There are gaps and inconsistencies in the quality and quantity of data and information available to analyze cross-border trade and traffic flows and their impact on the economy and the transportation planning process. A more critical issue is the lack of reliable origin-destination and routing data which are essential to the task of defining national or transcontinental traffic corridors for any mode or intermodal shipment.

In the 1970s, attempts were made to perform comprehensive national origin and destination studies. However, these efforts were abandoned in the 1980s when a number of transportation data collection programs were eliminated. Many of the remaining data collection programs are inadequate, outdated, fragmented, and underfunded.

The Commodity Flow Survey currently being conducted by the Bureau of the Census may help in some way to fill this void. The survey will provide commodity flows for state- and region-to-foreign country. These commodity flows will be by type, value, and weight. The data will be useful for corridor analysis, but will not have enough detail for specific infrastructure planning.

Commercial data services are available which impute traffic volumes and mode split between city-pairs from a variety of secondary sources. However, these data do not specify routings, e.g., for a given city-pair. A report will show type and volume of commodities by mode but not provide any information on the route by which those commodities traveled.

Various state and regional studies are underway (some with ISTEA funding) to examine origin and destination traffic and commodity flow patterns.

U.S.-Mexican Institutional Issues

Institutional constraints at the U.S.-Mexican border crossings are associated with Federal security issues and inspection procedures, local shipping practices, public and private sector modal investment responsibilities, and frustration of potential growth of intermodal traffic.

This border region has developed an institutional infrastructure to try to address many of the most pressing issues. In addition to the many Federal agencies, each of the four border states (Texas, New Mexico, Arizona, and California) have public institutions which also regulate cross-border trade and transportation. The transportation agency in each state is

responsible for the provision of highways to border crossings and to intermodal facilities which serve international movements. Working with metropolitan planning organizations in urban areas, they develop transportation plans, transportation improvement programs, and individual projects and programs.

The state transportation agencies have recently established an organization to improve borderwide planning and they hope to work together with the Mexican border states in coordinating the provision of infrastructure. There are also a number of private sector organization active along the border. At least one of which has a borderwide perspective.

Each state has ongoing research and project planning activities in the border areas. Some of the research topics being addressed are studies on border infrastructure and trade and transportation issues, feasibility studies for intermodal facilities, estimates of facility demand, and evaluations of trade and development potential. Several colleges and universities along the border have excellent programs focused on U.S.-Mexican studies. These institutions provide a valuable resource to the region in identifying options for addressing border crossing issues.

Air Quality Issues

The San Diego and El Paso metropolitan areas have been classified as air quality nonattainment areas for ozone and carbon monoxide emissions. The Federal Highway Administration and Environmental Protection Agency (EPA) are working with the states to provide guidance on the development and implementation of transportation and other measures necessary to demonstrate and maintain attainment of the national ambient air quality standards (EPA, 1992). The extent to which these transportation control measures will affect border crossings in these areas is presently unknown and a matter of concern for the affected areas. Many participants in the public outreach meetings expressed hope that air quality requirements might bolster the push for more efficient border crossings.

Regulation of Motor Carriers

A closely related role is the regulation of motor carriers which is usually vested in the taxation arm of the state government. This is the case in Texas, New Mexico, and Arizona. The Highway Patrol has this responsibility in California. Motor carrier regulators establish and enforce rules and regulations concerning weight and size limitations, operating practices (such as insurance and driver licensing), and safety. Many carriers and shippers cite a lack of consistency in such regulations and

standards as a barrier to efficient transportation. Many of the states are concerned about their role in enforcement of Federal standards (particularly in the NAFTA), and cite lack of funding. We found agreement among users and law enforcement personnel alike that existing laws cannot be enforced effectively without substantial increases in funding.

Enforcement concerns are not solely an issue for the U.S.-Mexican border. The adequacy of sites and facilities to conduct commercial motor vehicle drive and vehicle inspections, weigh vehicles, and carry out other enforcement responsibilities is currently being addressed, with other issues, in a study being conducted by the International Association of Chiefs of Police.

Regulation of Animals and Plant Products

The agriculture agencies in each state also prescribe regulations for the import of animal and plant products. These regulations are in addition to applicable Federal regulations. These additional regulations were not cited as major impediments to trade by the regional roundtable or future assessment participants.

Local and Regional Economic Development

Local and regional public institutions along the border were portrayed by most users as minor influences on border issues. Many of the border communities have serious infrastructure deficiencies and no financial means to remedy them. Residents and leaders of the smaller border communities are frustrated because they alone bear the cost of a regional--and in some cases national--benefit to cross-border commerce. Yet, in spite of these problems, many communities along the border see a new crossing in their location as the key to their economic growth. Economic development agencies within the states provide assistance to businesses seeking to establish or expand operations. Operating in parallel are many local and regional economic development agencies.

Intermodal Standards

A lack of standardization in truck weight, registration, and marking requirements present obstacles to truck-rail intermodal movements at the borders.

Intermodal Information Systems

The information systems required to service intermodal movements is fairly advanced in the United States and almost non-existent

in Mexico. Such systems consolidate billing, customs declarations and other documents, and provide tracking capabilities. Two of the U.S. rail companies offer single bills of lading and Customs pre-clearance, and the other two plan to begin this service very soon. The lack of information systems has hindered this development, and substantial cost has been incurred to overcome this obstacle. Most of the rail managers felt that the ability to track and report shipment status was an important factor in mode choice among shippers.

Intermodal and Multimodal Border Clearance Process

The customs clearance process is a source of widespread frustration on both sides of the border. However, most noted that the situation has improved dramatically in the past year. They gave high marks to the Mexican Government for improving the process. In cases where preclearance is completed by the U.S. carrier, container shipments on rail can pass unimpeded through the border crossing to Mexico City. The shipment is inspected at the Pantaco Terminal by Mexican Customs if required, rather than stopping the train at the border. This service is only available on a limited basis for single customer trains, but carriers have high hopes that it can be quickly extended to rail traffic with trailers on flatcars. This rail traffic presently takes far longer to clear Customs than do containers. The U.S. Customs Service has a similar line clearance program, but because of deficiencies in the information infrastructure in Mexico, the documents are often not filed far enough in advance to preclude delays at the border, especially for intermodal operators who do not offer door-to-door service.

Marine Ports

The National Ports and Waterways Institute (NPWI) calculated that the port industry has excess capacity. The outreach efforts identified a series of institutional issues that are considered critical to the industry. These are: port access, port clearance process, maritime fees and user charges, regulatory policy, and port financing.

CHAPTER 4: FUTURE TRADE AND TRAFFIC FLOW TRENDS

Projections of future trade and traffic trends were made using appropriate models to ascertain the direction of growth and use of transportation systems. The purpose is to quantify to the extent possible the adequacy of transportation systems to accommodate expected changes in patterns of trade.

Chapter 4 presents projection methods and the resulting baseline projections of trade and traffic patterns. Because the potential for growth in maritime trade is a significant factor for U.S.-Mexico trade, its projections are discussed separately under that region. This potential is indicated by Mexico's recognition of the unused capacity and its planned investments in maritime port facilities and access roads. Major factors influencing past, current, and future flows are identified to assist in establishing likely patterns and ranges of uncertainty associated with these patterns. The factors include the economy of the regions, technology applications, intermodal trends, planned infrastructure, and institutional arrangements.

Recent historical trends in trade are reasonable indicators of where trade may go in the future when there is historical data covering a long period. This is the case for U.S.-Canadian trade, even taking into account recent events and conditions which have impacted U.S.-Canadian trade levels.

This is not the case for historical data about U.S.-Mexican trade. For this reason, a more structured model was used to forecast trade flows for the U.S.-Mexican border region. The forecasts are segmented by all transportation modes and maritime transportation. The chapter includes the methodology used for the forecast, an explanation of the economywide forecast, future trade flows through the border gateways, and the growth of traffic at each gateway.

The major factors that influence past, current, and future flows are identified to assist in establishing likely patterns and ranges of uncertainty associated with these patterns. The factors include the economy of the regions, technology applications, intermodal trends, planned infrastructure, and institutional arrangements.

Two general approaches to projecting future trade flows were used in this analysis. The first approach was to apply recent historical trends to existing trade and traffic levels. This approach was applied for trade with Canada and for maritime trade with Mexico. Trend line analysis was considered appropriate for these cases because the current relationships are relatively stable and known. In addition, recent studies for the International Trade Commission indicate that even with the adoption of NAFTA, trading patterns between the United States and Canada would not be affected greatly.

These conditions were not the case for landborne trade between the United States and Mexico. Here, the environment is very dynamic and the understanding of the various sectoral changes less well known. Consequently, the results from an analysis performed to assess the impacts of NAFTA on U.S.-Mexico trade were adapted to the purposes of this study. The model and the adaptation needed are described below.

Detailed reports which describe the procedures for projecting future trade and traffic trends are:

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 2: Transportation and Trade Expansion in Western U.S. and Mexico; Volume 3: Transportation and Trade Expansion between the U.S. and Mexico.

Working Summary of Key Methods of Forecasting Trade and Traffic Patterns.

The results of both projection approaches were subjected to review at the Futures Assessment outreach meetings held throughout the country. At these sessions, industry representatives from the shipper and carrier communities and government and academic experts provided a check of reasonableness for the study teams' preliminary projections. The results of this process is documented in *Results of the Futures Assessment Process*.

U.S.-CANADIAN FUTURE TRENDS

U.S.-Canadian trade is a mature, longstanding trade relationship. For this reason, recent historical trends in trade may be considered reasonable indicators of where trade may go in the future. However, recent events and conditions have undoubtedly affected recent U.S.-Canadian trade levels.

First, the Canada-U.S. Free Trade Agreement (FTA) was adopted in January of 1989. While much trade between the two countries was largely tariff-free prior to FTA adoption, significant barriers did exist in many areas of trade, particularly in some of the agriculture and natural resource commodity areas. Remaining tariffs on trade between the two nations are being gradually phased out under the agreement, and a variety of nontariff barriers are being addressed to reduce their trade effects. The FTA spurred trade between the two nations by removing trade barriers and would have boosted trade above its historical growth

path beginning in 1989, however, both the U.S. and Canadian economies entered nationwide recessions in 1991 that continued into 1992. This reportedly dampened trading between the two countries. Aggregate trade data compiled by the U.S. Department of Commerce indicate that U.S.-Canadian merchandise trade increased by nearly 14 percent from 1988 to 1989 in inflation-adjusted dollars. In the following year, it grew by 8 percent. In 1991, trade flattened, showing less than 1 percent gain (comparable figures compiled by Statistics Canada indicate no gain in trade during 1991). In 1992, trade rebounded, increasing to between 7 and 8 percent according to estimates of both the U.S. Department of Commerce and Statistics Canada.

Since cross-border trade is largely between population and employment centers, growth in both Canadian exports from and U.S. exports to these regions of Canada will closely follow future growth in these Canadian and U.S. population centers.

The population of Canada is significantly smaller than that of the United States; 27.3 million in 1991 versus an estimated U.S. population in 1992 of 255 million. While the U.S. population grew by 10 percent during the last decade, Canada's population grew by 12 percent. Nearly 37 percent of Canada's population resides in Ontario, Canada's longstanding heartland and center of trade with the United States. Ontario's population grew 17 percent in the last decade and has projected growth of 9 percent during the current decade.

According to the current population forecasts, the provinces of Alberta, British Columbia, and Ontario are projected to see the fastest population growth in Canada. However, population projections for the United States, as well as for Canadian provinces, were developed prior to the most recent census counts in both countries. Because of this, projections are likely to be substantially revised with new information from each census.

Eastern U.S.-Canadian Future Trends

Future trade activity and traffic levels are estimated for each of the frontiers in the Eastern region. The method for this estimation was trend lines extrapolated for basic trends in trade and traffic for five years to 1997 using data for the period 1990-1992.

The historical data from which a trend line could be determined are limited. The U.S.-Canada Free Trade Agreement became effective in January, 1989. This agreement substantially altered the terms of trade between the two countries so that pre- and post-1989 trends should be expected to differ. Complicating this

situation is the fact that the Bureau of the Census data are not detailed enough for this analysis pre-1989. Because 1989 data are also inconsistent with the 1990-1992 data, they were excluded from the trend line data.

Using these data, future traffic levels are estimated and the implicit growth rates for the frontiers calculated. The demands on the systems from commercial vehicles is small in comparison to existing or future demand from passenger vehicles.

Trends in Trade

Estimates of future trade levels between the United States and Canada passing through each of the frontiers are presented in this section. For a given frontier, the average annual rate of growth in each of the seven commodity classes is calculated from the data for 1990-1992.

Based upon the recommendation of participants at outreach sessions held by FHWA, the trends are estimated for both trade-in-value terms and for the number of shipments. Most participants felt that estimating the transportation demands from the dollar volume of trade would be misleading, partially because of changes in the composition of trade obscured by dollar estimates and partially as a result of changes in logistics that favor smaller, more frequent shipments. In order to capture this effect, the number of Census records associated with the trade is used as a proxy for the number of shipments. This measure should be a relatively precise estimate of the work load imposed on the Federal Inspection Services (FIS) but may not be as precise in tracking the number of vehicles involved in trade. However, when used with other measures, the trends in shipments can help bracket the probable levels of future traffic.

Over the period 1990-1992, the value of exports for the Michigan frontier grew at nearly 3 percent and imports at 3.4 percent annually. Over this same period, the consumer price index increased at an annual rate of 3.6 percent. Thus, in real terms, there was very little change from 1990 to 1992. The export growth is especially affected by a drop in vehicles, the most important export commodity.

Measured in terms of shipments, exports grew at nearly 6 percent and imports at 9.2 percent annually. This supports the contention that logistics practices were changing over the period. Vehicle exports, which fell in dollar terms, had an increase of 4.7 percent in the number of shipments. Since both rail and truck carriage are included in the trade figures, this increase in shipments, in light of a fall in the dollar volume,

may represent a shift from rail to highway movement of vehicles and parts. This shift, if real, may not continue, especially if the Michigan frontier develops rail double stack capability.

In dollar terms, exports for the Niagara frontier grew at an annual rate of 6.4 percent and imports at 4.8 percent. The dominant commodity groups for the Niagara frontier, vehicles and machinery/appliances, grew at rates similar to the frontier average. The exception is a fall of 3.1 percent in imports of the machinery/appliances commodity group.

The annual growth rates in shipments are 5.1 percent and 5.5 percent for exports and imports respectively. These rates are higher, on average, than the dollar rates of change if price levels are adjusted by the 3.6 percent CPI increase. However, the differences are not as great as those for Michigan, indicating a somewhat more stable logistics pattern for shippers using the Niagara crossings.

The Eastern New York frontier shows growth in exports of 9 percent by volume and 3 percent by shipments, reversing the relationships seen before. The growth overall comes from rather significant shifts in the commodities transiting the frontier. The two largest commodity groups in 1990 both experienced declines while other groups, most noticeably vehicles, grew rapidly.

Imports through the Eastern New York frontier grew slowly, as a result of drops in the levels of two of the three largest commodity classes. Unlike exports, there was little offsetting growth, and unlike exports, vehicles dropped in value and shipment terms.

Trade trends through the Montreal South frontier results show that exports fell in dollar terms, based on declines in minerals/metals and vehicles. Shipments, on the other hand, increased for nearly all commodity classes if the CPI changes are factored in. Imports, in dollar and shipment terms, increased over the period in spite of a significant decline in the dollar volume of vehicles. Vehicle shipments, however, increased at nearly the frontier average.

The Maine frontier experienced export increases of 8 percent in dollars and shipments. Imports, however, fell in almost every category. Only chemicals/plastics, of the major commodity groups, grew over the period.

Trends in Traffic

Traffic levels for the highway crossings were presented in Chapter 1 and the Appendices. Motor carriers are the dominant mode for this region; however, they are not the dominant source of demand for border crossing infrastructure. Passenger cars far outnumber commercial vehicles, although each truck imposes a greater burden upon the FIS.

The relative pattern of vehicle demand by Eastern border frontiers is shown in table 4-1. The four-year average annual rate of growth in total traffic, i.e., inbound and outbound, was calculated for each frontier for passenger and commercial vehicles. Passenger traffic rose 10.5 percent for the eastern border in total. Most frontiers were close to the average, although Niagara grew 20 percent slower and Eastern New York grew 50 percent faster.

Commercial vehicle traffic grew at 7.5 percent per year for the eastern border as a whole. Thus, passenger demand was not only the most important source of traffic, it grew in relative importance over the period. Note that more recent vehicle counts indicate that, in some areas, passenger demand is slowing.

**TABLE 4-1 TRENDS IN TRAFFIC BY FRONTIER
BASED ON TWO-WAY TRAFFIC, 1989 to 1992**

FRONTIER	Average annual rate of increase in percent for:		
	Passenger Vehicles	Commercial Vehicles	Total Vehicles
Michigan	10.6	7.2	10.1
Niagara	8.1	4.7	7.8
Eastern New York	15.8	9.8	15.3
Montreal South	11.9	13.5	12.1
Maine	11.1	7.8	11.0
TOTAL	10.5	7.5	10.2

Commercial traffic at most of the frontiers grew at rates close to the eastern average. Niagara, however, grew nearly 40 percent slower and Montreal South grew nearly 80 percent faster. Thus the overall rate of growth in traffic for Niagara also fell below the eastern regional average of 10.2 percent.

Impacts on Current Trade and Traffic Patterns

In order to estimate the level of demand likely to be imposed on the system, the current trends have been extrapolated out five years to 1997. The trade trends and traffic trends provide alternative bases for projecting traffic levels in the future. Table 4-2 shows the comparison of trade and traffic growth rates.

For this comparison, passenger levels were extrapolated from the 1992 levels to 1997 by using the passenger average annual rate calculated from the 1990-1992 data. These rates were applied to the frontier total passenger counts as of 1992. The individual growth rates are calculated directly from the data. Overall passenger traffic is projected to increase at a rate of 6.2 percent per year. This is a weighted average of the frontier rates.

TABLE 4-2 COMPARISON OF TRADE AND TRAFFIC GROWTH RATES

Frontier	Five Year Forecast to 1997			
	Passenger Vehicles	Commercial Vehicles-- in 000's of Commercial Vehicles and as a percentage of Passenger Vehicles (in parenthesis)--based on trend in:		
		Traffic	Trade	Shipments
Michigan	31,170	3,682 (11.8)	3,477 (11.2)	4,180 (13.4)
Niagara	18,990	1,703 (9.0)	2,233 (11.8)	2,181 (11.5)
Eastern New York	11,363	519 (4.6)	642 (5.6)	555 (4.9)
Montreal South	12,765	1,199 (9.4)	1,107 (8.7)	1,166 (9.1)
Maine	17,287	730 (4.2)	759 (4.4)	855 (4.9)
TOTAL	91,576	7,833 (8.6)	8,218 (9.0)	8,937 (9.8)

The commercial traffic levels were calculated using three rates of growth. The first applies the observed 1990-1992 annual average rate of growth in commercial traffic at each frontier to that frontier's 1992 actual count. Thus, these are calculated as the passenger traffic had been. The rates of growth shown for each frontier are derived directly from the data. When applied to the 1992 commercial traffic levels, the 1997 levels are estimated. Overall the total eastern border traffic is estimated

to be 7.8 million vehicles, as compared to the 1992 figure of 6.4 million. This is an annual growth of 4.0 percent.

Trade projections applied the commodity class rate of growth in each frontier to the 1992 trade levels in dollars for the appropriate commodity class to generate a forecast of trade levels. The total eastern border trade in 1997 is estimated to be \$160 billion. The frontier-by-frontier average annual rates of growth in trade were then applied to the 1992 frontier commercial traffic levels to yield estimated traffic for 1997. The resulting total traffic level is 8.2 million commercial vehicles, equivalent to an average annual rate of growth of 5.1 percent.

The third projection of commercial traffic used the commodity-specific rates of growth in shipments for each frontier to generate 1997 estimates of shipments by frontier. The average frontier growth rate was then applied to the frontier's 1992 commercial traffic level to calculate 1997 levels. The result is an estimate of commercial traffic of 8.9 million vehicles. This is an average growth of 6.8 percent per year.

Under no projection does commercial traffic become large vis-a-vis passenger traffic. In the lowest growth case, commercial traffic is 8.6 percent of passenger traffic by 1997. In the highest growth case it becomes 9.8 percent. Thus, from the point of view of demands upon crossing facilities, passenger travel becomes relatively more important in two of the three cases.

Western U.S.-Canadian Future Trends

Estimates for future trade in this region were developed and discussed along with factors affecting future cross-border trade and traffic trends.

Existing cross-border trade in the western U.S.-Canadian region involves interregional trade between the regions of western Canada and many different regions of both the western and eastern United States. Therefore, western trade growth in the future hinges upon trends in many different regions, including ones in the East and ones on the border as well as far away from the border.

Economic trends among western states and provinces could heavily influence U.S.-Canadian trade growth in the East. For one, trade between the United States and Canada is focused between major population centers in both countries, and recent trends show fairly rapid population growth in many regions of the West.

For cross-border road traffic in the region as a whole, non-commercial auto traffic accounts for approximately 95 percent of total traffic volume, with the remaining 5 percent primarily commercial vehicle traffic. Patterns are not likely to change significantly in future years.

Baseline estimates of future U.S.-Canadian trade in the West were developed during the study. The projections were based on two assumptions: continuation of growth at average annual rates of change and disaggregated straight line estimates. This assessment of trade futures focuses upon cross-border trade by all modes except pipelines and transmission lines. Also, trade across the western Ontario-Minnesota border is not included in these projections.

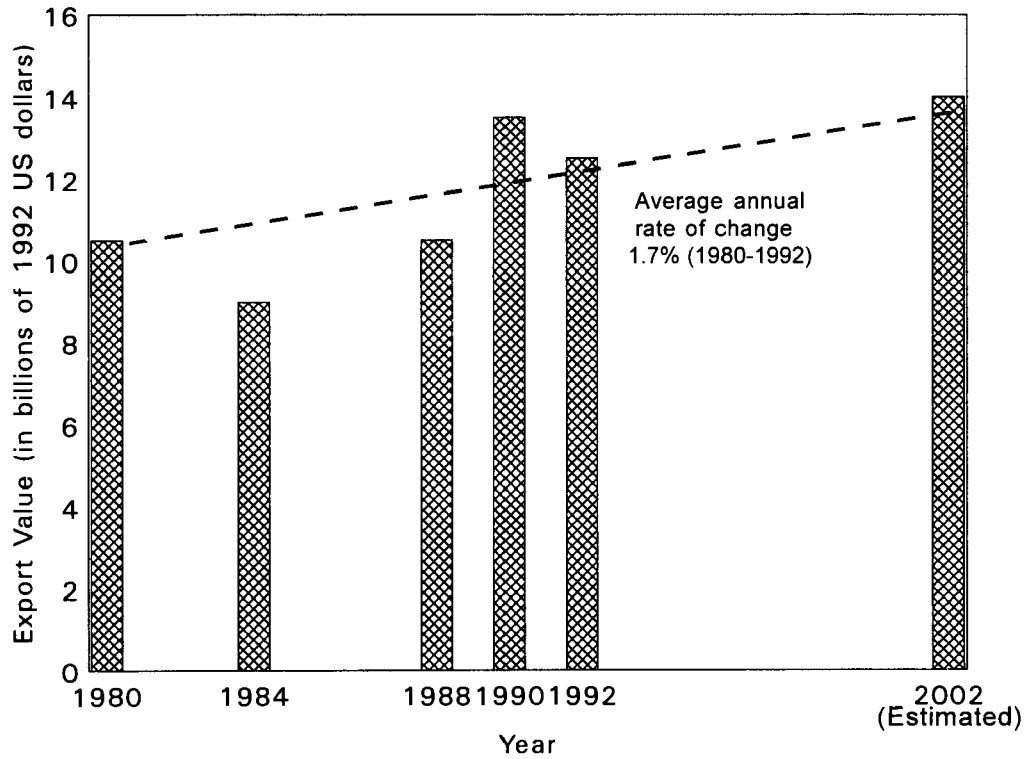
To gauge how the composition of trade may be changing over time, recent trade and future trade were evaluated for 17 different commodity categories disaggregated from five major product groups: agriculture commodities and products, energy products, chemicals/metals and minerals, wood and paper products, and manufactured and industrial goods (e.g., machines, vehicles, equipment, electronics, and household goods).

Average annual rates of change assumption: The value of Canadian and U.S. exports for the five major product groups were used for the years 1980, 1984, 1988, 1990, 1991, and 1992. Between 1980 and 1992, Canada's western exports increased at an average annual rate of over 3 percent. U.S. exports increased at 1.7 percent annually. Continuing at these rates, Canada's exports will grow to over \$14.1 billion by the year 2002; an increase of 34 percent. U.S. exports from the West would reach \$14.6 billion; an increase of 16 percent.

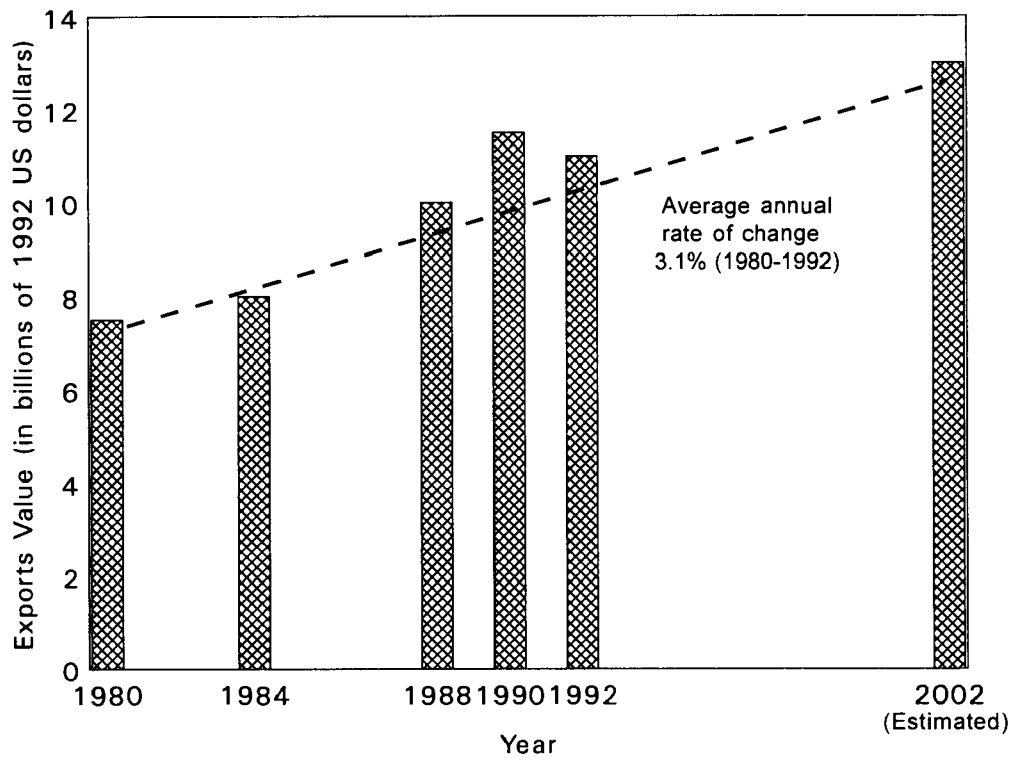
Straight line projection assumption provides very conservative future estimates since it implies steadily decreasing annual rates of growth. This approach was used in establishing a broad array of baseline estimates for future trade in 17 different commodity categories. Two different sets of straight line trend estimates for the year 2002 are shown in figure 4-1 for aggregate trade figures and for commodity groups and subgroups for both Canadian and U.S. exports in the West. According to the most disaggregated commodity forecasts, the total value of Canadian exports would increase from \$10.5 billion in 1992 to over \$13 billion in 2002; a 24 percent increase. U.S. exports would increase from their current level of \$12.6 billion to \$15.6 billion in 2002; also an increase of 24 percent.

FIGURE 4-1 U.S.-CANADIAN TRADE IN THE WEST
STRAIGHT LINE TRENDS TO 2002

U.S. Exports to Canada



Canadian Exports to U.S.



Under both projection methods, the value of Canadian exports in the West would increase from 24 to 34 percent during the next 10 years. These baseline estimates suggest growth in U.S. exports over this same period of 16 to 24 percent. However, it is quite possible that actual trade growth over the next ten years will significantly exceed these rather conservatively derived forecasts.

The discussion which follows covers three subregions: Pacific Northwest, Rocky Mountains, and Upper Plains. Patterns of U.S.-Canada population growth during the most recent ten-year period show that many subregions and regions of the West are relatively fast-growing. Growth is focused all along the Pacific Coast from Alaska through British Columbia to California. In effect, north-south trade should expand as they continue to grow.

Much of the U.S. region along the western U.S.-Canadian border is relatively sparsely populated, particularly from Idaho, in the west, through Montana and Wyoming and into North and South Dakota. Population growth is occurring in many less-populated, high-amenity tourism and recreation areas of the Rocky Mountain region. Similar recreation-oriented nonmetropolitan area growth is occurring north and west of Minneapolis-St. Paul in the Lake of the Woods Area. With some exceptions, rural counties throughout the Upper Plains region from central Montana and Wyoming to Minnesota have stable or declining populations. Most of these counties are heavily dependent upon agriculture and rural agricultural areas throughout the United States continue to lose population.

The economies of all three subregions of the Northwest are relatively dependent upon agricultural and other natural resource industries, such as oil and gas exploration and extraction, mining, and wood products. This industrial dependency on natural resources greatly influences population trends and economic conditions in many of the region's nonmetropolitan areas. To varying degrees, economic conditions in many of the region's metropolitan areas are also affected by this dependency.

However, most urban areas in all three regions are gaining population while many rural populations decline or grow very slowly. As is the case nationally, the region's services sector is growing rapidly, but unevenly, with metropolitan growth rates two to four times higher than most rural areas. These trends should largely continue during the 1990s. Many rural areas will continue to lose population, although some rural areas with high amenities and recreational opportunities will be among the region's fastest growing. Most urban areas will continue to gain population. These trends will affect cross-border trade and

traffic in the three major subregions differently. With major population centers located close to the border and the subregion's major gateway, the Pacific Northwest will continue to see fairly rapid growth in cross-border trade and traffic, particularly on the Pacific Highway and at other crossings nearby major population areas. Cross-border tourism trade and traffic in this region also should continue to expand. Businesses and Government decisionmakers on both sides of the border appear anxious to expand this trade and commerce.

In the Rocky Mountain area, trade growth will largely hinge upon economic growth and trade expansion by the province of Alberta and its two urban centers, Calgary and Edmonton. Both cities are continuing to grow, and the Alberta economy is progressively diversifying. Cross-border tourism development should continue in this region as well, with major national and provincial parks stretching from Teton and Yellowstone in the south to Banff and Jasper in the north. Interest has been shown in organizing a private sector-oriented corridor group to promote cross-border trade and commerce in the region.

In the Upper Plains area, trade growth also should continue, particularly in the area between Canada's Prairie region (Saskatchewan, Manitoba, and Alberta) and the Upper Plains and Great Lakes regions of the United States. The population of the Upper Plains region has been slowly growing, with most growth focused in the greater Minneapolis-St. Paul area. However, this has not appeared to have significantly affected cross-border trade growth in this region. Business and government decisionmakers in this region are aggressively seeking to expand cross-border trade and commerce. Cross-border cooperation and trade expansion are also being promoted by communities and businesses near the North Portal and Portal gateways.

As regional economic and trading blocs develop, there will be an ever-increasing need for harmonization of transportation equipment and infrastructure, as well as information systems. The investment costs associated with this need--as well as with new technologies to alleviate congestion, speed up delivery times, and reduce pollution--are expensive and must compete with other investment proposals within both the public and private sectors. The investment decision process is complicated by the fact that available data and information are insufficient to suggest the best solutions.

The United States and Canada have made significant strides in intermodal technology, particularly in the area of rail/truck intermodal. However, competition between nations, modes, U.S. and Canadian carriers, and between of various equipment designs

remains. This competition can impede progress toward a technologically-advanced, integrated transportation system. Determining where and which technology applications are appropriate for border facilities can also present problems.

U.S.-MEXICO FUTURE TRENDS

The discussion of the forecast of trade flows is segmented by all transportation modes. It includes the methodology used for the forecast, an explanation of the economywide forecast, future trade flows through the border gateways, and the growth of traffic at each gateway.

The Forecast Model

The economywide forecasts developed using the INFORUM model have been scrutinized by the U.S. International Trade Commission (ITC, 1992), which concluded that it performed well compared to other economywide models of the economic implications of the North American Free Trade Agreement (NAFTA). It is a static model, and, as such, does not capture the dynamic effects likely to increase trade, such as increases in foreign direct investment in Mexico. Many economists feel that models which do not consider the effects of foreign direct investment under-predict the likely increase in trade under liberalized trade conditions (ITC, 1993). Thus results being reported here are conservative in their representation of traffic demand and infrastructure needs.

Many transportation professionals interviewed during this study intuitively felt that California would likely increase its share of U.S.-Mexican trade under a free trade agreement. This was based on the expectation that trade with the Far East in maquiladora and traditional manufacturing would increase, probably replacing some inputs presently provided by the United States. But as industrial productivity increases in Mexico, most economists expect both U.S. and foreign trade with Mexico to increase. Increases in Mexican household consumption are expected to occur as Mexican wages and employment increase under a free trade agreement, resulting in increased trade in consumer durables. Lastly, California's role with major ports at Los Angeles and Long Beach, and as a land bridge to Mexico from the Pacific Rim, is not expected to diminish over the next decade.

Such expectations lend support to the projections generated by the modified INFORUM model. Lacking a better model or empirical evidence to discredit the results, the projections are used as a basis for policy planning at the regional level, although the projections are not recommended for project planning without further work.

All Modes

The INFORUM model is applied to the national economies of both countries to produce national estimates of changes in trade, employment, and output. The model was not designed to be used to assess regional or statewide changes and does not address modes of transportation. This shortcoming is not unique to the INFORUM model, but rather to most econometric models of trade, (ITC, 1992). In order to use the results of the modified INFORUM model to project flows through gateways, the following assumptions had to be made:

- constant transportation mode share
- unchanged commodity group trade flow

The shares of each mode of transportation will remain constant over the forecast period. The study team learned from the regional roundtables, and in future assessments, that most shippers and carriers expect this to be generally true.

One trend that deserved special attention was intermodal freight transportation. In the data used in this study, the mode of transportation of commodities was determined to be the mode as the trade crossed the border. Intermodal traffic traveling to the border and there transferred to truck would be recorded as a truck movement.

Because growing intermodal shipments could not be adequately captured in the data provided for this study, these shipments are not estimated. Information presented by shippers and carriers, however, shows that intermodal transportation has displaced some long-haul truck movements and that this trend will continue.

Trade flow by commodity group will remain unchanged in each gateway. Put differently, each gateway's share of the trade in each commodity group will remain constant. It also implies that each gateway's rate of growth will correspond to the growth of the commodities being transported through the gateway. Over the period covered by available data, each gateway's share of total exports remained relatively constant, as did their share of total imports. Although a number of participants in the roundtables and assessments indicated that they expected to see changes in trade composition over time, trade growth based upon the forecast growth of commodity groups is a reasonable assumption.

Overcoming the need for the second assumption would require the application of a comprehensive econometric model capable of incorporating changes in the Mexican and U.S. economies and

forecasting trends at the gateway level. No such model exists; it would not have been possible to construct such a model during this study.

Using these two assumptions, an allocation of the trade increase projected by the modified INFORUM model was made to the gateways, based on existing shares of trade by commodity group. Exports through all four gateways are projected to increase by 61 to 64 percent between 1992 and 2000 under the baseline scenario, i.e., that current pre-NAFTA conditions will prevail over the forecast period. Import trade through the South Texas gateway is expected to increase by almost 50 percent between 1992 and 2000. It is projected to grow by almost 40 percent in West Texas-New Mexico and by 25 percent in Arizona over the same period. Trade through the California gateway is expected to grow 127 percent, the largest increase of the gateways.

The model used two NAFTA scenarios to compare to the baseline case of no NAFTA: tariff removal only and tariff and barriers removed. Under the tariff removal only scenario, export trade is projected to grow at a slightly lower rate. Exports are expected to increase between 52 and 56 percent for all four gateways between 1992 and 2000 under this scenario. Growth in imports will be higher than under the baseline scenario, with South Texas experiencing an 85 percent increase in trade growth and West Texas-New Mexico trade growing 77 percent. Trade through the Arizona gateway is expected to grow by 52 percent, and the California gateway by 172 percent.

Finally, the tariff and barriers removed scenario presents projections of higher growth across all gateways. Exports are projected to increase between 65 and 70 percent for all gateways over the period 1992 to 2000. Imports through the South Texas gateway are projected to increase by 120 percent, while West Texas-New Mexico will grow by 110 percent. The Arizona gateway is projected to increase imports by 85 percent, while the California gateway again leads the increase with a projected increase of 208 percent.

The degree to which the four gateways will continue to emerge as regional trading corridors will be heavily influenced by future growth among the major metropolitan areas in western Canada associated with each of the gateways.

Maritime

Maritime trade is most conveniently discussed in terms of petroleum imports and petroleum and nonpetroleum export flows. The patterns of trade for petroleum and nonpetroleum products appear quite stable, and growth at or near recent rates are sustainable. Shifts in the transportation systems, however, could establish a new basis for even higher growth. Some of the possible shifts are noted later.

Petroleum and petroleum products are 80.8 percent of waterborne imports from Mexico. Petroleum imported into the United States is predominantly crude oil originating from the Mexican Gulf fields and being shipped from the Mexican ports of lower Veracruz to Campeche. The patterns show the destinations to be the Gulf refinery centers of Houston and Pascagoula and the Mid-Atlantic complexes. Given the rigidity of the sources and sinks associated with this flow, there is no reason to believe that the pattern will change in the mid- to long-term. The public outreach efforts support this position. The historical growth rate, measured in dollars (3.1 to 3.8 percent) or tonnage (3.9 to 4.6 percent), appears sustainable.

Institutional decisions within Mexico may affect the level of Mexican crude flowing to the United States. The petroleum industry is currently protected from foreign control. However, foreign firms are being granted greater opportunities to participate in exploration, and this could lead to expanded production and shipments. The geographic patterns should not be affected unless Mexico expands its refinery capacity significantly.

The most significant commodity classes of exports to Mexico are petroleum and petroleum products, agricultural products, and chemical/plastics. The petroleum exports to Mexico are predominately products refined in the United States and sent by water to Tuxpan, the closest port in terms of transit time to the population center of Mexico. Mexico has insufficient refinery capacity, which is partially a result of decisions to close a refinery without replacing its capacity. Given the current growing demand for petroleum products in Mexico, a forecasted growth of total waterborne trade of 3.1 percent is conservative. The Gulf of Mexico and east coast port trade should increase at the aggregate rate or better.

Exports of agricultural products represent the largest export by water from the United States to Mexico. Over the study period, tonnage of these commodities have fallen by 3.2 percent per year for total waterborne exports and by 1.4 percent for east coast

and Gulf of Mexico ports. The predominant sources for these exports are Louisiana and the midwestern agricultural states shipping to or through Louisiana. This trend seems unlikely to continue in the light of continued liberalization between the United States and Mexico. Such exports would likely continue to be dominated by the New Orleans and Texas ports, which account for 98.4 percent of total tonnage to the population centers of central Mexico.

Chemicals/plastics exports by water have been growing at approximately 12 percent in total from the east coast and Gulf of Mexico ports. The Louisiana and Texas ports also dominate this flow, originating 87.7 percent of the exports to Mexico. Such trade is likely to continue, with minor positive impacts from passage of a free trade agreement.

Several factors may result in an increase in the modal share of waterborne commerce between the United States and Mexico. There could be an increase in intermodal shipments. This could entail the development of more conventional intermodal movements. New Orleans and Houston would be most likely to serve as U.S. bridge ports for these trades. Both ports have excellent rail connections to major U.S. railroads and well-developed intermodal yards that currently serve non-Mexico cargo.

In addition, several U.S. railroad companies have investigated establishing rail-barge service to Mexico. Burlington Northern has begun regular service from Galveston to Coatzacoalcos, where the rail cars are transferred to FNM, the Mexican National Railroad. Such service represents an innovative application of existing technology and could be expanded to relieve some of the demand at land border crossings if the economics prove out. However, for this to expand beyond a niche market also requires improvements to the Mexican port and rail systems. There are proposals to expand to Veracruz and to Altamira, which are both closer to the industrial center of Mexico physically, but not necessarily in terms of transit time. In the United States, there has been discussion of establishing service from a port further east such as New Orleans or Mobile.

Implementation of new water transportation technologies being used in Europe and Russia would allow the inland waterway system to be used as an alternative to rail and truck transportation as North American trade between Canada, the United States, and Mexico expands during the 1990's. Proponents of such an approach argue that there are comparative cost advantages and related environmental advantages (i.e., air quality, lowered cost of pollutant control) for bulk and general cargos that normally would move via unit train services.

CHAPTER 5: VIEWS FROM THE REGIONS

The perceptions of the adequacy of physical and institutional infrastructure issues were examined through public outreach meetings involving private sector border users, facility owners and public sector transportation planners and implementers at the national, state/province, and local levels. The purpose of the meetings was to identify areas of concern and priorities of these concerns by subregion and region. Very often, perceptions of persons who have direct experience can increase the value of findings of data analysis and direct observations. Further, inclusion of persons in the public and private sector is a part of the National Transportation Policy which states that "all those who have a stake in efficient transportation must participate--Federal, State, and local governments, private businesses, academic institutions, transportation interest groups, communities, and individuals. The measure of our Federal policies will lie in their success at unleashing private resources and at using public resources most efficiently to meet the Nation's transportation needs."

In reporting the outcomes of these meetings in this chapter, no attempt was made to filter or provide commentary about the perceptions of meeting participants. However, in formulating the findings and conclusions of this study, these perceptions were analyzed and either supported or refuted by using the factual information found in the literature and collected from data bases, and through visits to border crossings and other ports of entry. The outcomes are reflected in the conclusions which are detailed in Chapter 6. Literature sources used by the study teams and referenced in their reports are listed in Appendix B, Bibliography.

Participants at these meetings included state and local transportation officials, shippers, receivers, carriers, and Federal Inspection Service representatives. They provided information and input into the findings and recommendations. Nearly 1,000 persons representing the different transportation modes and state, local, and private sector trade and transportation interests participated in 13 formal meetings in the United States and one in Canada. About 40 percent of the participants were from the private sector. Nearly 400 participants were from public sector agencies in the United States, Canada, and Mexico. There were 63 participants from Canada and Mexico.

Some states presented formal documents at the meetings. Among the invitees to the roundtables and workshops were all known coalitions, associations and other groups representing communities that either border Canada or Mexico or share existing or emerging corridor alignments.

There were nine subregional one-day roundtables to discuss trade and traffic flow issues and four two-day regional workshops to obtain reactions and develop future action agendas for facilitating international trade. At the invitation of the governments of Mexico and Canada, two additional meetings are planned for the last quarter of 1993. As part of the public outreach effort, the FHWA policy study representatives also addressed a variety of modal associations, other groups, and Governors at their invitation.

The eastern roundtable meetings were held during June 1993 in Buffalo, New York; St. Louis, Missouri; and Norfolk, Virginia. The northwestern roundtable meetings were held in Winnipeg, Manitoba; Billings, Montana; and Tacoma, Washington. The southwestern roundtable meetings were held in San Diego, California; Las Cruces, New Mexico; and Laredo, Texas. The futures assessment workshops were held in July 1993 in Whitefish, Montana; Detroit, Michigan; New Orleans, Louisiana; and Tucson, Arizona. Additionally, as part of the public outreach effort, the FHWA policy study representatives have also addressed a variety of modal associations, other groups and Governors at their invitation.

This chapter summarizes the perceptions of the participants during these meetings. The titles of reports listed in Appendix A in which more detailed information about the public perspectives may be found are:

Summary of International Border Crossings Round Table Meeting Held in Buffalo, New York, June 7, 1993,

Summary of International Border Crossings Round Table Meeting Held in St. Louis, Missouri, June 9, 1993,

Summary of International Border Crossings Round Table Meeting Held in Norfolk, Virginia, June 11, 1993,

Making Things Work: Transportation and Trade Expansion in Western North America, Volume 6, Reaching Out: A Compendium of Stakeholder Views, and

Results of the Futures Assessment Process.

Perspectives about the current status of borders and ports of entry are integrated into the information in Chapter 3, Status of the Border. Similarly, future perspectives were taken into consideration in the methodology for projecting future trade and traffic flow trends presented in Chapter 4.

Specific multimodal infrastructure concerns, new institutional arrangements, and means of facilitating international commerce were the central topics discussed.

SUMMARY OF ROUNDTABLE VIEWS

Eastern Views

Although specific physical border infrastructure needs were identified throughout the day, institutional concerns developed more discussion among the participants. Many areas face similar institutional problems, and the discussion seemed to focus upon two major issues. The first dealt with the inspection process. There is recognition that the law enforcement responsibilities of the inspection services naturally must impose restrictions upon the free movement of people and commodities across the border. However, many thought that the inspection process needs to be changed to better facilitate trade and traffic. The second major institutional issue related to the need for the states, provinces, and localities to cooperate more effectively among themselves and with the various Federal agencies.

The success of the southwestern states in focusing Federal attention upon common regional needs was pointed to as a possible model for the northeastern states. These northeastern states formed the Eastern Border Transportation Coalition to mirror the Southwest Border Transportation Alliance. Both are listed in Appendix C, List of Border and Corridor Groups.

Major topics discussed at the Buffalo, New York, roundtable are:

- Infrastructure needs.
- Efficiency in the use of existing infrastructure.
- Adequacy of access to crossings and ports of entry.
- Age of facilities.
- Funding.
- Clearance of cargoes at crossings.
- Staffing of crossings.
- Facilitating Trade.
- Technologies for processing trade.

- Transportation and border crossing planning needs.
- Regional cooperation.
- Trade corridors.
- Role of border crossings in the regional economy.

Major topics discussed at the Norfolk, Virginia, roundtable focused on maritime and intermodal movement of commodities into and through the east coast states. These topics are:

- Infrastructure needs.
- Multistate planning.
- Impacts of intermodal rail and truck movements on local traffic.

Institutional issues:

- Federal policies affecting the relative competitiveness of U.S. ports with Canadian ports.
- Differences in enforcement and other procedures by U.S. Customs affecting port selection.
- Impact of harbor maintenance fees and container taxes on the use of United States ports.
- Impact of improvements to the U.S.-Canadian land crossings.
- Resolution of the dispute over the Trans-Atlantic Agreement, which establishes maritime rates, also affects the level of diversion from United States ports.
- Environmental regulations impose major costs on dredging of waterways and on the construction of new bridges.

Trade corridors:

- Interest in developing north-south trade corridors by land and water with more direct trade with Mexico and Canada.
- Transportation pricing competitive with land carriers.
- Inadequate rail service in Mexico at ports in the Gulf of Mexico.

- The role of ports in the regional economy.

The primary focus of the St. Louis, Missouri, roundtable was on issues related to border access for the movement of commodities into and through the central part of the country. Topics discussed include:

- General aspects of physical infrastructure needing increased investment.
- Access links to the transportation system going to the border.
- Local access links to the border crossings and the Interstate highway system.
- Relief of the heavy burden on local community streets and services.
- Funding the border crossings was not seen as a major problem.

Institutional aspects of the clearance process:

- Clearance issues that impose significant costs upon shippers and carriers, including long delays and hassles at the borders as well as construction of warehouses to hold material until it can be released especially for commodities that need Food and Drug Administration (FDA) inspections.
- Delays caused by imbalances and inadequacies of staffing by the Federal inspection services (FIS) which constrain the number of lanes that can be opened.
- Inconsistencies in the hours of operation of the U.S., Mexican, and Canadian crossings.
- Conflict between staffing adequacy and hours of operation of private sector brokers needed to process documents in Canada and Mexico.
- Options for improving the clearance process include:
- Reconsidering the roles and objectives of the inspections services.
- Greater use of electronic processing.
- Authorization of private joint provision of inspection.

- Off-border inspections, spot checks, and road side inspections of truck shipments.
- Ramp inspections.
- Recognition of joint terminals/common bondage warehouses.
- Inspections at the point of shipment.
- Expediting large, routine shipments.
- Negotiating greater comparability in working hours of inspectors and brokers.
- Electronic data interchange for bills of lading.

Improved planning

- Need for local planning organizations to recognize the requirements of international traffic--freight movements and the consequences of local border crossings.
- Greater cooperation among planning organizations and coordination between states and localities, the private sector, and the Federal agencies.
- Consideration of private sector shippers' and carriers' preferences for certain routes and crossings.
- Greater coordination with Federal agencies.
- Improved coordination of plans across borders with appropriate counterparts.

Trade corridors

- Several existing trade corridors that are continuing to develop and factors that could lead to the creation of new corridors.
- Existing corridors discussed included the Toronto to Mexico City corridor, and the St. Louis to Mexico City corridor expected to develop significant rail links served by special trains.
- Proposed I-35 corridor north from Duluth as a major tourist route to Canada.

- Factors that may determine future corridors may result in mode shifts.
- Changes in the transportation systems of trading partners can shift existing trade flows.
- Many of the trade benefits lie far from the borders.

Northwestern Views

Western U.S.-Canadian one-day roundtables were held in Winnipeg, Manitoba; Billings, Montana; and Tacoma, Washington. Participants at each roundtable were representative of trade and transportation interests within each subregion. In each meeting there were open discussions and a structured consensus process for setting priorities. The high priority themes from these roundtables were:

- Making the most effective infrastructure investment decisions.
- Reducing and eliminating institutional and other barriers to trade.
- Improving border crossing capacity and efficiency.
- Standardizing Customs' procedures.
- Encouraging cooperative planning in border areas.
- Educating policymakers.

While each of the three subregions has some unique characteristics, common themes and concerns emerged from the roundtable discussions. The most common theme was improved institutional arrangements. Without governmental cooperation within and between agencies and cross-border, regional efforts to promote efficient use of border infrastructure facilities and economic development through expanded trade will be unnecessarily affected.

Agreement was apparent within and across the three broad subregions, with the focus on working together to develop and maintain an efficient, cost-effective, and competitive transportation system. This requires not only that transportation planning extend across state, provincial, and national borders, but also that cooperation and partnerships develop between the public and private sectors. These planning

partnerships must address concerns associated with freight and passengers in with urban as well as rural areas and with the way in which transportation decisions are made.

The key points from the Winnipeg, Manitoba, roundtable are:

- In a global economy, regions must work cooperatively in a bottoms-up approach, with momentum for policy and economic change generated at a local level.
- trade flows and the trade corridor concept viewed in the context of the overall economy of a particular region or subregion.

Transportation Planning:

- Developments on one side of national or state borders, or local jurisdictional boundaries affect both sides.
- Individual states and provinces, as well as nations, need to consider the broader implications of planning decisions and activities.
- Individual states and/or provinces often lack the authority to deal directly with one another on many trade and transportation-related issues.

Transportation Investments:

- Flexibility in applying federal funds to local projects.
- Increased awareness and education in how funds can be applied.
- Public investment decisions sometimes fail to consider the future return on investment for improvements needed to promote trade and economic development.
- The ability to quantify and identify benefits may result in different financing strategies or public-private partnerships.
- Need to identify opportunities for, and to encourage, public/private sector partnerships.
- Include the interests and concerns of individual states, provinces, and regions within states and provinces when considering infrastructure improvements within a continental corridor.

Data Issues:

- Better regional data and information are needed to understand trade and traffic flows and to assess their impact on the economy, business, infrastructure, and people.
- Improve the quality and usefulness of the data.
- Conduct comprehensive review and evaluation of already available trade and transportation planning.

Application of Technology:

- Constraints to applying technology to border operations are financial requirements, condition of facilities and institutional practices.
- Handle border operations off-border with new technology.
- Economic efficiency of technology and the consequences of investing in technology are options to funding physical infrastructure improvements.
- Equipment standards, particularly intermodal equipment, are needed.

Institutional Barriers to Trade:

- Private sector participants object to institutional barriers over which they have no control.
- Institutional barriers, rather than infrastructure, are the constraining factor in transborder trade. While some north-south infrastructure improvements are needed, many of these routes are not currently at capacity.
- Increase uniformity of U.S. Customs' regulations and procedures.
- Consider how investment policy might help alleviate institutional barriers.

Rail Issues:

- Increased cooperation among railroads within single countries and across-borders, while at the same time maintaining competition.
- North-south transborder Amtrak service is of potential interest.

Trucking Issues:

- Standardize laws and regulations regarding motor carrier operations throughout the continent, enabling carriers to operate throughout a broader geographic trade area is desired.

Intermodal Issues:

- Greater flexibility needed by carriers regarding what they can and will haul.
- Develop linkages among carriers (and shippers) to identify backhauls.

Air Service Issues:

- More direct service between United States and Canadian cities would serve to promote and stimulate transborder trade to the benefit of both countries.

Cultural Issues:

- Although the United States and Canada have many common or compatible characteristics, a need exists for greater awareness and mutual respect for one another's culture and traditions.

The following issues were high priority themes from the Billings, Montana, roundtable:

- Standardized trade and transportation regulations.
- Define "transparent borders."
- Maintain and improve infrastructure for efficient use to facilitate trade and meet future needs.
- Seeking ways to increase value-added services to trade.
- Eliminate bureaucratic red tape at the border.
- Uniform trucking regulations and highway design standards.
- Move bulk shipments off the roads onto the rails.

The key points are summarized from the general discussion sessions.

Transportation Planning:

- Include rural planning organizations (RPOs) in transportation planning processes, particularly to address branch rail lines.
- Link planning between states and provinces and consider connections between remote rural areas and major transportation grids as well as cross-border connections.
- More coordination in the planning of national highway systems within the United States and Canada and in cross-border infrastructure.

Transportation Investment:

- Give attention and investment to maintaining existing facilities and systems.
- More flexibility in highway spending decisions, particularly in rural areas.
- Concern that sparsely populated states, integral parts of a trade corridor, will bear costs not proportionate to benefits of road construction and maintenance.
- Base National Highway System route decisions on sound data, not parochial interests.

Border Operations:

- Problems are more often institutional than infrastructure-related.
- Staffing and training are critical issues for Customs and Immigration and Naturalization Services.
- Congestion problems are often greater in the northbound direction, affecting infrastructure and traffic on the U.S. side of the border.
- Among the significant differences between customs operations of the United States and Canada is that U.S. Customs' supervisors are allowed to work the line when congestion and backups occur, while Canadian union contracts prohibit supervisors from doing so.
- Cost efficiencies related to full or part-time and seasonal or overtime employees are key factors.

Technology Issues:

- As an alternative to full staffing, employ a combination of electronic surveillance and pass cards at smaller border stations, which is primarily low-volume local auto traffic.
- In some cases, old facilities are not configured or designed to employ efficient technology.

Trade Issues:

- Differences in legal and financial systems among the three countries need to be addressed.

Passenger and Freight Issues:

- The movement of people and freight is often a source of conflict, particularly in the West, where tourism is important. Both tourism and commercial vehicle safety concerns must be considered when defining the traffic corridors.

Truck, Rail and Intermodal Issues:

- Significant differences exist between Mexican trucking roads and those in Canada and the United States.
- In northern border states, the cost of maintaining and repairing rural roads damaged by heavy trucks is significant, and some feel more effort should be made to move a larger share of heavy freight by rail, which may require commitment to and retention of short lines.

Air Service Issues:

- The lack of direct air service between the United States and Canada in the West is a sensitive issue because distances to access air service are greater.

High priority themes from the Tacoma, Washington, roundtable are:

- Overcoming institutional barriers and resistance to change.
- Streamlining the border crossing process.
- Increasing public agency coordination between the United States, Canada, and Mexico.

- Ensuring adequate infrastructure and personnel to facilitate border crossing.
- Applying technology to promote efficient cross-border movement.

Key points summarized from the general discussion sessions at Tacoma are:

Regional Cooperation:

- In the Pacific Northwest, states and provinces have established cross-border contacts and lines of communication, recognizing their interdependence and the need for coordination.

Transportation Planning:

- More emphasis on long-range planning of border facilities. When proposing expansion of border stations, give consideration to staff availability, separation of commercial personal auto traffic, and the adequacy of surface road systems leading to and from the border station.
- Recognize the difference between rural and urban transportation needs and the demands placed on planners in different areas.
- A single view of border issues becomes less important at the state level, where it is one of many transportation issues.
- Regional transportation planning organizations have helped increase awareness of border concerns at the state and province levels.

Transportation Investment

- A congressionally mandated 5-year border capital improvement program on the southwest border has no counterpart on the northern border. If mandated, such a program could possibly speed up desired border improvements on the U.S. side. Attention should be focused on identifying those relatively minor infrastructure or operational changes which could result in improved border efficiency.

Freight and Passenger Issues

- When evaluating border crossings, the volume of trade is important; however, the volume of traffic (both freight and passenger) is equally--if not more--critical. All types of traffic represent economic activity, whether it be cross-border shopping or gas purchases or commercial truck activity..

Technology Issues:

- Future planning should focus on seamless borders through use of high technology, such as biometrics, smart cards and electronic license plates. Other new technologies mentioned included broader application of bar code scanning in border operations and drug detection technology.

Institutional Barriers to Trade:

- Border problems are more institutional than infrastructure.
- Technological or possibly user changes to help alleviate some of these institutional problems, are suggested. Staffing requests can take as long as two years to fill.
- Various Federal agencies have different responsibilities apart from the borders which would be affected by any realignment or restructuring. In trying to achieve transparent borders, consider a number of issues relating to culture and sovereignty
- To help alleviate duty collection problems northbound, Canadian Customs has begun a bill-by-mail program to collect taxes on certain consumer goods such as liquor and tobacco.
- Truck, Rail, and Intermodal Issues
- Uniformity of weight and other regulations across state lines is desired, thereby relieving some enforcement burdens.
- Some in the rail sector suspect that trade corridor development is an opening wedge for permitting longer combination vehicles (LCVs) on U.S. highways, which many feel pose both safety issues and road capacity problems.
- Aviation Issues--In some areas of the West, U.S.-Canadian air service is a critical issue, both with respect to passenger and freight. An open skies policy is favored by many of the participants.

Maritime Issues:

- A disproportionate share of transportation resources and attention go to transit projects, with marine ports getting less attention or funding although they are major economic generators. A review of the Jones Act, with respect to commercial and tourist trades, was suggested, particularly restrictions imposed on Alaska cruise ships, cross-sound traffic, and ferry services.
- Customs delays and traffic congestion are critical issues at ports. In addition, harbor fees can reduce the competitiveness of the marine mode, which may result in more freight moving by truck, thereby increasing highway traffic.
- The majority of freight handled at the Port of Tacoma is unloaded during the day, leading to increased strain on already congested highways. Businesses may not be willing or able to absorb the costs of extending deliveries to off-peak hours.

Southwestern Views

The three southwestern roundtables viewed in perspective demonstrate the unity and the common concerns of the U.S. southwestern region. In each meeting there were open discussions and a structured consensus process for setting priorities.

Participants in San Diego, Las Cruces and Laredo, expressed needs for

- Coordinated planning.
- Federal assistance in handling international trade traffic.
- Improved U.S.-Mexican communications.
- More efficient border crossing procedures.

One overriding issue is congested main border crossing points. Transportation systems at Laredo, El Paso, Nogales, and San Diego are overloaded by current demand. The border region must continue to derive economic benefits from international trade but is concerned with maintaining the quality of life for its citizens.

Each roundtable had an illustration of various U.S. and Mexican local, state, and Federal Governments' plans and choices regarding transportation infrastructure.

- In San Diego, the problem expressed was between the GSA and the FHWA over design of a commercial truck facility accessed through a residential area.
- In Laredo, the problem was a major new port of entry, the Colombia Solidarity Bridge, 21 miles upriver from Laredo, lacking sufficient highway access on both sides of the border.
- At the Las Cruces roundtable, the difficulty was in deciding how to reconcile competing interests in the effort to attract trade and economic development to the Paseo del Norte area.

The need for reconciling intergovernmental, binational regional planning with improved border operations was a common theme. Despite the recognized need for coordination with other jurisdictions, participants exhibited a high level of local self-reliance with a desire for some degree of state and local autonomy. Some specific recommendations were related to cooperative planning and border crossing operations.

Participants felt that the Mexican and U.S. Federal Governments should be more forthcoming in providing infrastructure needs to benefit regional and international trade. However, it was recognized that their needs will perhaps not be met by an influx of Federal funds. Innovative means of financing needed transportation projects were discussed. Some options included public/private partnerships, U.S. investment in Mexican infrastructure projects, earmarking a portion of Customs revenue for improvements necessary for international trade, and a non-regressive tax alternative to using property taxes for financing local infrastructure.

The following emerged as high priority issues at the San Diego, California, roundtable:

- Establish cooperative planning and financing for binational improvements
- Provide Federal financial assistance for highway and ports of entry improvements.
- Modernize ports of entry, including highway access and egress, staffing, and technology and operations.
- Improve regional planning and funding for transportation infrastructure.

- Provide transportation infrastructure needed through binational planning.
- Develop liaison between North American countries to pass standardized government regulations.
- Fund State Road 905 ASAP!
- Fund transportation infrastructure in San Diego and the Imperial Valley region.
- More interagency cooperation between the GSA and communities.

Major directions from the discussions are:

- More efficient use needs to be made of infrastructure.
- Use various Intelligent Vehicle Highway Systems.
- Widen or expand roads.
- Improve inspection facilities at ports of entry.
- Simplify and integrate border crossing procedures.
- Increase staffing and expand hours of operation at ports of entry also fall within this category.
- Enforce driver and truck safety rules and regulations and insurance requirements; these also affect the efficiency of freight movement.

Technology:

- Governments and the general public need to be convinced that the negative costs of congestion warrant implementation of technologies such as weigh-in-motion, electronic license plates or automatic weight classification systems, and that such solutions are cost-effective.

Transportation Investments:

- The cost for border state and community infrastructure improvements and maintenance should be equitably distributed, based on regional and national trade benefits.

Private Sector Financing:

- Private sector-operated toll roads and ports of entry should be considered by U.S. and Mexican Governments as potential builders of facilities without public capital. This strategy should reflect the availability of private capital for various types of projects and would require stable federal ground rules to guarantee investment return.
- Toll strategies may not produce expected results due to uncertainty of traffic flows.

Border Operations:

- More cooperation between Federal agencies on both sides of the border and streamlined operations are necessary to efficiently use border crossings. A one-stop border crossing procedure should be designed and implemented.

Intergovernmental Planning:

- Closer coordination between the General Services Administration (GSA), which builds and designs U.S. Customs ports of entries, with the FHWA and other Government entities, is encouraged.
- GSA's role in selecting ports of entry sites and infrastructure is of concern.
- Federal agencies, regional and national, should meet regularly on regional border issues.
- Agencies also need better planning coordination at the state private sector and local levels.
- Federal agency understaffing and limited resources are further stretched by siphoning off effort for drug interdiction actions.

Federal Infrastructure Financing:

- The general consensus, especially among local governments, is that they will not be able to fully finance necessary regional and international improvements for trade benefits, and that Federal assistance should be forthcoming.
- Increased demands on Federal agencies will cripple border areas. Consideration should be given to funding adequate

staffing and for using revenue earned at U.S. Customs facilities for actual operation.

Improved Regional Planning and Cooperation:

- The border region is unable to identify and implement transportation strategies without binational planning, improved communication, and regional coordination. Planning should start within the United States and should be between Federal agencies, state and local Governments, the private sector, and the general public.
- Local entities are interested in binational planning, but the different institutional arrangements used at the border make this issue very complex. In Mexico, a federal top-down planning approach is a dominant feature. Ad hoc informal cross-border arrangements have borne some fruit but are generally ineffective for short- and long-term problems.
- Pressure created by expanding trade and transportation needs for border areas may encourage more local and regional decisions on the Mexican side. This has occurred in Europe where country differences have been set aside for integrated planning.

Data:

- Without binational data standards, the utility of cross-border planning between the United States and Mexico may not be apparent.

Trucking Issues:

- Standardized and coordinated enforcement of regulations affecting truck operation, safety, and insurance are important.
- Standardization issues were addressed by a regulatory subcommittee which is part of CALTRANS Binational Border Transportation Study.
- Movement of hazardous materials between twin plants along the border is a major concern. Consideration should be given to separating vehicles that carry hazardous materials from other traffic.

Railroads:

- Improved freight and passenger rail service was viewed as an option to move goods and people more efficiently and lessen highway congestion. Two routes were mentioned: San Diego to Imperial Valley and from Los Angeles to Calexico.
- Presently, the Santa Fe Railroad--the only Class I railroad serving the San Diego area--has the physical capacity to improve service but lacks economic incentive. Santa Fe agrees that the rail option should be protected for future use.

Alliances

- Considerable attention was given to the need for public/private sector alliances for developing support for transportation planning, project selection, and funding.
- The role of the newly created Southwest Border Transportation Alliance (SWBTA) in coordinating transportation goals and funding needs of southern border states and ensuring a better understanding of border infrastructure needs and problems.

The following issues emerged as high priority at the Laredo, Texas, roundtable:

- Lack of manpower staffing at the ports of entry.
- Provide funds for international connection improvements.
- Connections to Columbia Bridge port of entry.
- Financial support from Federal and state levels to meet trade-related needs and demands.
- Infrastructure improvements at Laredo for international trade.
- Support for regional planning efforts and staffing at local bridges.
- Routes to lower border crossings should be built to Interstate standards.
- Trade will continue to increase with or without NAFTA.
- Adequate funding for trade-related infrastructure.

A summary of the discussions follows.

More efficient use of border infrastructure and some methods of improving productivity include:

- Extended hours of operation at U.S. Customs' facilities.
- Vary local business hours to spread traffic.
- Streamline freight forwarding.
- Improve tax collection procedures at ports of entry.
- Improve/encourage mode switching: truck/rail/truck.
- Amend local cartage rules and practices.
- The local Laredo practice of prohibiting U.S. carriers from back-hauls from the Mexican side of the border results in congestion in north-bound lanes and loss of productivity. A cross-border consensus is required to change this local practice.

More Efficient Use of Customs Facilities:

- Laredo ports of entry are frequently congested, with miles-long backup a common, almost daily, occurrence. Pre-filing of customs data by shippers can save time, but not all shippers have the capability of preparing documents at the point of origin and electronically sending them ahead.
- Increased staffing levels for U.S. Customs, Immigration and Naturalization Service (INS), and other inspection agencies are needed.
- Truck patterns along the border are constantly changing. A better understanding of why this occurs would result in a more efficient use of infrastructure.

Enforcement and Congestion:

- Enforcement policies at the border are tough choices due to the lack of government staff and its impact on slowing commerce.
- Another problem is the work load: Customs Service alone is responsible for enforcing over 600 separate laws on behalf of other U.S. Government agencies and departments.
- The lack of enforcement of standards involving truck sizes and weights, driver's hours, safety, and other laws has

accelerated deterioration of Laredo's city streets and created a public safety problem. Considerable discussion ensued as to whether public safety should come at the expense of economic development and if enforcement could occur under the present staffing levels and traffic conditions.

- Better connections are required to utilize Columbia Solidarity Bridge. This new U.S. Customs' port of entry located 21 miles upriver from Laredo. Though the facility was built to alleviate congestion and border bottlenecks at Laredo, it remains substantially unused. Some reasons for under-utilization are lack of incentives for customs brokers and lack of good road connections on either side of the border.

Hazardous Cargo

- The Colombia Bridge port of entry was built to handle hazardous cargo, and while it might otherwise be feasible to route all such cargo through it instead of downtown Laredo, it is not an option until road access is improved on each side of the border.
- Besides routing issues, better U.S.-Mexican coordination is required to identify hazardous cargo in a uniform manner. Currently, drivers themselves are required to identify their cargo as hazardous. An efficient means of separating hazardous material cargoes from others is required for the Laredo crossing.

Transportation Plans:

- Specific infrastructure projects are listed in *Making Things Work: Transportation and Trade Expansion in Western North America, Volume 3: Transportation and Trade Expansion between the U.S. and Mexico*. Several are examples of an economic development proposal based on transportation connections.
- Federal Support for Border Infrastructure--Consideration should be given to dedicating a portion of U.S. Customs revenue to state/border communities for infrastructure improvements and maintenance that benefit regional and national trade.
- New ISTEA Planning Process--The ISTEA mandates a planning process which allows regions to set their own spending priorities and requires the integration of state plans with local and regional plans. This change gives local governments more influence and encourages essential short- and long-term planning.

- Corridor Management--Transportation agencies should identify future corridors and obtain right-of-way to preserve options. In addition, incompatible land use along existing and future corridors should be discouraged.
- Binational Planning--Integrated cross-border economies require joint planning, mapping, and coordination between international entities. Particularly, the status of U.S. and Mexico infrastructure investment strategies and future needs, to be shared on a regular basis.

Data:

- Without reliable origin-destination and routing data, governments have a difficult time making sound investment decisions. Cooperation from the private sector in developing a good data base is necessary but often such information is not forthcoming due to proprietary consideration.
- A binational origin and destination study is necessary to encourage cross-border planning. Developing in-depth origin and destination data should be linked to future Section 6015 studies.
- Other data, such as reliable population and environment statistics, are lacking for adequate cross-border planning.

The following issues emerged as high priority during the Las Cruces, New Mexico, roundtable:

- High-technology intermodal port of entry at Santa Teresa.
- Develop and open Santa Teresa access.
- Government safety and regulation.
- Improved/consolidated U.S.-Mexican communications.
- Adequate data bases for planning border development.
- Infrastructure development synchronized with border planning.

Following is a summary of the discussions.

Efficient Use of Infrastructure:

- Seamless transportation systems are required to increase border efficiencies and reduce costs.

Border Operations:

- Use of streamlined customs procedures for rail and trucks would decrease congestion at border ports of entry.
- Fair share for staffing and maintenance at the border is needed.
- Ports are opening without adequate infrastructure. Santa Teresa was the most frequently cited example.
- Balanced consideration should be provided by governments on facility/infrastructure improvements so that border communities are not unfairly disadvantaged.

Policy Questions More Compelling than Infrastructure:

- A vision is needed for common regional and interstate policies to deal with trade and transportation issues and remove institutional barriers to support trade.
- Policymakers need to keep a clear vision of removing continental barriers to trade and not replacing them with state-mandated systems of tariffs and fees to generate income. Current New Mexico taxation policies--such as the weight-distance tax, high diesel fuel tax, and the gross receipts tax--discourage in-state customs brokers services.
- Information on trade growth/opportunities and their impacts should be developed for businesses, policymakers and the general public.
- Local governments need innovative and alternative ways to finance infrastructure improvements instead of relying on property taxes. As demands increase, local officials may face resistance from their constituents to fund infrastructure necessary for international trade.

Binational Planning/Coordination:

- Cross-border coordination for short- and long-term planning were viewed as critical. The International Planning Organization (IPO) of El Paso/Ciudad Juarez was discussed as a vehicle.
- The discussion of binational coordination differed from San Diego and Laredo, where the emphasis was placed more on coordination between U.S. entities. At Las Cruces, a direct link was made between the planning process needed to involve

local, state, and Federal agencies, as well as public and private sectors on both sides of the border.

Paseo del Norte As a Trade/Planning Region:

- Five southern New Mexico counties, along with El Paso, Texas, and Ciudad Juarez, Chihuahua, Mexico, form the Paseo del Norte region. (Population, 1.5 million; \$15.9 billion, annual economy.) The area is a rapidly developing international trade and manufacturing center and by 2010 the population projection is more than 3.5 million. Regional views on jobs (location and competition) and safety (licensing, hazardous cargoes and pollution) must be determined before common problems and goals can be discussed.
- The region's economic viability is tied to transportation improvements and planning cooperation. Changes are necessary to improve air quality and border crossing efficiency, reduce congestion, and relocate intermodal facilities.
- Four strategies for expanding trade based on improved infrastructure and changing conditions were given.
- State Efforts--State policy makers are engaged in a concerted effort to capture more economic development benefits from increased trade with Mexico. Strategies vary: seeking a more common ground on transport-related taxes, providing in-state tuition for Mexican nationals, increasing technology transfer, and developing Santa Teresa as a regionally important border crossing. Other initiatives include establishing direct New Mexico-Mexico air links and promoting binational tourism.

Corridor Concepts:

- The United States needs a more direct land bridge between the Pacific Northwest and Mexico. North-south connections are necessary for economic growth.
- Arizona and Utah need to consider an extension of I-17 to connect Salt Lake City to Flagstaff. Much of the extension would pass through the Navajo Nation, so efforts have been made to include Navajos in the decisionmaking.
- Developing a transportation hub is needed at Midland/Odessa, Texas, along with improved links with I-10 to the south, I-27 to the north, and the Midland/Odessa airport.
- Truck Safety/Hazardous Cargo--Resources for enforcing truck standards and monitoring hazardous cargoes will be stretched

beyond capacity, especially for local governments, when Mexican trucks gain access further into the United States.

Data:

- Reliance on historical data provide an inaccurate picture of trade, especially for New Mexico, because southbound traffic into Mexico goes through El Paso and is counted by U.S. Customs as a Texas export. The Section 6015 study would place too much emphasis on the past rather than factors that affect the future trade/transportation picture.
- Good reliable data on trade flows and population is lacking. An in-depth origin/destination survey is needed.
- The New Mexico State University Geography Department is developing a Border Atlas for New Mexico and Chihuahua.

FUTURE CONSENSUS VIEWS

Futures Assessments

As one component of the forecasting methodology, the Futures Assessment Process aims to develop a consensus-based outlook among key stakeholders. This outlook then forms part of the range of possible outcomes derived from the various methods and data sources used in the study.

The consensus approach to forecasting represents an independent means of obtaining insight about possible outcomes and issues. It is not an extension of other forecasting methods used in the study because it would constrain stakeholders to a particular theory and logic thus diminishing their autonomy from non-stakeholder beliefs and assumptions. The process does not dismiss the validity of stakeholder intuition. On the other hand, causal factors and interrelationships are considered desirable as an element of the consensus outlook.

The locations of the meetings were selected to distinguish northern from southern international borders with Canada and Mexico, and eastern from western regional economies of the United States. The eastern workshops were held in Detroit, Michigan, for the northeastern region on July 12 and 13, 1993, and in New Orleans, Louisiana, for the southeastern region on July 21 and 22. The western workshops were held in Whitefish, Montana, for the northwestern region on July 8 and 9, 1993 and in Tucson, Arizona, for the southwestern region on July 23 and 24. These latter workshops differed markedly in both focus and format from those held in the East and addressed distinct differences in

perspective, problems, and opportunities in the two economic regions.

The term of stakeholder was defined broadly to include industry, shippers and carriers, government at the Federal, state and local levels, and political representation. It covered the transportation planning community in both Government and industry and included institutional representation such as U.S. Customs. It was also defined to include those with academic or other expert-oriented interest in the region and in the notion of trade-related transportation corridors. Representation included the United States, Canada, and Mexico.

Panel selection was not conducted as a statistically randomized process. Instead, knowledge of each region was applied to draw a broadly representative group. Workshops ranged in size from 20 to 100 participants.

National Consensus

Five broad categories of consensus emerged or can be intimated from the four workshops taken together.

The relationship between trade and transportation is viewed in terms of traffic, infrastructure, institutional requirements, and business services, but not corridor. Corridor is viewed as the transportation system and the origin-destination patterns of the traffic flows. The route chosen is considered as the relevant corridor for each shipment or traffic movement.

Factors influence the location and pattern of trade and shape the effectiveness of transportation systems. Consensus here emerged in three broad areas:

- the nature and relative importance of trade versus other market forces on intercontinental and binational trade and traffic patterns.
- the sources of pressure on border crossings.
- the nature and relative importance of trade in commodities versus services and investments in the emergence of intercontinental and binational trade and traffic patterns.

The role and quality of information and transportation planning was discussed at each workshop, resulting in regional consensus.

Existing and emerging trade and traffic patterns impact transportation and productive efficiency.

International coordination is necessary for intercontinental and binational transportation planning.

Regional Consensus

Eastern Consensus

The eastern workshops were held in Detroit and New Orleans. The Detroit workshop primarily focused on the northeastern border with Canada and the southeastern region primarily focused on the maritime and intermodal industries for states on the east coast and bordering the Gulf of Mexico. Three broad consensus-based findings may be drawn from the eastern workshop results.

First, the U.S. domestic transportation system has a weak influence on trade growth. The adequacy of the U.S. transportation system is not viewed as a major factor in forecasting the volume or the value of trade growth. The condition of Mexican transportation is, however, viewed as a potential trade barrier in the southeast.

Trade growth has a weak influence on traffic patterns. Trade growth measured in terms of either value or volume is not viewed to be a significant factor in forecasting the outlook for overall traffic patterns. As a proportion of total movements, trade both now and in the future is considered too small to be a driving factor. The adequacy of certain transportation subsystems, however, is seen to be influenced by trade growth, especially border transportation facilities and related links to the primary transportation system.

Transportation has a strong influence on the productivity of trade-oriented industries. The adequacy of transportation infrastructure is seen to influence the productivity and competitiveness of industries engaged in intercontinental and binational export activity. While transportation subsystem adequacy at border crossings has a visible impact on the productivity of trade-oriented industries, congestion, circuitry, and other problems in the principal arterial system are also seen to diminish the productivity of export industries, just as they are seen to diminish the productivity of industry in general. Effects on trade and nontrade are seen as largely indistinguishable beyond the border. Freight shipping industries are those whose productivity is seen to be the most sensitive to transportation adequacy. Productivity of export-oriented service industries is not seen to be immune, but is clearly viewed as being less in jeopardy, as a result of enhanced trade.

Western Consensus

The western workshops were held in Whitefish and Tucson. The northwest and the southwest frontiers differ markedly. However, a common consensus did emerge in a number of areas.

Consensus of stakeholders in the West indicate the U.S. domestic transportation system has a weak influence on trade growth in most sectors, but that bottlenecks and other inadequacies adversely influence the productivity and profitability of exporting and importing industries. Stakeholders emphasize deficient border crossing facilities and urban congestion as key impediments to regional trade-related benefits.

Strong consensus emerged, particularly among stakeholders in the southwest, that poor transportation infrastructure in Mexico dampens the productivity of exporting and importing industries in both nations. This is to the detriment of real wage growth and consumer prices in both nations. Stakeholders believe that policy and investment decisions about the Mexican transportation system are likely to be more significant in their bearing on trade than transportation policy and investment.

Trade growth and its composition are viewed as influential factors in the West. The nature of traffic and traffic patterns relate directly to the use of alternative modes of transportation, increasing the significance of intermodal shipments. The degree of efficiency in the movement of goods and people is directly related to border crossings and links to main transportation systems. In the southwest, stakeholders point to joint production trade (the maquiladoras) as evidence of the implications of intermodalism and just-in-time transportation system.

Stakeholders are uniform in the view that presently available data sources do not accurately portray the extent of intermodal shipments. Accordingly, the data are believed to provide poor and misleading signals for transportation planning.

Stakeholders conclude that, rather than the value or volume of trade itself, transportation planning should be guided by the pattern of origins and destinations. Transportation needs must fulfill the anticipated flows of commodities classified by groups.

Stakeholders were of the view that planning border transportation systems should transcend traditional trade patterns. Transportation planning in border communities must be planned comprehensively and more broadly. This would include due regard

for trade in services, retail activities and the growing interdependence between local economies and the nature of trade-related traffic.

ROUNDTABLES--FUTURE PERSPECTIVES

During the eastern roundtables, there was discussion of future perspectives. These are presented separately for the purpose of clarity.

Buffalo, New York, Roundtable--Future Perspectives

To assess the adequacy of border infrastructure to accommodate future needs, it is important to know what changes are likely to take place. Several major shifts in the trade and transportation environment were anticipated. These are:

- Continued growth in advantageous intermodal movements, i.e., the merger of motor carrier and rail.
- Impact of increased use of double stack trains, which may require pre-clearance so as not to tie up an entire train for the inspection of a single container.
- Possible reemergence of canal traffic.

St. Louis, Missouri, Roundtable--Future Perspectives

The discussion of future trends fell into two broad areas: technology and institutional. The move toward having more of the clearance activity done electronically appears inevitable. However, several actions may be needed to accelerate the adoption of existing and developing capabilities. Customs needs to have the Modernization Act passed. Technologies and protocols need to have greater standardization by the public sector or through incentives provided by the public sector. Alternatively, the defense sector could be redirected to address issues associated with international trade.

It was noted that not all future improvements need to be of the high technology variety. Better utilization of low tech options, such as larger locks, ships, and bridges, can also help meet the needs for handling increased trade.

Some of the institutional factors that will affect the future are:

- Environmental standards, some of which may be unduly restrictive.

- Labor force changes that make it more difficult to find and retain qualified drivers.
- More blurring of the lines between modes, with firms establishing working arrangements across modes, and firms buying equipment for use on another mode, e.g., trucking firms buying containers.

Norfolk, Virginia, Roundtable--Future Perspectives

In addition to the descriptions of future trends discussed with other issues above, several other trends were noted. These include the trend toward having fewer, but larger, ships serving specific ports. Occasionally, this is accomplished by having major lines sharing vessels. This trend is expected to create major peaks and valleys in traffic to and from ports.

Some ports are expected to grow much larger. Given the overcapacity of ports currently, this may result in some ports falling by the wayside.

Current studies underway that look at electronic data interchange (EDI) among states for inspections purposes may also indicate ways in which such systems could be applied to international trade movements as well. The need for EDI standards was raised as a critical issue.

Standards are also important for intermodal containers. This is still viewed as an immature market that requires only a broadly accepted standard to reach its full potential. Mexico's ban on 53-foot trailers was cited as a similar issue.

CHAPTER 6: DISCRETIONARY PROGRAM FOR HIGHWAY INFRASTRUCTURE

During the time that the Section 6015 study was conducted, the Volpe Center led the Section 1089 study. Meetings were held with selected highway agencies of major import and export states to discuss the feasibility of a discretionary highway program specifically directed at border crossings. A one-day session was held in Cambridge, Massachusetts, to gather views on the feasibility of a discretionary infrastructure program. This outreach meeting on discretionary infrastructure involved a panel of experts from state transportation agencies. The study team structured their exploration of the feasibility and advisability of a highway infrastructure program directed to border areas in terms of project selection criteria, implementation, relationship to ISTEA, funding sources, and roles.

The study team also examined data and information on trade and highway transportation patterns. The detailed report of the Section 1089 study is listed in Appendix A, Final Reports, and is titled *Feasibility Study for an International Border Highway Infrastructure Discretionary Program*.

The purpose of Chapter 3, Status--Border Infrastructure and Institutional Systems, is to establish likely physical infrastructure requirements to accommodate existing and anticipated highway system demands resulting from increased international trade. For the purpose of Section 1089, the requirements must be established to determine the feasibility and advisability of different program delivery mechanisms. Because summaries in the preceding chapters detail the status of highway infrastructure at border crossings and on the approaches to them, and the trade and transportation flow patterns, separately and in combination, that material will not be repeated here. Rather, attention will be given to the outcomes of discussions with states' highway officials and the structured outreach meeting with a panel of experts.

OPERATIONAL DEFINITION OF DISCRETIONARY HIGHWAY PROGRAMS

Traditionally, a discretionary program is one in which funds are allocated using administratively determined formulas and/or criteria provided in law. Some discretionary programs have shifted in a direction that removes project selection from the planning process. In such cases, projects are often selected in the annual appropriation process. This, by far, is a principal objection to a discretionary program, based on interviews with state and Federal border trade specialists. This objection formed the basis for the discussions of program design and program funding considerations.

FUNDAMENTAL ISSUE

Although the international border crossings are partially a Federal responsibility, the burden of international trade falls primarily on states. The consequences of decisions made at the state level fall exclusively on the local border communities and the transportation users, private and public. Tension exists between states' desire for flexibility in meeting their infrastructure needs and their desire for some focus and guidance at the Federal level for the Federal mandates for border crossings and ports of entry. All participants agreed that border and border approach infrastructure needs exist and will increase in the future as trade and traffic increase.

Findings from the expert session to discuss the need for a discretionary program for international border highway infrastructure are divided into two categories--program design and program funding. The session was held in Cambridge, Massachusetts, in July 1993.

PROGRAM DESIGN

A new program with new revenues had strong support. The program needs to be carefully tailored to include a comprehensive planning process with objective and fair criteria to prioritize projects.

Everyone objected to earmarking projects, in part, because such action would be exclusive of any meaningful planning process.

A program should not be limited to highways and international border crossings; other transportation modes and interior states should be included if the criteria can be satisfied. Furthermore, Canada and Mexico need to be brought into the planning process.

Funds dedicated for international trade-related infrastructure can be distributed by means of project selection or an apportionment formula.

There is agreement that some type of benefit-cost assessment needs to be included in the planning process. A cost-benefit assessment could consider safety, mobility, environmental, and trade benefits.

One program design suggestion was based on the apportionment distribution in the Congestion Mitigation and Air Quality Improvement Program. For example, each state would be guaranteed

a minimum amount. Areas having high benefit-cost projects would be given greater weight in the formula while areas not having international trade-related infrastructure needs would receive funds as Surface Transportation Program funds.

PROGRAM FUNDING

The concept of establishing a program focused on international trade and border crossing issues without new funds did not receive much support. An argument against such a program is that ISTEA is currently underfunded and added responsibility without new financing would reduce states' flexibility. All agreed that a program for international trade needs should be funded with new money.

With limited resources and an increasing demand for infrastructure investment, creative funding solutions, including private sector funding, need to be considered.

Attending experts urged that funds for a discretionary program not be dispersed from funds already designated.

If states receive an apportionment, two options were discussed about the use of this money to finance projects. First, the money could be loaned out and, at the point that states have accumulated sufficient funds, they could use this money to fund a project. The second option is that states could use their future apportionment as security to borrow funds for projects now ready for construction.

Another option is to attract private capital to help bridge this gap. Sections 1012 and 1044 of ISTEA encourage private sector involvement in highway development projects.

Another suggestion for funding such a program is a revolving fund. Such a revolving fund could attract private capital for public infrastructure investment. Revolving funds can operate on a state or national level. This fund would operate as an investment bank and offer a full range of credit enhancements to finance projects principally financed by the private sector. Credit enhancements could include direct loans, letters of credit, standby credit, and loan guarantees at commercial rates.

At the national level, the initial seed money could come in the form of loans or contributions from the federal governments of the United States, Mexico, or Canada, from border states, sale of stock, or from the private sector. On the state level, the initial money could come from loans supported from the state's

general fund or highway account. A state revolving fund could issue stocks, bonds, or other instruments, such as certificates of participation. If a revolving fund is successful, it would eventually become self-replenishing.

In summary, a new program for infrastructure needs related to international trade, funded with new money, has strong support. Of near equal importance is the inclusion of a planning process.

CHAPTER 7: POLICY IMPLICATIONS

This chapter documents findings, conclusions, and recommendations about the feasibility and advisability of a discretionary highway infrastructure program for border areas, and the ability of the border crossings and related transportation subsystems to handle current and likely levels of demand, and recommendations for needed system improvement programs.

The study process included a technical side and a consultation or public process side. The technical side involved the development of data bases that enabled the description of increased commerce and the role of transportation because of existing U.S.-Canada Free Trade and current and anticipated increases in trade between the U.S. and Mexico. Other data was collected during visits to all major border crossings and some ports of entry, discussions with government officials on both sides of the borders at the land crossings, and review of infrastructure plans for border station facilities. Identification of instances and opportunities for increased use of advanced technology to reduce congestion, increase pavement life, communicate best routings, and the like was also a part of the technical side.

The consultation with the public was a partnership process. With the assistance of the Highway Users organization, the study managers had access to many States' Governors. There were government to government level meetings with Mexico and Canada. Through a series of meetings across the country, in Mexico and in Canada, experts from the private and public sectors engaged in dialogue to add to the pool of information for the study. The public sector participants came from Immigration and Naturalization Service, Customs, Agriculture, General Services Administration, Border Patrol, and the State Department, as well as local, state and Federal transportation, planning and economic development agencies. There was also involvement from elected government officials. The private sector included shippers and carriers. Verification of perceptions from these interactions was accomplished through review of materials submitted by participants and analysis of data to attempt to discern patterns.

PRINCIPAL FINDINGS

- Volumes of trade and traffic will increase among the three North American countries. The traffic growth rate at both the U.S.-Canadian and U.S.-Mexican borders has been increasing at rates significantly higher than average national growth rates, particularly at the southern border.
- Passenger traffic through U.S.-Canadian ports of entry in the eastern region is projected to increase at a rate of 6.2 percent a year through 1997. Total trade through eastern ports of entry is projected to reach \$160 billion by 1997, resulting in an increase in commercial traffic to between 8

and 9 million vehicles or an average annual growth rate of between 5 and 7 percent through 1997.

- U.S.-Canadian trade processed through border ports of entry in the western region is also expected to increase. U.S. exports to Canada are projected to increase by 16 to 24 percent in the next ten years. Canada exports to the United States are projected to increase 24 to 34 percent over the same period.
- With ratification of the NAFTA, the projected increase in trade between the United States and Mexico will be much larger. U.S. exports to Mexico are projected to increase between 65 and 70 percent by 2000. Mexican exports to the United States through the South Texas ports of entry are projected to increase 120 percent; exports through the West Texas-New Mexico ports of entry should increase by 110 percent; exports through Arizona are projected to grow by 85 percent; and exports through California are projected to increase by over 200 percent.
- The facilities immediately at the border crossings, principally bridges and tunnels plus facilities housing Federal inspection agencies (the U.S. Customs Service, the U.S. Immigration and Naturalization Service, the U.S. Department of Agriculture and their Mexican and Canadian counterparts), are adequate and will remain so for the foreseeable future, even with the anticipated increased in trade. The General Services Administration (GSA) is completing a \$364.5 million Southwest Border Capital Improvement Program that will enable southern border crossing facilities to accommodate 8.4 million trucks annually. Approximately 2.3 million trucks entered the United States from Mexico during Fiscal Year 1992.
- Arterials leading to and from border crossing sites are part of the border approach infrastructure. Today they are under stress and will be hard pressed to handle significantly greater amounts of cross-border traffic. The GSA improvements cited above are confined to facilities at border crossings which handle traffic and inspection. The GSA improvements do not extend beyond the immediate crossing area to roads and other transportation channels. These arterials connect border crossings to the main interstate and interregional transportation system within the United States. They are badly in need of repair and upgrading.
- In addition to needed improvements in access to the border crossing points, some incremental improvements to

transportation systems in the United States may be necessary to handle increases in both domestic and international trade. These include improvements in access to inland ports, seaports, airports, and intermodal transfer facilities. Local planning agencies, in general, pay far too little attention to issues related to border crossing, port and airport access, other intermodal access, and international and domestic freight. The intermodal management system and the metropolitan and statewide planning processes currently under development by the Department of Transportation strengthen these areas.

- Communities that adjoin busy international border crossings face special problems resulting from the concentration of trade-related traffic, including congestion of local arterials with accompanying delays in travel times for local residents and deterioration of air quality, safety risks associated with heavy vehicle traffic, and increased deterioration of highway infrastructure.
- Border states, in distributing Federal highway funds, seem not to have allotted sufficient funds to border communities for improvements to border crossing approaches. The reason, in some cases, is because of competing priorities within states and in other cases because of legal limitations prior to ISTEA on the use of such funds for access roads to certain crossings (e.g. toll bridges). New sources of infrastructure funding and improved methods for its allocation appear necessary.
- A significant proportion of the delays at border crossings are not due to a lack of adequate infrastructure, but is caused by volume of trade, by complexities of inspection requirements, and by less than optimal traffic management and cargo clearance procedures. The inspection agencies require that many vehicles undergo lengthy inspections. Inadequate or incomplete paperwork accompanying cross-border shipments is common and constitutes another source of delay. Improvements appear to be needed in a combination of partnerships and technology applications to resolve some delay problems. Generally, Federal Inspection Service (FIS) operating practices need modernizing, although individual stations are already implementing innovative solutions in partnership with shippers and carriers.
- Inspection agency staffing shortages can lead to excessive waiting time at border crossings. Traffic at most crossings is typically concentrated during peak hours, and border facilities often are idle for long periods during off-peak hours. More efficient use of border facilities could spread

traffic over a longer period during the day, and thus alleviate some congestion.

- A need exists for increased coordination among the stakeholders which include the FIS, other Federal agencies, local and regional planners, facility operators, carriers and shippers. Cooperation must be binational and it should include broader representation from the public sector. Policies and practices of foreign governments often contribute to congestion at the border. For example, inspection agencies on both sides of the border work different hours.
- Infrastructure and facilitation planning for major border crossings is fragmented and inadequate. The Federal government maintains an interagency group that coordinates review of proposals for additional crossings on the southwest border, but it does not deal with border communities or with planning of ancillary roadway or other needs beyond the crossings themselves. Adequate planning will require improved coordination among public and private entities, and among Federal, state, and local governments. Such planning should be binational and applied to both the northern and southern borders. The Federal Government should have the lead role as regards the involvement of foreign government entities. The Federal Government should also take on a leadership role as facilitator and convener of the mix of domestic government entities.
- There is insufficient linkage between available data on trade and transportation to permit the establishment of a firm definition of what constitutes an existing or emerging international trade corridors for all modes of transportation. It is important to note that any major new transportation corridors in the U.S. cannot currently be justified alone on the basis of North American foreign trade. There are studies that indicate the general need for augmented infrastructure. However, there is no outstanding data that supports construction of any particular border to border transportation corridor.

RECOMMENDATIONS

To improve transportation associated with North American trade, the Department of Transportation has three recommendations.

Transportation Infrastructure Needs—Section 1089 of the ISTEA directs the Department to evaluate the feasibility and advisability of establishing a discretionary border infrastructure investment program. While the Department is

certainly capable of implementing such a program if it were established by the Congress, we do not believe it to be advisable because of earmarking that subverts statewide and local planning efforts. Even though the Department finds that investment is needed to address deficiencies in highway approaches to international ports of entry and intermodal facilities crossings, a number of alternative actions to the discretionary program are recommended:

- Fully fund the ISTEA to provide needed resources for states to allocate to trade-related and other high priority projects.
- With state and local governments, private financial institutions, carriers, and other private interests, develop a range of funding options for infrastructure improvements, emphasizing non-Federal, existing Federal, and potential sources. Identify, and eliminate wherever possible, impediments in Federal programs to innovative public/private collaborative efforts.
- As part of a future surface transportation authorization bill, develop Federal-aid program options to improve transportation infrastructure related to international trade, including border approaches and access roads, and connections to port, airport, and intermodal facilities. Funding program options could include a separate trade corridor, intermodal and port of entry program or a setaside percentage of an expanded National Highway System or Surface Transportation Program.

One illustrative separate program option for future deliberation is an "International Trade and Intermodal Transportation Program." This could be a separate funded program for improving modal transportation facilities' connections from ports of entry to the Nation's core transport system (e.g. Interstate System). This funding should include connections to key intermodal transfer facilities and, as a second priority, serve trade traffic both nationally and internationally.

Border Station Congestion—The Department will support the creation of a task force or multi-task forces composed of Federal, state and local government agencies, and the private sector to address congestion at border crossings in general or at specific gateways or crossings. The purpose of the task force(s) is to identify critical border initiatives and to aggressively promote the use of new technologies and techniques and other non-capital intensive methods of facilitating the movement of people, cargo, and vehicles through major border crossings. One prospect

might be to investigate the possibility of separating commercial and automobile traffic as well as the possibility of automobile by-pass lanes for commuters and repeat business users. Any initiatives should be closely coordinated with the Mexican and Canadian governments. A limited number of pilot projects could be undertaken to address congestion at various gateways. Funding for these projects could include a variety of Federal, state, local or private resources.

An illustrative legislative option is an "International Border Efficiency Pilot Program." This could include limited funding with the goal of more efficient movement of commercial and noncommercial traffic through major border crossings, and other major ports of entry between the United States, Germany, and Canada. The efficiency program could include the identification of four to six gateway projects which may involve joint funding of infrastructure improvements in the United States and Mexico, or in the United States and Canada. The selection of the projects should be accomplished through a competitive process. This efficiency program would further advance some of innovative efforts now occurring at some border crossings.

Transportation Planning and Data Needs—To assure that planning for future border trade-related infrastructure and technology requirements for all modes is included in state and national planning processes, the Department of Transportation and other Federal agencies should establish binational planning zones to engage in an integrated binational planning process. Planning for infrastructure and technology improvements in these zones would be coordinated with Federal, state, local, and private sector organizations that would identify improvement priorities. Additionally, regional forums to discuss international trade and border issues would be encouraged. Cross-border consultation and coordination would be an integral part of the overall process.

To further assist in future border region and trade corridor transportation system planning, the Department recommends the development and implementation of a program for improving methods of collecting and analyzing data on cross-border trade and traffic flows.

APPENDIX A: FINAL REPORTS

These detailed reports will be available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161, (703) 487-4634. All reports are numbered FHWA-PL-94-009-xx. The suffix (xx) is shown following the title listed below.

ISTEA SECTION 1089 STUDY

Feasibility Study for an International Border Highway Infrastructure Discretionary Program. (01)

ISTEA SECTION 6015 STUDY

SOUTHEAST

An Assessment of the Adequacy of East Coast and Gulf of Mexico Port Infrastructure to Accommodate Trade with Mexico. (02)

U.S. Border Crossings with Canada and Mexico-Port Facilities, Inventory, and Constraints. Volumes 1 and 2. (03-04)

NORTHEAST

An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings. (05)

Appendices:

1. Descriptive Profiles of Maine Frontier. (06)
2. Descriptive Profiles of Montreal South Frontier. (07)
3. Descriptive Profiles of Eastern New York Frontier. (08)
4. Descriptive Profiles of Niagara Frontier. (09)
5. Descriptive Profiles of Michigan Frontier. (10)

Summary of International Border Crossings Roundtable Meeting Held in Buffalo, New York, June 7, 1993. (11)

Summary of International Border Crossings Roundtable Meeting Held in St. Louis, Missouri, June 9, 1993. (12)

Summary of International Border Crossings Roundtable Meeting
Held in Norfolk, Virginia, June 11, 1993. (13)

WEST

Making Things Work: Transportation and Trade Expansion in
Western North America

Volume 1: A Summary Report. (14)

Volume 2: Transportation and Trade Expansion in
Western U.S. and Canada. (15)

Volume 3: Transportation and Trade Expansion between
the U.S. and Mexico. (16)

Volume 4: Profiles of Western U.S.-Canada Border
Crossings. (17)

Volume 5: Profiles of U.S.-Mexico Border
Crossings. (18)

Volume 6: Reaching Out: A Compendium of
Stakeholder Views. (19)

Trade and Transportation in the Intermountain
West. (20)

U.S.-Mexico Transportation: A Trade
Perspective (21)

Western U.S.-Canada Trade and Transportation
Perspectives from the Northern Border. (22)

Western U.S.-Mexico Trade and Transportation
Perspectives from the Southern Border. (23)

Future Assessment of North American Border:
Perspectives on Key Factors Affecting North
American Trade and Transportation. (24)

Volume 7: Commissioned Special Reports. (25)

Disparities in the Law and Practice of Surface
Transportation of Goods between the U.S. and
Mexico. (26)

Financing Options for U.S.-Mexico Border
Transportation Projects. (27)

Transportation Technology Trends and North
American Trade. (28)

Case Study: The Sweetgrass, Montana and Coutts,
Alberta Border Crossing. (29)

Working Paper on Trends in International Trade and Impacts on North American Transportation. (30)

Working Paper on the Impact of Expanded U.S.-Mexico Trade on the Western States (31)

Section 6015 Study: Results of the Futures Assessment Process. (32)

Future Assessment Reference Book, Whitefish, Montana, July 8-9, 1993. (33)

Future Assessment Workbook, Whitefish, Montana, July 8-9, 1993. (34)

Future Assessment Reference Book, New Orleans, Louisiana, July 21-22, 1993. (35)

Future Assessment Workbook, New Orleans, Louisiana, July 21-22, 1993. (36)

Future Assessment Reference Book, Detroit, Michigan, July 12-13, 1993. (37)

Future Assessment Workbook, New Orleans, Louisiana, July 12-13, 1993. (38)

Future Assessment Reference Book, Tucson, Arizona, July 23-24, 1993. (39)

Descriptive Report on Trade and Transportation Patterns in the Western U.S.-Canada Region. (40)

Descriptive Report of Cross-border Traffic and Transportation in the Western U.S.-Canada Region. (41)

Working Paper on Intermodal Requirements on the U.S.-Canadian Border in Western North America. (42)

Working Paper on the Role of Government in Trade and Transportation between U.S.-Canada in Western North America. (43)

Working Paper Analysis of Sub-Regional Economic Trends Potentially Affecting U.S.-Canada Trade Patterns. (44)

Descriptive Report on Trade and Traffic Patterns between U.S.-Mexico. (45)

Working Paper on the Impact of Western Economic Growth on Trade with Mexico. (46)

Working Paper on the Role of Government in Trade and Transportation Between U.S.-Mexico. (47)

Working Paper on Intermodal Requirements on the U.S.-Mexico Border. (48)

Descriptive Report on Cross-Border Travel Activity between the U.S., Canada and Mexico. (49)

Working Paper Inventory of Institutional and Legal Barriers to Seamless Interstate Borders within the United States. (50)

Regional Data Base and Working Paper on Regional Computerized Data Base. (51)

Institutional Profile Data Base and Working Paper on Institutional Profiles for Continental Trade and Transportation in the Western United States. (52)

Inventory of Existing Trade, Traffic and Visitor Flow Data Sources. (53)

Working Summary of Key Methods of Forecasting Trade and Traffic Patterns. (54)

Working Paper on Data Requirements for Intermodal Planning and Analysis. (55)

APPENDIX B: BIBLIOGRAPHY

The literature addressing North American trade and transportation is extensive. The purpose of this bibliography is to provide illustrative items from the vast literature and items that are referenced in the text of the final reports which are listed in Appendix A.

The selected bibliography by subject matter is referenced in Volume 1 of the final report--"Making Things Work: Transportation and Trade Expansion in Western North America." Certain titles may appear in more than one listing as they pertain to the different subject matter groups.

The selected bibliographies for Mexico and Canada are referenced in the final reports "An Assessment of the Adequacy of East Coast and Gulf Port Infrastructure to Accommodate Trade with Mexico" and "An Assessment of the Adequacy of U.S.-Canadian Infrastructure to Accommodate Trade through Eastern Border Crossings," respectively.

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APPENDIX C: LIST OF BORDER AND CORRIDOR GROUPS

Following is a listing of groups which have identified themselves with specific border crossings or transportation corridors, existing and emerging. Identification of the areas of interest of each group is also included in this listing.

U.S. Route 219 Association

P.O. Box 174
Barnesboro, Pennsylvania 15714

Mr. Jerry Brant, Executive Director

Mission: to promote U.S. 219 connecting from the Queen Elizabeth Highway (QEH) in Toronto through Buffalo, New York, and the states of Pennsylvania, Maryland, West Virginia to I-77 to Virginia and the Carolinas to I-95 to Georgia and Florida. Associated with the Western New York Economic Development Corporation and the Western New York Canada Council involving Ontario, Municipality of Niagara, the New York State Department of Transportation, and the Niagara Frontier Transportation Committee.

Eastern Border Transportation Coalition

Michigan Department of Transportation
Michigan State Transportation Commission
P.O. Box 30050
Lansing, Michigan 48909

Mr. Irving Rubin, Commissioner

Mission: to identify and help implement optimum solutions to border crossing and international transportation corridor problems, issues and opportunities. The coalition recognizes the increase in the international movement of goods resulting in the emergence of international transportation corridors. As a result of emerging traffic patterns, the coalition is committed to the development and maintenance of international rail, highway, air and maritime shipping corridors as they will increase the competitiveness and productivity of good and services produced on the North American continent.

CAN/AM Border Trade Alliance

155 South 5th Street
Lewiston, New York 14092

Mr. James Phillips, Contact

Mission: To maximize global commercial activity and personal visitation along the entire common U.S./Canadian border to ensure continued growth of cross-border trade and to focus on issues related to the proposed NAFTA and the U.S./Mexican border in close cooperation with the Border Trade Alliance (BTA) in the southwest.

Mid-Continent Trade and Transportation Association

Kansas Department of Commerce and Housing
700 SW Harrison
Suite 1300
Topeka, KS 66603-3712

Mr. Randy Tosh, Contact Person

Purpose: To work cooperatively on issues of transportation and trade in the central United States with the Canadian provinces and the Mexican states.

Red River Trade Corridor

Red River Trade Corridor, Inc.
University of Minnesota, Crookston
208 Selvig Hall
Crookston, Minnesota 56716-5001

Mr. Allen Olson, President

Goals: To establish a network of communication and information sharing, provide education programs, and create an economic development database for the region.

Western Trade/Transportation Network

Colorado Department of Transportation
Transportation Planning
4201 East Arkansas Avenue
Denver, Colorado 80222

Mr. Harvey Atchison, Director

Mission: to accomplish fact finding and system development for technological optimization of the broader western state network beyond individual states' trade and traffic information and

inventory strategic planning activities to support network development. Established by resolution of the Western Association of State Highway and Transportation Officials, Planning Committee. Invited states include western states, Kansas and Nebraska, western provinces of Canada, border states in Mexico, state departments of economic development, and industry representatives.

Central North American Trade Corridor

MSU University Center
1600 2nd Avenue S.W.
P.O. Box 1356
Minot, North Dakota 58702

Mr. Steven A. Pedersen, Managing Director

Mission: act as a catalyst in promotion, development, and establishment of a north/south international trade corridor through the heartland of the North American continent from Saskatchewan and Manitoba in Canada, and through Minot, North Dakota, and the states of South Dakota, Nebraska, Kansas, and Oklahoma to Nuevo Leon, Texas, in the United States to Mexico along Highway 83 with a focus on rural revitalization.

Pan American Highway Association

(U.S. Highway 81 Association)
P.O. Box 210
Hebron, Nebraska 68370

Mr. Kim Johnson, President

Mission: promote US 81 as the international highway of the Americas with a route running from the tip of South America at Tierra Del Fuego in Chile to Winnipeg in Canada. In the United States, from Laredo, Texas to Minneapolis, Kansas, with the connecting I-29 to the Canadian border.

Southwest Border Transportation Alliance

Texas Transportation Commission
800 NW Loop 410
Suite 728N
San Antonio, Texas 78216

Mr. Henry Muñoz III, Chairman

Mission: to develop cross-border binational transportation planning process.

Border Trade Alliance

10145 via de la Amistad
San Ysidro, California 92173

Ms. Mary Alice Acevedo, Chair

Mission: a grass roots alliance of United States/Mexico border organizations to educate, build consensus and solve problems related to interests of the border; a network of economic development, chambers of commerce, trade associations, banks, industrial parks, service providers, manufacturers, and state, and local government agencies.

Montana/Alberta Boundary Advisory Committee

Office of the Governor
State Capitol
Helena, Montana 59620-0801

Mr. Patrick Owen, Coordinator International Affairs

Formed by Memorandum of Understanding to facilitate the free flow of commerce between Montana and Alberta by commercial vehicles by eliminating differences in vehicle size and weight regulations in Montana and Alberta as permitted by a special act of the Congress.

High Plains Trade and Development Corridor

Huck Boyd National Institute for Rural Development
301 Umberger Hall
Kansas State University
Manhattan, Kansas 66506

Mr. Ron Wilson, Director

Mission: support for the corridor concept from Canada to Mexico.

Cascadia Corridor Commission

(Cascadia Transportation /Trade Task Force)

Discovery Institute
1201 Third Avenue, 40th Floor
Seattle, Washington 98101-3099

Mr. Bruce Agnew or Ms. Joan Hammond, Contacts

Mission: proposed international intergovernmental alliance in Urbanized Vancouver, B.C. to Eugene, Oregon, a designated high-speed rail corridor.

North American Inland Trade Route

Southwestern Illinois Planning Commission
203 West Main Street
Collinsville, Illinois 62034

Mr. George Andres, Director

Mission: explore the use of the Inland Waterway System including the St. Lawrence Seaway, the Great Lakes, the Mississippi River, the Ohio River, other tributary rivers and the Gulf Intercoastal Canal to support intermodal container movement--ship, barge, rail, and truck.

Midland/Odessa Transportation Alliance

Odessa Chamber of Commerce
700 North Grant, Suite 200
Odessa, Texas 79760

A. Neil McDonald, Jr., Director of Economic Development

Mission: determine the transportation needs for the odessa-Midland area and work to develop the systems it determines to be needed; to support its contention that the proposed National Highway Systems for Texas, and a new trade corridor, should include a north-south highway through the Odessa-Midland metropolitan area.

