Truckee Airport Operations Analysis

Summer Season Before (2015/2016) and After (2018,2019)

Vector Development Tasks

Vector Tasked to Produce Two New Analysis Tools for TRK

1. Create Runway Use Report

- Develop tabular runway use report
- Include four types of aircraft (engine types) in filter
- Report data semi-annually to the Board

2. Create Flight Track Heat Maps

- Develop color-coded track density plots
- Include three types of aircraft (engine types) in filter
- Report data semi-annually to the Board

Analysis Mission Statement and Limits

Compare runway use Before and After the introduction of the control tower

- **Before** tower period defined as average of 2015 & 2016 operations
- **After** tower period defined as average of 2018 & 2019 operations

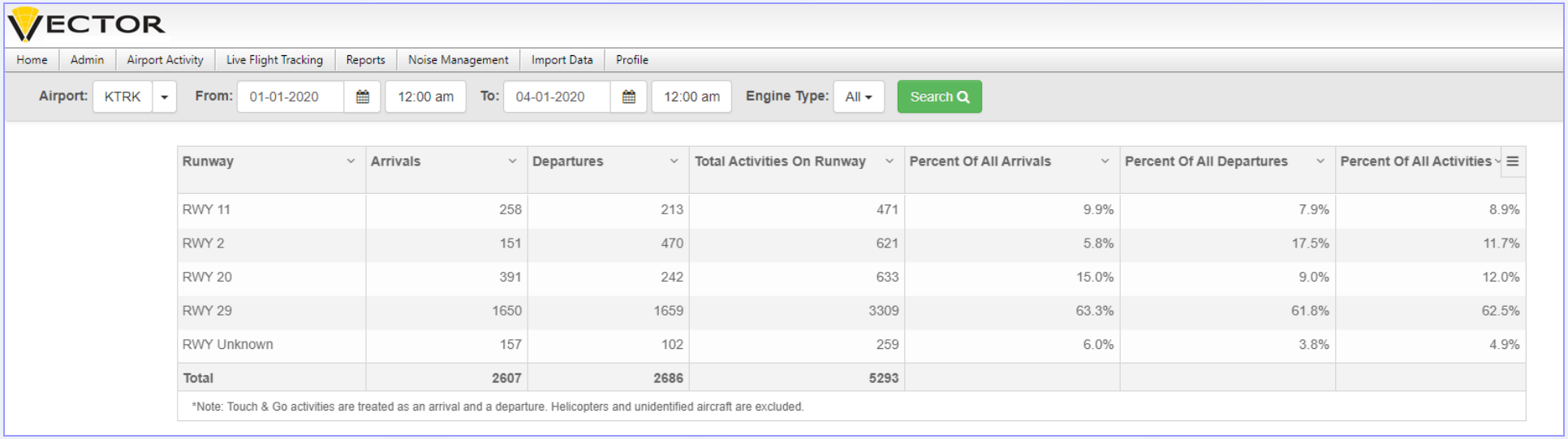
Limits of Tower Analysis

- Include only summer (peak) season operations - June 15th to September 15th
- 2017 excluded as first year of ATC tower operation
- Summer season (three months) represents approximately half the total annual traffic and summer is the season when residents are most impacted by airport operations

Runway Use Analysis

Runway Use Analysis

- Four aircraft types – jets, turbos, twin pistons, and single pistons
- Four runways (11, 2, 20, 29) and unknowns
  - Unknows are aircraft of all types that were not assigned a runway
  - Some helicopters included in unknowns



VECTOR

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Airport: KTRK From: 01-01-2020 12:00 am To: 04-01-2020 12:00 am Engine Type: All Search

Runway	Arrivals	Departures	Total Activities On Runway	Percent Of All Arrivals	Percent Of All Departures	Percent Of All Activities
RWY 11	258	213	471	9.9%	7.9%	8.9%
RWY 2	151	470	621	5.8%	17.5%	11.7%
RWY 20	391	242	633	15.0%	9.0%	12.0%
RWY 29	1650	1659	3309	63.3%	61.8%	62.5%
RWY Unknown	157	102	259	6.0%	3.8%	4.9%
Total	**2607**	**2686**	**5293**			

*Note: Touch & Go activities are treated as an arrival and a departure. Helicopters and unidentified aircraft are excluded.

Sample of Vector Runway Use Report

Runway Use Analysis

Runway Use Data

- Average of **Before** (2015 & 2016) tower and average of **After** (2018 & 2019) tower summer season runway use data compared
- Absolute and relative numbers (After minus Before) computed

Overall Results of Comparison

- Total peak season traffic increased 29% between Before and After
  - 1,674 more total arrivals after tower
  - 1,417 more departures after tower
  - Total increase of 3090 operations
  - Total operations during summer season Before 10,602 vs. After 13,693
  - Number of unknown runways decreased by 40% (better tracking data)

Runway Use Analysis

Operations by Aircraft Type (total traffic up 29%, 3090 ops)

Jets	26.8%	(478)
Turbos	18.8%	(452)
Twin pistons	3.0%	(15)
Single pistons	36.3%	(2145)

Total Aircraft Operations Change by Runway

RWY 11	50.6%	(+103 arrivals +104 departures)
RWY 2	-1.9%	(-74 arrivals +61 departures)
RWY 20	27.4%	(+640 arrivals +216 departures)
RWY 29	50.4%	(+1335 arrivals +1223 departures)

Jet Runway Use Analysis

Change in Jet Operation Percentages by Runway

	Before	After
RWY 11	14%	11.9%
RWY 2	1%	0.1%
RWY 20	12%	9.3%
RWY 29	62%	76.8%
Unknown	11%	2.1%

RWY 29 Total Operations Change by Aircraft Type & Operation

	Arrivals		Departures
Jet	62% to 76.8%	Jet	83% to 93.2%
Turbo	53% to 64.9%	Turbo	65% to 74.5%
Twin	41% to 59.1%	Twin	57% to 73.2%
Single	35% to 40.5%	Single	41% to 43.7%

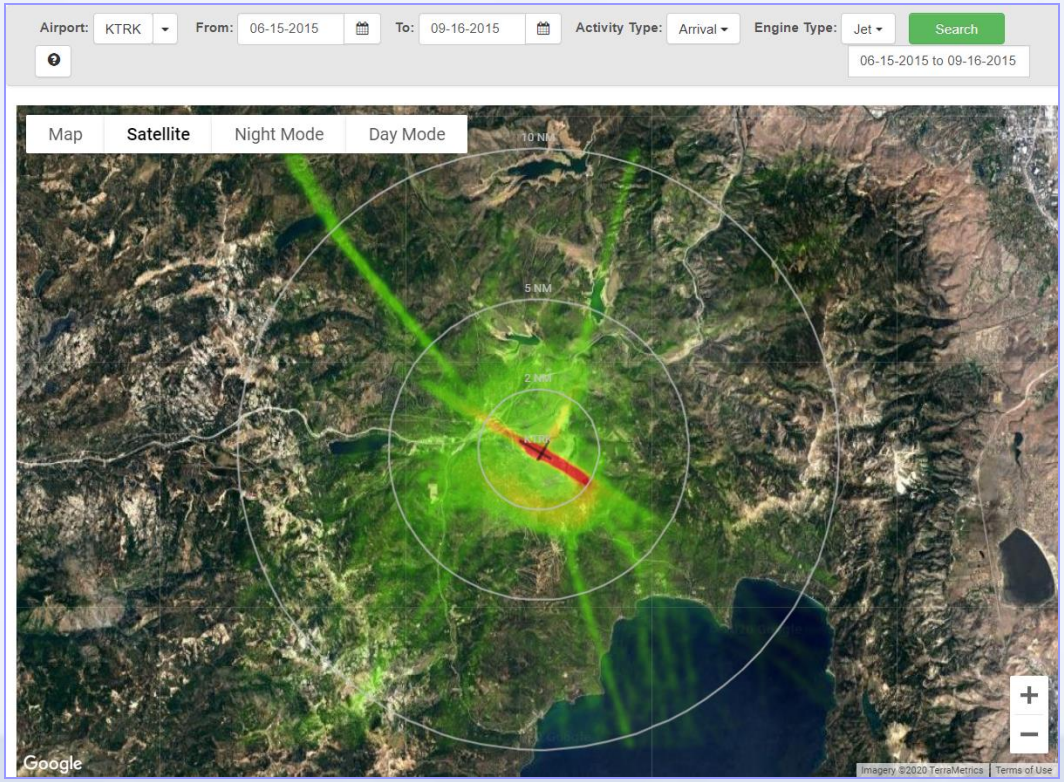
Runway Use Analysis Conclusion

- Total operations increased between Before and After by 29%
- After Tower, all aircraft types increased relative use of RWY29
- Single engine aircraft operations increased 36% and singles dominate all other aircraft numbers by a ratio of 2:1
- Jet operations increased 26.8%, less than total of increase of 29%
  - 730 jets departed RWY 29 per year Before, 1056 jets After
  - Relative increase of 44.7%
- Peak season IFR departures require RWY 29
  - 22% (1,408) IFR departures in 2018
  - 18% (1,306) IFR departures in 2019
- Single engine piston IFR departures, including charter flights, are contributing to increasing RWY 29 total operations
- 29 VFR to IFR “pick up” Departures occur.
- This analysis does not consider wind data, the primary driver of runway use

Develop Heat Map Capability

Flight Track Heat Maps

- Show track density (heat) on VNOMS mapping
  - Includes capability to specify start and stop dates and times
  - Includes filtering by aircraft types
  - Includes filtering by operation (arrivals, departures)



Heat Map Analysis

Heat Maps Generated Include:

- Operations data from each year and each aircraft type created
  - 12 plots for arrivals (four-years, three aircraft types)
  - 12 plots for departures (four years, three aircraft types)
  - Years include 2015, 2016, 2018, and 2019
  - Aircraft types include jets, turbos, and all pistons
- Plotted out to a range out to 15NM
- Heat map movies show transitions from year to year

Heat Maps Show Relative Data

- Each map shows relative frequency of tracks for only that year, aircraft type, and operations (arrival or departure)
- Different heat maps should not be compared for density, only trends

See what you've been missing

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