

Analysis of Airline Related Tweets from February 16-24, 2015

Prepared by Gregory Maly for WMATA Internal Business Operations

January 2022

gamaly@gmail.com | <https://gamaly.github.io>

[Click here to access an interactive version of this analysis](#)

(best viewed in Chrome)

[Click here to download the modified excel file](#)

Steps Taken to Clean Data Prior to Analysis

1. Remove duplicates based on Tweet_ID
2. Recode JetBlue tweets incorrectly labeled as Delta. Delta was removed from the analysis due to a small sample size (n=24).
3. Review tweets directed at American Airlines and US Airlines. Make determination as to when/whether to recode some due to ongoing merger in 2015.
4. Import to PowerBI
5. Conduct Left outer join to combine Tweets with Users table.
6. Add a new column to create tag for whether a person was tweeting from their home time zone.
7. I'm sure I missed something

Other Issues Identified and Analysis Limitations

1. Time zones are not all equally labeled. Some are cities, some are actually time zones. If conducting time zone analysis I prefer to use UTC +/- . Because this is about travel, cities would be more useful. For further regional analysis, data could be subset to cities only.
2. American Airlines mentions are not as comprehensive over time, possible due to merger, or just the design of the dataset for the sake of the exercise.
3. Within this analysis, I sometimes make a claim that one group has a higher percent of a given factor/variable another group. I have not conducted chi-square tests to check for statistical significance, but would do so if given more time.

Snow Storm Affects Travel Across North America

February 22, 2015

The latest winter storm to sweep across a wide swath of the Midwest and East dumped up to 2 feet of snow but also brought a much-needed respite to many areas -- above-freezing temperatures.

Some areas of the East, which has been frozen by temperatures 20-degrees or more below seasonal norms, are seeing high temperatures not seen in 10 days or more, AccuWeather meteorologist Tyler Roys said.

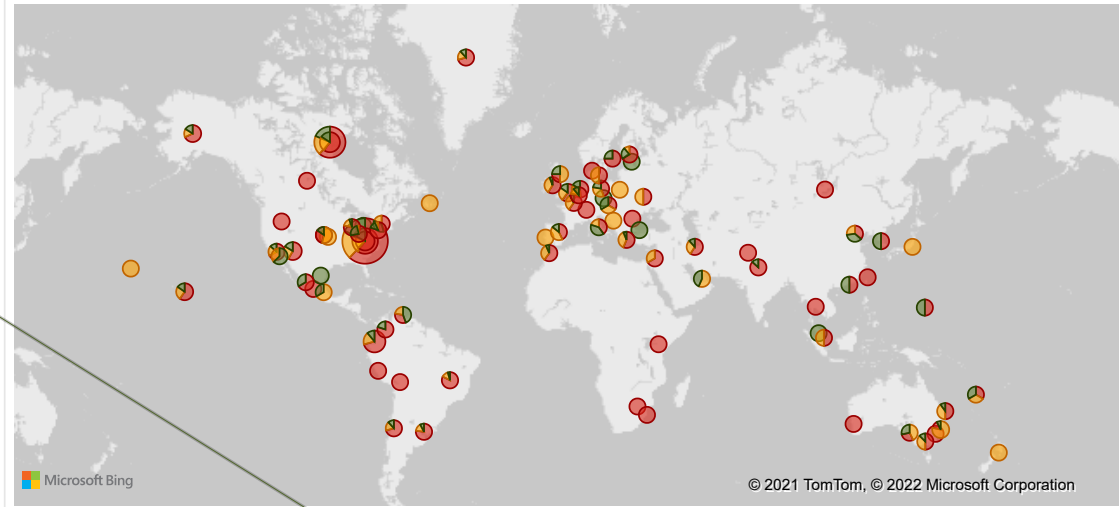
That should make Sunday's digout a bit easier for cities such as Indianapolis, which got 7 inches of snow, Columbus and Baltimore with 6, and Philadelphia and Washington, D.C., which got more than 4 inches. Many suburbs of those cities saw 8-12 inches and the mountains of West Virginia saw up to 2 feet of snow, Roys said.

Winter weather continued to snarl air traffic. Nearly 1,500 flights had been canceled and more than 2,750 delayed Saturday at airports across the region. As early Sunday, 563 flights were canceled and 1,184 delayed across the nation.

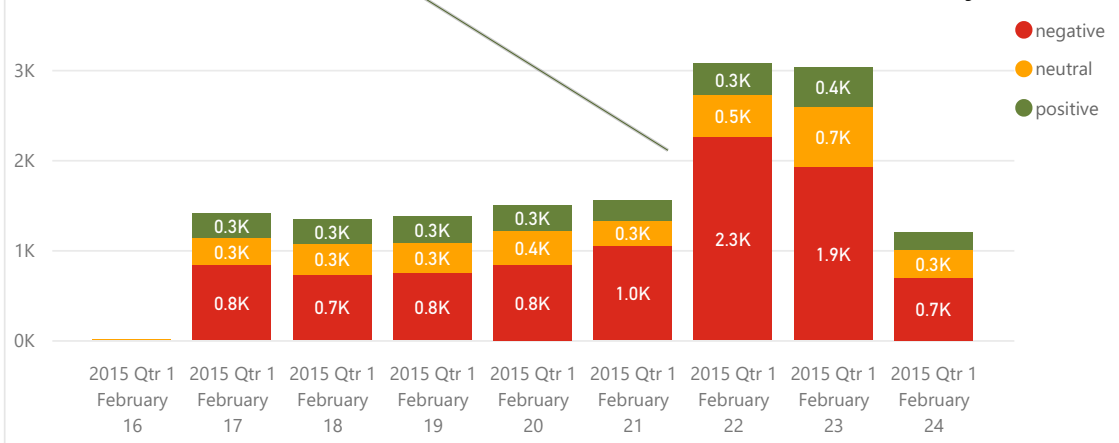
Source: <https://www.usatoday.com/story/weather/2015/02/22/storm-snow-northeast/23835607/>

Count of Tweets by Location

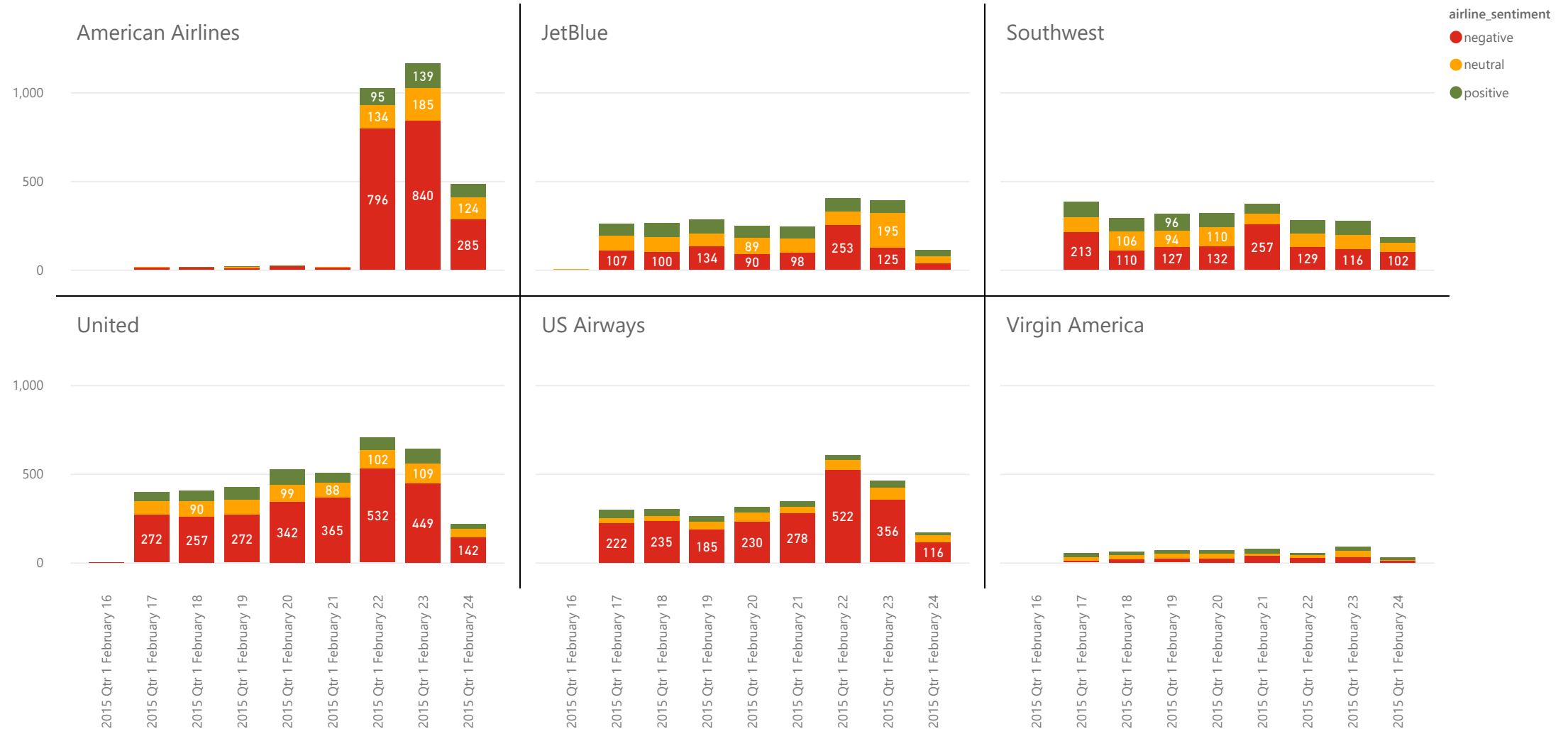
Sentiment ● negative ● neutral ● positive



Tweets Count by Sentiment



Tweets by Sentiment Over Time

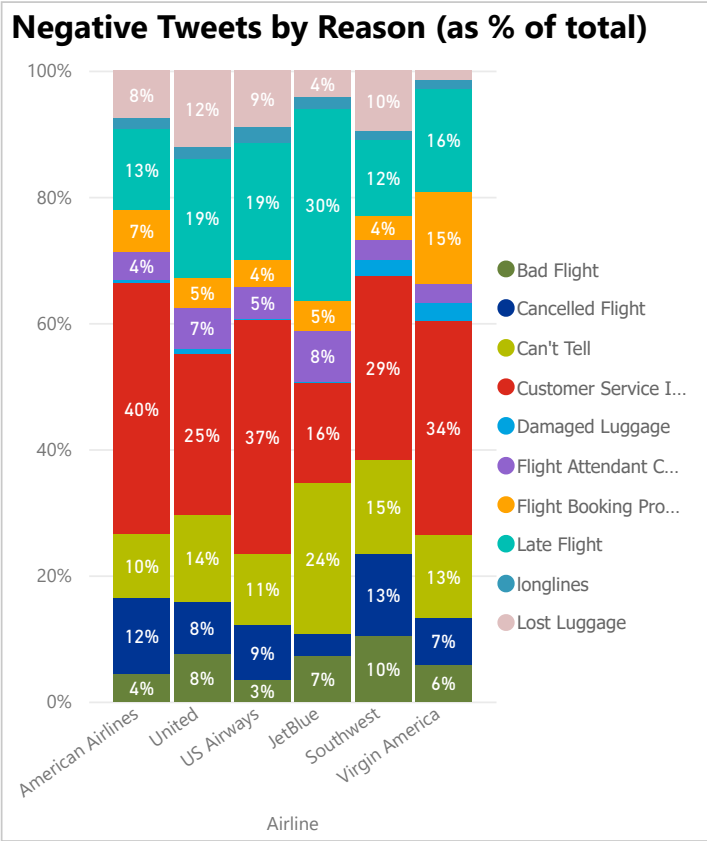
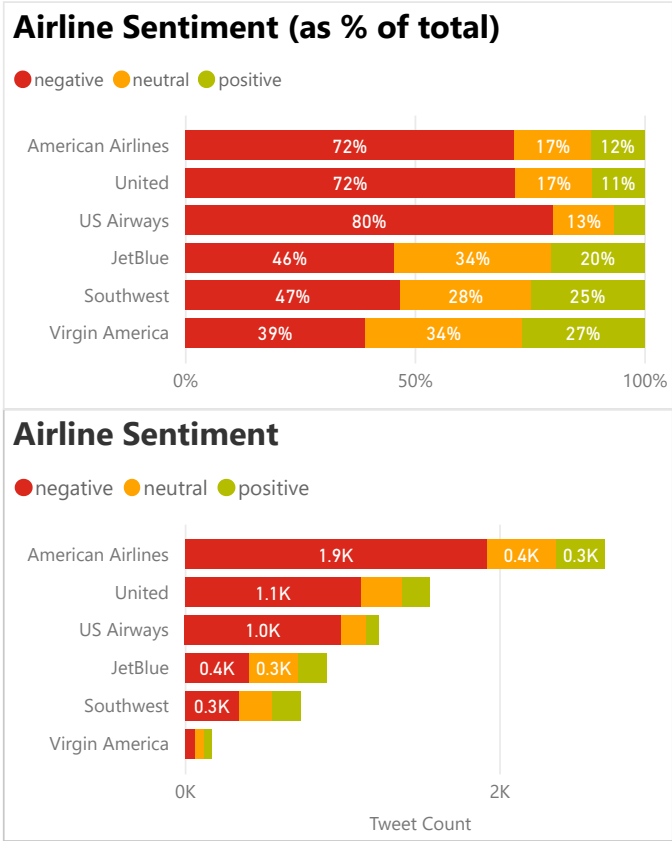
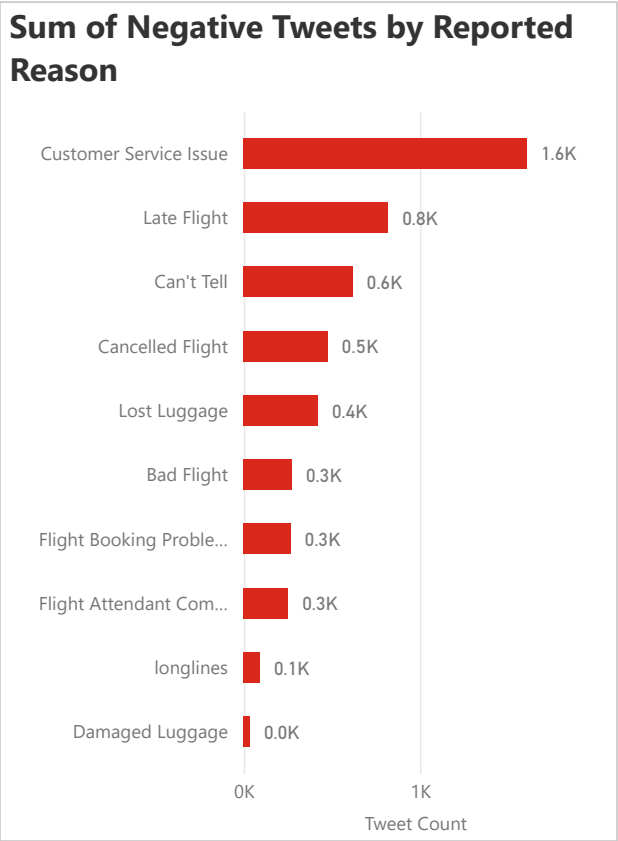


1. American Airlines and US Airways announced a merger in 2013. Flyers often tweeted at both interchangeably. The merge was completed in the Fall of 2015, and both Twitter accounts were active during this time. Some US Airways tweets were recoded as American.
2. Most JetBlue tweets were incorrectly coded as Delta. They have been recoded in these graphs.

Sentiment By Airline (February 22 - 24)

Key Findings

- US Airways (80%) and American Airlines (72%) received the highest percentages of negative tweets during the snowstorm, followed by United (72%). This may be due to the ongoing merger between the groups at the time.
- The highest complaint among customers during the snowstorm was related to customer service. Looking at a three day average, American Airlines received the highest percentage of complaints (40%) followed by US Airways (37%).
- Virgin America's high percentage of flight booking problems (15%) appears to be an outlier among this area of complaint.



1. With the exception of "long lines" and "damaged luggage", sample size for all data exceeded the threshold of $n > 100$. Ideal analysis would conduct chi-square test of statistical significance ($p < 0.05$) when comparing the difference between two figures. This was not done in this analysis due to time limitations.

Filters

Airline ▼
 ▼

2/16/2015 2/24/2015

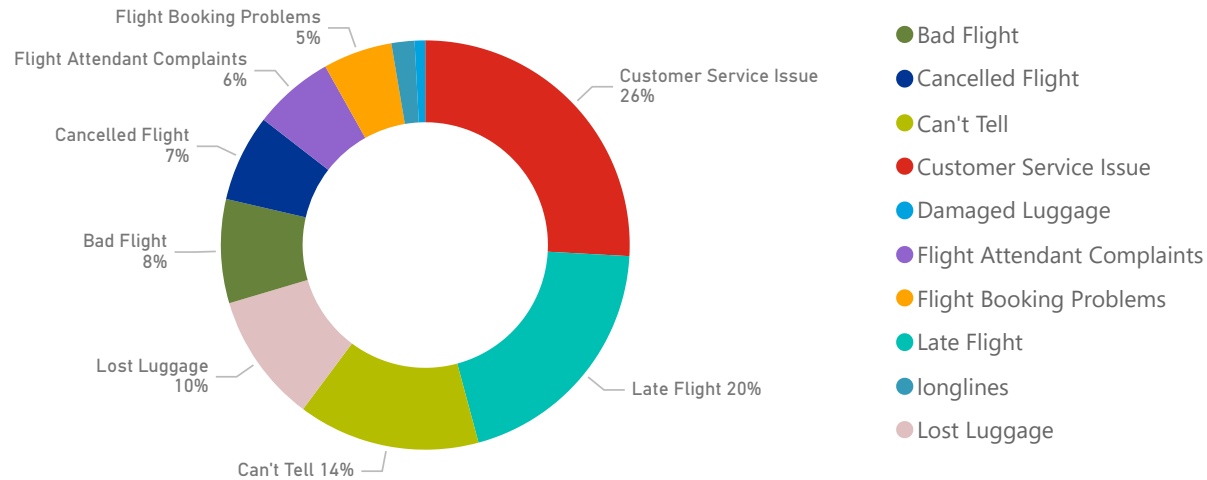


United Airlines in Focus

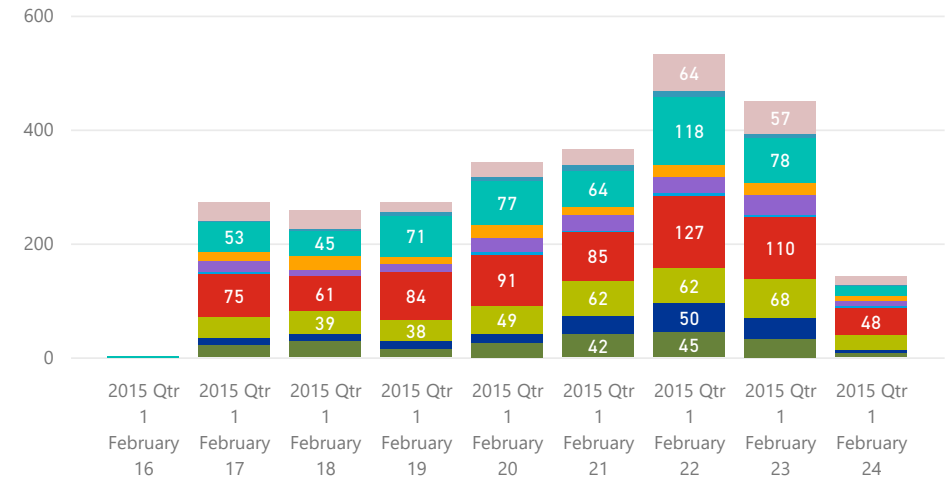
Negative Sentiment Around United Airlines Remains Consistent Throughout the Snow Storm

While customer service ranked highest among total complaints (26%) during the full time period of the dataset, complaints about customer service dropped during the snow storm (Feb 22 and 23) when compared to before and after (though no test was run to check for statistical significance).

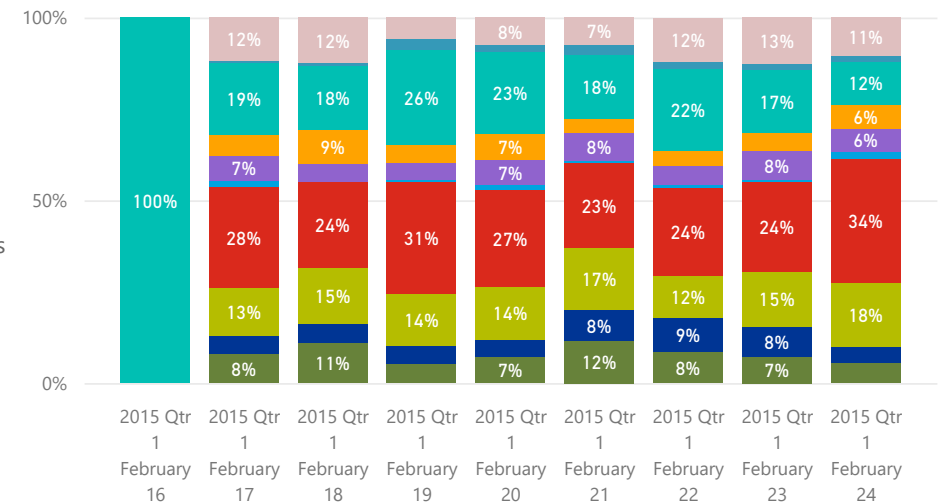
The results of this analysis showcases United Airline's ability to maintain consistent service during severe weather storms, yet highlights an area for improvement. This is consistent with most Airlines in this analysis.



Count of Negative Tweet by Reason Over Time



Reason for Negative Tweet as Percent of Total

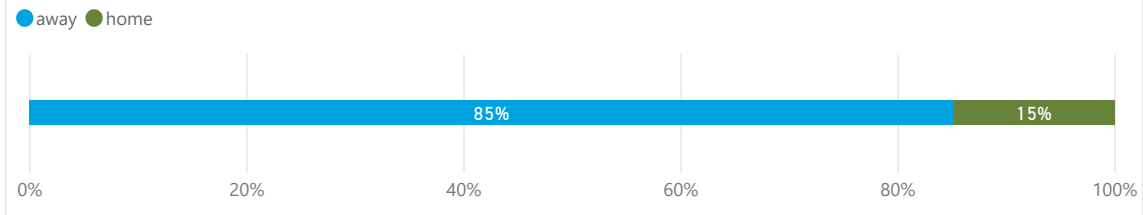


Sentiment By Location Relative to Home

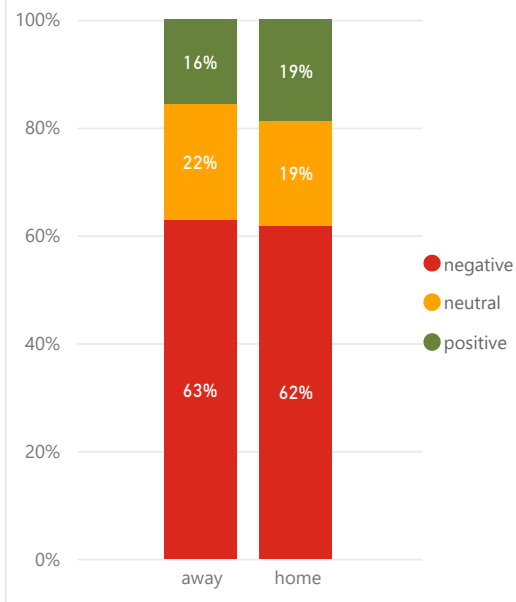
Among all users in the dataset.

- The vast majority of users (85%) tweeted at airline while outside of their home time zone.
- There were no significant differences between tweet sentiment whether at home or away.
- There were no significant differences between the reasons for negative tweets whether at home or away.

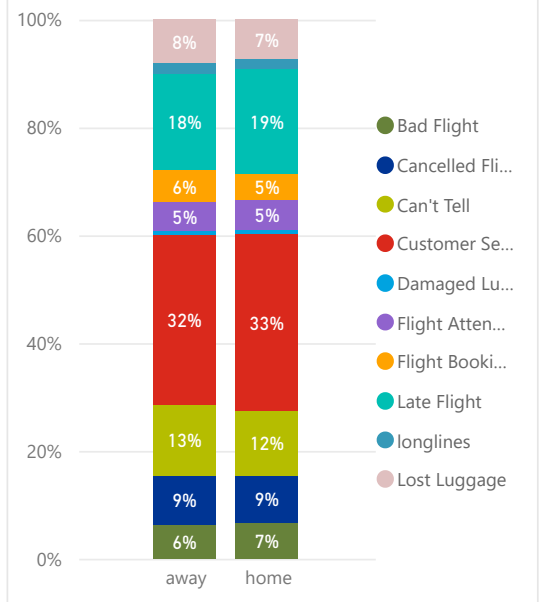
Tweets at Home vs Away



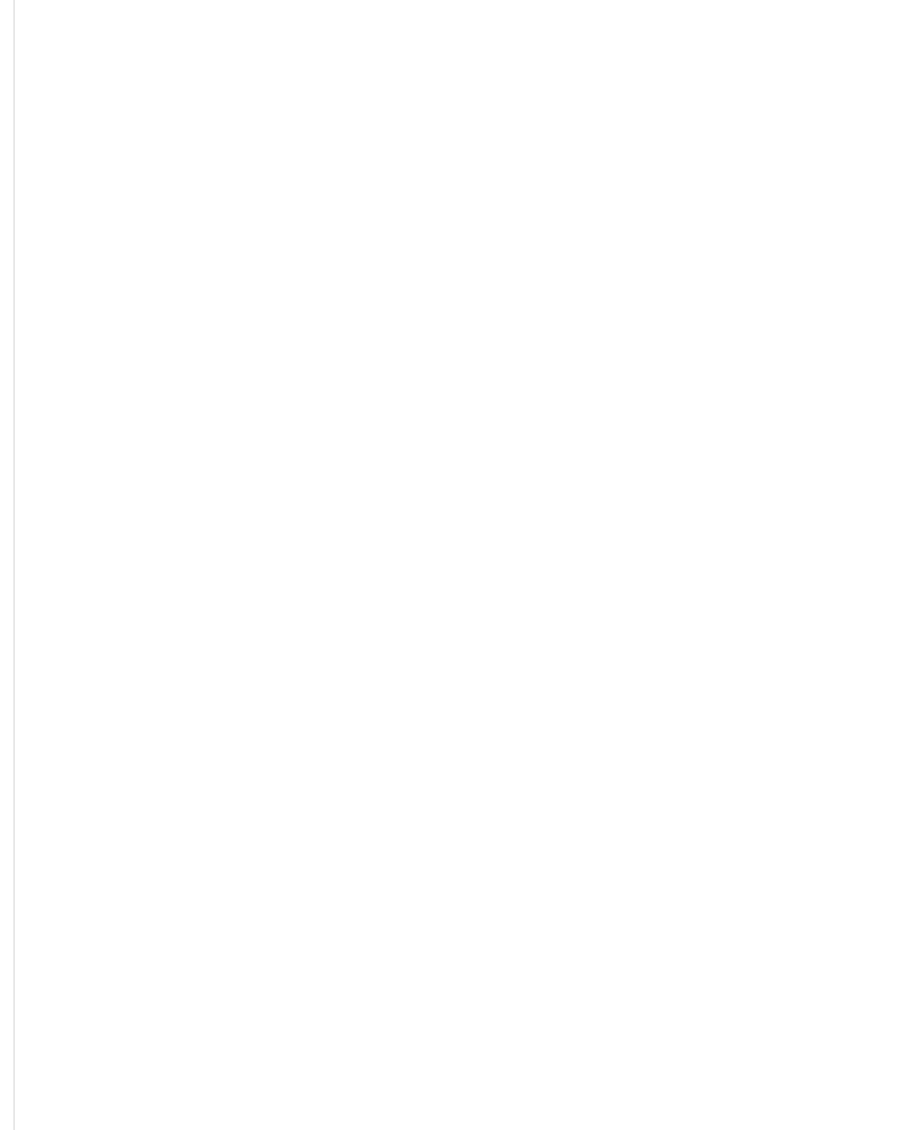
Tweets at Home vs Away (% of Total)



Tweets at Home vs Away (% of Total)



User Home vs Tweet Location



Airline Mentions Disaggregated by Preferred Carrier

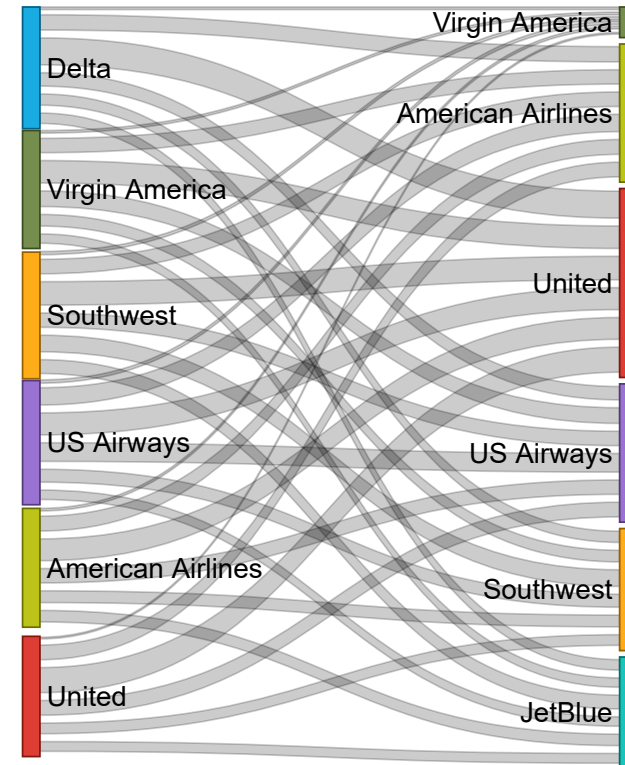
Key Findings

- When disaggregated by preferred airline, United Airlines received the most mentions during the entire week across all user.
- If US Airways and American Airlines are combined due to the merger, they received the most mentions throughout the week.

Preferred Airline

Airline Mention

Airline	American Airlines	Delta	Southwest	United	US Airways	Virgin America	Total
Virgin America	85	85	72	105	71	86	504
US Airways	443	422	443	450	532	470	2760
United	599	707	633	667	603	613	3822
Southwest	389	377	490	365	413	386	2420
JetBlue	383	360	432	346	340	337	2198
American Airlines	453	462	446	449	505	442	2757
Total	2352	2413	2516	2382	2464	2334	14461



Analysis of Influencers

Key Findings

- Among all influencers, the United received the highest number of mentions (31%) followed by American Airlines (22%) and Southwest (18%).
- Among all influencers, United received the highest percent of negative sentiment (71%) followed by American Airlines (60%) and US Airways (57%).
- Among all influencers, the reason for negative tweets varied greatly. For example, Southwest received a high percentage of complaints (60%) about customer service, while JetBlue received a high percentage of complaints (67%) about Late Flights, and Virgin America a high percentage (67%) about booking problems.
- Due to the small sample size, these numbers should be looked at over a longer period of time to better understand the role of influencers.

