

Process Book

Analyzing Congressional Travel Data from 2007-Present

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Can analyzing where congressmen travel give insights into what is important to them?

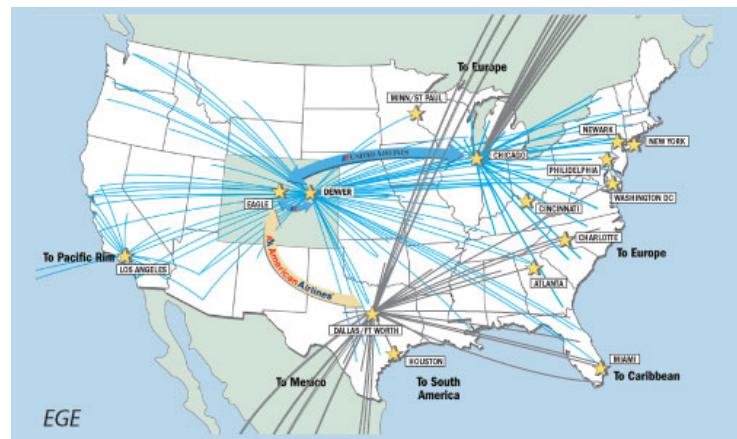
Part 1: Overview and Motivation

Until 2007, privately funded travel was allowed for Members of Congress as long as it was not sponsored by a foreign government or a registered lobbyist. International travel could last no longer than seven days and domestic days could last no longer than 3 days (4 for the House). In 2007, both chambers of Congress changed their rules so that all privately funded travel must be approved by the House or Senate. Members of congress are required to disclose data of any privately funded travel (both domestically and abroad) that they undertook while in office that was sponsored by a third party. This data is publicly available for the [House](#) (the Senate is available as well, but the interesting data is tiny comparative to the House, so we decided to focus our analysis on the House). Analyzing this data can provide valuable insights into which third parties have closest relationships with certain members, where certain members travel the most, and if and when members traveled together. The project is motivated because the students working on the project are affiliated with Quorum, a student startup based out of Cambridge that provides data analytics for politics. As such, we will have access to a large database with existing data about congressmen which we will integrate with this travel data to make it searchable, filterable and cleaner.

There are many trips that do not have to be disclosed: trips paid from taxpayer allowances provided to members, paid for by the U.S. government or foreign governments, paid for elected representatives or staff for campaign purposes or paid for by personal friends. Thus our data will only provide part of the overall picture but a meaningful part nonetheless.

Part 2: Related Work

The most important inspiration for the data analysis part of the project was the startup that the members of the project are affiliated with, [Quorum Analytics](#). This gave us access to an enormous amount of information about each member of Congress, so we were able to match the travel to those members and then use the rest of the Quorum database to provide even more insights into the travel patterns of the members of Congress. In terms of our visualizations, we were inspired by flight maps, such as the one to the right. We were also inspired by the CS171 project from last year, [A Century of Corn](#), in terms of the overall look and feel of the visualization. For the “dots” part of the visualization, which we will explain further in the next sections, we were inspired in part by the following [CS171 visualization](#), as well as the Datamaps library we used liberally in our project. From a interest perspective, through our work at Quorum, the members of the team are deeply interested in finding and



visualizing information about our legislators and we found the travel data to be one that had not been looked into by Quorum previously and also one that provided very interesting data to be visualized.

Part 3: Questions

Some examples of questions we hope to be able to answer:

1. Which Congressman have traveled to Israel in the past 2 years and who sponsored them?
2. Which Congressman has Harvard University sponsored to travel in the past 5 years?
3. Where does Congressman Ben Ray Lujan travel the most?
4. When did two congressman travel to the same place at the same time last year?

The data made the answers to these questions fairly easy to ascertain. The difficulty was in creating a visualization that allowed a user not acquainted with the dataset to understand and make the same insights we were able to with a detailed analysis of the dataset. To that extent, the initial questions we had upon first deciding on our dataset did not change much. When we successfully matched the Travel Data to the Quorum Database, we were able to answer even more interesting questions, related to the ethnicity and religion of the members of congress:

1. When did Catholic Congressmen visit Rome in the past year and who sponsored them?
2. When did Jewish Congressman visit Israel?

Part 4: Data

The Data is available for the Senate for Members and Staffers and for the House for Members. We restrict our data to only members of congress (not their staffers). The data is available in XML format with the dates of travel, the member, the destination and the sponsoring organization for the House. There are over 11,000 such trips recorded for the House. For the Senate, the XML data does not provide the destination of the trip or the sponsoring destination. There are only 169 recorded instances of privately funded travel for the Senate that are publicly disclosed so we did not bother adding in the Senate data. An example of the House XML Data:

```
<Travel>
  <DocID>500005076</DocID>
  <FilerName>Bobby Cornett</FilerName>
  <MemberName>Franks, Trent</MemberName>
  <State>AZ</State>
  <District>8</District>
  <Year>2011</Year>
  <Destination>Las Vegas, NV</Destination>
  <FilingType>Original</FilingType>
  <DepartureDate>1/7/2011</DepartureDate>
  <ReturnDate>1/9/2011</ReturnDate>
  <TravelSponsor>Consumer Electronics Association</TravelSponsor>
</Travel>
```

We used the parser attached to this file (travel_parser.py) to parse the travel data. While much of it is simple XML parsing, there are several processing functions we had to write to clean the data and get in in a source we wanted.

Overview of Data Processing

The Data from the XML files requires a lot of processing and sanitization to get it to a form where we can use it. We used the Django framework for the backend to create a database that is linked to the overall Quorum database that contains a number of different models.

TravelDestination:

Object for a destination for travel that contains a number of fields. The state and country fields are important for filtering, whereas the latitude and longitude are essential for a map-based visualization.

- name in the disclosure form
- cleaned name (google geocoding api verified)
- state
- country
- latitude
- longitude

TravelSponsor: Sponsor of the travel.

Travel: Actual trip.

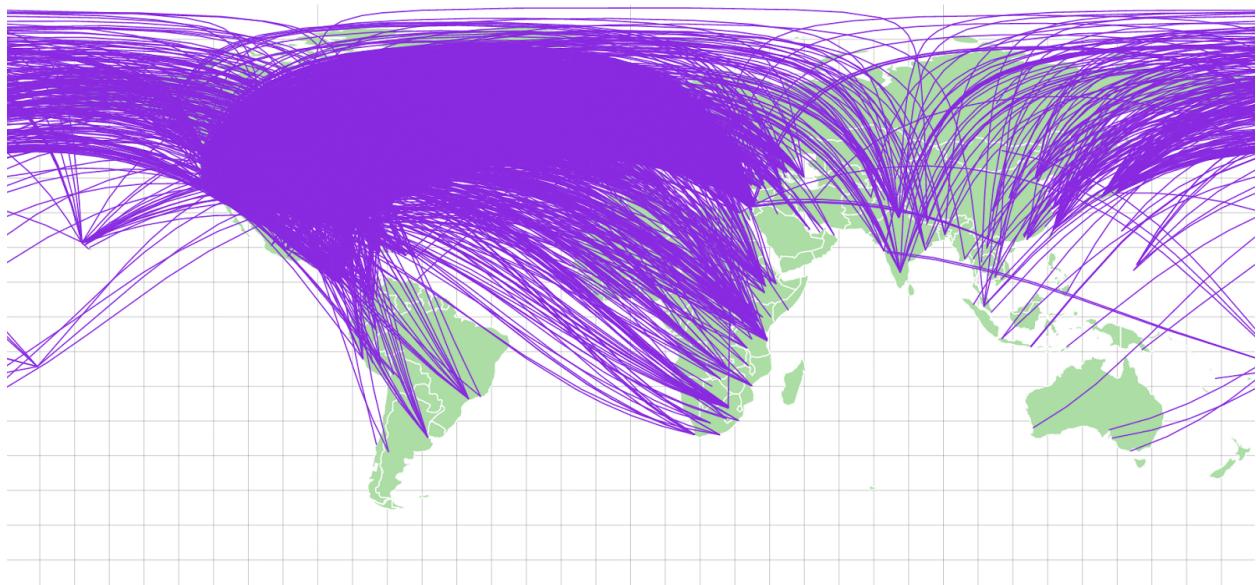
- member - contains a foreign key to the member in the Quorum database. This member object contains various biographical and legislative information about the member which
- destination - contains a foreign key to the aforementioned destination object
- sponsor - foreign key to aforementioned sponsor object
- departure date
- return date

To take the data from the XML and get it into a form accepted by our database and sanitizing the data took a number of steps.

We used the Google GeoCoding API to search each location and get back a cleaned address, along with geocoded information that we used to create the TravelDestination object. We also had to manually sanitize the Travel Sponsor Data to correct for differences in spelling and grammar. For instance, Fellowship Foundation and Fellowship Foundations are clearly the same sponsor, yet our database would treat them as two different sponsors so we had to create a mapping of over 2000 distinct sponsor names to <500 unique sponsors to account for these differences. We also had to match the person's name in the XML data to the person's name in the overall Quorum database, which was very time consuming as well.

Part 5: Exploratory Data Analysis

The first visualization we constructed looked something like this:



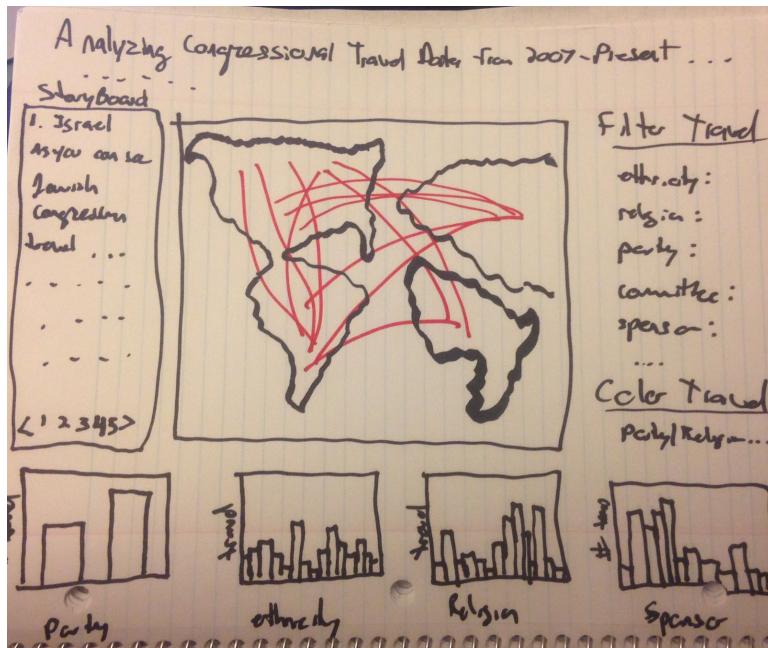
Though we initially planned our website around the arc visualization, this result showed us that the arcs were limited in feasibility. The Datamaps library did not support adding popovers to arcs, and when too many arcs were displayed the data became hard to interpret. This led us to implement the “markers” visualization, which allowed us to implement markers and didn’t look too cluttered even with large amount of travel instances. One appeal to using arcs was that it allowed you to see where the Congressman traveled from, but since nearly all of them simply traveled from their home state this information was not interesting.

Part 6: Design Evolution

From the beginning we knew that our main visualization would be our world map, with lines that show where from and where to congressmen had traveled. We knew this wasn’t enough, however, to gain useful insights into the motivation behind travel and notice interesting patterns in the data. Thus, from there we decided that a way to filter the travel based on a number of different options would be useful to be able to narrow in on the data and really analyze it at a closer level. For example if I want to see where exactly Catholic Democrats were traveling, I could filter the travel based on congressmen who are Democrats, and who are Catholic. From there we thought it would also be very helpful to be able to color the travel by party, religion, sponsor, or ethnicity. This would be useful for showing how Democrats travel differently from Republicans, among many other examples.

We also thought that it would be useful to show distributions of the number of times traveled based on party, ethnicity, religion, sponsor, and committee. For this we thought the best way was to include a set of histograms below our map and filters that would allow one to examine these distributions and notice any outliers or patterns.

Finally, we thought that a storyboard that contained preset filters and coloring to show interesting and insightful findings would be very helpful. If you scroll through this storyboard, you will see several different interesting patterns arise in our map and graphs, and we will provide some background explanation as to why you see what you see. Here is an initial sketch of what we planned to design:



From there the only major changes we made were firstly adding another way to view the travel in the map, as markers instead of paths. This sort of clears up the visualization and allows you to hover over trips to gain more info about them. Secondly we changed the storyboard on the left to a set of 3 tables which contain information about the travel presented in the map. The first is a table of the top destination countries, the second is a table of the top sponsors, and the third is a table of the top members. We did this because we thought it was a nice addition to the map visualization and allows you to get more detailed info about the travel presented. We also added a table at the bottom of the page that simply lists all the travel.

Lastly, we did everything we could to make the whole page very interactive, so that when you click on any item in a table it filters the data to what you clicked (for example if you click the country United States in top Countries it will only show trips to the United States). Additionally we made it so that if you click on any dot in the dates graph, it will filter to just that day.

Part 7: Implementation

Our website consists of several interactive and interconnected visualizations. At the focus of the visualization is our map of the world (created using the DataMaps JavaScript library), which displays where Congressmen travel geographically.



Another key part of the user experience is the ability to filter the data. To the right of our map visualization, we include several selects that allow the user to filter across a number of variables and also reveal what values are included in the dataset. In this area we also included forms allowing the user to change the map visualization. Specifically, we allow them to visualize the data in arcs or dots and color the data points based on ethnicity, religion, or party.

Select Visualization

Filter Travel

01/01/2014 to 04/01/2015

Color Travel

To the left of the map visualization, we include lists providing the user of useful information related to the current data selection. We include the top members, countries, and sponsors related to the currently filtered data in scrollable lists.

Top Countries

Destination Country	Trips
United States	1045
Israel	302
Turkey	136
Japan	50

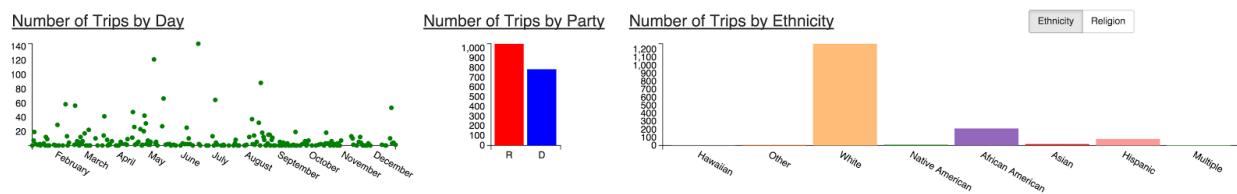
Top Sponsors

Trip Sponsor	Trips
Congressional Institute	303
AIEF - American Israel Education Foundation	278
Turkic American Federation	89
...	...

Top Members

Congress Member	Trips
Rep. Fred Upton (R-MI6)	29
Rep. John Conyers (D-MI13)	18
Rep. Barbara Lee (D-CA13)	18
Rep. Henry Waxman (D-CA33)	17

Below the map are three graphs, which display the filtered data. We wanted users to be able to see when travel was occurring the most as well as what kind of people were traveling the most based on party, ethnicity, and religion. The first graph is a scatter plot on an ordinal scale showing how much travel occurred on each day in the filtered time range. The second graph reveals how many instances of travel came from Republican members and how many came from Democrats. The last graph reveals how much each ethnicity in the currently filtered data traveled. We also wanted this functionality for religion, so we included a simple button allowing the user to switch between the two.



Lastly, because we wanted to enable users to look at individual travel instances en masse, we implemented a table at the bottom of the page. Here users can see the filtered travel instances in a table format. Should the user see something interesting, he/she can even click the values in the table to filter by that value.

Member	Destination	Dates	Sponsor
Rep. Ann Wagner (R-MO2)	Cambridge, MD, USA	1/28/2014 to 1/30/2014	Congressional Institute
Rep. Ed Whitfield (R-KY1)	Las Vegas, NV, USA	1/5/2014 to 1/7/2014	Consumer Electronics Association (CEA)
Rep. Tom Marino (R-PA10)	Las Vegas, NV, USA	1/5/2014 to 1/8/2014	Consumer Electronics Association (CEA)
Rep. Fred Upton (R-MI6)	Las Vegas, NV, USA	1/5/2014 to 1/7/2014	Consumer Electronics Association (CEA)
Rep. Brett Guthrie (R-KY2)	Las Vegas, NV, USA	1/6/2014 to 1/8/2014	Consumer Electronics Association (CEA)
Rep. Doris Matsui (D-CA6)	Las Vegas, NV, USA	1/6/2014 to 1/8/2014	Consumer Electronics Association (CEA)

Part 8: Evaluation

The biggest takeaway we gained from the data is that Congressmen travel A LOT. We had to change our expectations of what visualizations worked best when we saw how cluttered the initial arc visualization was. However, by adding in the markers visualization and additional functionality into our graphs and tables, we were able to make the data more accessible. The visualization was ultimately able to answer all of the questions we posed at the beginning of our project.

We are content with how the visualization ended up, but if we wanted to improve it further we would modify the marker visualization to change marker size if needed so markers wouldn't overlap. We would also try to implement popovers on the arc visualization. This functionality was not supported by DataMaps, however, so implementing this would be a hefty task.