Data Visualization of U.S.-Mexico Border Crossings in the Last Decade

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Introduction

From the Gulf of Mexico all the way to the deep waters of the Pacific Ocean there is a 3,145-kilometer border separating two very unique, but exceptionally connected countries. Through this large stretch of land, we have varying terrains that mainly include deserts, dry hills and long rivers such as the Rio Grande. The United States side of the border is composed by four geographically large states which are California, New Mexico, Arizona and Texas. Reflecting those states, there is a total of six Mexican states that have a direct land border with the U.S. which are: Baja California, Sonora, Chihuahua, Coahuila, a small section of Nuevo Leon and Tamaulipas.

STRECH OF BORDER ACROSS THE U.S.

SAN DIEGO-TIJUANA BORDER

RIO GRANDE BORDER

PEDESTRIAN CROSSING– SAN YSIDRO

BORDER IN NOGALES, SONORA

PORT BROWNSVILLE, TEXAS

Name of Entry Port in Each State

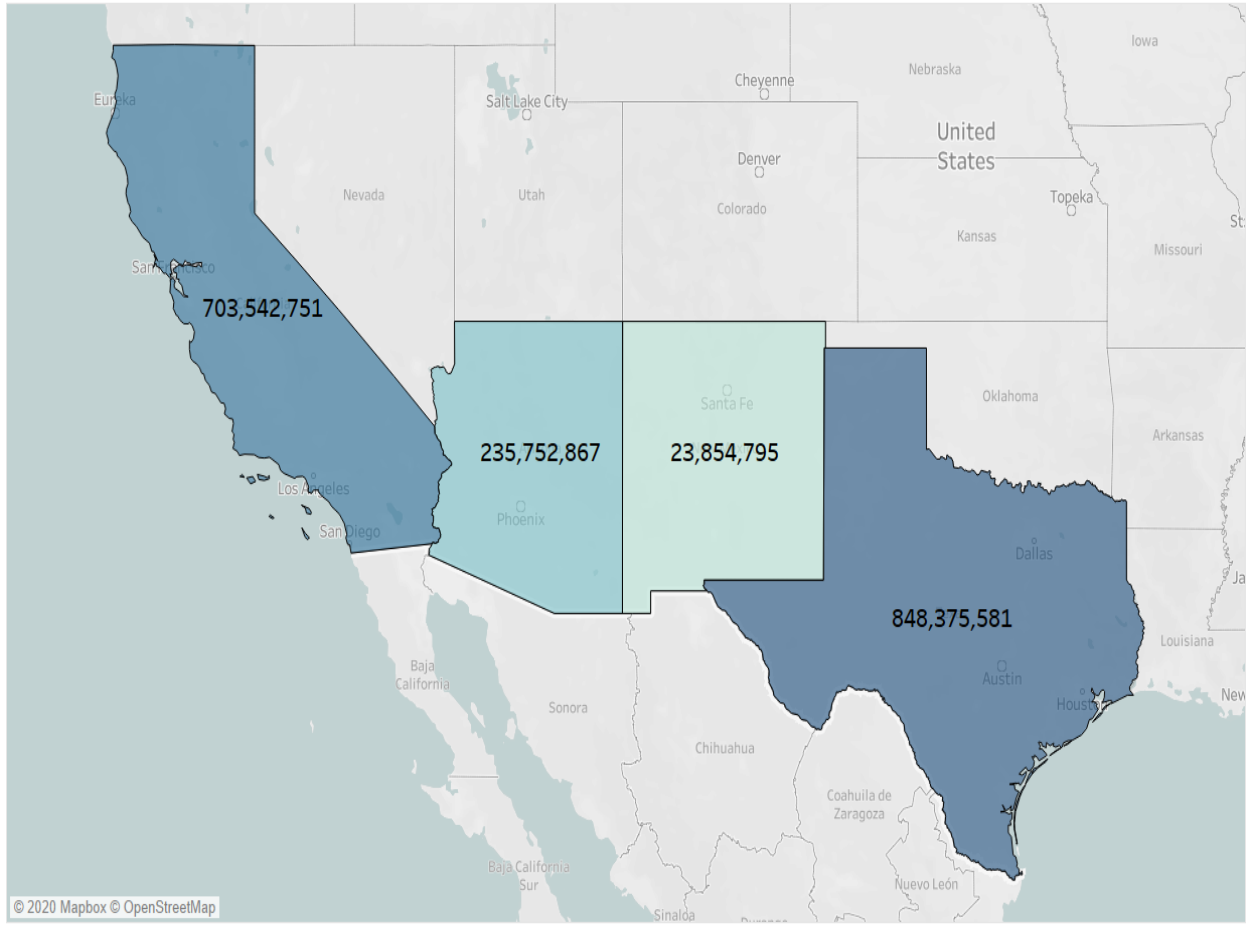
Texas	California	Arizona	New Mexico
El Paso	San Ysidro	Douglas	Columbus
Hidalgo	Otay Mesa	Lukeville	Santa Teresa
Laredo	Andrade	Naco	
Boquillas	Calexico	Nogales	
Brownsville	Calexico East	San Luis	
Del Rio	Cross Border Xpress	Sasabe	
Eagle Pass	Tecate		
Presidio			
Progreso			
Rio Grande City			
Roma			
Tornillo-Fabens			

Overview

- In this report we will explore the crossing rate for 27 different entry ports all across the US-Mexico border. We will only focus on data from this past decade (*2010-2019)* where we will mainly address land traffic, meaning northbound border crossings done through bus, train, car, truck and walking. We will be using *Tableau*, which is a data visualization tool, to illustrate our data and provide clear graphical representations on specific subjects.
- This report will be divided into two sections.
  - *Section I:* Will focus on the overall scope of the entire border area, where we will run comparisons between busy entry ports and highlight trends.
  - *Section II:* Will be a very specific analysis on the entry ports between San Diego, CA and Tijuana, BC, where the "Busiest Land Port of Entry in the Western Hemisphere" is located.

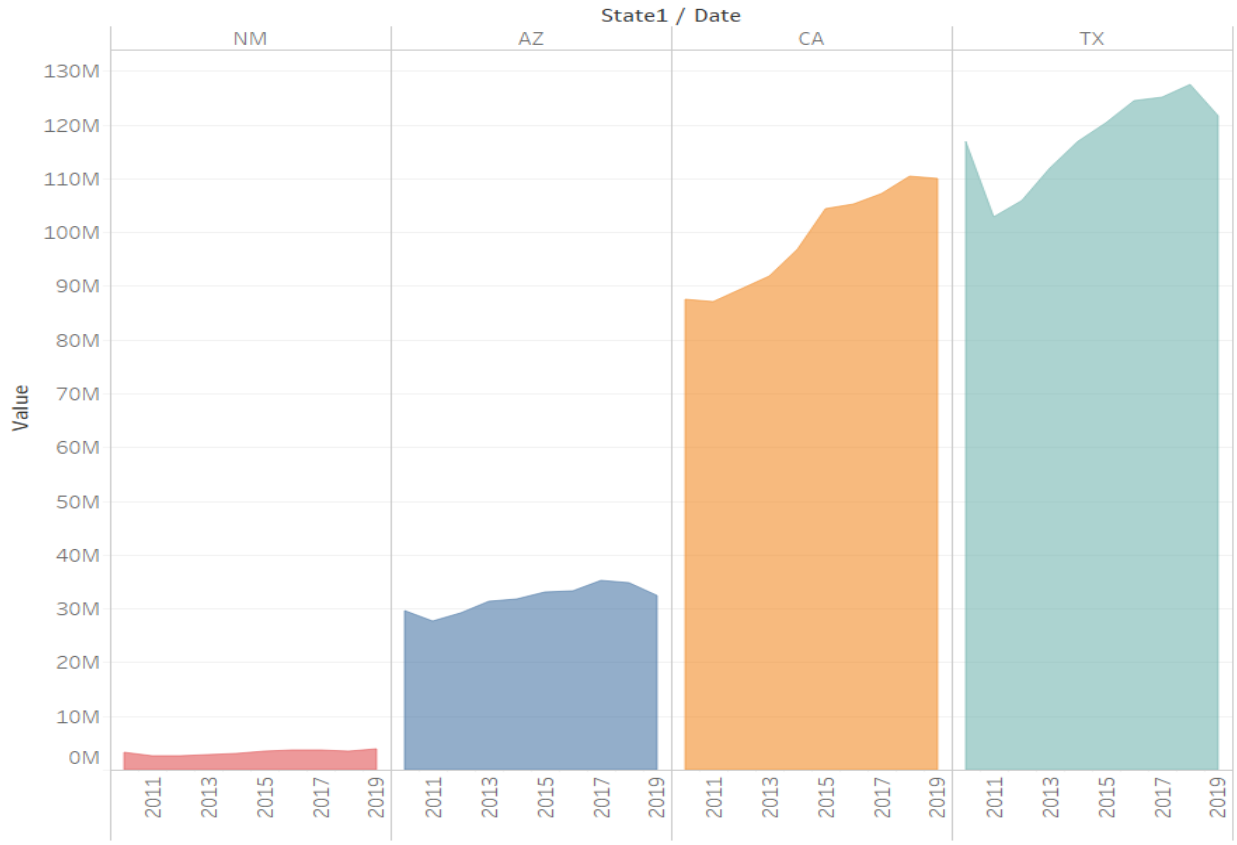
Section I: General Crossing Data for Each State for the Past Decade

Total Crossings per U.S. State *(2010 - 2019)*



Map based on Longitude (generated) and Latitude (generated). Color shows sum of Value. Details are shown for State1. The data is filtered on Measure1, which keeps Bus Passengers, Pedestrians, Personal Vehicle Passengers, Train Passengers and Trucks.

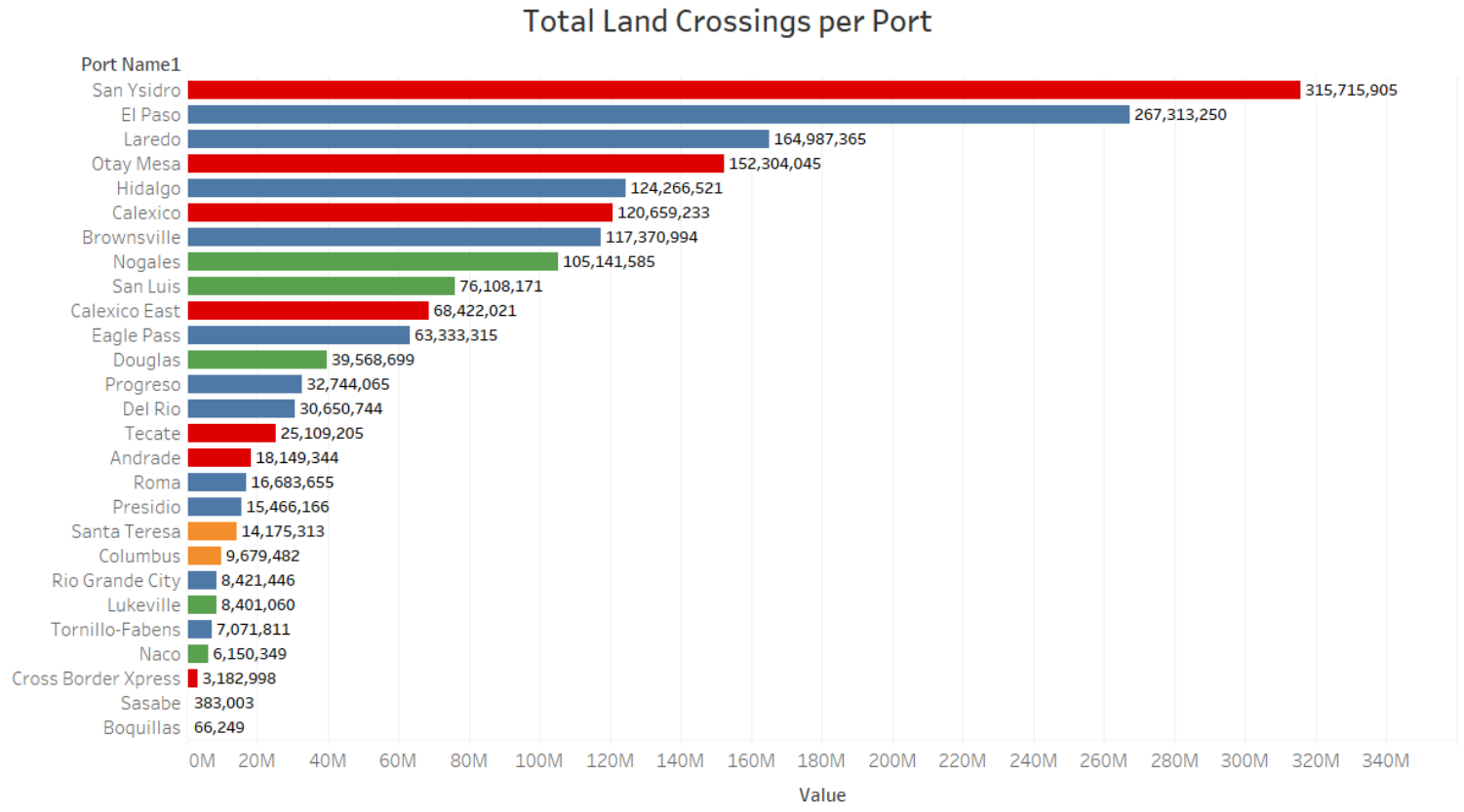
Rate of Crossing per State



Sum of Value for each Date Year broken down by State1. Color shows details about State (group).

State (group)
- NM
- AZ
- CA
- TX

Section I: Why California and Texas Are Overwhelmingly Busier

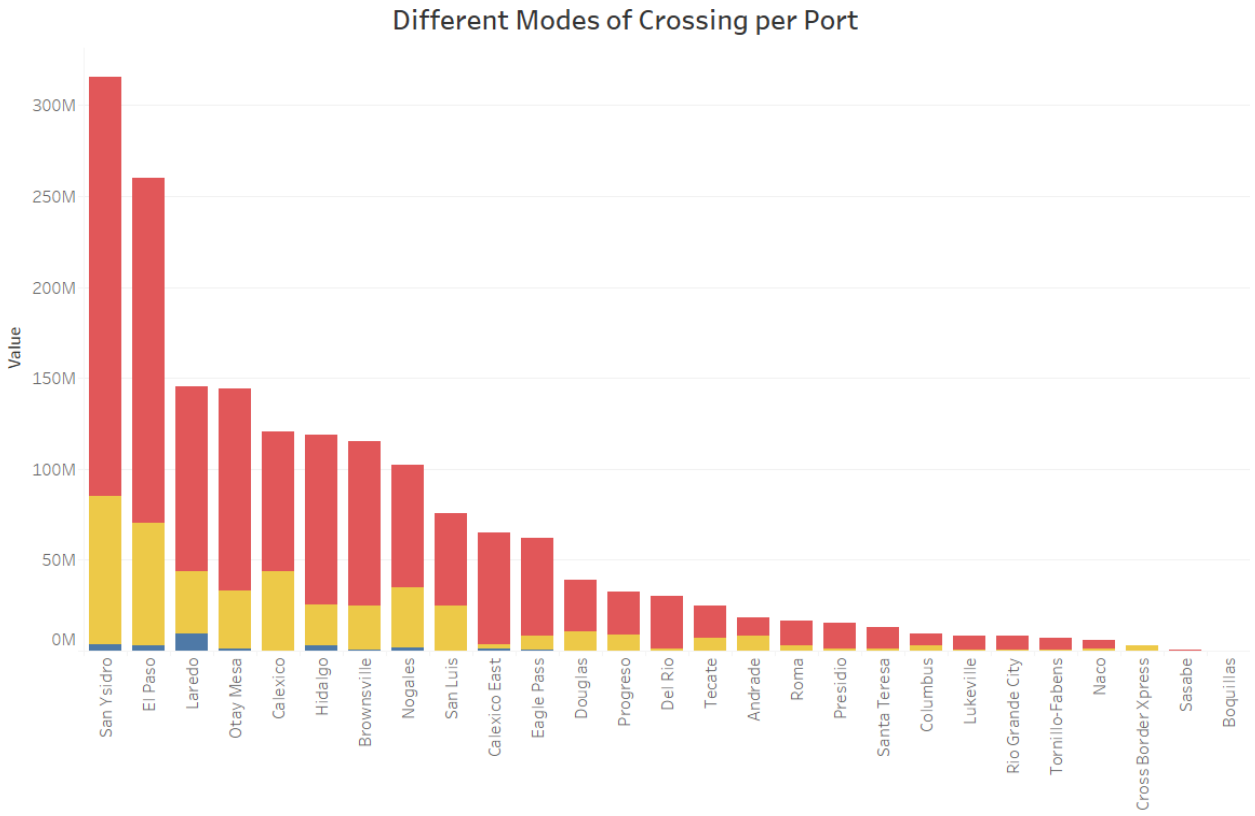


Sum of Value for each Port Name1. Color shows details about State1. The data is filtered on Measure1, which keeps Bus Passengers, Pedestrians, Personal Vehicle Passengers, Train Passengers and Trucks.

State1
- CA
- TX
- AZ
- NM

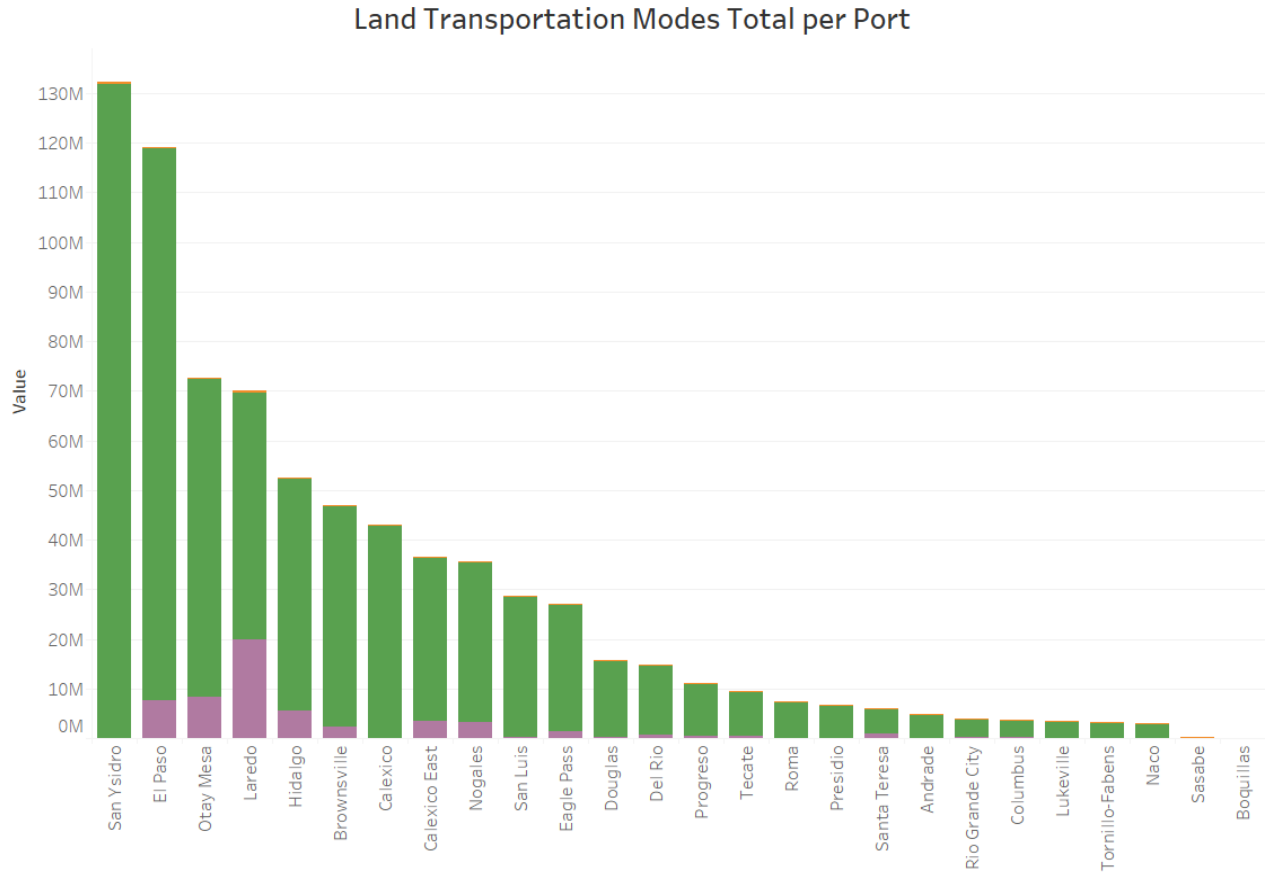
- As the plot illustrates, the port of San Ysidro dominates all land crossings when compared to other entry ports.
- On that note, we clearly see the busiest entry ports derive from either California or Texas. The entry port of El Paso, alike San Ysidro, carries a large portion of the all crossings within its state.
- Arizona's busiest entry port is Nogales, which came in 8th place
- New Mexico, with only two entry ports registered, had fairly low traffic over the past decade coming in at 19th and 20th place

Section I: Closer Look at All Entry Ports



Sum of Value for each Port Name1. Color shows details about Measure1. The view is filtered on Measure1, which keeps Bus Passengers, Pedestrians, Personal Vehicle Passengers and Train Passengers.

Measure1
- Personal Vehicle Passengers
- Pedestrians
- Bus Passengers
- Train Passengers



Sum of Value for each Port Name1. Color shows details about Measure1. The view is filtered on Measure1, which keeps Buses, Personal Vehicles and Trucks.

Measure1
- Buses
- Personal Vehicles
- Trucks

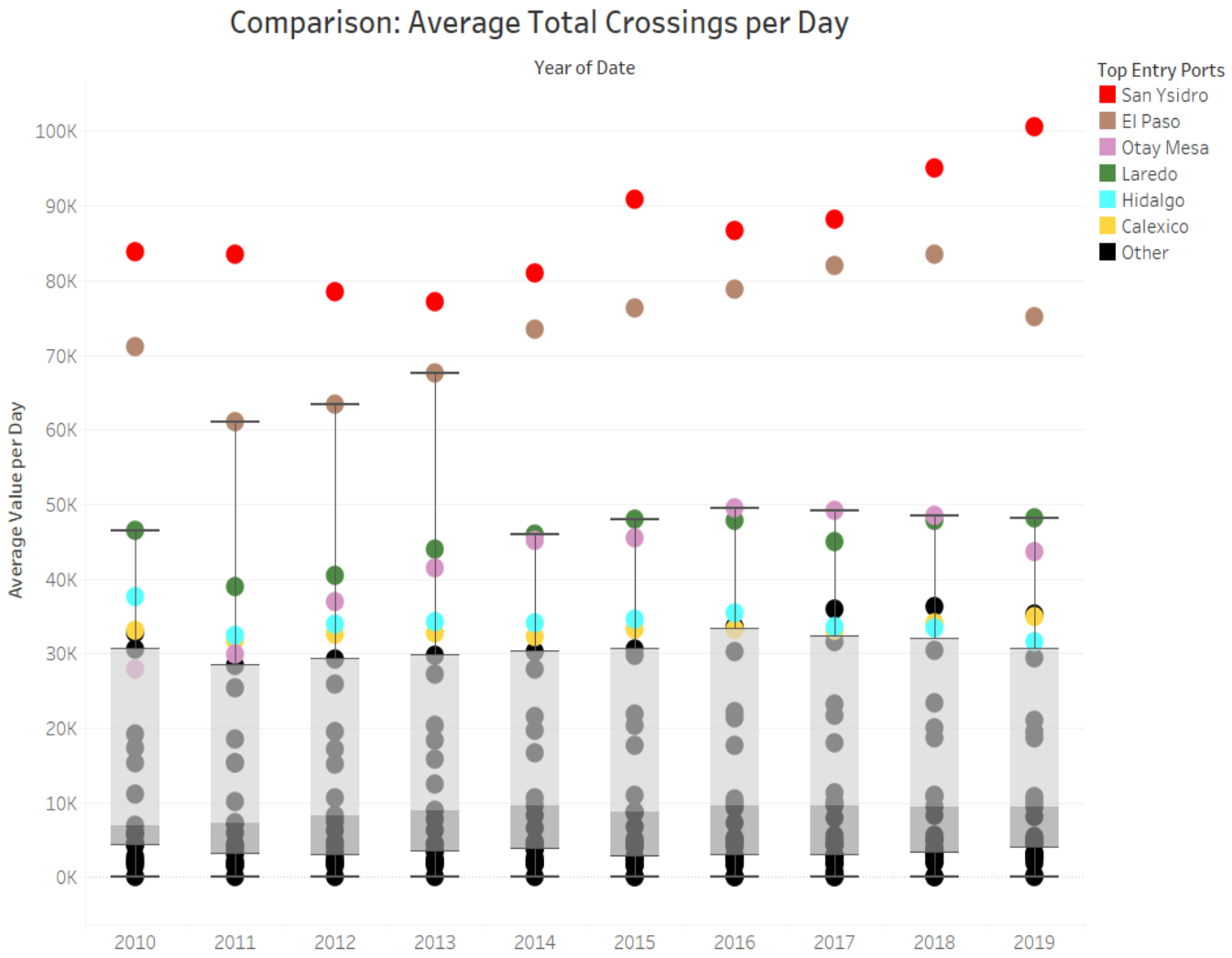
Left Bar Chart

- Illustrates how people typically cross the border: personal vehicle, walking, bus, or train
- Personal vehicles dominates how individual come into the U.S.
- Walking constitutes almost 1/3 of all crossings done in each port while busses only have a small percentage, ranging within the thousands for an entire decade
- Generally, all bordering U.S. states are large land regions with dispersed cities with limited public transportation options, hence this can explain why people opt for cars as their primary choice to cross the border.

Right Bar Chart

- Demonstrates the type of transportation used by people crossing: Personal vehicle, truck or bus
- Again, there is clear dominance of personal vehicles within most entry ports, specifically San Ysidro and Calexico, which report no truck traffic
- There was also very few buses being used to cross the border in the past decade for most ports, as they only range in the ten to couple thousands per year
- The U.S. and Mexico have a well established commercial partnership estimated to generate $1.7 billion in goods and services per day (2018 fiscal year), hence it is important to have ports that can handle vast numbers of trucks per year
    - Laredo, TX entry port is very important as it leads with 28% of their total crossings being trucks
    - Otay Mesa, CA second with 11%
- Additionally, it is worth to point out that a large portion of the workforce for U.S. border cities/towns are people who cross these ports daily, meaning most vehicle numbers are people commuting to work

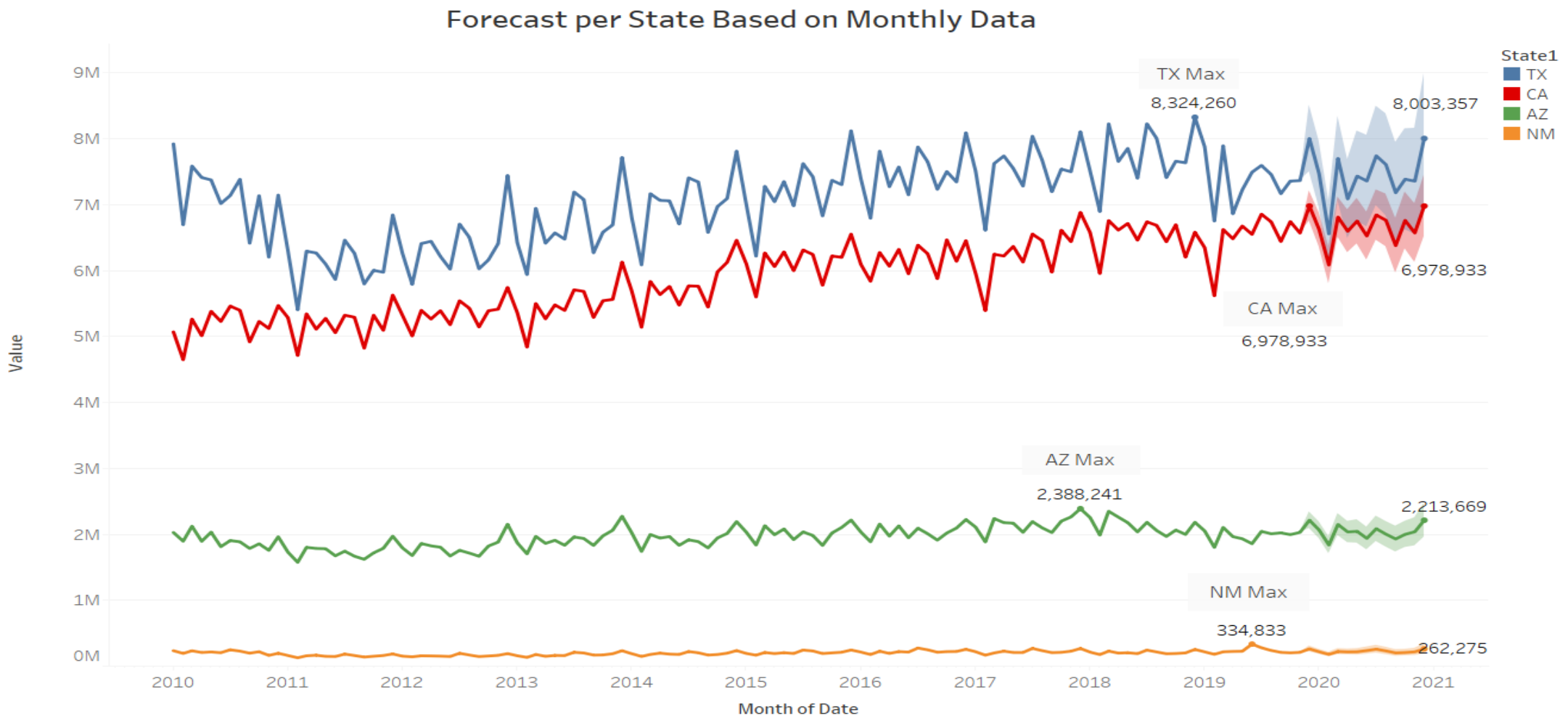
Section I: Closer Look at All Entry Ports



In this box plot we see the average range of all entry port crossings

- Immediately we San Ysidro exceeding all overall averages with a constant and steady increase in the last half of the decade
- El Paso's high traffic stayed relatively constant over the past decade, with a sharp decrease in 2019
- Its interesting how Otay Mesa and Laredo received fairly similar average crossings per day as both serve as important entry ports for both cars and trucks
- Same can be stated for Hidalgo and Calexico, demonstrating a parallel trend for ports between California and Texas

Section I: Projected Forecast for 2020



The trend of sum of Value (actual & forecast) for Date Month. Color shows details about State1. The data is filtered on Measure1 and Date Year. The Measure1 filter keeps Bus Passengers, Pedestrians, Personal Vehicle Passengers, Train Passengers and Trucks. The Date Year filter keeps 10 of 10 members.

Section I: Forecast Analysis

Based on the monthly data given we forecasted monthly land crossings for the year 2020.

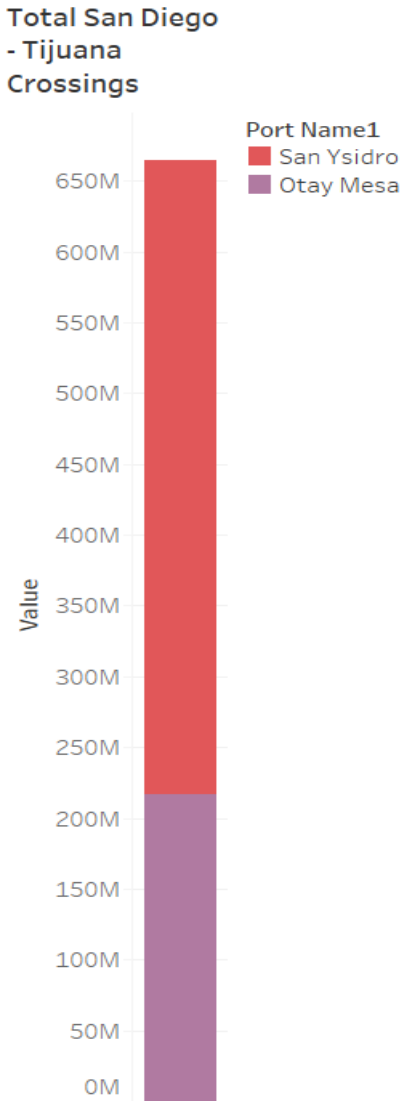
- In this monthly data report we can see Texas received a lot more crossings depending on the month, such as December, but drastically loses a lot of traffic posterior to them
- On the other hand, California has had a constant and steady growth over the past years, coming close to surpassing Texas

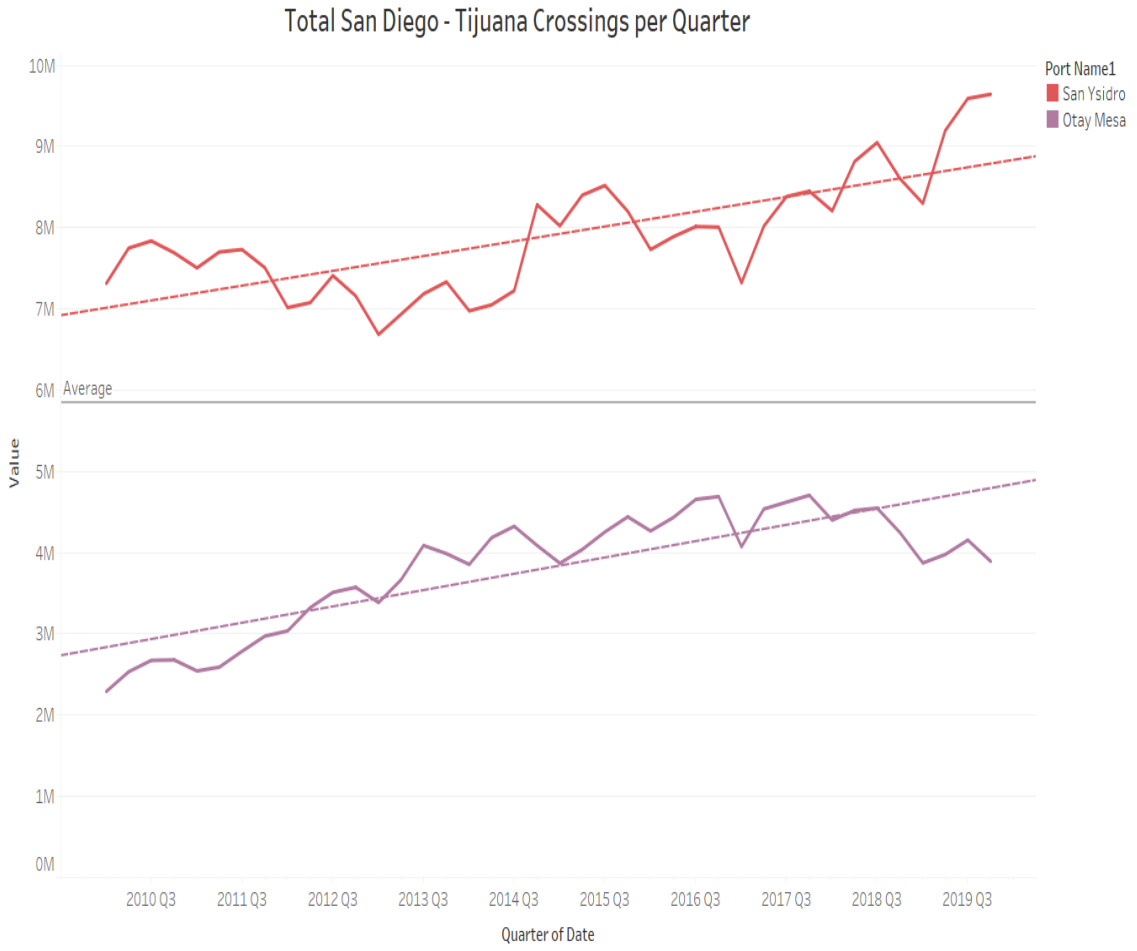
<u>Prediction</u>

- In all, our forecast indicates that Texas will still remain on top and receive similar crossings numbers found in 2019
- California is also projected to come close to its 2019 crossing numbers for the last months of 2020, meaning it will either surpass or come close to its maximum crossing number in the last decade
- Arizona and New Mexico will remain steady with minimal growth for the upcoming year

Section II: San Diego-Tijuana Border Analysis

Section II: Analysis on a Local Level





Total: 664,653,610 crossings in the San Diego – Tijuana border from 2010-2019

Average: almost 6 million people cross each quarter of the year, or alternatively a little less than 2 million per month

Decade Results: Both borders have had incremental growth totaling to approximately 2 million crossings more than last decade, but it seems that in 2019 a lot of traffic began shifting from Otay Mesa to San Ysidro

Key Differences: Both ports receive heavy vehicular traffic, as both train and bus crossings slowly become obsolete.

Unlike San Ysidro, Otay Mesa's growth is affected if trucks are not accounted for

Section II: Analysis on a Local Level

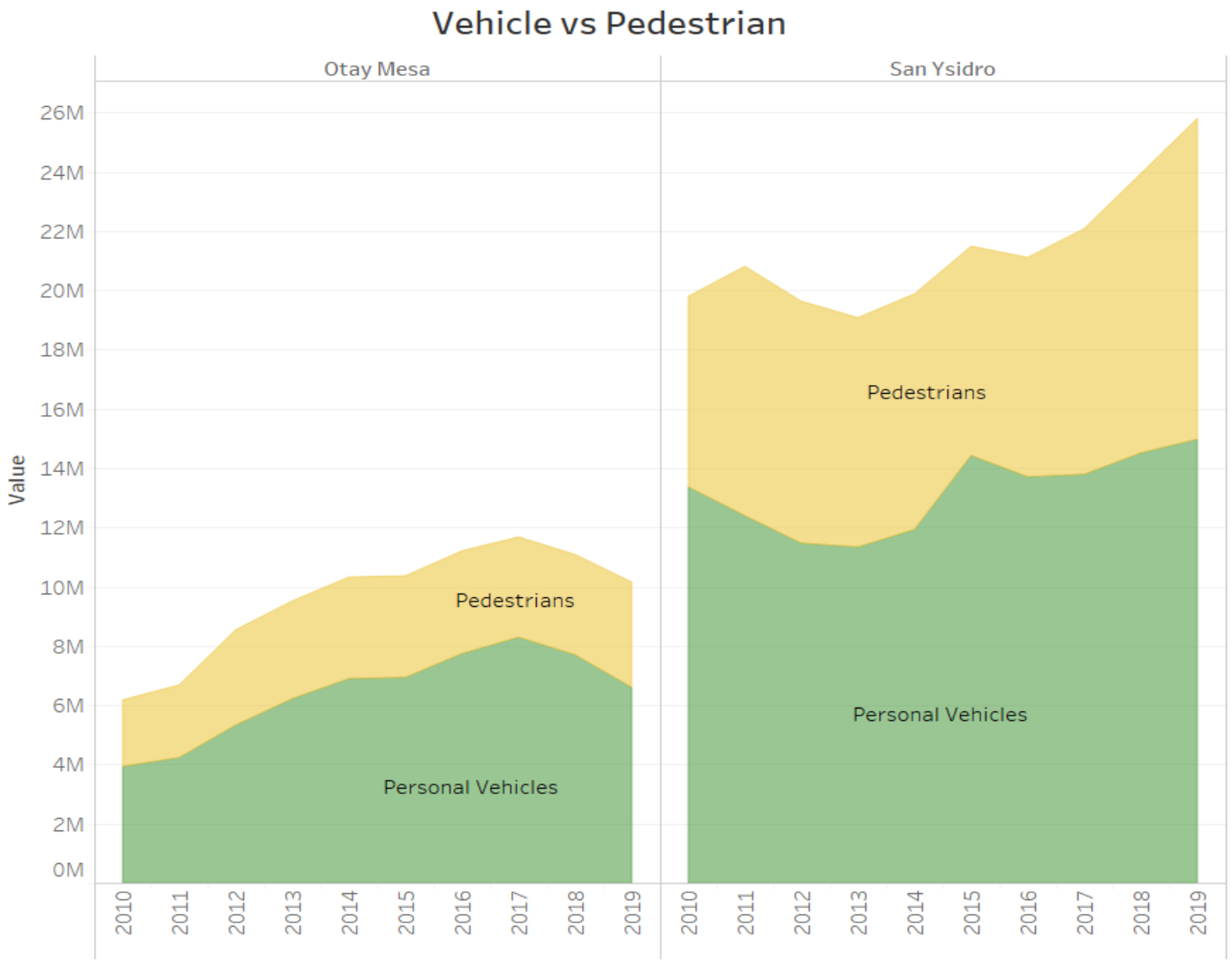
San Ysidro LPOE Project

Seeing the growing demand for a port expansion, in 2010 the GSA led a $741 million project to accommodate this traffic growth

- Took almost 10 years to complete (until Winter 2019)
- Added a new bi-directional pedestrian crossing (finished 2016) & expanded old one (finished 2018)
- Increase inspection lanes to 34, added 1 dedicated bus lane = to a total of 64 inspection booths
- Goal to accommodate the millions of vehicles that pass through primary inspection each month

Otay Mesa is also expected to have its own expansion project done by 2023. Its goal is to double its pedestrian lanes, reduce vehicle traffic and most importantly expand its commercial port

Section II: Analysis on a Local Level



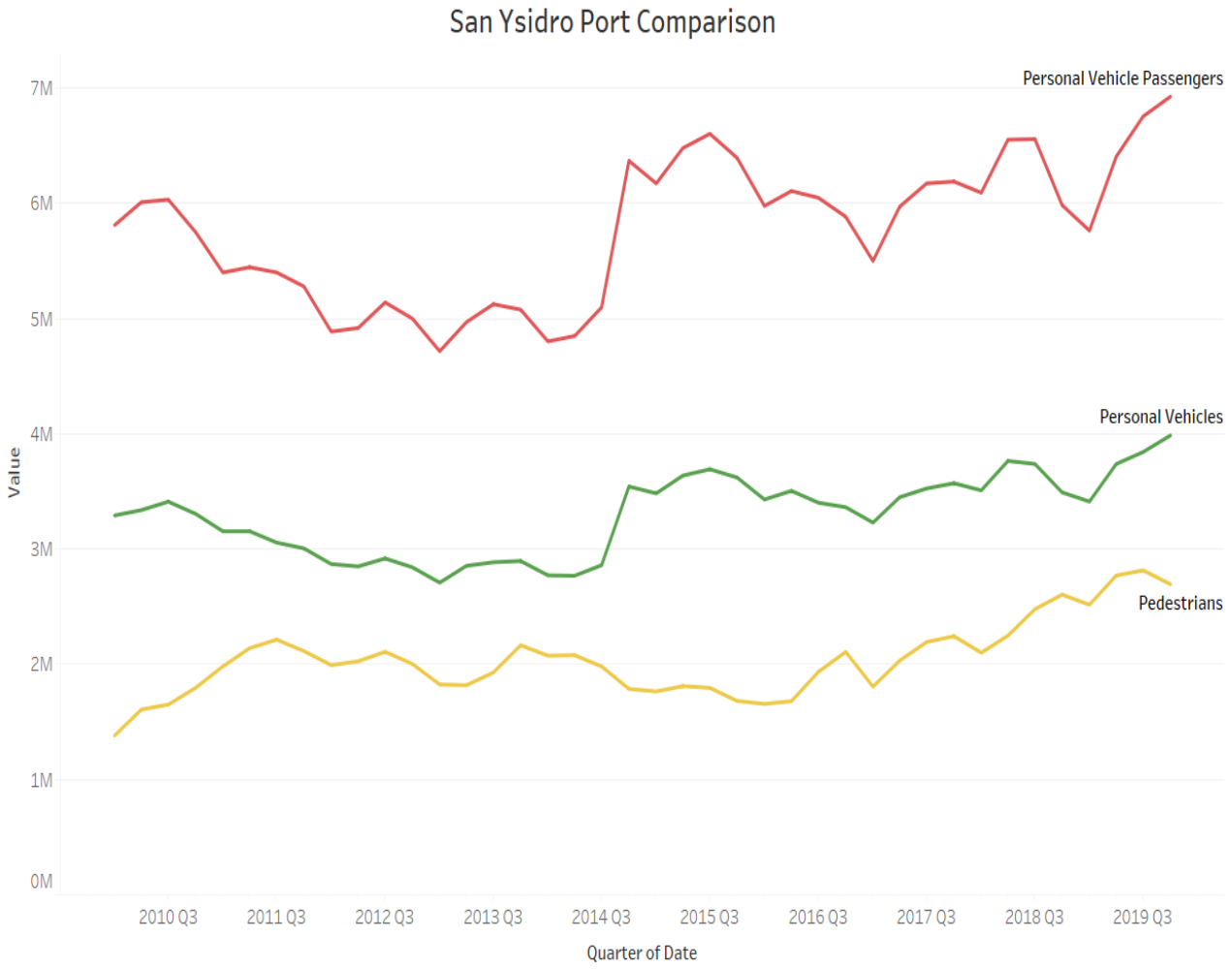
It is clearly visible the impact this new expansion project had on San Ysidro.

Most notably we see a surge of pedestrian traffic starting in 2016 which was when the new pedestrian entry port (PedWest) was finished.

This has allowed Otay Mesa's pedestrian traffic to stay relatively constant without overwhelming its traffic lanes

Also with the project culminating in 2019, more people are opting for San Ysidro where its strategic location to main highways, public transportation and retail spaces make it a lot more convenient

Section II: Analysis on a Local Level – San Ysidro



Why was there a surge in Vehicle Passengers and Vehicles in 2014?

This can be attributed to the completion of Phase 1B of the expansion project in December of that year, where a total of 64 inspections booths where put in service

Additionally it can be attributed to it occurring between Q3 and Q4, where a lot of people normally cross to do their holiday shopping

What can be said about each Quarter?

Q1: Typically find the lowest traffic, especially when it comes to vehicle passengers, thus this is why we see drastic falls along the line

Q2: Usually there is a small increase, but not significant

Q3: Summer months, typically the busiest time of the year with the most vehicle traffic. Expect long lines !

Q4: Last 3 months, where we see the most pedestrian traffic but, also start seeing decreasing vehicle traffic

Section II: Analysis on a Local Level- Otay Mesa

Here we see the opposite effect occurring with vehicle traffic.

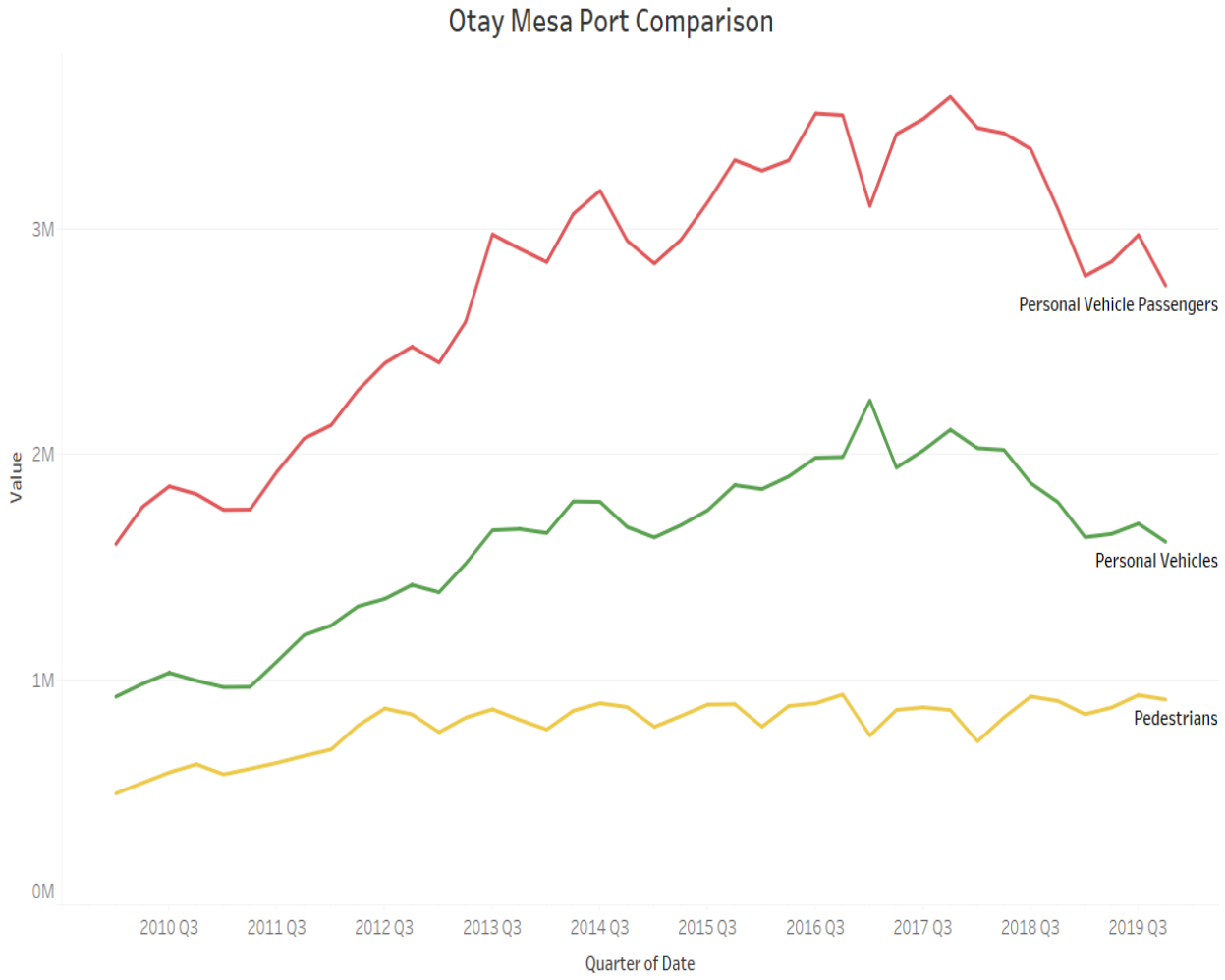
As mentioned in the previous slide, with San Ysidro's capacity increased, Otay Mesa began losing a big percentage of their vehicular traffic.

It can be even stated that Otay Mesa only received such increase in vehicle traffic over the decade because of the construction work taking place in San Ysidro, which closed many lanes

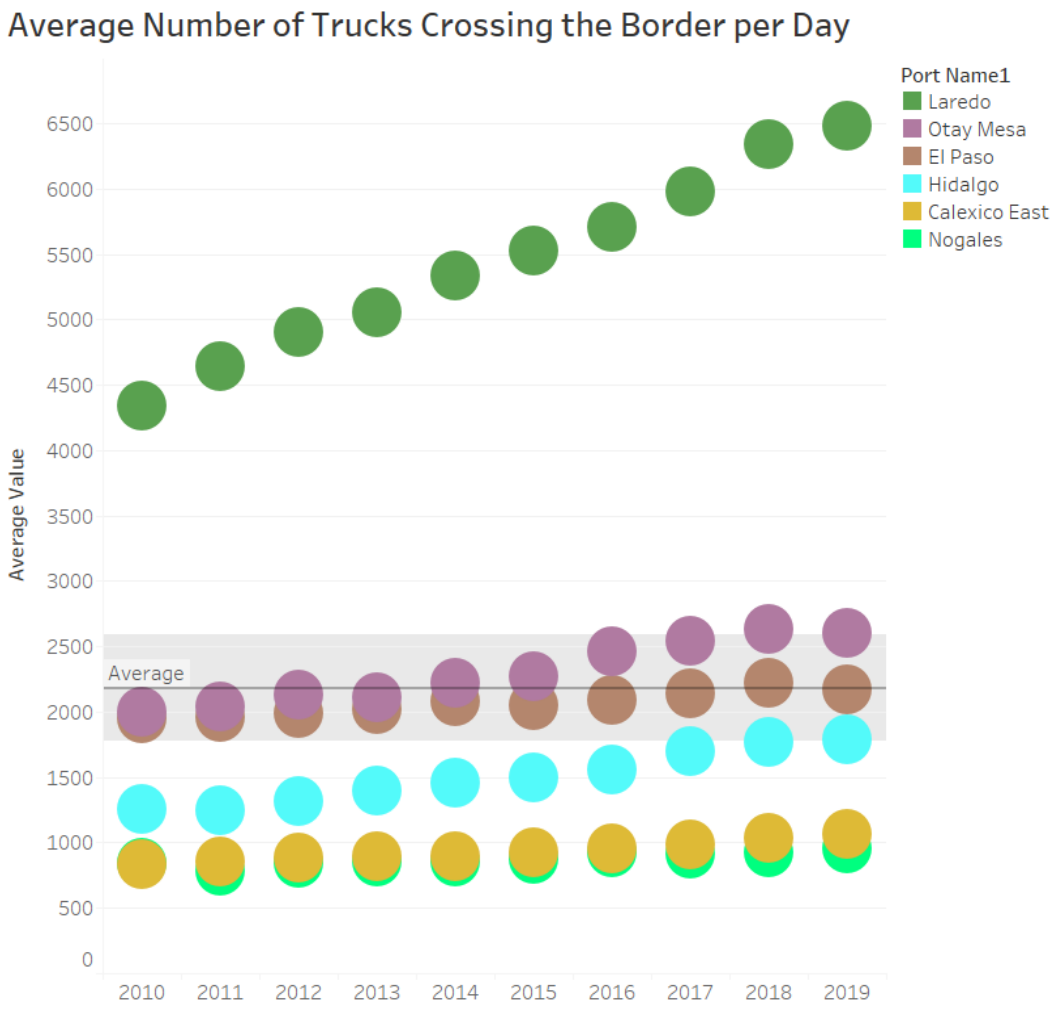
Pedestrian numbers stayed relatively low, amounting less than 1M per quarter, this is not surprising considering this entry port is relatively farther away from the city center.

What can be said about each Quarter?

Almost identical activity to San Ysidro, with Q1 being the slowest and Q3 the busiest



Section II: Commercial Impact of Otay Mesa



		Date									
Measure1	Port Name1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Trucks	El Paso	14.98%	14.68%	14.20%	14.22%	14.02%	13.51%	13.16%	12.90%	12.85%	12.30%
	Laredo	33.43%	34.84%	35.06%	35.54%	35.97%	36.42%	35.91%	36.14%	36.67%	36.72%
	Otay Mesa	15.38%	15.30%	15.26%	14.82%	14.96%	14.99%	15.50%	15.39%	15.25%	14.73%

Percentage of Tot..
12.30% 36.72%

The importance of Otay Mesa from a commercial stand point

- It is the second busiest commercial port with an estimated average of 2500 trucks crossing every day in 2019
- It accounts for roughly 15% of all trucks crossing the U.S.-Mexico border each year
- The only other port above Otay Mesa is Laredo, who's linear growth is incomparable to all others with roughly 37% of all truck crossing through there per year
- The San Diego Association of Governments (SANDAG) estimates that roughly $42 billion worth of goods cross the Otay Mesa border each year

Section II: Analysis on a Local Level

		Date									
Measure1	Port Name1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Pedestrians	Cross Border Xpress								2.42%	2.77%	3.30%
	Otay Mesa	5.64%	6.19%	7.79%	7.99%	8.29%	8.28%	8.31%	7.89%	7.34%	7.25%
	San Ysidro	16.13%	21.12%	19.77%	18.79%	19.23%	17.13%	17.51%	19.44%	20.43%	21.96%
Grand Total		21.77%	27.32%	27.56%	26.77%	27.51%	25.42%	25.82%	27.99%	30.55%	32.51%

		Date									
Measure1	Port Name1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Personal	Otay Mesa	6.14%	6.89%	8.53%	9.37%	9.93%	9.35%	10.21%	10.79%	10.02%	9.01%
Vehicles	San Ysidro	20.84%	20.22%	18.31%	17.05%	17.16%	19.47%	18.12%	17.88%	18.86%	20.50%
Grand Total		26.98%	27.11%	26.84%	26.42%	27.08%	28.81%	28.33%	28.67%	28.88%	29.50%

		Date									
Measure1	Port Name1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Bus	San Ysidro	20.54%	17.18%	20.36%	17.99%	17.65%	17.23%	10.66%	3.57%	2.92%	3.71%
Passengers	Otay Mesa	5.49%	6.15%	5.71%	6.47%	6.72%	5.43%	2.51%	2.72%	2.45%	0.51%

Percentage of Tot..

0.51% 20.54%

I. Over the last couple years, these specific ports have taken a bigger percentage of all pedestrian crossings, this may be due partly because of the addition of *Cross Border Xpress,* which is only for pedestrians departing/arriving from the Tijuana International Airport

II. Overall in the last decade 27%-30% of all vehicle crossings occurred in this area. This is remarkable when you think of the importance these ports have for the city of Tijuana.

III. Here it is important to highlight the drastic drop in bus passengers in the year 2017 for San Ysidro and in 2016 for Otay Mesa. It would be an interesting subject to investigate and see if the SY expansion project had a direct effect.

Concluding Remarks

Rather than just doing a summary I will go ahead and provide a quick reflection. Now that we have seen the data and plots, we have to take into account that all of these numbers are actual people. It would be common to think that most people who cross the border are those who just go eat, visit relatives or are returning from a nice vacation down in Mexico but, the reality is that a vast majority of those daily crossings are workers, students or children who live in one country but have to commute to the other in search of a better opportunity. Now, I do not want to generalize for every entry port hence, I will only be talking out of my experience here in the San Diego-Tijuana region.

We are very unique in the sense that this is an area where people can have a taste of the "American Dream" without abandoning their roots. It is not an easy life through. A large portion of people who decide to do this cross-country commute also have to make big sacrifices. The most common is long lines, which lead people to start their day at 3am in order to get to the other side on time as wait times can last on average up to two hours, generating large amounts of stress. To be fair, the U.S. government has been doing a very good job reducing wait times as the influx of pedestrians and cars increases. Another includes the lack of free time this type of commute offers people, especially those without a vehicle. Thus, the most impacted are students, particularly when it comes to their academic performance. Lastly, when people's whole lives depend on crossing that border sometimes they tend to sacrifice their integrity. That is through expired visas, fake documents or most commonly illegal crossings which if caught, can nullify any future attempt they do to enter the U.S.

On the other hand, this presentation is an opportunity to show the strengthened ties between both countries, the importance of maintaining an economic partnership and a reason why we should focus on making all border regions a place where all dreams can be true.

Sources

Data Source: https://www.bts.gov/content/border-crossingentry-data

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