



# Dashboard Effectiveness

---

Using San Francisco airport cargo data

Sean Caldwell





# Table of contents

- Data explanation
- Overview of Analysis
- Dashboard
- Conclusion
- References

The Dataset

▲	A	B	C	D	E	F	G	H	I	J	K	L
1	Activity Period	Operating Airline	Operating Airline IATA Code	Published Airline	Published Airline IATA Code	GEO Summary	GEO Region	Activity Type Code	Cargo Type Code	Cargo Aircraft Type	Cargo Weight LBS	Cargo Metric TONS
2	201809	China Eastern	MU	China Eastern	MU	International	Asia	Enplaned	Cargo	Passenger	295217	133.9104312
3	201809	Singapore Airlines	SQ	Singapore Airlines	SQ	International	Asia	Enplaned	Express	Passenger	17163	7.7851368
4	201809	China Airlines	CI	China Airlines	CI	International	Asia	Deplaned	Mail	Freighter	119173	54.0568728
5	201809	Air Canada	AC	Air Canada	AC	International	Canada	Enplaned	Mail	Passenger	4619	2.0951784
6	201809	United Airlines	UA	United Airlines	UA	International	Europe	Deplaned	Mail	Passenger	279014	126.5607504
7	201809	Air China	CA	Air China	CA	International	Asia	Deplaned	Cargo	Passenger	709281	321.7298616
8	201809	China Airlines	CI	China Airlines	CI	International	Asia	Deplaned	Cargo	Passenger	505443	229.2689448
9	201809	SAS Airlines	SK	SAS Airlines	SK	International	Europe	Enplaned	Cargo	Passenger	358249	162.5017464
10	201809	United Airlines	UA	United Airlines	UA	International	Asia	Deplaned	Express	Passenger	420	0.190512
11	201809	Thomas Cook Airli	MT	Thomas Cook Airlines	MT	International	Europe	Deplaned	Cargo	Passenger	12366	5.6092176
12	201809	French Bee	BF	French Bee	BF	International	Australia / Ocean	Deplaned	Cargo	Passenger	878	0.3982608
13	201809	China Eastern	MU	China Eastern	MU	International	Asia	Deplaned	Cargo	Passenger	700000	317.52
14	201809	United Airlines	UA	United Airlines	UA	International	Europe	Enplaned	Mail	Passenger	114522	51.9471792
15	201809	United Airlines	UA	United Airlines	UA	International	Middle East	Enplaned	Mail	Passenger	17049	7.7334264
16	201809	Sun Country Airlin	SY	Sun Country Airlines	SY	Domestic	US	Deplaned	Mail	Passenger	18512	8.3970432
17	201809	SAS Airlines	SK	SAS Airlines	SK	International	Europe	Enplaned	Express	Passenger	3656	1.6583616
18	201809	KLM Royal Dutch A	KL	KLM Royal Dutch Airli	KL	International	Europe	Enplaned	Mail	Passenger	17148	7.7783328
19	201809	Thomas Cook Airli	MT	Thomas Cook Airlines	MT	International	Europe	Enplaned	Cargo	Passenger	11433	5.1860088
20	201809	United Airlines	UA	United Airlines	UA	International	Canada	Enplaned	Express	Passenger	82	0.0371952
21	201809	Aer Lingus	EI	Aer Lingus	EI	International	Europe	Enplaned	Cargo	Passenger	101062	45.8417232
22	201809	Sun Country Airlin	SY	Sun Country Airlines	SY	Domestic	US	Deplaned	Cargo	Passenger	7656	3.4727616
23	201809	Japan Airlines	JL	Japan Airlines	JL	International	Asia	Enplaned	Mail	Passenger	89276	40.4955936
24	201809	Alaska Airlines	AS	Alaska Airlines	AS	International	Mexico	Enplaned	Cargo	Passenger	490	0.222264
25	201809	United Airlines	UA	United Airlines	UA	International	Australia / Ocean	Enplaned	Express	Passenger	298	0.1351728
26	201809	SAS Airlines	SK	SAS Airlines	SK	International	Europe	Deplaned	Mail	Passenger	16566	7.5143376
27	201809	Southwest Airline	WN	Southwest Airlines	WN	Domestic	US	Deplaned	Cargo	Passenger	328904	149.1908544
28	201809	British Airways	BA	British Airways	BA	International	Europe	Deplaned	Cargo	Passenger	548328	248.7215808
29	201809	American Airlines	AA	American Airlines	AA	Domestic	US	Deplaned	Mail	Passenger	232424	105.4275264
30	201809	China Airlines	CI	China Airlines	CI	International	Asia	Enplaned	Cargo	Passenger	356097	161.5255992
31	201809	United Airlines	UA	United Airlines	UA	Domestic	US	Deplaned	Express	Passenger	39689	18.0029304
32	201809	United Airlines	UA	United Airlines	UA	Domestic	US	Enplaned	Cargo	Passenger	4860610	2204.772696
33	201809	EVA Airways	BR	EVA Airways	BR	International	Asia	Deplaned	Mail	Passenger	146655	66.522708
34	201809	United Airlines	UA	United Airlines	UA	International	Canada	Enplaned	Mail	Passenger	17135	7.772436
35	201809	Federal Express	FX	Federal Express	FX	Domestic	US	Enplaned	Cargo	Freighter	3329596	1510.304746
36	201809	Air New Zealand	NZ	Air New Zealand	NZ	International	Australia / Ocean	Deplaned	Cargo	Passenger	539645	244.782972
37	201809	Lufthansa German	LH	Lufthansa German Air	LH	International	Europe	Deplaned	Mail	Passenger	42234	19.1573424
38	201809	Air India Limited	AI	Air India Limited	AI	International	Asia	Deplaned	Express	Passenger	20357	9.2339352

# Descriptive statistics

```
data.describe().T
```

	count	mean	std	min	25%	50%	75%	max
Activity Period	29094.0	201162.928920	389.633930	200507.000000	200809.000000	201112.000000	201507.000000	2.018090e+05
Cargo Weight LBS	29094.0	472226.338730	922620.702874	1.000000	19666.250000	132124.500000	552535.000000	1.120641e+07
Cargo Metric TONS	29094.0	214.201867	418.500751	0.000454	8.920611	59.931673	250.629876	5.083227e+03

# Value counts

---

```
In [7]: data['GEO Region'].value_counts()
```

```
Out[7]: Asia                10950  
US                8017  
Europe            4778  
Australia / Oceania  1777  
Canada            1620  
Mexico            974  
Middle East       492  
Central America   391  
South America     95  
Name: GEO Region, dtype: int64
```

```
In [8]: data['GEO Summary'].value_counts()
```

```
Out[8]: International    21077  
Domestic                 8017  
Name: GEO Summary, dtype: int64
```

```
In [9]: data['Activity Type Code'].value_counts()
```

```
Out[9]: Deplaned    14835  
Enplaned    14259  
Name: Activity Type Code, dtype: int64
```

```
In [10]: data['Cargo Type Code'].value_counts()
```

```
Out[10]: Cargo    15845  
Mail    9607  
Express    3642  
Name: Cargo Type Code, dtype: int64
```

```
In [11]: data['Cargo Aircraft Type'].value_counts()
```

```
Out[11]: Passenger    23847  
Freighter    4822  
Combi    425  
Name: Cargo Aircraft Type, dtype: int64
```

# Missing value percentages

:

	percent_missing
Operating Airline IATA Code	0.14436
Published Airline IATA Code	0.14436
Activity Period	0.00000
Operating Airline	0.00000
Published Airline	0.00000
GEO Summary	0.00000
GEO Region	0.00000
Activity Type Code	0.00000
Cargo Type Code	0.00000
Cargo Aircraft Type	0.00000
Cargo Weight LBS	0.00000
Cargo Metric TONS	0.00000



## Data after processing

- Reformatted the Activity period column to the year/month/day format for easier reading from tableau.

	Activity Period	Published Airline	GEO Region	Activity Type Code	Cargo Type Code	Cargo Aircraft Type	Cargo Metric TONS
0	2018-09-01	China Eastern	Asia	Enplaned	Cargo	Passenger	133.910431
1	2018-09-01	Singapore Airlines	Asia	Enplaned	Express	Passenger	7.785137
2	2018-09-01	China Airlines	Asia	Deplaned	Mail	Freighter	54.056873
3	2018-09-01	Air Canada	Canada	Enplaned	Mail	Passenger	2.095178
4	2018-09-01	United Airlines	Europe	Deplaned	Mail	Passenger	126.560750
...	...	...	...	...	...	...	...
29089	2005-07-01	Northwest Airlines	US	Deplaned	Mail	Freighter	0.161028
29090	2005-07-01	Northwest Airlines	US	Deplaned	Mail	Passenger	0.161028
29091	2005-07-01	Northwest Airlines	US	Enplaned	Cargo	Freighter	55.702534
29092	2005-07-01	Northwest Airlines	US	Enplaned	Cargo	Passenger	55.702534
29093	2005-07-01	Northwest Airlines	Asia	Deplaned	Cargo	Freighter	58.205952

29094 rows × 7 columns

# Overview of Analysis

---

Performed exploratory data analysis on the dataset to answer the business questions.



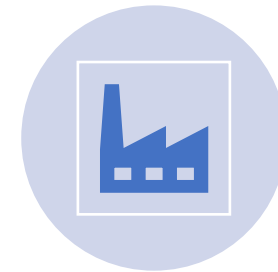
WHICH QUARTER SEES  
THE MOST CARGO  
MOVEMENT?



WHAT REGIONS USE THIS  
AIRPORT THE MOST?



WHAT TYPE OF PLANE  
MOVES THE MOST  
CARGO?



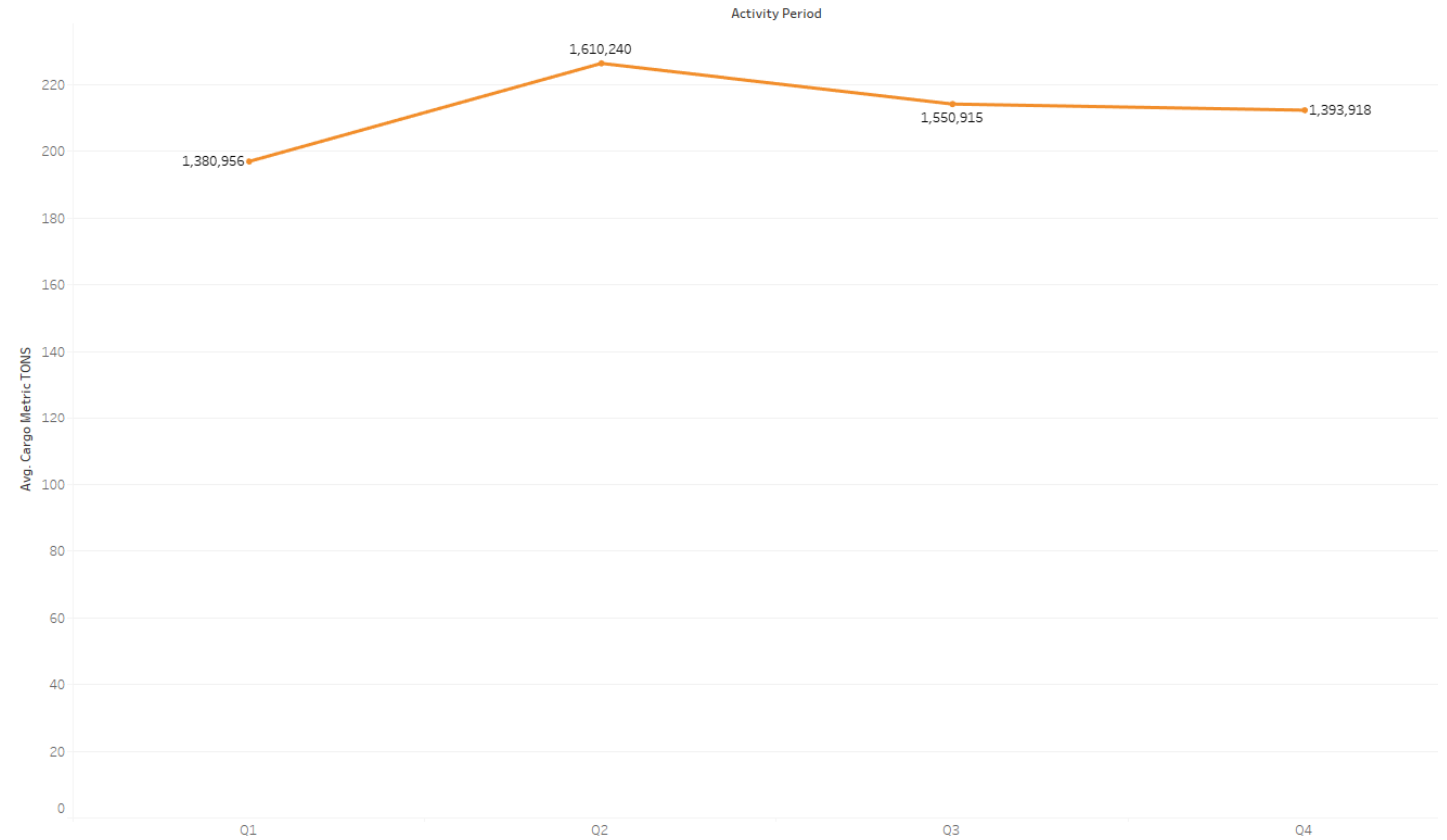
DOES THE US IMPORT OR  
EXPORT MORE CARGO?



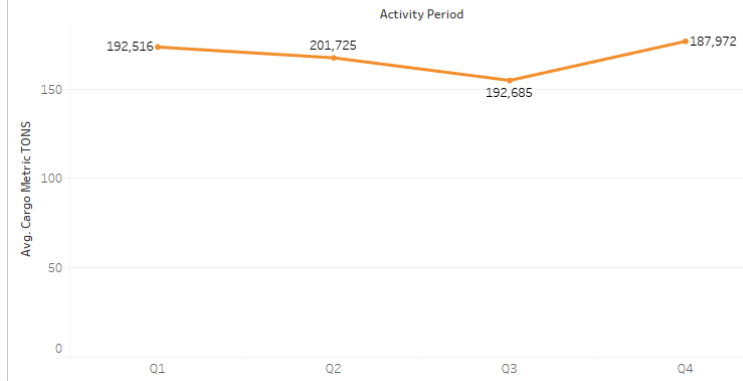
# Average cargo moved per quarter

---

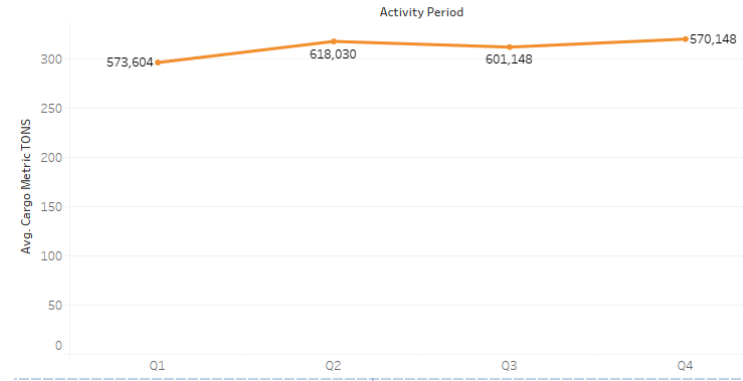
Avg cargo moved per quarter



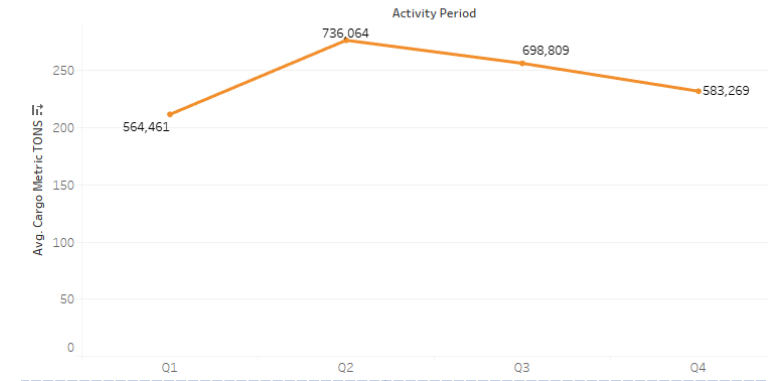
Avg cargo moved per quarter



Avg cargo moved per quarter



Avg cargo moved per quarter

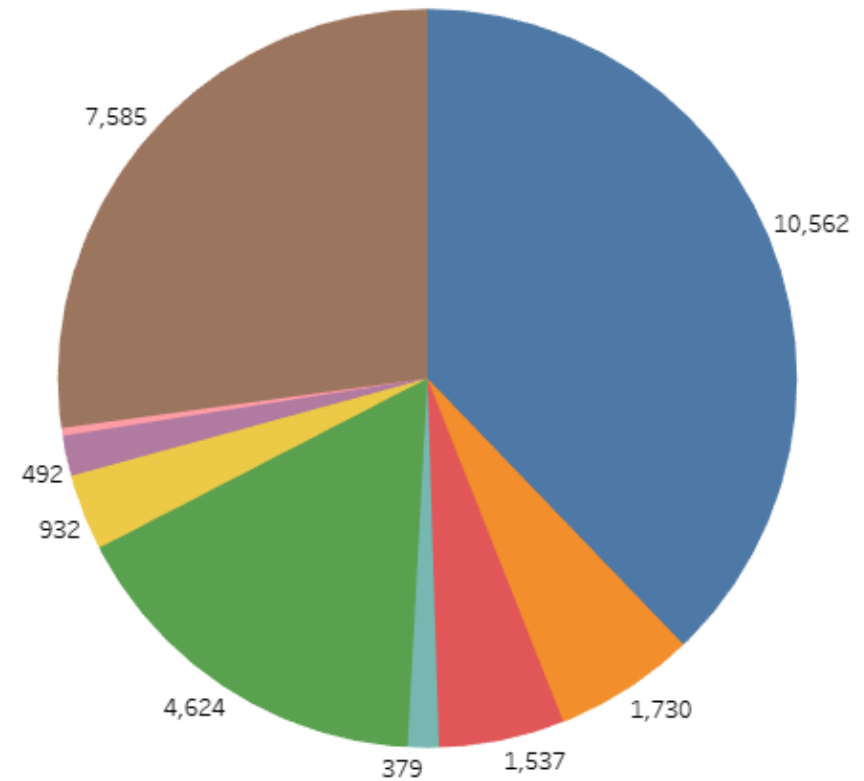


# Europe vs US vs Asia

---

## Airport usage by region

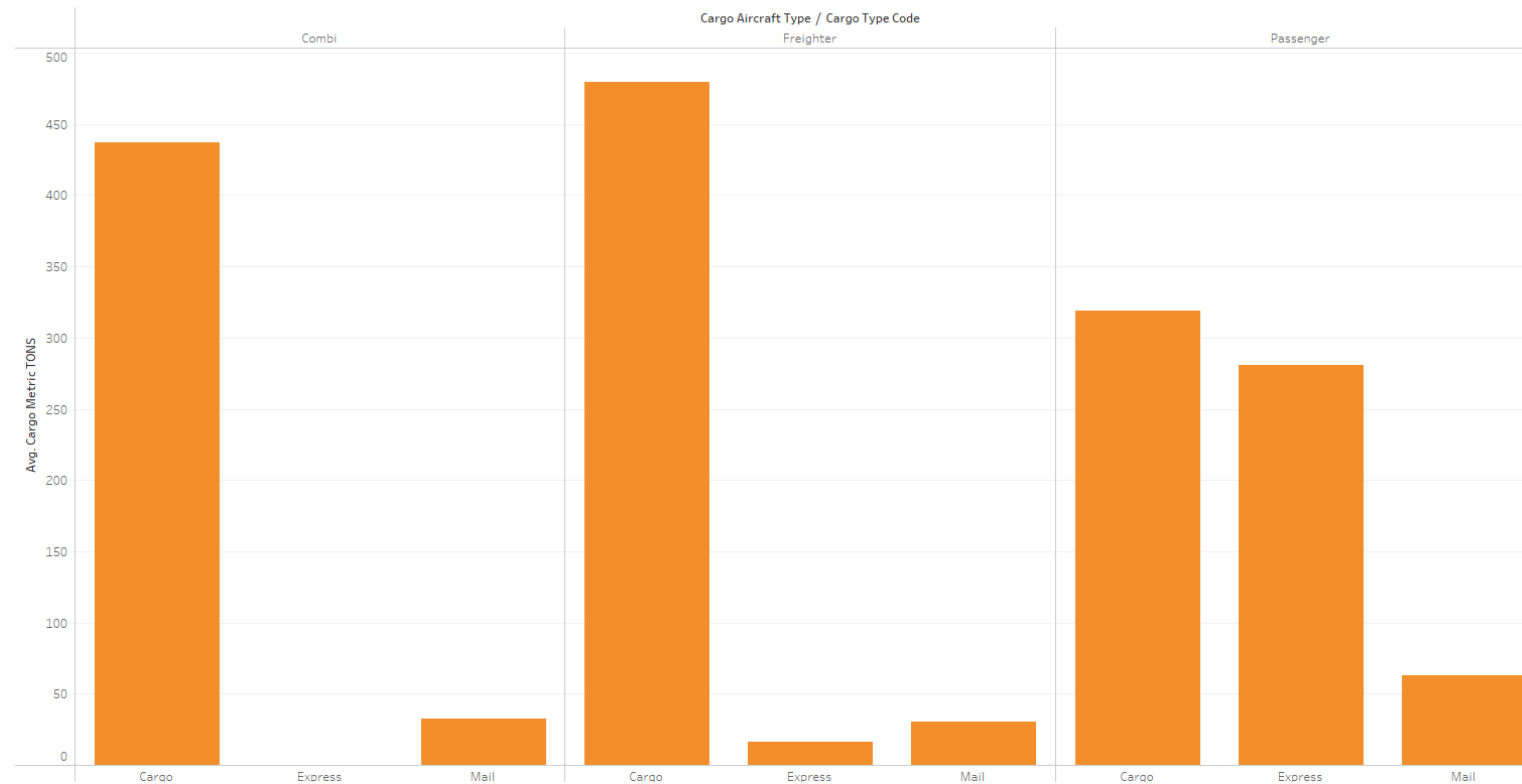
### GEO Region



# Cargo Moved by Plane type

Passenger	23847
Freighter	4822
Combi	425

Cargo type per aircraft type

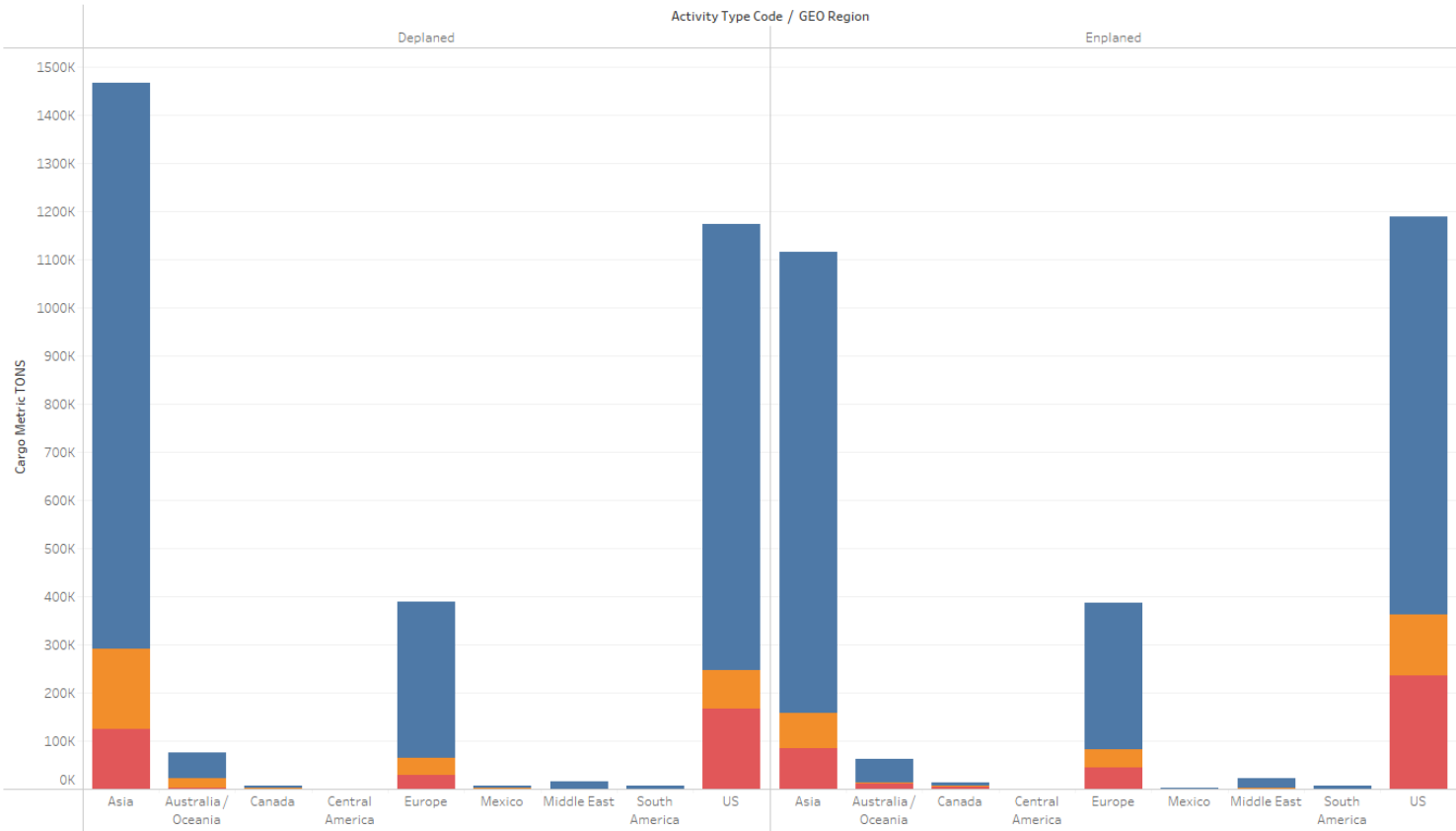


# Imports vs exports

## Cargo Type Code

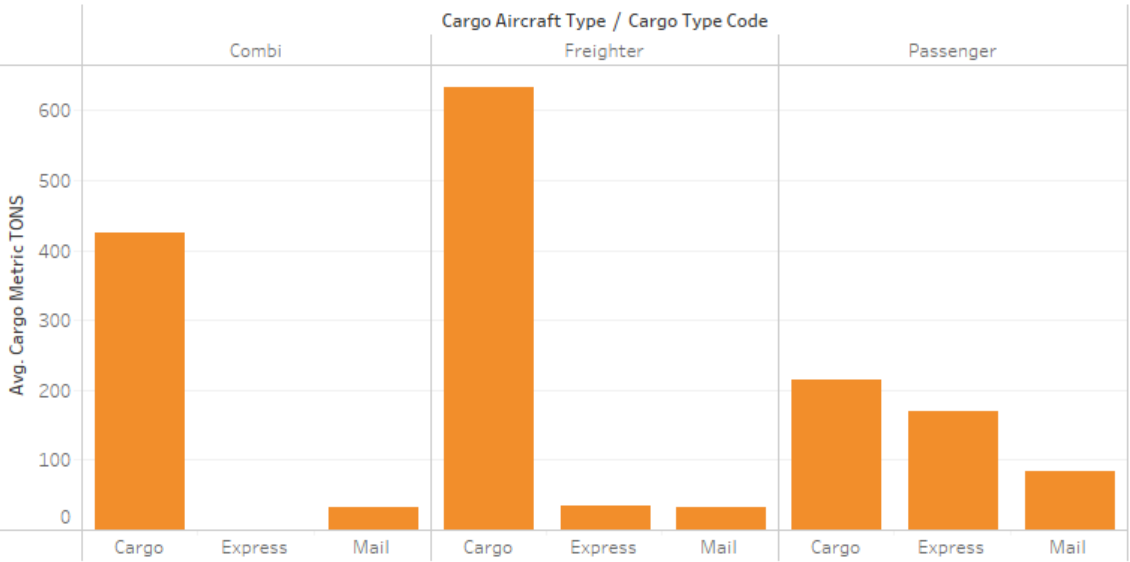
- Cargo
- Express
- Mail

Activity type per region

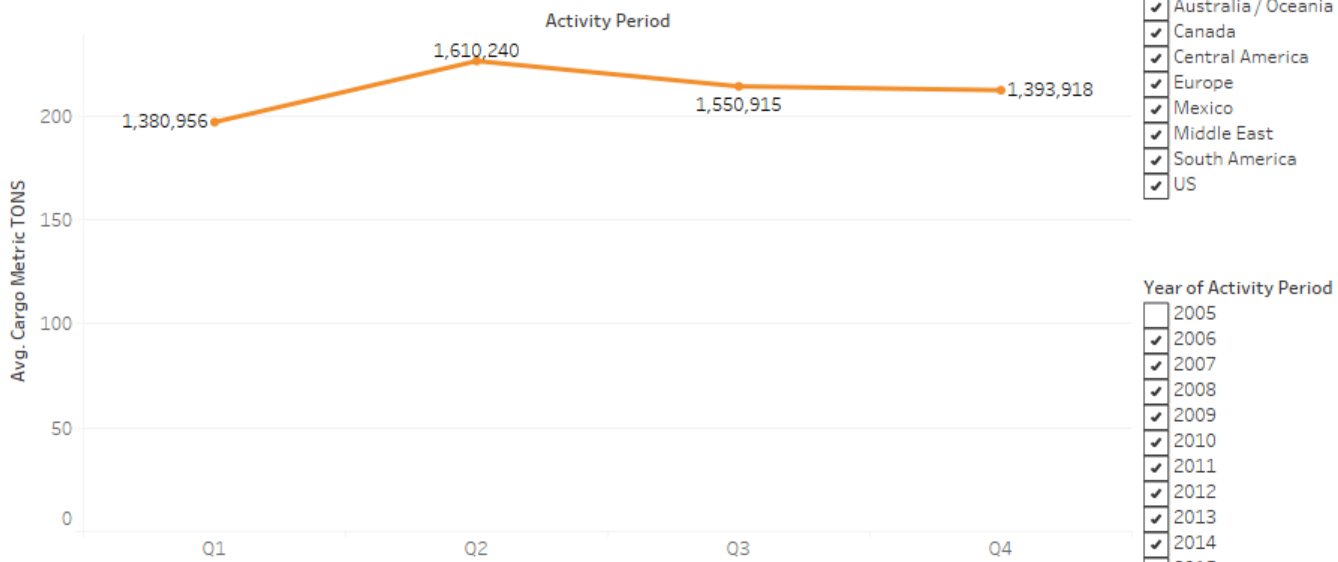


# San Francisco Airport Cargo Traffic

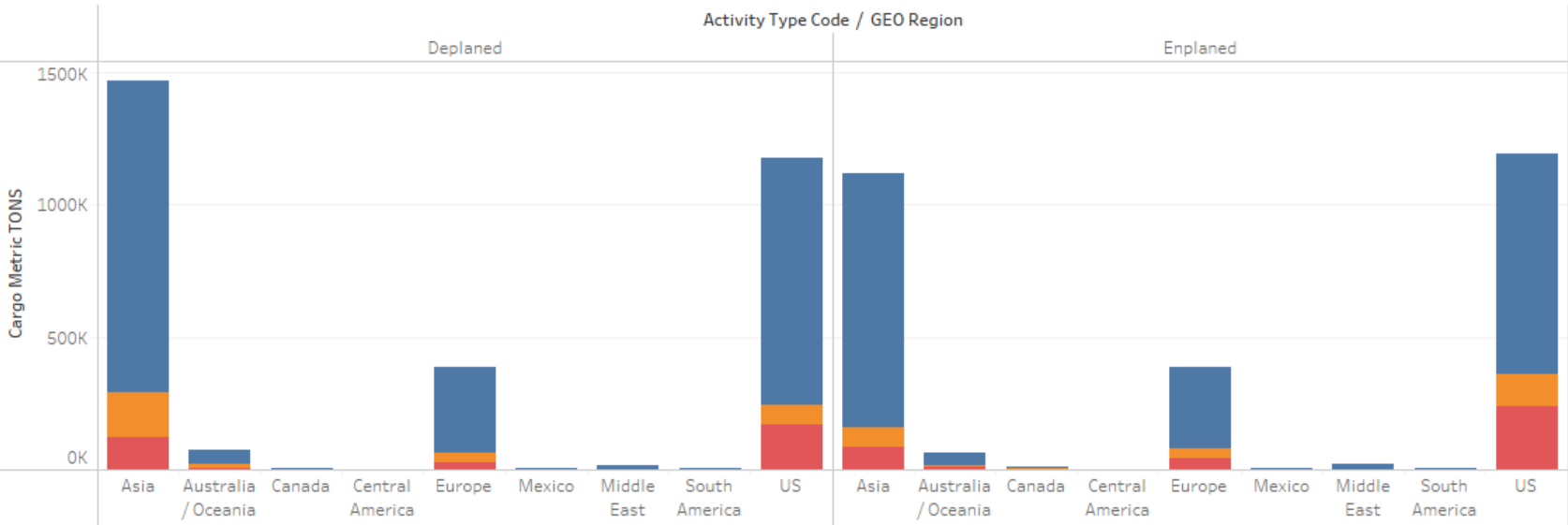
Cargo type per aircraft type



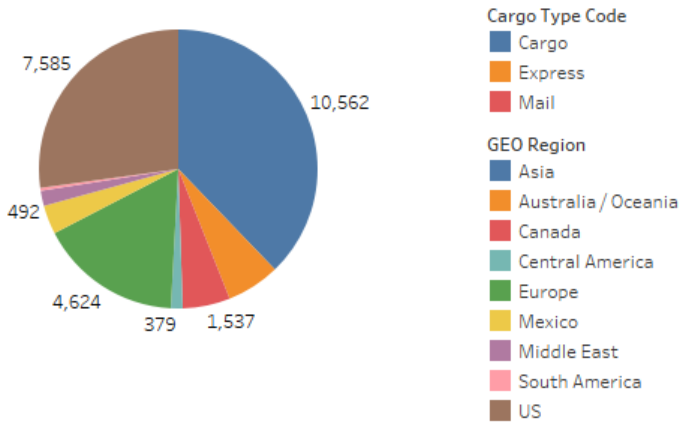
Avg cargo moved per quarter



Activity type per region



Airplane traffic per region



# Conclusion



---

- The second quarter sees the most cargo movement, but it differs by region.
- Asia uses the airport the most, with the US and Europe following.
- On average cargo planes move the most cargo, however there are significantly more passenger planes flying carrying a smaller amount.
- This airport takes in more cargo from planes than it sends out, most of the incoming cargo comes from Asia.



# References

---

- <https://data.world/sanfrancisco/u397-j8nr/>