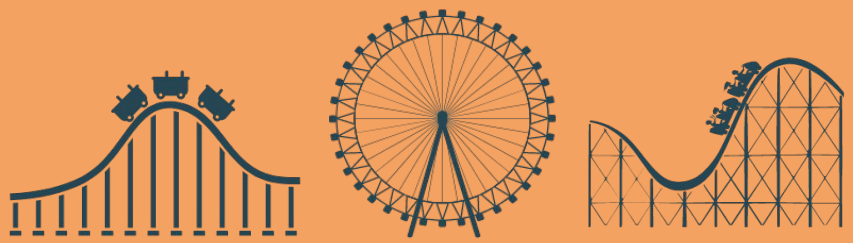


April Gao, Will Hughes,
Vanessa Martinez, Omar Zaher

Theme Park Accidents

Project 3 - Group 1

Theme Park Data

Fasten your seatbelts
and
“Enjoy” the ride

Our group was inspired by the recent news that Frisco,Tx was the new location for a Universal Studio family friendly theme park.

There is not a lot of public information regarding theme parks ride accidents. We found one main source called Saferparks that provided information for us to analyze and it turns out that the only data on Theme Parks is accident data.

Saferparks is a non-profit public service organization founded in 2000 to help prevent amusement ride accidents through research, information sharing, and effective public safety policy. The organization is no longer actively engaged in research or advocacy. Safety related data collected by Saferparks in prior years has been uploaded to RidesDatabase.org as a public service.

There are no mandatory national safety standards for U.S. amusement rides.

Theme Park Data continued

In 2000, 2002, 2004, 2006, 2007, and 2017 Saferparks submitted public records requests to U.S. state and federal safety agencies that regulate amusement rides, asking for data on ride-related accidents and injuries. The resulting records were harmonized and incorporated into the Saferparks Database.

There are no mandatory national safety standards for U.S. amusement rides but the amusement ride industry has developed an extensive suite of consensus safety standards through the ASTM F-24 committee. State and local rules, where they exist, may reference ASTM industry standards, government-drafted requirements, or a combination of both.

We took a sample of the collected data and analyzed accidents by device type, device category, business type, injury, year, and location.

Research Questions

Given our data we became curious of the following :

- What type of theme or amusement park (business type) has more reported incidents of injury?
- How many accidents were reported over time?
- What type of rides(device types) cause the most amount of injuries?
- Where are the parks with reported accidents located?

Data.json

Our original data from the saferparks website: “https://ridesdatabase.org/wp-content/uploads/2020/02/Saferparks-data-description.pdf”
There wasn't much data outside of the years “2000-2008” so we took a sample of the data using pandas for those years and also created a new column labeled address so we could map out the location of incidents. The original data came in csv format, however we had to jsonify the file and read it in using d3.

```
#Make an address
df['Address'] = df.acc_city + ', ' + df.acc_state
df.head()
```

```
sample_df = df2.sample(n=1000, random_state=1234)
sample_df.info()
```

```
In [ ]:

In [ ]: sample_df.to_json("data.json", orient="columns", index=True)
```

Our Website Link

Theme Park Accident Dashboard

Dashboard Design

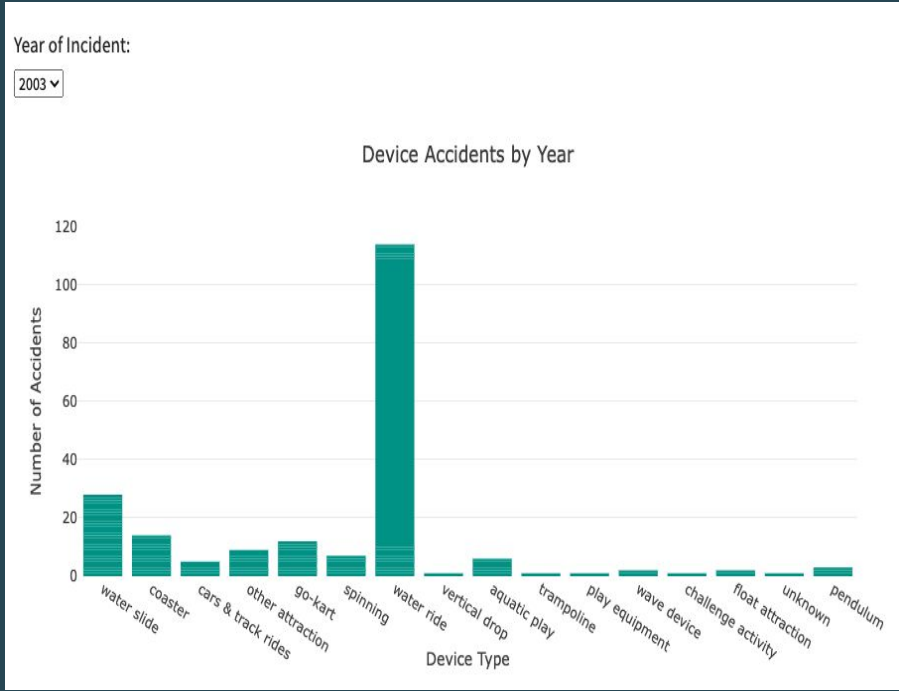
- Main Page
- Map
- Data
- About us
- Works Cited

Our Dynamic dashboard can be utilized so we can get the picture without paying for it after the ride. YAY DATA VIZ!!!

The main libraries we used for our visualizations :

- Plotly- Bar Chart
- Tableau- Tree Map Chart
- d3-Lollipop Chart
- Leaflet-Cluster and Heat Map

Bar Chart Design



Accidents by device type through years 2000-2008

Our bar chart was able to let us know which “device types” had the most amount of injuries.
We were also able to filter by year and display the year with the most accidents.

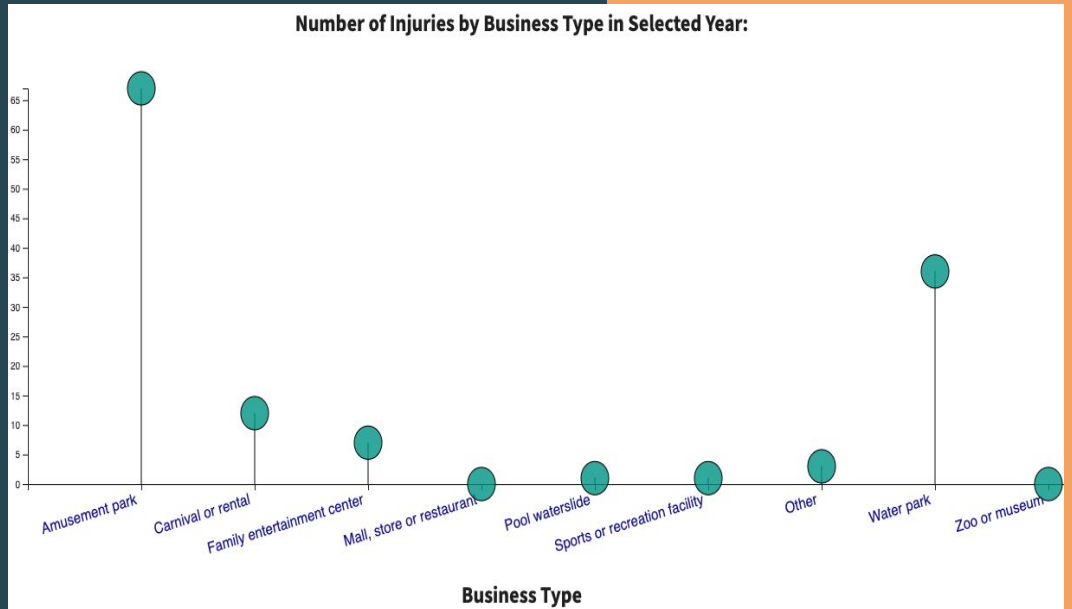
Conclusions:

- 2003 had the most accidents.
- Water device types have the most accidents.

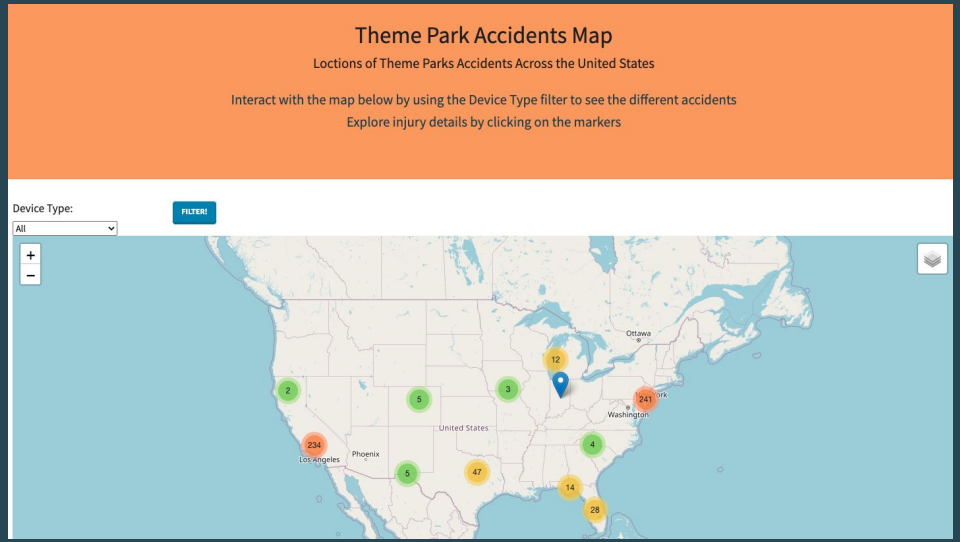
Lollipop Design

Using d3 we were able to generate a lollipop graph that displays a count of injuries by business type.

Conclusions: Amusement parks have the most consistent accidents across the board every year, although water rides have a higher rate of injury.



Leaflet Map

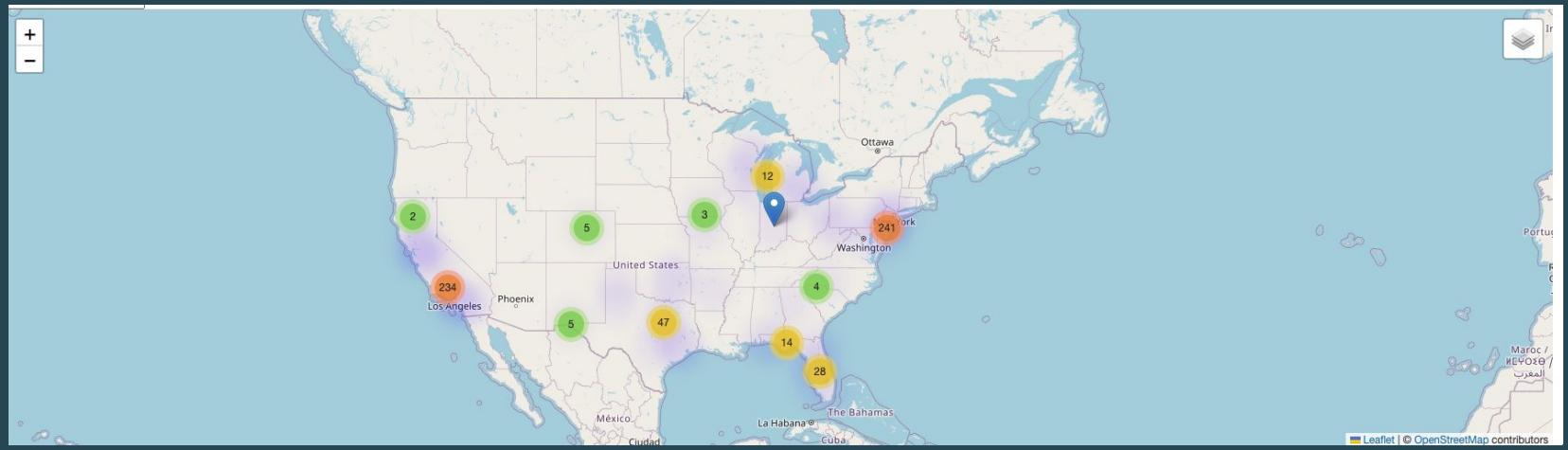


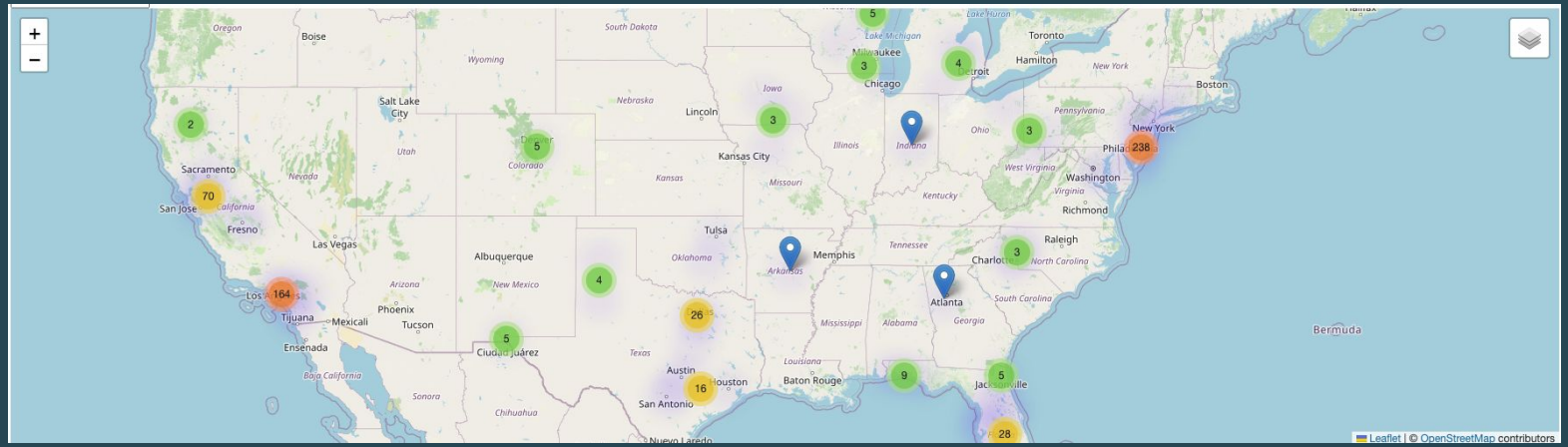
We created a leaflet map with a heat filter and marker clusters that give a unique description of each individual injury description at the given location that you can filter by device type.

Conclusions:

California and New Jersey have a majority of reported accidents.

Map


Ottawa
Washington
United States
Phoenix
Los Angeles
México
La Habana
The Bahamas
Cuba
Leaflet | © OpenStreetMap contributors


Boise
Salt Lake City
Sacramento
San Jose
Fresno
Las Vegas
Albuquerque
Phoenix
Tucson
Tijuana
Mexicali
Ensenada
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Austin
San Antonio
Houston
Baton Rouge
Tulsa
Kansas City
Lincoln
Chicago
Toronto
Hamilton
Boston
New York
Washington
Richmond
Raleigh
Memphis
Atlanta
Bermuda
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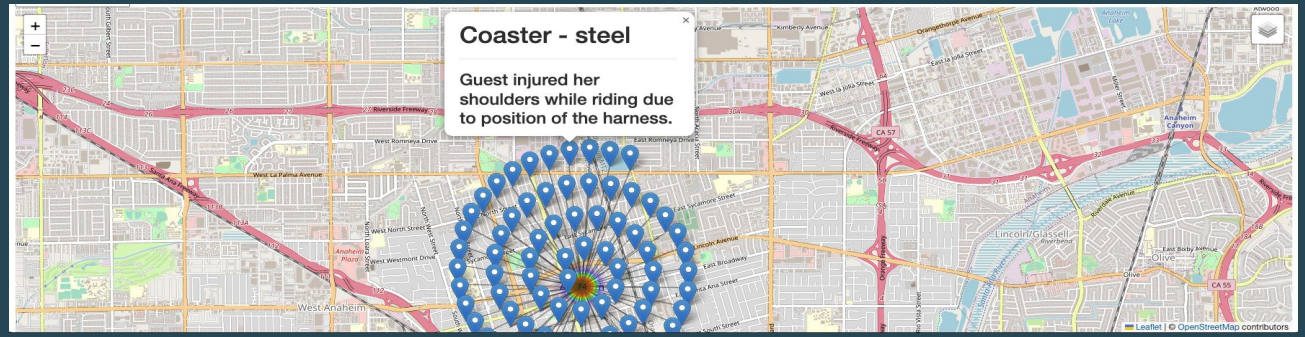
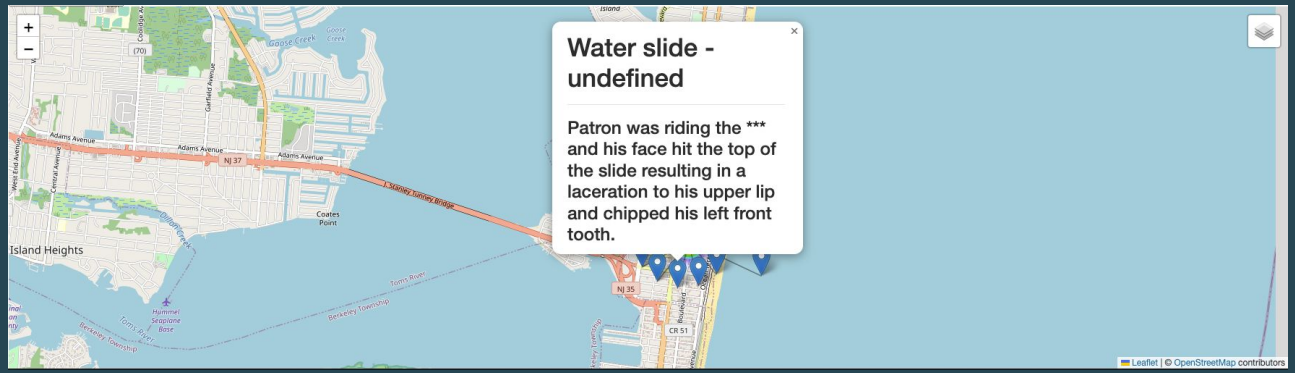
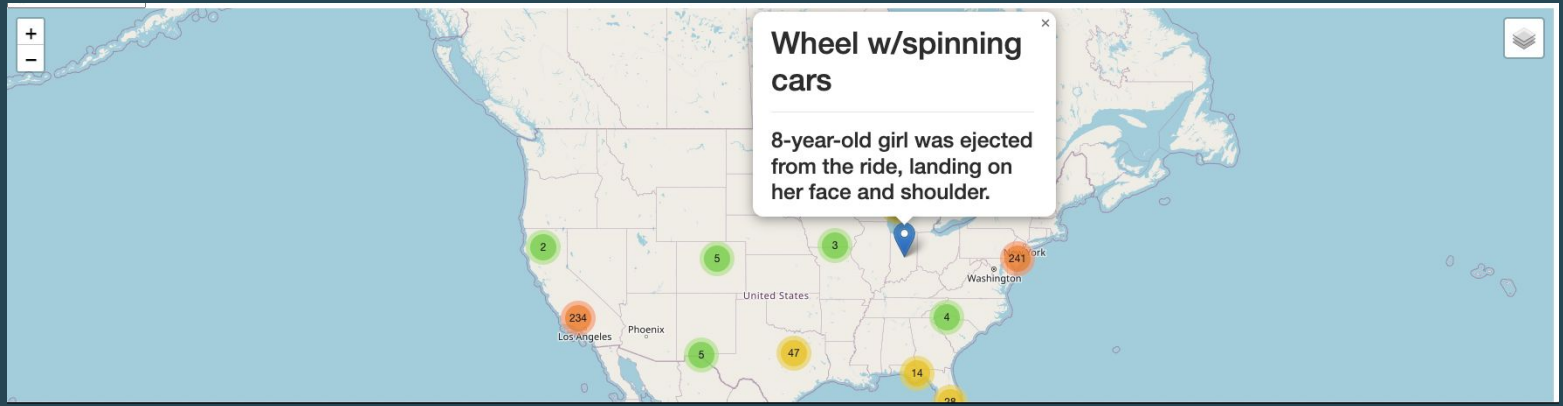
Map





Injury Description examples

Map



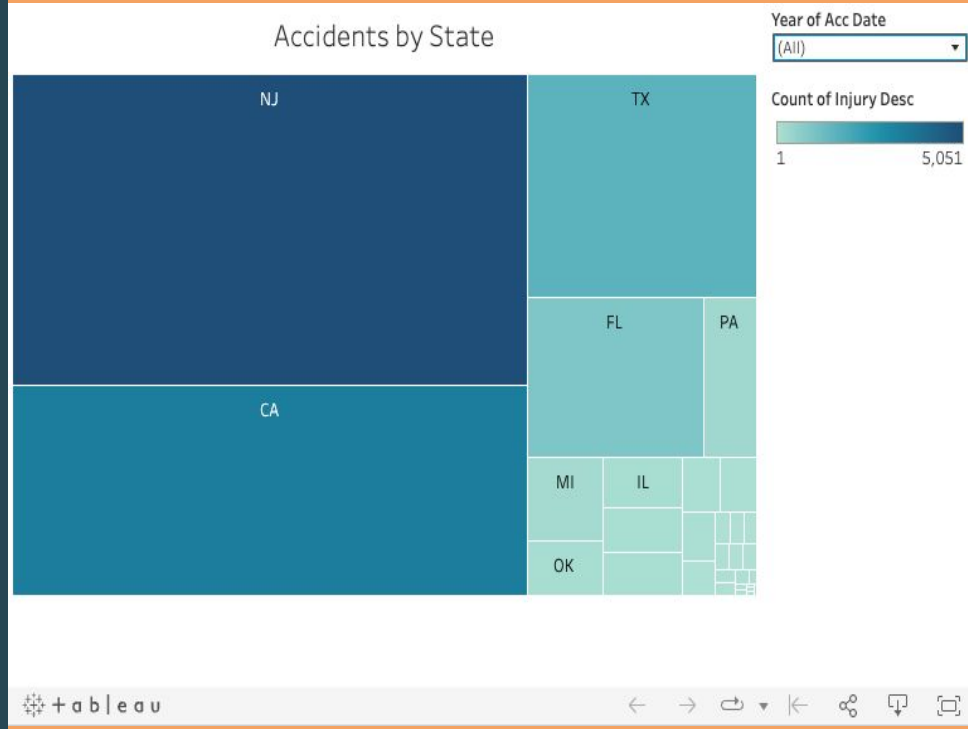
Injury Description examples - This one in particular is alarming

Tableau Design

We incorporated a Tableau Tree map graph that was able to visualize a total count of injuries by each individual state and filter by year and all time.

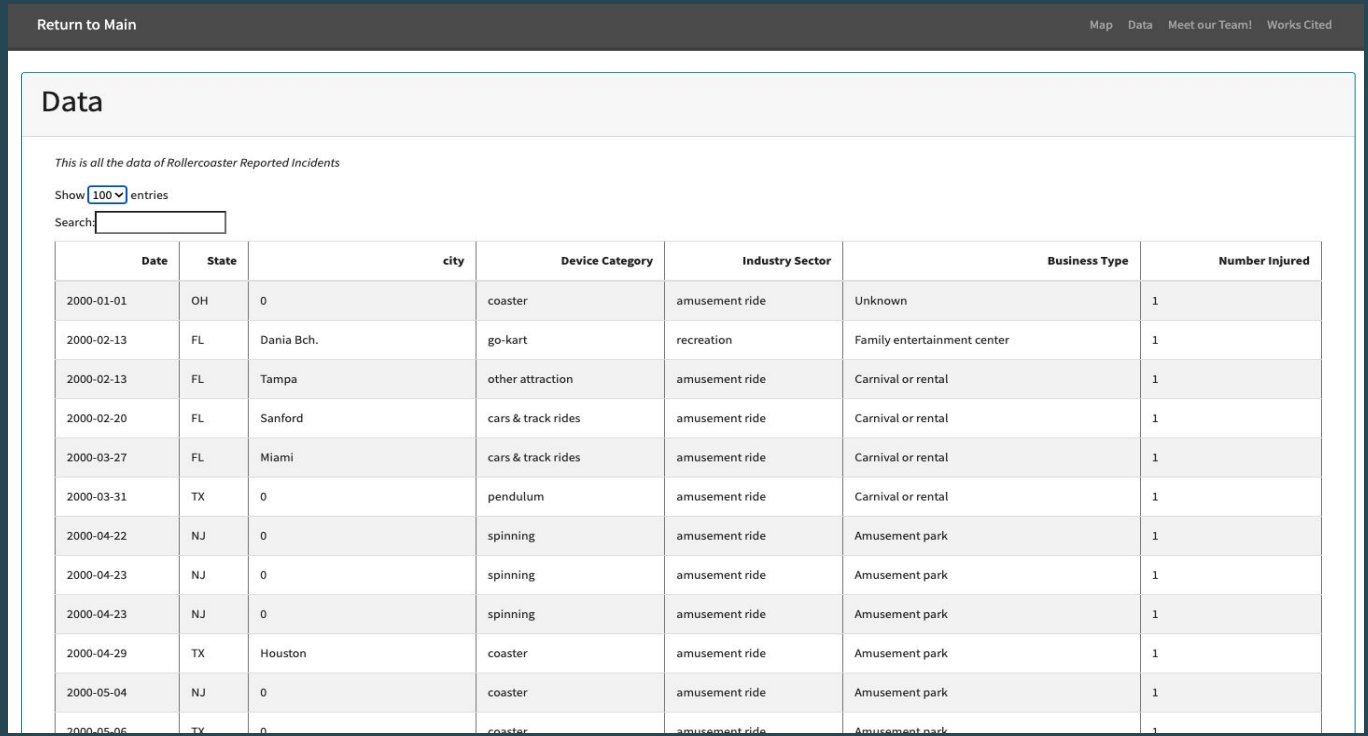
Conclusions:

- The graph supports our leaflet map showing NJ and CA having the highest instances of injury.
- Based on our sample data there were 5,051 number of reported injuries over the 8 year span.



DataTables page

We incorporated a DataTable with our sample data that you can search through and choose how many rows are displayed



Date	State	city	Device Category	Industry Sector	Business Type	Number Injured
2000-01-01	OH	0	coaster	amusement ride	Unknown	1
2000-02-13	FL	Dania Bch.	go-kart	recreation	Family entertainment center	1
2000-02-13	FL	Tampa	other attraction	amusement ride	Carnival or rental	1
2000-02-20	FL	Sanford	cars & track rides	amusement ride	Carnival or rental	1
2000-03-27	FL	Miami	cars & track rides	amusement ride	Carnival or rental	1
2000-03-31	TX	0	pendulum	amusement ride	Carnival or rental	1
2000-04-22	NJ	0	spinning	amusement ride	Amusement park	1
2000-04-23	NJ	0	spinning	amusement ride	Amusement park	1
2000-04-23	NJ	0	spinning	amusement ride	Amusement park	1
2000-04-29	TX	Houston	coaster	amusement ride	Amusement park	1
2000-05-04	NJ	0	coaster	amusement ride	Amusement park	1
2000-05-06	TX	0	coaster	amusement ride	Amusement park	1

Future Work & Limitations

Future Work

- We will find better color scheme that is more universal with amusement parks. The limitation with this is there are many different colors associated with them.
- We will be organizing our bar chart and lollipop chart in a descending/ascending order.
- We will get our site to fit above the fold
- Incorporating more bootswatch and bootstrap themes in to our website to make it more visually pleasing
- We will be updating our heat map to display a red color rather than blue

Limitations

The number of accident reports in a category depend on many variables unrelated to rider safety. These include: popularity of the ride type, regulatory inclusions/exclusions, local government record retention and public disclosure policies, and individual corporate record keeping policies.

States with stronger government oversight tend to log more accidents. States that carefully monitor a broad range of safety incidents, have efficient data management systems, and provide a transparency to the public will, by definition, produce a higher number of public accident reports. This is an indicator of more attention to safety, not less.

Limitations

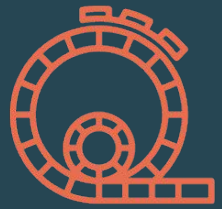
The Saferparks' accident data set may not reliably predict nation-wide or industry-wide patterns. The relative frequencies of certain types of accidents, on certain types of equipment, may not accurately reflect the aggregate safety records of **all** amusement devices in the United States.

For example: State laws require that **go-kart** accidents be reported in Florida, **but not** in California.

Thrill ride accidents at **major theme parks** must be reported in California, **but not in Florida.** Therefore, records from the Florida Dept. of Agriculture will tend to show a higher percentage of go-kart accidents and a lower percentage of roller coaster accidents, than is accurate for that state.

Sources

- Kaggle - Roller Coaster Accidents
- Data – Rides Database
- Saferparks Accident Data
- Palette - Coolors
- Canva



The End!