
Nationwide Characteristics

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Description of our assignment

- Sum up PersonTrips, PersonTripMiles by state
- Generate aTaxi vehicle trip files for all counties in the US (3,144 counties, ~110 gb of personTrip files in total)
 - $CD = 3$, $DD = 300s$, max circuitry = 25%, taxi size = infinite
- Summarize those trip files, compute AVO, show occupancy of taxis
- (all for trips with distance between 2 and 200 miles)

Process

- Obtaining all ~3000 files
- Uploading them to the Della
- Writing Matlab code that would create an aTaxi fleet for each state
- Sum up personTrips, aTaxiTrips, personTripMiles, aTaxiVehicleMiles, #aTaxisDepartingWithOnePassenger, ..., #aTaxisDepartingWith15orMorePassengers for each state
- Sacrifice each of our firstborns to Della

PersonTr

(Top ~25 states by
PersonTripMiles)

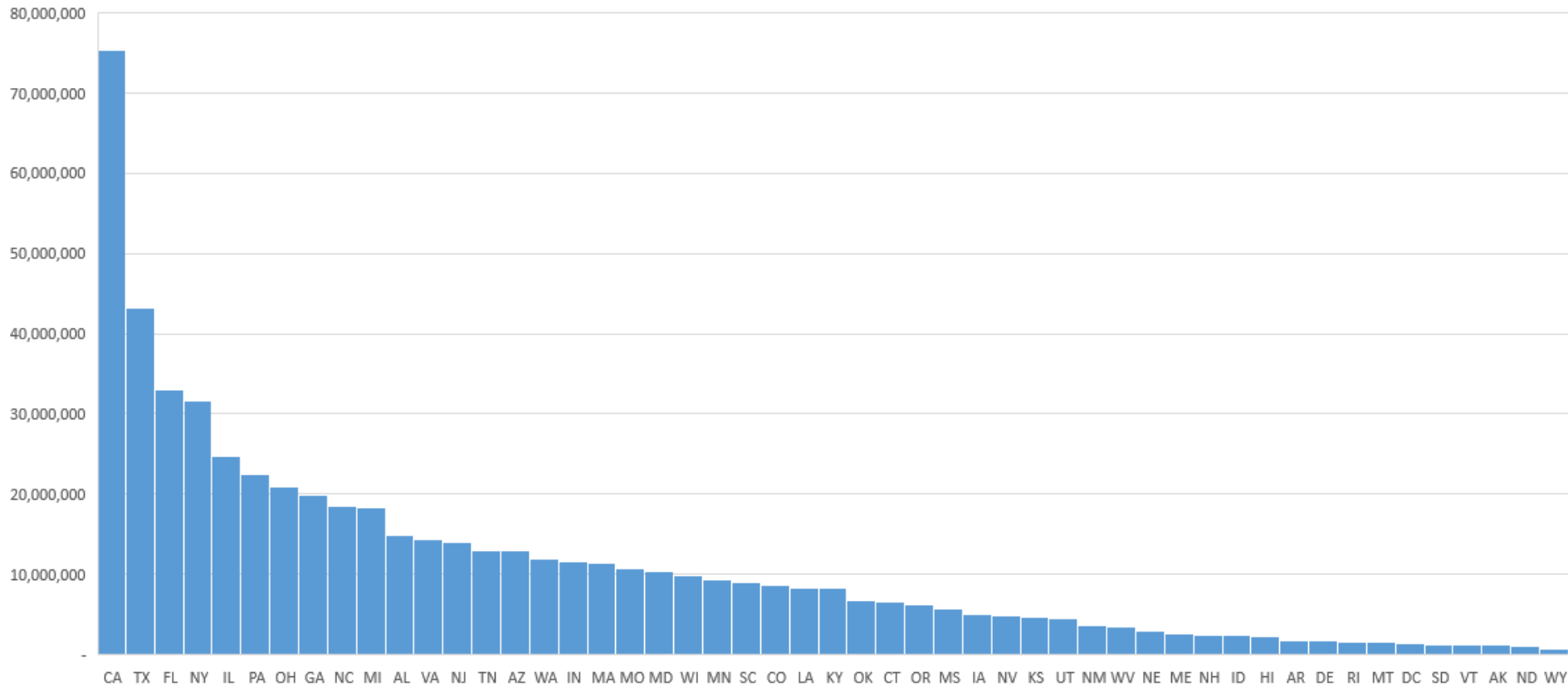
State	State Code	FIPS code	regTrips	regTripsMiles	regTrips %	regTrips Miles%
California	CA	6	75,274,095	1,242,516,857	13.3%	12.3%
Texas	TX	48	43,164,348	821,456,690	7.6%	8.1%
Alabama	AL	1	14,817,309	632,158,317	2.6%	6.3%
Florida	FL	12	32,998,488	523,231,835	5.8%	5.2%
New York	NY	36	31,693,655	480,684,713	5.6%	4.8%
Georgia	GA	13	19,976,818	442,483,195	3.5%	4.4%
Illinois	IL	17	24,782,640	418,412,917	4.4%	4.1%
Ohio	OH	39	20,892,719	352,905,195	3.7%	3.5%
Pennsylvania	PA	42	22,407,244	343,308,031	4.0%	3.4%
Michigan	MI	26	18,323,460	310,166,620	3.2%	3.1%
Arizona	AZ	4	12,927,641	305,147,214	2.3%	3.0%
North Carolina	NC	37	18,600,152	290,286,662	3.3%	2.9%
Tennessee	TN	47	12,943,835	277,827,939	2.3%	2.8%
Virginia	VA	51	14,289,469	238,670,438	2.5%	2.4%
Missouri	MO	29	10,713,995	202,358,872	1.9%	2.0%
Indiana	IN	18	11,564,843	198,413,872	2.0%	2.0%
Louisiana	LA	22	8,391,554	182,573,621	1.5%	1.8%
New Jersey	NJ	34	14,073,301	179,902,504	2.5%	1.8%
Washington	WA	53	11,952,819	173,231,921	2.1%	1.7%
Wisconsin	WI	55	9,881,693	167,141,424	1.7%	1.7%
South Carolina	SC	45	9,019,553	162,688,604	1.6%	1.6%
Massachusetts	MA	25	11,358,238	156,491,863	2.0%	1.5%
Minnesota	MN	27	9,303,861	146,621,109	1.6%	1.5%
Kentucky	KY	21	8,278,433	145,335,090	1.5%	1.4%

PersonTr

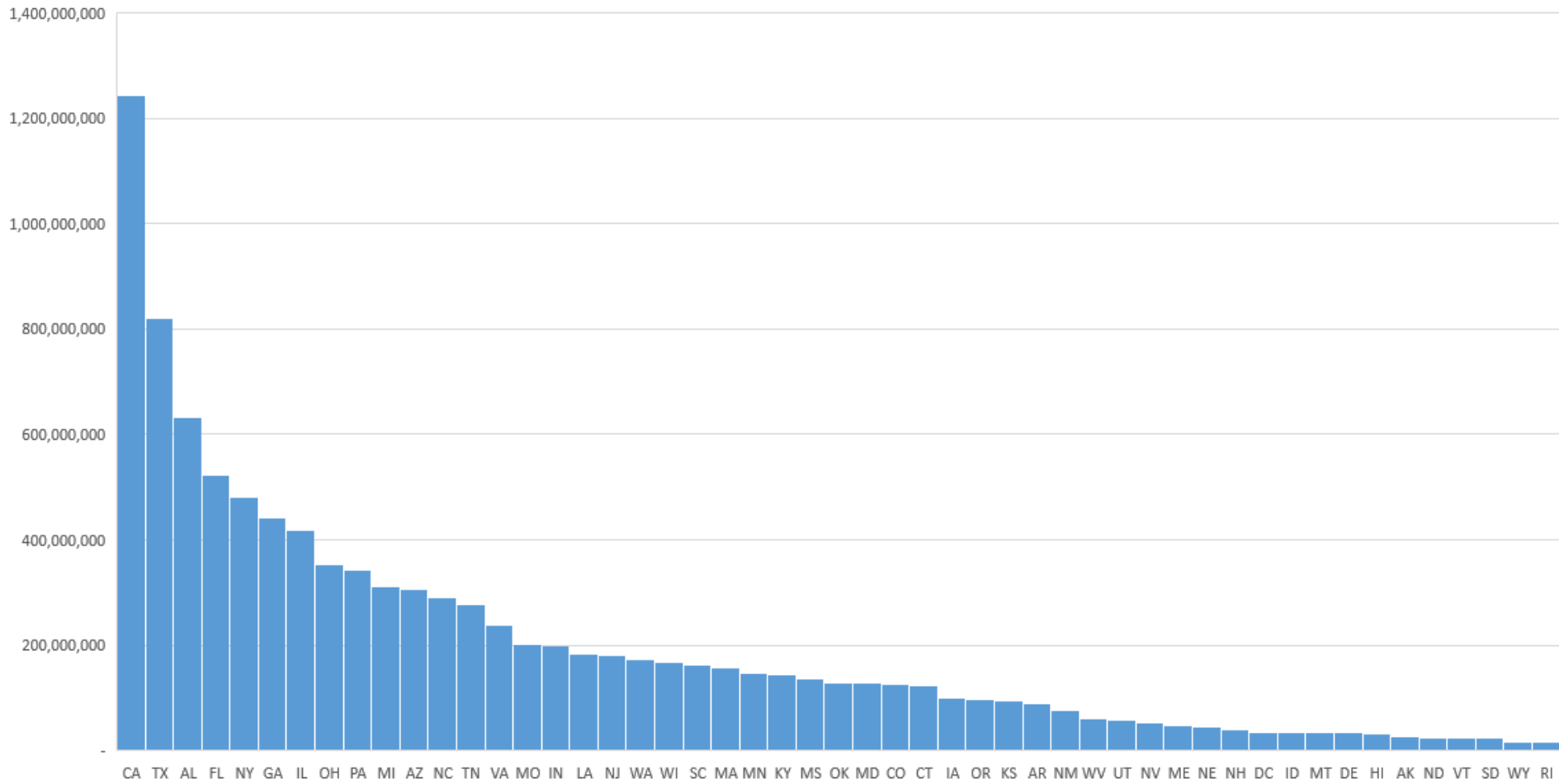
(bottom ~25 states and totals)

Mississippi	MS	28	5,767,286	136,004,338	1.0%	1.3%
Oklahoma	OK	40	6,776,061	128,165,956	1.2%	1.3%
Maryland	MD	24	10,380,493	127,987,692	1.8%	1.3%
Colorado	CO	8	8,706,925	126,435,035	1.5%	1.3%
Connecticut	CT	9	6,662,969	122,783,818	1.2%	1.2%
Iowa	IA	19	4,977,361	99,185,484	0.9%	1.0%
Oregon	OR	41	6,304,511	96,007,576	1.1%	1.0%
Kansas	KS	20	4,707,145	94,924,363	0.8%	0.9%
Arkansas	AR	5	1,759,568	90,314,799	0.3%	0.9%
New Mexico	NM	35	3,609,809	77,465,279	0.6%	0.8%
West Virginia	WV	54	3,513,089	61,324,309	0.6%	0.6%
Utah	UT	49	4,521,535	58,780,268	0.8%	0.6%
Nevada	NV	32	4,924,667	52,185,662	0.9%	0.5%
Maine	ME	23	2,546,828	46,785,614	0.5%	0.5%
Nebraska	NE	31	2,903,605	44,873,601	0.5%	0.4%
New Hampshire	NH	33	2,490,348	41,026,938	0.4%	0.4%
District of Columbia	DC	11	1,468,686	35,545,392	0.3%	0.4%
Idaho	ID	16	2,417,771	34,936,467	0.4%	0.3%
Montana	MT	30	1,612,789	34,484,275	0.3%	0.3%
Delaware	DE	10	1,738,643	34,042,765	0.3%	0.3%
Hawaii	HI	15	2,267,887	30,742,076	0.4%	0.3%
Alaska	AK	2	1,208,987	26,418,510	0.2%	0.3%
North Dakota	ND	38	1,023,363	25,368,319	0.2%	0.3%
Vermont	VT	50	1,229,261	22,970,887	0.2%	0.2%
South Dakota	SD	46	1,276,809	22,871,003	0.2%	0.2%
Wyoming	WY	56	784,251	16,502,851	0.1%	0.2%
Rhode Island	RI	44	1,671,057	16,060,307	0.3%	0.2%
Sum			564,881,867	10,098,209,086	100%	100%

Number of PersonTrips by State



Number of PersonTripMiles by State



aTaxi Vehicle Trip files

- We split up the analysis by state, so 51 files (one for DC also)
- Sent each job to Della separately; each state took anywhere from ~1-12 hours, with most taking about 5-6 hours
- The output files totaled 27.2 gb

Contents of the Trip

- Each aTaxi Vehicle Trip File contains a row for every aTaxi trip
- The table to the right shows the columns

1	ith aTaxi
2	oXPixel
3	oYPixel
4	DepartureTimeFromThisPixel (Person Trip oTime +300)
5	Riders@Departure
6	CD1XPixel
7	CD1YPixel
8	RidersGettingOff@CD1
9	CD2XPixel
10	CD2YPixel
11	RidersGettingOff@CD2
12	CD3XPixel
13	CD3YPixel
14	RidersGettingOff@CD3
15	PersonTripMilesServed
16	DXPixel
17	DYPixel
18	ArrivalTime
19	ATaxiVehicleMiles
20	AVO

PersonTrips vs. aTaxi

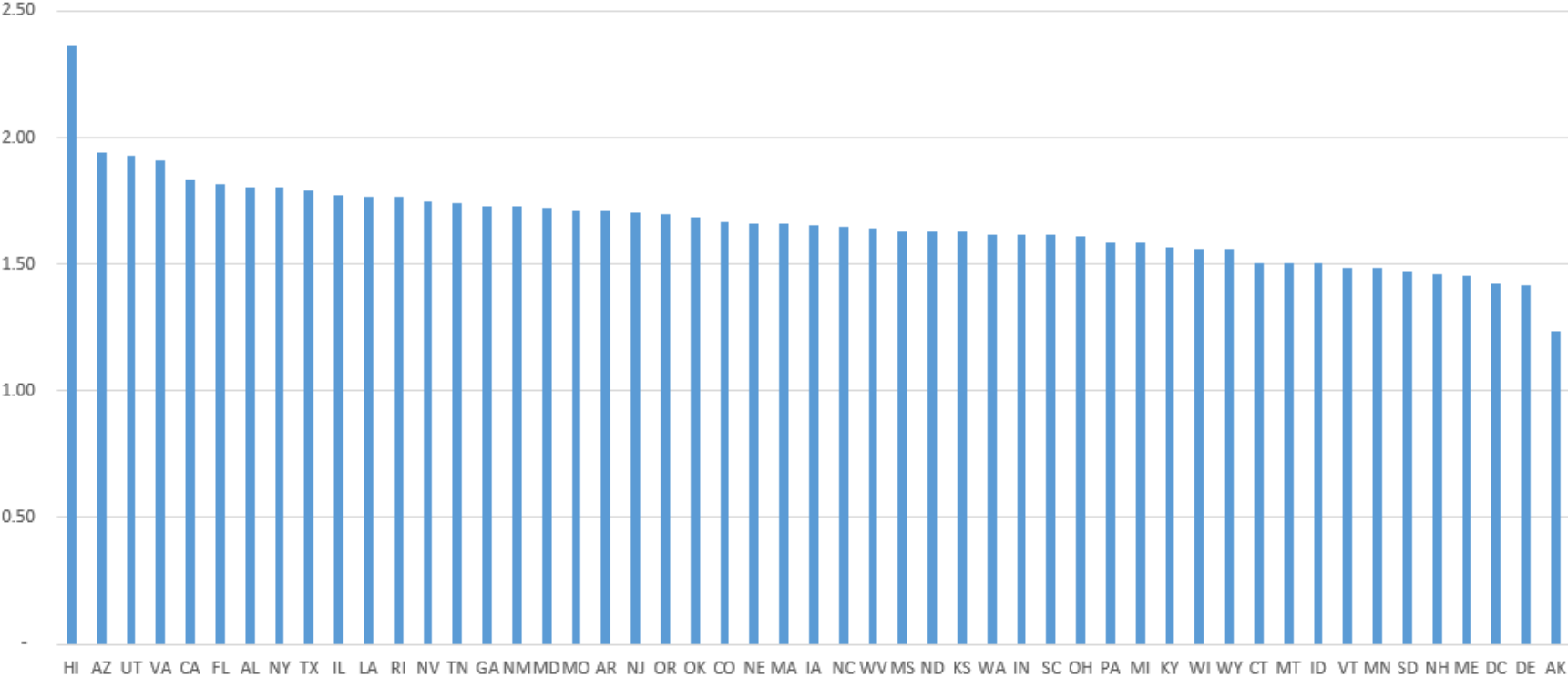
State	State Code	regTrips	aTaxi TripCount	regTrips Miles	aTaxi Miles	State	State Code	regTrips	aTaxi TripCount	regTrips Miles	aTaxi Miles
						Mississippi	MS	5,767,286	2,872,499	136,004,338	83,408,320
						Missouri	MO	10,713,995	4,977,922	202,358,872	118,209,384
						Montana	MT	1,612,789	816,008	34,484,275	22,918,115
						Nebraska	NE	2,903,605	1,321,666	44,873,601	27,022,196
						Nevada	NV	4,924,667	1,787,517	52,185,662	29,838,669
						New Hampshire	NH	2,490,348	1,278,855	41,026,938	28,108,055
						New Jersey	NJ	14,073,301	5,552,053	179,902,504	105,708,554
						New Mexico	NM	3,609,809	1,506,586	77,465,279	44,728,119
						New York	NY	31,693,655	11,426,112	480,684,713	266,469,297
						North Carolina	NC	18,600,152	8,725,553	290,286,662	176,474,069
						North Dakota	ND	1,023,363	527,031	25,368,319	15,564,811
						Ohio	OH	20,892,719	9,481,675	352,905,195	219,239,693
						Oklahoma	OK	6,776,061	3,130,132	128,165,956	75,950,637
						Oregon	OR	6,304,511	2,647,637	96,007,576	56,579,822
						Pennsylvania	PA	22,407,244	10,000,119	343,308,031	216,421,579
						Rhode Island	RI	1,671,057	632,978	16,060,307	9,096,156
						South Carolina	SC	9,019,553	4,315,832	162,688,604	100,767,894
						South Dakota	SD	1,276,809	664,371	22,871,003	15,539,624
						Tennessee	TN	12,943,835	5,974,292	277,827,939	159,360,395
						Texas	TX	43,164,348	18,805,385	821,456,690	459,059,985
						Utah	UT	4,521,535	1,683,899	58,780,268	30,433,413
						Vermont	VT	1,229,261	658,356	22,970,887	15,500,000
						Virginia	VA	14,289,469	5,432,099	238,670,438	125,000,000
						Washington	WA	11,952,819	4,976,597	173,231,921	107,000,000
						West Virginia	WV	3,513,089	1,698,465	61,324,309	37,400,000
						Wisconsin	WI	9,881,693	4,816,275	167,141,424	107,000,000
						Wyoming	WY	784,251	393,036	16,502,851	10,600,000
						Sum	Sum	564,881,867	235,131,899	10,098,209,086	5,877,342,154

Nationwide stats

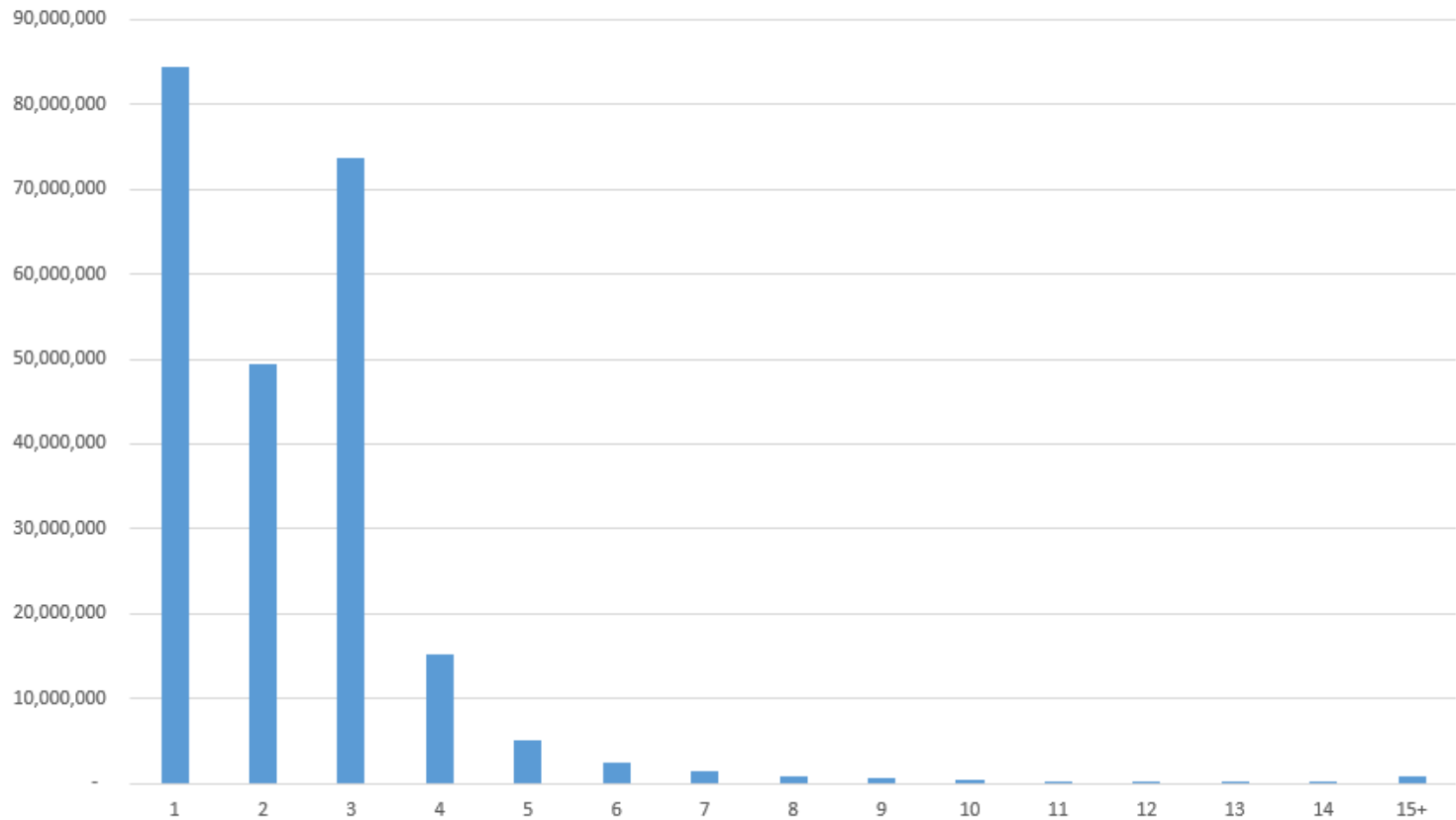
- Total regular PersonTrips = 564,881,867
- Total aTaxi Trips = 235,131,899
- Total PersonTrip Miles = 10,098,209,086
- Total aTaxi Vehicle Miles = 5,877,371,824

- Nation AVO = 1.72

AVO by state



of aTaxis departing by # of passengers



Thanks to Michael Bino for all his help with Della

Our friend, Della

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Thu, Jan 12, 2017 at 2:14 PM
Subject: SLURM Job_id=9733547 Name=submit06.txt Ended, Run time 02:26:47
To: <tianayz@princeton.edu>

Job ID: 9733547
Cluster: della
User/Group: tianayz/orfe
State: FAILED (exit code 137)
Cores: 1
CPU Utilized: 02:26:38
CPU Efficiency: 99.90% of 02:26:47 core-walltime
Memory Utilized: 3.22 GB
Memory Efficiency: 82.39% of 3.91 GB

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Thu, Jan 12, 2017 at 12:48 PM
Subject: SLURM Job_id=9733589 Name=submit51.txt Ended, Run time 00:58:00
To: <tianayz@princeton.edu>

Job ID: 9733589
Cluster: della
User/Group: tianayz/orfe
State: CANCELLED (exit code 0)

00:57:57
99.91% of 00:58:00 core-walltime
Memory Utilized: 3.96 GB
Memory Efficiency: 101.43% of 3.91 GB

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Fri, Jan 13, 2017 at 3:28 AM
Subject: SLURM Job_id=9735961 Name=submit17.txt Ended, Run time 04:54:55
To: <tianayz@princeton.edu>

Job ID: 9735961
Cluster: della
User/Group: tianayz/orfe
State: FAILED (exit code 137)
Cores: 1
CPU Utilized: 04:51:17
CPU Efficiency: 98.77% of 04:54:55 core-walltime
Memory Utilized: 3.31 GB
Memory Efficiency: 84.73% of 3.91 GB

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Fri, Jan 13, 2017 at 6:39 AM
Subject: SLURM Job_id=9735964 Name=submit48.txt Ended, Run time 08:05:22
To: <tianayz@princeton.edu>

Job ID: 9735964
Cluster: della
User/Group: tianayz/orfe
State: TIMEOUT (exit code 1)
Cores: 1
CPU Utilized: 00:00:00
CPU Efficiency: 0.00% of 08:05:22 core-walltime
Memory Utilized: 3.78 GB
Memory Efficiency: 47.22% of 8.00 GB

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Thu, Jan 12, 2017 at 2:23 PM
Subject: SLURM Job_id=9733576 Name=submit37.txt Ended, Run time 02:34:15
To: <tianayz@princeton.edu>

Job ID: 9733576
Cluster: della
User/Group: tianayz/orfe
State: FAILED (exit code 137)
Cores: 1
CPU Utilized: 02:34:13
CPU Efficiency: 99.98% of 02:34:15 core-walltime
Memory Utilized: 3.77 GB
Memory Efficiency: 96.62% of 3.91 GB

----- Forwarded message -----

From: SLURM User <noreply@princeton.edu>
Date: Thu, Jan 12, 2017 at 12:31 PM
Subject: SLURM Job_id=9733590 Name=submit53.txt Ended, Run time 00:41:30
To: <tianayz@princeton.edu>

code 0)
6 of 00:41:30 core-walltime
GB
01.51% of 3.91 GB