



# Expanding Trade through Safe and Secure Borders

## Executive Report

Commissioned by the Governor's CANAMEX Task Force  
Sponsored by the Arizona Department of Transportation  
Conducted by The University of Arizona Office of Economic Development

**CYBERPORT™**

# Nogales CyberPort Project Executive Report, June 2003

In partnership with:

**Arizona Customs Management Center**

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**National Law Center for Inter-American Free Trade**

**Science Applications International Corporation**

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# Preface

The Nogales CyberPort Project began in the Spring of 2002 amid dramatic changes to the safety and security of U.S. borders. Throughout the following year, extraordinary change was experienced in policy and practice regarding the treatment of the border at the local, state and federal levels. While the movement toward a more efficient and effective border-crossing environment has been underway in Arizona and the U.S. for a number of years, there is perhaps a no more appropriate time to undertake the effort to define and implement a CyberPort than right now.

Because of a strong and interdependent relationship with Mexico, the southwestern U.S. border states were among the most impacted by the post-September 11th environment. The historic cultural and economic ties between the U.S. and Mexico have been tested, as border ports-of-entry have had to respond to new demands as the gateways between two nations. The new role of moving trade, people and information through these gateways will continue to be an extremely demanding and complex effort.

Without action, the social and economic livelihood of citizens in both countries may be in jeopardy – across cities, states and regions. In response to the dramatic change that has occurred in border policy and practice, equally dramatic change is needed in improvements to infrastructure, law and procedure. This will undoubtedly require significant investment and long-term commitment.

As a finding from this project, the will appears to be there. It must be tapped and coordinated and continued. Participation and support of this effort has been extraordinary and thanks go out to more than can be noted here. Former Governor Jane Dee Hull, the Governor's CANAMEX Task Force and the Arizona Department of Transportation were responsible for the commissioning of this effort, which represents the high priority each places on the Arizona-Mexico relationship. Governor Janet Napolitano has continued to provide support for the project and maintain the CyberPort effort as a high priority for the State of Arizona.

A cadre of over 70 stakeholders from the trade community and government agencies in both Mexico and the United States served as advisory committee members and were invaluable in providing insight and guidance for this project. Providing direct assistance with the project were the U.S. Department of Transportation, Bureau of Transportation Statistics and the U.S. Environmental Protection Agency, Region IX.

Many thanks are also due to the project partners involved in providing data, analysis and evaluation. They are: the U.S. Bureau of Customs and Border Protection, Arizona Customs Management Center; The National Law Center for Inter-American Free Trade; A. Epstein and Sons International, Inc.; Wilbur Smith Associates; Science Applications International Corporation; and, Reebie Associates. Thanks to Jan Elster and Associates for providing professional group facilitation services. Special thanks go to the staff at the University of Arizona Office of Economic Development and the UA Center for Applied Spatial Analysis. Thanks to Godat Design for their work on the project publications and related materials and to Nexo Communications for their translation services. Coordination and cooperation, underlying principles of the CyberPort concept, have been fundamental to this project – it has been and will continue to be a team effort.

Scott Davis  
Project Director

## Nine Rules for New Global Trade

The North American Free Trade Agreement was ratified in 1993. In that same year, a great deal of activity took place to estimate the impending demands of increased trade throughout North America and to determine the types of responses that would be necessary.

The Nogales CyberPort Project revisits this analysis ten years later to develop a new conceptual model for the movement of international trade.

The ideas are not new. What is new is the presentation of a holistic and systematic framework by which the entire trade-flow process can be improved. Past improvements have largely been incremental and independent. This new approach is still incremental, but each step is coordinated with all other components in the trade-flow process.

As an example of how these ideas have been expressed elsewhere, both the banking and airline industries deal with processing, finance, security and risk at tremendous scales with a focus on customer service. In order to meet these challenges, both industries have demonstrated the application of CyberPort principles for the last 15 years. They now are operating more safely, securely and efficiently than ever before.

CyberPort's nine guiding principles and nine components of the trade-flow process come together to produce the nine rules for the future of global trade. The rules are timeless – they applied ten years ago and they continue to apply today; however, the difference is that NAFTA is no longer in its infancy and the growing pains of a North American trade community dealing with unprecedented security concerns are near crippling.

We are at a critical juncture in how we respond to this challenge. The nine rules for new global trade are simple and perhaps more important now than ever before.

### **1 Share the Work**

*When you are all tapped out, let the user do the work.* More and more, companies and government agencies are realizing extraordinary gains in efficiency by enabling the user to prepare for a transaction at the front-end of the process. Whether it is making a deposit or boarding an airplane, user preparation saves everybody time and money. Giving users a secure opportunity to establish themselves as legitimate and, literally, check themselves through the process, results in labor savings and reduced congestion at processing choke points. Pre-payment of fees, pre-issuance of documents and pre-clearance for security significantly streamline the trade process.

## 2 Give Preferred Treatment

*Good behavior is consistently rewarded.* It is no secret that special treatment encourages desired behavior. This is no different in the world of trade. Specific incentives to save time and money must be provided to encourage users to modernize their traditional ways of operating.

Dedicated access to facilities as well as low-risk designations help expedite the trade-flow process and reduce the chance of time-intensive inspections. Incentives also are needed to encourage users to invest in new technology, maintain preferred safety and security standards and make infrastructure upgrades.

## 3 Staff to Demand

*Trade is a 24-hour operation and people are involved in every minute of it.* People are at the heart of commerce – more so than infrastructure, more so than technology. However, cooperative hours and levels of operation among the trade community and government agencies are not always synchronous.

Industry and agencies on both sides of the border must work together to create a flexible framework for staffing that allows for variable allocation of human resources to accommodate changes in demand throughout the day, week, month and year. Staffing levels must respond to high demand for services. Cooperation between management and labor unions (in both private industry and government agencies) also is required to best meet the needs of the system.

## 4 Build to Demand

*Even frictionless movement needs somewhere to go.* No matter how rapidly processing operations occur, the sheer volume of peak flows will create a bottleneck if there is not sufficient space to accommodate the demand. At the same time, to build facilities and infrastructure that are half-empty most of the time in order to handle the occasional peak demand is not a pragmatic solution.

Large variations in flow make it difficult, if not impossible, for physical infrastructure to consistently operate at maximum efficiency. With limited resources, it is simply not feasible to accommodate all demand all the time. Variations in flow need to be reduced while facilities and infrastructure must be flexibly designed and large enough to accommodate demand the vast majority of the time.

## 5 Maximize Technologies

*The application of technology allows for exponential leaps in efficiency and effectiveness.* Technology has and will continue to play a major role, perhaps the biggest, in the movement of goods and services throughout the world. Government and industry are working closer together than ever before in developing “off-the-shelf” technologies to be quickly and easily implemented.

The application of new technologies throughout the trade-flow process and manufacturing supply-chain is essential to 1) experiencing greater and greater levels of productivity, and 2) maximizing safety and security. A uniform platform for the identification, testing and application of new technologies in a multi-national user environment must be developed.

## 6 Execute Placeless Transactions

*The placeless transaction is where e-trade meets e-government.* The only thing that must physically change hands in the world of trade is the good itself. All other aspects of a transaction can occur electronically. The advantage to electronic commerce is clear. However, tremendous coordination involving complex information management systems is required.

Electronic commerce must secure the transfer of information with access only allowed by authorized users. Harmonized documents also are required, ideally necessitating only a single entry of all information at the origin of a transaction, which could then be accessed by a multitude of users for varying purposes. Harmonizing trade documents within the legal and regulatory environments of multiple countries remains one of the greatest challenges in this area.

## 7 Manage Risk

*The vast majority of transactions and shipments are made in good faith.* Risk management is perhaps the single greatest principle affecting the physical flow of commerce. It is imperative that Customs and other government inspection agencies have the greatest amount of information possible to make an informed assessment as to the legitimacy of a transaction or shipment.

Quite simply, the more information, the better the judgment – and the sooner they have the information, the better prepared they are to make a judgment. Users need to be given the opportunity to demonstrate their legitimacy, thereby significantly reducing the chance of inspections.



Inspection agencies need to trust users that demonstrate legitimacy and users need to trust inspection agencies to use the information provided in strictest confidence.

## 8 Share Inspection Responsibility

*Enforcement is a team effort.* Every trade shipment is subject to a multitude of authorities at the local, state and federal level. A redundancy of inspection often occurs when there is a breakdown in coordinated enforcement protocol. The challenge lies in each agency having its own criteria for inspection, which may change depending on conditions. The fact that inspection criteria are dynamic and agency-specific virtually negates the opportunity for complete harmonization of inspection procedures among agencies and countries.

However, agencies can help one another simply by knowing what each agency is trying to achieve and the protocols by which they operate. This may be demonstrated in developing a binational protocol that provides for accountability in re-sealing shipments inspected in transit. Ultimately, shared access and inspection responsibility must be granted by trading countries, where each is able to establish a designated zone in which to perform pre-inspections in the country of origin. Redundant inspections must be eliminated.

## 9 Measure Performance

*You've got to know where you are to know where you're going.* In a world of performance-based evaluation, agencies must be able to measure the degree to which they are successful. This proves to be incredibly complex when measuring the movement of international trade. Significant data gaps are the most pressing variable inhibiting comprehensive measures of success.

Standard classifications of trade and standard metrics by which to measure data are essential. The data must then be gathered in a consistent fashion and time frame among countries. Also crucial is the establishment of goals or standards of success. The development of performance standards again becomes difficult, as certain questions need to be addressed – for example, what is a reasonable amount of time for international trade to cross the border?

**There is great need for an international trade-flow process that responds to these rules. CyberPort is a beginning.**

# The Nogales CyberPort Project

## Vision

Establish the Nogales border port-of-entry (BPOE) as a port of choice for U.S.-Mexico trade.

## Goal

Increase efficiency and effectiveness with regard to safety, security and trade-flow throughput.

## Objective

Develop a new conceptual model for the Nogales port of the future and identify short-term recommendations designed to achieve the long-term vision.

## Perspective

CyberPort looks beyond technology and beyond the port compound to identify innovation and advancement throughout the entire trade-flow process. The project employs a holistic, system-wide perspective to cooperation at the following levels:

- Local/State/Federal
- Binational/Multinational
- Public/Private

## Framework for Trade

Understanding each component in the trade-flow process is essential to re-envisioning a new conceptual model. The CyberPort process was developed around the following framework of trade-flow components:

- 1 Physical infrastructure
- 2 Human resources/staffing
- 3 Processing
- 4 Regulatory environment
- 5 Systems integration
- 6 Security and access control
- 7 Data systems, information and communication
- 8 Technology
- 9 Planning

# CyberPort's Guiding Principles

The project worked with industry and agency experts from throughout North America and Europe to identify the wide variety of functions that a CyberPort should serve under an ideal scenario. Over one-hundred ideas were put forward, which aligned with the following nine guiding principles:

- 1 Binational, interagency and public/private cooperation
- 2 Integrated and harmonized procedures and systems
- 3 Incentives for pre-clearance, pre-inspection and compliance programs
- 4 Risk identification and management
- 5 Safety, security and efficiency through infrastructure design
- 6 Secure shared information
- 7 New technology
- 8 Maximum transparency and visibility of shipments
- 9 Performance standards and systems for measurement

## Technical Studies

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A series of technical studies were conducted to inform the development of the CyberPort concept addressing legal, logistical and commodity-flow issues.

### Legal Study

The National Law Center for Inter-American Free Trade conducted a legal study that provided an overview of the legal considerations regarding the implementation of the CyberPort concept. The report reviewed U.S. and Mexican federal legislation as well as the regulatory environment of customs agencies on both sides of the border. The study identified key legal challenges and areas for advancement regarding 1) duplication of inspections, 2) pre-entry certifications, 3) information exchange, 4) standard paper-based and electronic documentation, and 5) privatization of port functions.

### Logistics Study

A logistics study, conducted by the engineering firm A. Epstein & Sons, examined the physical movement of people, vehicles, and freight through the Nogales port-of-entry. While operations within the port compound are identified as efficient, bottlenecks continue to occur prior to northbound arrival at the port. The logistics study found that the number of arrival lanes at the Mariposa commercial facility and the width of the Mexican approach (both roadway and bridge) were the single greatest contributors to northbound congestion.

### Commodity-Flow Study

The commodity-flow study conducted by the UA Office of Economic Development examined the flow of U.S.-Mexico trade in terms of volume, value and number of vehicles in both the northbound and southbound directions. Specific focus was placed on the seven major U.S.-Mexico border crossings and their performance relative to that of the Nogales BPOE. The study also defines Arizona's natural tradeshed for U.S.-Mexico market capture. Arizona's border ports-of-entry perform in the middle of the established market share range for northbound trade and at the low-end for southbound trade. There is significant potential for increased market capture of U.S.-Mexico trade through Nogales in both directions.

The study found that in terms of weight (tons), only Laredo processes more northbound trade than the port of Nogales. However, in terms of trade value and commercial truck crossings, the port does not maintain its position of prominence. In terms of value, the Nogales share of U.S.-Mexico surface trade in 2002 (5.4 percent) was at its lowest point since 1994 when it accommodated 7.9 percent of all U.S.-Mexico surface trade. Nogales also imports the lowest average value of goods in price per ton among the major border ports-of-entry. In terms of northbound commercial truck crossings, the Nogales port has experienced a constant decline since 1998 resulting in a loss of share from 6.6 percent in 1998 to 5.8 percent in 2001.

While operations within the Nogales port compound were found to be relatively efficient, trade through the port has continued to decline despite this efficiency. This cause for concern demanded an examination of infrastructure and procedures throughout the entire trade-flow process.

# Concept Model Development and Evaluation

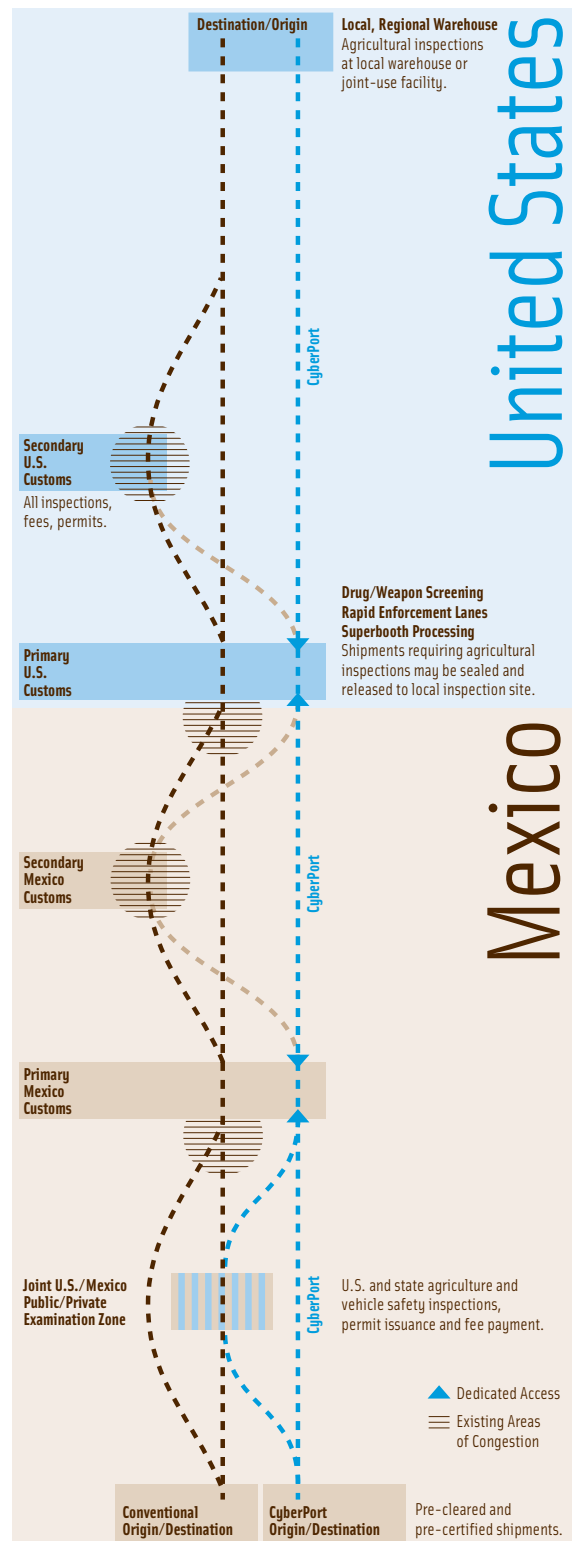
In response to the descriptive function of an ideal CyberPort trade-flow process, four concept model alternatives were developed ranging from a highly centralized border-crossing process to a highly decentralized one. Each concept alternative was consistent with the established CyberPort principles and was evaluated with respect to safety, security, efficiency, legal requirements, future growth scenarios, and impacts on the local, state, national and multinational levels.

The preferred concept model for the development of a CyberPort in Nogales was a hybrid that optimizes a mix of consolidation and decentralization of border-crossing procedures at locations throughout the process where each is the most appropriate, efficient and effective. Among the key elements of this concept is the implementation of off-site inspection for many of the activities that currently occur inside the port compound such as agricultural inspections, truck safety inspections, fee and permitting procedures, and truck weight certification.

A significant amount of congestion inside the port compound can be relieved through pre-clearance and pre-certification, as compliant trade is able to avoid the need for secondary inspection in most cases. Other key elements of the CyberPort concept include dedicated access for qualified shipments to primary customs facilities and the establishment of joint U.S.-Mexico public/private examination zones in the country of origin. Following is a diagram illustrating the CyberPort concept.

The CyberPort concept diagram illustrates the U.S.-Mexico trade-flow process under conventional and CyberPort scenarios. Critical areas of congestion in the conventional process are upon approach to customs facilities and within secondary customs compounds. Key components that relieve congestion are:

- off-site inspections (particularly for agriculture and truck safety)
- pre-certification (electronic fee payment and permitting)
- pre-clearance (sealed shipments from C-TPAT compliant warehouses and carriers)
- dedicated access to customs facilities for qualified users



# Recommendations for Arizona and the Nogales Border Port-of-Entry

## **At the State and Customs District Level**

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- 1 Establish a binational CyberPort task force on behalf of the governors of Arizona and Sonora to oversee project development and implementation
- 2 Establish a dedicated hazardous materials coordination officer
- 3 Designate the Nogales BPOE as a national pilot test site and model port
- 4 Expand Northbound U.S. commercial processing capacity
- 5 Develop highway infrastructure improvements in Mexico and the U.S.
- 6 Examine and implement a user-friendly agricultural “seal and release” inspection program
- 7 Develop a program for the identification, testing and implementation of new technology at the Nogales POE
- 8 Increase inspections in Mexico
- 9 Enhance commercial truck and bus safety procedures
- 10 Develop U.S. exit control improvements
- 11 Implement the pilot use of a uniform cargo document (bill of lading)
- 12 Develop regional highway and rail infrastructure improvements
- 13 Develop intermodal inland port infrastructure

## **At the Federal and Binational Level**

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- 1 Coordinate enforcement of sealed shipments
- 2 Promote federal pre-inspection authority in U.S. and Mexico
- 3 Coordinate the application of new border technology between Mexico, Canada and the U.S.
- 4 Engage Arizona in the binational trade data harmonization and integration process

## **Further Studies**

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- 1 Examine the feasibility of passenger vehicle commuter lanes (SENTRI) through Arizona's high-use border crossings
- 2 Arizona trade leakage and transportation routing study
- 3 Regional economic impact of U.S.-Mexico trade on Arizona and the CANAMEX region
- 4 Cost-benefit study of major port infrastructure improvements along the U.S.-Mexico border
- 5 Examination of solutions addressing the impact of commercial rail traffic through downtown Ambos Nogales
- 6 Examine the feasibility of a port authority for Nogales and Southern Arizona
- 7 Detailed design, engineering and cost studies for port infrastructure improvements in Arizona
- 8 Environmental impact studies of port infrastructure improvements in Arizona

# Introduction: What is CyberPort?

## History and Context

Total U.S.-Mexico surface trade has more than doubled in terms of value from approximately \$88 billion in 1994 to more than \$200 billion in 2001. Northbound U.S.-Mexico commercial truck crossings have experienced a similar increase from approximately 2.7 million in 1994 to over 4.3 million in 2001. This growth has simply outpaced the increase in capacity at U.S.-Mexico border ports-of-entry. The Nogales Mariposa border port-of-entry is nearing capacity and frequently operates over capacity during peak winter months, resulting in long lines to cross the border and increasing the cost of moving trade through Arizona.

Recent changes in the U.S. approach to border security and the regulation of Mexican commercial trucks have combined to place a unique set of pressures on border ports to perform in an efficient and effective manner. Border ports-of-entry have been forced to increase levels of inspection and enforcement while operating with limited capacity to accommodate significant increases in U.S.-Mexico trade. The security of hazardous material shipments and the safety of commercial motor vehicles are of particular importance.

To address this issue in Arizona and position the state as a national and global leader, the Governor's CANAMEX Task Force commissioned the Nogales CyberPort Project. The project is administered by the Arizona Department of Transportation and is conducted by the University of Arizona Office of Economic Development in partnership with the National Law Center for Inter-American Free Trade, A. Epstein and Sons International, Wilbur Smith Associates, Science Applications International Corporation, and the Arizona Customs Management Center of the U.S. Bureau of Customs and Border Protection.

The time period under which the project was conducted (Spring 2002 to Spring 2003) was one that experienced extraordinary and unprecedented change in the management structure and organization of U.S. federal border agencies. The formal creation of the U.S. Department of Homeland Security at the conclusion of the project in March 2003 began a new era of management, operations and policy regarding the federal management of U.S. borders.

The technical studies and analyses conducted within this project, however, were completed prior to the federal reorganization. As a result, the project's *Comprehensive Report* refers to agencies under their previous name and organization prior to March 2003. Federal agencies in the Executive Report are referred to under the new U.S. Department of Homeland Security reorganization structure.



## Project Description

The goal of the Nogales CyberPort Project is to achieve a coordinated, seamless, flexible and integrated system for the safe, secure, efficient and effective movement of trade. The project looks beyond technology and beyond the port compound to consider a holistic, system-wide approach to the development of innovation and advancement throughout the entire trade-flow process – from the point of origin to the point of destination. The project involves a specific focus on the movement of trade through commercial border ports-of-entry. However, the movement of people and passenger vehicles through the international border is an equal and inherent role of a border crossing and is considered in the development of the CyberPort process.

The project objective is the development of a new conceptual model for the future of U.S.-Mexico trade, the CyberPort concept. Phase I of the project defines the CyberPort concept and puts forward specific recommendations for the Nogales BPOE to achieve the capabilities and status of a CyberPort. Future phases of the project will be required to fully implement the identified recommendations and realize the benefits of the CyberPort process. Phase II of the project will consist of a series of feasibility and impact studies as well as detailed physical design and cost proposals for individual infrastructure projects. While operational adjustments and physical changes may occur during these two phases, Phase III will involve the physical implementation and construction of major CyberPort improvements.

## CyberPort in Nogales

The Nogales port-of-entry not only serves as Arizona's primary point of access to Mexico but as a principle commercial gateway between much of Mexico and the western United States. The Nogales Mariposa commercial port facility accommodates approximately three-fourths of Arizona's northbound commercial truck traffic.

Topographic constraints have limited the capacity of roadway and port infrastructure through the canyons of Nogales, Sonora and Nogales, Arizona. The resulting bottleneck in the movement of trade and people is a primary challenge to the implementation of the CANAMEX Corridor, linking the states of Arizona, Nevada, Utah, Idaho and Montana with Mexico and Canada. As such, the Nogales port-of-entry, and the Mariposa commercial port facility in particular, is a key site in need of new and progressive ideas about how to accommodate trade in a more efficient, predictable and timely manner.

**CANAMEX Trade Corridor** Nogales serves as a principal gateway for U.S.-Mexico trade. Arizona's direct tradeshed encompasses 14 states in the western U.S. and Mexico. Arizona's extended tradeshed serves the entire U.S. for southbound trade destined for western Mexico as well as Mexico's 13 southern states for trade destined for the western U.S. and Canada. Arizona's tradeshed is that of the CANAMEX Corridor. In addition to key north-south access, Arizona is also positioned along three major east-west freight corridors: I-8, I-10 and I-40.

## The Goals of CyberPort: Local, State, Regional, Global

The goals of the CyberPort are overarching and address the needs of multiple countries at the local, state and regional levels. The impacts of CyberPort have been considered from the local to the global. At the most direct level, the CyberPort concept is intended to increase the capacity of local border communities in Arizona and Sonora to serve as efficient and effective gateways between the U.S. and Mexico. As a result, the U.S. and Mexico sister cities of Douglas and Agua Prieta, San Luis and San Luis Río Colorado, and specifically Nogales, Arizona and Nogales, Sonora, may increase their capacity for accommodating trade while minimizing negative impacts on the local community. The goal is to make Arizona's border crossings as safe, secure and efficient as possible.

The benefits of this goal are also intended to extend to the state, regional and global level. Through the operation of efficient and effective border crossings, major metropolitan areas with access to multiple modes of transport are better positioned to become hubs for the flow of trade and tourism between the U.S. and Mexico. Tucson has the potential to serve as an inland port, where a wide variety of trade and transportation services are provided at the intersection of primary air, rail and highway trade routes. Another goal of the CyberPort concept is to position the state of Arizona as a leading gateway between the western U.S. and Mexico, thereby increasing its regional competitiveness. The facilitation of the growth of commerce in and through Arizona will create jobs in transportation and distribution, export-related activities, tourism and other trade-related services.

The regional goals of applying the CyberPort concept in Arizona are to strengthen the relationship between Arizona and Sonora and to facilitate the development and competitiveness of the CANAMEX region. The binational Arizona-Sonora region serves as a keystone to the development of the CANAMEX Corridor and as such becomes a critical

link in fostering trade throughout North America from Mexico City, Mexico to Edmonton, Canada. The CANAMEX Corridor connects the rapidly growing U.S. states of Arizona, Nevada, Utah, Idaho and Montana to the growing markets of Mexico and Canada.

The development of the CyberPort as a universal concept enables its application elsewhere along the U.S.-Mexico border. While the challenges of implementing the concept in Arizona are evaluated specifically with respect to Mexico, the CyberPort concept itself is intended to be applicable to all border ports-of-entry in the U.S. and throughout the world. While great diversity exists among all international border ports-of-entry, the CyberPort concept may serve as a comprehensive framework for developing place-specific models appropriate for use anywhere.

# Outside the Box: Developing the CyberPort Concept

## A History of Cooperation, Study and Innovation

The origins of the CyberPort concept, working toward new and progressive ways to enhance U.S.-Mexico trade in the region, began over forty years ago. Arizona has been a national leader in fostering U.S.-Mexico trade relationships long before the implementation of NAFTA in 1994. The establishment of the Arizona-Mexico West Coast Trade Commission in 1959 was among the pioneering efforts in integrating the two countries as a unified economic region. The relationship between the states of Arizona and Sonora developed into the Arizona-Mexico Commission and the Comisión Sonora-Arizona in 1972 and remains active today with binational plenary sessions held twice annually.

Binational study of the region also has a considerable history. The Arizona Trade Corridor Study in 1993 assessed Arizona's capacity to perform under NAFTA and served as a basis for the establishment of the CANAMEX Corridor. Since 1994, the Arizona-Mexico Program at the University of Arizona Office of Economic Development has co-coordinated a variety of study efforts on cross-border trade issues in the areas of mining, manufacturing, agribusiness, tourism, health services and transportation. The program continues to evaluate Arizona's competitiveness and monitor regional economic indicators on an annual basis.

Specific examination of the Nogales port-of-entry was the focus of the *Arizona Port Efficiency Study*, commissioned by the Arizona Department of Transportation in 1997. Conducted by TransCore in cooperation with Science Applications International Corporation (SAIC) and the National Law Center for Inter-American Free Trade, this study resulted in significant efficiencies within the port-of-entry compound.

The unprecedented concept of state and federal agents sharing the same processing space (known as a Superbooth) was subsequently implemented and is extremely successful in the operation of the commercial port's "rapid enforcement lane" system. Approximately 60 percent of northbound commercial truck traffic arriving at the U.S. Customs facility is processed through the rapid enforcement lane and proceeds into the U.S. without having to enter the secondary port compound. The commissioning of the Nogales CyberPort Project by the Arizona Department of Transportation in 2002 is an extension and continuance of this long tradition of cross-border study and cooperation.



# The Process

The project has a number of components that are organized around the following areas:

- Information
- Analysis
- Concept Development
- Outreach

## Information

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The CyberPort project is informed by the following:

- Stakeholder Advisory Committees
- Industry Experts and Consultants
- Stakeholder Interviews
- Field Surveys and Assessments
- Literature Review

### Stakeholder Advisory Committees

The project solicited input from a 42-member Technical Advisory Committee, a 17-member Steering Committee and a 10-member Oversight Committee. Meetings with these committees occurred periodically throughout the project and were invaluable in identifying key areas of focus as well as heightening the project's understanding of technical, procedural and agency issues.

### Industry Experts and Consultants

The assistance of experts from both government and industry was solicited to help conceptualize the ideal trade-flow process and to inform the development of a concept model addressing areas such as process improvement, technology gaps and interagency collaboration. These experts participated in the project's advisory committees and as direct partners on the project team.

As part of the CyberPort project team, technical and legal assistance was provided by SAIC and the National Law Center for Inter-American Free Trade, both of which were part of the 1997 Arizona Port Efficiency Study. A. Epstein & Sons International, an architecture and engineering firm, provided assistance on logistical issues. Wilbur Smith Associates, an economics, engineering and planning firm, assisted in the evaluation of the CyberPort concept as well as providing economic analysis and forecasting. The firm was previously responsible for the 2000 *CANAMEX Corridor Study* commissioned by the Arizona Department of Commerce.

### Stakeholder Interviews

The project was informed by over two-dozen personal interviews with various stakeholders from both government and the trade community. These interviews presented tremendous insight regarding the specific challenges facing port users, administrators and inspection agents. The institutional knowledge of these stakeholders provides an extraordinarily valuable asset toward understanding the holistic and incremental changes to cross-border trade over time.

### Field Surveys and Assessments

On-site field surveys in Nogales and other U.S.-Mexico border ports-of-entry served as an excellent opportunity to identify best practices and experience how other border crossing facilities address their own site-specific challenges. As each port-of-entry is unique in its configuration, resources, capacity and history, a consistent periodic scan and assessment is invaluable in understanding the scope and diversity of problems that need to be addressed. The Technology Assessment of the Nogales, Arizona Border Port-of-Entry can be found in the *Comprehensive Report*.

### Literature Review

Hundreds of documents and publications were reviewed to inform the project. Cross-border trade is a dynamic and fast-moving issue with new information presented on a weekly basis. Government, academic and trade publications in this area are numerous and general media on the issues of North American trade and U.S. border security is constant.

A general and abbreviated listing of publications referenced for this project is included in the *Comprehensive Report*.

### Analysis

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A series of four technical studies was conducted to inform the project. Each study was led by a project partner in the following areas: 1) legal issues, 2) logistical issues, 3) commodity flows, and 4) concept evaluation and trade forecasts. The studies were collectively reviewed and finalized by all project partners and advisory committees. The four studies are as follows:

- *Alternative Trade Flow Projections and CyberPort Concept Models*, Prepared by Wilbur Smith Associates
- *Assessment of Legal Issues*, Prepared by the National Law Center for Inter-American Free Trade

- *Trade Flow Logistics Study*, Prepared by A. Epstein & Sons International, Inc.
- *Commodity Flow Study*, Prepared by The University of Arizona Office of Economic Development

Summaries of the study findings are presented in this report. The complete documents are included within the *Comprehensive Report*.

### Concept Development

The development of the CyberPort concept model began with the identification of basic guiding principles that are applicable to the entire trade-flow process, from the point of origin to the point of destination. A Port Expert Roundtable was convened to identify these basic principles through a retreat-style workshop. The purpose of the roundtable was to assimilate ideas, both known and new, into a macro, system-wide framework that looks beyond the border-crossing process occurring directly at the border.

Supplemented by binational stakeholder interviews and project advisory committees, the Port Expert Roundtable served as the beginning forum to think outside the box and present creative new ideas for consideration. The results of the roundtable served to facilitate the evaluation process by public and private stakeholders as the ideas and concepts experienced refinement and further definition.

The primary objective of the Port Expert Roundtable was to convene a small group of industry specialists to identify the basic guiding principles and organizational framework for the ideal U.S.-Mexico trade-flow process, a CyberPort process. The roundtable workshop was attended by 12 project partners and 12 invited port experts. The results of the roundtable served as the foundation for the CyberPort concept. The complete roundtable summary and proceedings are included in the *Comprehensive Report*.

### Outreach

Constant outreach and feedback from a variety of agencies and organizations throughout the development of the CyberPort process was essential in developing a concept that responds to the wide range of needs by a multitude of stakeholders. All U.S. state and federal agencies involved in the U.S.-Mexico trade process were represented on the project advisory committees. In addition to the agencies and

organizations represented on the project advisory committees, targeted outreach efforts were made to the following organizations and individuals:

- Nogales City Council
- Santa Cruz County Board of Supervisors
- Asociación de Maquiladoras de Sonora
- Nogales Association of the National Customs Brokers & Forwarders Association of America
- Border Trade Alliance
- Arizona-Mexico Commission
- Comisión Sonora-Arizona
- Governor's CANAMEX Task Force
- Western Governors' Association
- Good Neighbor Environmental Board and EPA Region IX Headquarters
- Transportation Research Board, National Research Council
- U.S. Department of State, U.S.-Mexico Border Coordinator
- Secretaría de Relaciones Exteriores
- Secretaría de Hacienda y Crédito Público
- Secretaría de Comunicaciones y Transportes
- Comisión de Avalúos de Bienes Nacionales
- Secretaría de Gobernación
- Comisión para Asuntos de la Frontera Norte
- Secretaría de Desarrollo Social
- Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
- Gobierno de Sonora
- Policía Federal Preventiva

## Implications for Arizona and Beyond

The Nogales port-of-entry is Arizona's primary gateway for U.S.-Mexico trade and the application of the CyberPort concept to that gateway is the focus of the project. However, the secondary Arizona commercial ports located in San Luis and Douglas are well positioned to apply the CyberPort concept to their respective border-crossing procedures. The application of CyberPort at San Luis is particularly timely and relevant as a new port-of-entry is to be constructed. CyberPort was developed initially as an ideal concept applicable to the international trade-flow process. The CyberPort concepts and ideas were ultimately refined to apply to the conditions present in Nogales. However, the CyberPort concept is a universal one and has appropriate application to other ports-of-entry along both the southern and northern U.S. borders as well as internationally.

# CyberPort: Flexible, Smart, Dynamic, and Advanced

## Nine Components of Trade-flow

The ideal port-of-entry and trade-flow process needs to be flexible, smart, dynamic and advanced in its coordinated planning, design and operation. The following nine-point framework attempts to address the various components or characteristics involved in the port-of-entry and trade-flow process.

- 1 Physical infrastructure
- 2 Human resources/staffing
- 3 Processing
- 4 Regulatory environment
- 5 Systems integration
- 6 Security and access control
- 7 Data systems, information and communication
- 8 Technology
- 9 Planning

As indicated, the CyberPort concept looks beyond technology and beyond the port compound. Through an assessment of the nine-point component framework, it was identified that flexibility, dynamism and intelligent foresight have particularly relevant application in different areas. The ideal port-of-entry and trade-flow process should maintain a particular focus relevant to each function or component of the trade-flow process. In addition to CyberPort, the notions of FlexPort, DynaPort, and SmartPort also apply.

### *FlexPort*

Physical Infrastructure  
Human Resources/Staffing  
Processing

### *DynaPort*

Systems Integration  
Security and Access Control  
Regulatory Environment

### *CyberPort*

Data Systems, Information and Communication  
Technology

### *SmartPort*

Planning

Following are examples of variables and considerations within each component of the trade-flow process.

### **Physical Infrastructure**

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- Port terminal design
  - Processing capacity (number of lanes, amount and type of dock space, amount of office space, amount of land, etc.)
  - Design and layout (arrangement of inspection functions, sharing of land and facilities, routing process, etc.)
- Highway and rail infrastructure
- Intermodal facilities
- Design of conveyance (accessible truck trailers and rail cars from 2 or 3 sides)
- Consolidation and preparation facilities
- Secure manufacturing plants and packing warehouses
- Warehouse and distribution facilities
- Inland port infrastructure
- Dedicated infrastructure for compliant trade and commuter traffic

### **Human Resources/Staffing**

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- Joint training and shared missions
- Joint certification for inspection authority
- Adequate staffing levels for daily, weekly and seasonal variations
- Coordinated hours of operation (among the entire trade community including binational agency staffs, shippers, carriers, brokers, importers, etc.)
- Unified port management structure and coordination

### **Processing**

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- Fee and duty payment process for the driver, freight and conveyance
- Inspection processes for the driver, freight, and conveyance
- Coordinated and optimized offloads of freight
- Return process and/or on-site accommodation for failed inspections

### **Regulatory Environment**

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- International trade law
- Federal agency regulations and the process of change
- State agency regulations and the process of change
- Legal and financial business practices such as bonding and insurance
- Labor unions and work schedules

### **Systems Integration**

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- Agency structure and organization
- Unified port management/port authorities
- Binational protocol for inspection and enforcement procedures along the entire trade route
- Industry/agency coordination and cooperation
- Agency/agency coordination and cooperation
- Binational and multi-state operating standards regarding truck size and weight, truck safety and insurance requirements
- Consolidation, distribution and terminal market functions

### **Security and Access Control**

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- Security within the port compound
- Secure facilities throughout the supply-chain
- Other strategic points of inspection outside of port compounds
- Identification and monitoring of drivers, freight and conveyance
- Secure data networks
- Secure access to information
- Risk management

### **Data Systems, Information and Communication**

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(information gathering and information sharing)

- Intra-agency
- Interagency
- Port users
- Planning and performance measurement
- Emergency response
- Security

### **Technology**

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- Non-intrusive inspection technology
- Information technology
- Biometric identification
- Transponder technology
- Electronic seals
- Intelligence and surveillance technology
- Environmental technology

## Planning

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- Performance measures for safety, security and efficiency
  - Qualitative and quantitative
  - Metrics of measurement
  - Methods of measurement
- Binational stakeholder groups for problem solving, coordination and planning
- Public-private partnership alternatives for financing, operations and facility ownership and maintenance

## Nine Guiding Principles

The *Port Expert Roundtable* yielded over 110 individual concepts applicable to the ideal port-of-entry and trade-flow process. The concepts identified range from broad to specific. Many were closely related and applied to a number of port functions and trade-flow processes. The same concept often applied to all areas: security, safety, efficiency and effectiveness.

Nearly all concepts fell within nine overarching or guiding principles. These guiding principles constitute the foundation of the CyberPort concept. The *Nine Guiding Principles* are as follows:

- 1 Binational, interagency and public/private cooperation
- 2 Integrated and harmonized procedures and systems
- 3 Incentives for pre-clearance, pre-inspection and compliance programs
- 4 Risk identification and management
- 5 Safety, security and efficiency through infrastructure design
- 6 Secure shared information
- 7 New technology
- 8 Maximum transparency and visibility of shipments
- 9 Performance standards and systems for measurement

The *Nine Guiding Principles* are not mutually exclusive; many relate to and are dependent on one another. For example, risk management comes through cooperation; cooperation involves shared information; and, shared information requires the use of new technology, etc.

### Binational Smart Border Action Plans

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Each of the *Nine Guiding Principles* works in support and agreement with the 22-Point U.S.-Mexico Border Partnership Action Plan. Each principle advances a number of the initiatives identified in

the binational smart border agreement. The *Nine Guiding Principles* are also consistent in support of the 30-point U.S.-Canada Smart Border Action Plan. These binational plans focus on the secure movement of people, goods and information as well as secure border infrastructure.

## The CyberPort Concept

### The Function of a CyberPort Process

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Following are a variety of functions that a CyberPort process should serve. The list is not all-inclusive, but provides a number of examples representing CyberPort functions. It may be used as a checklist by which to evaluate any particular port-of-entry.

#### Binational, Interagency and Public/Private Cooperation (at the local, state, regional and federal level)

The CyberPort process should:

- Maintain a system for binational port intelligence functions.
- Establish a binational forum to address national and international issues.
- Administer joint-agency training in security and intelligence procedures.
- Intercept terrorism prior to port infrastructure through joint port intelligence functions.
- Incorporate binational emergency response plans and procedures.
- Provide a single point of contact and information clearinghouse to inform users of port-of-entry status and requirements.
- Maintain a management and operational structure that can accommodate changing standards on a real-time basis.
- Require and enforce standardized binational training of commercial vehicle operators and personnel.
- Comply with the best prevailing legislation on working conditions.
- Maintain a jointly coordinated and trained hazardous materials team to respond to issues on both sides of the border.
- Maintain a unified port management entity or agency.
- Administer joint certification and/or authorization between state and federal inspection agencies.
- Adapt to flexible and/or extended hours of operation.
- Understand clearly the expectations and requirements from all state and federal agencies.
- Maintain a process to identify systems and responsibility overlap.
- Maintain a mechanism for addressing the needs of the private sector involved in commerce.

- Maintain a mechanism for ongoing dialogue with citizen stakeholders.
- Promote competition in hours and practices among customs brokers.
- Minimize all negative impacts to the local community.

### **Integrated and Harmonized Procedures and Systems**

The CyberPort process should:

- Maintain binational integrated information systems on a real-time basis.
- Maintain shared lookout systems for threats to port infrastructure.
- Maintain predictable, harmonized hours of operation.
- Promote and encourage unified inspection procedures among countries and across ports.
- Be commensurate with both inbound and outbound procedures.
- Minimize error through common training for inspection and enforcement.
- Use uniform import and export filings and revisions (e.g., bills of lading).
- Maintain a task-force mechanism dedicated to harmonizing the regulatory environment.
- Accommodate duty payment before and after entry.
- Allow for a continuous transfer of goods between origin and destination without a breakpoint.
- Eliminate intermediaries.

### **Incentives for Pre-Clearance, Pre-Inspection and Compliance Programs**

The CyberPort process should:

- Provide for origin clearance of agricultural products in consolidated growing regions.
- Provide for origin clearance of manufacturing products in consolidated manufacturing regions.
- Employ systems to help shippers and carriers ensure that freight and conveyance is free of contraband before reaching the port.
- Maintain a certification process for safety-compliant carriers.
- Maintain a certification process for security-compliant carriers.
- Maintain a system that credentials each shipment with coherent data transfer along the entire trade route.
- Provide incentives for pre-clearance by offering dedicated infrastructure.
- Provide incentives for pre-clearance by offering a streamlined processing and inspection system.
- Provide dedicated infrastructure and/or processing procedures for expeditious processing of pre-approved commuter traffic (pedestrian and passenger vehicle).

- Promote ultimate perimeter clearance (pre-pay, pre-inspect, pre-certify and seal) where the border is the last line of defense.
- Provide time-cost and financial incentives to facilitate desired behaviors.

### **Risk Identification and Management**

The CyberPort process should:

- Provide customs officials with as much information as possible as far in advance as possible.
- Promote the use of conveyances and technologies that allow for maximum transparency of a shipment.
- Employ methods to identify traffic that has a high probability of non-compliance.
- Use secure, shared databases to administer compliance programs and identify low-risk movement from high-risk movement.
- Intercept terrorism prior to port infrastructure through joint port intelligence functions.
- Employ clear, understandable reporting responsibilities regarding the suspicion of a security risk.
- Maximize remote or automated technology to detect safety and security risks.
- Administer ongoing screening for public health issues.
- Prepare facilities and employ inspection procedures for high-risk shipments.

### **Safety, Security and Efficiency through Infrastructure Design**

The CyberPort process should:

- Physically separate low-risk and high-risk traffic.
- Have the ability to divert suspicious or high-risk crossings to remote areas.
- Minimize safety and security risks for agency staff and port-users.
- Separate traffic by mode (pedestrian, passenger vehicle, commercial truck, rail).
- Have adequate staging areas for approaching traffic and inspections in-wait.
- Ensure personal safety for inspection personnel.
- Maximize safety for the port host community.
- Employ intelligent transportation systems (ITS).
- Employ flexibility in infrastructure design to accommodate expansion and/or contraction over time.
- Effectively accommodate predictable variations in trade flows.
- Minimize traffic impacts to the port host community.

## Secure Shared Information

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The CyberPort process should:

- Allow for direct, real-time communication between the shipper, shipment and receiver.
- Maintain a single centralized information site for port users on both sides of the border.
- Maintain a secure electronic network where information on individual shipments can be accessed only by authorized users among the trade community and necessary government agencies.
- Report accurate and timely crossing and wait-time information.
- Maintain a binational database identifying commodity flows in both directions by mode, state of origin, state of destination, volume and value.
- Employ internationally standardized units of measure and commodity classification.

## New Technology

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The CyberPort process should:

- Deploy rapid screening technology for hazards and contraband.
- Maximize use of non-intrusive inspection technology (NII).
- Maximize the use of all technology that ensures the security of shipments in-transit (e.g., electronic seals) and real-time monitoring (e.g., transponders).
- Employ intelligent transportation systems (ITS).

## Maximum Transparency and Visibility of Shipments

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The CyberPort process should:

- Allow importers, exporters, shippers, and customs brokers to access real-time status reports of individual shipments.
- Maximize the amount of status information for individual shipments to be communicated while in-transit – from point of origin to point of destination.
- Allow all inspection agencies to access complete shipment status and freight content in the most rapid, effective and non-intrusive manner.
- Promote the use of conveyances (truck trailers and rail cars) designed to be quickly and easily accessed from multiple sides.

## Performance Standards and Systems for Measurement

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The CyberPort process should:

- Establish benchmarking for system performance with feedback to port users.
- Subject all major public investments to cost/benefit analysis.
- Measure port efficiency and effectiveness in relation to one another.
- Define measures of trade-flow efficiency and employ the appropriate data collection methods needed to quantify them.
- Measure levels of staffing necessary to meet variations in demand.
- Measure the capacity of infrastructure in relation to variations in demand.
- Identify the trade-offs between security and trade-flow efficiency.

## CyberPort Concept Alternatives

Once the function of the ideal CyberPort process was identified, individual scenarios of how such a concept would be employed were established. Four alternative CyberPort concept models were developed and each was analyzed within the same framework for evaluation. The models cover a spectrum and range from a completely centralized concept with maximum consolidation of border-crossing activities at a single unified port facility to a concept based on maximum decentralization of border-crossing procedures and requirements.

The genesis for the concept models was derived from the technical reports on legal, logistical and commodity-flow issues, reviews of the literature, project advisory committees, stakeholder interviews, field visits, and expert consultation both individually and in a workshop forum.

The four CyberPort concept models were defined as follows:

- *Concept Model 1: Maximum Consolidation of Activities at a Single Binational Unified Port Facility*
- *Concept Model 2: A Hybrid – Optimizing a Mix of Consolidation and Decentralization*
- *Concept Model 3: Maximum Decentralization of Border-Crossing Procedures and Requirements*
- *Concept Model 4: Least-Cost Model – Minimum Necessary Upgrades to the Existing Facility*

The preferred concept, Model 2, was selected with regard to how each of the guiding principles could be specifically applied to the areas of security, safety, efficiency and effectiveness at the Nogales Mariposa commercial port facility.

The four CyberPort concept models have many elements in common with key differences occurring in physical infrastructure, human resources/staffing, and processing functions and procedures. This demonstrates the CyberPort concept's wide applicability to all U.S. land border ports-of-entry. Following are the key elements to the three alternatives not selected as the preferred concept model.

### **Concept Model 1**

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Maximum Consolidation of Activities at a Single Binational Unified Port Facility.

Key Elements of Concept Model 1:

- One comprehensive cross-border facility that eliminates the need for conveyances to physically cross the border.
- All weighing, inspection, agricultural grading, driver certification, cargo detention and storage to occur on-site at the port facility.
- U.S. and Mexican customs, immigration, transportation safety, and agricultural inspection personnel all housed in one shared facility.
- Significantly reduced requirements for secure conveyance due to complete transfer of cargo at a single consolidated cross-dock port-of-entry facility.

#### **Evaluation**

The benefit of this concept is found in that only the freight and not the commercial truck or its driver would need to cross the border. However, several large factors make this concept inappropriate for selection as the preferred model.

The tremendous investment in cross-dock infrastructure needed to accommodate 100 percent of all trade would be extraordinarily costly and not flexible enough to respond to significant fluctuations in trade-flow volume. The binational authority and facilities management of such an operation is unprecedented and would require significant modifications to the legal and operational structure of multiple state and federal agencies in both Mexico and the United States. Lastly, the concept does not facilitate the NAFTA mandate to allow for complete access of foreign motor carriers throughout the U.S., Mexico and Canada.

### **Concept Model 3**

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Maximum Decentralization of Border-Crossing Procedures and Requirements.

Key Elements of Concept Model 3:

- Export Facilitation Centers in the country of origin offering all required inspections and related services. These centers would be located in primary agricultural growing regions and major manufacturing centers along trade routes.
- U.S. and Mexican customs, immigration, transportation safety, and agricultural inspection personnel located at point-of-origin inspection facilities in a foreign country.
- Secure packing warehouses both in the supply chain and at the shipment point of origin.
- Very few shipment inspections conducted at the border port-of-entry facilities. Confirmation of the integrity of pre-inspections and the secure seal of shipments would be the primary function occurring at the border.

#### **Evaluation**

The benefit of this concept lies primarily in its ability to remove most border-crossing operations away from the border, which is where the choke points occur. However, security and safety concerns demand that many functions remain at the border. This model would necessitate significant relocation of inspection infrastructure. The costs of that relocation as well as the associated operational and human resource costs of dispersion would again be significant and is seen as a major challenge to the concept's success. The legal and regulatory change required at the state and federal level in Mexico and the United States is unprecedented and also serves as a major factor limiting the concept's viability.

### **Concept Model 4**

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Least-Cost Model – Minimum Necessary Upgrades to the Existing Facility.

Key Elements of Concept Model 4:

- Existing border port-of-entry facilities and highway infrastructure utilized with incremental investment for future improvements.
- Little or no increase of state and/or federal inspections in Mexico.
- Little or no change in existing processing and inspection procedures.



## Evaluation

The only benefit to this concept is the minimal financial costs involved in minimal facility and infrastructure upgrades. However, it was determined that the costs of potential loss of trade due to insufficient port capacity would significantly outweigh any savings experienced in minimal upgrades. This option was determined to be the most inappropriate for application to Nogales in that it does not accommodate the anticipated increase in U.S.-Mexico trade and may result in further loss in market share. It also does not provide for flexibility in the trade-flow process, which is fundamental to the CyberPort concept. It was determined that the minimal upgrades made under this model would have little to no effect on reducing or eliminating existing choke-points and bottlenecks through the Nogales port-of-entry.

## The Preferred Alternative: A Hybrid

Concept Model 2: A Hybrid – Optimizing a Mix of Consolidation and Decentralization is designed to build on the strengths of decentralization already occurring at the Nogales Mariposa border port-of-entry and at the U.S. federal level, while maintaining those functions most efficiently and effectively administered in a centralized border zone.

This model includes a flexible range of responses to fluctuations and shifts in trade flows while leveraging the advantages of existing infrastructure. It also builds on existing agency operational procedures and is compatible with the potential development of inland ports. The primary weakness of the model is that it involves fairly significant infrastructure and operational change and requires sizable but achievable changes to the regulatory environment.

### Key Elements of the Preferred Concept Model

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- Reduced on-site inspection within the port compound.
- Reduced need for dock space, cargo detention and storage facilities within the port compound.
- Customs and immigration personnel at BPOE; truck weight and safety inspections at points of origin and/or other public/private joint examination zones along the trade route.
- The majority of agricultural inspections conducted outside of the port compound.
- Secure packing warehouses both in the supply chain and at the shipment point of origin.

- Increased inspections and permitting functions at off-site agricultural trade service facilities.
- Secure sealed conveyance wherever possible.
- Dedicated access to port facilities for qualified users.

### Definition of the Preferred CyberPort Concept Model

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#### 1 Physical Infrastructure

- a Reduced on-site inspection of freight and conveyance within the customs compound.
- b Dedicated infrastructure at the BPOE to facilitate a streamlined border-crossing for low-risk, compliant shipments and individuals (frequent crossers).
- c Inland ports in country of destination located at intermodal distribution hubs along trade corridors. Inland ports would facilitate the distribution of goods by air, rail, and highway as well as provide all related trade services (financial, legal, etc.).
- d Secure packing warehouses both in the supply chain and at the shipment point of origin (controlled access, monitoring, etc.). Conditions must meet the security standards established by the U.S. Customs and Border Protection's Trade Partnership Against Terrorism (C-TPAT).
- e Infrastructure at points of origin to administer pre-inspection, pre-clearance and compliance programs.
- f Infrastructure capacity (booths, lanes, bridges, rail lines, dock space, office space, etc.) at the border that can accommodate all necessary processing and inspection during peak flows without causing significant delay.
- g Public/private partnership in construction, ownership and/or operation of trade facilitation and inspection facilities.
- h Shared joint-use facilities among government agencies and among countries.
- i Port facilities to have dedicated areas to inspect and contain hazardous materials.
- j Separation of commercial vehicle and passenger vehicle traffic.
- k Enough highway lane-miles to accommodate commercial truck and passenger car volumes without causing congestion.
- l Enough mainline rail track to accommodate commercial and passenger train flows without causing congestion.

- m Highways and rail lines that transport hazardous materials should not transect urban centers.
- n Provision of adequate staging areas at port-of-entry compounds for out-of-service vehicles.
- o Location of commercial rail lines outside of downtown urban cores with significant pedestrian and passenger vehicle activity.
- p Automated entry and exit control infrastructure at the border port to facilitate the crossing of people and vehicles.
  - Turnstiles at pedestrian crossings equipped with machines to read electronic visas and identification cards.
  - Passenger vehicle lanes equipped with machines to read electronic visas, identification cards and vehicle license plates.
  - Commercial vehicle lanes with raised booths to accept driver and vehicle identification. Sufficient staging area and dock space for trucks to accommodate any additional inspections required.
- q Port-of-entry compound design to provide for direct re-entry of shipments that do not receive authorized clearance (avoid formal exit and re-entry into country of origin once problem shipments are identified).
- r Provision of adequate parking for passenger vehicles at all ports-of-entry.
- s Truck trailers and rail cars designed to be secure yet accessible from multiple sides.
- t Diesel engines for trucks and locomotives that use low-sulfur, clean-burning fuels and are engineered to be as energy efficient as possible.

## 2 Human Resources/Staffing

- a Deployment of agency permitting and certification processes to points outside the port compound as more border-crossing functions occur elsewhere throughout the trade-flow process.
- b Staffing of state inspection and processing personnel at points of origin and other places throughout the trade-flow process.
- c Adequate staffing levels of all government agency personnel at the border port-of-entry to accommodate all necessary processing and inspections during peak periods without causing significant delay.
- d Binational agreement to perform federal inspections in NAFTA country of origin.
- e Certification of state laboratories to conduct FDA required tests and sampling of agricultural products.

- f Binational joint training of personnel with specific common responsibilities.
  - Inspection Procedures
  - Enforcement Protocol
  - Shipment Processing
- g National joint training of personnel among local, state and federal agencies with specific common responsibilities.
  - Inspection Procedures
  - Enforcement Protocol
  - Shipment Processing
- h Employment of a staffing system and structure that is able to accommodate predictable daily, weekly and seasonal variation in demand.
- i Accommodation of flexible hours of operation.
- j Direct and synchronous coordination of hours of operation between ports-of-entry on both sides of the border.
- k Direct coordination between hours of operation at ports-of-entry and the operation of the trade community (i.e., importers, exporters, freight-forwarders, shippers, carriers, customs brokers, warehouse and distribution, etc.).
- l Employment of a random assignment system for daily placement of inspection personnel.

## 3 Processing Functions and Procedures

- a All necessary fees and permits able to be issued and paid electronically prior to shipment departure at origin.
- b Reduced but complete provision of inspection and processing functions within the border port-of-entry compound. Limited access to these services within the port compound serves as an incentive to pre-certify shipments and pre-process documents to the greatest extent possible.
- c All required inspections needed for final shipment clearance determined prior to departure (e.g., agriculture and truck safety).
- d Shipments that undergo pre-primary inspections are sealed and certified by the respective agency and individual. Seals are not to be broken unless necessary. If necessary, seals must be re-sealed and re-certified by the respective agency and individual inspecting the shipment in-transit.
- e Electronic pre-payment of all fees and duties prior to departure.

- f Issuance of necessary permits, registrations, and licenses at points of origin and/or other points prior to arrival at the border port-of-entry.
- g Dedicated Rapid Enforcement Lanes at primary BPOE where multiple agencies can verify and authorize commercial shipments in one stop.
- h Coordinated communication among customs and emergency response agencies regarding when hazardous materials and hazardous waste is to be processed through ports-of-entry (applies to both rail and commercial vehicle shipments).

#### **4 Legal and Regulatory Environment**

- a Uniform and consistent enforcement of trade shipment regulations among all border ports-of-entry and NAFTA countries.
- b Uniform, harmonized import and export filing documents between NAFTA countries.
- c NAFTA uniform bill of lading for use among importers, exporters, shippers, carriers and banks.
- d Facilitation of lines of credit for imports and exports of NAFTA trade.
- e Diplomatic and legislative authority to perform joint-inspections among NAFTA countries.

#### **5 Systems Integration**

- a Use of the same commodity-code classification system (10-digit Harmonized Tariff System) between all NAFTA countries.
- b Maintain a transnational inspection record for individual shipments that accounts for all agency inspections. This record travels with the shipment and records: (1) the purpose of the inspection; (2) the type of inspection; (3) the status of the inspection; (4) actions taken or alterations made to the shipment; and (5) the agent and agency that conducted/certified the inspection and re-seals the shipment.
- c Direct linkage and access to license information for all licensed drivers in the U.S., Mexico and Canada. Ability to instantly verify the validity of all drivers licenses by any state or federal agency.
- d Uniform readability of electronic biometric identification cards in the U.S., Mexico and Canada.
- e Integration of criminal databases in the U.S., Mexico and Canada.
- f Integration of shipment sealing systems between carriers and inspection agencies.

- g Integration of inspection and re-sealing protocol between inspection and law enforcement agencies in the U.S., Mexico and Canada.
- h Integration of the U.S. Customs Automated Commercial Environment (ACE) and the SAIAA-M3 customs broker interface system in Mexico.
- i Integrate advance processing and inspection systems between points of origin or joint examination zones and the ports-of-entry.

#### **6 Security and Access Control**

- a Controlled access and security controls throughout the supply-chain for major manufacturers.
- b Secure conveyance (commercial truck, trailer and rail car) to the fullest extent possible.
- c Maximized use of risk management strategies by all inspection agencies.
- d Secure infrastructure at all BPOEs as well as all remote inspection facilities.
- e Maximize the amount of information that can be forwarded in advance to customs facilities to better enable risk management decisions.

#### **7 Data Systems, Information and Communication**

- a Direct linkage and access to information for all licensed drivers in the U.S., Mexico and Canada. Ability to instantly verify the validity of all drivers licenses by any state or federal agency.
- b Implementation of an international trade data system that identifies shipment characteristics such as place of origin, place of destination, port-of-entry, commodity type, value, gross weight, mode of shipment, etc.
- c Shared entry and exit records between Department of Homeland Security, State Department, FBI, CIA and their respective agencies in Mexico and Canada.
- d Shared criminal records database between law enforcement agencies in NAFTA countries.
- e Inform port users of real-time crossing information (wait times, etc.)
- f Development of data to quantify and measure performance standards.

#### **8 Technology**

- a Machines in place at pedestrian, passenger vehicle and commercial truck crossings to read electronic biometric identification cards.
- b Development of a uniform biometric standard used for personal identification in the U.S., Mexico and Canada.

- c Use of shipment transponders that provide real-time information on the tractor, trailer, freight and driver that can be accessed remotely.
- d Development of a “smart box/smart container” that is tamper-proof or tamper-indicating and is trackable. This technology should provide:
  - (1) detection of contraband inserted into product container;
  - (2) protection of product from theft; and (3) monitoring of product health/integrity.
- e Application of information technology focused on the management, security, and integrity of data provided and accessed by multiple users.
- f Use of in-transit security technologies to secure shipment containers.
- g Continued development and use of non-intrusive inspection technologies such as radiology scans and imaging as well as innovative detection technologies for chemical and biological contraband and radiation.
- h Continued coordination and development of Intelligent Transportation Systems for Commercial Vehicle Operations (ITS/CVO) and Commercial Vehicle Information Systems and Networks (CVISN).

## 9 Planning

- a Binational coordination and planning for border infrastructure and facility development.
- b Binational coordination and planning for emergency preparedness and emergency response.
- c Establishment of definitive, measurable performance standards for port efficiency and effectiveness.
- d Subject all major investments to a cost/benefit analysis.
- e Work toward establishing a more common, general understanding of the entire supply chain process for public agencies and planning bodies.
- f Harmonize data collection methods and metrics of measurement among NAFTA countries. Key data needed for infrastructure planning include:
  - (1) a standard measure of gross weight for all goods;
  - (2) synchronous and consistent time-series for data gathering;
  - (3) identification of state and/or province of shipment origin and destination;
  - (4) the port-of-entry used; and (5) common commodity code classifications and descriptions.
- g Establishment of a formal mechanism among binational public agencies and industry for the ongoing harmonization of hours of operation between U.S. and Mexican port facilities.
- h Examination of the role and impact of lines of credit on imports and exports of NAFTA trade.

## Concept Evaluation

### Efficiency and Effectiveness of Safety, Security and Trade-Flow Throughput

The preferred CyberPort concept model has high efficiency and effectiveness in regard to safety through the use of pre-clearance and vehicle safety compliance programs. Security is also efficient and effective due to the flexibility in selecting the best location for each activity and the intensive application of risk management. Trade-flow throughput with this model is efficient due to activities occurring in their most appropriate locations to reduce inspection redundancies and unnecessary offloads of freight.

However, increased agency resource requirements to perform functions at multiple locations in addition to the port compound needs to be strongly considered. A cost-benefit analysis and user study should precede all changes considering additional locations of inspection and processing functions. The concept model is highly efficient and effective in terms of logistics due to its dispersion of activities to various appropriate locations thereby increasing flexibility and responsiveness in meeting user needs.

### Alternative Growth Scenarios

Wilbur Smith Associates conducted a series of trade forecasts for the Nogales port-of-entry based on 2010 and 2020 economic forecasts provided by Global Insight (formerly DRI-WEFA) for surface trade through the U.S.-Mexico border. Three growth scenarios were projected: low (or decline), baseline (or moderate growth) and high (or significant growth). Each concept model was evaluated relative to its ability to respond to the respective trade flows of each scenario.

The preferred CyberPort concept model is only somewhat appropriate under the low forecast scenario since it involves fairly significant infrastructure investment and operational change. It is highly appropriate under the moderate-growth and high-growth scenarios since it offers a flexible range of responses to fluctuations and shifts in trade flows.

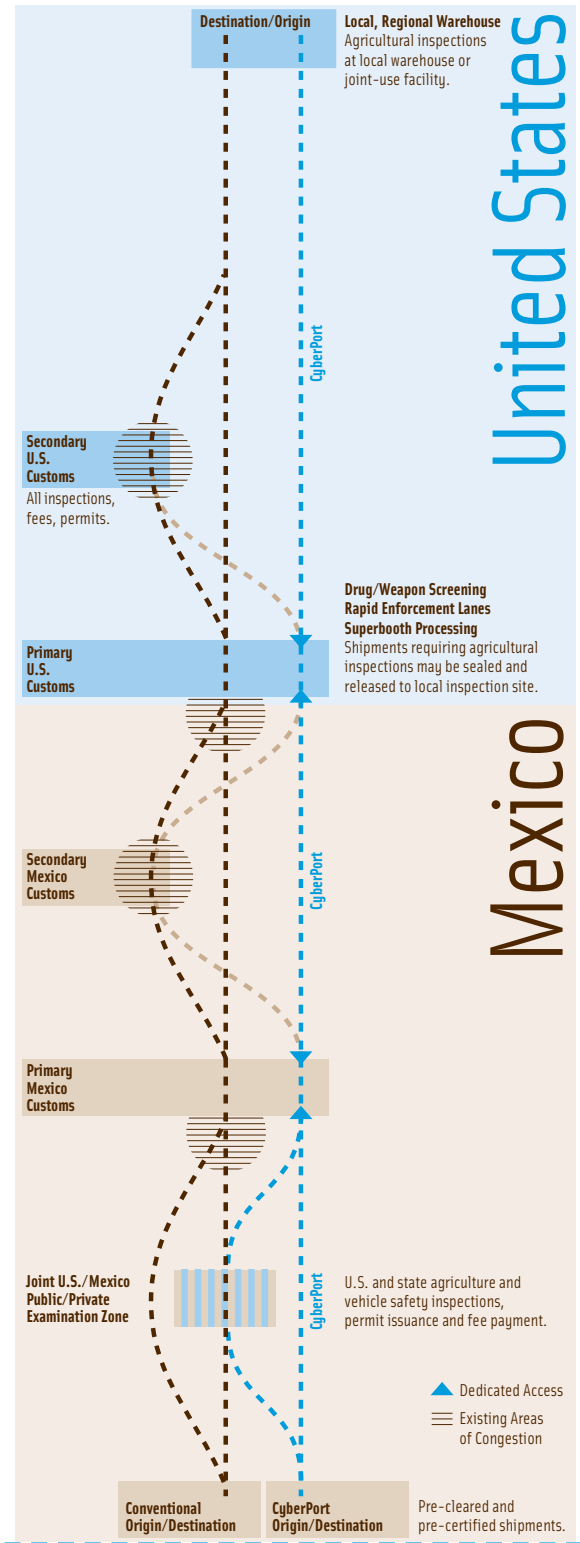
### Local, State and Regional Impacts

Each concept model was evaluated with regard to its impact at the local, state, regional and NAFTA level. The preferred CyberPort concept builds on local strengths unique to the Nogales border port-of-entry. However, as with all CyberPort concept scenarios, it may fail to impact or control global macroeconomic factors leading to increases or decreases in regional market share. The concept model raises the potential for increased activity at inland ports and supports the development of business services related to trade. The concept provides for increased job potential in the states of Arizona and Sonora, which may experience an increase in value-added manufacturing activity as well as trade-related services at inland ports and other public/private joint-use facilities. The CyberPort concept promotes the dispersion of trade-related activities throughout the CANAMEX region.

## CyberPort Concept Diagram

Following is a diagrammatic representation of the CyberPort Concept as it applies to Mexico and the United States. Although the diagram represents both the northbound and southbound trade-flow process, this extrapolation of the CyberPort concept was conducted primarily in response to the northbound process due to the unique demands of U.S. security for trade entering the country. The generic CyberPort diagram for the southbound trade-flow process is essentially the reverse of the northbound process.

The diagram identifies two lines by which U.S.-Mexico surface trade may travel. One is a conventional shipper with little or no pre-clearance certification that takes care of most border-crossing procedures at the border within the port-of-entry compound. Critical areas of congestion in the conventional process are upon approach to customs facilities and within secondary customs compounds. The highlighted blue line represents the CyberPort process. This includes a shipper that has gone through a variety of pre-clearance procedures to certify that the shipment is low-risk and has made every effort to pay duties and receive permits electronically before arrival at the border. All shipments are always subject to the possibility of requiring a secondary inspection; however, that chance is significantly reduced for the shipper who is pre-cleared and compliant and participates in the CyberPort process.



There are three key elements that are critical to the implementation of the CyberPort concept: 1) Pre-inspection and pre-clearance; 2) Dedicated access for qualified shipments; and 3) Off-site agricultural inspections. Implementing each of these elements involves a large and coordinated undertaking.

The first element is maximum pre-inspection of the freight as well as pre-clearance for the driver, truck, trailer, all fees and permits. It is critical, however, that a comprehensive system to preserve the integrity of a sealed shipment in transit is enforced among all inspection authorities throughout the entire trade route. For shipment points of origin that benefit from economies of scale, pre-inspection and pre-clearance may be able to be completed at the shipment's warehouse of departure. All other shipments may require the use of a Joint U.S.-Mexico Public/Private Examination Zone that offers a range of trade processing and inspection services.

These services may include agricultural and/or other freight inspections, commercial vehicle safety inspections and the issuance of all necessary fees and permits. Those shipments not requiring these services may proceed directly to the primary Customs facility for the country of export with a qualified low-risk shipment. Others may access the services provided in the Joint Examination Zone and subsequently proceed with a qualified low-risk shipment.

The second element is to provide dedicated access to the primary customs facilities of both countries for all qualified low-risk shipments. This is a necessary component that serves as an incentive for shipments to pre-qualify as low-risk and to maintain the shipment's integrity en-route. The reduced risk of secondary inspection must be accompanied by actual time-savings and greater predictability in crossing the border. Without this incentive, motivating the desired pre-shipment behavior and related investment on behalf of the trade community is likely to be very difficult to induce.

Both commercial and passenger vehicle pre-clearance should merit the relief of waiting in line behind others who have not made the similar investment of time and effort to qualify themselves as bona fide or low risk. Qualified shipments should be able to proceed directly to the border port-of-entry without experiencing extraordinarily long wait times.

The third major component to implementing the CyberPort concept is to establish a flexible process for the inspection, grading and sampling of all agricultural shipments. Such a process is currently offered by the Agricultural Quarantine Inspection program within the U.S. Bureau of Customs and Border Protection and by the Arizona Department of Agriculture.

Maximized utilization by the trade community of flexible agricultural inspections could significantly relieve congestion within the secondary customs compound. A coordinated "seal and release" program could take advantage of a single offload at a local, approved warehouse, where inspectors seal a shipment in the primary processing lane at the port-of-entry and then inspect the shipment at a local warehouse where it is then handled for transfer or distribution.

The CyberPort process is designed to provide a range of options for a diverse array of shipments. It focuses on relieving the choke points in the trade-flow process which typically occur upon arrival to primary customs facilities and within the secondary compounds. The objective is to avoid these two areas of congestion thereby streamlining the trade-flow process, reducing the number of stops and reducing the number of freight offloads.

# Looking at Trade: Defining Arizona's Traded

## U.S.-Mexico Trade by Mode, Weight and Value

The analysis of international trade is a complex endeavor. The reasons for analysis are as numerous and varied as the metrics for measurement and evaluation. Additionally, as with all analysis, the basis of judgment must be considered in relation to the completeness and accuracy of data currently available.

As trade is analyzed in terms of its different characteristics (mode, weight, value, port, commodity type, container, etc.), different pictures appear – and these pictures may often contrast with one another. The character of trade through any single port or region cannot be defined by a single variable. The complex character of international trade is perhaps nowhere more evident than through the Nogales border port-of-entry with its unique mix of agricultural, maquiladora, and bulk trade via both rail and truck transport.

### **Different Variables, Different Pictures**

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#### **Commercial Truck Crossings**

While there is great variability in truck crossings as a measure of international trade (e.g., differences in the percentage of empty trucks, average weight per truck and average value per ton), it is still a helpful metric in determining the need for overall port capacity at primary inspection lanes as well as the need for roadway infrastructure on both sides of the border.

The port of Nogales has witnessed a constant decline in northbound commercial truck crossings since 1998, with 242,237 truck crossings reported for 2002. This represents a 6.4 percent decrease over the period 1998 to 2002. While most U.S.-Mexico border ports-of-entry witnessed a decline in truck crossings in 2000, Nogales experienced this trend for an extended period of time. This has resulted in a loss in Nogales' share of northbound truck crossings among all U.S.-Mexico border ports from 6.6 percent in 1998 to 5.5 percent in 2002.

However, it must be noted that during this period of stagnation in the growth of northbound truck crossings through Nogales, the average number of tons per truck increased from 12.4 tons per truck in 1998 to 14.9 tons per truck in 2001, a gain of 20.2 percent over that time period. The rate of decrease in truck volume was overcome by a corresponding increase in truck productivity, which resulted in more tons of freight processed northbound by truck through Nogales in 2001 than at any previous time.

## Northbound Commercial Truck Crossings

| Year | Nogales BPOE | Annual Percent Growth/Decline | All US-Mexico Border Ports | Annual Percent Growth/Decline | Nogales Relative Share of US-Mexico Total |
|------|--------------|-------------------------------|----------------------------|-------------------------------|---|
| 1994 | 191,902      |                               | 2,763,120                  |                               | 6.9%                                      |
| 1995 | 206,032      | 7.4%                          | 2,860,625                  | 3.5%                          | 7.2%                                      |
| 1996 | 229,337      | 11.3%                         | 3,254,084                  | 13.8%                         | 7.0%                                      |
| 1997 | 242,830      | 5.9%                          | 3,689,665                  | 13.4%                         | 6.6%                                      |
| 1998 | 258,828      | 6.6%                          | 3,946,543                  | 7.0%                          | 6.6%                                      |
| 1999 | 256,426      | -0.9%                         | 4,358,721                  | 10.4%                         | 5.9%                                      |
| 2000 | 254,694      | -0.7%                         | 4,525,579                  | 3.8%                          | 5.6%                                      |
| 2001 | 249,237      | -2.1%                         | 4,304,959                  | -4.9%                         | 5.8%                                      |
| 2002 | 242,237      | -2.8%                         | 4,426,593                  | 2.8%                          | 5.5%                                      |

### U.S. Imports from Mexico by Weight

As reflected through increases in truck productivity as well as increases in the number of northbound rail containers per train through Nogales, the overall weight (in tons) of trade imported to the U.S. through the port by both rail and truck has grown consistently since 1996. Again, however, the picture is more complex. Due to the abundance of agricultural shipments, the overall profile for the type and mix of commodities moving northbound through Nogales is high-volume and low-value relative to the profile of goods moving through other U.S.-Mexico ports.

A relatively stable agricultural market, combined with an increase in bulk shipments by rail, has resulted in a consistent increase in the amount of northbound trade by weight through Nogales since 1996. While the rate of growth of U.S. imports by weight through Nogales only sometimes mirrors that of the entire U.S.-Mexico border, Nogales' relative share of U.S. imports by weight has increased from 12.9 percent in 1996 to 14.3 percent in 2001.

### U.S. Imports from Mexico by Weight (in Metric Tons)

| Year | Nogales BPOE | Annual Percent Growth/Decline | All US-Mexico Border Ports | Annual Percent Growth/Decline | Nogales Relative Share of US-Mexico Total |
|------|--------------|-------------------------------|----------------------------|-------------------------------|---|
| 1995 | N/A          | N/A                           | N/A                        | N/A                           | N/A                                       |
| 1996 | 2,590,643    | N/A                           | 20,093,599                 | N/A                           | 12.9%                                     |
| 1997 | 2,831,946    | 9.3%                          | 21,766,838                 | 8.3%                          | 13.0%                                     |
| 1998 | 3,174,390    | 12.1%                         | 23,393,738                 | 7.5%                          | 13.6%                                     |
| 1999 | 3,369,398    | 6.1%                          | 26,009,466                 | 11.2%                         | 13.0%                                     |
| 2000 | 3,580,200    | 6.3%                          | 27,578,400                 | 6.0%                          | 13.0%                                     |
| 2001 | 4,045,255    | 13.0%                         | 28,230,689                 | 2.4%                          | 14.3%                                     |

**Source for North Commercial Truck Crossings:** The University of Arizona Office of Economic Development, data from the U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

**Source for U.S. Imports from Mexico by Weight:** The University of Arizona Office of Economic Development, data from the U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.



### Total U.S.-Mexico Surface Trade by Value

Total surface trade includes both northbound and southbound trade shipments combined (U.S. imports and exports). While the Nogales port-of-entry processes a greater share of lower-value commodities than other major ports, the rate of growth and decline for the annual sum total of trade by value has performed relatively close to that

of all U.S.-Mexico border ports combined. As illustrated in the table below, the relative share of total surface trade by value for Nogales remained fairly stable from 1996 to 2000. However, the relative share of total surface trade through Nogales experienced a consistent decrease during 2001 and 2002 to an all-time low of 5.4 percent.

### Total U.S.-Mexico Surface Trade by Value (in Current U.S. Dollars)

| Year | Nogales BPOE   | Annual Percent Growth/Decline | All US-Mexico Border Ports | Annual Percent Growth/Decline | Nogales Relative Share of US-Mexico Total |
|------|----------------|-------------------------------|----------------------------|-------------------------------|---|
| 1994 | N/A            |                               | 88,161,772,018             |                               |   |
| 1995 | 7,301,461,642  |                               | 94,824,296,399             | 7.6%                          | 7.7%                                      |
| 1996 | 7,353,144,363  | 0.7%                          | 113,440,789,296            | 19.6%                         | 6.5%                                      |
| 1997 | 8,830,939,184  | 20.1%                         | 136,324,510,964            | 20.2%                         | 6.5%                                      |
| 1998 | 10,237,296,021 | 15.9%                         | 151,884,698,381            | 11.4%                         | 6.7%                                      |
| 1999 | 10,532,407,243 | 2.9%                          | 171,152,325,535            | 12.7%                         | 6.2%                                      |
| 2000 | 13,630,809,409 | 29.4%                         | 210,595,380,416            | 23.0%                         | 6.5%                                      |
| 2001 | 12,508,628,243 | -8.2%                         | 200,796,702,776            | -4.7%                         | 6.2%                                      |
| 2002 | 10,794,216,340 | -13.7%                        | 199,538,614,515            | 0.6%                          | 5.4%                                      |

Source for Total U.S.-Mexico Surface Trade by Value: The University of Arizona Office of Economic Development, data from the U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Surface Freight Data.

## Trade Data

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In order to present the most comprehensive picture of trade through Nogales as possible, a number of data sources were used for the Commodity Flow Study, a technical report that can be found within the project's *Comprehensive Report*. However, data gaps exist with respect to the gross weight of U.S. exports, the actual Mexican state of origin for U.S. imports, and the number of trucks and rail containers exiting the United States. In order to supplement available data from U.S. agencies, the Reebie Associates TRANSEARCH U.S.-Mexico trade database was used.

This database involves trade route modeling and other types of estimation to assign trade from state of origin to state of destination by port. Trade is also identified by mode, weight and commodity type. The Reebie TRANSEARCH database estimates trade flows for both northbound and southbound U.S.-Mexico trade and is cross referenced to port-of-entry data reported by U.S. Customs and Border Protection and the U.S. Department of Transportation Bureau of Transportation Statistics.

## Arizona's Tradeshed and Regional Market Share

The Commodity Flow Study identifies Arizona's tradeshed or geographic area of market capture for U.S.-Mexico trade based primarily on topography and transportation infrastructure. Through the identification of Arizona's tradeshed, reasonable and appropriate expectations of trade-flow through the region can be made.

The Reebie TRANSEARCH database was disaggregated based on origin and destination of commodities by region and port-of-entry. To facilitate analysis of the data, the United States and Mexico were divided into regions along state lines based on topography, interstate highways and rail infrastructure. The regions represent natural trade corridors, or tradesheds, for purposes of analyzing commodity flow.

The tradeshed method of analysis is based on regional, watershed-based ecological planning and can be a helpful method for understanding the geographic and systematic relationship of trade flows. The tradeshed principle of analysis begins to address the complex system of interrelated factors that determine not only the movement of trade but also the geographic location of production activities in relation to market areas.

In principle, trade corridors (much like rivers) serve to capture flows of trade from surrounding areas of production and transport that trade to the destined points of distribution or market areas. The assignment of trade to regions and ports-of-entry considers proximity to markets and transportation costs as the primary variables in the determination of trade-flow routing. In reality, trade flow routing decisions are based on a more complex variety of factors, which are unique to the type of commodity being transported. However, for purposes of analysis, the tradeshed and trade corridor principles are used to better understand the overall movement of trade through large regions.

The Mexican states of Baja Norte and Baja Sur, although representing a separate trade region, were not included in the targeted analysis for Arizona. It is assumed that trade to and from this region is naturally positioned to flow directly through the ports at the California-Baja Norte border.

As described previously, the U.S. was divided into three primary tradesheds or regions – Western, Central, and Eastern. In a similar fashion, Mexico was divided into five primary trade regions (four of them considered in this analysis). Total northbound and southbound trade flow in tons between regions is pictured in the figures that follow. The arrowheads on the diagrams represent the direction of the flow of goods between the two countries. The delineation of states constituting each region can be found in the complete Commodity Flow Study.

# Arizona's Tradeshed Regions

## Direct Tradeshed

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*For trade between the western U.S. and western Mexico*

Arizona should be the primary gateway for trade between these regions. It should accommodate nearly all trade within this tradeshed.

## Extended Tradeshed A

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*For trade between the western U.S. and southern Mexico*

Arizona should be a primary gateway for trade between these regions. It should accommodate the strong majority of trade within this tradeshed.



## Extended Tradeshed B

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*For trade between the entire U.S. and western Mexico*

Arizona should be a primary gateway for trade between these regions. It should accommodate a significant amount of trade within this tradeshed.

### Key

-  Origin for trade goods
-  Destination for trade goods

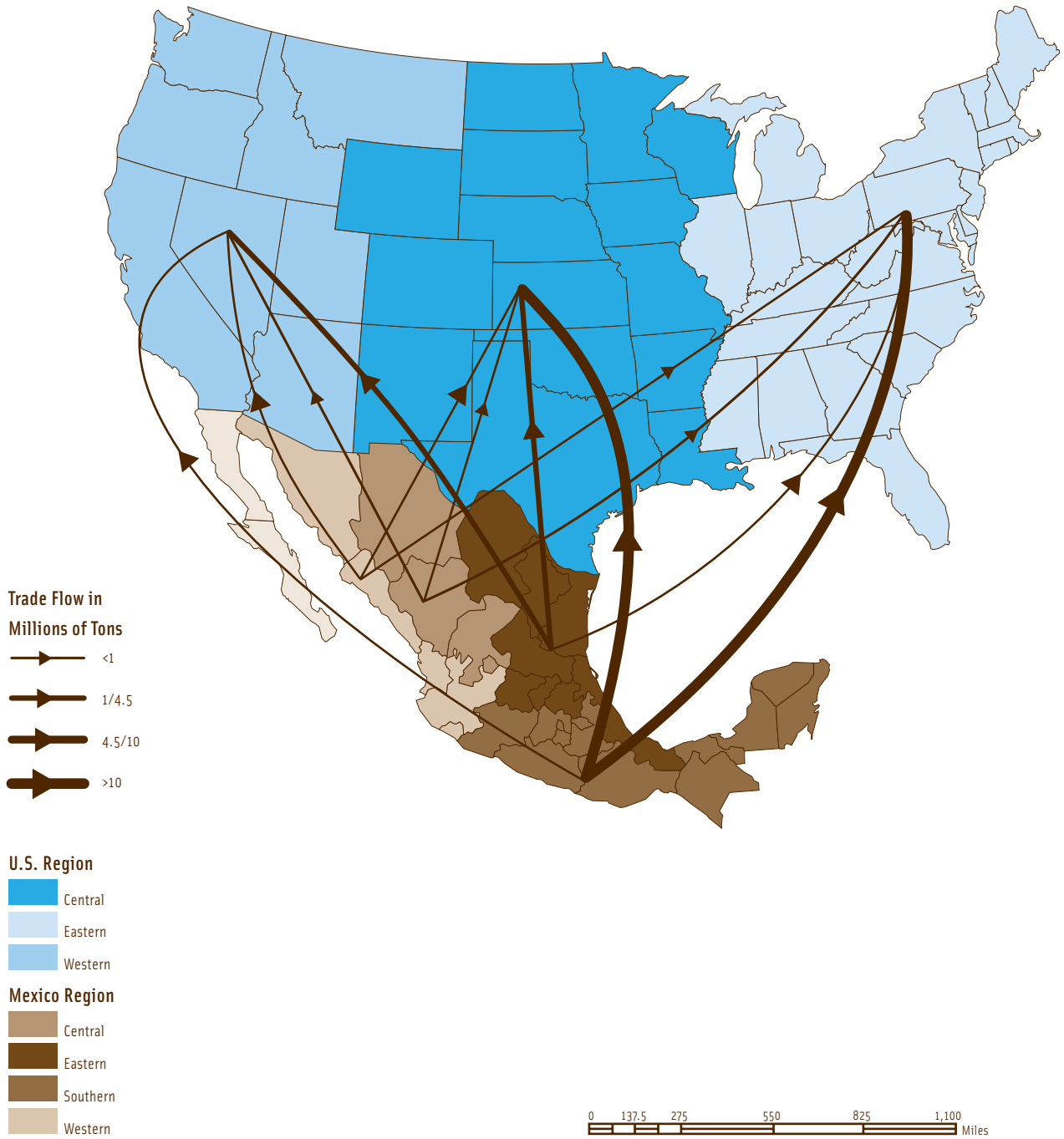
Southbound Trade Originating in the U.S. and Destined for Mexico



Northbound Trade Originating in Mexico Destined for the U.S.



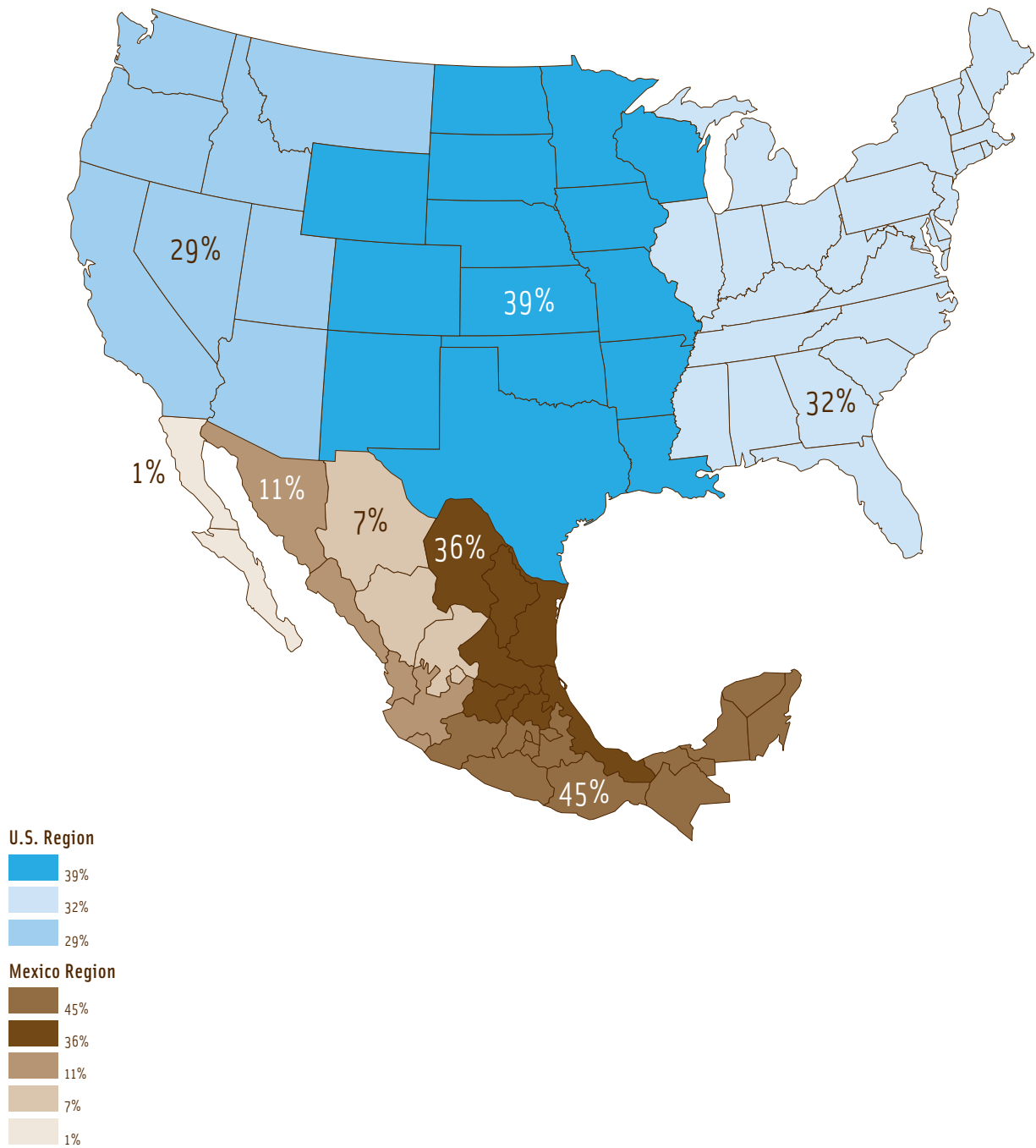
**Total Northbound U.S.-Mexico Trade, 2000**



Source: The University of Arizona Office of Economic Development and the UA Center for Applied Spatial Analysis, data from Reebie Associates TRANSEARCH Database, Stamford, CT, 2002.

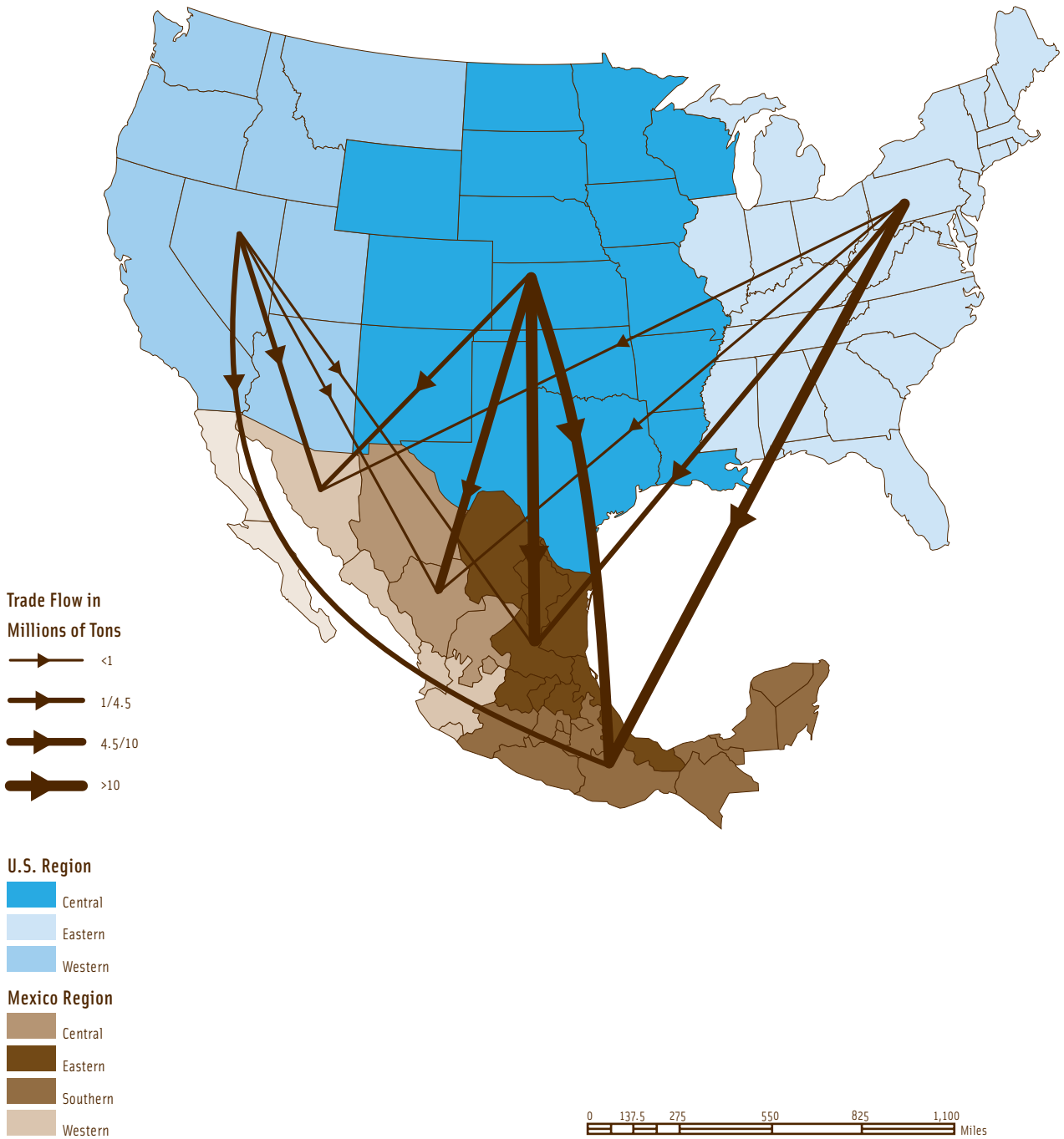
Spatial data source: ESRI  
 Projection Albers  
 Units Meters  
 Datum NAD83

**Percentage of Northbound U.S.-Mexico Trade by Region of Origin (Mexico) and Destination (U.S.), 2000**



Source: University of Arizona Office of Economic Development and the Center for Applied Spatial Analysis, data from Reebie Associates, TRANSEARCH Database, Stamford, CT, 2002.

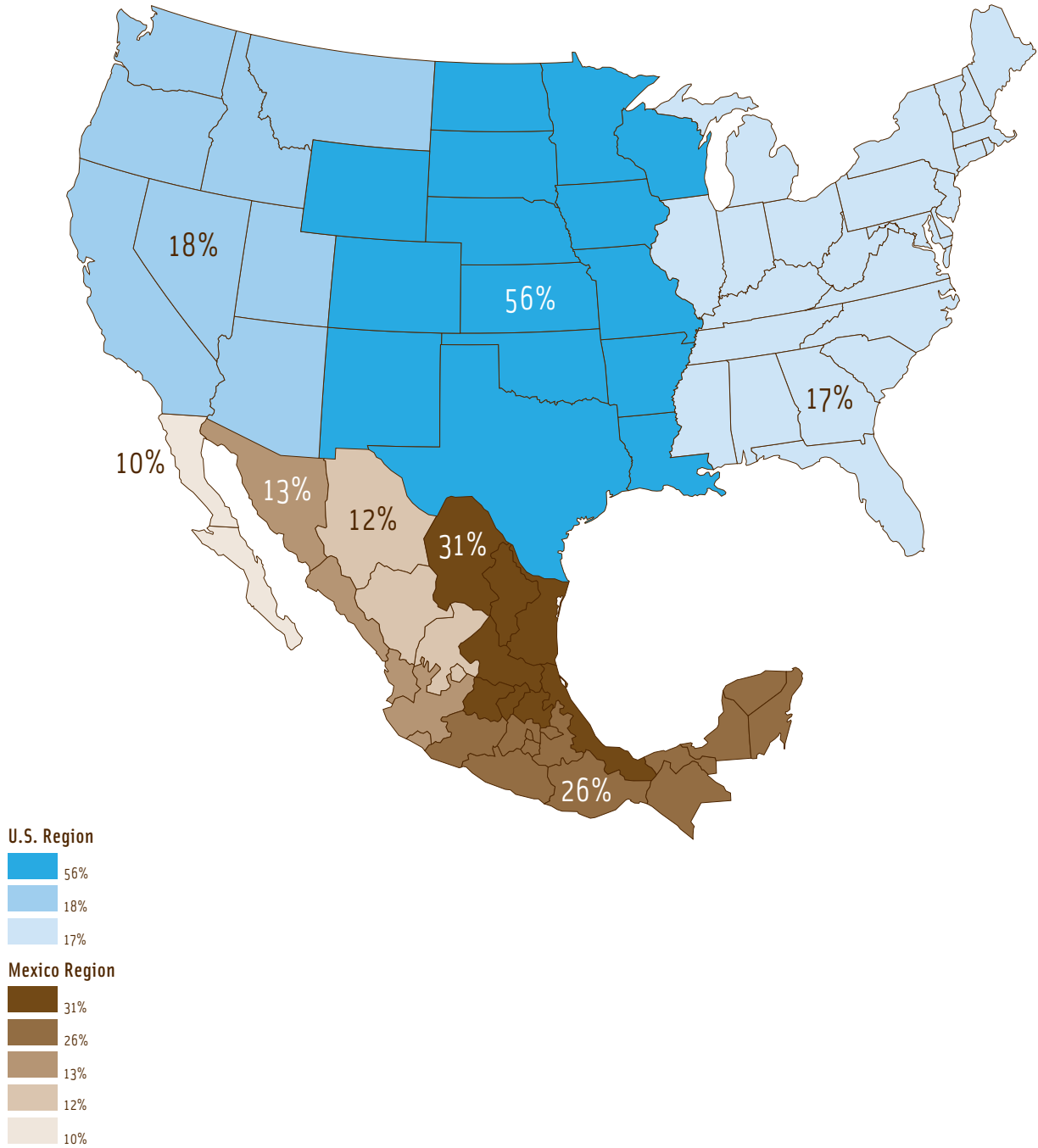
**Total Southbound U.S.-Mexico Trade, 2000**



Source: The University of Arizona Office of Economic Development and the UA Center for Applied Spatial Analysis, data from Reebie Associates TRANSEARCH Database, Stamford, CT, 2002.

Spatial data source: ESRI  
 Projection Albers  
 Units Meters  
 Datum NAD83

**Percentage of Southbound U.S.-Mexico Trade by Region of Origin (U.S.) and Destination (Mexico), 2000**



**Note:** National totals do not sum up to 100 percent due to trade origins and/or destinations classified as "unknown."

**Source:** The University of Arizona Office of Economic Development and the UA Center for Applied Spatial Analysis, data from Reebie Associates, TRANSEARCH Database, Stamford, CT, 2002.



## **The Importance of Regional Development to Arizona**

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The relative position of the western U.S. and Mexico regions in terms of their capacity for production and consumption is a direct factor contributing to Arizona's performance with respect to accommodating and facilitating U.S.-Mexico trade. As a gateway state, Arizona serves not only itself and its adjacent border states but also the entire western region of North America. It is in this capacity that Arizona is a keystone to the successful implementation of the CANAMEX Corridor.

Arizona's tradeshed is therefore defined as those regions accessed by the CANAMEX Corridor and includes the entire western United States as well as the western mainland and southern portion of Mexico. The southern region of Mexico (including Mexico City) is by far the most dominant within the country in terms of both production and consumption. However attention should be focused on the relative position and performance of the western regions in both Mexico and the U.S.

While the western U.S. receives a fairly proportional share of Mexico's exports, 29 percent, it serves as the origin (or region of production) for only 18 percent of U.S. exports to Mexico. Conversely, the western mainland of Mexico receives only 13 percent of U.S. exports and serves as the region of production for only 11 percent of Mexico's exports to the U.S.

The fast growing population of the western U.S. will secure its firm position as a region of consumption; however, the export or production capacity of the region in serving Mexico's markets is of crucial importance to Arizona. Similarly, while western Mexico does not hold a strong share of the country's population, the development of value-added production capacity for exports to the U.S. is also critically important.

## **Estimating Regional Market Share**

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It is possible to estimate a range of potential market capture for the Arizona-Sonora border ports-of-entry by examining the relative share of trade that is naturally positioned to move through the region based on origin and destination. The low end of the range for Arizona-Sonora market capture can be defined as that share of trade moving exclusively between the Western regions of the United States and Mexico (Arizona's direct tradeshed). The high end of the northbound range extends to include the share of trade from Southern Mexico to the Western U.S. as well as from Western Mexico to the entire U.S. (Arizona's extended

tradeshed). Conversely, the high end of the southbound range extends to include trade from the entire U.S. to Western Mexico as well as from the Western U.S. to Southern Mexico.

## **Establishing the Northbound Range of Market Share**

Only 11.1 percent of Mexico's exports to the U.S. originate in the western states (excluding Baja). Of that 11.1 percent, only 38.5 percent is destined for the Western Region of the U.S. This equates to 4.3 percent of total U.S.-Mexico northbound surface trade. This figure of 4.3 percent establishes the low end for northbound market capture.

The high end of the range includes Arizona's Extended Tradeshed A (11.6 percent of total Mexico-U.S. exports) Extended Tradeshed B (the 11.1 percent previously noted). The combination of these two regional shares equates to 22.7 percent of total U.S.-Mexico trade and establishes the high end of the range. Thus, the range for Arizona-Sonora market capture of northbound U.S.-Mexico surface trade is between 4.3 percent (direct) and 22.7 percent (extended).

## **Establishing the Southbound Range of Market Share**

Only 18.1 percent of U.S. exports to Mexico originate in the western states. Of that 18.1 percent, only 26.6 percent is destined for the Western Region of Mexico. This equates to 4.8 percent of total southbound U.S.-Mexico surface trade. This figure of 4.8 percent establishes the low end for southbound market capture.

The high end of the range includes Arizona's Extended Tradeshed B (12.9 percent of total U.S. exports to Mexico) as well as Extended Tradeshed A (15.5 percent of the 18.1 percent previously noted, which equates to 2.8 percent of total U.S. exports to Mexico). The combination of these two regional shares equates to 15.7 percent of southbound U.S.-Mexico trade and establishes the high end of the range. Thus the range for market capture of southbound U.S.-Mexico surface trade is between 4.8 percent (direct) and 15.7 percent (extended).

The low-end of the range of U.S.-Mexico market share for Arizona-Sonora ports is relatively low – 4.3 percent of northbound trade and 4.8 percent of southbound trade. This reflects the relatively low position that the western regions occupy in terms of production and consumption relative to other regions in both countries. However, the low-end of the market share range is based solely on trade between the two western regions.

### Arizona's Position

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Based on data for the year 2000, the identified range of potential market share for Arizona was between 4.3 percent and 22.7 percent of all northbound U.S. -Mexico surface trade and between 4.8 percent and 15.7 percent of all southbound trade. According to the Reebie TRANSEARCH database for the year 2000, Arizona accommodated 13.1 percent of northbound trade and 5.5 percent of southbound trade by weight. Both figures are within the established range.

### Potential Market Capture of U.S.-Mexico Surface Trade for Arizona-Sonora Border Ports-of-Entry, 2000

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|                  | Low  | High  | Actual |
|------------------|------|-------|--------|
| Northbound Trade | 4.3% | 22.7% | 13.1%  |
| Southbound Trade | 4.8% | 15.7% | 5.5%   |

Arizona's figure of 13.1 percent is firmly in the middle of the range for northbound market share. Arizona's southbound figure of 5.5 percent is at the bottom of the market-share range and illustrates the state's under performance as both a source and gateway for U.S. exports to Mexico's accessible market regions.

### Commodity Types

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Approximately one-third of U.S. imports by weight through Nogales are comprised of fresh vegetables, fruits and tree nuts. However, types of commodities representing a significant share of trade processed through other major border ports, yet not through Nogales, are the "value-added industries" of electrical equipment, motor vehicles, and industrial machinery. While these three commodities collectively account for 27 to 37 percent of trade by weight through the six other major ports examined, these value-added industries account for only 14 percent of trade through Nogales.

Due to the uniquely high volume of agricultural products shipped northbound through Nogales, the relative share of other product types may be slightly less prominent. However, when considered in terms of total tonnage, Nogales continues to rank poorly in two of the three value-added industries. The port accommodates a significant share

of motor vehicle imports from Mexico with a Ford Motor Company manufacturing facility located in Hermosillo, Sonora. Of the seven major U.S. -Mexico ports-of-entry, Nogales ranks third behind Laredo and El Paso in terms of motor vehicle imports. With respect to U.S. imports of general industrial machinery and electrical equipment, Nogales ranks sixth and seventh, respectively, among the seven major ports. The under-performance of Arizona's tradeshed to both produce and consume these value-added commodities has direct implications affecting the creation and retention of relatively high-paying jobs.

### Hazardous Materials

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Nearly 690,000 tons of hazardous materials were transported both southbound and northbound through the Nogales port-of-entry in 2001. In 2002, approximately 370,000 metric tons of sulfuric acid was transported northbound through Nogales by rail. Rail shipments of sulfuric acid are processed directly through the heart of the downtown core of Nogales, Sonora and Nogales, Arizona. A full breakdown of the volumes and types of hazardous materials transported through Nogales can be found within the Commodity Flow Study in the project *Comprehensive Report*.

The movement of hazardous materials by rail through highly populated areas poses a significant and increased risk of harm if a train derailment or other traffic accident should occur. Efforts must be taken to provide for the safest possible movement of these materials via modes and routes that place the fewest people, as well as the environment, at risk.

### Regions of Focus Within Arizona's Tradeshed

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Target areas for strategic economic development within this tradeshed are California and Arizona in the U.S. In Mexico, areas of focus include the Guadalajara and Mexico City regions as well as the state of Sonora. Approximately 90 percent of all U.S. -Mexico trade by weight within Arizona's tradeshed originates in or is destined for these primary areas.

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Source for Potential Market Capture of U.S.-Mexico Surface Trade for Arizona-Sonora Border Ports-of-Entry: The University of Arizona Office of Economic Development, data from Reebie Associates TRANSEARCH/Database, Stamford, CT, 2002.

# Rules & Regulations: Legal Issues of U.S. - Mexico Trade

## The Assessment of Legal Issues

*The Assessment of Legal Issues* conducted by the National Law Center for Inter-American Free Trade focused on the current U.S. and Mexican legal regimes governing the importation of goods. The report identified major legal obstacles to the implementation of the CyberPort concept and examined Customs legislation in Mexico and the U.S. The conclusions and recommendations of the assessment follow. The complete study can be found in the Comprehensive Report.

In recent years, Mexico's *Secretaría de Hacienda y Crédito Público* (Secretariat of Finance and Public Credit or SHCP) has directed its attention to fighting contraband and documentary fraud. Under this policy, amendments were made to the Mexican Customs Law (CL) that have resulted in additional administrative burdens for the importation of goods into Mexico.

SHCP has emphasized that the *Administración General de Aduanas* (Mexico's Customs Authority or AGA) is working to enable compliance with non-tariff regulations and restrictions through digital means. However, in isolation, such a measure will not substantially impact the efficiency and effectiveness of the flow of goods through customs. AGA has recently announced a project that is intended to modernize and contribute to the efficiency of ports-of-entry within a span of two years.

Genuine simplification is required, not merely a rearrangement of old constructs. Such simplification should be based on the principle that good faith transactions are to be facilitated; it should lead to enhanced efficiencies and reduced costs for both businesses and governments.

Comparatively, the border enforcement structure for the United States is one that has been in a constant state of change over the past decade. In the year after the September 2001 terrorist attacks, the potential for changes appears to be greater than ever before with the creation of the Department of Homeland Security in March 2003. This unified coordination and management structure could facilitate the changes necessary to the implement the CyberPort concept – most significantly, the exchange of information, pre-certification and joint-inspections.

# Inspections

In order to expedite the customs clearance process, it would be advisable for both Mexican and U.S. authorities to implement joint inspections. Such inspections would imply the coordination of federal, state and local authorities involved in the process in order to subject goods to a single inspection at customs premises or at other designated locations.

Single inspections would also need to factor in risk analysis assessments that would likewise need to be coordinated by both countries, while recognizing that it will be impossible to have total consensus by both countries on all of the factors to be considered high risk. Inspections would be contingent, for instance, on the record of the exporter, shipper, carrier, and importer; the type of goods that are being transported; compliance with C-TPAT requirements; and additional criteria, as necessary.

A variant to this alternative would be to implement joint-inspections by the aforementioned authorities only for certain qualified shipments, at the place where shipments originate (e.g., the exporter's facilities). Once goods are inspected, the shipment would be sealed and transported abroad. Upon reaching the border, the shipment would only be inspected in the event customs officials detect gross irregularities in the documentation or tampering with the seals.

Whether joint-inspections apply to all importers and exporters or only to pre-selected companies, the structuring of a special facility or facilities to such effects would create considerable legal challenges. In the U.S., the possibility to create a Privatized Examination Zone (PEZ) would be a novel concept, and additional in-depth analysis would be needed to ascertain what legislative changes would be required in order to implement such a zone.

Customs officers may currently be stationed in foreign countries for the purpose of examining persons and merchandise prior to their arrival into the U.S.<sup>1</sup> However, in order to exercise this power, the Secretary of State must enter into an agreement with the foreign country so as to authorize the presence of U.S. customs officials in that country.<sup>2</sup> In addition, if cross-border inspection services are envisioned as an eventual element of the CyberPort concept, it would be advisable to conduct an in-depth study of possible civil liability and insurance issues, which could very likely become a concern for certain U.S. agencies.

Also in theory, in the U.S. this area could be created as a particular type of Foreign Trade Zone, or under a similar legal framework. In the Customs Regulations at 19 C.F.R. 146.3, Customs supervision is required for foreign trade zones, but the type and level of supervision is left to the discretion of the Port Director, and it can consist of physical supervision, periodic audits or spot checks. As mentioned, such a zone could be created outside of customs premises or as an adjunct of the examination area currently in existence at the port of entry. If, as stated, supervision of such a zone is under the control of the Port Director, implementation could take as little as one year in the United States.

Under the Mexican current legal framework, such an area could be created either at the customs premises, or by resorting to a concession or authorization, where private parties can carry out the handling, storage and surveillance of goods, with special facilities designated for customs and other authorities from both countries to carry out the relevant inspections. In addition, under proposed amendments to the Mexican CL, such an area could be located in an industrial park. These amendments, however, could take up to two years to be actually incorporated into the legal framework. If a concession or authorization were to be granted under the existing framework, the award procedure could be initiated right away – such a process, including the preparation of the call for tenders and up to the final award, may take anywhere from one to two years.

Enhanced security would be required around this area, with access given to a wide array of U.S. and Mexican government officials, as well as private service providers. In this sense, both in the U.S. and in Mexico the creation of such a zone is deeply connected to the issue of privatization.

Arguably in Mexico, the creation of such an area would also imply substantial amendments to Articles 43 and 44 of the CL, regarding the dispatch process and procedures for the inspection and second inspection of goods. Nevertheless, it is believed that such changes could initially be implemented and enforced through amendments to administrative rules by the Customs Authorities, an inter-agency agreement, or a Presidential Decree that would redefine the scope of applicants and/or operations that would benefit from these procedures.

<sup>1</sup> 19 U.S.C. § 1629, 19 C.F.R. § 162.8.

<sup>2</sup> *Id.*

## Pre-Entry Certifications

A primary concern when goods enter a country is that of national security. In the U.S., this has been further enhanced by the events of September 11, 2001 – and one of the ways it has been addressed is by making U.S. Customs and Border Protection one of the main fronts of defense. Hence, goods entering the U.S. need to pass through various filters and comply with pre-clearance mechanisms.

Inspections at the border could be substantially reduced if importers and exporters who operate at the Nogales port-of-entry on a regular basis were pre-certified by customs authorities in both countries and were therefore eligible for fast-track or special-lane treatment by customs officials. Pre-certification systems have been and continue to be used by both countries. For example, the U.S. has implemented the Border Release Advanced Screening and Selectivity (BRASS) program. This experience could be used by both governments in coordinating a common approach.

It is to be expected that a considerable number of maquiladoras would be favorably impacted if a pre-certification procedure were to be instituted.

In addition to the above, it should be noted that the Consejo Nacional para la Industria Maquiladora de Exportación (Mexico's National Maquiladora Association or CNIME) is currently working on an initiative that would potentially benefit companies operating within the maquiladora sector. Under this initiative, pre-certified maquiladoras would benefit from the use of expedited crossings, whereby inspections shall under no circumstances exceed two percent of the company's truck imports.

A pre-certification proposal could be implemented in the customs legislation, preferably by means of a Presidential Decree that would establish the applicable terms and conditions.

In addition to the BRASS program in the U.S., efforts are underway to implement the C-TPAT agreement, whereby participating companies will benefit from a reduced number of inspections (and, hence, reduced border-crossing times). C-TPAT is currently open to all importers and carriers by air, rail and sea, and it is expected that enrollment to a broader spectrum of the trade community will be available in the near future. C-TPAT membership will be made available to all sectors of the supply chain.

## Information Exchange

In addressing the information-exchange obstacle to the expeditious flow of goods between Mexico and the U.S., it is worth mentioning that a cornerstone of any significant change in port operations would be the harmonization of their respective import and export tariff classifications.

Although full implementation of this measure is not likely to happen in the near future, a common database administered by a private party that would correlate existing tariff classifications in Mexico and the U.S. is an alternative that may currently be applied in terms of Articles 15 and 16 of the CL; similarly, in the U.S. such a database could be structured as part of a privatization process. Such a database would ideally serve as a tool for importers and exporters to gather information regarding tariff classifications and to comply with non-tariff restrictions and regulations applicable in both countries.

Once implemented, this database could also serve as an interface between the importer/exporter and the agencies administering or issuing the permits and authorizations required for the importation or exportation of merchandise. It would also be a significant tool to enable agencies to interact with each other and to avoid unnecessary delays.

The implementation of a common database would require an inter-governmental agreement whereby all secretariats and agencies involved in the issuance of non-tariff regulations would create such a common database through which importers and exporters may obtain information regarding the requirements that need to be met in order to import goods. SHCP and U.S. Customs and Border Protection would also exchange a list of the current tariff codes existing in Mexico and the U.S., as well as any relevant rulings.

From a safety standpoint, an enhanced exchange of information between the U.S. and Mexico would provide an effective tool for identifying dangerous cargo, as well as for tracking the movement of hazardous materials. C-TPAT represents a potentially remarkable opportunity for a concept like CyberPort in this area. Data will be collected on the participating parties. The expediting of known trustworthy shipments will also rely on technology, such as transponders, barcodes and radio frequency identification ("RFID") tags on cargo and conveyances.

U.S. and Mexican government agencies have stringent rules about the disclosure of information they collect. In the U.S., for instance, information can only be disseminated to an outside agency, even

under the same cabinet department, on a “need to know” basis, and the agencies have a signed memorandum of understanding that details the specifics on the information sharing arrangement. The implementation of a CyberPort concept, which involves the coordination of many agencies, would result in an entanglement of memoranda such that the prospect of the governments sharing information with each presents a tremendous challenge.

On the other hand, private parties, typically the importer, who have all of the cargo and conveyance information, are free to share this information with whomever they wish. Competition factors present good reasons not to make the information completely public, but importers and exporters readily share the transaction data with customs brokers and freight forwarders. A third party service provider that specializes in collecting and routing confidential information to the parties that need it could significantly benefit the CyberPort concept.

Different pieces of information arrive at different times from different sources. Different pieces of information are fed to government agencies at different times. These agencies similarly respond at different times, typically with a “go/no-go” or “green light/red light” decision. The differences in processing times and decisions cause many delays, duplicate inspections, and other problems. A centralized, neutral coordinating party – perhaps under the auspices of a port authority and/or a chamber of commerce or trade organization – could provide the communication and coordination necessary to engineer a single point of examination and the integrity and security necessary to obtain the buy-in of governmental stakeholders.

Such a coordinating party would have to be the subject of voluntary participation by the parties involved. The government cannot compel the use of a specific service provider. An ideal scenario would perhaps be the creation of a new and separate facility built around the PEZ concept previously described. It would have ample examination facilities for a moderate volume of cargo, presence of U.S. and Mexican government officers in the appropriate places, excellent perimeter security and a coordinating party who would be authorized by the importers and other parties to receive and transmit data on their behalf.

In areas such as these, the potential for private sector assistance is considerable, and arguably the most necessary. Government agencies are often granted considerable operational flexibility but have little incentive to exercise it without outside influence. For a government

agency to attempt to coordinate with several other agencies is a large undertaking with no perceived benefits for the agency.

In addition, a coordinated council or CyberPort authority, by understanding not only information needs but also operational limitations, can open the door to new and efficient practices, improving the efficiency, trade facilitation and enforcement capabilities of the border crossing process.

If such a cross-border council could be endorsed by the NAFTA regulatory and dispute resolution bodies, its credibility and effectiveness would be greatly enhanced. This, however, would likely entail a long-term commitment.

Under the coordinated information exchange scenario, a truck would travel toward the border zone. Data on the merchandise, origin, truck, driver and parties involved would be transmitted to the usual parties, such as customhouse brokers, who would pass it on to the coordinating service provider (CSP). The CSP in turn would identify the data elements necessary to provide to the Mexican and U.S. governments.

Once the truck has passed through a “point of no return” checkpoint, a signal to this effect would be transmitted, perhaps through the use of a transponder, to the CSP, who would pass it on to the governmental authorities. These authorities would have a fixed amount of time to render a decision on whether their particular agency desires to conduct an examination.

If there are no agencies needing to examine the goods, this series of “green lights” would be communicated back to the CSP. The gate allowing the truck into the United States could then open. The actual access could be controlled by Customs, or by the CSP with Customs supervision. If any examinations are required, the CSP would collect these determinations and communicate them to a centralized Examination Control Office (ECO).

The ECO would be staffed by representatives of each agency with a stake in the matter and would be able to determine the feasibility of joint examinations, or the relative priority of each targeted examination for a given truck. The truck would then be directed to an examination station for inspection from any and all agencies needing to conduct a review. Once all examining parties complete their review, the ECO would notify the CSP, who then could communicate or arrange for the truck to move on to its destination.

Since the exchange of information is closely interrelated in both countries to privatization issues, implementation of full-scale coordinated efforts may very well be a mid to long-term goal.

An additional matter that needs to be taken into consideration and that could also benefit from an improved exchange of information is the proposed implementation by the U.S. of the Data Management Improvement Act (DMIA), passed in May 2000. The Act is intended to document every entry and exit of people to and from the U.S., a process that could potentially generate delays even more severe than those that currently exist. Community meetings have been held in various locations along the border as part of the work of a special congressional Task Force that was created to examine the issue. The report identifying the recommendations of the Task Force, *Data Management Improvement Act Task Force First Annual Report to Congress*, was issued by the U.S. Department of Justice in December 2002.

## Standard Paper-Based and Electronic Documents

As set forth in Article 512 of NAFTA, harmonization of the necessary documentation in order to carry out international trade operations would significantly contribute to a smooth flow of trade between the United States and Mexico.

In order to achieve this harmonization, substantial modifications to Articles 36 (import and export documentation) and 59 (import obligations) of the Mexican Customs Law would need to be implemented. In addition, rule 2.6.1 of the Resolution establishing General Foreign Trade Rules (RGFT) would need to be modified in order to harmonize the terms and fields of commercial invoices and those currently required by U.S. regulations.

Harmonization of trade documents is, as a threshold matter, needed in order to implement a uniform electronic system whereby documents can be shared by both Customs administrations – as well as by other agencies involved in the clearance process. This would enable the SAAI M3 electronic processing system used by Mexican customs brokers to incorporate other document formats, in addition to pedimentos.

However, in order for the system to be truly operative, a study would need to be undertaken to determine how to interconnect the SAAI M3 system to its U.S. counterpart, the Automated Commercial System (ACS) and its successor, the Automated Commercial Environment (ACE).

In addition, significant modifications to current Mexican legislation would be needed in order to migrate many of the current documents attached to import filings to an electronic format. Under the Mexican legal framework, this would need to be promoted as a policy consideration, depending on the interest of the Mexican Congress. Legislative efforts need to include the enactment of specific electronic signature regulations.

In the case of maquiladoras, for example, a paperless environment that would enable the electronic filing of documents such as value declarations and certificates of origin would contribute significantly to the clearance process. In the case of railroad crossing, the possibility of filing import and export documents electronically would contribute to the simplification of the current process, which in many instances requires repeated filings in order to import a single container.

In light of the legal modifications required, the complete migration to electronic documents following the existing models would be a long-term goal. The possibility to fully interconnect the SAAI M3 system and the U.S. ACS/ACE system under a uniform set of data elements also appears to be a long-term objective, given the changes that would be required under the SAAI M3 legal infrastructure (including incorporation of additional documents and/or information and administration of the system) and the fact that ACE, while releasing its first phase in Summer 2003, is not scheduled for full completion for several more years.

As a general recommendation that could be implemented in the short to mid-term, it should be noted that carriers, importers and customs authorities alike would benefit from a single document created for transport administrative purposes. All NAFTA countries currently require carriers to have a customs cargo control document for customs. The format and required data for these documents are not standardized; a uniform cargo control document would eliminate this duplication and assist carriers in satisfying regulatory requirements of the customs agencies.

The best use of a single cargo control document may be in the exchange of information by electronic means. It is recommended that the carriers and customs services work together to develop a document that would satisfy the needs of the government interests and the transportation industry. This effort could include the incorporation of the bill of lading or other shipping documents into the uniform cargo control document.

The standard practice in all three countries is for the carrier to also issue a bill of lading when receiving a shipment from an exporter. Much of the information on the cargo control documents and the bill of lading is compatible. Critical information regarding motor carrier safety could also be incorporated into the document. A document must be created that is acceptable to the customs services as a cargo control document, but could also be used by the motor carrier industry as a bill of lading, including necessary contractual requirements. The uniform NAFTA bill of lading could be of significant assistance when developing such a document.

## Public-Private Partnerships

According to Mexico's Customs Authority, AGA, activities related to the dispatch of goods at Mexico City's airport have been almost completely privatized. Apparently, AGA currently does not own a single warehouse within such premises. Likewise, customs warehouses at maritime ports in Ensenada and Baja California are almost wholly owned by private parties.

Considering the efficiency with which such facilities operate, a widespread adoption of this solution would be consistent with the CyberPort concept. Under Articles 14, 15 and 16 of the CL and Article 512 of NAFTA, individuals may apply for concessions to operate services related to customs operations. In Mexico, such services may cover, for example, the exchange of information for customs purposes and operations related to the loading, unloading and storage of goods. Similar functions could be privatized under the U.S. legal framework in the form of a privatized examination zone, as previously described. Such an undertaking could be completed in both countries as a mid-term objective.

Nevertheless, if under a CyberPort concept, authorizations and concessions were also to be extended to industrial parks and other privately owned facilities that would allow the delivery of imported and exported goods in compliance with international standards, such as "just-in-time" delivery or on an as-needed basis, this would imply additional amendments to the Mexican legal framework (which are currently under consideration).

Finally, it should be noted that many of the proposals identified are very closely interrelated. Most notably, privatization issues permeate the consideration of how to better implement joint inspections and the exchange of information. In addition, full implementation of an electronic environment is highly dependent on current efforts by the private sector.



# Relieving the Bottleneck: Trade-Flow Logistics

## Assessing Logistics

The engineering and logistics firm of A. Epstein & Sons International, Inc., conducted the Trade Flow Logistics Study. This study examined the process through which trade travels from point of origin in Mexico, through the Nogales, Arizona BPOE and is distributed to a final U.S. destination. The study assessed two distinct types of trade, agriculture (fresh fruits and vegetables) and maquiladora manufacturing. The complete logistics report is included within the project *Comprehensive Report*.

The study found that operations among multiple government agencies within the port compound were well coordinated and efficient. The typical processing time for a truck without irregularities to be processed through the rapid enforcement lanes is 3 to 5 minutes. As such, there is little room for logistical improvement within the port compound to further reduce processing time. The Nogales Mariposa facility is operating at a point where logistical efficiencies may be experienced at the margins.

Much of the existing efficiency within the port compound can be attributed to the implementation of the Superbooth concept, which was a product of the 1997 Arizona Port Efficiency Study. The concept is a low-cost solution to processing trucks by placing agents from U.S. Customs and Border Protection, the Federal Motor Carrier Safety Administration, and the Arizona Department of Transportation Motor Vehicle Division in a single shared booth. Trucks with their paperwork in order need only make one stop and are able to proceed directly through the facility upon clearance and approval.

## Physical Infrastructure is No.1

The study found that the single greatest factor contributing to a bottleneck of northbound flow is the lane capacity in Mexico approaching the U.S. port facility. Improvements are needed on both the U.S. and Mexico sides of the border. The current two-lane capacity is not sufficient to accommodate both commercial trucks and passenger vehicles during peak times. The expansion of northbound lane capacity involves two primary components.

### **Mexico Approach**

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The bridge in Mexico traversing a small canyon just prior to the U.S. border is a significant factor contributing to the bottleneck. The absence of an upgrade and expansion to this piece of infrastructure seriously compromises any lane improvements made on the U.S. side. The expansion of commercial truck processing lanes and/or the addition of a dedicated lane for qualified shipments at the Mariposa facility would have limited impact since all traffic must still wait in the same line until the last 100+ feet.

## U.S. Approach

The separation of passenger vehicle traffic from commercial truck traffic is recommended for reasons of safety and logistical efficiency. An expansion in the number of lanes for processing commercial vehicles is needed and could be accommodated by converting the existing lanes used for processing passenger vehicles to commercial only. New improvements will be required to accommodate passenger vehicles, preferably adjacent to the existing facility.

The expansion in the number of commercial processing lanes would create the opportunity for a single lane to be dedicated to the successful implementation of security and compliance programs such as C-TPAT. Access to dedicated infrastructure is a critical component in securing widespread participation in such programs.

A dedicated commuter lane is also recommended for passenger vehicle traffic. A cost and feasibility study should be conducted to determine if such an allocation of space would be beneficial. Fast-track commuter programs, such as SENTRI, have been successfully used in San Diego and El Paso since 1995.

## Procedural Efficiencies

### Moving Beyond the Port-of-Entry

Similar to most port facilities, the Nogales Mariposa facility lacks room for the expansion of dock space for inspections. A logistical solution to addressing increased demand for limited space in the port compound

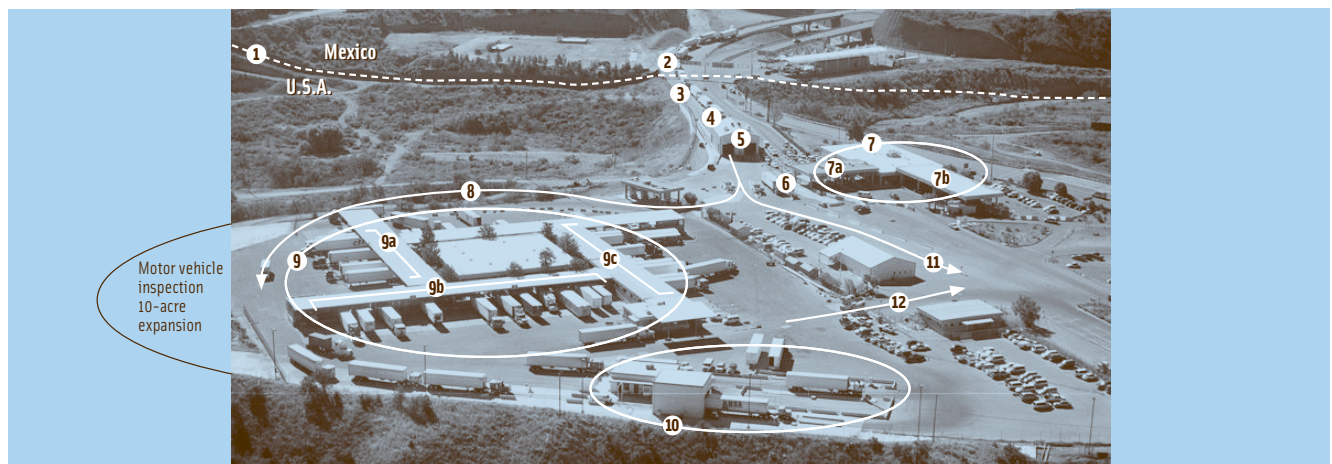
is to relieve the compound of this function by providing as many inspections as possible at locations outside of the port facility.

There are many considerations to be made with such a bi-national proposal, most notably security for agents, liability, authority, and shipment integrity. However, this is a fundamental principle of the CyberPort concept and is consistent with the direction being taken by a number of state and federal agencies.

Due to the large volume of agricultural products processed through the Mariposa facility, those inspections concerning agriculture in particular should be consolidated among agencies and performed either prior to arrival at the port or sealed and inspected immediately after at a locally approved facility or warehouse. Maximum advantage should be taken with respect to a single offload of freight for any inspection.

Coordination among state and federal agencies as well as with the trade community is essential for such a remote inspection program to be successful. However, this could alleviate a significant amount of congestion inside the port compound and improve the logistical efficiency of the overall trade-flow process considerably.

Continued improvements in the automation and integration of entry processes are also necessary. One of the most immediate and valuable automation improvements needed is the electronic integration of the Agricultural Quarantine and Inspection program or AQI (formerly the USDA Animal and Plant Health Inspection Service or APHIS) now under the authority of the Bureau of Customs and Border Protection in the Department of Homeland Security.



1. Border 2. Document distribution 3. USDOT inspection 4. Weigh-in-motion 5. Drug and weapons screening 6. Primary/superbooths 7. Personal vehicle entries 7a. Primary entry 7b. Secondary entry 8. Flow into secondary inspection 9. Secondary Inspections 9a. USDA 9b. Intensive inspections 9c. Brokers 10. X-ray, VACIS 11. Primary exit 12. Secondary exit

# Findings and Recommendations

The goal of the Nogales CyberPort Project is to develop a conceptual framework for what constitutes the ideal state-of-the-art trade-flow process for the future (a CyberPort) and to identify specific ways in which the Nogales border port-of-entry can begin to achieve this status. The project's focus is on the role of the border port-of-entry in processing international trade, specifically through the Mariposa port facility in Nogales, AZ.

The objective of the CyberPort concept is to maximize efficiency and effectiveness with respect to safety, security and trade-flow throughput. The CyberPort is based upon the fundamental notion that safety, security and trade facilitation are not mutually exclusive concepts but mutually reinforcing. Through creative and flexible solutions as well as the application of new technology, it is possible to increase one aspect of the trade-flow process without compromising another. This highlights the importance for taking a holistic, system-wide perspective to defining and implementing the CyberPort concept.

## Findings

The major project findings from the various technical studies have been identified throughout this report. Following are the findings for the trade-flow process as it occurs through the Nogales Mariposa border port-of-entry:

- 1 The port is home to a level and degree of cooperation between state and federal agencies unlike that experienced at most border ports-of-entry in the U.S. State and federal agencies share land, facilities, and office space.
- 2 The Nogales Customs district is progressive in welcoming new and innovative ideas and as a result has implemented a number of procedural and technological improvements unprecedented in the U.S. Within the port compound, the Mariposa facility serves as a national and world model in many respects.
- 3 Despite its demonstrated efficiencies within the port compound, the Nogales port-of-entry has lost approximately one-quarter of its market share since 1995. Nogales accommodates a smaller share of U.S.-Mexico trade than it is positioned to with respect to its natural tradeshed. Improvements at other primary border ports-of-entry in Texas and California have increased their relative capacity and serve to capture the considerable leakage of trade experienced by Arizona's primary gateway in Nogales.

- 4 The mix and type of commodities processed through the Nogales port are unique. As a primary gateway for U.S. importation of fresh agricultural products, trade-flow volumes through the port are subject to more variation with respect to the day, week and season than any other border port-of-entry.
- 5 There is a clear need for increased capacity of transportation infrastructure through the Nogales border port-of-entry in both Arizona and Sonora. In addition to northbound highway and bridge infrastructure accessing the U.S. and Mexican ports, other improvements are also in need. Access connecting the Mariposa port facility and Interstate 19 is insufficient to handle the projected future volumes of commercial truck traffic. Rail infrastructure through the downtown core also presents safety and congestion problems for the urban centers of Nogales, Arizona and Nogales, Sonora.
- 6 Anticipated growth in commercial truck traffic also presents a congestion problem accessing the eastbound I-10 freight corridor through metropolitan Tucson.
- 7 The hills and canyons of the U.S.-Mexico border in Nogales present considerable topographic constraints to infrastructure development. However, appropriately engineered solutions can be constructed at a higher cost.
- 8 There is a need to continually assess changes in markets, commodity types and distribution processes as they occur throughout Arizona and the CANAMEX region.
- 9 There is a need for Arizona to develop strategic market opportunities with a focus on the state of Sonora and the metropolitan areas of Guadalajara and Mexico City. The Puerto Nuevo Project in Tucson should be further examined and explored for its potential as a regional distribution center. Located at the convergence of the CANAMEX and I-10 freight corridors, the Union Pacific mainline and the Tucson International Airport with excess air cargo capacity, Puerto Nuevo is naturally positioned to play a much greater role in the domestic distribution of trade. However, significant improvements must occur and significant changes must take place.
- 10 The CyberPort concept, while having universal application to all land-based border ports-of-entry, is especially appropriate for application at the San Luis and Douglas ports-of-entry in Arizona. San Luis is particularly well poised to implement many CyberPort concepts as it undertakes the development of a new port facility.

## Recommendation Process

Recommendations were developed in consultation with the project advisory committees and evaluated in terms of:

- Priority
- Time Frame
- Difficulty of Implementation
- Cost of Implementation
- Benefit
- Financing Source

Initial recommendations were developed around each component of the trade-flow process. They were then consolidated into comprehensive, integrated efforts implemented at two different levels: 1) the state and customs district level and 2) the federal or binational level. The intent is to present a series of recommendations that can be taken forward under local or regional initiatives as well as to identify important initiatives at the national and binational level that need regional participation and application. The following recommendations identify actions that need to be taken for the Nogales Mariposa port-of-entry to conform to the CyberPort concept model involving the application of new technologies and the implementation of progressive processing practices.

## State- and Customs District-Level Recommendations

### Recommendation 1

*Establish a Binational CyberPort Task Force by the Governors of Arizona and Sonora to Oversee Project Development and Implementation:*

Establish a planning, coordination and implementation task force in the state of Arizona consisting of binational representatives for the continued advancement and development of CyberPort initiatives. The body should include members of the trade community as well as representatives at the local, state and federal level. Two distinct subcommittees should be formed to address the implementation of projects 1) at the state and customs district level and 2) the federal and binational level.

### Recommendation 2

*Establish a Dedicated Hazardous Materials Coordination Officer:*

Dedicate an officer to the full-time coordination and management of Hazardous Materials movement through the Nogales Port-of-Entry. This position should serve as a direct liaison between U.S. Customs, Arizona Department of Environmental Quality, U.S. Environmental

Protection Agency, Federal Motor Carrier Safety Administration and the Nogales Fire Department as the lead agency in the Binational Emergency Response Plan.

### **Recommendation 3**

*Designate Nogales BPOE as a National Pilot Test Site and Model Port:* Establish the Nogales Port-of-Entry as a national "pilot" test site for the implementation of new technologies and procedures. Also establish a formal program for the identification, testing and evaluation of technology to be used along the border with Nogales as a preferred test site.

### **Recommendation 4**

*Expand Northbound U.S. Commercial Processing Capacity:* The separation of commercial vehicle and passenger vehicle traffic through the Mariposa port facility. This would entail the rerouting of passenger vehicle traffic to a new processing facility located nearby or adjacent to the current crossing. The existing space currently used for processing passenger vehicles should be converted to accommodate commercial truck processing. It is anticipated that this would double the lane capacity allocated to processing commercial trucks as well as provide for a dedicated lane to accept low-risk compliant shipments participating in trade programs such as C-TPAT.

### **Recommendation 5**

*Develop Highway Infrastructure Improvements in Mexico and U.S.:* The widening and expansion of the northbound roadway and bridge infrastructure in Mexico approaching the Nogales Mariposa port-of-entry is critical in realizing the value of any increase in processing capacity at the port facility itself. In addition to regular access for commercial trucks and passenger vehicles, dedicated access needs to be provided for qualified and pre-approved compliant trade shipments as well as for passenger vehicles participating in a commuter program. Capacity, access, safety and efficiency improvements should also be evaluated in the U.S. on State Highway 189 between the Mariposa facility and Interstate 19. It is essential to coordinate improvements between Sonora and Arizona.

### **Recommendation 6**

*Examine and Implement a User-Friendly Agricultural "Seal and Release" Inspection Program:* Assemble a Port Users Task Force to examine the seal and release program offered by the U.S. Agricultural Quarantine Inspection (AQI) division under the Bureau of Customs

and Border Protection. The optimal use of such a program should automate inspection procedures to provide the option for a northbound agricultural shipment requiring inspection to be sealed while in the rapid enforcement lane (at the superbooth) and proceed to a local warehouse for inspection by an AQI official. The task force, including agency officials and port users, should identify workable solutions to the logistical requirements needed for maximum participation such as the provision of work-space and hours of operation.

### **Recommendation 7**

*Develop a Program for the Identification, Testing and Implementation of New Technology at the Nogales BPOE:* A partnership of state, federal and university resources should be assembled to establish a system for the testing and evaluation of new technologies. Such a consortium should include partnership with the Arizona Customs Management Center to use the Nogales border port-of-entry as a pilot technology test-site with consideration for future implementation of successful technologies.

### **Recommendation 8**

*Increase Inspections in Mexico:* Deploy state and federal inspection agents to secure pre-inspection locations within Mexico and the U.S. While the location of federal personnel in Mexico is currently prohibited, it is recommended that the State of Arizona build on the precedent established by the Arizona Department of Agriculture in locating authorized inspection agents and processing personnel from the Arizona Department of Transportation Motor Vehicle Division or third-party personnel to the CAADES agricultural compound in Nogales, Sonora.

### **Recommendation 9**

*Enhance Commercial Truck and Bus Safety Procedures:* Continue cooperation among agencies regarding the safety of commercial motor vehicles and buses. While a crisis or deficiency regarding the safety of commercial vehicles does not exist, the Arizona Department of Public Safety, Arizona Department of Transportation and Federal Motor Carrier Safety Administration should continue to work together and explore greater opportunities for inspection and certification of foreign commercial motor vehicles and buses in Mexico.

**Recommendation 10**

*Develop U.S. Exit Control Improvements:* Construction of southbound U.S. exit control and inspection facilities. These improvements should be located directly at or immediately upon arrival to the Mariposa port facility along the southbound entrance Route 189. Improvements for commercial truck traffic should include at least two processing lanes equipped with superbooths, office space to house appropriate personnel and related administration, and the appropriate amount of dock space at which to conduct all required inspections. Exit control infrastructure must also include passenger vehicle processing improvements. Exit controls for individuals fall under a U.S. federal mandate by the Data Management Improvement Act of 2000 and are scheduled for implementation in Nogales in 2004 (all U.S. ports by 2005).

**Recommendation 11**

*Implement Pilot Use of a Uniform Cargo Document (Bill of Lading):* Implement the pilot use of a uniform cargo document (such as the truck bill of lading) that could be integrated with an electronic and paper-based commercial manifest used by Customs officials. The National Law Center for Inter-American Free Trade has worked with representatives from the transportation industry to develop a North American uniform truck bill of lading (both paper-based and paperless). A pilot project should be undertaken to implement the use of a manifest-adaptable version of this document among those in the trade community who use Arizona ports-of-entry. The document would be coordinated with the best North American standard transportation practices as well as federal and state agencies in the U.S., Mexico and Canada. Coordinated use would involve shippers, carriers, importers, customs brokers, customs agencies, the insurance community and the financial industry.

**Recommendation 12**

*Develop Regional Highway and Rail Improvements:* Begin detailed study and examination for future potential improvements including: 1) Commercial truck bypass connecting the Mariposa port facility and I-19, 2) Commercial truck bypass around metropolitan Tucson for eastbound traffic from I-19 to I-10, and 3) Relocation or grade separation of the commercial rail line through Nogales.

**Recommendation 13**

*Develop Intermodal Inland Port Infrastructure:* The City of Tucson has conceived the Puerto Nuevo project as an inland port and distribution hub at the convergence of the I-10 freight corridor, Union Pacific

railroad mainline and Tucson International Airport. The development of an inland port in southern Arizona presents the opportunity to serve as a freight distribution hub for northbound and southbound U.S.-Mexico trade throughout North America. Value-added export activities may also evolve as the inland port occupies a key access point to the markets of the western U.S. and Mexico.

## Federal- and Binational-Level Recommendations

**Recommendation 1**

*Coordinate Enforcement of Sealed Shipments:* Begin a binational effort to harmonize and coordinate protocol and accountability for all inspection authorities that may break a shipment's seal along the trade route. Outreach, training and education is needed to reduce the significant percentage of sealed shipments that are broken upon arrival at the border.

**Recommendation 2**

*Promote Federal Pre-Inspection Authority in U.S. and Mexico:* Creation of a physical zone and legal environment where pre-inspections by federal agency officials can take place in both the U.S. and Mexico. This should be accompanied by training for consistent and harmonized enforcement protocol for the inspection of sealed shipments along trade routes as well as enforcement of truck safety standards.

**Recommendation 3**

*Coordinate Application of New Technology in Mexico, Canada and the U.S.:* Establish a multi-national working-group mechanism for the coordinated development and integrated use of border technologies; specifically, the readability of biometric identification cards in the U.S., Mexico and Canada and the use of shipment transponders among the trade community.

**Recommendation 4**

*Engage Arizona in the Multinational Trade Data Harmonization and Integration Process:* The Arizona Department of Commerce and Arizona Department of Transportation need to participate in the development of the International Trade Data System, led by the Department of Homeland Security. Integration and harmonization of the SAAI M3 electronic customs broker processing system in Mexico and the Automated Broker Interface (ABI) system in the United States is also needed.

State data needs should be considered and all systems should be integrated for the impending development of the Automated Commercial Environment (ACE).

## Further Studies

- 1 *Examine the Feasibility of Passenger Vehicle Commuter Lanes (SENTRI) through Arizona's High-Use Border Crossings:* Examine the feasibility and requirements of a commuter lane for northbound passenger vehicle traffic through the DeConcini crossing and the Mariposa port-of-entry. The successful application of the Secure Electronic Network for Travelers Rapid Inspection (SENTRI) program in San Diego and El Paso should be considered for use in Nogales.
- 2 *Arizona Trade Leakage and Transportation Routing Study:* It is imperative that the Nogales CyberPort be informed by a clear understanding of the complex nature of cost and routing decisions regarding both northbound and southbound U.S.-Mexico trade, specifically through Arizona ports-of-entry. This investigation should be region-specific and should focus on the specific commodity types of agricultural and maquiladora manufacturing products. Centers of production, distribution, and market destination should be thoroughly examined within the regions of trade capture for Arizona-Sonora border ports-of-entry. The study should also identify the regional capacity for trade through the Douglas, Nogales, and San Luis border ports-of-entry.
- 3 *Regional Economic Impact of U.S.-Mexico Trade on Arizona and the CANAMEX Region:* This study is essential to conducting a cost/benefit analysis for investment in port and transportation infrastructure as well as in considering processing changes. Importance should be placed on identifying the various ways that communities, states and regions benefit from the movement of trade. The study should quantify how the state of Arizona and the CANAMEX region benefit from U.S.-Mexico surface trade in quantifiable terms such as: direct investment; tax revenue; jobs created by transportation and distribution services (direct and indirect); jobs created by value-added export-related industry (direct and indirect); and, jobs created by local, state, and federal agency personnel. It is necessary for quantifiable benefits to be identified in order to inform subsequent cost/benefit analyses.
- 4 *Cost-Benefit Study of Major Port Infrastructure Improvements Along the U.S.-Mexico Border:* This study is critical in understanding the relationship between investments in port infrastructure and the corresponding impact on trade-flow throughput. This would entail a survey of major improvements along U.S.-Mexico border ports-of-entry and a detailed examination of the changes in trade through the respective port. This study is also helpful in better understanding the cost/benefit ratio regarding infrastructure investment and its impact.
- 5 *Examination of Solutions Addressing the Impact of Commercial Rail Traffic Through Downtown Ambos Nogales:* The feasibility of specific solutions addressing commercial rail traffic through downtown Nogales needs to be explored. Alternative solutions should include the possible re-routing of the rail line as well as ways to mediate the existing situation such as the addition of grade separated crossings for pedestrians, passenger vehicles and emergency vehicles.
- 6 *Examine the Feasibility of a Port Authority for Nogales and Southern Arizona:* Explore the formation of a Port Authority for its ability and appropriateness to serve as a financing and management mechanism for the Nogales port-of-entry and Southern Arizona.
- 7 *Detailed Design, Engineering and Cost Studies for Transportation and Port Infrastructure Improvements in Arizona:* Specific infrastructure projects need site studies as well as design and engineering studies to accurately estimate the cost of the improvement.
- 8 *Environmental Impact Studies of Transportation and Port Infrastructure Improvements in Arizona:* These studies are necessary to understand the impact of highway and port infrastructure projects on the environment. Both direct and indirect impacts should be examined. Such studies are required by law to precede all government-funded construction projects.

# Appendix: Project Committees

## Oversight Committee

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