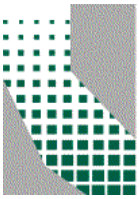


California Integrated Waste Management Board

August 2009

Contractor's Report

To The Board

The Flow of Used and Waste Tires in the California-Mexico Border Region

PRODUCED UNDER CONTRACT BY:

Institute for Regional Studies of the Californias, San Diego State University

STATE OF CALIFORNIA

Arnold Schwarzenegger
Governor

Linda S. Adams
Secretary, California Environmental Protection Agency

•

INTEGRATED WASTE MANAGEMENT BOARD

Margo Reid Brown
Board Chair

Sheila Kuehl
Board Member

John Laird
Board Member

Carole Migden
Board Member

Rosalie Mulé
Board Member

•

Mark Leary
Executive Director

For additional copies of this publication, contact:

Integrated Waste Management Board
Public Affairs Office, Publications Clearinghouse (MS–6)
1001 I Street
P.O. Box 4025
Sacramento, CA 95812-4025
www.ciwmb.ca.gov/Publications/
1-800-CA-WASTE (California only) or (916) 341-6306

Publication # IWMB-2009-018

Copies of this document originally provided by CIWMB were printed on recycled paper containing 100 percent postconsumer fiber.

Prepared as part of contract number IWM 05053 for $250,000.

The California Integrated Waste Management Board (CIWMB) does not discriminate on the basis of disability in access to its programs. CIWMB publications are available in accessible formats upon request by calling the Public Affairs Office at (916) 341-6300. Persons with hearing impairments can reach the CIWMB through the California Relay Service, 1-800-735-2929.

Executive Summary

This study is about the flow of used tires* that are exported from California across the international border into Mexico, including the states of Baja California and Baja California Sur and part of the state of Sonora. The study analyzes this flow in quantitative and qualitative terms, estimates the economic impact of the flow in California and Baja California, discusses the environmental impacts of waste tire piles in Baja California, and details the ultimate disposition of tires in this transborder tire trade. The report concludes with recommendations for possible actions by the California Integrated Waste Management Board and agencies in Mexico to cooperate across the border to mitigate the negative impacts of the cross-border tire flow and to support the continuance of this binational commercial activity. One goal of this study is to provide reliable data and analysis to support development of policies and actions to address health, safety, and environmental problems in the border region caused by California waste tires.

The cross-border flow of used tires is a response to basic economic, social, and political factors. Residents of Mexico's border cities rely on the automobile for transportation, but in the face of low per-capita incomes and inadequate credit availability, vehicle owners depend on access to used tires. Used tires in Baja California sell for about one-third of the price of new tires; in California, used tires are about half the price of new tires. New tires in Baja California are more expensive than in California ($60 versus $45 according to survey data) because of protective import taxes in Mexico and a less competitive market there. The flow of used tires is so large in scale that inadequate disposal of resulting waste tires has produced large and small tire piles scattered within and near the urban margins of Mexico's border cities of Tijuana, Playas de Rosarito, Ensenada, Tecate, and Mexicali in Baja California and San Luis Río Colorado in Sonora. Waste tire piles have also accumulated in Baja California Sur, partly as a result of the flow of used tires from California. U.S. and Mexico federal, state, and local environmental authorities came together to address the accumulation of these tire piles under the aegis of Border 2012, the U.S.-Mexico binational international border environmental program based on the 1983 La Paz Agreement. In Baja California and in San Luis Río Colorado the Border 2012 cleanup successfully eliminated the largest and most problematic legacy waste tire piles. Nonetheless, the forces that created the tire piles remain intact and the challenge for the state of California, other U.S. border states, and Mexican states is how to cooperate to better regulate this flow and mitigate the negative impacts.

In order to understand the ongoing problem of the flow of used tires, this study begins with a discussion of the social, economic, and governance structures of the California-Mexico border region, the geographical focus of this study. Next, the generation of used tires in California, along with the resale and export processes, is described. Each year, California generates large numbers of waste tires and some of these are of sufficient quality to be used within the state or exported, primarily to Baja California. In 2005, California produced 1.6 million tires for reuse within the California-Baja California region and in 2006, the figure was 2.7 million. Of these, 1.2 million in 2005 and 2.1 million in 2006 were reused within the state. In addition to those reused within

* This report employs definitions of the terms "used tire," "scrap tire," and "waste tire," which are based on statutory definitions and which are set forth in Appendix C of this study. Briefly, a "used tire" is no longer mounted on a vehicle but is still serviceable according to California and Mexican definitions; a "scrap tire" is a damaged or worn tire that cannot be repaired and is no longer serviceable; a "waste tire" is no longer serviceable, but for the purposes of waste tire hauling may include, among other things, scrap tires and used tires but not for resale. (See Public Resources Code Sections 42806.5, 42805.6 and 42807.)

California, 425,000 tires in 2005 and 637,500 in 2006 were exported to Baja California through formal trade mechanisms. In 2005, California was able to export 26 percent of all the used tires produced in the state for reuse; in 2006, the figure was 23 percent. In addition to the formal flow of tires, there is an informal flow of used tires from California into Mexico. Estimates by Mexican agencies and individuals of this informal flow range from 10 percent to 75 percent to 150 percent of the authorized number.

The formal flow of used tires into Baja California is governed by a yearly quota that is negotiated by Mexican federal and state officials in concert with organizations of border tire importers and dealers (llanteros) and chambers of commerce. For 2007, the import quota for Baja California and the adjacent zone of Sonora was 820,000 and for 2008 the quota—only issued for Baja California—was 750,000 units. In order to import used tires, Baja California tire dealers must present a certificate verifying that the required number of waste tires had been disposed at an authorized facility.

The informal flow of tires is part of the petty contraband of the border region, with individuals taking used tires into Baja California to sell or to use. In addition, there are small businesses that smuggle tires across the border through the non-commercial lanes at the ports of entry, often in vans, small covered trucks, or as part of a mixed load of used goods. There is no evidence of systematic and large movements of unregistered tires through U.S. and Mexico Customs at the commercial ports of entry.

In addition, used and waste tires flow from California to Baja California with the importation of used and scrap vehicles. Each year, approximately 67,000 automobiles and light trucks are imported into Baja California for dismantling, repairing, or scrapping. The Baja California environmental secretariat estimates that some 80,000 used tires are imported by this mechanism that falls outside the formal quota system.

Disposal of waste tires has been an ongoing problem for Mexico's border communities, caused in large measure by an inadequate waste tire disposal infrastructure, but exacerbated by the flow of used tires across the border which become waste tires. Tire life is shortened by driving conditions in Baja California, with unpaved streets and roads, deteriorated surfaces, road hazards, and so forth. The result is that on a per-capita basis, waste tires accumulate at a faster rate than in California. Each year, Baja California is faced with disposal of about 1.5 million waste tires. About one-third of these are diverted as Tire-Derived Fuel to cement kilns; a similar number is used for civil engineering projects and informal construction projects by homeowners. Rubberized asphalt and other major productive uses for waste tires are not developed markets in Baja California. The rest of the annual accumulation of waste tires is disposed at municipal landfills, the Mexicali ADSA industrial waste site, or scattered around the region in abandoned large and small tire piles that appear in neighborhoods and on the urban fringes. These small illegal piles are cleaned up by municipal authorities or set on fire by local residents or illegal dumpers. Preliminary results from the Board's tire pile remote sensing identification project are promising as an aid to local authorities in Mexico for the identification of these tire piles.

The used tire trade between California and Baja California is an important economic activity for both states. In 2008, formal used tire sales to Baja California generated more than $5.4 million in revenue for California companies. These sales also removed 637,500 tires from California, which did not have to be disposed within the state, despite previous payment of the per-tire disposal fees. The 2008 imports from California generated $13 million in revenue for Mexico used tire businesses, including $1.2 million in tax revenue for Mexican federal authorities. When estimates for informally imported tire sales are included, the used tire trade in Baja California and the

adjacent state of Sonora drives an industry that involves 1,515 to 2,015 businesses, provides from 4,545 to 6,045 jobs, and pays between $20 and $26 million in wages. Approximately 24,000 residents of Baja California and the nearby part of Sonora are supported by the used tire industry.

The used tire flow also produces negative environmental and health effects and related costs in Baja California and the adjacent California border area. Tire fires in Baja California, even in the small dispersed tire piles and mixed solid waste sites that contain tires in the Mexicali Valley, impact local residents and add contaminants to the binational California-Mexico air basin, with obvious human health effects. The presence of tire piles also increases the risk of vector-borne diseases, including West Nile Virus and various forms of encephalitis. Removal of tire piles is a necessary action for prevention of air pollution and vector-borne diseases, and a considerable expense for governments in the border region. The cleanup of legacy piles in Baja California, 2004–2006, removed 1.4 million tires at a cost of about $666,000, or 48 cents per tire. The ongoing clean up of small tire piles has a higher per-tire cost and the expense is considerably higher when tires are carried by stormwater across the border into California and require clean up.

This report describes the Used and Waste Tire Manifest System, the tire hauler registration program, and the tire facility program, which were implemented by the Board and together constitute the California tire tracking system. Its usefulness for tracking the flow of tires to the border and into Baja California, into California from other states, or from other U.S. states and through California into Baja California, is analyzed. The system works reasonably well for tracking tires that are exported formally to Baja California, although the data for the flow into Baja California are not as complete or as accurate as might be desirable. However, the system loses track of tires that enter the informal trade to Mexico. This is because tires are removed from California generators in small lots, mainly by individuals, and not manifested. Many of these go to Mexico.

The Board has developed and implemented numerous actions and activities directly related to waste and used tires in California and along the border region with Baja California. Border region tire-related activities are listed in Appendix F.

Mexico has a set of emerging laws, regulations, and practices that constitutes waste tire management programs. Mexico's federal environmental agency—the Secretariat of Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales—SEMARNAT)—has provided federal leadership and support. Cross-border collaboration, through Border 2012 and the Border Governors Conference, has been important for the cleanup of legacy piles and sharing of information. In 2008, the state of Baja California signed an agreement with tire importers to establish an import fee on used tires to be used for tire clean-up purposes. The state is also planning a monofill in the Mexicali region for waste tires, including tire baling machinery and proper administration and security, to provide an economical and accessible disposal site. Baja California municipalities are actively engaged in tire cleanup activities and solid waste management efforts. Mexico's federal government, through its environmental agency (SEMARNAT), is facilitating development of safe tire storage sites and regulations for management of used tires for the northern border states.

This report concludes with a series of policy options for California to address issues related to the cross-border flow of used tires and the shared California-Baja California problems resulting from this flow. These options include actions that California might initiate and actions to enhance cross-border cooperation on tire-related activities. The report also includes initiatives that Baja California might pursue in order to better address the effects of waste tires in the border region. Since the waste tire problem in the border region is the result of binational forces, the problem

requires binational solutions and the synergy from coordinated actions by Baja California and California. If either state fails to implement appropriate policies, then the management of the border waste tire problem will be handicapped.

Options for the Board to initiate are the following:

- Strengthen the tracking system to develop better data on flow of used tires into Baja California that can be shared with Baja California authorities;
- Work with U.S. Customs and Border Protection to obtain regular data on California used tire exports through the California ports of entry with Mexico;
- Work with the California Highway Patrol and Customs/Border Patrol on southbound vehicle inspections at the non-commercial lanes at the ports of entry to develop better information on the informal flow of used tires,

Options for Baja California include:

- Continue to develop the monofill in Mexicali for waste tires;
- Share data on import quotas and related topics with the Board;
- Coordinate with California and the border region private sector on market development for tire-derived products;
- Expand waste tire disposal regulations and strengthen enforcement of the regulations to include all waste tire generators.

Options to enhance cross-border cooperation on tire-related activities include:

- Information exchange workshops for the Board and local enforcement agency (LEA) personnel and Mexican counterparts to discuss matters of mutual interest;
- Personnel exchanges between the Board and local enforcement agencies and Mexican counterpart agencies;
- Develop regular data exchange to facilitate binational used and waste tire management, including providing Baja California authorities with satellite imagery analysis for the location of clandestine waste tire piles;
- Support cross-border private sector collaboration on crumb rubber asphalt paving in Baja California through work with binational agencies;
- Support development of technical and engineering standards for use of waste tires in civil engineering applications in Baja California;
- Support Baja California's development of a tire and disposal site through technical support and equipment loans and maintenance.

Introduction

This study is about the flow of used tires from California across the international border into Mexico, including the states of Baja California and Baja California Sur and part of the state of Sonora. Research shows that this flow is in response to basic economic, social, and political factors. It is so large in scale that inadequate disposal of resulting waste tires has produced large and small tire piles scattered within and near the urban margins of Mexico's border cities of Tijuana, Playas de Rosarito, Ensenada, Tecate, and Mexicali in Baja California and San Luis Río Colorado in Sonora. Waste tire piles have also accumulated in Baja California Sur, partly as a result of the flow of used tires from California. U.S. and Mexico federal, state, and local environmental authorities came together to address the accumulation of these tire piles under the aegis of Border 2012, the U.S.-Mexico binational border environmental program based on the 1983 La Paz Agreement. In Baja California and in San Luis Río Colorado the Border 2012 cleanup successfully eliminated the largest and most problematic legacy scrap tire piles. Nonetheless, the forces that created the tire piles remain intact, and the cleanups did not reach the root of the problem. In order to understand the ongoing problem of the flow of used tires, this study begins with a discussion of the social, economic, and governance structures of the California-Mexico border region, the geographical focus of this study.

The U.S.-Mexico Border Region

The border between the United States and Mexico is some 2,000 miles (3,200 km) in length and is characterized by a pattern of densely settled binational urban areas—such as the San Diego-Tijuana metroplex—that are separated by great areas of lightly populated deserts and mountains.[1] The focus of this study, the California-Mexico border, is some 140 miles (225 km) in length. The border region is the interface between the United States and Mexico and also between the developing and developed world. There are great economic differences across the border as well as different cultures, languages, legal systems, and structures of governance and public administration.

From the World War II period, the border area was the most dynamic region of both countries and the post-war Sunbelt phenomenon of the Southwest United States was mirrored on Mexico's northern border. This demographic dynamism is still to be seen along the California-Mexico border.

Currently, there are about 5.5 million residents in the California-Baja California border region and in a few years, by 2010, more will be living south of the international boundary line than to the north. The rate of population growth in this region has moderated in recent decades. San Diego is now growing at about 1.5 percent per year and Tijuana is growing at more than 5 percent yearly. San Diego's population doubling time is about 58 years, while Tijuana's population will double in just 13 years. The total regional population growth is impressive—each year Tijuana

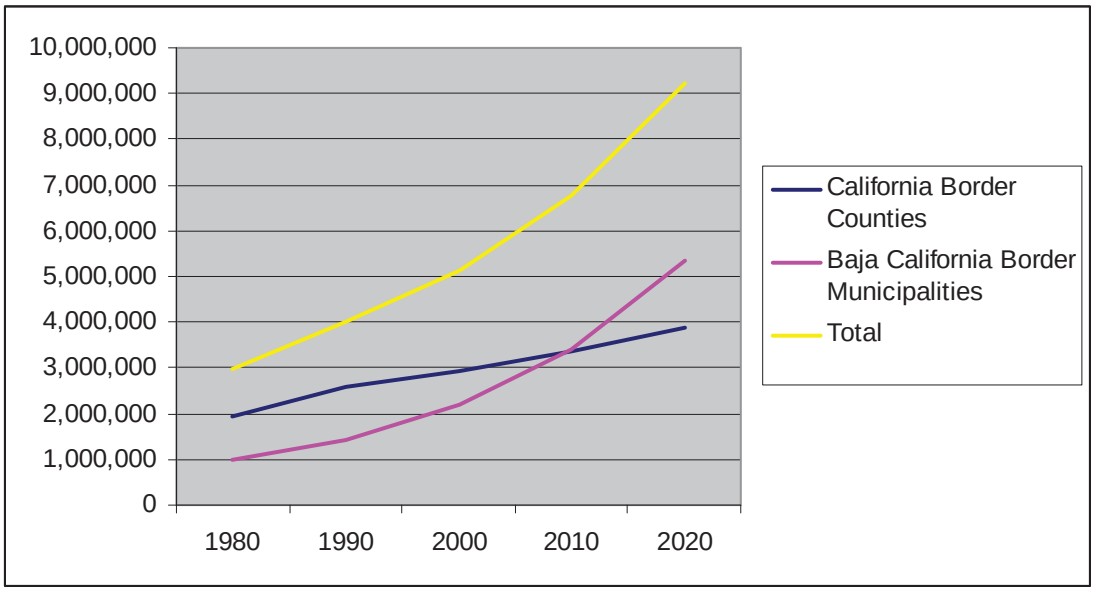
Map 1: The Greater California-Mexico Border Area

adds population equivalent to the total population of Tecate, or at least 80,000 people. Most of the population growth in the California-Mexico border region is related to its economic expansion since World War II. In recent decades, people from all over Mexico have migrated to the Baja California border region, attracted by the demand for low cost labor in neighboring California and the expansion of manufacturing in the *maquiladoras (*foreign-owned assembly plants along the border region in Mexico) in Baja California.

Table 1. Population Estimates for the California-Baja California Border Region, 1980–2020

Location	1980	1990	2000	2010	2020
California Border Counties	1,953,956	2,607,319	2,941,502	3,355,351	3,889,001
Baja California Border Municipalities	1,002,459	1,400,873	2,188,899	3,424,592	5,343,687
Total	2,956,415	4,008,192	5,130,401	6,779,943	9,232,688

Figure 1. Population Estimates for the California-Baja California Border Region, 1980–2020



Source: James Peach and James Williams, "Population and Economic Dynamics on the U.S.-Mexican Border: Past, Present and Future," in Paul Ganster, ed., *The U.S.-Mexican Border Environment: Road Map to a Sustainable 2020* (San Diego: SDSU Press and SCERP, 2000).

Economic Asymmetry

Although the United States' poorest region is its border area, even when including the more prosperous San Diego region,[2] Mexico's northern border is among its most prosperous, along with Mexico City, Guadalajara, and Monterrey. Nonetheless, the economic differences from north to south across the border are significant, particularly along the California-Mexico border. The minimum *hourly* wage in San Diego is roughly equivalent to the minimum *daily* wage in Baja California. The gross regional product of San Diego County is about 15 times larger than

that of Tijuana. In addition, the local government budgets of San Diego County total approximately 20 times that of the municipality of Tijuana.

Public Administration and Governance

Due to the rapidly growing population in the border region, demand for public services has increased as well. As large cross-border metropolitan areas emerge—such as San Diego and Tijuana—not only do economic linkages span the boundary, but also many environmental and social issues. These include water quality and quantity in the Imperial-Mexicali valleys as well as air quality problems in the shared air basin, binational conservation challenges in the San Diego-Tijuana-Tecate region, surface water quality issues in the San Diego-Tijuana area, border crime (auto theft, drug trafficking, arms smuggling, money laundering), and infectious disease flows such as tuberculosis and HIV/AIDS, to name a few. These issues and opportunities are best addressed through cross-border approaches implemented by California and Mexico government agencies at all levels. But, for a number of reasons, governmental cooperation on border problems is often lacking or inadequate.

Mexico and the United States are both federal republics, but Mexico is much more centralized with most of its power and wealth concentrated at the federal level. Although for the past several decades Mexico has been in the process of devolving government responsibilities to the state and municipal levels, the process has been slow, especially with regard to government funding.[3] In Baja California, the federal government still provides about 40 percent of local and state government budgets. Due to the rapidly growing cities where most of the urban expansion is unplanned, local government priorities are to provide basic services of electricity, water, and sewage collection and treatment. Solid waste has been a lower priority and only recently has attention been turned to its collection and construction of modern landfills. The control of the unauthorized disposal of solid waste, including waste tires, in the urban environment has historically been a low priority in Baja California and elsewhere in Mexico due to competing priorities.

The differences between U.S. and Mexico federalism mean that often California and U.S. government agencies do not have direct counterparts across the border. Local government in Mexico is organized on a territorial basis by municipalities, which are governed by a municipal president and council and include the urban areas as well as surrounding rural areas. This corresponds to the counties of California and incorporated cities within the boundaries of those counties. In Baja California, water and wastewater services are provided by a state government agency and in San Diego, these urban services are provided at the municipal level. For used and waste tires, the Baja California Secretariat of Environmental Protection (SPABC) has recently acquired responsibilities somewhat similar to those of the California Integrated Waste Management Board, although Baja California is still handicapped in its efforts by an inadequate and incomplete regulatory and legislative framework. Through the California EPA Border Environmental Program, these two agencies, then, have excellent opportunities for cross-border collaboration on matters related to used and waste tires.

In Mexico, there is no re-election of public officials at any level. Thus, there is turnover of elected officials every three years at the municipal level and every six years at the state and federal levels. Moreover, Mexico's public administration generally does not have the equivalent of civil service, which could protect technical and administrative staff from changes related to political pressures.

There could be continuity of employment even with shifts in political parties. Thus, with each change of elected officials, there is change of personnel that deeply affects the administrative structure of local, state, and federal agencies. While continuity and institutional memory between one administration and the next is improving, there are still problems. From the perspective of California elected officials, this turnover is problematic since personal relations have to be established with each new administration. Furthermore, viable programs are often dropped due to different priorities by newly elected and appointed officials.

Also complicating effective cross-border cooperation is the issue of resources and funds. Mexico's government agencies have very small annual budgets relative to counterpart agencies across the border. Thus, the ability of Mexico's local governments to fund and implement activities is often quite limited. While a California local agency might expect, for example, a regular inspection program of waste tire generators, implementation of a similar program in Mexico might simply be too expensive due to lack of personnel, equipment, and the inability of generators to comply with requirements.

Agencies in California also operate under conditions that do not foster effective binational operation. Turnover of elected and politically appointed officials, especially at the local and State levels, can disrupt and shift priorities for cross-border collaboration. State, local, and federal agencies in California are often prohibited by law from spending funds across the border in Mexico or decision makers are unwilling to authorize such expenditures.

According to the Board, "In California, in particular, there are constitutional restrictions that constrain spending tire fees outside the state. Generally a fee is imposed on every new tire sold in California. Tire fees may be used for purposes addressing a benefit associated with or a burden created by waste tires. Charges allocated to the fee must bear a fair or reasonable relationship to these benefits or burdens. Funding designed to address border projects must have a nexus (factual connection) between the activities to be funded and the impact within California that is being addressed, such as protecting the environment and the health and safety of the public."

Thus, agencies in California usually cannot transfer funds to Mexico for cooperative programs that would otherwise be cost-effective and also have positive impacts on California and its residents. California State regulations on foreign travel generally do not distinguish between a routine trip across the border to Tijuana or Mexicali for a two-hour meeting and attending an international conference in Paris, regardless of expense.

Border Trade

A sizable portion of the population of the California-Mexico border region is made up of individuals and families who often interact on both sides of the border.[4] They may work on one side of the border, but they also regularly purchase goods and services in the other country. Border consumers are a savvy group. As exchange rates fluctuate and pricing policies evolve, border consumers move back and forth to purchase goods and services at the best rate. Recently, in 2008, gasoline and diesel became less expensive in Tijuana than in San Diego, so consumers flocked to gas stations south of the border; when fuel prices dropped in California, the flow of consumers reversed.

Historically, there has been a strong demand by Baja California consumers for low-cost used goods from Southern California. This has included used building materials for self-constructed

housing, which is the origin of most housing in Tijuana, Tecate, Mexicali, San Luis Río Colorado, Ensenada, and other urban areas in the border region. Used clothing, appliances, and automobiles have also flowed in great numbers across the border to Baja California and beyond. Used tires have always been a component of this flow of used goods.

Until recently, the flow of used goods that included tires was relatively unimpeded. Baja California and Baja California Sur were so isolated from central Mexico and the country's economy that, for many decades, the peninsula was part of an economic free zone that allowed a relatively unrestricted flow of goods from the United States. With the implementation of the North American Free Trade Agreement beginning in 1995, Mexico's authorities began to impose restrictions on the flow of new and used goods across the border. However, among Baja California consumers, the pattern of buying and importing used goods from California continues at high levels.

The Tire Cycle: Dismount, Reuse, and Disposal

Large numbers of used tires are formally imported or informally transported each year from California into Mexico. Although Mexico's federal laws prohibit the importation of unusable or waste tires, anecdotal evidence suggests that some tires not suitable for reuse—according to California Vehicle Code specifications[5] —are occasionally included in used tire shipments going from California into Mexico. However, Baja California purchasers of used tires are unlikely to continue to buy used tires that do not meet minimum standards for resale from California sources. In other words, market forces intervene to assure that usable used tires flow across the border.

Mexico's federal government regulates used tire imports by establishing a yearly quota for the state of Baja California.[6] The only other border state with an import quota for used tires is Chihuahua. Until 1994, tire dealers from the state of Baja California Sur could import used tires as part of the global quota for the border free zone.

The formal importation of used tires as authorized by the annual quota is paralleled by the informal introduction of used tires into Mexico. Loads that lack the proper used tire import permits and customs paperwork regularly cross the border into Mexico, mainly in small quantities through the non-commercial lanes at the ports of entry. While the number of formally imported used tires into Mexico is determined by the annual quota, the total of the informal flow is difficult to estimate.

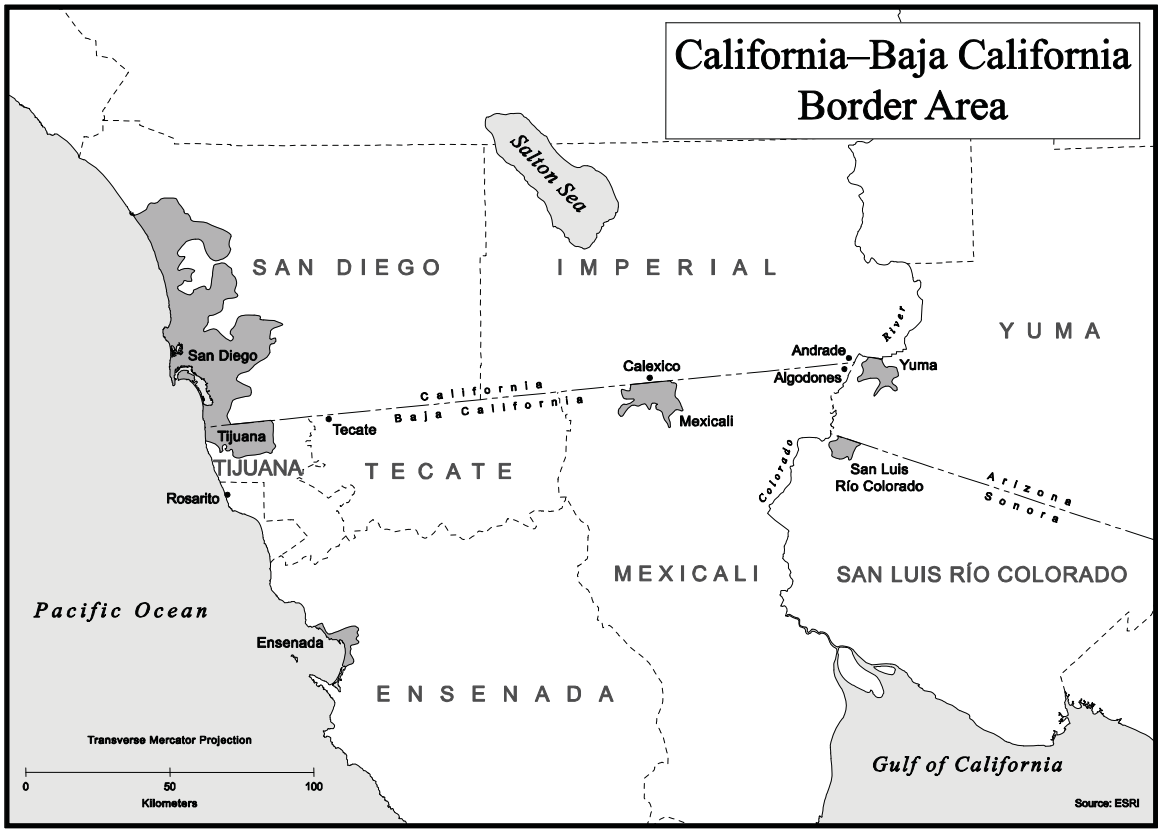
One of the principal objectives of this study is to estimate the number of used tires being transported from California into Mexico with or without formal authorization. Toward this end, the research team reviewed the published literature, collected data from official documents and databases, conducted interviews with U.S. and Mexico federal, state, and local officials, surveyed tire dealers, and participated in field observations in California and Mexico, among other activities.

The Dynamics of the Cross-Border Flow of Used Tires

The process by which waste tires are generated in California and then transported to Baja California to be resold as used tires is important for understanding the dynamics of the cross-border flow of tires in the region. In California, used and waste tires are generated mainly by two sources:

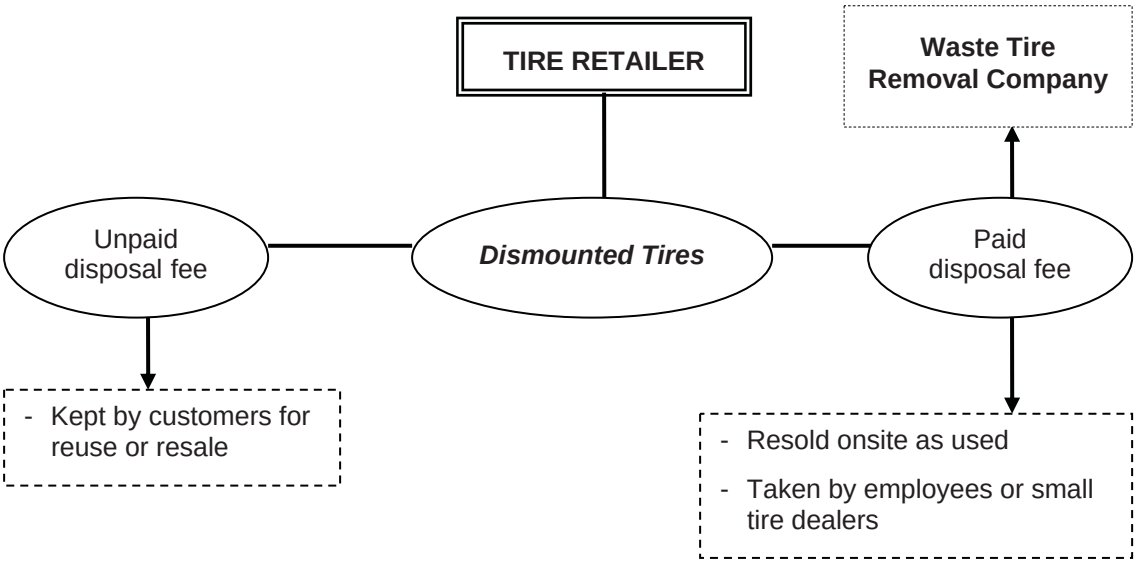
- Formal sources or established tire retailers, used tire dealers, agricultural industries, fleet vehicle departments of companies or public agencies, automobile wrecking yards, automotive and truck repair shops, and waste tire removal companies;
- Informal sources or unlicensed used tire dealers, swap meets, and employees and customers at tire retailers.

Map 2: California-Baja California Border Area



Formally established tire businesses in California dismount tires from a vehicle and store them for later disposal, contingent on the client paying the retailer a disposal fee, which ranges from $1.25 to $4 per tire. This fee is in addition to the mandatory California tire fee of $1.75 that is paid for each new tire purchased within the state.[7] However, customers are given the option of keeping their dismounted tires (also called take-off tires), often avoiding the retailer-imposed disposal fee. No formal records are kept on the number of tires that are retained for disposal by retailers or on the tires that are kept by customers after being dismounted.[8] Documentation of the number of waste tires begins when nine or more tires are picked up for transport to a disposal facility, either by a tire hauler or other business or individual with a tire hauler permit. Survey data produced for this study[9] indicate that some customers who purchase new or used tires in San Diego or the Imperial Valley elect to keep their take-off tires for other purposes and to avoid paying the tire dealer-imposed disposal fee.[10] Tire retailers in San Diego and Calexico located close to the border report that many of their customers keep their old tires for personal reuse or resale.[11] Many of these customers are from Baja California. Figure 2 illustrates the initial phase of the waste tire cycle.

Figure 2. Initial Phase of the Tire Flow Process



After waste tires are generated, the next step in the process occurs when tire removal companies, tire recyclers, and other authorized tire haulers in California pick up the stored waste tires from the tire retailer. If tire retailers store tires for more than 90 days or accumulate more that 500 tires at any time, they are required to apply for a Minor Waste Tire Facility Permit and meet its requirements. Many generators do not have a large amount of storage space and do not wish to apply for the additional permit. So, the take-off tires are removed by tire hauling companies frequently, usually on a weekly, biweekly, or monthly basis. These companies charge the tire retailer a disposal fee that ranges from $1.25 to $1.75 per passenger vehicle tire. The fees for oversized tires (truck and tractor tires) range from $4 to $20.[12] A number of surveyed tire retailers said that some waste tire removal companies charge $175 per ton of waste tires, which is roughly 100 passenger vehicle tires. Several small shops take their own waste tires to waste tire transfer stations, recycling centers, or landfills.[13] Tire retailers, as noted previously, had already charged their customers this disposal fee along with the mandatory California tire fee for new tires purchased. In this way, various tire retailers in California pass the disposal cost of waste tires to their customers.

Some tire retailers reportedly collect the disposal fee and then, during the period when tires are stored on-site, reduce the number of reusable tires before waste tire removal companies or tire recyclers pick them up.[14] According to survey information, tire retailers resell some reusable tires or simply let their own employees and/or other small used tire dealers take them.[15]

In general, waste tire removal companies provide continuity to the tire flow as wholesalers of used tires. These companies pick up reusable and waste tires from generators and sort them for redistribution, including reuse as used tires or diversion for productive end uses. Waste tire removal companies sell reusable tires to established used tire retailers and distributors in California, Mexico, and elsewhere. They also divert unusable tires for productive end uses, or transport them for final disposal at landfills or monofills.[16] Some California and Mexico used tire distributors also sell used tires to smaller tire dealers on both sides of the border, primarily in Baja California.[17] In some cases, waste tire removal companies or other commercial freight companies deliver the used tires directly to California and Baja California used tire retailers. Figure 3 illustrates this process.

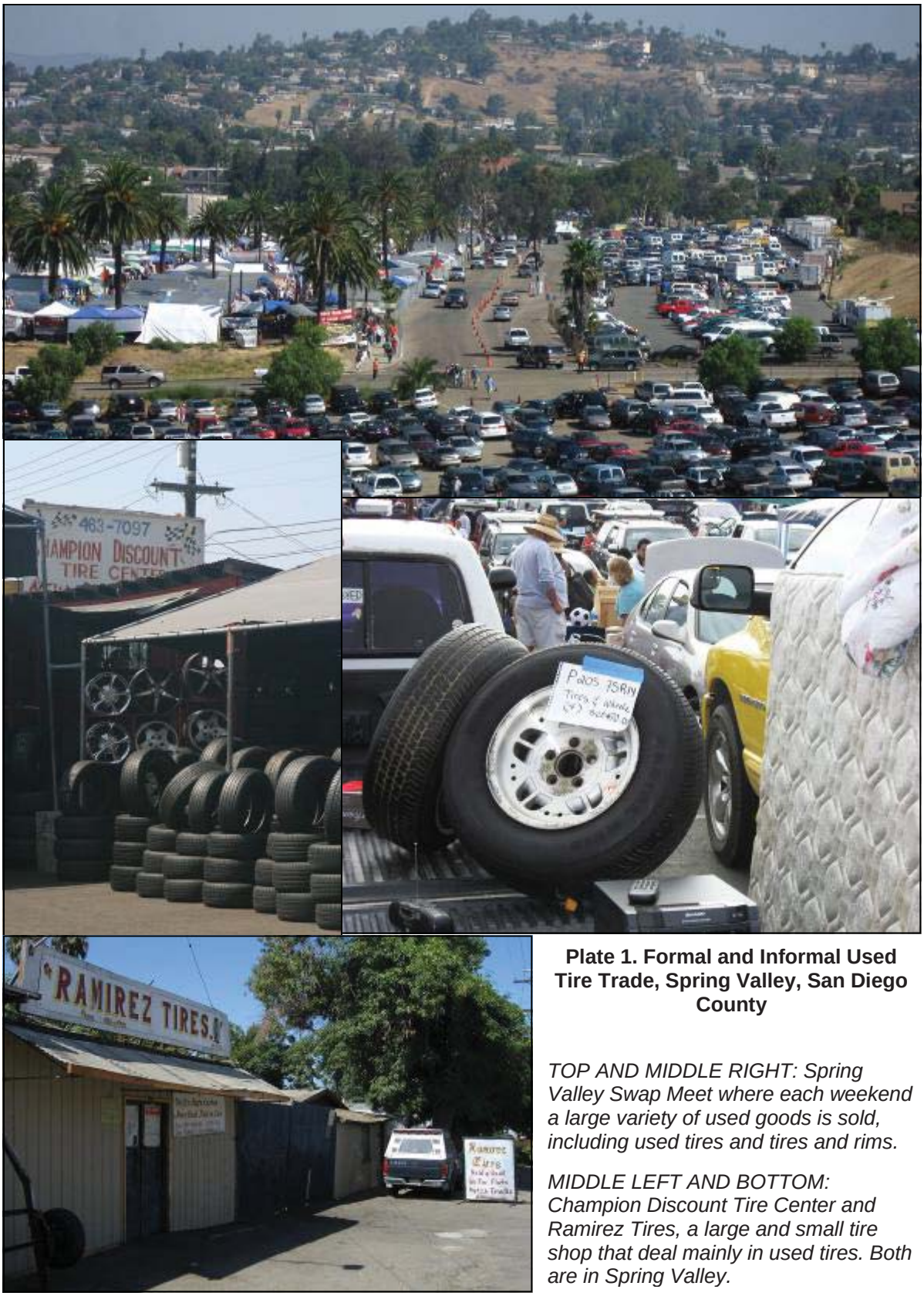
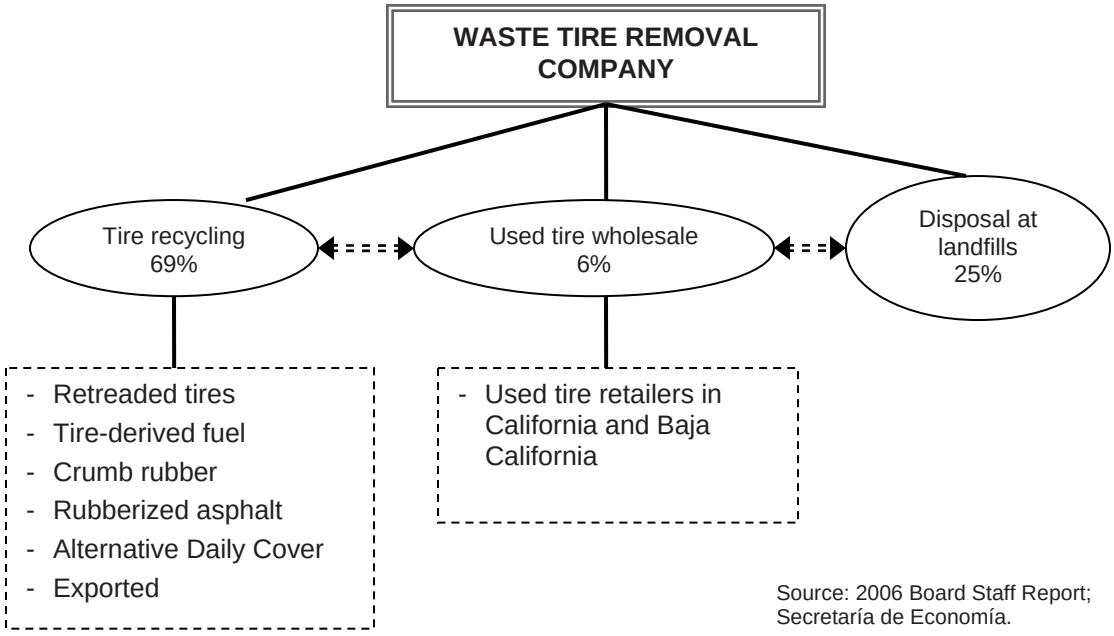


Plate 1. Formal and Informal Used Tire Trade, Spring Valley, San Diego County

TOP AND MIDDLE RIGHT: Spring Valley Swap Meet where each weekend a large variety of used goods is sold, including used tires and tires and rims.

MIDDLE LEFT AND BOTTOM: Champion Discount Tire Center and Ramirez Tires, a large and small tire shop that deal mainly in used tires. Both are in Spring Valley.

Figure 3. Intermediate Phase of the Tire Flow Process



Source: 2006 Board Staff Report; Secretaría de Economía.

It is important to note that the majority of used tire distributors and used tire retailers operate within the legal framework of their place of business, whether in California, or Mexico, or both. However, as it will be explained in the following sections of this report, there is also an informal tire trade that accounts for a substantial number of used tires flowing from California into Baja California.

The only record of unpermitted tire haulers is from occasional enforcement actions carried out by the California Highway Patrol or other local enforcement agencies. Pickup and larger trucks with racks and piled high with used tires once were a common sight on streets and highways near the border. Many or most of these were informal, unpermitted businesses or individuals taking used tires to Mexico, primarily through the non-commercial lanes at the ports of entry. Through the Board's enforcement efforts, in cooperation with the California Highway Patrol and local enforcement agencies, obvious unpermitted large tire haulers in open trucks have largely disappeared. Instead, enclosed trucks, trailers, and vans are used to move waste tires without permits.

Waste tire facilities are prohibited by California law to give or sell reusable tires to unpermitted tire haulers. However, unregistered haulers do transport used tires within California and into Mexico without the proper California permits and often without permits from Mexico. According to some estimates by Baja California federal, state, and municipal environmental officials, the number of reusable tires informally brought into Mexico equals or even exceeds the legally authorized used tire importation quota.[18] Mexico's Customs officials claim that the environmental officials' estimates are inflated and based mainly on anecdotal information or inadequate data.[19] The present study likewise concludes that the illicit flow size is exaggerated for reasons that are detailed later in the report. Whatever the size, control of the informal flow is a matter of concern for officials in both countries.

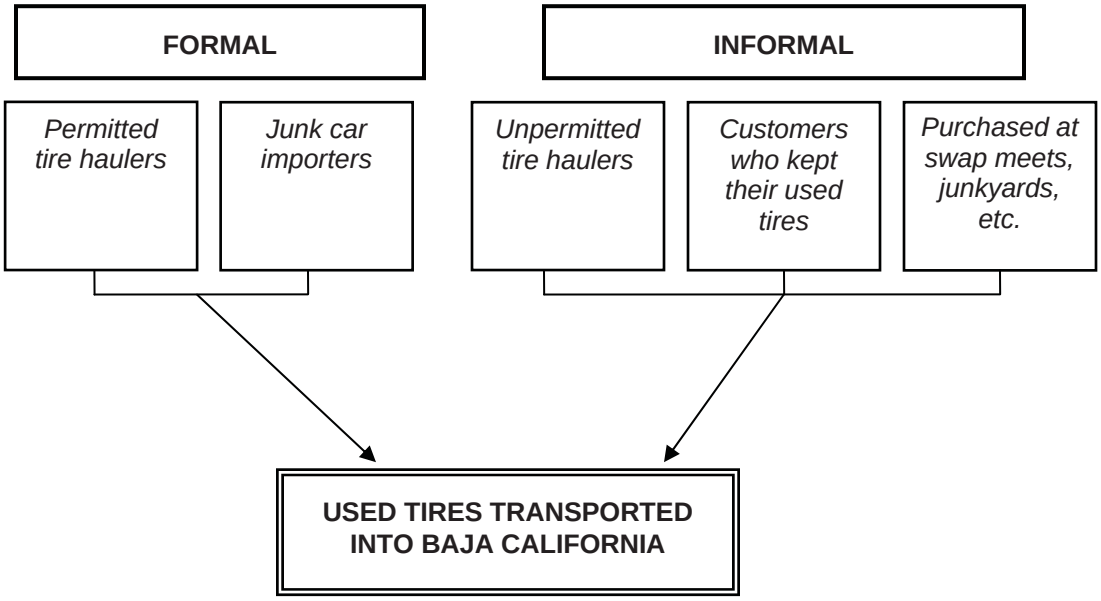
Plate 2. Used and Scrap Tire Enforcement Actions, Imperial Valley

TOP: Calexico, transferring used tires from a semitrailer for transport across the border in the van, most likely through the non-commercial lanes at the port of entry. December 2007.

BOTTOM: CHP traffic stops in the Imperial Valley occasionally encounter vehicles transporting tires without the Board-issued tire hauler permit. January 2007.

The tires that are dismounted in California retail stores, but kept by Baja California customers, represent a portion of the waste tires transported into Mexico without import permits.[20] These customers may decide not to pay a disposal fee to tire retailers and take their dismounted tires back to Mexico. Others might purchase their tires from other types of California tire vendors, such as at swap meets, from junk yards, and from other occasional used tire sellers, that do not offer tire disposal services.[21] As a result, take-off tires in California—whether reusable or not—that are kept by customers residing in Baja California, account for a small but steady flow of informally transported tires back into Mexico. It should be noted that there are at least 60,000 workers who reside in Baja California and regularly commute to work in California. In addition, thousands of Baja California residents cross daily or frequently to shop or visit with friends or relatives in California. These people also transport some reusable tires into Mexico. Every year, tens of thousands of unserviceable automobiles and light duty trucks and vans are imported into Baja California for dismantling. The environmental secretariat of Baja California estimates that these scrap vehicles have at least 80,000 tires and the usable tires from these scrapped vehicles enter the used tire market in Baja California.[22] Figure 4 shows the formal and informal sources of used tires transported from California into Baja California.

Figure 4. Final Phase of the Tire Flow Process



Used tires also flow through California into Mexico from other U.S. states or foreign countries. For instance, waste tire haulers or trucking companies from Oregon, Utah, Nevada, or Arizona apparently transport used tires through California into Mexico. Survey data indicate that some Baja California and San Luis Río Colorado used tires dealers acquire their supplies from Las Vegas.[23] The Arizona Department of Environmental Quality estimated in its Waste Tire Report for FY 2002 that one waste tire removal company transported 600,000 dismounted tires from Arizona into California per year, of which around 150,000 were destined for resale.[24] This is a significant addition of both waste and used tires to the California market and also possibly to the Baja California and Mexico market from neighboring states through California. According to the

California Public Resources Code, if the dismounted tires pass through California without being unloaded within the state, the haulers are not required to register and the tires need not be manifested.[25] The research team contacted representatives from out-of-state waste tire management agencies to determine the size of this flow; however, the results indicate that most neighboring states do not keep estimates of used tire resale or exports.[26]

Along with the used tire flow from the United States, Baja California experiences the normal local waste tire generation that results from the purchase of new and used tires within Mexico. Data on annual new tire sales in Baja California are not available from official government sources and new tire trade groups do not release sales data for new tires for Baja California. However, in a March 2008 meeting presentation, the Baja California environmental protection agency estimated that new tire sales were 500,000 units per year, including new tires purchased in California and those purchased from Mexican tire distributors.[27] This number of new tires sold annually over a period of years would produce a significant number of used and waste tires per year. Baja California auto dismantlers, junk yards, and agricultural activities also generate numbers of waste tires locally. While the waste tire problem in Baja California and adjacent areas of Mexico is exacerbated by the cross-border flow of used tires from California and elsewhere in the United States, locally generated waste tires contribute to the overall problem.

Recommendations

This section provides recommendations regarding changes to the current California and Baja California waste tire policies, laws, regulations, programs, and procedures in order to improve waste tire management efforts in the California-Mexico border region. These recommendations are based on the information, analysis, and findings of this tire flow study. A key component of this study is to provide decision makers with reliable data and information to support determination of appropriate policies and actions to address health, safety, and environmental issues in the border region caused by California used tires that are exported to Mexico. The underlying assumption of the study and recommendations is that the accumulation of waste tires in Baja California impacts both sides of the border and that it is a regional problem that requires regional solutions. A related assumption is that resolution of the waste tire problem in Baja California will help avoid disruption of a valuable export market for California companies and also a large increase in the number of waste tires for which California must provide final disposition. One obstacle that California faces with cooperating across its borders with neighbors is the limitation on expenditure of funds outside of state. In California there are constitutional restrictions that constrain spending tire fees outside the state. Generally a fee is imposed on every new tire sold in California. Tire fees may be used for purposes addressing a benefit associated with or a burden created by used tires. Charges allocated to the fee must bear a fair or reasonable relationship to these benefits or burdens. Funding designed to address border projects must have a nexus (factual connection) between the activities to be funded and the impact within California that is being addressed, such as protecting the environment and the health and safety of the public.

It is important to take into account that the waste tire problem in the border region is binational in its origins. Thus, sustainable and cost-effective solutions can best be developed through joint efforts of California and Baja California in concert with their federal governments and with the support of local governments and other stakeholders. In that light, these recommendations are grouped into three broad categories: (1) actions that the Board might implement within California; (2) initiations that Baja California might pursue; and (3) enhanced cross-border cooperation on tire-related activities and programs.

1. Actions that the Board might initiate.

These include the following:

a. Strengthen the California tire tracking system so that it is possible to quantify the numbers of used tires flowing from California and through California and into Baja California. Most important is to eliminate gaps in the current system so that used tires can be tracked from point of origin to ultimate disposal, including formal and informal export to Mexico.

b. Develop arrangements with neighboring U.S. states to track tire shipments that originate outside the state but are transported into Mexico through California ports of entry.

c. Work with U.S. Customs and Border Protection to obtain regular data on California used tire exports to Baja California through the commercial facilities at Otay Mesa, Tecate, Mexicali, and Andrade.

d. Work with U.S. Customs and Border Protection and the California Highway Patrol at the occasional south-bound vehicle inspections to develop specific data on small, informal exporters of used tires.

e. Continue to support the waste tire enforcement capabilities of local and state agencies to eliminate improper transportation, storage, and dumping of used and waste tires.

f. Continue with its analysis of satellite imagery in the border area to identify likely sites of clandestine tire dumps. The initial analysis project, an effort of the Board and San Francisco State University, had very promising results.

2. Initiatives that Baja California might pursue.

These include the following:

a. Continue to develop the monofill in the Mexicali region in order to provide a safe and secure site for ultimate disposition of waste tires from throughout the state.

b. Share data with the state of California on the annual import quota, the actual number of imported used tires, and the authorized tire importers.

c. Work with California and the border region private sector to develop sustainable markets for tire-derived products.

d. Expand regulations and enforcement for proper waste tire disposal to include all tire generators in the state of Baja California.

3. Enhance cross-border cooperation on tire-related activities and programs.

This applied research project recommends that the Board should increase activities to enhance cross-border cooperation with Mexico and Baja California agencies on matters related to used and waste tires. These recommended initial activities relate to improving mutual understanding between the Board and its counterpart agencies in Mexico, sharing of information and expertise, and confidence building. A second stage of cooperation could include a number of specific activities and programs in the border region.

a. **Specific recommended initial activities include the following:**

- Information exchange workshops for the Board and its counterparts in Mexico, especially the Secretariat of Environmental Protection of Baja California (SPABC). These should include presentations on Baja California and California legislation, regulations, enforcement, and data regarding used and waste tires. Specialized workshops should address specific issues such as dealing with tire fires, proper storage techniques, managing final disposition of waste tires, and so forth.

- Personnel exchange. One or more Board staff should be detailed to the Secretariat of Environmental Protection in Mexicali or to local or federal agencies in Mexico to develop in-depth knowledge of the agency and its work on waste tire issues. The Board should also host Mexican agency personnel exchanges for extended periods of time.

These exchanges could occur under the recently signed Memorandum of Understanding between California agencies and Mexico's federal Secretariat of the Environment and Natural Resources (SEMARNAT).

- Based on information exchange workshops and personnel exchanges, the Board and its counterpart agencies in Mexico should initiate regular data sharing related to the cross-border tire flow. Examples of data that might be exchanged include:
    - The Board could provide the Baja California Secretariat of Environmental Protection (SPABC) with information from the tire hauler manifests.
    - The Board could work with U.S. Customs and Border Protection to obtain used tire export data from California ports of entry into Baja California, which would be helpful in tracking authorized shipments.
    - The Board could work with the relevant federal, California, and neighboring state agencies to track used tire shipments that originate outside of California and are exported to Baja California through California ports of entry. Currently, these shipments do not require a waste tire hauler permit from California and thus are not recorded.
    - The Board could work with the responsible parties in California and Baja California to monitor and ensure that only quality used tires are sold for export to Mexico, thus reducing the number of waste tires entering Mexico.
    - Mexican agencies could share information with the Board on annual quotas for used tire imports, actual used tire imports, and authorized tire importers.
    - The Board and agencies in Mexico could share data on enforcement actions regarding used or waste tires when relevant to the cross-border flow.
    - The Board could work with U.S. and Mexican agencies to make possible the import and export of waste tires and products including rubber chips and crumb rubber that are linked to trade, manufacturing, and business development efforts.

While California and Mexico's regulatory and institutional frameworks are fundamentally different, the cooperation and exchanges previously outlined should provide the basis for better understanding barriers and opportunities for creating improved cross-border cooperation to serve both California and Baja California border communities.

b. Specific activities and programs in the border region and Baja California. Since the flow of used tires is a regional and binational issue, to be most effective at addressing the problem, the Board should be able to engage in activities on both sides of the border. The enhanced cross-border cooperation on tire flow issues can be coordinated directly with Mexican agencies or through the Border Governors Conference, through the Border 2012 process, or through the Border Environment Cooperation Commission providing appropriate state, federal, and bilateral agency support. There is ample precedence for U.S. federal and state level agencies engaging actively with border issues, including eagerly participating in projects in Mexico. For example, USEPA provides funding for projects in Mexico, both through the International Boundary and Water Commission and through the binational Border Environment Cooperation Commission. For some projects involving business development and affordable housing development in Baja California, the United States Agency for International Development in Mexico is a possible

partner. California state agencies including the Air Resources Board, Cal/EPA, and Health and Human Services have many years of working with counterpart agencies in Mexico and in supporting border-related activities in both countries.

Opportunities for Board cooperation with Baja California agencies that will have positive impacts on California are many. However, given the current state of technology and likely uses for large numbers of waste tires, two areas stand out. These are:

- **Rubberized asphalt paving**. Work with California and Mexican companies, Mexican agencies, USEPA, and the Border Environment Cooperation Commission to build capacity for use of crumb rubber asphalt in paving projects in Baja California border cities. Baja California companies do not have the equipment required for rubberized asphalt paving or for the production of crumb rubber. Baja California government agencies find the higher initial cost daunting for installing rubber asphalt paving. An important part of this effort should be to identify innovative and practical financing mechanisms to offset the higher initial costs of asphalt paving. The Board could consider facilitating this process through subsidies or incentives that would have positive business development impacts on California companies. Or, the Board could transfer funding to Baja California agencies or companies by working with the binational Border Environment Cooperation Commission. The Board would thus contribute to sustainable end uses of waste tires in Baja California, thereby reducing the negative impacts of improper storage and disposal of tires in the California border area. Paving in Baja California border cities would also reduce particulate matter generated by vehicular traffic on unpaved and deteriorated roads and would improve regional air quality for the binational border area.

- **Waste tires for construction and civil engineering**. Large numbers of waste tires are used as a free- or low-cost building material by homeowners or neighborhood associations in urban areas of Baja California. However, many of these local informal projects are completed without appropriate guidelines or standards and, consequently, are subject to failure, particularly during and after the typical intense winter storms. In Tijuana, tires from the failed structures wash down the canyons and end up in the Tijuana Estuary in California, most often buried in sediment. The Board could play an important role in fostering the correct use of waste tires for formal and informal construction projects in Baja California. The Board could support development of technical and engineering standards, building codes, and practical training and information for use of waste tires in self-constructed projects. These could include retaining walls, stairways, energy efficient affordable and sustainable housing, and formal civil engineering applications. This could be accomplished through participation of Mexico's universities (engineering, architecture, and energy areas) and their U.S. counterparts, professional associations, and Mexico's local and state governments. It would be useful to fund demonstration pilot projects through involvement of California companies or agencies with Baja California agencies, developers, and community groups. Proper standards and guidelines in combination with demonstration projects should increase the safe and effective use of waste tires in the self-constructed housing movement in Baja California.

Baja California Waste Tire Disposal Site. Subject to the funding restrictions imposed by California law, the Board has an opportunity to cooperate with Baja California authorities to help with the start up and ongoing operations of a new waste tire disposal site in the Mexicali region. This could be accomplished through long-term loans of necessary equipment such as trucks and

baling machinery and supplies, provision of technical training and maintenance service, and so forth. Finally, California and Baja California should explore innovative private sector initiatives for regional, transborder programs that will use significant numbers of waste tires in beneficial ways. Transborder projects can take advantage of the regional, binational waste tire generation, providing adequate numbers of tires for large-scale projects. Transborder business development projects can take advantage of lower cost labor in Mexico and advanced technology and capital resources in California. To some extent, this is the same business model as in the successful *maquiladora* industry.

Endnotes

[1] A recent survey of the border region and its contemporary issues in: Paul Ganster and David E. Lorey, *The U.S.-Mexican Border into the Twenty-First Century*, Rowman & Littlefield Publishers, Inc., Lanham, MD, 2008.

[2] "At the Crossroads: US / Mexico Border Counties in Transition," US / Mexico Border Counties Coalition, El Paso, TX, March 2006, pp. 4-1.

[3] A useful overview of governance in Baja California is: Tonatiuh Guillén López and Glen Sparrow, "Governance and Administrative Boundaries," in Paul Ganster (ed.), *San Diego-Tijuana International Planning Atlas*, San Diego State University Press, San Diego, CA, 2000, pp. 41–47.

[4] A useful typology of U.S. and Mexican border residents, people who regularly cross the border is presented in: Oscar J. Martínez, *Border People: Life and Society in the U.S.-Mexico Borderlands*, University of Arizona Press, Tucson, AZ, 1994.

[5] The "California Vehicle Code," Division 12, Chapter 5, Article 4, Section 27465, establishes that no tire dealer should sell, offer for sale, expose for sale, or install on a vehicle a tire when it has less than four thirty-second (4/32) of an inch tread depth at all points in all major grooves on the steering axle of any motor vehicle.

[6] Every year since 1991, the Mexican Federal government has issued a decree that establishes a yearly used tire importation quota for the state of Baja California.

[7] California Public Resources Code, Division 30, Chapter 17, Article 5, Section 42885.

[8] Small tire businesses need not have a waste tire facility permit as long as they do not store tires for more than 90 days or accumulate more than 1,500 waste tires at any one time according to: "California Public Resources Code," Division 30, Part 3, Chapter 16, Article 1, Section 42808.

[9] The terms "survey data" and "survey information" refer to the results of survey research conducted for this study. For more information see Appendix C.

[10] Data from San Diego and Imperial Valley Tire Dealers Survey, 2006-2007.