

# Appendix U14

## Borders

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# Borders

## Introduction

The San Diego region's borders have traditionally been thought of as limited to the jurisdictional boundaries of San Diego County; however, over the years, our perceived borders have expanded. San Diego County increasingly has close ties to its neighboring counties, the Republic of Mexico, and the 18 tribal governments that are sovereign nations within our region. For this reason, SANDAG created the Borders Committee in 2001 to bring together elected officials and representatives from San Diego, Orange, Riverside, and Imperial counties; the Southern California Tribal Chairmen's Association; and Mexico in order to address joint challenges and opportunities related to regional planning.

SANDAG and partner agencies collaborate within a geographic area that encompasses San Diego, Orange, Riverside, and Imperial counties, the 18 sovereign tribal nations, and the Tijuana–Tecate–Playas de Rosarito metropolitan zone in northern Baja California (see Figure U14.1).

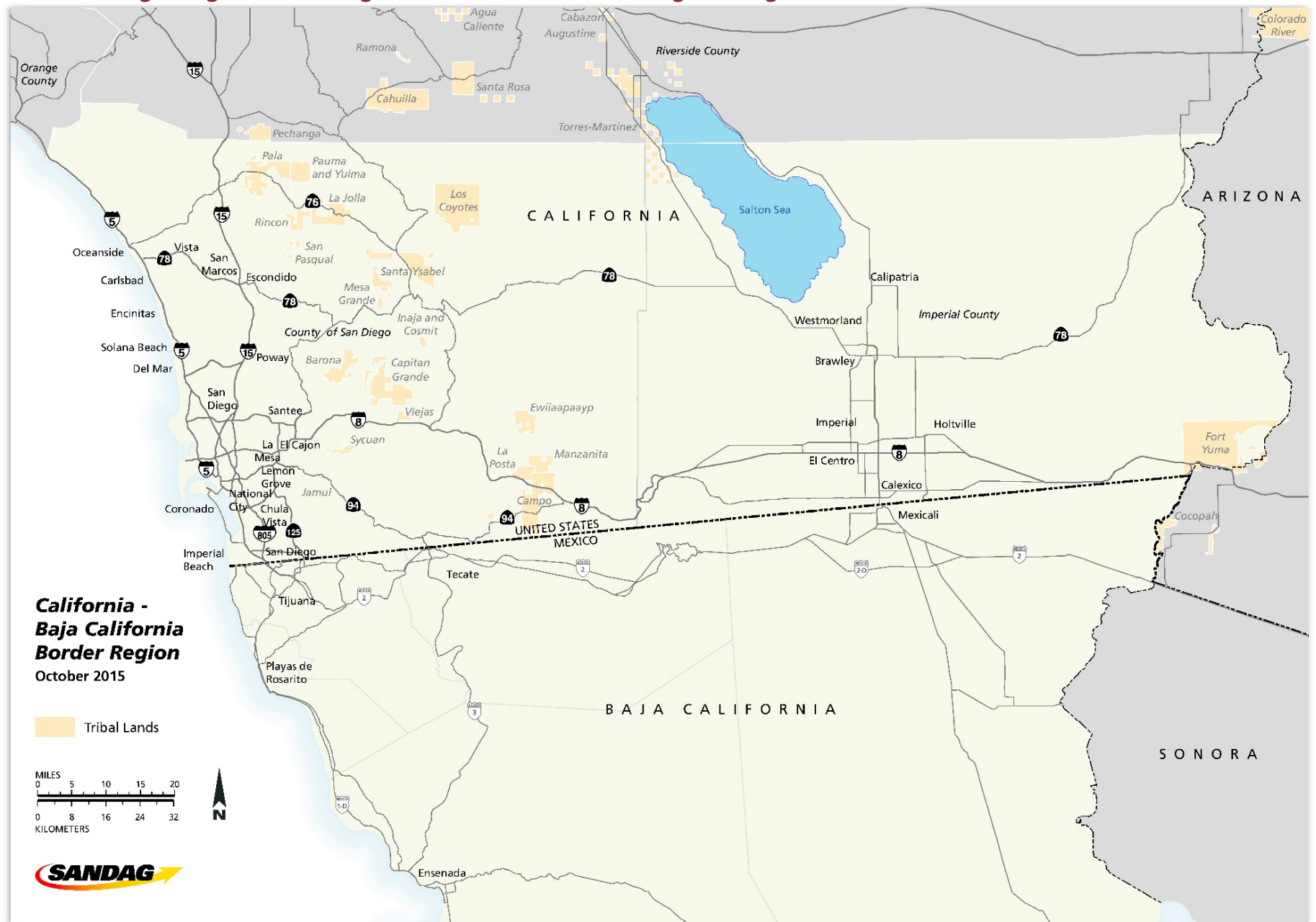
This focus on collaboration across jurisdictions and even international boundaries is consistent with the growing trend of the megaregion, which groups metropolitan zones into a combined geographical area based on interdependent relationships. Megaregions are characterized as a network of urban clusters and their surrounding areas connected by the existing economic, social, and infrastructure relationships, which are characteristic of the binational San Diego–northern Baja California region. Developing and marketing megaregions is an emerging approach to not only allow for a coordinated methodology to implement effective planning on an extended geographical scale, but also for increasing and leveraging the global competitiveness of a greater metropolitan area.

The San Diego region is included in the California megaregion, which consists of five important metropolitan areas in terms of freight movement (Los Angeles/Long Beach, Sacramento, San Diego, and San Francisco/San Jose (Bay Area) in California as well as Las Vegas, Nevada). The four Californian metropolitan centers are located on or near the Interstate 5 (I-5) corridor.<sup>1</sup>

With the rise in the last several years in interregional and international commuting, goods movement, and linked industries, the San Diego–northern Baja California region is not only an increasingly important and interdependent trade and commuting corridor but has become an important binational megaregion with a distinct globally competitive advantage. In fact, the Cali-Baja Binational Megaregion Initiative encompasses the entire California–Baja California border region (San Diego and Imperial counties and the State of Baja California in Mexico) as a globally unique and economically competitive binational region.<sup>2</sup>

Through collaborative efforts, the Borders Committee tackles a number of significant issues facing the region and its neighbors. It provides oversight for planning activities that impact the borders of the San Diego region (Orange, Riverside and Imperial counties, and the Republic of Mexico) as well as government-to-government relations with tribal nations in San Diego County.

**Figure U14.1**  
**The San Diego Region, Sovereign Indian Nations, and Neighboring Areas**



Source: SANDAG, 2015

## **Crossborder Purview**

The activities of the Borders Committee are considered from three perspectives: (1) the binational perspective with relation to our international border with Mexico; (2) the interregional perspective regarding issues with our Orange, Riverside, and Imperial County neighbors; and (3) the perspective of government-to-government collaboration with tribes within San Diego County boundaries, which are part of the region but are also sovereign nations, and thereby best discussed in the Borders context. This Appendix focuses on these three perspectives in regard to specific current border-related issues.

In 2004, the Borders Committee identified six critical planning areas around which to focus its collaborative efforts: (1) jobs/housing accessibility; (2) transportation; (3) energy and water supply; (4) environment; (5) economic development; and (6) homeland security. These six issue areas serve as the focus of this appendix. Subsequent focus areas added more recently include climate change collaboration, active transportation, and public health.

## **Existing Setting**

The San Diego region occupies a unique geographic position. Our boundaries are defined by mountains, deserts, and the Pacific Ocean as well as the growing counties of Orange, Riverside, and Imperial and the U.S.–Mexico border. Within our boundaries, we also have 18 federally recognized sovereign tribal nations with jurisdiction over 19 reservations and several military installations, including Marine Corps West Installations (Camp Pendleton and Miramar) and Navy Region Southwest (including Naval Bases San Diego and Coronado).

The region features diverse landscapes, politics, economics, languages, and culture. Therefore, it behooves us to make every effort to understand and consider not just our own future but also that of our geographic neighbors.

## **Binational Perspective**

Our regions are linked socially and economically, as demonstrated by the quantity of goods, services, and people that flow across our borders on a regular basis. Otay Mesa, our region’s main commercial port of entry (POE), is the third-busiest commercial crossing in trade value on the U.S.–Mexico border and ranks second for the greatest volume of truck crossings.<sup>3</sup> The passenger POE at San Ysidro is the busiest international land POE on the U.S.–Mexico border and one of the busiest in the world. In addition, the San Diego region imports about 85 percent of its energy and approximately 75 percent of its water each year<sup>4</sup> while sharing delivery systems for these resources with our neighbors to the north, east, and south. Therefore, infrastructure that crosses our boundaries, such as roadways, POEs, energy transmission lines, and water delivery systems, are issues of joint concern.

How we grow inevitably affects those around us, just as growth around us affects our region. Between 2010 and 2018, San Diego County’s estimated average annual population growth rate of 0.94 percent was above the U.S. national average of 0.70 percent and below Mexico’s national average of 1.24 percent. Simultaneously, Tijuana’s population grew at a rate of 1.52 percent; Tecate’s at 1.41 percent; and Playas de Rosarito’s at 2.11 percent. The growth along the northern Mexican border remains high even after a more significant population boom seen in the decade prior.<sup>5</sup>

With a current combined border population of 7.2 million in San Diego and Imperial counties and the municipalities of Baja California that include Tijuana, Tecate, Playas de Rosarito, Ensenada, and Mexicali, the region is projected to add 1.7 million by 2040.<sup>6</sup> Our binational border region also faces a number of challenges. Among these challenges are the issues of long border-crossing wait times, water quality and supply, energy supply, air quality, habitat preservation, natural disaster and emergency preparedness and response, and border enforcement. Since the terrorist events of September 11, 2001, crossborder issues have tended to be addressed with a heightened sensitivity to national security. Today, stakeholders on both sides of the border are collaborating to address these challenges in our border region in order to ensure a prosperous future by maintaining security at our international border while still providing for the efficient flow of people and goods.

## **Interregional Perspective**

Growth in our neighboring counties is also a key factor when considering impacts to our local systems. Between 2010 and 2018, Riverside County's average annual population growth rate was almost double the U.S. national average of 0.7 percent. San Diego County's growth was about one-third higher, Orange County's growth was on par, and Imperial County's growth rate was slightly below the national average over the same period.<sup>7</sup>

Population growth increases the demand for local and imported resources, such as water and energy; creates a need for more infrastructure, such as housing and roadways; and places increasing pressure upon the natural environment. How we plan to meet these demands will affect those around us and vice versa. Coordinated interregional and intergovernmental planning is needed to alleviate potential conflicts, promote collaborative solutions, and protect the overall quality of life in our region.

## **Tribal Perspective**

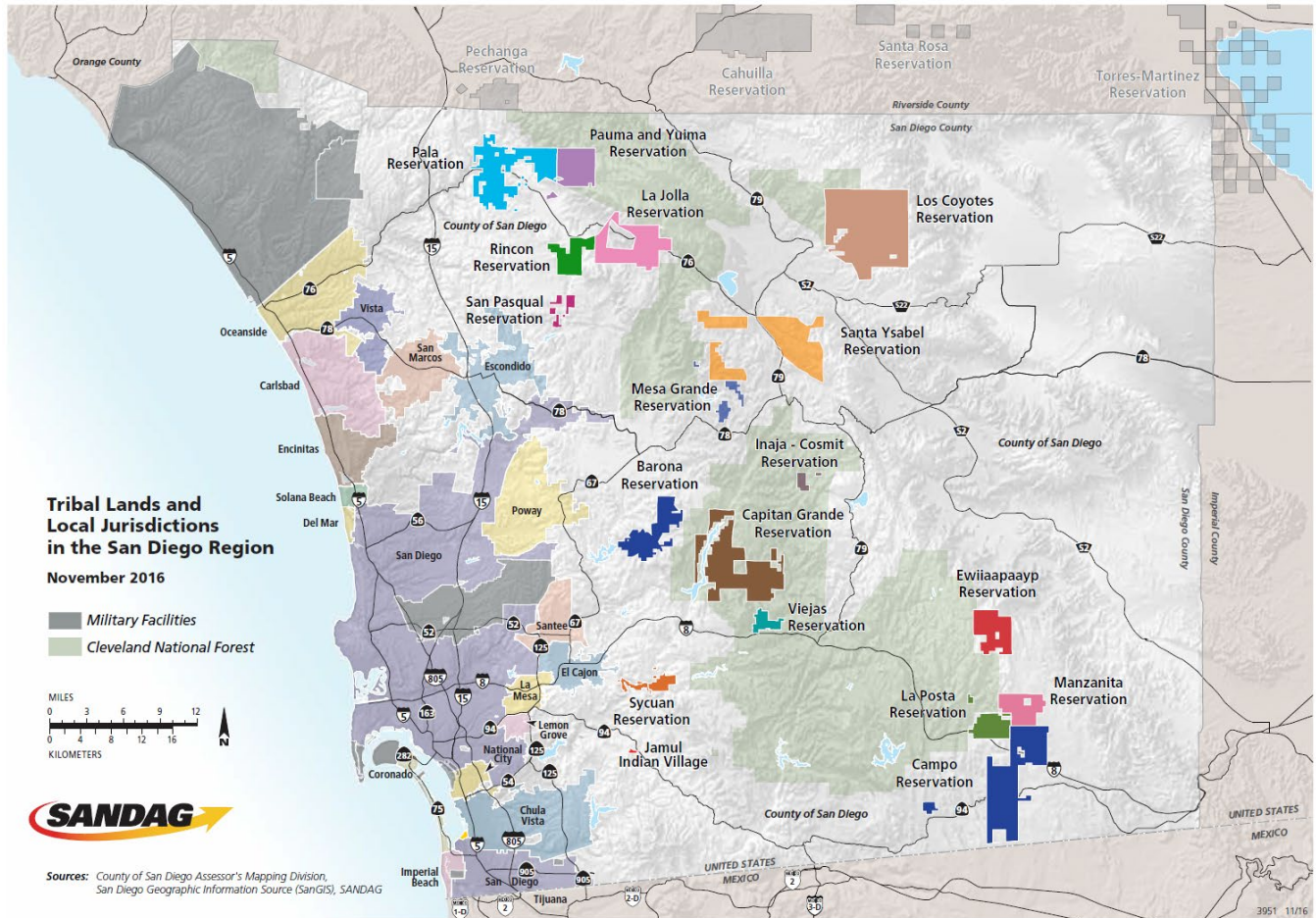
The region is home to 19 Native American reservations represented by 18 tribal governments,<sup>8</sup> the most in any county in the United States (see Figure U14.2). Reservations have generally been established by Executive Order, and most of the land within the boundaries of reservations is owned by tribes and held in trust by the federal government. Native American reservations currently cover more than 127,000 acres, or approximately 4 percent of the region's land. Four tribal groupings make up the indigenous peoples of San Diego County: (1) the Kumeyaay/Diegueño, (2) the Luiseño, (3) the Cupeño, and (4) the Cahuilla.

The U.S. Constitution and treaties recognize Native American communities as separate and independent political communities within the territorial boundaries of the United States. Tribes are subject to federal regulations but are not subject to local or state regulations unless the U.S. Congress delegates implementation of federal law to the state. Tribal governments operate much like those of local jurisdictions. In addition to the standard governmental functions of regulating, taxing, and delivering services, tribal governments act to preserve and protect tribal culture and the tribal community. Tribal governments are also responsible for the development, management, and operation of tribal economic enterprises.<sup>9</sup>

A number of planning issues surround these reservations. Reservations in San Diego County are typically in remote areas. Inadequate access to and from the reservations often results in a lack of employment opportunities as well as insufficient health, social, and cultural services. In the 1990s, 14 of the tribes developed agreements to develop gaming facilities as a means of economic development. Today, ten tribes have functioning gaming facilities, giving San Diego County the greatest number of Indian gaming facilities in California. Gaming-related and other types of development have led to rapid economic growth for these tribes while also providing jobs and stimulating the regional economy. This growth has been accompanied by increases in traffic, jobs–housing accessibility issues, and the need for additional resources such as water and energy. Those tribes that do not have gaming facilities continue to have economic development, transportation, and infrastructure needs. For more than a decade, SANDAG has developed a government-to-government framework for working with the region's tribal nations through a successful partnership approach. The tribal nations in the region have been actively involved in the last four cycles of the Regional Transportation Plan (see *Appendix G: Tribal Consultation* for more details).

Figure U14.2

## Tribal Lands and Local Jurisdictions in the San Diego Region



### Existing Plans and Programs

The SANDAG Binational, Interregional Collaboration and Planning, and Tribal Liaison programs address important binational, intergovernmental, and interregional issues such as transportation infrastructure, economic development, and environmental planning and preservation.

The Borders Committee provides policy direction for planning activities that affect all the borders of the San Diego region (Orange, Riverside, and Imperial counties, Baja California, Mexico, and tribal nations). It advises the SANDAG Board of Directors on major interregional planning and policy matters and oversees two working groups: (1) the Committee on Binational Regional Opportunities (COBRO); and (2) the Interagency Technical Working Group on Tribal Transportation Issues.

### Binational Collaboration and Planning

The SANDAG binational collaboration and planning program calls on a wide array of experts in this region to provide advice on important binational topics. COBRO serves as a working group to support the SANDAG Borders Committee and makes recommendations for actions by appropriate agencies. COBRO brings together representatives from cities, government agencies, businesses, academia, and other organizations located on both sides of the U.S.–Mexico border and is the region's only government-sponsored public advisory committee addressing the binational community since 1996. Following recommendations from the Borders Committee and input from COBRO, the SANDAG Board of Directors, and the Tijuana City Council, approved the Otay Mesa–Mesa de Otay Binational Corridor Strategic Plan (Plan) in 2007.<sup>10</sup> The Plan created a process for collaboration and established a framework for planning in the border region and resulted in a number of joint initiatives, including an annual joint meeting of the Borders Committee, COBRO, and

the City of Tijuana. In more recent years, the annual joint meeting has expanded to include the municipalities of Tecate, Playas de Rosarito, and the State of Baja California. The City of Tijuana and the State of Baja California also have liaison offices at SANDAG in order to better coordinate activities.

SANDAG works with many other public agencies, private organizations, and institutions (beyond COBRO) to address crossborder issues in a comprehensive manner. They include:

- Business organizations such as local chambers of commerce and economic development corporations
- Academic institutions such as California State University San Marcos (CSUSM), San Diego State University (SDSU), University of California San Diego (UC San Diego), University of San Diego (USD), Centro de Enseñanza Técnica y Superior (CETYS), Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), El Colegio de la Frontera Norte (COLEF), Universidad Autónoma de Baja California (UABC), and Universidad Iberoamericana (UIA)
- Public policy research centers such as Center for U.S.-Mexican Studies (UC San Diego), Institute of the Americas, Institute for Regional Studies of the Californias (SDSU), and Trans-border Institute (USD)
- Nonprofit organizations such as the International Community Foundation (ICF) and the San Diego–Tijuana Smart Border Coalition (SBC).
- Multisectoral crossborder initiatives such as Border 2020, Tijuana Innovadora, the Binational Watershed Advisory Council (BWAC), and the Tijuana River Valley Recovery Team
- Local Consul General offices of Mexico and the United States, which have played an important role in facilitating federal participation in important crossborder initiatives

Many other community-based, environmental, and issue-specific entities are also engaged in crossborder collaboration and problem solving.

Transportation infrastructure in the border region is critical to both Mexico and the United States. SANDAG coordinates several comprehensive planning efforts to improve U.S.–Mexico border transportation and infrastructure. Border-related transportation projects are included in the Transportation section of this appendix.

Other crossborder efforts include plans and policies to improve water quality and supply, develop and expand energy resources, and protect marine and terrestrial habitats.

Innovative leadership among governments, agencies, and other stakeholders in northern Baja California and Southern California has helped improve transportation infrastructure, enhance economic competitiveness, and work toward a more sustainable environment for the region.

### **Interregional Collaboration and Planning**

The Borders Committee includes Imperial County as a voting member and Orange and Riverside counties as advisory members. In 2010, the Board of Directors approved the Southern California Association of Governments (SCAG) as the newest advisory member of the Borders Committee. The neighboring counties of Orange and Riverside are two of the six counties included in SCAG. SANDAG coordinates with these counties on regional transportation, land use, and environmental issues to explore opportunities for collaboration.

One of the SANDAG model interregional programs is the Interstate 15 (I-15) Interregional Partnership (IRP). The IRP was a voluntary partnership among elected officials representing communities along I-15 formed in 2002. Three regional government agencies — SANDAG, SCAG, and the Western Riverside Council of Governments — met for several years to address the jobs and housing imbalance that caused increasing traffic congestion between San Diego

and Riverside counties. The IRP successfully competed for funding from the California Department of Housing and Community Development (HCD), as well as Caltrans, to study the situation and develop a set of interregional strategies to address it.

The I-15 IRP model has influenced other collaborative interregional planning efforts including the Otay Mesa–Mesa de Otay Binational Corridor Strategic Plan (Strategic Plan) that follows similar principles to the I-15 IRP as it focuses on planning and effective collaboration related to four key issue areas: (1) transportation, (2) economic development, (3) housing, and (4) environmental conservation. The interregional model was adapted to an intraregional focus for analyzing multimodal transportation concerns of the tribal nations as well as the military through two strategic initiatives undertaken as early actions of the 2015 Regional Plan.

### **Tribal Collaboration and Planning**

As tribal reservations continue to develop and interregional planning issues become more related to surrounding jurisdictions rather than only to federal and state agencies, the need for establishing a government-to-government framework at a regional level become increasingly apparent. Tribes operate under independent constitutions, have their own systems of governance, and establish and administer their own laws. This sovereign status of tribal governments dictates that the United States and all agencies operating within it are expected to engage in government-to-government relationships with Native American tribes. Government-to-government interaction with Native American tribes should follow the principles of coordination, cooperation, and consultation.

For more than a decade, SANDAG and the Southern California Tribal Chairmen’s Association (SCTCA) have developed a government-to-government framework to engage in planning dialogue and action at the regional level. The success of this model has demonstrated that by working collaboratively, public agencies and tribal governments can create a mechanism for timely, meaningful, and effective involvement of tribal governments in the regional and transportation planning process.

The core of the framework is an ongoing structured dialogue among key stakeholders at the regional level. Today, all three principal transportation planning agencies in the region have tribal liaisons: (1) SANDAG, (2) Caltrans, and (3) the County of San Diego. Intertribal organizations play a key role as facilitators for this regional government-to-government framework. In particular, SANDAG has a strong working relationship with the SCTCA.

It is through the Borders Committee that SANDAG has been pursuing government-to-government relations with tribal governments in the region. In 2005, the SCTCA joined the Borders Committee as an intertribal council of governments to engage in a dialogue on tribal planning issues. Following the 2006 San Diego Regional Tribal Summit, the SCTCA and SANDAG signed a historic Memorandum of Understanding (MOU) in which the SCTCA joined SANDAG with representatives on the Board of Directors and all Policy Advisory Committees. Tribal leaders are now part of the regional decision-making process at a policy level, offering a tribal perspective to complex regional issues.

At a technical level, the Interagency Technical Working Group on Tribal Transportation Issues was formed to serve as a forum for tribal governments in the region to discuss and coordinate transportation issues of mutual concern with the various public planning agencies in the region, including SANDAG, Caltrans, the County of San Diego, and the transit operators. In partnership with the SCTCA, the working group monitors and provides input on the implementation of the strategies and planning activities related to transportation that were mutually developed through the 2006 San Diego Regional Tribal Summit and reviewed and revised at each subsequent Summit in 2010, 2014, and 2018 (see *Appendix G* for more details).

The principal area of consultation and collaboration with tribal nations at the regional level has been in tribal transportation. Significant advances have been made through last several cycles of the Regional Transportation Plan. An early action of the 2015 Regional Plan was the development of an Intraregional Tribal Transportation Strategy (ITTS) to analyze the mobility needs of the tribal nations in a regional context. Completed in 2018, the ITTS serves as a guide to pursuing collaborative efforts in resolving tribal mobility issues.<sup>11</sup>

In recent years, SANDAG and the tribal nations have been exploring other policy areas of mutual interest that coincide with the borders framework, including habitat conservation, cultural resources, energy, economic development, and public safety.

## **Key issues**

### **Access to Jobs and Housing**

The growth projected for the San Diego region is a function of economic expansion and job creation, a continued influx of people moving to the area, and natural population growth within the area. However, home construction in the San Diego region has not kept pace with population growth. While the region has seen growth in housing permits issued for above-moderate-income housing units in the past several years, the region has not seen a substantial increase in the permitting or construction of housing affordable to very-low-, low-, and moderate-income households. The lack of affordable housing development has had a detrimental effect on the ability of San Diego residents to purchase or rent a home. Half of San Diegans cannot afford a market-rate rental, 60 percent cannot afford home ownership, and over the last several years, rent prices have increased at a pace significantly higher than wage increases.<sup>12</sup>

As a result, many people who are employed in the region have moved to neighboring regions, including southwestern Riverside County, Imperial County, and Baja California, in search of homeownership. According to the SANDAG Regional Housing Needs Assessment for 2010–2020, the pace of residential building permits in San Diego County through 2015 was about half of what the region requires each year in order to adequately supply housing for the growing population. If we continue to build homes at a slower pace than we add people, interregional commuting is likely to increase. This imbalance will result in the worsening of four trends we see in the region today: (1) high housing costs, (2) low vacancy rates, (3) more persons per household (“doubling up”), and (4) an increase in long-distance interregional commuting by the region’s employees who seek less expensive housing in surrounding areas.

Long-distance commuting, both interregional and from within the region, puts a tremendous strain on our roads, freeways, infrastructure, and personal lives. Seventy-seven percent of workers in San Diego County drove to work alone in 2017, and this number has remained relatively stable for more than a decade.<sup>13</sup> In addition, 5 percent of commuters in San Diego County are estimated to commute from outside of the region.<sup>14</sup> While some amount of interregional commuting will always occur, providing additional housing capacity in key locations within the more urbanized areas of the region could assist in reducing the projected increases in interregional trips and provide more housing and transportation choices to our residents.

### **Binational Perspective – Jobs and Housing**

While it is well known that many Mexican residents cross the border on a daily basis to work, recreate, shop, and attend schools, it is less well known that many Americans also reside in Mexico and cross the border daily for these same purposes. Based on a 2003 demographic estimate from El Colegio de la Frontera Norte, 50,000 to 60,000 U.S. legal residents were estimated to live in Tijuana alone. The U.S. State Department estimates that 1.5 million U.S. citizens currently live in Mexico, although they do not track the specific state or municipality in which they reside.<sup>15</sup>

According to the 2017 SANDAG Border Survey, one-third of respondents crossing into the United States through the land POEs in the San Diego region indicated the primary reason for crossing the border was for work.<sup>16</sup> This binational relationship and shared housing and job markets place daily pressure upon the border POEs and their related infrastructure. Commute times can be long and unpredictable, resulting in losses to productivity and efficiency.

Although the population growth rate for the northern urban areas of Baja California has slowed down gradually over the two decades between 1990 and 2010, Tijuana's population is expected to reach over 2 million by the year 2030, a 15 percent increase from its current population of 1.8 million people.<sup>17</sup>

For many years, the housing deficit in Tijuana had been met by self-constructed houses, gradually leading to urban sprawl and an overflow of unregulated housing along the eastern edges of the city. This type of growth can present challenges to human health and impact open space preservation, mobility, safety, and a myriad of other issues. Given the need to expedite the process of building new housing units, the City of Tijuana and the National Chamber of Housing Promotion (*Cámara Nacional de la Industria de Desarrollo y Promoción de Vivienda* or CANADEVI in Spanish) agreed in early 2014 to promote the modernization of outdated municipal building regulations, which inhibit new construction. Production of new housing units, however, continued to fall short of demand. In 2016, only about 67 percent of the initial goal for new housing units to be constructed in Baja California were ultimately built, with the municipality of Tijuana representing more than half of the housing market intending for these new units built by CANADEVI and local authorities.<sup>18</sup>

In more recent years, Tijuana has seen an increase in vertical densification occurring within the urban core of the city, largely consisting of high-end and luxury apartment units. As the local economy has matured with a share of the manufacturing sector evolving to include more advanced production and engineering in-house, the workforce has also seen an increase in higher wage earners. Capitalizing on demand for more centrally located and higher-quality units, developers have been tapping into the market potential of the area by catering to increased living standards of Tijuana residents and potential foreign buyers looking to locate there.

Housing costs are key factor in where people choose to live and, thus, have a significant impact on daily mobility. The average monthly rent in Tijuana in 2018 was 4,942 pesos, or roughly 250 U.S. dollars.<sup>19</sup> Compare this to the 2017 average monthly rent in San Diego of \$1,552 and it becomes clear why many would choose to live south of the border and commute to jobs in the United States.<sup>20</sup>

Similar to the partnership created with southwestern Riverside County, a partnership could be developed with authorities in Mexico to address the issues surrounding jobs and housing accessibility in the binational region. The existing mechanisms for coordination (i.e., policy committees, working groups etc.) could be utilized to bring the proper binational group of agencies together in creating programs that assist crossborder businesses with travel demand strategies like carpool, vanpool and transit incentive programs.

### **Interregional Perspective – Jobs/Housing**

Access to jobs and housing between San Diego and its neighboring counties continues to be an important issue related to the cost of living and quality of life. Although housing is generally more affordable in Riverside and Imperial counties than in San Diego County, the higher transportation costs due to long commuting distances impact the actual cost of living. Other related impacts include increased emissions of air pollutants and greenhouse gases which cause human health effects and can adversely affect water quality and habitat, further diminishing the overall quality of life in the region.

Interregional planning efforts (like the I-15 IRP) focused on the more active interregional I-15 corridor and have resulted in increased accessibility between San Diego and Riverside counties. The IRP developed and implemented a number of short- and long-term strategies in the areas of transportation, economic development, and housing, designed to increase housing opportunities in job-rich areas, promote job creation in housing-rich areas, and reduce traffic congestion. The I-15 IRP also led to the creation of a preliminary Smart Growth Concept Map for selected cities in southwestern Riverside County modeled after the SANDAG Smart Growth Concept Map and led the groundwork for strategic planning. For example, SANDAG and the Riverside Transportation Commission (RCTC) recently partnered on a study to develop best management practices for park and ride lots, which are key assets for increasing carpooling, vanpooling and access to transit. These planning efforts aim to increase jobs and housing access and are part of a long-term strategic plan to address job accessibility in southwestern Riverside County. A study conducted by the I-15 Interregional Partnership observes that:

*“Increasing numbers of long-distance commuters — generated by land use decisions — will have serious impacts on transportation, our environment, and general quality of life. Increased air pollution, increased stress in commuting, and decreased leisure time reduce the quality of life in an area where many residents must commute long distances by automobile. For many, a jobs–housing imbalance means they cannot choose to live near where they work.”<sup>21</sup>*

Transportation systems in the northern areas of the San Diego region are showing stable traffic volumes after a period of substantial growth in the early 2000s. According to Caltrans, there were 146,000 average daily vehicle trips along the stretch of I-15 connecting the two regions in 2017, which is an 11 percent increase since 2012.<sup>22</sup> The I-15 Managed Lanes completed in the San Diego region have reduced delays and helped optimize the overall capacity of the I-15 corridor, improving access between San Diego and Riverside counties.

### **Tribal Government Perspective – Jobs/Housing**

The tribal gaming facilities are now major employers in the region, yet their involvement in the region’s commuter services program, iCommute, is limited. In the I-8 corridor, Barona, Campo, Sycuan, and Viejas have approximately 6,000 total employees. In the SR 76 corridor, Pala, Pauma, Rincon, and San Pasqual have a total of almost 5,000 employees. It is estimated that each gaming facility attracts a daily count of anywhere from 6,000 to 12,000 guests. The tribal governments invest extensively in the San Diego region. Statistics show that the Indian gaming industry as a whole purchases approximately \$263 million in goods and services annually. Although many tribal members now live on the reservations, non-tribal employees travel from all over the region and other counties, including Riverside, Imperial, and Orange counties, to jobs on the reservations. These commutes would be considered “reverse” commutes, as urban residents are traveling to rural employment opportunities.

Over the years, SANDAG has collaborated with tribal transportation organizations to address these issues, including the development of a Tribal Transit Feasibility Study in 2008, which led to a tribal consortium accessing the federal tribal transit program and a 2010 study to develop a tribal Transportation Demand Management Association coordinated by an intertribal organization. Discussion of the viability of this approach continues.

### **Transportation**

Regional transportation facilities and services connect to larger transportation systems beyond the San Diego region’s boundaries. These connections have become more important with the rise in both interregional and international commuting and goods movement in the last several years.

San Diego and the rest of Southern California are home to major U.S.–Mexico trade corridors where goods pass through the region on their way to markets throughout the country and the world. Our transportation systems are also greatly affected by interregional commuting patterns historically driven by jobs and housing imbalances as well as general traffic.

As growth continues in this region and the surrounding areas, maintaining major transportation systems will be an even greater challenge. To address these issues, SANDAG develops and updates the Regional Transportation Plan (RTP), which is the blueprint for addressing the San Diego region’s travel needs through the year 2050, including highway improvements and transit, bike, and pedestrian paths all working together to increase our mobility.

### **Binational Perspective – Transportation**

The main formal mechanism through which binational transportation planning is coordinated by California and Baja California is the California–Baja California Border Master Plan (BMP). The California–Baja California BMP is a bilateral effort to collaborate on the planning and delivery of projects at land port of entries and the transportation infrastructure serving them. Its “area of influence” includes San Diego and Imperial counties in California and the municipalities of Tijuana, Tecate, Playas de Rosarito, parts of Mexicali, and the urban area of Ensenada in Baja California. Caltrans, in partnership with the Secretariat of Infrastructure and Urban Development of Baja California (*Secretaría de Infraestructura y Desarrollo Urbano del Estado de Baja California* or SIDUE in Spanish) and the U.S.–Mexico Joint Working Committee (JWC), led the development of this Plan in 2008, which was updated in 2014. Within this framework, short-, mid-, and long-term POE and transportation projects are analyzed and prioritized. In 2020, stakeholder agencies will begin efforts to update the BMP while revisiting many of the key elements of the previous plan. This effort is expected to conclude in 2021.

### **Ports of Entry and Related Infrastructure**

There are seven existing international land POEs connecting California to Baja California, Mexico through San Diego and Imperial counties, while an eighth is planned at Otay Mesa East (as discussed later in this section). These international POEs accommodate millions of crossings every year, including pedestrians, personal vehicles, buses, and trucks and trains carrying cargo. In 2018, the border between San Diego and Baja California was crossed more than 55.6 million times by individuals (including pedestrians and vehicle occupants), 23.3 million times by privately owned vehicles (POVs), and more than one million times by trucks heading northbound into our region from Mexico. That breaks down to approximately 152,000 individuals and 63,800 POVs crossing northbound every day.<sup>23</sup>

To accommodate the high volumes and maintain an efficient border transportation system while keeping pace with growth in population, trade, and binational commuting, projects are underway to improve access to border crossings, improve POE connectivity with transit and active transportation networks, expand border crossing infrastructure, improve freight rail service, increase the efficiency of commercial vehicle crossings, and continue to expand programs such as the Secure Electronic Network for Travelers Rapid Inspection (SENTRI), Global Entry, dedicated Ready Lanes, Customs–Trade Partnership Against Terrorism (C–TPAT), and Free and Secure Trade (FAST) that expedite border crossings for prescreened participants and for cargo.

#### *San Ysidro POE*

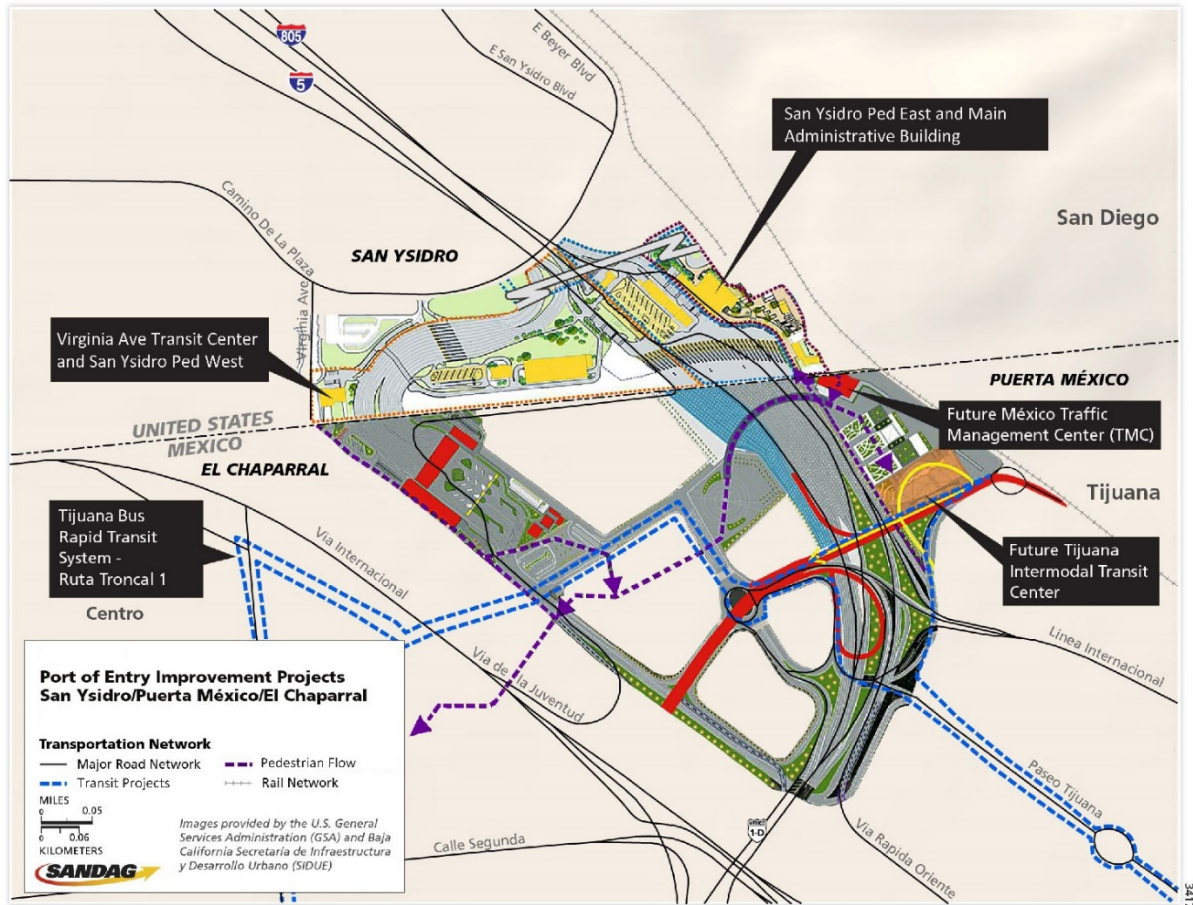
In 2018, the San Ysidro POE handled an estimated 69.4 million combined northbound and southbound crossings by people in POVs and pedestrians. For comparison, if this facility were an airport, it would have been the third-busiest airport in the United States – comparable to Dallas/Fort Worth International Airport, which accommodated 69.1 million passengers in 2018.<sup>24</sup>

The U.S. General Services Administration (GSA) is near completion on a major expansion and reconfiguration project to improve the San Ysidro POE, which is the busiest POE in the region and one of the busiest in the world. The project has introduced critical capacity improvements for vehicles and pedestrians including primary booths, a secondary inspection area, administrative space, and new pedestrian processing facilities on both sides of the port. Once complete, the modernization project will increase its capacity from 24 to 34 northbound vehicle lanes with a total of 63 inspection booths. Pedestrian capacity increased with the addition of Ped West in July 2016, which houses 14 lanes. The opening of Ped East in August 2018 increased the number of northbound pedestrian lanes on the east side of the port from 13 to 22, substantially improving access and the physical environment for pedestrians crossing northbound through San Ysidro.

On the west side of the port, the modernization project also delivered a reconfiguration of I-5 that increased the number of southbound vehicle lanes from five to ten and included a new intermodal transit center at Virginia Avenue, which serves border crossers connecting to the Ped West facility. The Virginia Avenue Transit Center designates areas for taxis, buses, jitneys, pedicabs, and private vehicles dropping off and picking up passengers. The Virginia Avenue Transit Center is located on the west side of the pedestrian bridge, which can be utilized to access the San Ysidro Blue Line Trolley station on the east side of the POE. This \$8 million project was jointly funded by GSA and Caltrans using Coordinated Border Infrastructure program funds administered by the Federal Highway Administration (FHWA). Development of this facility was a collaborative effort that involved the federal government, Caltrans, the City of San Diego, MTS, and SANDAG.<sup>25</sup> Upon completion of the expansion project, which is anticipated in late 2019, the increased capacity is projected to reduce the long border crossing delays at this POE. Figure U14.3 illustrates the infrastructure improvements on either side of the POE that are either completed, underway or planned.

Figure U14.3

## San Ysidro-Puerta México/Ped West-El Chaparral POE Improvement Projects



Source: Mexican Secretariat of Infrastructure and Urban Development (SIDUE) and U.S. General Services Administration, 2015

### Otay Mesa POE

Similar to the pressures on the busy San Ysidro POE, the number of personal crossings and commercial vehicle flows through the Otay Mesa POE are also substantial. In 2018, more than 962,000 trucks passed northbound through the port, which is historically the highest level of commercial crossings.<sup>26</sup> The increase in commercial truck traffic since the early 1990s is related to the implementation of the North American Free Trade Agreement (NAFTA), which has spurred substantial growth in trade between California and Mexico.

Two-way trade in goods between Mexico and the United States increased dramatically from \$81.4 billion in 1993 to \$611.5 billion in 2018. For California, Mexico is the number one export market, purchasing nearly \$30.7 billion of the state's exports in 2018 — 84 percent of which is carried via commercial truck.<sup>27</sup> Similarly, imports from Mexico to California have increased dramatically as binational industry clusters and shared production processes have grown over the years. In 2018, \$47.5 billion in goods moved between the United States and Mexico through the Otay Mesa and Tecate POEs alone, which is a 9 percent increase over 2017, nearly 45 percent more than the same figure in 2008, and 205 percent higher than the total in 1998.<sup>28</sup>

As the vast majority of total trade between California and Mexico is transported by trucks, enormous strain is placed not only on the commercial POEs but also on local road and highway networks. Local governments and authorities responsible for transportation infrastructure have begun to plan or construct new projects to link POE infrastructure with local transportation systems and trade corridors in order to facilitate continued growth in binational trade.

In 2009, the Department of Homeland Security (DHS) began initial efforts to explore modernization of the Otay Mesa POE. In addition to preliminary study, adjacent land was acquired for future improvements to both commercial and non-commercial facilities within the port. In May 2019, GSA awarded a design–build contract for the Otay Mesa POE Modernization project, which is planned to expand pedestrian processing capacity and improve circulation and efficiency for commercial truck movements.<sup>29</sup> Planned improvements include doubling the number of pedestrian lanes from six to twelve within the customs facility and a pedestrian bridge connecting from an existing east-to-west bridge that crosses over SR 905 to the newly constructed Otay Mesa Transit Center discussed later in the Appendix. The project is also expected to construct nine new commercial lanes (six for laden trucks and three for unladen trucks), a return-to-Mexico lane for inbound trucks, additional import lot exit booths, and relocation of the hazardous materials docks from the export facility to the import facility in order to improve operations. According to GSA, the \$122 million project is expected to be complete in 2023.

For southbound truck movements, accessibility to the outbound facilities has been a focus for both regional and local authorities. After exiting the regional highway network, the main access road for Mexico-bound trucks exiting through the Otay Mesa POE is La Media Road – a two-lane local road running parallel to the international border on the City of San Diego’s local street network. Excessive traffic volumes and congestion prompted the City of San Diego to invest local and federal grant money to improve and expand these roadway facilities linking southbound commercial trucks to the CBP Export facility. In 2011, an additional lane was constructed to a roughly half-mile segment between Drucker Lane and the Export lot inspection facilities at the POE. Additional truck lanes are planned for a north–south segment of La Media Road and Britannia Court as well as expanded capacity for the existing east–west access road. The City of San Diego expects to award a construction contract for these improvements by 2020 with a total estimated project cost of \$14.6 million.<sup>30</sup>

### *Tecate POE*

The Tecate Land POE in San Diego County is a multimodal inspection facility that provides service for pedestrians, buses, passenger vehicles and commercial vehicles, and freight rail (the rail line crosses at Campo, located east of the POE). This facility is open 18 hours a day, from 5 a.m. to 11 p.m. In 2018, more than one million POVs carrying approximately 2.1 million POV occupants crossed northbound through this facility. Elements of the CBP processing infrastructure at this POE were most recently renovated in 2005. Two rail projects, one on either side of the border, have been proposed to rehabilitate and modernize the crossborder rail line, potentially increasing the market potential of this route for international and interstate movement of goods (see *Multimodal Issues* section for more details).

### *Future Jacumba POE*

In 2000, SANDAG conducted a feasibility study for a new border crossing that would link Jacumba in San Diego County and Jacumé in the Municipality of Tecate, Mexico. This study recommended that California and Baja California government agencies continue planning and coordination efforts to identify and reserve right-of-way for inspection facilities and connecting roadways to allow for the development of a future POE. The Secretariat of Infrastructure and Urban Development (SIDUE), Baja California’s state planning agency, and the municipal government of Tecate have also considered this location for a future POE in long-range plans, most recently in the 2014 California–Baja California Border Master Plan. A new POE in this area could provide additional access for passenger vehicles and trucks that travel between Baja California and locations east of San Diego.

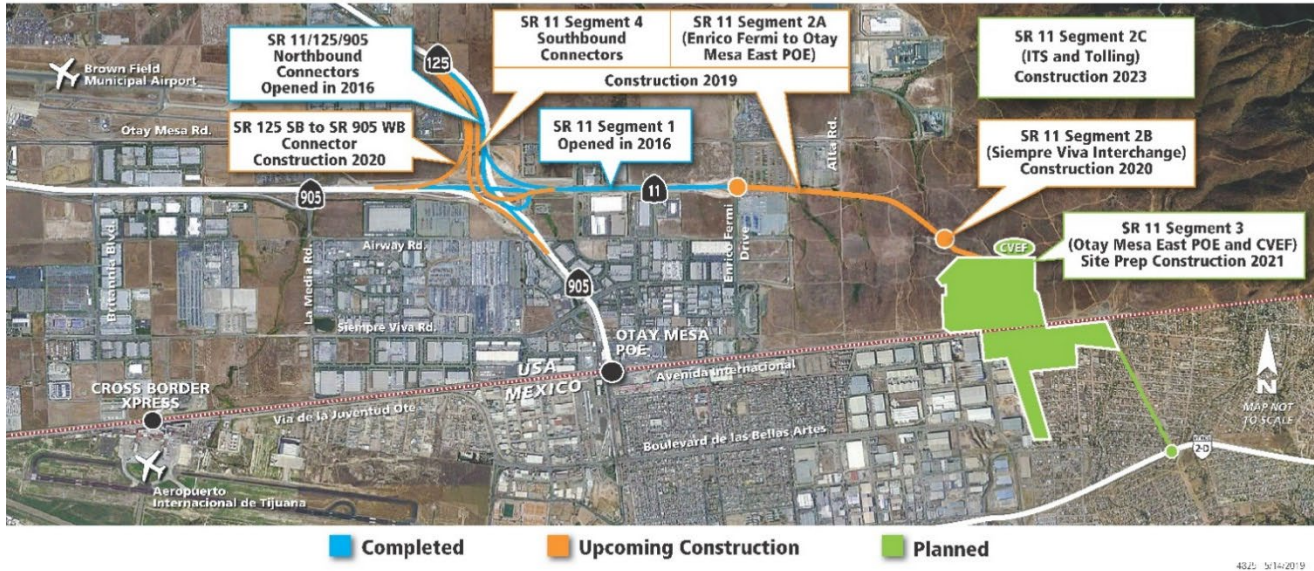
### *Future Otay Mesa East POE*

The development of a new POE, Otay Mesa East (*Mesa de Otay II* on the Mexican side), is underway and will provide an alternate entry for vehicles and commercial traffic approximately two miles east of the existing Otay Mesa crossing. The lead project sponsors — SANDAG and Caltrans — are working with the U.S. and Mexican federal governments in collaboration with local and state partners to evaluate innovative concepts like flexible lanes, variable tolling, and joint inspections from the standpoint of efficiency, security, revenue potential, and cost-effectiveness.

The Otay Mesa East POE will be linked to SR 905 and SR 125 through the construction of the SR 11 toll road. Under a plan approved in January 2012 by the California Transportation Commission (CTC), the U.S. portion of the project is being built in separate segments. The first segment of SR 11 was completed and opened in 2016, and the final highway segment to complete the link to the future border crossing is currently under construction. The project team continues to advance discussions with U.S. federal partners on how to fund the operations and maintenance of the new crossing on the U.S. side. SANDAG and Caltrans are also in the process of conducting a Traffic & Revenue Study to determine the best and most efficient facility size and layout for the new port of entry. On February 11, 2019, The U.S. Department of State issued a new presidential permit for the project, authorizing the construction of the new POE on the international U.S.–Mexico boundary.<sup>31</sup>

On the Mexican side, this port will also connect to the Tijuana–Tecate toll road and the Tijuana–Rosarito corridor, a highway in Baja California that connects the coastal area of Rosarito to the east of the Otay Mesa POE. The project is included in Mexico’s National Development Plan (or *Plan Nacional de Desarrollo* in Spanish), which is developed by the Secretariat of Communications and Transportation (or *Secretaría de Comunicaciones y Transportes*) as a priority project for investment. SANDAG and Caltrans are continuing to work with Mexican officials at all levels of government to ensure project delivery and coordination of efforts on both sides of the border. The border crossing facility itself is expected to be under construction by 2021, as shown in Figure U14.4.

**Figure U14.4**  
**SR 11 Otay Mesa East Port of Entry Overview**



Source: Caltrans, 2019

*Calexico West POE (Imperial County)*

The Calexico West POE is located adjacent to the downtown center of the city of Calexico in the U.S. and is the closest border crossing to the urban center of Mexicali – the state capital of Baja California. This facility processes only personal crossings and sees the highest volumes of people crossing by car and as pedestrians through Imperial County. In 2018, more than 8.4 million POV occupants and 4 million pedestrians crossed northbound here. GSA started construction on a reconfiguration and expansion of the Calexico West POE in 2015. Phase I of the project was completed in fall 2018, which added three southbound POV lanes and a southbound bridge over the New River, ten northbound POV inspection lanes with primary and secondary inspection canopies, booths and inspection equipment, and a new administration building. As part of that expansion, Caltrans, the Imperial County Transportation Commission (ICTC), and local jurisdictions have been closely managing changes to traffic circulation near the POE and investing in roadway improvements to accommodate additional volumes. Phase II of the GSA project is expected to include demolition of the old port building, a new pedestrian processing facility, five southbound POV inspection lanes with canopies and booths, and six additional northbound POV inspection lanes.<sup>32</sup> GSA is working to request an appropriation of additional funds to complete the remaining elements.

On the Mexican side, SIDUE is advancing the planning and design for the connecting POE and roadway facilities in Mexicali. Among the improvements are three key elements: a new inspection facility for Mexican customs; an underpass for below the existing rail track located just east of the port; and a new bridge connecting the border crossing to downtown Mexicali. SIDUE is working with the Mexican federal government, through the Secretary of Communications and Transportation (*Secretaría de Comunicaciones y Transportes* or SCT in Spanish) to implement these projects, some of which are currently underway.

### *Calexico East POE (Imperial County)*

About seven miles east of the Calexico West border crossing in downtown Calexico is the Calexico East POE, which services POVs, pedestrians, and commercial vehicles. Approximately 6.5 million POV occupants and 300,000 pedestrians crossed northbound at this facility in 2018. Through the commercial side of the port, more than 376,000 northbound commercial trucks used this facility, supporting the binational economy and prominent agricultural industry in Imperial County. A unique characteristic of this crossing is the bridge structure that spans north to south over the All-American Canal, which runs east to west parallel to the international boundary and connects U.S. and Mexican customs facilities on either side. Bottlenecks experienced at the bridge are being addressed as part of plans to increase capacity on the bridge structure. Caltrans, in partnership with ICTC, received \$3 million in Senate Bill 1 Trade Corridor Enhancement Program (SB1 TCEP) funding to develop the environmental document for the Calexico East LPOE truck crossing improvements. The overall project will add four northbound lanes, two each for commercial and passenger vehicles, to the existing bridge over the All-American Canal. The additional lanes will relieve an existing freight bottleneck as the existing structure only accommodates two northbound commercial lanes and three passenger vehicle lanes. Using the SB1 TCEP funds as a match, ICTC recently received a FHWA BUILD grant for \$20 million to construct the Calexico East LPOE expansion project, which is anticipated to begin construction late 2020.

### *Andrade POE (Imperial County)*

The Andrade POE is the easternmost border crossing in California and facilitates personal crossings via POV and pedestrians. Located near the state line with Arizona to the east, abutted by tribal land to the north and west, and expansive agricultural land to the south in Mexico, this facility experiences distinctive changes in border crossing volumes with peak seasons depending on the time of year. In 2018, more than 1.1 million people in POVs and more than 901,000 pedestrians crossed northbound through the Andrade POE. To accommodate pedestrians, which account for 45 percent of the total crossings through this POE, improved sidewalks and new ADA standard pedestrian access paths were constructed on the U.S. side in 2014 as part of a collaborative effort between Caltrans, ICTC, GSA, CBP, and the Quechan Tribe of Indians, which operates a large parking lot directly adjacent to the Andrade POE.<sup>33</sup>

### **Additional Innovations at POEs**

In addition to expanding capacity and modernizing the border crossing infrastructure, U.S. and Mexican customs agencies, stakeholder agencies, and crossborder businesses have been advocating and applying innovative operational strategies to help reduce delays experienced at the border. To expedite commercial truck crossings, one approach undertaken by U.S. CBP and SAT Aduanas (*Servicio de Administración Tributaria* – Mexico’s customs agency) involves joint inspections of U.S.-bound commercial cargo qualified as low-risk under the FAST program. As part of the joint inspections, CBP and SAT Aduanas agents work side-by-side within one facility to inspect cargo, instead of both agencies inspecting the same load separately. First piloted in Arizona in 2016, the Unified Cargo Processing (UCP) program exceeded expectations for reducing wait times as part of the first pilots and has gradually been expanded to other commercial POEs along the U.S.–Mexico border. By 2017, the pilot program had been rolled out to five more POEs along the U.S.–Mexico border, including Otay Mesa. In March 2018, U.S. CBP and SAT Aduanas signed a Memorandum of Understanding stating the bilateral commitment for further implementation of UCP on a more permanent basis.<sup>34</sup>

Over the years, the crossborder community and regional stakeholders have recognized that the transportation infrastructure and border crossings in the region act as a comprehensive mobility network. Goods and people may use one crossing or access roadway one day and another the next, depending on anticipated conditions. The historic approach of treating each border crossing and the connecting mobility facilities independently cannot be successful as the demands and strains placed on the border mobility network continue to increase. For transportation agencies tasked with improving access to and from the border, accurate wait time information is key to making this

orchestrated approach possible. In 2018, as part of a larger Intelligent Transportation System (ITS) architecture envisioned for the border, SANDAG and Caltrans successfully piloted a technology solution using WiFi detection equipment to measure wait times at the border. The initial pilot deployed WiFi readers at nine different locations along the I-5 and I-805 southbound approach roads leading to the San Ysidro POE and began disseminating the information to the public in real-time via the Caltrans QuickMap travel alert webpage.<sup>35</sup> As part of the California Sustainable Freight Action Plan “*Advanced Technology Corridors at Border Ports of Entry*” pilot project, Caltrans plans to build on this success and deploy the system at all ports of entry along the California-Baja California border in the next few years, while concurrently working with Mexican agencies to deploy the system south of the border in order to gather northbound wait time data.

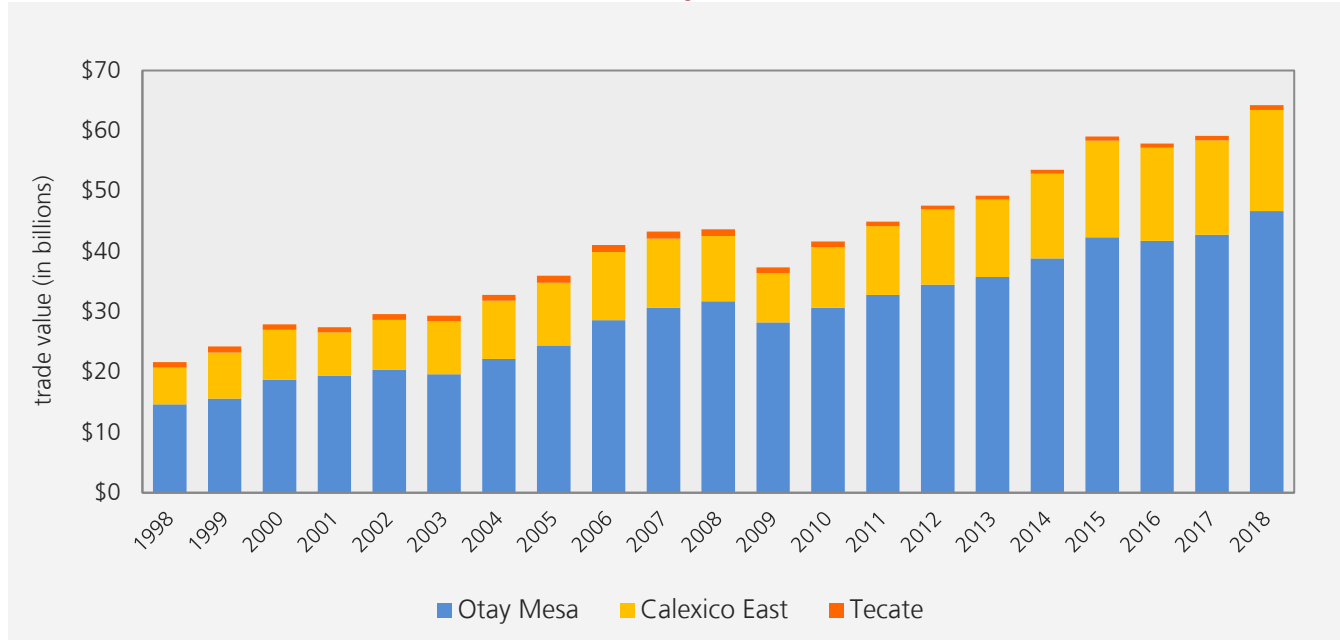
### *Key Trade Corridors*

Improvements to our regional transportation infrastructure will, in turn, strengthen key trade corridors throughout the region. In 2018, more than 1.4 million trucks crossed northbound at the three commercial POEs along the California-Baja California border at Otay Mesa, Tecate, and Calexico East with annual trade via truck totaling \$40.1 billion in imports and \$24.4 billion in exports. Figure U14.5 shows the historical growth in trade value through these ports over a two-decade period with an all-time record seen in 2018. A significant portion of freight that enters the California POEs from Mexico is ultimately destined for locations outside of the region, including warehousing and distribution centers, other multimodal ports, and states across the continental U.S. near and far from the border.

The American freight transportation network has been experiencing tremendous growth in the past decades due to changes in the makeup of the economy and expansion in international trade. Shifts in established patterns of international trade will contribute to this growth, and that includes a trend towards “near-shoring” of production to Mexico for the North American market with some shifting away from overseas production that is no longer based only on low labor costs. This trend particularly benefits Mexico as a rapidly growing source for U.S. imports. The recent trend is for the United States and even Asian and European manufacturers to expand production in Mexico, often referred to as “near-shoring” in order to serve the entire North American market, often with advanced technologically manufactured goods. According to the U.S. Department of Transportation’s (DOT’s) Freight Analysis Framework (FAF) version 4, the volume of U.S. NAFTA trade will more than double between 2012 and 2050, as will the volume of all imports and exports over the same period. As a result, there is growing pressure to maintain, upgrade, and expand the current freight transportation network to meet the demands of various U.S. and international markets.<sup>36</sup>

Figure U14.5

## Total Trade Value via Truck: California–Baja California Commercial Land POEs



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Transborder Freight Data, 2018

Given the nationwide benefits of maintaining these key market entry routes and improving infrastructure for trade that flows through San Diego from Mexico, support is needed from state and federal partners in securing funding for trade corridor infrastructure in the international border zone. These corridors include I-5, I-805, I-15 and SR 125 as the primary north–south corridors, and SR 94, I-8, SR 905, and SR 11 as the region’s east–west corridors.

The southbound truck routes through these corridors are just as significant, since trucks crossing into Mexico through the San Diego region supply many of the components or raw materials needed for the thriving advanced manufacturing industry along the border. The Maquiladora Industry Program was established in Mexico in the mid-1960s to create jobs and to bring the Mexican national production system to the international market. Northern Baja California has developed competitive commercial and manufacturing industries that are able to take advantage of complementary resources on both sides of the border in order to jointly produce goods – from automobiles and flat screen televisions to medical instruments. Today, of the 5,155 maquiladoras in Mexico, 925 are in Baja California, and 590 of those are located in the Tijuana–Tecate–Playas de Rosarito metropolitan zone.<sup>37</sup> These businesses depend on local transportation systems to move supplies quickly and efficiently.

### Multimodal Issues: Rail Freight, Maritime, and Airports

Opportunities for binational collaboration also exist around freight rail transportation along the California–Baja California border, as shown in Figure U14.6. The existing binational railroad, the San Diego & Arizona Eastern (SD&AE) Railway, runs southeast from San Diego into Tijuana and Tecate and then into the Imperial Valley. The SD&AE links Tijuana and San Diego with the rest of the railroad networks in the eastern part of both countries. The “Desert Line” of the SD&AE runs from the international border between Tecate into Plaster City in the Imperial Valley where it joins the Union Pacific Railroad. The Desert Line was out of service from 1983 until 2004, when it was reopened. However, due to deteriorating conditions, the railroad ceased all revenue freight on the Desert Line in 2008. In December 2012, SD&AE entered into a 99-year operating lease for freight service with the Pacific Imperial Railroad (PIR) company and initial inspections of the railway conditions were completed in 2013. Issues concerning management of the company resulted in another sublease agreement being signed in June 2016 involving the Metropolitan Transit System (MTS), PIR, and Baja California Railroad (Baja Rail). Under the “Cali-Baja Joint Venture

Sublease and Operating Agreement,” the parties agreed that Baja Rail, which also maintains the rights for the segment connecting Tijuana and Tecate on the Mexican side, will oversee and pay for the railroad repair, maintenance, and operational obligations for the first 60 miles of the Desert Line while also adhering to specific reimbursement and milestone requirements.<sup>38</sup> Baja Rail is currently in discussions with CBP regarding potential locations for the necessary rail inspection facilities.

Project proponents expect that rehabilitating and upgrading the Desert Line of the SD&AE will improve the international and interstate movement of goods from this region, as well as provide greater access to agricultural products from the Imperial County by providing a link for base materials and finished products between the United States and Mexico.

In Mexico, the State of Baja California publicized plans in 2014 to spend funds on rebuilding sections of the 44.4-mile Tijuana–Tecate Short Rail Line, which connects the Desert Line and the San Ysidro border crossing through the municipalities of Tijuana and Tecate. Under a 2012 contract with the Baja California agency *Administradora de la Vía Corta Tijuana-Tecate* (ADMICARGA), Baja Rail is committed to investing \$20 million for repairs and upgrades to the line. The rehabilitated Tijuana–Tecate line would carry passenger traffic, which is important for tourism, as well as commercial cargo, thereby expanding Baja California’s ability to send goods across the border through rail.

The State of Baja California, along with active Mexican business groups, have also been proposing and studying a new rail connection between Tecate and the maritime port of El Sauzal near Ensenada. This connection could add another option for cargo shipment between the border and existing sea ports, potentially attracting some of the shipment volume currently sent to the ports like Long Beach and Los Angeles.

It is anticipated that if these crossborder rail connections are reestablished, it will provide exporters and importers an alternative to transporting goods by truck, which will in turn increase efficiency and economic competitiveness and relieve freight network congestion throughout the border region.

**Figure U14.6**  
**Multimodal Infrastructure**



Source: SANDAG, 2015.

Maritime transportation at our local ports plays an important role in the region’s transportation system as well. The Ports of San Diego and Ensenada are vital links to national and international networks, moving millions of metric tons of cargo every year. Since 2013, the administrative managing agency for the port of Ensenada (*Administración Portuaria Integral de Ensenada* or API in Spanish) has been expanding its navigation areas and modernizing its port gates. In conjunction with a private lease holder for the commercial port, Hutchinson Ports EIT, extensive redevelopment since 2016 has involved quay construction, dredging, and new equipment purchases including new large-scale cranes. In 2017, Hutchinson EIT announced a 20-year extension of its concession rights and a long-term investment of \$100 million to increase operational capacity and efficiency.<sup>39</sup> Today, it is one of Mexico’s few specialized container terminals and has potential for even more growth. Between 2015 and 2018, it saw a 152 percent increase in the volume of containers entering the port (measured in TEUs).<sup>40</sup>

While the Port of San Diego also has expansion plans, its growth must occur within its fixed existing footprint. Given this restriction, the Port of San Diego’s business plan and upcoming Port Master Plan Update include terminal optimization, making the port more environmentally sustainable, and supporting the U.S. DOT’s America’s Marine Highway (AMH) Program, which is an initiative to divert truck traffic to move cargo by water instead, where market conditions favor such a diversion.<sup>41</sup> In order to accommodate the growing trade from the Pacific Rim that is destined for the West Coast, the ports of Ensenada and San Diego are working together to coordinate their respective strategic agendas. The two ports are also key partners in regard to cruise ship and recreational boating business. The economic impact of the cruise ship business is substantial, directly supporting \$46 million in local economic benefits and approximately 460 jobs in San Diego County.<sup>42</sup> Part of any port’s ability to attract new cargo depends on the region’s

ability to move those goods from the waterfront to destinations both within and outside of the region. Therefore, efficient transportation systems in the form of roadways, land POEs, railways, and air cargo facilities are key complements for a port's successful growth.

Our region possesses an extensive system of private, commercial, and military airports; however, the regional passenger and cargo facilities are close to reaching their maximum capacity. The San Diego County Regional Airport Authority (Airport Authority) is responsible for planning to meet the future projected passenger and air cargo needs. The Airport Development Plan (ADP) is the master plan for the San Diego International Airport (SAN) and identifies improvements that will enable the airport to meet demand through 2035, which is when it is estimated that the airport's single runway will reach capacity for passenger activity. The ADP aims to improve access to the airport, redevelop terminal facilities to accommodate future demand, optimize the productive use of the airport property, and evaluate parking and ground access needs.

The City of San Diego operates Brown Field, which is a general aviation airport located 1.5 miles north of the U.S.–Mexico border in the community of Otay Mesa. This airport is classified as a reliever airport for SAN, serving general aviation aircraft that might otherwise use the congested air carrier airport facility. In 2017, the City of San Diego Airports Division began developing the Brown Field Municipal Airport Master Plan to establish the long-term development strategy for the facility. In February 2019, the city issued a notice of preparation for the Program Environmental Impact Report (PEIR) for the plan. Previously, the San Diego City Council approved the redevelopment of Brown Field as part of the Metropolitan Airpark in 2012, after which much of the land surrounding the airfield and associated facilities was leased out for a four-phase commercial development covering about 331 acres of the city-owned facility near the U.S.–Mexico border. The Airpark development called for a 116,875-square-foot fixed-base operator facility for private aircraft, 10 large-aircraft hangars, 45 small-plane hangars, and solar-powered storage and support facilities with a restaurant and other commercial elements. The ADP will involve development of the areas not included in the previous Airpark effort. The current proposed alternative includes a new 14,000-square-foot terminal building, a new runup pad (which is currently lacking for the smaller runway), and, depending on the timeline for construction of the Airpark development, construction of up to 87 new hangars.<sup>43</sup> The expansion efforts would improve and modernize airport operations, bring facilities into compliance with current U.S. Federal Aviation Administration design standards, and ensure that long-term aviation needs are met in the region.

In Baja California, the Tijuana and Mexicali airports have been partially privatized to improve operations, and these airports serve passengers from both sides of the border. As part of the solution to strained regional air capacity and congested land POEs, the Cross Border Xpress (CBX) facility was built in 2015 by a binational group of private investors with endorsements from U.S. and Mexican government agencies and stakeholder groups after years of effective binational collaboration and planning. At CBX, ticketed airline passengers pay a fee for direct access between the passenger terminal at Tijuana International Airport (TIJ) and the United States. Users cross the border via an enclosed, elevated, 390-foot pedestrian bridge with two divided corridors to separate northbound and southbound pedestrians. Southbound crossers go through Mexican immigration and customs inspections, and northbound crossers are processed by U.S. CBP. The CBX facility includes shops and services to accommodate travelers, paid overnight and drop-off parking facilities, and areas for car rentals, carshare, taxi, and shuttle services. Before CBX, those traveling to the U.S. after arriving to TIJ would typically need to cross the border through the San Ysidro or Otay Mesa POEs. With the added convenience of direct access to domestic flights within Mexico as well as select flights to China, overall crossing demand at CBX has grown substantially. TIJ accommodated almost 4.9 million total passengers in 2015, and in 2018 that number grew to more than 7.8 million – a 60 percent increase.

Part of that increase can be attributed to the addition of CBX, which accommodated nearly 2.3 million users in 2018 – a 66 percent increase since its first full year of service in 2016.<sup>44</sup>

Anticipating this growth, TIJ’s airport facilities have been undergoing expansions since 2015. The \$93.5 million expansion and renovation effort, which is expected to be complete in 2019, includes 91,493 square feet of expanded space and 182,986 square feet of renovated space within the terminals, new technology and equipment for passenger processing, new facilities for servicing aircraft, and more aircraft parking to improve the boarding process.<sup>45</sup>

In Imperial County, the Calexico International Airport facilitates crossborder and international travel, with U.S. Customs and Border Protection (CBP) inspections officers based at the airport. The Holtville Airstrip is currently closed to civil aircraft operations but has future economic development potential for a regional air cargo and passenger facility. In 2007, the Imperial County Airport Feasibility and Site Analysis Study identified the Holtville Airstrip as a feasible regional airport facility. Since 2017, Imperial County stakeholders are pursuing the opportunity of a new regional airport facility.

### **Interregional Perspective – Transportation**

Just as the international border acts as a key linkage between closely interdependent populations, economies, and cultures, the boundaries between San Diego County and its neighboring jurisdictions serve as a nexus for thousands of people who choose to live in a different county from where they work as well as other types of travel.

The San Diego region employs thousands of people living within Riverside, Orange, and Imperial counties who contribute to our way of life and local economy, commuting longer distances to take advantage of what our region offers. Understanding the importance and impact of these long interregional commutes on our region highlights the need for thoughtful planning.

An estimated 43,600 Riverside County residents commuted to San Diego jobs in 2015, with the I-15 acting as the main corridor.<sup>46</sup> The 2018 SANDAG Commute Behavior Survey found that the mean trip duration for western Riverside County residents who commute to San Diego County was 1 hour and 12 minutes.<sup>47</sup> The U.S. Census Bureau also lists the Riverside County-to-San Diego drive as one of the top “mega commutes.”

An estimated 10,800 Orange County residents commute to San Diego County for work, utilizing the multimodal transportation infrastructure between the two regions. The I-5 and the Los Angeles – San Diego – San Luis Obispo (LOSSAN) Rail Corridor are highly utilized by vehicle traffic, passenger rail, and freight rail.<sup>48</sup> The LOSSAN Rail Corridor is also the only viable freight rail link between San Diego and the rest of the nation. BNSF Railway operates the freight service, with the Port of San Diego as a major customer.

From Imperial County, an estimated 900 Imperial County residents travel into San Diego County each day via the I-8.<sup>49</sup> Beyond commute patterns, San Diego County and Imperial County share an international boundary with Mexico and together make up the U.S. component of the Cali-Baja Binational Megaregion. Many aspects of transportation planning mirror each other in both counties, especially with respect to mobility near the ports of entry and crossborder travel.

#### *Highway Improvements*

In 2010, the I-15 IRP completed three phases of work and developed strategies to address the transportation issues resulting from commutes from southwestern Riverside County to San Diego County for work. The IRP also identified transit priority treatments and transit infrastructure development to support possible future BRT and commuter express on the I-15 and I-215 corridors. In 2014 the San Diego region completed 20 miles of Express Lanes on I-15 between SR 163 in San Diego and SR 78 in Escondido, which also started serving the MTS *Rapid* bus network around the same period. In the same year, RCTC and Caltrans added a general-purpose lane to both directions of the I-215, which links

areas as far north as San Bernardino through communities east of the I-15 corridor and merges with the I-15 in the City of Murrieta.<sup>50</sup> Recently, RCTC and SCAG included the addition of mixed flow and HOV lanes through the southern segment of the I-15 (at the I-215 junction) to the San Diego County line in their fiscally unconstrained RTP project list. The I-15 and I-215 service most interregional commuters coming into San Diego County from western Riverside. SANDAG plans to continue working with RCTC to explore the potential of implementing HOV/Managed Lane systems with the goal of closing the gap at the county line.

Along the I-5 corridor, the Orange County Transportation Authority (OCTA) and Caltrans completed the I-5 South County Improvements Project in 2018, which added an HOV lane in each direction and improvements to the Avenida Pico interchange located just over three miles north of the San Diego County line. OCTA recently completed a traffic analysis that included the remaining stretch of I-5 from Avenida Pico to the county line, in which SANDAG and Caltrans participated on the project team. Extension of the new HOV lanes to the county line are included as a future project in the SCAG RTP.<sup>51</sup> SCAG also amended their existing RTP to include a highway project along ten miles of SR 241 in the Foothill Transportation Corridor, which would implement tolled Express Lanes and mixed flow lanes between the San Diego County line and Oso Parkway by the year 2026. This would provide more access to and from the I-5 corridor for communities in eastern Orange County, western Riverside County and travel choices between these areas and San Diego County.

In Imperial County, highway improvements help address passenger and commercial vehicle transportation within the county as well as to and from the border with Mexico. In 2012, the Brawley Bypass Project in Imperial County was completed, improving the flow of general traffic and international goods between California and Mexico by providing an alternate route for commercial trucks and motorists around Brawley. The project constructed an eight-mile expressway around the city of Brawley from SR 86 north of Brawley to south of the eastern junction of SR 78 and SR 111. New bridges were also added at the New River and Union Pacific Railroad crossings along with an interchange at the junction of SR 78 and SR 111. Along the I-8 corridor, key interchange projects and pavement rehabilitation have improved safety and connectivity. Caltrans began rehabilitating pavement on I-8 in 2016 as part of a five-phase effort to increase durability and overall lifespan for a 48-mile segment between SR 111 and the border with Arizona. All five segments are scheduled to be completed by the end of 2019.<sup>52</sup> Also in 2016, the I-8/Dogwood Road Interchange Project was completed, adding additional turn lanes and widened onramps linking the I-8 corridor with the city of El Centro and key destinations like the Imperial Valley Mall. Improvements and expansions are planned for additional highways including SR 98, SR 111, SR 7, and SR 115. Imperial County officials emphasize that these efforts are part of a comprehensive approach for improving intra-county agricultural and recreational travel as well as interregional, interstate, and international travel through the POEs in Imperial County (see *Port of Entry and Related Infrastructure* section above for more details).

### *Intercity Passenger Rail Corridors*

Pacific Surfliner intercity passenger rail service for the region is operated by Amtrak along the LOSSAN Rail Corridor. The 351-mile-long LOSSAN Rail Corridor is the second-busiest intercity rail corridor in the nation with nearly 3 million annual passengers. The LOSSAN Rail Corridor Agency is a Joint Powers Authority originally formed in 1989 that works to increase ridership, revenue, capacity, reliability, coordination, and safety on the coastal rail line between San Diego, Los Angeles, and San Luis Obispo. It is governed by an 11-member Board of Directors composed of elected officials representing rail owners, operators, and planning agencies along the rail corridor. OCTA serves as the managing agency for LOSSAN. Since 1971, service on the Pacific Surfliner between Los Angeles and San Diego has increased from the original six daily trips to the current level of 24 daily trips. In November 2016, a twelfth daily round trip between Los Angeles and San Diego was added – the first service increase in more than a decade.

### *High-Speed Rail*

The California High-Speed Rail Authority is the lead agency responsible for planning, funding, constructing, and operating the state's high-speed rail system that could potentially connect Los Angeles with San Francisco via the Central Valley with extensions south to San Diego and north to Sacramento. Initial funding for the project was approved by California voters in 2008. Downtown San Diego is planned to be the southern terminus with a station in Escondido connecting to downtown Riverside, San Bernardino, and Los Angeles via the Inland Empire. Proposed alignments for this section include the I-15 corridor as well as the I-5 corridor where the high-speed rail would run along the existing LOSSAN passenger rail like Metrolink and the Pacific Surfliner. If implemented, this would add a new modal connection between western Riverside County and the San Diego region.

### *Rail Freight*

Rail freight in the San Diego region is transported by private operators BNSF Railway and the San Diego and Imperial Valley (SDIV) railroads. BNSF operates on the coastal rail line and a branch line between Escondido and Oceanside. The SDIV moves freight on the San Diego & Arizona Eastern (SD&AE) Railway between San Diego and Tijuana. The Mexican agency ADMICARGA, along with private operator Baja Rail, moves freight between Tijuana and Tecate (see *Multimodal Issues: Rail Freight, Maritime, and Airports* section above for more information).

### *Airport*

The Airport Authority completed the expansion of SAN Terminal 2 in August 2013. The expansion included adding ten new gates, a dual-level roadway, and additional airport parking, which will suffice to meet the airport's needs until it reaches 20 million–21 million passengers annually. The airport later added a general aviation Fixed-Based Operator complex in 2014, a new 5,000-car-capacity rental car facility in 2016, and the three-story Terminal 2 Parking Plaza and parking structure in 2018, which added 2,900 parking spaces. Currently, the Airport Authority is developing an ADP that will evaluate potential options for further expanding passenger and air cargo capacity through 2035. The centerpiece of the ADP is the replacement of Terminal 1 with a modern facility housing up to 30 gates. In addition, the ADP includes airfield enhancements and major improvements to roadways serving the airport that will help reduce traffic congestion. The Airport Authority has committed to coordinating with regional stakeholder agencies, including SANDAG and MTS, to incorporate transportation elements within the development plan with the goal to connect the airport to high-frequency regional transit service. In July 2019, the Airport Authority reached a new ten-year agreement with its airline partners that contributes over \$500 billion dollars to help alleviate traffic congestion and access to the passenger terminals at SAN.<sup>53</sup> As an advisory member to the SANDAG Board of Directors, the Airport Authority is able to be closely involved in regional transportation decision-making.

## **Public and Active Transportation**

Expanding public transportation networks, as well as improving facilities for pedestrians and people on bikes, are critical areas of focus in transportation planning. Not only are public and non-motorized transportation essential parts of the overall transportation system, they are increasingly important, given their environmental and public health benefits.

### *Public Transportation*

MTS operates three Trolley lines and a network of bus lines that served 86 million passenger trips in FY 2018.<sup>54</sup> The Blue Line, which connects downtown to the U.S.–Mexico border at San Ysidro, continues to be the service with the highest ridership, with more than 17.5 million passenger trips in FY 2018. The busiest station along the Blue Line Trolley service is just steps away from the San Ysidro POE, where about 40 to 45 percent of the total boardings occur on an average weekday at the San Ysidro Transit Center. In northern San Diego County, passenger light rail services are provided by the North County Transit District; the COASTER commuter train serves eight stations between Oceanside and downtown San Diego, and the SPRINTER trains run east–west between Oceanside and Escondido.

The Mid-Coast Corridor project, the largest transit project in the region's history, will soon expand the reach of the Blue Line Trolley service from the southern terminus in San Ysidro to UC San Diego and University City once the 11-mile extension is open to the public in 2021.

Recently, new transit services and supporting infrastructure have been implemented linking the border to the rest of the regional transportation system, providing more mobility options. The South Bay *Rapid* bus service began operating in January 2019, offering access from the U.S.–Mexico border at Otay Mesa to downtown San Diego via a 26-mile route that also connects communities in eastern Chula Vista. Supporting infrastructure built to complement this service includes six miles of dedicated transit guideway through communities in Chula Vista, transit signal priority systems, and the Otay Mesa Transit Center. Built in coordination with MTS to serve as the anchor station on the southern terminus, the new transit center also includes boarding platforms for local bus routes 905, 909, and 950 Express. Prior to the launch of South Bay *Rapid* and the Otay Mesa Transit Center, only local bus service was available near the Otay Mesa POE. Transit riders looking to access other regional services frequently would transfer via local bus to stations along the Blue Line Trolley. The modernization of the Otay Mesa POE by GSA will improve the connectivity between the pedestrian processing facility and the transit center by constructing a new pedestrian ramp (see *Ports of Entry and Related Infrastructure* section above for more information).

In November 2016, the Municipality of Tijuana started operating the Tijuana Integrated Mass Transit System (*Sistema Integral de Transporte Masivo de Tijuana* or *SITT* in Spanish), the city's first uniformly branded and operated mass transit service. Operated as a bus rapid transit (BRT) service, SITT came to fruition after inclusion in Mexico's National Transportation Infrastructure Investment Program and was financed through Mexico's Mass Transit Program (*Programa de Transporte Masivo* or *Protram* in Spanish). The system was designed to include two BRT truncan routes and a number of feeder routes. The primary service route called *Ruta Troncal* (or Route 1) connects downtown Tijuana to the northern terminus at the San Ysidro – Puerta México – El Chaparral POE via a dedicated lane on Paseo Centenario and extends to the east of Tijuana along the Tijuana River channel to the right of the Express Lane or *Vía Rápida*. The southern terminus of *Ruta Troncal* is located about 12 miles to the southeast of the urban core of Tijuana at *Terminal Insurgentes*. The SITT project also introduced dedicated stations constructed mainly within the roadway medians of Route 1, allowing direct access for passengers to board the bus traveling within the dedicated lanes. The original plans called for a second truncan route connecting the Otay Mesa–Mesa de Otay POE with southwestern Tijuana, although this route is currently served as feeder route with more limited hours of operation.<sup>55</sup> The existing operating contracts between Tijuana's municipal government and the private transportation firms that supplement the SITT network are currently being renegotiated. The city of Tijuana has stated that service of the main routes will be maintained through this period.

### *Active Transportation*

Active or non-motorized transportation is any mode of transportation that is powered by human energy, primarily walking and biking. The San Diego Regional Bike Plan (Bike Plan) is a guide for the region through 2050 and proposes a vision for a system of interconnected bike corridors, support facilities, and programs to make biking more practicable and desirable to a broader range of people. One of the bike routes included in the Bike Plan's Early Action Program, which identifies 42 of the highest-priority projects to be implemented first, is the Border to Bayshore Bikeway, which will connect the San Ysidro border area to the Bayshore Bikeway via the communities of San Ysidro and Imperial Beach. The conceptual planning and designs were finalized in 2018 and environmental clearances were obtained in early 2019. The project is now in the final design phase, which will extend until early 2021.<sup>56</sup>

Binational collaboration also occurs in support of active transportation. One of the most prominent joint efforts in the San Diego–Baja California region is the Bike to Work Day and “*Tijuaneando en Bici*” sister events. Bike to Work Day is a national event celebrated annually in the United States on the third Friday in May, as part of National Bike Month. In San Diego, the event is organized by the SANDAG iCommute program, in conjunction with local jurisdictions, businesses, and several partners. Beginning in 2011, the city of Tijuana has joined the San Diego region each year in celebrating Bike to Work Day with its *Tijuaneando en Bici* program. The events occurring in parallel at the border typically encompass community bike rides, informational forums, and pit stops to share information and assist bicyclists on either side of the border. Previous year’s events have concluded with an active transportation public forum in Tijuana and/or the community of San Ysidro. *Tijuaneando en Bici* has become an important way to highlight larger multimodal and active mobility plans and programs like the ones developed by SANDAG and IMPLAN (*Instituto Metropolitano de Planeación* in Spanish), which is the para-municipal planning agency for the city of Tijuana.

In 2017, IMPLAN began efforts to develop the *Programa Integral de Movilidad Urbana Sustentable (PIMUS)*, which is a comprehensive urban mobility plan for the metropolitan zones of Tijuana, Tecate, and Playas de Rosarito. This plan assesses the existing conditions within the urban area as they relate to urban mobility, analyzes current travel behaviors and patterns, and discusses challenges for implementing efficient urban mobility solutions. The PIMUS incorporates an earlier study conducted by IMPLAN and Tijuana’s Economic Development Council (*Consejo de Desarrollo Económico de Tijuana* or CDT in Spanish) that assesses the urban bike infrastructure environment and summarizes research findings and input from local active mobility advocacy groups. Twenty-four kilometers of core bike routes were identified that would connect users to public spaces, public transportation services, and the border as well as an additional 18 kilometers of recreational and tourist-focused routes.<sup>57</sup> The PIMUS builds on and expands from this exercise, incorporating it into a broader scope dealing with all forms of urban mobility within the metropolitan zone.<sup>58</sup> Also in 2017, the Tijuana city council approved an administrative restructuring, creating a new department focused on better coordinating the functions of IMPLAN and SITT in development of sustainable urban mobility solutions. The Secretary of Sustainable Urban Mobility (*Secretaría de Movilidad Urbana Sustentable* or SEMOV in Spanish) fulfills this function within the city government and plays a lead role in the development of the PIMUS.

Another study aimed at improving pedestrian and bike mobility within the border region was completed in 2015. The Pedestrian and Bicycle Transportation Access Study for the California–Baja California Land POEs had the overarching goal to analyze existing conditions and to identify access improvements for people walking or biking across the six main land POEs that connect Imperial and San Diego counties with Baja California.<sup>59</sup> SANDAG, Caltrans, and the SIDUE also were active partners of the binational Agency Working Group that provided input to the study, along with other Mexican partner agencies. The study area encompassed a one-mile radius around each POE extending on either side of the border. Efforts included gathering data, identifying proposed solutions from previous studies and surveys, walking audits, and gathering feedback from border travelers, community groups, and public agencies. The study identified 102 projects or policy recommendations in San Diego and Imperial counties, and municipalities of Baja California to improve POE facilities, infrastructure and connectivity for pedestrians and people on bikes that travel through the POEs. The final report was adopted by the ICTC Board of Directors on February 25, 2015.

## **Energy and Water**

The San Diego region and its neighbors are highly dependent upon both energy and water resources from outside the region. Therefore, diversifying our energy and water resources is a priority of the San Diego region, our neighboring counties, and the municipalities in Baja California.

## **Energy Supply and Demand**

Energy is fundamental to the San Diego and Baja California regional economies and the quality of life for these communities. Energy lights, heats, and cools homes and offices; runs businesses and industrial machines; delivers and heats water; and impacts nearly every facet of daily life. Abundant amounts of electricity (from renewable and nonrenewable sources) and natural gas are required.

The U.S. and Mexico are two major energy exporting and importing countries with different energy production histories, institutions, and regulatory frameworks. The two countries are also energy partners deeply engaged in a system of crossborder energy interdependence in terms of production and transmission. California, which has for some time been in the forefront of adoption of renewable energy standards and policies, imports both wind power and natural gas-generated electricity from Baja California. Current trends indicate that San Diego regional electricity consumption will grow by up to 55 percent by 2050 due to increases in population, housing, and the number of electronic devices used by families and businesses. Per capita consumption is projected to remain flat through 2020 due to advances in energy efficiency and distributed generation, then grow by approximately 15 percent by 2050.<sup>60</sup> Similarly, energy demand in Baja California is anticipated to grow by 5 to 8 percent annually through the year 2025.<sup>61</sup>

### **Binational Perspective – Energy Supply and Demand**

Baja California, which is geographically cut off from Mexico's national energy grid, is connected to the energy grid system of the western United States through transmission lines across the California and Arizona borders. In this sense, Baja California is an "energy island" and, therefore, its energy future is more closely tied to that of the United States than to that of Mexico. Consequently, both opportunities and challenges exist for crossborder energy generation, transmission, and coordination in the binational region. The recent and anticipated population growth and dynamic economy of the border region will require continued efforts to plan and implement coordinated energy solutions.

Traditionally, the California–Baja California border region has relied on imported energy from outside sources delivered via gas pipelines, oil trucks, and power transmission lines to meet its energy demand. As a result, an important binational energy market has developed, as a number of power plants have been built or are planned in the California–Baja California region. Baja California depends mainly on natural gas to generate electricity, about a third of which is exported to California. SDG&E, which is a subsidiary of Sempra Energy, operates two binational transmission lines that connect the California electric grid with the federal Mexican transmission system in Baja California. Together, these two lines are capable of exporting 800 megawatts of electricity from Baja California to California. Baja California exports electricity to California through these lines and from power plants near the border.

Baja California's electricity sector is the primary consumer of natural gas, representing more than 90 percent of the state's total annual consumption in each of the last ten years.<sup>62</sup> However, Baja California is not connected to Mexico's natural gas pipeline system and therefore does not have access to domestic natural gas. Sempra Energy owns and operates two bidirectional pipeline systems that transport natural gas into northern Baja California. Until 2007, regional consumption was entirely supplied by imports from the southern U.S. through pipelines that transport liquefied natural gas (LNG). In 2008, the region began to diversify its supply with the entry into operation of the LNG terminal in Costa Azul, which is 30 kilometers from Ensenada and is owned by Sempra.

It is expected that natural gas demand in Baja California will increase. Some of the demand could be met by increased exports to Mexico via the El Paso Natural Gas system's southern mainline pipeline, which supplies areas through several western states, including San Diego area, and is currently underutilized.

On the renewable energy front, the California–Baja California border region has several large-scale solar and wind projects and potential for more. The concentration of solar radiation is very high in both states, making them convenient locations for producing energy through solar technology. In fact, California is one of the top markets in the nation for both solar and wind, supported not only by weather conditions, but also because of supportive energy policies. Established in 2002 under Senate Bill 1078, and expanded in 2011 under Senate Bill 2, California’s Renewables Portfolio Standard (RPS) is one of the most ambitious in the country, requiring 33 percent of total procurement to come from renewable energy sources by 2020. California ranked number one in the United States in 2018 in terms of megawatts of solar energy capacity installed.<sup>63</sup> With regard to wind power generation, California ranks fourth in the United States for wind power installations.<sup>64</sup> San Diego in particular is also making great progress toward contributing to meeting the RPS goals, with 45 percent of SDG&E retail electricity sales generated from renewable sources in 2018.<sup>65</sup> In Mexico, there are three key geographic areas identified with high wind intensity, one of which is in the mountainous areas of Baja California, giving the border region strategic potential for the development of sustainable wind energy.<sup>66</sup>

Between 2010 and 2012, two wind turbine installations became operational in the mountains of La Rumorosa, close to Mexicali in Baja California. In 2015, Sempra also built and started operating the *Energía Sierra Juárez* (ESJ) wind energy plant, which houses 47 wind turbines about 70 miles east of San Diego and just south of the U.S.–Mexico border. Original plans hoped to connect this plant to the existing Southwest Powerlink at SDG&E’s ECO Substation in eastern San Diego County via a new crossborder transmission line. The presidential permit authorizing the crossborder transmission line was challenged in court in 2012 to include analysis of additional distribution alternatives; however, the permit currently remains in effect, and the ESJ transmission line continues to operate, transmitting electricity generated at the Mexican wind farm to the electric grid in California.<sup>67</sup> Also, Sempra and its Mexican subsidiary IEnova are pursuing a loan through the North American Development Bank (NADB) to expand the capacity of ESJ.<sup>68</sup> There are several additional wind energy projects that are being considered in Baja California, most of which are planned for export purposes.

In the near future, the interdependent energy relationship between Baja California and the southwestern United States, and specifically California, may change significantly. Mexico has plans to eventually connect Baja California to the national electricity grid. Such a transmission line has been considered in Mexico for many years and advanced planning is underway. This development would allow Baja California’s energy market to depend less on energy imports from California and make it possible to receive energy from the mainland and from renewable projects that are being developed in the neighboring state of Sonora, Mexico. Installation of the transmission line would also allow the development of renewable energy projects in Baja California to send energy to other Mexican states.<sup>69</sup>

The increase in regional energy generation could provide more opportunities for regional self-reliance, represent significant investment in the regional infrastructure, and encourage the use of cleaner-burning fuels than some existing plants in the binational region.

#### *COBRO and the regional energy working group*

Continued coordination between California and Baja California can help identify common issues, interdependencies, policies, and actions to address energy planning and infrastructure on both sides of the border. Two SANDAG forums for continued discussion are the Committee on Binational Regional Opportunities (COBRO) and the Regional Energy Working Group (EWG). COBRO organizes an Annual Binational Event to address a variety of border issues. In 2009 and 2010, the binational event addressed challenges, opportunities, and strategies for crossborder climate change collaboration. Energy, as the largest contributor to GHG emissions, played a significant role in the events.

The EWG is comprised of elected officials, business organizations, environmental groups, regional universities, and transportation and energy industry experts, and meets monthly. The EWG oversaw development of the SANDAG Regional Energy Strategy (RES), which is the San Diego region’s energy policy blueprint to improve quality of life through increased use of clean energy supplies in an efficient manner. Reducing energy use through conservation and efficiency has the co-benefits of reducing GHG emissions and utility bills while improving the localized economy and air quality. The RES contains 11 goals, including an Energy and Borders Goal, which is to “integrate energy considerations into existing and future collaborative border initiatives.”<sup>70</sup>

### **Interregional Perspective - Energy Supply and Demand**

The RES,<sup>71</sup> which was updated in 2014, addresses our regional energy needs through 2050 and includes goals that achieve the following: promote energy efficiency and conservation, support the development of renewable energy resources, reduce water-related energy use, increase the deployment of alternative transportation fuels and vehicles, reduce energy demand through transportation and land use planning, develop indigenous renewable sources, and integrate energy considerations into existing and future collaborative border initiatives.

Interregional collaboration and consensus among the jurisdictions in the region are necessary for the region to diversify its fuel sources, expand renewable energy resources, and address environmental and climate-related pollutants from transportation. Similarly, this consensus should be sought with our neighboring regions to establish a coherent energy plan that examines and addresses potential impacts on our neighboring counties.

The SDG&E Sunrise Powerlink Transmission Line project is an example of how interregional planning can help achieve energy goals. This energy asset connects the El Centro area of Imperial County to northwestern San Diego County via a 117-mile-long 500-kilovolt transmission line. This project is consistent with the RES goals in that it increases transmission system capacity as necessary to maintain required reliability and to promote better access to renewable resources and low-cost supply. This transmission line was realized through collaborative interregional energy planning and provides needed infrastructure capacity and access to renewable energy resources that can help achieve RES goals.

### **Tribal Perspective – Energy Supply and Demand**

Tribal governments across the country have been developing energy projects with varying degrees of success and difficulties in recent years. With the federal Energy Self-Determination Act in 2005 came the ability to establish Tribal Energy Resource Agreements (TERA). Under a TERA, a tribe may enter into leases and business agreements for the purpose of energy resource development on tribal land including the exploration for, extraction of, or other development of the energy mineral resources of the Indian tribe located on tribal land, including, but not limited to, marketing or distribution; construction or operation of electric generation, transmission, or distribution facility located on tribal land; and a facility to process or refine the energy resource developed on tribal land. In recent years, tribal nations have developed wind and solar projects on their lands generating energy for themselves and the region.

Under an approved TERA, a tribe may grant rights-of-way for purposes of energy resource development on tribal land or for construction or operation of a pipeline or electrical transmission or distribution line serving an electric generation, transmission, or distribution facility located on tribal land or a facility located on tribal land that processes or refines energy resources developed on tribal land.

How tribal nations and SANDAG could work together to address energy reliability and independence and the development of clean, alternative, and reliable energy resources is an area for further consideration.

Looking to the future, developing more indigenous energy sources can strengthen grid reliability in Southern California. While the San Diego region does not possess large amounts of fossil fuels or natural gas, there is potential for the development of renewable sources such as solar photovoltaics, wind, and geothermal in various parts of Southern California. Likewise, reducing demand by making gains in energy efficiency reduces environmental impacts.

## **Water Supply**

Most of the water used in Southern California and northern Baja California is imported from outside sources. This dependence on outside sources is cause for both conflict and cooperation. Whether used predominantly for agricultural purposes, as in the Imperial and Mexicali valleys, or needed to meet urban demand, increasing pressure is being placed upon these supplies as the population and economy continue to expand. Because water (like energy) is an integral component for a healthy economy, we should consider water reliability not just for ourselves, but for our neighbors as well.

Water authorities in the San Diego region, as well as its neighboring regions, are addressing water reliability issues for the future through a number of strategies. In order to reduce conflict, a cooperative approach will be necessary to assure water reliability for the entire region.

### *Binational perspective – water supply*

San Diego and Imperial counties and the municipalities in Northern Baja California all rely heavily upon water delivered from the Colorado River. Colorado River water is brought to the western portion of the border region through two aqueducts, one on each side of the border. Water systems in San Diego and Tijuana–Tecate are united through an emergency connection, which can deliver water to Mexico in case of a failure of the delivery system on the south side of the border.

The 1944 U.S.–Mexico Water Treaty signed by both countries assures water allocation to California and Mexico. Based upon the treaty, California’s allotment is 4.4 million acre-feet (AF) per year, while Mexico’s is 1.5 million AF per year.<sup>72</sup> Of the allotted amount, the majority of the water on both sides of the border is dedicated to agricultural production, while the urban areas make up their water supply with a mix of Colorado River water, other imported supplies, local supplies such as groundwater, surface water captured in local reservoirs, and recycled water.

However, because of rapid economic and population growth along the border, both regions face increases in demand and therefore are exploring new ways to secure increased water resources for the future. A study released in 2012 by the U.S. Bureau of Reclamation predicted a possible shortage of three billion cubic meters by 2035. To plan for the projected water deficit that the Colorado Rivers Basin will face in the next 20 years, the United States and Mexico, within the binational structure of the International Boundary and Water Commission (IBWC), signed an amendment to the 1944 Treaty, called Minute 319. Minute 319 called for saving water through conservation improvements and gives Mexico a small amount of additional water in an attempt to restore the once-fertile Colorado delta region. A successor agreement, Minute 323, was signed in 2017 and ensured an extension of cooperative measures and adoption of a Binational Water Scarcity Contingency Plan. The contingency plan provides mechanisms to remedy water supply and scarcity issues through management of delivery and exchange between both countries.<sup>73</sup> Likely options for assuring long-term water reliability in this arid region include a mix of increased conservation, maximization of local supplies, water recycling, and desalination.

In fact, the San Diego County Water Authority (Water Authority) has successfully incorporated seawater desalination into its water supply portfolio, with facilities in operation treating brackish groundwater from underground aquifers as well as ocean water desalination. In December 2015, the Claude “Bud” Lewis Carlsbad Desalination Plant began delivering water supply to San Diego residents through a 30-year purchase agreement with the Water Authority.

The plant is the largest desalination facility in the nation, producing 50 million gallons of water each day and about 10 percent of the San Diego region's water demand.<sup>74</sup> In 2012, the Border Environment Cooperation Commission (BECC) certified a project for a desalination plant in Ensenada, Baja California. The plant was constructed in 2018 with funding from NADB, Mexican water authorities, and private investors. It currently supplies about 5.7 million gallons a day (mgd) of converted seawater to municipal water users in Ensenada. As the only municipality in the state that does not receive water from the Colorado River, and therefore is dependent largely on aquifers for its supply, the plant was an important step toward sustainability for the area. The second ocean desalination plant in Baja California is currently under construction in San Quintín, about 160 miles south of the plant in Ensenada. The project is being developed through a public-private partnership (PPP) and is expected to deliver about 5.7 mgd once operational.<sup>75</sup> The Water Authority also participated in a binational feasibility study of a large-scale desalination plant that would be constructed in Playas de Rosarito. This facility has been advanced by another PPP but has not yet obtained all of the necessary permits to begin construction. The plant, as envisioned by project proponents, would be the largest in the Western Hemisphere and supply about 100 mgd once completed. This resource could be made available to U.S. and Mexican water users and would help significantly augment Colorado River supplies.

### *Imported Water Quality*

A significant issue related to the allocation of Colorado River water is water quality, or salinity. Water from the river is used many times over. It is drawn out, used, treated, and discharged back into the river by many users before it reaches its southernmost destination. This results in a deterioration of the water quality, producing high levels of salinity by the time it reaches Mexico. High salinity levels make it difficult to grow certain crops and can damage municipal and household pipes and fixtures. The 1974 Colorado River Basin Salinity Act authorized the construction, operations, and maintenance of works in the Colorado River Basin to control the salinity of water delivered to Mexico. Title I of the Act deals with the United States' salinity commitments to Mexico, while Title II of the Act creates the Colorado River Basin Salinity Control Program (Program) which focuses on improving the water quality of the Colorado River to U.S. users above Imperial Dam. Legislative mechanisms exist to set standards and develops implementation programs to reduce the annual salt load of the Colorado River. The program has reduced the salinity concentration at Hoover, Parker and Imperial dams; however, even with these efforts, the quantified damages to U.S. users are still approximately \$454 million per year. Damages are projected to increase to \$574 million per year by 2035 if the Program does not continue to be aggressively implemented.<sup>76</sup> The salinity problem has been the object of several studies and investigations, and numerous surveys of salinity sources and control measures have been pursued over the years by the U.S. Department of Reclamation, the U.S. Geological Survey, the EPA, the Water Resources Council, the Colorado River Board of California, the Basin States, and several universities.

### *Water Infrastructure*

While both sides of the border face increasing water demand, existing water conditions differ on each side of the border. For example, per-capita water use in Baja California is much lower than that of the San Diego region. The average per-capita rate in Tijuana is 125 liters/day or 33 gallons/day,<sup>77</sup> while the rate in San Diego County is 150 gallons/day.<sup>78</sup> San Diego's geographic service area is nine times greater, representing 1,420 square miles (3,678 square kilometers) as compared to a service area of 152 square miles (392 square kilometers) in the Tijuana-Playas de Rosarito area.

Another major difference is in the existing infrastructure of each area. The San Diego region has well-developed water-delivery systems; 100 percent of the population has access to potable water. Tijuana's infrastructure has been unable to keep up with the massive growth in that city. As a result, not all of the city's population has water-delivery infrastructure. In 2015, an estimated 97 percent of the population in Baja California had potable water coverage, constraining the poorest segment of the population to purchase water liter by liter, thereby spending a significant amount of their per-capita income on this basic human necessity.<sup>79</sup>

Similar to its water-delivery system, San Diego's wastewater-collection system is capable of handling 100 percent of the wastewater generated. However, even with several efforts made in Tijuana, its wastewater infrastructure only serves approximately 90 percent of the population.<sup>80</sup> This has significant implications on the city's ability to collect, recycle, and reuse existing resources and leads to negative water quality and human health, especially during the rainy season.

### *Tijuana's Master Plan for Water and Wastewater Infrastructure*

The U.S. Environmental Protection Agency (EPA) Border Environment Infrastructure Fund (BEIF), working through BECC and NADB with Mexico's National Water Commission (*Comisión Nacional del Agua*, or CNA in Spanish), has supported a number of wastewater-related projects in Baja California. In conjunction with the state Public Services Commission (*Comisión Estatal de Servicios Públicos de Tijuana* or CESPT in Spanish), the agencies developed the Tijuana 20-year Master Plan for drinking water and wastewater facilities and improvements to the wastewater-collection system throughout the city. The Master Plan identified alternatives for meeting Tijuana's water and wastewater infrastructure needs for the 20-year period between 2002 and 2023. The Master Plan developed a framework for guiding investments, including: potable water resources, including water reuse alternatives; potable water infrastructure; wastewater collection and conveyance; and wastewater treatment infrastructure, including pretreatment of industrial wastewater. Since the Master Plan was created, several studies have been conducted in the U.S. and Mexico by both private and public entities focused on the watershed, water supply, and the challenge of transboundary flows impacting the region (see *Watersheds and Water* section below for more information).

The Master Plan was an important step in averting a water crisis in the northern Baja California region. Given the proximity of our populations, the integration of significant sectors of our economies, and the social and cultural ties that we share, it is important for San Diego to support efforts in Tijuana and the entire northern Baja California region to upgrade the water supply and collection system.

### *Binational Conveyance Study*

One example of a potential approach to ensure water reliability in the binational region is shared infrastructure across the border. The water authorities for San Diego County and Baja California concluded a binational study in 2002 to analyze the alternatives of transporting water from the Colorado River through a joint aqueduct. This study included technical information from both sides to evaluate the possibilities of a binational aqueduct and proposes alternative routes. However, it appeared that implementation of the proposed aqueduct was unlikely because Baja California's impending water needs were more immediate than those of San Diego. Therefore, Mexican authorities decided to expand their own aqueduct, the Rio Colorado–Tijuana Aqueduct and commissioned a project in 2007 to build approximately forty miles (64.4 kilometers) of pipeline and increase the capacity of six existing pumping plants. The aqueduct began operating at full capacity in 2011.

## **Interregional Perspective – Water Supply**

The Water Authority currently delivers approximately 75 percent of the region’s water supply primarily through purchases of imported supplies from the Metropolitan Water District (MWD) and through purchases of conserved agricultural water from the Imperial Irrigation District (IID). MWD imports its supply from two main sources, the Colorado River and the State Water Project, the latter of which is pumped from the San Francisco Bay/Sacramento–San Joaquin River Delta through the California Aqueduct. The reliability of these two supplies directly affects the reliability of San Diego’s overall water supply mix. The Water Authority is meeting approximately 15 percent of the region’s water demand by diversifying water sources through local supplies from surface water, groundwater, recycled water, and conservation.

### *Imperial Irrigation District Water Transfer Agreement and All-American Canal and Coachella Canal Lining Projects*

A key element in the Water Authority’s diversification strategy is the Imperial Irrigation District (IID) Transfer Agreement, which allows the Water Authority to purchase conserved Colorado River agricultural water from the Imperial Valley. The transfer agreement was approved in October 2003 after many years of complex negotiations among the water agencies and the state and federal governments. In 2003, the Water Authority purchased 10,000 AF to start, which increases each year to 200,000 AF in 2021. In October 2003, the Water Authority was also assigned Metropolitan’s rights to 77,700 AF per year of conserved water from projects that lined the All-American Canal (ACC) and Coachella Canal (CC). These projects reduced the loss of water that occurs through seepage and that conserved water is delivered to the Water Authority. This provides the San Diego region with an additional 8.5 million AF of water over the 110-year life of the agreement. The ACC lining project, which was completed in 2009, faced opposition in Mexico given that Mexican farmers in the Mexicali Valley have depended for decades on the seepage from the All-American Canal to recharge the aquifer and provide water to their wells.<sup>81</sup>

The transfer agreement and lining projects are key elements of California’s plan to live within its current Colorado River water allocation of 4.4 million AF. The aptly named “California 4.4 Plan” promises six other western states that California will stop using more than its allotted portion of the Colorado River. California has routinely taken surplus water from the Colorado River amounting to approximately 5.2 million AF annually. The transfer allows the San Diego region to receive more water from the IID and therefore less water from the MWD, making it possible to reduce MWD’s withdrawals from the Colorado River.

This agricultural to urban transfer of Colorado River water will not only help the State stay within its 4.4 million AF allotment but will also reduce Southern California’s dependency on water supplies from the State Water Project, which will greatly benefit other users of that water supply. In 2018, the canal lining transfer made up 15 percent of the Water Authority’s water supply.<sup>82</sup>

## **Tribal Government Perspective – Water Supply**

Most tribal reservations in San Diego County are outside of the San Diego County Water Authority’s boundaries and are, therefore, reliant on groundwater.<sup>83</sup> The rules and regulations governing surface water and groundwater are different for tribes than for the communities that surround them. This has often created confusion and at times led to some conflict between some tribes with gaming facilities and nearby rural residents who claim that their groundwater supply is being depleted by on-reservation developments. At the same time, several tribes claim that non-tribal neighbors are taking their groundwater for commercial purposes. Several tribes are investigating alternative water supply options such as receiving water from the Otay and Padre Dam water districts.<sup>84</sup> The tribes along the San Luis Rey River formed a water district and sued the federal government for violating their water rights. They claim that Vista and Escondido have long usurped water that should have been available to the tribes.

They won the litigation in 1988 but are still waiting for the water. The issue of groundwater and different rules applying to tribes and the surrounding communities will become an increasingly important issue.

## **Environment**

Ecosystems know no political boundaries. Flora and fauna, air, water, and the pollution that affect them are transverse through a system not restricted by national borders or political governance. Environmental issues are best addressed at a larger landscape level or ecosystem basis. To protect habitat, we should consider open space corridors in order to address the movement of species and ecosystem processes across a region. To address water quality, we should use a watershed perspective. To understand air quality, we need to understand air basins. Habitat corridors, watersheds, and air basins define a respective geographical area in which a particular ecological system functions. Our borders do not follow these lines, but our management of environmental issues should.

The San Diego region has made great strides in habitat management through the Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP). The region must now work to link these efforts with similar efforts in the surrounding regions and encourage similar consideration of open space planning where needed. Likewise, this region is responding to challenges in water quality through a mixture of responses within jurisdictional boundaries and by collaborating across jurisdictional lines within larger watershed areas.

Regarding clean air within the State of California, air quality is governed by a system that considers the basin level. However, this approach has not been successfully applied to the international boundary where environmental issues may cross the border, but regulation and enforcement do not. To shed light on the gaps in air quality information for the border communities, U.S. and Mexican partners are pursuing joint monitoring efforts to collect data in both the San Diego–Tijuana area as well as the Imperial–Mexicali area.

## **Habitat**

### **Binational Perspective – Habitat**

With the rapid economic and social development in the binational border region, finding the balance between new development and the conservation of the environment is an important challenge.

The border region is home to habitat significant for the conservation of species of flora and fauna, including coastal sage scrub and chaparral vegetation. Because of the varied climate, topography, and vegetation, the region is one of the most ecologically diverse in the world.

Conservation biologists know the ecological area that encompasses much of Southern California and northern Baja California as the “California Floristic Province.” In its entirety, the province runs from northern Baja California north to the California–Oregon border, known for its unique biodiversity and large numbers of threatened and endangered species and habitats. Because of these features, significant opportunities exist for collaborative approaches to conservation across the California–Baja California border.

### *Binational Conservation and Restoration Efforts*

Situated in a highly urbanized location, the Tijuana River Estuarine Research Reserve (TRNERR) faces critical issues of habitat restoration and recreational use, as well as management of endangered species, wastewater, and sediment. In 2002, the TRNERR and the Tijuana City Council signed an MOU regarding the creation of conservation easements that would reduce environmental impacts on the TRNERR. The Reserve organization has a long history of coupling rigorous science with ecosystem restoration and has completed major studies focused on synthesizing restoration and ecosystem science to inform effective decision-making.

The United States and Mexico signed the first binational conservation easement in 2003. The easement protects the highest peak in Tecate, known as Cerro Cuchumá to the native Kumeyaay Indians, who consider the mountain sacred. This chaparral-covered mountain supports endemic plants and other species protected by Mexican law. The approximately 819-hectare easement restricts land uses to those consistent with the conservation of its biodiversity, such as research.

Also, in 2003, environmental conservation organizations from both sides of the border collaborated to form the Las Californias Binational Conservation Initiative. The aim of the Initiative was to promote coordinated efforts to establish binational habitat corridors and protect biodiversity in the region. The Initiative made recommendations for specific actions to take in order to protect the region's natural resources and outlined a conservation network that would preserve the ecological integrity of the borderlands. The network proposed by the Initiative is partially based on an analysis launched by The Nature Conservancy, the Conservation Biology Institute, and Mexican environmental conservation group Pronatura, which identified areas with large, intact wilderness areas that represented regional biodiversity patterns and possessed irreplaceable resources and key landscape linkages that could ensure compatibility between human land use and wildlife movement and ecological processes. The Nature Conservancy has been involved in a number of land acquisitions that would expand protected natural areas in the transborder region in eastern San Diego County and Baja California, including studies and plans to maintain binational landscape linkages for bighorn sheep and mountain lions.

In 2008, the Mexican Ministry of the Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales* or SEMARNAT in Spanish), the California Environmental Protection Agency, the California Department of Food and Agriculture, and the State of California signed an MOU on Environmental Cooperation in order to promote and carry out broader collaborative activities with regard to environmental issues, including wildlife and habitat conservation.<sup>85</sup>

In 2009, the State Commission for Public Services in Tecate (*Comisión Estatal de Servicios Públicos de Tecate* or CESPETE in Spanish), the La Puerta Foundation (*Fundación La Puerta*, in Spanish) and BECC collaborated to restore wetlands adjacent to the Alamar River. The restored wetlands introduce plant species that help cleanse the river's water, create areas for groundwater recharge, help reduce flooding, and provide refuge and food for resident and migratory birds.<sup>86</sup>

A binational seabird population restoration effort was launched on the Baja California Pacific Islands in 2011 with funds from the Montrose and Luckenbach Trustee Councils and the Government of Mexico and support from partner conservation organizations on both sides of the border. The partnership began work in January 2012 on Coronado, Todos Santos, San Martín, San Jerónimo, Natividad, Asunción, and San Roque Islands, targeting seabird species that face threats from non-native species, nest and burrow destruction, and disturbances from lights and other man-made structures. Restoration projects use decoys, mirrors, and broadcast calls and songs to increase social interactions and construct artificial nests to improve nesting opportunities. On San Jerónimo, two boardwalks were installed providing paths for fisherman to avoid human disturbance to nesting habitats.<sup>87</sup> The partners also conduct habitat restoration, reduce human disturbance and artificial light, and support environmental education in surrounding communities. This binational project will benefit seabird populations in both countries for years to come.

At the community level, success in dedicating habitat space in the border region can occur more organically. In 2015, a community group in the municipality of Tecate organized and successfully petitioned the Mexican federal government and State of Baja California to grant local control over 3 kilometers of sensitive riparian land near the Arroyo Alamar. The group, called *Mesa Técnica*, worked with authorities to preserve the area after more than 70 percent of the waterway was paved for channelization between 2011 and 2014.<sup>88</sup>

Binational conservation efforts present many challenges, including population growth and rapid development and differences in land ownership, legal framework, financial resources, and existing conservation patterns. Despite these challenges, local, state, and federal agencies and non-governmental organizations from both sides of the border have come together and continue to work collaboratively on conservation planning and habitat restoration.

### **Interregional Perspective – Habitat**

In 1991, the California Legislature enacted the Natural Community Conservation Planning (NCCP) Act. This act created a program to provide counties in Southern California with long-term regional protection of natural vegetation and wildlife diversity while allowing compatible land uses and appropriate development and growth. The program started with five counties that included San Diego, Orange, Riverside, San Bernardino, and part of Los Angeles. While each county is undertaking its own habitat planning efforts, the NCCP Program provides the criteria for ecosystem planning by focusing on preservation of an entire ecosystem versus preservation on a species-by-species basis. The U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife are mandated to assure that these planning efforts are integrated across counties and implemented by the various jurisdictions. Therefore, the planning oversight for interregional habitat protection lies at the state and federal levels.

The local Multiple Species Conservation Program (MSCP) and the Multiple Habitat Conservation Program (MHCP) are consistent with the NCCP guidelines and meet the requirements of the NCCP Act (for more information regarding habitat planning in San Diego County, please refer to Chapter 2 of the 2019 Federal RTP). Similar planning efforts in the counties of Riverside, Orange, and Los Angeles have applied the same standards and criteria to ensure the compatibility and integration of these systems across county lines. As of October 2017, the NCCP includes 13 counties and coverage over an area of nearly 10.4 million acres throughout California.<sup>89</sup> As part of the program, the region and most counties implementing the NCCP participate in the California Habitat Conservation Planning Coalition. The purpose of the coalition is to increase the effectiveness and promote conservation plans in California. The coalition does this through lobbying, seeking funding solutions, and promoting collaborative based solution.

Along our eastern border with Imperial County, most of the land is public land, including the Anza Borrego State Park, the Cleveland National Forest, and other areas owned and managed by the Bureau of Land Management (BLM). Therefore, there is less concern that this habitat will be lost to development or other disturbances. Nonetheless, the County of San Diego has outlined the future development of the MSCP East, which will address conservation and development pressures in these areas covering approximately 1.6 million acres.<sup>90</sup> In addition, efforts are underway with the Desert Renewable Energy Conservation Plan, which will help provide effective conservation of desert ecosystems while allowing for the appropriate development of renewable projects.

### **Tribal Perspective – Habitat**

Tribes are invested in environmental and habitat conservation, but they are often not included in planning efforts. Tribal concerns, values, and impacts are not broadly known. While most conservation planning is done from a species and biological perspective, tribal conservation planning comes from a cultural perspective. Certain plants and animals have great cultural significance to local tribes, but do not necessarily fit the definition of an endangered species.

Tribal lands are often considered open space by state and local planners seeking to “preserve” this land or include it in conservation and endangered species habitat plans. Tribes have sovereign authority over the development of their land; however, such assumptions should not be made.

Each tribe has their own habitat-conservation concerns based on where their land is located and what kind of development plans the tribe has in place. Some tribal lands come more into contact with larger municipalities than others do, and the considerations then become more complex. Some examples of projects with the tribes include creek realignment, wetlands-restoration projects, habitat restoration along San Luis Rey, and Trujillo Creek and Oak tree monitoring partnerships with California Native Plant Society.

Positive actions toward inclusion of tribal conservation values have occurred as a result of SB 18, enacted in 2005, which requires local jurisdictions to consult with tribes when amending their general plans and elements. The challenge for tribes is that consultation is an unfunded mandate. Often small non-gaming tribes cannot afford to spend limited resources and staff time on a consultation process.

Tribal governments are eligible for and have applied for land management and monitoring funds in the Environmental Mitigation Program. It should be noted, however, that some grants to other organizations have benefitted the tribes. An example is the grant to Wildlife Services to control a feral pig problem that was affecting areas of the unincorporated area, including several tribal reservations.

## **Watersheds & Water Quality**

### **Binational Perspective – Watersheds and Water Quality**

Besides sharing an important ecological region, San Diego, Tijuana, and Tecate share the Tijuana River Watershed, which encompasses approximately 1,750 square miles, one-third of which lies in the United States and two-thirds in Mexico as shown in Figure U14.7. The watershed runs 50 miles north–south and 70 miles east–west before draining into the Tijuana Estuary and the Pacific Ocean on the U.S. side of the border. The estuary became part of the U.S. Department of Commerce’s National Estuarine Sanctuary Program in 1982 and was designated a National Estuarine Research Reserve (thus creating the TRNERR). The watershed is one of the most important wetland/salt marshes remaining in Southern California and was designated a “wetland of international importance” by the United Nations’ Ramsar Convention on Wetlands. The TRNERR protects and manages the natural and cultural resources of the Tijuana River Estuary, including endangered plants, fish, and wildlife, by focusing on research and education along with compatible recreation and resource use.<sup>91</sup> Significant binational efforts have been made and are currently underway to address myriad issues throughout the watershed. Numerous working groups, coalitions, committees, and deliberative bodies have been convened over the years to address the issue of transboundary water issues and coordinate research on specific issues, discuss and identify solutions, and elevate funding needs.

#### *Binational groups formed to collaborate on Tijuana River Watershed issues*

One such earlier effort established the Tijuana River Watershed Binational Vision Project in 2002 to provide a framework for the many activities, projects, and research being conducted about the health of the watershed. Represented by a consortium of organizations and individuals including scientists, urban planners, academics, GIS specialists, community stakeholders, the Binational Watershed Advisory Council (BWAC) was formed with funding from the State of California, the County of San Diego, and San Diego State University to provide guidance for the Binational Vision Project by developing baseline information and a binational vision for the state of the watershed.

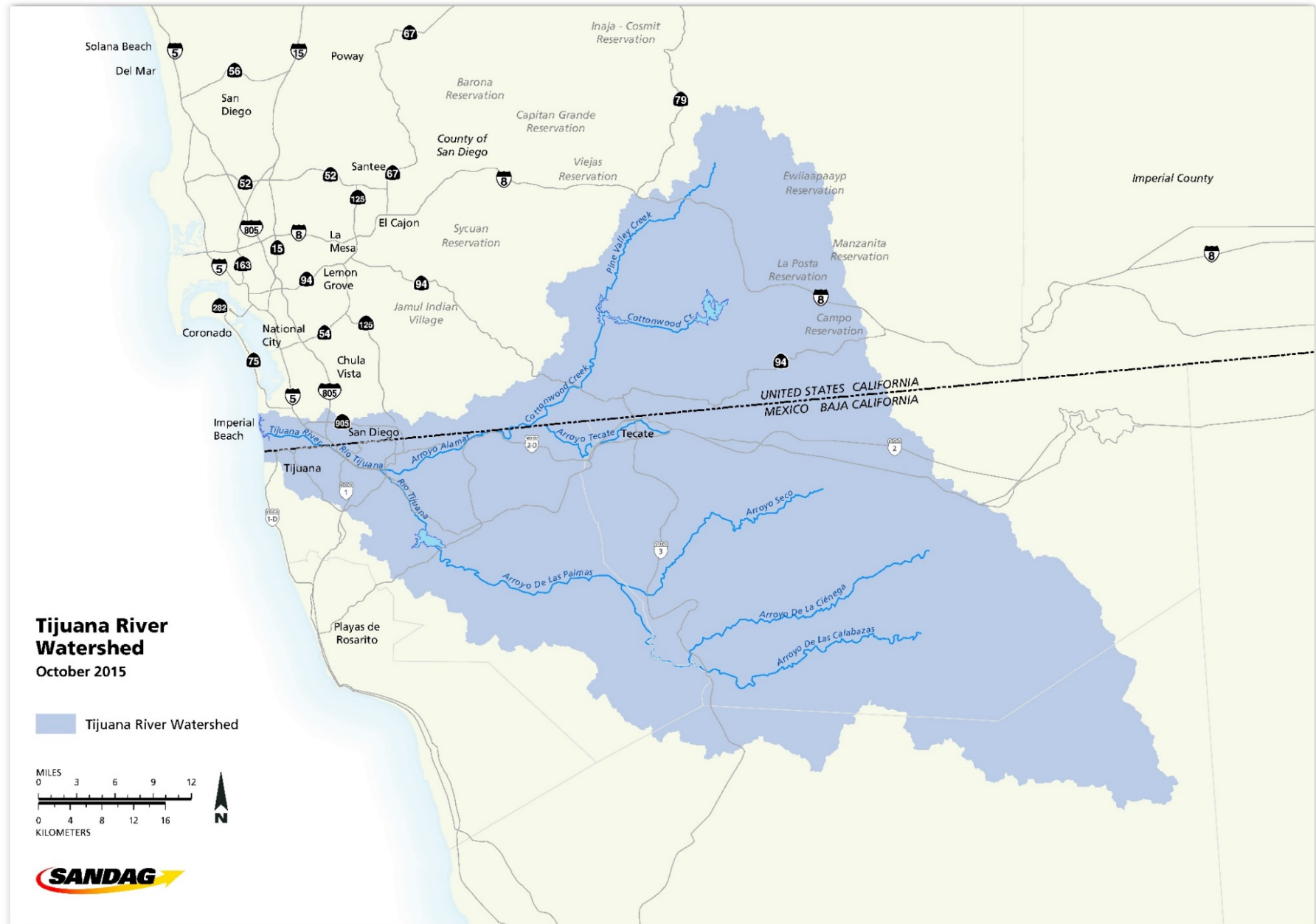
The Biodiversity Along the Border Committee, formed by the California Biodiversity Council in 2006, created a Tijuana River Estuary Issues Work Group to address environmental degradation in the Tijuana River Watershed. The work group identified strategies to improve the ecosystem health of the estuary, including the need for sewer systems for neighborhoods upstream of the estuary, new or retrofitted water diverters at the water treatment plant on the border, sediment basins on both sides of the border, and solutions to stop the flow of trash and tires into the estuary.<sup>92</sup> The strategies were developed by a binational coalition of government agencies at all levels (including

SANDAG) to be well-aligned with the TRNERR's activities. Among the main concerns addressed by the program were erosion in the canyon that leads to sediment buildup that threatens native species and pollutants, trash, and invasive species impacting the ecosystem.

In addition, through the Tijuana River Valley Recovery Team, which was established in 2008, many local agencies and organizations collaborated in an effort to address the problem of not only toxic sewage, but also sediment and trash that flows from Mexico across the border in the Tijuana River watershed, as well as habitat-recovery and protection of sensitive species. To further these efforts, the IBWC and its Mexican counterpart *Comisión Internacional de Límites y Aguas* (CILA) convened the first binational meeting in 2013 to discuss developing a new binational treaty amendment to the 1944 U.S.–Mexico Water Treaty. These discussions would shape what later would be called Minute 320, which was signed by the U.S. and Mexican governments in 2015. Through Minute 320, the IBWC established a framework that includes three work groups; water quality, sediment, and solid waste. Each work group is made up of stakeholders from both countries who have an interest and expertise in those areas. To oversee the activities of all three work groups, a core group comprised of leaders from the community was formed to direct the work groups and to forward their findings and recommendations to CILA.<sup>93</sup>

Following the establishment of the BWAC, the EPA proposed that the Border 2012 Water Task Force for the Tijuana River Watershed be formed from the existing Advisory Council and interested stakeholders. The Border 2012 Task Force focused on strategies for implementing the vision in order to meet the goals and objectives of Border 2012. The goals and vision established remain a part of the current Border 2020 program and help guide efforts of all levels of U.S. and Mexican government. Under the goal of improving access to clean and safe water, two objectives specifically relate to the Tijuana River Watershed: to “work bi-nationally to identify and reduce surface water contamination in transboundary waterbodies and watersheds” and to “provide the public with timely access to water quality data in binational water bodies and watersheds in a readily understandable, web-based format.”<sup>94</sup>

**Figure U14.7**  
**Tijuana River Watershed**



Source: SANDAG, 2015. Data from the United States Geological Survey (USGS) and Instituto Nacional de Estadística y Geografía (INEGI).

### *Transboundary flows and watershed infrastructure projects*

One of the most visible issues affecting the westernmost portion of the watershed (which lies in the urbanized areas of Tijuana and San Diego) is that of sewage and other toxic pollutants entering the Tijuana River on the Mexican side of the border. These flows eventually cross the border and pass through the Tijuana River Estuary before entering the Pacific Ocean. Unmitigated, the pollutants cause numerous beach closures and pose serious human health threats on both sides of the border. A major contributor to this problem is insufficient sewage collection infrastructure in Tijuana. Over the years, efforts on both sides of the border have led to the construction and ongoing operation of diversion structures, pump stations, and treatment plants to reduce the frequency, volume, and pollutant levels of transboundary sewage flows. Flows of untreated wastewater in the river in the U.S. that were common in the late 1980s and early 1990s have been greatly reduced due to treatment facility construction projects in both countries that were addressed under IBWC. Dry weather flows have been controlled to some extent by a river diversion and pump station (called Pump Station CILA) constructed in 1991 and located just upstream of the international border. This pump station operates when river flows are less than 1,000 liters per second (or 22.8 mgd) but is shut down when flow exceeds the pump station capacity due to submergence and clogging of the intake screen.<sup>95</sup> Capacity constraints and a lack of sufficient wastewater infrastructure in Mexico have urged bodies like the IBWC and others to call for greater investment.

A key regional effort to minimize the amount of raw sewage that flows across the border was the construction of the South Bay International Wastewater Treatment Plant (IWTP), which was funded through the EPA and the Mexican government. The plant was completed in 1997 and is operated by the IBWC on the U.S. side of the border, though both the United States and Mexico share in plant operation and maintenance. The IWTP treats up to 25 mgd of Tijuana's sewage, and has capacity for 100 mgd. The IWTP operates a dry weather diverter in the Tijuana River to collect up to 13 mgd of flow directly from the river and takes overflow sewage from the treatment system in Tijuana, which would otherwise flow down the Tijuana River, through the TRNERR to be discharged untreated directly into near shore waters and beaches of south San Diego County and Playas de Tijuana. The plant does not divert any flows from the river during wet weather. The original IWTP treated the sewage from Mexico to an advanced primary level, which technically does not meet standards set by the Clean Water Act in the United States. The plant was upgraded in 2010 to treat sewage at a secondary level that meets U.S. requirements.<sup>96</sup>

In Tijuana, CESPT rehabilitated or replaced 160 miles of deteriorated wastewater collection pipe in the city as part of the Tijuana Sewer Rehabilitation Project, known locally as *Tijuana Sana* (or Healthy Tijuana) in 2002. CESPT has continued to pursue wastewater rehabilitation projects annually and implements improvements as funding becomes available. In 2014, a project to rehabilitate various existing wastewater collector main lines and construct new residential wastewater lines in Tijuana was certified by NADB. The EPA, which partially funded these improvements, is currently pursuing a continuation of the project. Several miles of collector lines, numerous manholes, and other elements of the system have been rehabilitated as part of the first phase in the multiphase effort.<sup>97</sup> Over the past 25 years, NADB has participated in water and wastewater projects worth close to \$142 million in the Tijuana–Rosarito region.<sup>98</sup>

Recently, attention on the issue of transboundary flows has increased substantially following sewage spillover events in the binational region. A significant event occurred in February 2017, which prompted the IBWC to investigate the response actions taken by the relevant operating agencies. The report, called a "spill report," was submitted to the California Office of Emergency Services and the San Diego Water Board and discovered that 143 million gallons of wastewater was diverted to the Tijuana River during repairs to one of CESPT's collector lines in central Tijuana that was damaged after severe rainfall. The location of the broken sewer line was in the area just upstream of the confluence of the Alamar and Tijuana Rivers and approximately six miles from the international boundary.<sup>99</sup> The ensuing flows caused the IBWC and other stakeholder agencies to receive numerous complaints of odor and degraded water quality.

The investigation shed light on the existing gaps in binational communication protocol as well as the aging nature of the infrastructure, but also highlighted the robust response from the border community and the IBWC Minute 320 working group teams. In 2018, the Port of San Diego, City of Imperial Beach, and City of Chula Vista filed a legal complaint against the IBWC under the Clean Water Act and Resources Conservation and Recovery Act, citing violations. The California State Water Resources Control Board and other groups filed legal notices in the same year. Despite major investments in decades prior, emergency repairs, and efforts to improve collaboration on the issue, the current infrastructure still falls short of the needed capacity to contain impacts of untreated wastewater flows.

In 2019, a study directed by NADB, with funding from the EPA and in coordination with the IBWC, CILA, the Mexican National Water Commission (CONAGUA), and CESPT was published that identifies options to prevent and better manage the small, short-term flows that result at the tail end of storms, when the wastewater diversion system is preparing to restart, or when there is a breakdown in equipment. The study encompasses a transboundary flow analysis, a diversion system infrastructure and operations diagnostic, and an evaluation of technical alternatives identified for potential infrastructure investments in Mexico, in the U.S., or in both countries for mitigation of transboundary flows. The study also found that an average of 20 days of transboundary flows per year are the result of wastewater diversion system failure. Six alternatives for investment in wastewater infrastructure were analyzed and included capital cost estimates ranging from \$16 million to \$108 million per project, with annual operation and maintenance costs from \$4.7 million to \$7 million.<sup>100</sup>

Since the release of this study, legislators and government entities have called for more assistance federal government to assist with funding possible solutions. A coalition of legislators in U.S. Congress, led by Rep. Juan Vargas, has called for \$100 million in appropriations to be made in the federal FY 2020 Interior, Environment, and Related Agencies appropriations bill to fund binational projects through programs like the EPA's Border Water Infrastructure Program (or BWIP).<sup>101</sup>

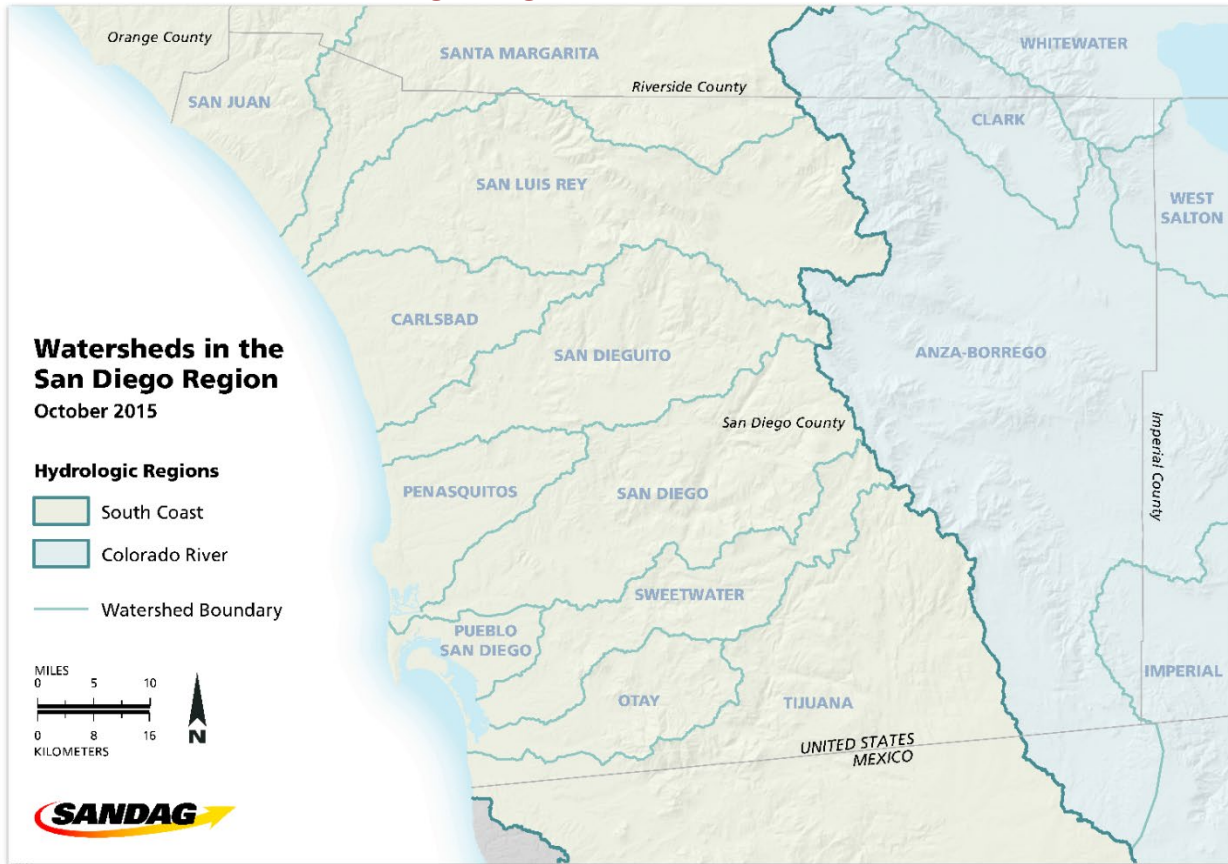
### **Interregional Perspective – Watersheds and Water Quality**

The San Juan and Santa Margarita watersheds lie along our northern border with Orange and Riverside counties, as shown in Figure U14.8.

The Santa Margarita Watershed encompasses approximately 750 square miles, most of which lies in southwestern Riverside County, but drains into the area of Camp Pendleton and ultimately discharges through San Diego County into the Pacific Ocean. Due to growth in the eastern areas of the watershed, the lower area of the watershed (Marine Corps Base Camp Pendleton) has experienced flood problems, increased erosion, and high levels of pollutants. Development in the valleys of the Santa Margarita Watershed, which includes the areas of Temecula, Lake Elsinore, and Hemet, will continue to negatively affect the lower reaches of the watershed where development has not occurred.

The San Juan Watershed covers 496 square miles in San Diego, Orange, and Riverside counties. Approximately 150 square miles (30 percent) of this area is located in northwest San Diego County, almost entirely within Camp Pendleton. There are five hydrologic areas in the San Juan Watershed, two of which, the San Onofre and San Mateo hydrologic areas, are within San Diego County. Due to the nature of the hydrological areas, development within the watershed in Orange County has not adversely affected San Diego County such as has occurred in the Santa Margarita Watershed.

**Figure U14.8**  
**Watersheds in the San Diego Region**



Source: USGS, National Hydrography Dataset, 2015

### **Tribal Government Perspective – Watersheds and Water Quality**

While tribal sovereignty has led many to believe that tribes do not have to adhere to environmental regulations in their developments, in truth, tribal governments’ relationship to the federal government in environmental matters is similar to that of states. They act as the authority delegated to implement federal environmental laws within their respective jurisdictions. They may enact regulations more stringent than the federal government’s rules, as California has done in many areas, or default to federal regulation. Tribes must prepare environmental impact statements in accordance with the National Environmental Policy Act (NEPA), and these reports must include the consideration and potential mitigation of off-reservation impacts.

### **Air Quality**

#### **Binational Perspective – Air Quality**

Air quality along the U.S.–Mexico border has traditionally been dealt with separately in each nation; however, it is understood that the border region includes a number of cities that share common airsheds and the designated regulatory air basins of California do commingle with air from the basin on the Mexican side of the border.<sup>102</sup> As development continues along the border, related air pollution from one side of the border may have negative effects on the other side, posing environmental and health risks to the community.

Air pollution in northern Baja California and San Diego is largely caused by motor vehicle traffic. Vehicles are a major source of air pollution by releasing ozone precursors, volatile organic compounds (VOCs), and particulate matter (PM) directly into the air. When vehicles drive on unpaved roads, they add to the problem by emitting dust into the air. According to EPA criteria, San Diego County does not meet federal clean air standards for ozone.<sup>103</sup>

At the state level, the San Diego air basin is designated nonattainment for ozone and the fine particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) standard.<sup>104</sup> Historically, Tijuana has not met the standards for ozone, carbon monoxide, or PM, although recent analysis has lacked sufficient data to update estimates for all pollutants. According to a 2016 study from Mexico's National Institute for Ecology and Climate Change (*Instituto Nacional de Ecología y Cambio Climático* or INECC in Spanish), the Tijuana area registered some of the highest daily average concentrations of PM in the country.<sup>105</sup>

In the San Diego region, all 19 jurisdictions have completed inventories of GHG emissions from government operations and the community as a whole, and all but one jurisdiction has either adopted or is in the process of developing a local Climate Action Plan. In addition, BECC has worked with the Center for Climate Strategies to complete GHG inventories for all six Mexican border states. At a state level, California has been at the forefront of climate change policy with the California Global Warming Solutions Act of 2006 (AB 32) and the Sustainable Communities and Climate Protection Act of 2008 (SB 375). AB 32 required California to reduce its GHG emissions to 1990 levels by 2020, a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario. SB 32, which was signed in 2016, establishes a new target for GHG reductions in the state at 40 percent of 1990 levels by 2030. SB 375 supports the state's climate action goals to reduce GHG emissions through coordinated transportation and land use planning with the goal of more sustainable communities.

In 2012, Baja California was one of the first states in Mexico to publish its state climate change law and also established the Climate Change Council (*Consejo de Cambio Climático* or CCC in Spanish). The goal of the legislation was to develop unique strategies for the state and to support the implementation of Mexico's national climate change plan.<sup>106</sup> Mexico, as one of the 196 nations to join the 2016 Paris Agreement of the United Nations, is committed to reducing GHG and black carbon emissions by 25 percent of "business as usual" rates by 2030.<sup>107</sup> The U.S.–Mexico Bilateral Framework on Clean Energy and Climate Change was established in 2009, setting precedent for federal-level policy collaboration on this issue. The Framework created a mechanism for bilateral cooperation and information exchange and promotes efforts that are part of the Border 2012 program as well as its successor, Border 2020.

An MOU on Environmental Cooperation between California EPA, the California Department of Agriculture, the California Resources Agency and the Mexican Ministry of the Environment and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales* or SEMARNAT in Spanish) was signed in 2008, identifying climate change as one of the priority areas of action. In 2014, a similar MOU was signed between California and the Mexican federal government to enhance cooperation on climate change and the environment. The California Air Resources Board (CARB) still maintains an active collaborative relationship with SEMARNAT and the Ministry of Environmental Protection (*Secretaría de Protección al Ambiente* or SPA in Spanish) to work on border air quality issues. One of the principal joint efforts underway is maintaining the Baja Air Quality Monitoring Network, which measures PM<sub>10</sub>, PM<sub>2.5</sub>, ozone and other pollutants in Tijuana, Playas de Rosarito, Tecate, and Mexicali. An example of this collaboration resulted in CARB and the Bureau of Automotive Repair assisting SPA in implementation of a smog check program which, as of 2018, has inspected nearly 40 percent of the existing vehicle fleet in Baja California.<sup>108</sup>

Air pollution caused by vehicles idling at the land POEs is a key air quality issue facing the San Diego-Baja California border region. Vehicle emissions during long border crossing wait times contribute to the San Diego County GHG emissions inventory and affect the quality of air in the binational region, which can negatively impact public health as well. Based on a study examining fiscal year 2009, GHG emissions for the three traditional border crossings in the region (San Ysidro, Otay Mesa, and Tecate), emissions were estimated at 80,000 metric tons of carbon dioxide equivalents (CO<sub>2</sub>Eq), which accounted for 0.5 percent of total on-road transportation emissions in San Diego County in that year.<sup>109</sup> On a per-vehicle basis, the majority of these emissions can be traced to commercial crossings of

heavy-duty diesel trucks at the Otay Mesa POE. The study found that, of the total 80,000 metric tons of CO<sub>2</sub>Eq, 45 percent is caused by idling vehicles.<sup>110</sup> The U.S. EPA conducted a Truck Stop Electrification Study in 2009 which explored options for eliminating heavy-duty diesel trucks idling at the Otay Mesa commercial crossing. The study estimated that 8,500 metric tons of CO<sub>2</sub> could be diverted from the atmosphere each year by reducing idling time from 90 to 22.5 minutes.<sup>111</sup>

Local efforts to address air quality in the border region often require technical and programmatic support from government agencies. The San Diego-Tijuana Air Quality Task Force was formed as part of Border 2012 and has continued in Border 2020 under the Air Policy theme, which is one of one of the five “Policy Fora.” This initiative includes specific goals for improving air quality in the border region through projects that are either led or supported by various agencies throughout the border region. The EPA supports and monitors progress to implement these efforts on an ongoing basis. Local efforts include air quality monitoring in the community of San Ysidro. A two-year project funded by the California Office of Environmental Health Hazard Assessment (OEHHA) installed a network of low-cost air-quality monitors throughout the border community in 2016. In collaboration with community group Casa Familiar, SDSU, and the University of Washington, this effort began providing real-time air-quality information via an online platform in 2017. The project team secured funding in 2019 through the Border 2020 program to expand coverage of the system by installing additional monitors in Tijuana, relying on close collaboration with researchers from UABC and U.S. partners.<sup>112</sup> Also, additional investment in air-quality data collection and community-based monitoring has come recently from the State via AB 617, which was passed in 2017. Through this legislation, CARB established the Community Air Protection Program to focus on reducing exposure in communities most impacted by air pollution. The San Diego Air Pollution Control District is shepherding local implementation of this effort, which plans to deploy community air monitors throughout disadvantaged areas in the region, starting with neighborhoods located near the port of San Diego.<sup>113</sup> For consideration in the next cycle of AB 617 funding, SDAPCD has nominated the border communities of San Ysidro and Otay Mesa.

Operational changes at ports of entry like the UCP program (see *Additional innovations at POEs* section for more information) may offer some relief to air-quality impacts resulting from long commercial vehicle queues. A study released in 2019 by the North American Research Partnership (NARP), in coordination with the EPA and NADB, examined the effectiveness of the UCP program at reducing emissions at the Nogales–Mariposa POE in Arizona. This analysis found that the UCP and Free and Secure Trade (FAST) programs substantially reduce queue lengths and crossing times to deliver an approximate 85 percent reduction in emissions of CO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> associated with queueing and inspection delays for northbound commercial traffic.<sup>114</sup> Although processing higher volumes of commercial traffic compared to the Nogales–Mariposa POE, the UCP program in effect at the Otay Mesa POE is likely benefitting the region in similar ways.

The proliferation of electric-vehicle technology, especially for passenger vehicles, has spurred increasing urgency for government entities to promote the construction of supporting infrastructure such as charging stations and power storage units. Under the framework of the Clean Energy & Pollution Reduction Act, Senate Bill 350 (SB 350), passed in 2015, implementation mechanisms for California to reduce air pollution and pollutant emissions from combustion engines were established. Recently, SDG&E launched a major effort to fund and construct electric-charging infrastructure for buses, trucks, and other large vehicles, advancing support for zero-emission transportation beyond passenger vehicles. In 2019, SDG&E received approval from the California Public Utilities Commission to build charging infrastructure for a minimum of 3,000 plug-in medium-duty and heavy-duty electric vehicles and equipment, including transit buses, school buses, delivery trucks, and forklifts. This initiative also supports the electrification of refrigerated semi-truck trailers, which are vital for transporting perishable goods.<sup>115</sup>

The implantation of these types of programs may help incentivize many of the trucking companies in binational industries modernize and transition their truck fleets to electric technology – reducing emissions and greenhouse gases.

SANDAG, in partnership with Caltrans and ICTC, are developing a study to quantify air quality impacts of border delays at the California–Baja California land POEs, including greenhouse gas emissions from idling vehicles. Additionally, the study will estimate economic impacts of border delays at these POEs for current as well as select forecast years.

### **Interregional Perspective – Air Quality**

Smog from San Diego’s neighbors to the north can affect our air quality. Ozone precursor emissions are transported to San Diego from the South Coast air basin during Santa Ana weather conditions. The South Coast basin comprises the metropolitan areas of Orange, Riverside, Los Angeles, and San Bernardino counties. Winds blowing toward the southwest transport the South Coast’s polluted air out over the ocean, and the sea breezes bring it onshore into San Diego County. Despite this occurrence, the San Diego region’s air quality has improved greatly since 1988, when San Diego exceeded the state one-hour ozone standard on 160 days. In 2015, San Diego exceeded the state standard on only 3 days. The San Diego air basin is still a nonattainment area in federal-standard for ozone and the San Diego County APCD continues to work with business and industry to meet state and federal standards.<sup>116</sup>

In Imperial County, residents experience poor air quality throughout the much of the year. A key factor is that the sprawling urban area of Mexicali, which has nearly five times the population of Imperial County, produces high levels of air pollution, which blows over the border into the Imperial County air basin. The city of El Centro ranked eighth-highest of U.S. cities by year-round particle pollution.<sup>117</sup> In 2014, the Imperial region began an initiative to invest in community-based air-quality monitoring and awareness, much like the effort later implemented in the San Diego community of San Ysidro. Community group Comité Cívico Del Valle, along with academic institutions and the California Department of Public Health, developed an air-quality-monitoring system to record and disseminate the information to the public via an online platform called IVAN Air.<sup>118</sup>

Additionally, surplus air-monitoring equipment was donated to SPA through California EPA in 2015 to help bolster the air-monitoring network along the border. In 2018, the Imperial County APCD, CARB, and a binational working group of governmental and civic groups collaborated on the Imperial County – Mexicali Air Quality Work Plan. This work plan is an initial assessment of priority areas that the work group proposes CARB and other government agencies focus on in both Imperial County and Mexicali to improve air quality in the border region. Priority areas include increasing the education and awareness of health impacts related to air pollution, improving regulatory authority, enforcement of protocols, enhancing air monitoring, and identifying funding mechanisms to achieve these goals. The working draft of the plan calls for a loan of monitoring equipment from CARB to the city of Mexicali in addition to technical support throughout the program.<sup>119</sup>

### **Tribal Perspective – Air Quality**

Their reservations lie within the boundaries of San Diego County, but tribes are subject to federal, not state, environmental laws. Air quality has always been a significant issue to tribes. Concerned about environmental projects on the perimeter of its reservation, the Pala Band of Mission Indians is the first tribe to apply for the “Treatment as a State” under the Federal Clean Air Act in March of 2007. In 2008, after more than a year of public comment and review, EPA officially designated the Pala Band as an “affected State” under the Act.

As an affected state, the Pala Band now must be notified of any Title V permit applications for a source that may impact air quality on the Pala Reservation or is within a 50-mile radius of the Reservation. The Pala Band can then submit written recommendations to the permitting authority regarding the permit and its terms and conditions. Other tribes are following suit to have a voice in the issue of air quality in the region.

### **Economic Development**

San Diego, combined with neighboring counties and northern Baja California, has the necessary scale and diversity to compete in the global marketplace. Likewise, this region, while separate in many ways from the Los Angeles area, does recognize our ties to our neighbors to the north as a way to access both domestic and international marketplaces.

### **Interregional and Binational Perspective – Economic Development**

#### *Benefiting from our Geographic Location*

San Diego's location on the U.S.–Mexico border offers many distinct opportunities, including economic opportunities in terms of crossborder manufacturing, trade, commerce, and tourism. Capitalizing on these requires a positive and productive relationship with the federal government of Mexico, as well as with Mexican state and municipal governments. From a geographical perspective, San Diego occupies an advantageous position. Its proximity to Mexico is a prime example, as is its access to other world markets, such as the Pacific Rim and Central and South American markets, making it one of the country's best places to do business. In order to benefit from our geographic position, however, continued collaboration is needed to become more competitive in attracting and retaining export-based enterprises, developing binational industrial clusters, and leveraging the trade potential of our binational region.

Due to San Diego's advantageous seaport location and abundant outdoor activities and tourist attractions, its economic development was for many years largely based upon the military defense industry, related manufacturing, and tourism. In the last two decades, San Diego has diversified its economy to some degree, although the defense industry and tourism are still huge economic drivers in the region. The leisure and hospitality industry accounts for almost 200,000 jobs.<sup>120</sup> In 2018, more than 35.8 million visitors spent nearly \$11.5 billion in the region.<sup>121</sup> The San Diego region is also home to a number of military installations that form the core of the U.S. defense establishment in the southwest. Its presence supports intelligence, analysis, research and development, manufacturing, and construction, accounting for 340,000, or 22 percent, of the region's total jobs and an estimated \$26 billion in direct spending in San Diego County in FY 2018.<sup>122</sup>

Beyond the military and tourism, the San Diego regional economy has expanded to include additional sectors that are significant economic drivers. Recognized as one of the leading high-tech hubs in the U.S., San Diego's innovation economy is anchored by established life sciences, aerospace, communications, cleantech, and software industries fueled by a collaborative culture and sophisticated support systems focused on commercializing research and growing entrepreneurial, knowledge-based companies. As of 2016, the innovation economy was responsible for 9 percent of the region's total jobs. Medical devices, a key driver behind the region's innovation economy, accounted for nearly 8 percent of these jobs.<sup>123</sup>

Many of the industry clusters in the San Diego region are actually binational in nature. San Diego's location has allowed it to rely heavily on the large labor force available in Mexico, while Baja California's economy has benefited from employment opportunities in San Diego. Mexico has implemented various strategies to bolster economic development along its northern border, the most well-known being the manufacturing industry developed through the maquiladora program (or in-bond industry). The maquiladora industry plays an important role in the region in that it not only generates employment opportunities in Baja California, but also in San Diego, as is demonstrated by the number of transnational corporations with sister facilities north of the border. Employment in the maquiladora

industry in Baja California doubled between 1991 and 2004. In Tijuana, employment in the sector reached its peak in 2008 with over 200,000 people employed. Since then, employment has decreased slightly, and there are currently about 195,000 employed by more than 590 maquiladora companies in the areas of Tijuana and Playas de Rosarito, nearly 11.5 percent of Mexico's total number of plants in 2018.<sup>124</sup>

By taking advantage of research and development hubs in San Diego, and advanced manufacturing capabilities in Baja California, goods are jointly produced and cross the border many times before becoming finished products. This phenomenon of joint production is evident in the fact that Mexican exports to the United States actually contain 40 percent of U.S. content, which greatly exceeds the U.S. value-added of any other foreign imports.<sup>125</sup> This manufacturing interdependence has huge implications for the local, regional, and national economy, given the enormous scale of U.S.–Mexico trade. The border crossings are the main conduit for the economic relationship of the San Diego–Baja California region. Close economic ties between the two areas are clearly demonstrated through the movement of people and goods across the international border and by economic activity along the border. The dollar value of bilateral trade that passed through the POEs connecting San Diego County and Baja California was more than \$47.5 billion in 2018.

As mentioned previously, congestion and delays at our California–Baja California land POEs hamper economic growth in the region on both sides of the border, resulting in losses of tens of thousands of jobs, millions of crossborder trips, and billions of dollars of income every year.<sup>126</sup> Projects underway to improve trade corridor infrastructure and expand the capacity of POEs in our region will help decrease these forgone opportunities. In addition, the use of more efficient technology at the POEs is also being explored in order to continue safeguarding the border while allowing the efficient flow of people and goods. In order to be globally competitive, San Diego and its neighboring counties and Mexico will need to approach market access issues collaboratively as a region. Moreover, the region should also focus its attention on supporting and expanding the highly qualified workforce specialized in the skills needed for growing industries. If we continue to take advantage of our geographic location and our shared resources, the San Diego–Baja California region will thrive in highly competitive international markets.

### **Tribal Government Perspective – Economic Development**

Tribal economic development is complex because laws apply differently to tribal governments than they do to states, counties, and cities. In particular, the laws regarding taxation create the greatest level of confusion. Unlike federal, state, and local governments, tribal nations do not have the ability to act as a taxing authority. For example, tribes are not able to levy income taxes or property taxes. Tribes can levy sales and excise taxes, but federal policy makes it difficult for most tribes to utilize tax exempt financing options (generally available to states) to fund construction of government infrastructure.

Gaming is a traditional social activity among many tribal nations; however, tribal gaming enterprises expanded exponentially nationwide in the early 1990s as a result of the passage of the Federal Indian Gaming Regulatory Act (IGRA).<sup>127</sup> Although several tribes in the San Diego region already had bingo facilities by the 1990s, most of the tribes had developed or had agreements to develop gaming facilities as a means of economic development. San Diego County now has ten tribal gaming facilities, which is the greatest number of Indian gaming facilities in any county in the United States.

Gaming-related and other types of development have led to rapid economic growth for a number of tribes, while also providing jobs and stimulating the regional economy. In the San Diego region, statistics show that the Indian gaming industry as a whole has created more than 10,000 jobs in the region, resulting in a \$1 billion industry with approximately \$263 million in goods and services purchased annually and \$500 million in payroll. It should be noted,

however, that poverty levels among the Native American population remain above the national average, and some gaming tribes have been much more successful than others.

Each local tribe has their own plan for economic development and diversification. There are many markets being explored, such as renewable energy, ecotourism, waste management, recreational facilities, and more for essentially state-run enterprises. Some tribes choose to run their own businesses, while others select contractors to operate their enterprises. Some tribal business ventures have been off-reservation, such as purchases of small businesses, historic buildings, golf courses, and land. There are some cases where tribes can support local jurisdictions through a contracting process, such as fire protection.

There are also tribal businesses on tribal land. The businesses tribes choose to develop often are dependent on the location of the reservation and availability of space. Some examples of businesses that local tribes run, other than gaming facilities, include motocross race tracks, campgrounds, wind/energy projects, gas stations, restaurants, shopping centers, and ballparks. Many tribes bring outside businesses onto their land under varied business agreements.

### **Border Security and Military**

The terrorist events of September 11, 2001 led our nation to reexamine national security both within and along our borders. The resulting decisions made in Washington, D.C. directly affect the people living in communities throughout the Southern California–northern Baja California region. While we support our nation’s efforts to safeguard our borders, we must also ensure that in implementing such measures, the quality of life in the region is not significantly diminished.

San Diego’s position as home to the busiest binational land POE in the world places us on the frontline of national security efforts. Likewise, our significant local defense industry places great responsibility upon this community for implementing those policies instrumental to safeguarding America.

### **The International Border**

The existing four land POEs and the future addition of the Otay Mesa East POE connecting the San Diego region with the State of Baja California allow our communities to interact, our economies to thrive, and our cultures to meld. Our region needs a border-management system that facilitates travel and trade opportunities while protecting the U.S. from potential terrorist threats. A seamless information-sharing system that allows for coordinated communication among border authorities and the broader law enforcement and intelligence gathering communities is also necessary.

The efficient use of technology for pre-screening and information collection is critical in light of limited resources at our border. According to the White House, “...extensive pre-screening of low-risk traffic [allows] limited assets to focus attention on high-risk traffic. The use of advanced technology to track the movement of cargo and the entry and exit of individuals is essential to the task of managing the movement of hundreds of millions of individuals, conveyances, and vehicles.”<sup>128</sup>

In this region, a number of programs are already in place to facilitate this movement. These programs include SENTRI (Secure Electronic Network for Travelers Rapid Inspection) for individual crossers and FAST (Free and Secure Trade) for commercial activity. Today, participation in these programs have increased to where nearly 40 percent of vehicle crossings through San Ysidro occur through the available SENTRI lanes. Encouraging more participation and innovations like these provide co-benefits for security and mobility.

## **The Department of Homeland Security**

To better protect the United States from a potential threat and to better secure our borders, in 2002, Congress authorized the creation of the Department of Homeland Security (DHS). DHS has five homeland security missions: (1) prevent terrorism and enhance security, (2) secure and manage our borders, (3) enforce and administer our immigration laws, (4) safeguard and secure cyberspace, and (5) ensure resilience to disasters. DHS combined 22 different federal departments and agencies into a unified, integrated cabinet agency. The department is organized under several directorates and offices. Of these, CBP plays the most active role in managing our local ports of entry (land, air, and sea).

## **Military in the San Diego Region**

San Diego remains home to the largest concentration of military forces in the country and plays an even more valuable role in the National Defense Strategy as the “Rebalance to the Pacific” emerges. San Diego homeports over 60 percent of the ships of the U.S. Pacific Fleet and over one-third of the combat power of the U.S. Marine Corps. There are over 110,000 active-duty Navy and Marine Corps personnel assigned to the ships and bases in the San Diego region and approximately 24,000 Department of Defense civilian employees. The unique relationship between the military and the San Diego region exists nowhere else in the country. The presence of Department of Defense (DOD) facilities, personnel, and equipment generates a significant economic impact on the San Diego region that far outpaces other industries in the area.<sup>129</sup>

## **U.S. Navy**

The Navy has an extremely wide complex of commands and operations in the region. As of 2018, the Navy employed 56,553 active duty military personnel and 18,504 civilians.

The principal Navy bases in the San Diego region are the Naval Base Coronado (Naval Air Station North Island/ Naval Amphibious Base Coronado), the Naval Base San Diego, the Naval Medical Center, the Naval Base Point Loma, the Naval Information Warfare Systems Command, and the Naval Weapons Station Fallbrook. Locally based aircraft carriers include the USS Carl Vinson and the USS Ronald Reagan — all homeported at North Island Naval Air Station.

In addition, Navy Region Southwest is the major command that provides the highest level of base operating support and quality-of-life services for all operating forces and shore activities in the Southwest Region. Naval Region Southwest is based in downtown San Diego at the Broadway Complex. The Shore Group supports command groups, including military recruit centers, the Fleet and Industrial Supply Center, Navy Antisubmarine Training Center, U.S. Coast Guard activities, the Naval Facilities Engineering Command, Navy Public Works, and all other Navy bases in the Naval Region Southwest.

## **U.S. Marine Corps**

The United States Marine Corps has 121 command groups based in the San Diego region, employing 53,660 active-duty military personnel and 1,914 civilians as of 2018. The major Marine bases are Marine Corps Base Camp Pendleton, Marine Corps Air Station Miramar, and the Marine Corps Recruit Depot.

The Marine Corps Base Camp Pendleton occupies 125,000 acres of largely undeveloped land and approximately 200 square miles of terrain north of Oceanside. The stretch of shoreline along the base (17.1 miles) is the largest undeveloped portion of coastal area left in Southern California. Camp Pendleton provides training facilities for many active-duty and reserve Marines, Army, and Navy units, as well as national, state, and local agencies. More than 40,000 military and civilian personnel work daily on the base, which is the home of the 1st Marine Expeditionary Force, 1st Marine Division, 1st Marine Logistics Group, and many tenant units. Camp Pendleton had 67 command groups with 40,785 service members and 1,524 civilian employees in 2018.<sup>130</sup>

The Marine Corps Air Station Miramar (MCAS Miramar) is a 23,065-acre installation located in the northern part of the City of San Diego. The mission of MCAS Miramar is to provide facilities, services and materials to support operations of the 3rd Marine Aircraft Wing, Marine Aircraft Group 46, and other Naval aviation units. MCAS Miramar had 48 command groups with approximately 8,722 active-duty military personnel and 50 civilian employees as of 2018.

The Marine Corps Recruit Depot San Diego (MCRD) is one of two Marine recruit training bases in the United States. The base has 388 acres north of downtown San Diego. The MCRD has six command groups and 2,084 personnel in 2018 and is the Corp's oldest West Coast installation.

The military is tightly woven into the social and economic fabric of the San Diego region. The Navy/Marine Corps team, coupled with the local defense industry, affords this region continuing opportunities to enhance our quality of life. As regional planning becomes ever more complex, it is important to understand the mutual impacts of the military and city and regional planning. For the past several years, the SANDAG Board and Department of Defense have discussed opportunities to collaborate. In 2012 the Board agreed to form the San Diego Regional Military Working Group (MWG). The MWG provides a collaborative forum for the various branches of military to coordinate programs, address issues of concern, and determine the best ways in which the military can support regional prosperity, while the region supports the effective operations of the military.

In 2017 SANDAG received a Caltrans Strategic Partnership Planning Grant to develop a Military Multimodal Access Strategy to analyze the issues related to access to the military bases. The Military Multimodal Access Strategy identifies multimodal solutions to facilities while reducing GHG emissions consistent with the SANDAG Regional Plan. The work is being coordinated through the MWG, which is composed of representatives from each of the region's military installations, adjacent local jurisdictions, and SANDAG and the Port of San Diego. Representatives from Caltrans, the region's transit agencies, and the San Diego Airport Authority were also invited to participate in the MWG meetings and workshops regarding the strategy.

### **Protecting Regional Infrastructure**

Just as our economies and societies are linked throughout the region, many of our public facilities and environmental assets are connected and would be adversely affected by disruptions on either side of the border. Earthquakes, floods, mudslides, tornados, hurricanes, wildfires, and hazardous materials spills or releases, which are often secondary effects of natural disasters, all pose a significant risk to the millions of people living in the U.S.–Mexico border region, as well as to the ecosystems and wildlife. Joint response capabilities are critical when disasters or emergencies occur along the border. On a government-to-government level, some institutional frameworks are in place to coordinate U.S.–Mexico binational response to natural disasters on a national level. Nonetheless, residents of the border region often rely on more informal, localized responses to organize binational cooperation in the absence of comprehensive formal agreements, especially when fast and effective real-time response is needed.

In San Diego County, overall county response to disasters is coordinated through the Unified San Diego County Emergency Services Organization, Office of Emergency Services (OES). The organization is comprised of the 18 cities within the region and the County of San Diego and provides for a single operational area for coordination of disaster activities. This office coordinated with the EPA to develop a crossborder contingency plan for the sister cities of San Diego and Tijuana. This plan addresses such issues as hazardous materials management, bioterrorism, and joint preparedness activities. Another binational effort in the San Diego region to address natural disasters is the Border Agency Fire Council (BAFC), which was formally created during the 1996 fire season. BAFC members established a Mutual Assistance Agreement that includes dispatching and resource utilization procedures that enable participating agencies to work cooperatively to suppress fires and take appropriate actions on other emergency situations along the U.S.–Mexico border. In addition, the Binational Integral Flood Alert System in the Tijuana River Basin was established

in 2003 in order to provide real-time data to emergency managers in the United States and Mexico in order to protect at-risk populations from the negative impacts of flooding of the Tijuana River. In the same vein, after the 2003 and 2007 fires, it became apparent that communication with tribal nations and other rural populations needed enhancement. After the 2010 San Diego Regional Tribal Summit, several tribes formed the Intertribal Long-term Recovery Foundation and have been working with the County OES to coordinate emergency preparedness.

A new study conducted by the San Diego Regional Chapter of the Earthquake Engineering Research Institute is analyzing potential impacts to the regional infrastructure through a scenario planning lens. The effort considers potential damage to infrastructure and the local economy resulting from a 6.9-magnitude earthquake along the Rose Canyon Fault. The active fault line stretches 42 miles through the urban areas of San Diego and Tijuana. This scenario study plans to deliver recommendations for policymakers on both sides of the border to enhance the preparedness and resiliency of the binational region.<sup>131</sup>

## Endnotes

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- <sup>1</sup> Federal Highway Administration, Literature Review of Organizational Structures and Finance of Multi-jurisdictional Initiatives and the Implications for Megaregion Transportation Planning in the U.S., submitted by Georgia Tech Research Corporation, October 2011.
- <sup>2</sup> CaliBaja Mega-Region Initiative ([calibaja.net/cbdb/p/](http://calibaja.net/cbdb/p/)), accessed October 2014).
- <sup>3</sup> U.S. Department of Transportation Research and Innovative Technology Administration Bureau of Transportation Statistics.
- <sup>4</sup> Energy data based on SDG&E correspondence (2019). Water data from San Diego County Water Authority <https://www.sdcwa.org/annualreport/2018/diversification-conservation.php>
- <sup>5</sup> Mexican municipal population growth rates from the State of Baja California's Planning Committee for Development (COPLADE in Spanish) and the State Socioeconomic Information System (Sistema Estatal de Información Sociodemográfica [SEIS]). U.S. growth rates from the U.S. Census Bureau.
- <sup>6</sup> Current population figure for 2018 and 2040 projected population is based on the most recent estimates from the California Department of Finance and Mexico's National Population Council (CONAPO).
- <sup>7</sup> 2010-2018 Estimates, U.S. Census Bureau American Community Survey.
- <sup>8</sup> Barona and Viejas have joint power authority over the uninhabited Capitan Grande reservation. Recently, Pechanga incorporated additional Trust land in a transfer of open space from the Bureau of Land Management (BLM); its boundaries now extend into the San Diego region.
- <sup>9</sup> Source: State of California Department of Transportation, "Transportation Guide for Native Americans," March 2017.
- <sup>10</sup> Otay Mesa-Mesa de Otay Binational Corridor Strategic Plan, 2007  
[sandag.org/programs/borders/binational/projects/draft\\_strategic\\_plan\\_0507.pdf](http://sandag.org/programs/borders/binational/projects/draft_strategic_plan_0507.pdf)
- <sup>11</sup> [sandag.org/uploads/publicationid/publicationid\\_4480\\_23377.pdf](http://sandag.org/uploads/publicationid/publicationid_4480_23377.pdf)
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- <sup>13</sup> U.S. Census Bureau American Community Survey
- <sup>14</sup> U.S. Census Bureau, 2011–2015 American Community Survey 5-year estimates.
- <sup>15</sup> U.S. State Department – Bilateral Relations Fact Sheet (April 2019). [state.gov/u-s-relations-with-mexico/](http://state.gov/u-s-relations-with-mexico/)
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