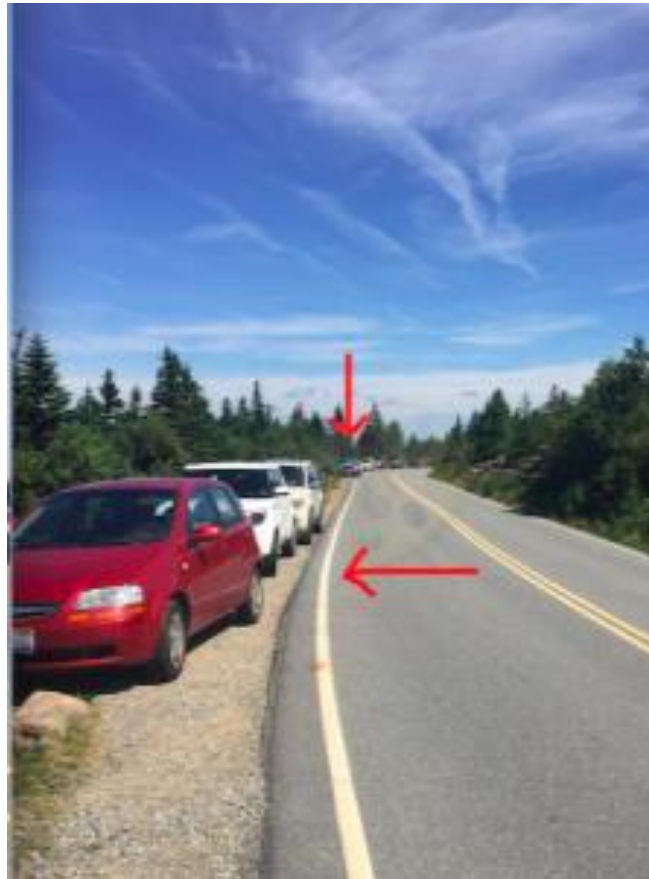




Vehicle Traffic and Visitor Use of the Cadillac Mountain Summit Road 2016



Cars Parked on Road Shoulder, Cadillac Mountain
Cadillac Summit Stewards 2016 Photo

Charles Jacobi, Natural Resource Specialist
February 2017
ANP Natural Resource Report 2017 - 1

Executive Summary

The Cadillac Summit Road traffic data from 2016 confirmed much of what we knew about traffic and the number of visitors from the previous four years of monitoring and anecdotal observations. Sunrise and sunset, holidays, July 25 to August 31, and 10:00 a.m. to 5:00 p.m. are the busiest times.

An estimated 259,000 vehicles and at least 777,000 visitors went to Cadillac Mountain between June 2, 2016 and October 31, 2016. This is an 8% increase over the same period in 2015.

Each month has peak traffic in excess of 2,000 vehicles per day. August 2016 averaged 2,100 vehicles and at least 6,300 visitors per day. The busiest day on the year was Sunday July 3, 2016 when 2,830 vehicles climbed Cadillac Mountain, even with an 81 minute closure in the early afternoon. The Ocean Drive was closed this day as well. In August, the only lull in traffic on a sunny day is the few hours after sunrise. Ascending traffic following sunrise is often in the single digits per hour. While sunrise and sunset traffic are weather dependent, the data show that if it is clear, the Independence Day, Labor Day, and Columbus Day holiday sunrises and sunsets are exceptionally busy times. Memorial Day weekend is also very busy, but not quite as busy as these three.

Over the past four years, the months of June – September have each shown a steady increase in traffic. October is excluded only because of an exceptionally busy 2015. This increase in use matches overall park visitation which is derived mainly from the traffic counter at Sand Beach. Weekends in September are now as busy as a typical day in July. September 2016 had ~15% fewer vehicles (~7,500) than July 2016. October 2016 had 15% more vehicles (~5,700) than June 2016.

In July and August 2016, hourly traffic did not begin to consistently exceed 100 vehicles per hour until 9:00 a.m. and 200 vehicles per hour until 10:00 a.m. The busiest hour of the day is clearly 11:00 a.m. to 12:00 p.m. and traffic then stays high but declines steadily until about 5:00 p.m. Eight of the nine hours with traffic greater than 300 vehicles per hour during these two months were at sunrise or sunset.

As in 2015, we could find no connection between closure of the road and hourly uphill traffic counts. There were still many days and hours of high traffic without closures, suggesting that if the number of vehicles is managed, closures can be avoided and many visitors can enjoy all the summit offers. This is not to suggest that the resource impacts or visitor experience under this level of use is acceptable.

Bicycle use in September and October averaged 41 and 26 respectively. One hundred twenty-nine bicycles climbed Cadillac Mountain on car-free morning.

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ACKNOWLEDGEMENTS

We thank A.J. Nedzesky and Josh Dent from the National Park Service Traffic Field Operations Technical Support Center in Denver and Friends of Acadia Recreation Technician Becca Flesh for her traffic counter work.

INTRODUCTION

As the highest point on the east coast and with a road to the top, Cadillac Mountain is the focal point for Acadia National Park visitors because it offers sweeping views of an island-dotted landscape in all directions. A recent study reported that 75% of visitors went to the summit during their stay (Manni et al 2010).

In spite of the importance of the summit to the management of the park, there was not a working traffic counter to track visitor use of the site until 2013. Several efforts in the early 2000s provide a little bit of a window on use of Cadillac Mountain. Park staff conducted one day censuses of traffic (5:00 a.m. to 8:00 p.m.) and made estimates of the number of park visitors on 8/14/2001 and 8/1/2002 to provide a snapshot of use on a busy August day (Jacobi 2001, Jacobi 2003). Results suggested that a busy August day might have 1,700 – 2,000 vehicles and 5,000 – 6,000 visitors. Work by Baldwin and LaPage (2003) in the summer of 2002 suggested that visitation to Cadillac from June to September averaged around 3,620 per day. This is reasonably consistent with the two censuses conducted around the same time. Note that 2001 – 2003 was just before the cruise ship bus traffic increased substantially.

The Intelligent Transportation System (ITS) pilot project begun in 2000 included the installation of traffic loops and a traffic counter at the bottom of the summit road. This system was intended to provide real-time traffic information from many Park Loop Road entrances and parking areas via land lines and cell phones calling in to a central server/computer. After 13 years of contractor defaults, software system failures, and other problems, park and Federal Highways Administration staff determined the project should end.

In 2013, with the ITS project ended, park staff decided to try to resurrect the traffic counter site at the bottom of Cadillac Mountain with a counter provided by A.J. Nedzesky, a contractor with the National Park Service Field Operations Technical Support Center (FOTSC) for traffic monitoring. The loops, wiring, and solar panels were all still workable and the equipment cabinet intact. We were not interested in real-time traffic information, only traffic counts downloadable each month, just like the three other counters in the park managed by FOTSC. FOTSC has since assimilated this counter as part of their operation in Acadia and provides support for it.

In 2016, our early season checks and validations of the FOTSC Cadillac Summit Road counter revealed that the uphill lane was inconsistently recording traffic. The downhill lane still appeared to be counting traffic well. The cause appeared to be a failure of the embedded traffic loop. As a result, we installed a portable JAMAR traffic counter at a nearby uphill site and replaced it with a second JAMAR counter at that site as described in the methods section of this report. All data reported is from these portable counters, including bicycle traffic data from the second counter. We do not report any data from the FOTSC traffic counter.

This report will summarize Cadillac Summit Road traffic data collected in 2016 with some estimations of visitor use based on Public Use Statistics Office methods and our own best judgment. We'll also compare 2016 to available data from previous years, look at summit road closures and traffic counts, traffic accumulations, and the bicycle counts.

METHODS

An Apollyon JAMAR traffic counter and traffic mat was installed on the Cadillac Summit Road on June 2, 2016 just above the second pulloff on the left (north) side of the road as you ascend the mountain. The traffic counter was secured to a tree on the right (south) side of the road. This is the same location as similar traffic counter installed in 2015 for the Resource Systems Group (RSG) study (see Jacobi 2016). The grade is steady and the road straight. On September 1, 2017, we removed the Apollyon and replaced it with a JAMAR Cycles Plus that also counted bicycles. The Cycles Plus was installed with two tubes spaced 24 inches apart.

We validated the first traffic counter three times and the second traffic counter four times and the results are in Appendix 1. The motor vehicle validations show that the traffic counters recorded an average of 98% of uphill traffic and 95% of downhill traffic. The most divergent percentages were for low traffic volumes of 13 and 15 where missing just a few vehicles results in a higher percent difference. Sometimes the traffic counter recorded more traffic than we observed (n=6), sometimes less (n=9), and sometimes exactly the same or 100% (n=5).

We also validated bicycle traffic four times in early September. These validations are more challenging because of the lower volumes, and we eliminated three other validations because of this. The Cycles Plus recorded an average of 85% of uphill bicycle traffic and 104% of downhill traffic. The downhill percentage is due to the traffic counter once recording seven bicycles when we counted six. The other three validations were all 100%. More validations are needed in 2017 to understand the accuracy of this traffic counter for bicycles but these results suggest we can be reasonably confident the bicycles counts are within 5 – 10 % of actual traffic. In addition, the manufacturer can advise on adjusting the sensitivity of the traffic counter for bicycles if needed.

DATA METHODS

This was the first season we have used the JAMAR traffic counting software with the Apollyon or the Cycles Plus and there is a learning curve. These traffic counters also do vehicle classifications but we have chosen to keep analysis simple for now. The traffic counts we report for motor vehicles are for *all* classes of vehicles except bicycles. We have begun to develop a “cheat sheet” for using the JAMAR TraxPro software, and it can be found in Appendix 2. It describes in further detail how we have processed and organized the data. How data is processed for vehicle classification can make a difference in the numbers.

Readers should note that for a full understanding of the data, all tables in this report are extensively footnoted and the footnotes matter.

We report data for ascending motor vehicle traffic (exception 2014) and ascending and descending bicycle traffic. We compare 2016 data with data from previous years as it was available.

As appropriate, we compiled seasonal, monthly, daily, and hourly data for motor vehicles and bicycles, reporting total, mean, and peak motor vehicle traffic and bicycle traffic including the date and time of peak use. If data was substantially incomplete during any month we removed it

from analysis. We removed very little data because of this. We did not remove any data because it was suspect for being too high or too low based on our local knowledge of traffic.

As part of our peak use analysis, we compiled the number of days per month with greater than 2,000 or 3,000 vehicles per day; the number of hours per month with greater than 200, 300, and 400 vehicles per hour; and the maximum number of consecutive hours with greater than 200 vehicles per hour for each month and the date of these occurrences.

We also estimated the number of visitors based on the vehicle counts. We assumed the three-person-per-vehicle multiplier has not changed and used it for *all* vehicles with the understanding that some of them, perhaps up to 50 a day at times, are buses with far more passengers. Thus when cruise ship buses are operating, visitor estimates in this report are low by a few hundred to perhaps 1,000 – 2,000 per day. For example, 40 buses times ~40 passengers per bus equals 1,600 visitors that are counted as 40 times 3, or 120 visitors.

We performed an accumulation analysis of traffic on Cadillac Mountain for each day from June – October from 0100 hours to 2400 hours. Accumulated vehicles may be parked along the 3.5 mile road in pulloffs, in the Cadillac Summit or Blue Hill parking areas, or be in transit during each hour. That's a lot of geography, and length of stay is a crucial factor in understanding accumulation as well. Because this traffic data is reported hourly, and because there may be as many as 50 or more vehicles simply on the road or looking for parking in addition to any cars parked, this is a messy dataset, but still useful.

Rachel Collins from the Denver Service Center performed the same analysis for the January 24-26, 2017 Transportation Plan meeting and accounted for the accumulation over the midnight hour with traffic from 2300 – 2400 the day before. We did our analysis without accounting for this and discovered our numbers were very close to hers (generally within 10 – 20 vehicles per hour during the busy hours). Therefore, we omitted the hour from 0000 to 0100 from analysis and assumed that traffic cleared at midnight, or came very close. Early hours and later hours sometimes had negative accumulations but the busy hours give an idea of the timing and magnitude of potential congestion or a road closure. It is best not to focus on the actual numbers, but on the number of and time that accumulations exceed a certain amount. We highlight in tables the accumulations that are > 160 vehicles (about the number of parking spaces), > 200 vehicles, and > 250 vehicles to illustrate this.

We compared traffic counts with the 2016 closures of the summit road due to congestion, and for convenience, report again on a similar analysis done in 2015.

We should also note that there are park and Dawnland Corporation concession and staff vehicles going up Cadillac Mountain every day, and these are non-reportable visits. Our estimate is that these might amount to up to 20 per day in August, and less in shoulder months. Any effect they have on congestion is minor compared with visitor traffic, and they are of course included in traffic counts reported here.

RESULTS

TOTAL NUMBER OF VEHICLES AND VISITORS PER MONTH

Tables 1 and 2 show the total number of vehicles and visitors to Cadillac Mountain by month. The footnotes in these and all tables are important for making any year to year comparisons. An estimated 259,000 vehicles and 777,000 visitors went to Cadillac Mountain between June 2, 2016 and October 31, 2016, an increase of 8% (~20,000 vehicles) from the same months in 2015. All months but October showed a 5,000 to 7,000 increase in the number of vehicles. October 2016 traffic declined about 3,000 vehicles from October 2015, which had an exceptionally high level of traffic that was difficult to explain (Jacobi 2016). September 2016 had ~15% fewer vehicles (~7,500) than July 2016. October 2016 had 15% more vehicles (~5,700) than June 2016.

While we report only the monthly and daily traffic volume *ascending* Cadillac Mountain in 2016, the descending traffic volumes were very similar. The difference between uphill and downhill monthly traffic was 168 in June, 43 in July, 55 in August, 42 in September and 10 in October. The difference for June was probably much higher than other months because we started collecting data at 11am on June 2, and thus vehicles were already in the system (they usually clear out after midnight.). On a daily basis most differences between uphill and downhill traffic were under ten vehicles. This gives us a higher degree of confidence in the count data.

Table 1: Total Number of Vehicles Ascending (2013, 2015, 2016) or Descending (2014) Cadillac Mountain by Month ¹ .				
Month	Vehicles 2013	Vehicles 2014	Vehicles 2015	Vehicles 2016
May	--	7,853 ^{2,3}	19,543	--
June	28,157	30,622 ²	31,927	37,522
July	49,888	51,690 ²	55,195	60,093
August	57,264	60,276 ²	60,010	65,702
Sept	42,027	42,616 ²	45,653	52,437
Oct	8,694 ⁴	34,500 ²	46,586	43,226
Totals	186,030 ^{4,5}	227,557 ^{2,5}	258,914 ⁵	258,980 ⁵

1. June 1 – October 31, 2013, May 23 – October 31, 2014, May 1 - October 31, 2015, June 2 – October 31, 2016.

2. In 2014, we only obtained data from vehicles descending Cadillac Mountain due to a traffic counter glitch.

3. Data was collected only the last nine days of month which includes the Holiday weekend.

4. Government shutdown October 1-16 inclusive. No vehicle traffic.

5. Do not compare totals due to missing data from some months.

Table 2: Total Number of Visitors ¹ Ascending (2013, 2015, 2016) or Descending (2014) Cadillac Mountain by Month ² .				
Month	Visitors 2013	Visitors 2014	Visitors 2015	Visitors 2016
May	--	23,559 ^{3,4}	58,629	--
June	84,471 ³	91,866 ³	95,781	112,566
July	149,664	155,070 ³	165,585	180,279
August	171,792	180,828 ³	180,030	197,106
Sept	126,081	127,848 ³	136,959	157,311
Oct	26,082 ⁵	103,500 ³	139,758	123,678
Totals	558,090 ^{5,6}	682,671 ^{3,6}	776,742 ⁶	776,940 ⁶

1. A three-person multiplier was applied to all vehicles regardless of size. It does not account for bus passengers.

2. June 1 – October 31, 2013, May 23 – October 31, 2014, May 1 - October 31, 2015, June 2 – October 31, 2016.

3. In 2014, we only obtained data from vehicles descending Cadillac Mountain due to a traffic counter glitch.

4. Data was collected only the last nine days of month which includes the Holiday weekend.

5. Government shutdown October 1-16 inclusive. No vehicle traffic.

6. Do not compare totals due to missing data from some months.

MEAN NUMBER OF VEHICLES AND VISITORS PER DAY

Table 3 shows the mean daily traffic counts and estimated visitation in from May – October by month for 2013 - 2016. Incomplete data for some months makes some comparisons difficult, and mean daily traffic in May and October are substantially affected by the Holiday traffic outliers, but we can make the following observations:

1. June, July, August and September show a steady increase in traffic over four years. Traffic in October 2015 was so exceptional the same trend is not apparent for that month.
2. Overall mean daily traffic in June, August and September 2016 increased 15%, 9%, and 15% respectively from 2015, and in July 2016 it was about the same.
3. August 2016 averaged more than 2,100 vehicles and 6,300 visitors per day and July 2016 was not far behind with nearly 2,000 vehicles and 6,000 visitors per day.
4. Weekend traffic in September 2016 was the same as a typical day in July 2016.

Table 3: Mean Daily Number of Vehicles Ascending (2013, 2015, 2016) or Descending (2014) Cadillac Mountain on Weekdays, Weekends, and Overall, and Daily Mean Number of Visitors Overall³, by Month¹.				
	May-2013	May-2014	May-2015	May-2016
Weekday Mean # Vehicles	--	622 ²	500	--
Weekend Mean # Vehicles	--	1,443 ²	904	--
Overall # Mean Vehicles	--	906 ²	636	--
Overall Mean # Visitors ³	--	2,718 ²	1,908	--
	Jun-2013	Jun-2014	Jun-2015	Jun-2016
Weekday Mean # Vehicles	864	971	1,076	1,253
Weekend Mean # Vehicles	1,088	1,410	1,245	1,401
Overall # Mean Vehicles	939	1,097	1,124	1,294
Overall Mean # Visitors ³	2,817	3,291	3,372	3,882
	Jul-2013	Jul-2014	Jul-2015	Jul-2016
Weekday Mean # Vehicles	1,739	1,898	1,960	1,982
Weekend Mean # Vehicles	2,113	2,042	1,884	1,937
Overall # Mean Vehicles	1,847	1,944	1,936	1,968
Overall Mean # Visitors ³	5,541	5,832	5,808	5,904
	Aug-2013	Aug-2014	Aug-2015	Aug-2016
Weekday Mean # Vehicles	1,739	2,113	1,847	2,133
Weekend Mean # Vehicles	1,898	2,042	1,944	2,081
Overall # Mean Vehicles	1,960	1,884	1,936	2,119
Overall Mean # Visitors ³	5,541	5,832	5,808	6,357
	Sep-2013	Sep-2014	Sep-2015	Sep-2016
Weekday Mean # Vehicles	1,292	1,366	1,379	1,681
Weekend Mean # Vehicles	1,655	1,570	1,923	1,933
Overall # Mean Vehicles	1,401	1,421	1,524	1,748
Overall Mean # Visitors ³	4,203	4,263	4,572	5,244
	Oct-2013⁴	Oct-2014	Oct-2015	Oct 2016
Weekday Mean # Vehicles	497 ⁴	1,007	1,431	1,371
Weekend Mean # Vehicles	806 ⁴	1,417	2,067	1,444
Overall # Mean Vehicles	580 ⁴	1,113	1,606	1,394
Overall Mean # Visitors ³	1,740 ⁴	3,339	4,818	4,182

1. June 1 – October 31, 2013, May 23 – October 31, 2014, May 1 - October 31, 2015, June 2 – October 31, 2016.

2. For only last nine days of month including Holiday weekend.

3. Three persons/vehicle multiplier applied to all vehicles.

4. Government shutdown October 1 – 16 inclusive. No traffic.

PEAK NUMBER OF VEHICLES AND VISITORS PER DAY

Table 4 illustrates peak vehicle traffic over the past four years. Each month has peak traffic days in excess of 2,000 vehicles and 6,000 visitors per day. The busiest day of 2016 was Sunday July 3, 2016 when an estimated 2,830 vehicles and 8,490 visitors went to Cadillac Mountain. On this day, rangers closed Ocean Drive and Cadillac Mountain due to traffic backups. Unlike 2015, in 2016 there were no days with more than 3,000 vehicles ascending Cadillac Mountain. August still has the most days with more than 2,000 vehicles per day. In May, September, and October the busiest days were Saturday or Sunday.

Table 4: Peak Number of Vehicles and Visitors¹ Ascending (2013, 2015, 2016) or Descending (2014) Cadillac Mountain per Day, Date of Peak Use, and the Number of Days with Vehicle Traffic >2,000 or 3,000 Vehicles per Day, by Month².				
	May-2013	May-2014	May-2015	May-2016
Peak # Vehicles	--	2,111 ³	2,410	--
Peak # Visitors ¹	--	6,333 ^{1,3}	7,230 ¹	--
Date of Peak Use	--	Sun 5/25/14	Sun 5/24/15	--
# Days> 2,000/3,000	--	1/0	1/0	--
	Jun-2013	Jun-2014	Jun-2015	Jun-2016
Peak # Vehicles	1,401	2,005	2,387	2,275
Peak # Visitors ¹	4,203	6,015 ¹	7,161 ¹	6,825 ¹
Date of Peak Use	Mon 6/24/13	Fri 6/27/14	Wed 6/24/15	Thu 6/30/16
# Days> 2,000/3,000	0/0	1/0	1/0	1/0
	Jul-2013	Jul-2014	Jul-2015	Jul-2016
Peak # Vehicles	2,548	2,570	2,609	2,830
Peak # Visitors ¹	7,644 ¹	7,710 ¹	7,827 ¹	8,490 ¹
Date of Peak Use	Fri 7/5/13	Tue 7/29/14	Wed 7/22/15	Sun 7/3/16
# Days> 2,000/3,000	8/0	5/0	9/0	17/0
	Aug-2013	Aug-2014	Aug-2015	Aug-2016
Peak # Vehicles	2,837	2,633	2,872	2,678
Peak # Visitors ¹	8,511 ¹	7,899 ¹	8,616 ¹	8,034 ¹
Date of Peak Use	Sat 8/10/13	Tue 8/12/14	Thu 8/13/15	Thu 8/11/16
# Days> 2,000/3,000	12/0	16/0	15/0	20/0
	Sep-2013	Sep-2014	Sep-2015	Sep-2016
Peak # Vehicles	2,791	2,123	3,111	2,737
Peak # Visitors ¹	8,373 ¹	6,369 ¹	9,333 ¹	8,211 ¹
Date of Peak Use	Sun 9/1/13	Sat 9/27/14	Sun 9/6/15 ⁴	Sat 9/3/16
# Days> 2,000/3,000	1/0	2/0	3/1	9/0
	Oct-2013⁴	Oct-2014	Oct-2015	Oct 2016
Peak # Vehicles	1,418 ⁴	2,933	3,722	2,620
Peak # Visitors ¹	4,254 ^{1,4}	8,799 ¹	11,166 ¹	7,860 ¹
Date of Peak Use	Sat 10/19/13	Sun 10/12/14	Sat 10/3/15	Sun 10/10/16
# Days> 2,000/3,000	0/0	1/0	10/5	8/0
¹ . Three persons/vehicle multiplier applied to all vehicles. ² . June 1 – October 31, 2013, May 23 – October 31, 2014, May 1 - October 31, 2015, June 2 – October 31, 2016. ³ . Only last nine days of month of May, including the Holiday weekend. ⁴ . Government shutdown October 1 – 16 inclusive. No traffic.				

PEAK NUMBER OF VEHICLES AND VISITORS PER HOUR

Peak hourly traffic counts for vehicles ascending Cadillac Mountain are greater than 200 vehicles per hour for many hours each month from July - October as shown in Table 5. More caution should be used with all these hourly statistics however. A day of peak use can have 5 – 9 consecutive hours of 200 vehicles per hour, usually in the middle of the day, and in August, September, and October merging into sunset.

Many peak hours occur at sunrise or sunset. Eight of the nine hours with greater than 300 vehicles per hour in 2016 occurred at sunrise or sunset. Six of these nine were at sunrise, two at sunset, and one from 10:00 a.m.-11:00 a.m. Remember, sunrise traffic is more usually more concentrated. Sunset traffic is usually spread over two hours or more. In 2016, the first hour with greater than 200 vehicles per hour *after* sunrise occurred from 10:00 a.m.-11:00 a.m. in June, July, and August and 9:00 a.m.-10:00 a.m. in September and October. In previous years and months, this start time has also been one of these two hours. On September 17, 2016 (the car-free Saturday), when the road opened at noon there were five consecutive hours of greater than 200 vehicles per hour. Road closures in 2015 and 2016 may have reduced the peak number of consecutive hours with high counts.

Table 5: Date, Time, and Peak Hourly Caution! Number of Vehicles Ascending (2013, 2015, 2016) or Descending (2014) Cadillac Mountain, by Month, with Other Peak Hourly Statistics.

Month	Date and Time of Peak Hourly Vehicle Use	Peak Hourly Vehicle Use	Hours/ Month with > 200/300/400 Vehicles/Hour	Most Consecutive Hours With > 200 Vehicles/Hour	Date/Time of Most Consecutive Hours > 200/Hour
May 2013	--	--	--	--	--
May 2014	Sun 5/25 ² 7p – 8p ³	310 ^{1,3,5}	4/0/0	3	Sun 5/25 ² 11a-2p
May 2015	Sun 5/24 ² 12n – 1p	249	6/0	5	Sun 5/24 ² 11a-4p
May 2016	--	--	--	--	--
June 2013	Sun 6/30 11a – 12n	165	0/0/0	0	--
June 2014	Fri 6/27 8p – 9p ³	218 ^{1,3}	1/0/0	1	Fri 6/27 8p-9p
June 2015	Mon 6/24 10a – 11a	220	4/0/0	3	Wed 6/24 10a-1p
	Mon 6/24 12n – 1p	220			
June 2016	Tue 6/30 10a – 11a	262	2/0/0	2	Tue 6/30 10a-12n
July 2013	Wed 7/24 10a – 11a	285	34/0/0	6	Wed 7/3 10a-4p
July 2014	Tue 7/29 3p – 4p	313 ¹	41/1/0	7	Tue 7/29 11a-6p
July 2015	Wed 7/22 10a – 11a	349	47/3/0	5	Sat 7/4 10a-3p
					Thu 7/16 10a-3p
July 2016	Sun 7/27 4a-5a ⁴	332 ⁴	58/4/0	5	Fri 7/8 10a-3p
Aug 2013	Sat 8/10 10a – 11a	295	47/0/0	7	Sat 8/10 9a-4p
Aug 2014	Sat 8/30 ⁵ 7p – 8p ³	391 ^{1,3}	79/1/0	6	Tue 8/12 12n-6p
Aug 2015	Thu 8/27 11a – 12n	307	59/1/0	5	Thu 8/13 10a-3p
Aug 2016	Wed 8/3 4a-5a ⁴	326 ⁴	67/1/0	5	Thu 8/11 10a-3p
Sept 2013	Sun 9/1 ⁵ 6p - 7p ³	304 ³	22/1/0	8	Sun 9/1 ⁵ 11a-7p
Sept 2014	Sat 9/27 2p – 3p	266 ¹	12/0/0	3	Sat 9/27 2p-5p
Sept 2015	Sun 9/6 ⁵ 6p – 7p ³	354 ^{3,6}	26/5/0	9	Sun 9/6 ⁵ 10a-7p
Sept 2016	Sun 9/4 ⁵ 5a-6a ⁴	430 ^{4,6}	54/4/1	6	Sun 9/4 ⁵ 10-4p
					Sat 9/24 10a-4p
Oct 2013 ⁶	Sat 10/19 4p - 5p ^{3,6}	171 ^{3,6}	0/0/0	0	--
Oct 2014	Sun 10/12 ⁷ 6p – 7p ³	367 ^{1,3,7}	31/0/0	8	Sun 10/12 ⁷ 11a-7p
Oct 2015	Sat 10/3 5p – 6p ³	448 ³	87/32/4	9 ^{7,8}	Sat 10/3, Sun 10/4, Tue 10/5 Wed 10/7 All 9a-6p ⁹
Oct 2016	Mon 10/10 ⁷ 11a -12n	393 ⁷	51/3/0	8	Mon 10/10 ^{7,10} 10a-6p

1. This is a descending count and not as easily compared with ascending numbers in 2013, 2015, and 2016.

2. Memorial Day Weekend.

3. Sunset.

4. Sunrise.

5. Labor Day weekend.

6. Government shutdown October 1 – 16 inclusive. No traffic.

7. Columbus Day Weekend.

8. There were eight consecutive hours on 10/3 with > 300 vehicles per hour.

9. There were four days with nine consecutive hours of > 200 vehicles per hour.

10. There were three consecutive hours on 10/10 with > 300/hour, and Note that Sat 10/17 had seven consecutive hours with > 200/hour.

MEAN NUMBER OF VEHICLES PER HOUR

We calculated the mean number of vehicles per hour for the hours between 9:00 a.m. and 6:00 p.m. by month in 2016 as shown in Figure 1. For each month, traffic increases substantially at 10:00 a.m. We also see clearly that 11:00 a.m.-12:00 noon is the busiest hour in July and August. Traffic remains quite high after noon but declines steadily. Mean traffic up Cadillac Mountain is greater than 150 vehicles from 10:00 a.m. to 4:00 p.m. in both months. Even September averaged more than 150 vehicles per hour for five straight hours, from 10:00 a.m. – 3:00 p.m. September and October show a lower, but steadier flow of traffic through the afternoon as compared with July and August. Data for 2013 and 2015 showed a similar pattern.

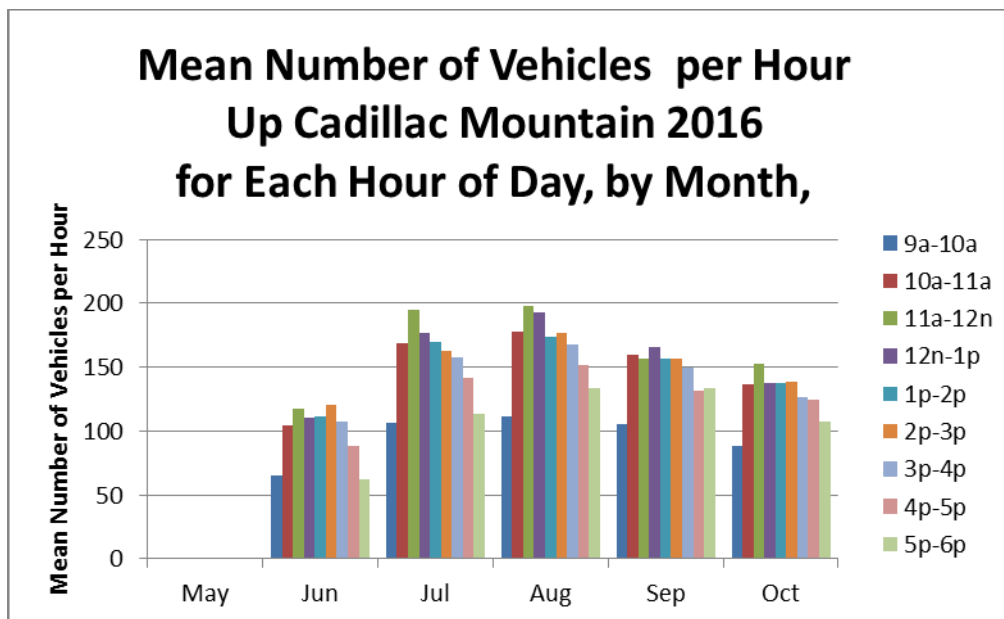


Figure 1: Mean Number of Vehicles per Hour Up Cadillac Mountain in 2016 for each Hour of Day by Month.

Two observations we made in previous years about hourly traffic still hold:

- Sunrise is followed by a 3-hour lull in traffic. In July and August, hourly traffic does not begin to consistently exceed 100 vehicles per hour until 9:00 a.m. Ascending traffic following sunrise is often in the single digits per hour.
- While sunrise and sunset are weather dependent, the data show that if it is clear, holiday sunrises and sunsets are exceptionally busy times. None of the road closures in 2015 came at sunrise or sunset, and there was only one 2016 closure that occurred at sunset.

SEASONAL PATTERN OF VEHICLE USE

We graphed the daily traffic counts for vehicles ascending Cadillac Mountain for 2013 – 2016 and included the mean traffic for each day over these years based on the available counts (one to four years of counts). Figure 2 shows each year graphed in a different color with the mean traffic each day shown as a bold black line. This mean traffic line shows clearly the Holiday weekends, a late July to mid-August peak, and another equivalent peak during the first ten days of October. What the mean traffic line does not illustrate well is the high use we have seen on Labor Day weekends, perhaps because of the limited number of data points and combined with some inclement weather on at least part of the weekend. Some (perhaps much) of this early October

peak is the result of an exceptionally high amount of traffic in early October 2015. Nonetheless, it is indicative of a trend of increasing use in the fall. The difference in mean traffic between the first two weeks of June and most of September after Labor Day is also striking, with September much busier.

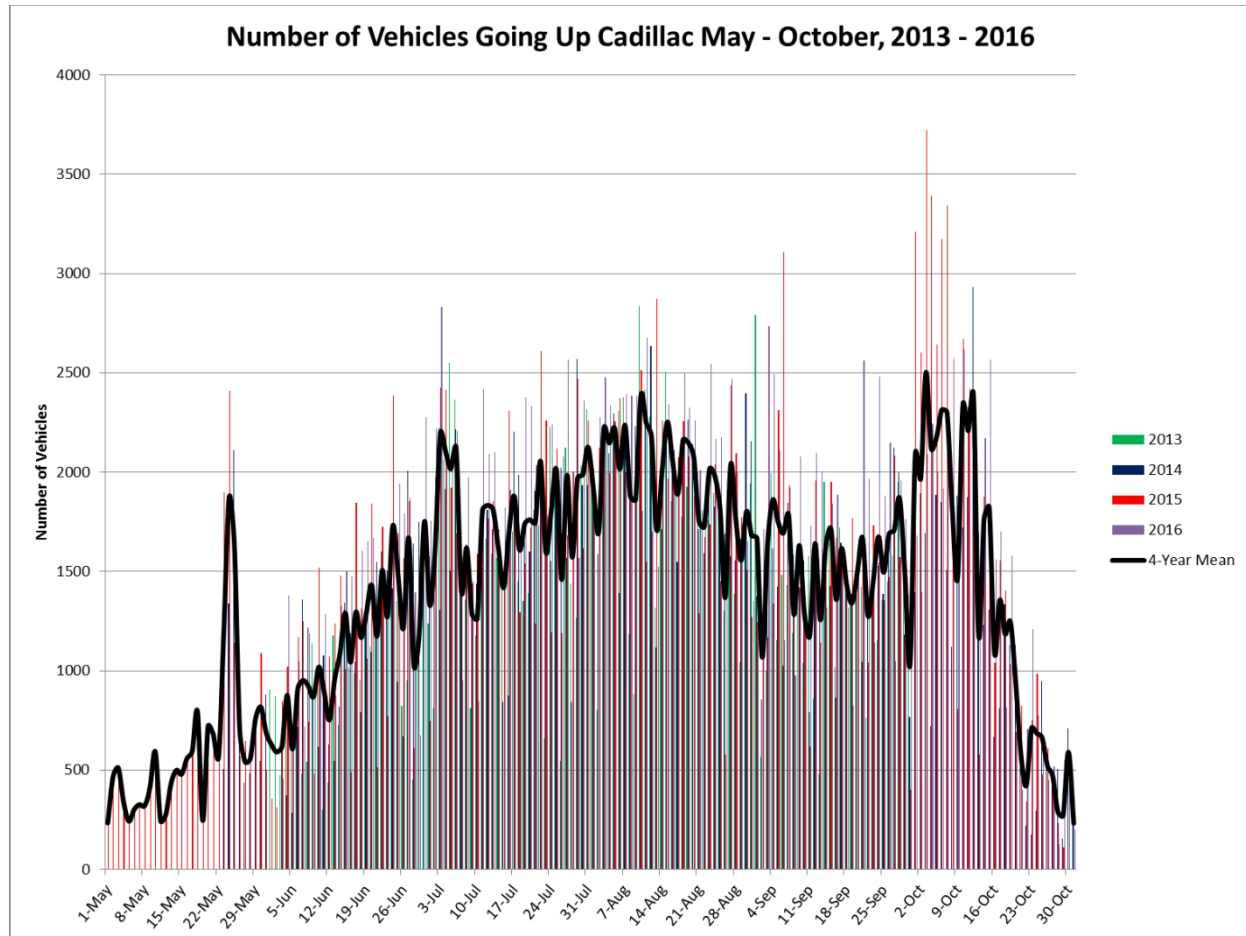


Figure 2: Number of Vehicles Going Up Cadillac Mountain May 1 – October 31, 2013 – 2016.

VEHICLE ACCUMULATION COUNTS

Vehicle accumulation counts are shown in tables 6 – 10 for June, July, August, September, and October. Each number in these tables represents an estimate of the number of vehicles on the Cadillac Mountain Summit Road and in the parking areas and pulloffs during that hour. Accumulations greater than 160 (size of Blue Hill and Cadillac Summit parking areas=157), 200, and 250 are shown in increasing color intensity, and include all counts above that amount (they are not exclusive). The number of hours each month with accumulations greater than 160, 200, and 250 are shown in Table 11. These six charts illustrate yet again traffic challenges on Cadillac Mountain at sunrise, sunset, and between 10:00 a.m. and 4:00 p.m.

Table 6: Hourly Traffic Accumulations for Cadillac Mountain June 2016.

Accumulation	June																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
W 01		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	>160
T 02		0	0	0	0	0	0	0	0	0	0	0	-18	57	82	73	67	30	50	83	10	8	4	>200
F 03		1	0	5	29	1	1	3	9	14	34	34	44	31	53	55	41	30	36	14	8	5	1	>250
S 04		0	2	5	46	2	-2	4	19	29	76	97	125	155	196	170	143	93	86	132	-16	7	4	-2
S 05		1	0	4	32	-3	1	4	16	43	72	114	71	66	68	56	53	33	15	7	6	1	5	2
M 06		0	0	0	3	-1	2	4	9	32	40	68	106	100	125	122	125	92	63	134	-8	17	8	5
T 07		0	1	11	87	-5	-2	5	26	81	112	83	50	70	40	52	45	30	7	9	2	6	1	0
W 08		0	0	5	25	0	3	11	49	91	126	129	88	95	131	96	76	62	66	119	-6	13	5	2
T 09		0	0	24	92	-19	5	10	21	48	73	92	88	104	97	91	67	50	37	62	2	15	0	1
F 10		1	0	5	46	-5	3	7	18	50	94	110	98	82	88	99	63	69	32	102	9	21	6	6
S 11		5	2	20	100	7	1	7	21	72	114	140	112	111	117	119	116	81	74	41	19	6	0	2
S 12		1	1	3	15	13	3	4	5	30	70	73	131	119	103	82	80	47	42	30	7	6	4	-1
M 13		0	0	1	13	3	2	2	5	18	69	121	97	101	106	95	97	54	45	23	14	6	4	0
T 14		0	0	6	27	0	1	10	21	64	110	113	101	129	134	140	89	95	88	147	14	32	3	1
W 15		0	0	35	130	-16	2	16	42	85	140	185	169	110	129	96	107	67	62	104	3	23	2	6
T 16		-2	1	25	151	-6	-2	12	27	82	115	140	142	144	117	108	94	71	55	147	21	29	1	2
F 17		1	1	28	92	-7	2	14	26	67	97	93	107	116	116	99	101	65	62	140	10	59	4	3
S 18		1	2	18	103	24	3	7	21	90	150	141	128	119	116	133	149	86	84	164	15	30	8	7
S 19		1	2	20	158	-6	3	16	19	73	137	172	156	138	137	132	117	72	88	162	7	33	4	3
M 20		1	2	24	145	-9	4	14	38	72	129	115	134	165	138	150	71	87	82	220	17	46	16	6
T 21		0	1	20	72	-15	4	9	24	57	121	133	107	113	133	105	126	100	81	132	9	38	3	3
W 22		1	3	32	133	-12	-2	9	36	84	145	153	122	128	108	116	87	63	51	114	20	32	4	5
T 23		0	2	22	141	-8	2	9	37	87	133	152	121	113	125	123	104	72	68	129	13	45	6	6
F 24		1	2	30	147	-15	2	6	44	95	146	148	160	122	155	143	115	80	91	177	9	45	5	4
S 25		2	2	20	167	-7	3	20	46	110	170	194	164	151	159	161	111	87	94	202	27	41	8	5
S 26		0	1	27	165	-10	-1	14	38	99	163	157	144	160	156	146	124	75	98	189	9	28	4	4
M 27		4	1	27	174	-24	5	12	37	88	171	182	159	164	141	152	115	107	100	171	7	37	9	6
T 28		0	1	15	63	-4	6	7	25	62	105	168	163	160	171	86	96	104	66	60	6	21	1	1
W 29		1	0	2	22	-2	4	5	14	34	51	89	64	60	80	68	44	53	30	32	10	5	2	0
T 30		1	1	15	114	-9	5	21	72	175	292	268	215	144	152	152	133	121	115	230	10	53	-5	7

Table 7: Hourly Traffic Accumulations for Cadillac Mountain July 2016.

[illegible]

Table 8: Hourly Traffic Accumulations for Cadillac Mountain August 2016.

Accumulation	01-Aug-1																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
M 01		0	1	4	100	30	9	20	45	96	180	244	242	201	200	160	118	106	84	73	8	-1	-1	0
T 02		2	3	9	120	40	10	19	41	126	235	280	229	201	225	187	158	149	177	296	53	58	15	11
W 03		-2	-1	13	337	173	21	18	53	133	197	249	222	214	205	187	126	128	173	276	47	33	21	16
T 04		5	10	17	249	122	8	8	35	115	205	205	198	176	147	184	116	111	163	230	27	19	10	0
F 05		0	0	7	204	47	7	21	50	110	192	202	183	165	170	173	130	94	114	167	-6	-7	-10	-13
S 06		3	4	14	104	62	10	14	55	114	190	204	208	175	169	168	152	136	171	241	33	24	19	23
S 07		5	3	6	190	79	7	20	49	112	182	232	222	212	234	176	142	105	162	227	3	0	-4	-10
M 08		3	1	6	167	63	9	8	48	101	210	292	259	162	229	216	169	175	200	216	23	21	11	4
T 09		2	4	11	181	69	7	23	55	148	229	249	269	259	226	181	205	136	177	183	16	10	11	4
W 10		3	0	5	172	125	11	21	64	150	161	203	191	138	109	65	50	30	19	2	-7	-7	-8	-6
T 11		4	3	8	76	128	21	14	51	113	208	262	266	297	274	217	222	190	246	248	74	89	91	80
F 12		0	-4	11	142	164	-15	2	27	86	164	156	138	127	105	95	93	81	119	83	-14	-20	-25	-26
S 13		-1	0	6	39	35	1	5	19	89	130	113	118	122	116	112	125	107	68	20	3	-2	-2	-1
S 14		0	0	1	18	22	4	8	22	64	170	230	264	228	184	186	192	159	217	151	23	15	14	12
M 15		0	1	1	67	153	12	10	35	111	203	291	273	276	252	216	189	157	256	206	35	28	22	22
T 16		1	1	5	124	125	18	28	56	149	270	318	299	247	233	164	181	115	54	7	4	1	1	0
W 17		0	0	0	13	19	4	5	11	49	113	193	205	199	179	182	132	115	185	141	27	3	0	-1
T 18		-1	0	2	127	271	20	18	53	114	230	280	255	225	189	167	139	122	264	160	22	17	9	6
F 19		3	3	7	135	264	20	19	41	121	194	240	247	221	190	176	147	131	282	153	34	18	18	12
S 20		2	3	4	83	204	13	13	40	95	171	207	220	207	208	154	153	143	252	87	17	1	0	-3
S 21		0	1	3	62	195	14	10	42	113	180	198	207	188	189	187	87	69	78	15	0	-1	-3	-4
M 22		1	1	1	2	9	2	1	10	18	46	52	110	174	229	225	225	166	260	36	16	7	-2	-7
T 23		1	1	2	94	280	16	19	68	153	222	318	325	295	222	207	166	152	254	54	19	29	16	6
W 24		1	0	3	86	283	18	19	60	129	203	244	210	186	193	176	140	150	241	50	17	11	8	6
T 25		1	2	4	79	280	19	16	62	108	208	202	238	193	175	155	133	140	182	28	16	18	11	10
F 26		1	1	1	37	149	23	19	51	108	153	189	179	158	158	155	124	134	282	95	29	26	7	8
S 27		0	0	2	81	309	21	16	50	124	222	231	223	208	192	183	167	155	314	77	39	29	16	3
S 28		-1	0	6	55	241	22	16	51	141	212	214	206	197	180	156	130	113	167	26	20	22	20	18
M 29		1	1	0	22	123	10	16	31	72	154	174	162	168	124	152	100	122	242	38	32	18	14	6
T 30		0	1	1	56	259	21	16	39	95	144	147	157	117	120	121	96	89	176	9	9	6	9	5
W 31		0	0	0	33	151	18	11	40	79	142	146	144	137	125	115	126	156	104	122	120	122	122	120

Table 9: Hourly Traffic Accumulations for Cadillac Mountain September 2016.

Accumulation	01-Sep-16																								>160
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
T 01		1	0	1	22	106	-14	7	31	93	137	119	7	84	99	94	107	128	203	-9	16	11	4	5	>200
F 02		4	0	3	32	189	-14	11	35	93	117	154	161	151	140	109	114	131	240	-9	19	7	20	11	>250
S 03		2	1	5	63	319	-26	-13	54	132	183	216	241	217	160	181	198	306	512	-96	36	15	30	15	
S 04		9	3	3	74	498	8	-39	49	136	267	300	224	251	261	235	172	-44	-19	0	33	29	23	15	
M 05		3	3	4	51	362	-19	2	54	133	211	198	146	155	163	131	173	150	215	-64	16	3	1	0	
T 06		0	0	0	10	87	1	3	10	48	74	83	94	108	109	127	127	106	157	-7	7	5	8	2	
W 07		0	0	0	10	105	10	8	30	95	188	205	167	181	207	165	156	162	266	-62	19	7	5	1	
T 08		1	0	1	3	88	10	5	16	53	85	137	128	123	112	71	61	51	24	9	-3	1	2	1	
F 09		1	1	0	9	59	12	13	42	150	229	268	251	174	142	164	134	192	250	-61	13	14	12	6	
S 10		2	1	2	30	272	-5	16	63	150	199	180	159	175	43	-14	-3	3	-4	4	-3	1	2	2	
S 11		0	0	0	8	64	10	21	42	79	133	158	132	138	181	192	186	197	215	-56	12	8	8	2	
M 12		1	2	0	24	191	-10	17	59	160	267	228	177	211	187	170	151	150	152	-49	11	5	4	-1	
T 13		0	0	4	37	225	-13	6	66	170	216	201	175	164	151	153	133	148	163	1	3	10	5	-1	
W 14		1	1	1	23	159	3	3	51	118	178	211	143	82	99	40	87	51	33	18	1	0	3	0	
T 15		0	0	0	17	133	-1	24	57	153	198	186	183	136	156	152	117	183	150	-36	15	7	7	0	
F 16		0	1	1	21	222	18	-6	50	119	168	181	158	154	140	139	139	192	180	-12	18	6	6	0	
S 17		0	0	0	0	0	0	1	4	3	8	9	211	303	234	188	216	185	117	59	8	4	8	5	
S 18		1	1	0	3	49	0	30	22	45	70	118	115	149	176	170	163	107	78	9	2	4	2	0	
M 19		1	-1	0	1	24	5	12	5	51	82	118	102	92	111	70	51	50	34	10	0	-1	1	1	
T 20		0	0	0	1	51	35	3	23	50	109	113	168	263	193	198	168	147	32	47	8	4	6	3	
W 21		0	0	0	15	204	65	-5	112	233	335	207	173	234	219	187	199	255	73	30	8	10	12	2	
T 22		2	0	3	22	251	54	11	50	113	209	184	171	150	143	138	145	208	48	45	5	6	5	5	
F 23		0	-1	1	0	36	12	10	21	67	98	87	99	93	98	107	108	153	42	72	8	13	10	8	
S 24		2	1	2	23	220	30	17	56	172	265	253	217	219	197	200	230	244	80	99	-17	-7	1	-35	
S 25		2	-1	-1	6	161	32	49	51	118	179	202	213	149	136	144	149	153	46	43	13	16	7	7	
M 26		1	0	2	8	158	25	31	44	150	236	220	220	188	182	184	174	242	7	64	1	8	2	0	
T 27		0	0	0	3	26	7	25	30	32	67	113	148	123	111	169	86	80	7	25	0	2	1	0	
W 28		1	0	0	2	62	10	52	25	132	224	233	214	176	167	185	184	247	-20	40	6	3	5	1	
T 29		0	0	0	5	169	32	35	38	105	190	195	165	116	121	135	152	257	-18	39	14	8	3	1	
F 30		2	1	0	4	144	41	27	37	90	173	172	137	96	172	131	123	156	25	29	4	12	5	3	

Table 10: Hourly Traffic Accumulations for Cadillac Mountain October 2016.

Accumulation	01-Oct-16																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	>160
S 01		-1	1	1	3	102	62	31	34	116	132	157	194	178	165	144	154	142	24	23	2	7	2	4	>200
S 02		0	0	0	2	13	16	22	28	98	175	221	157	164	140	106	108	101	34	25	2	1	1	0	>250
M 03		1	0	0	4	71	47	32	93	222	297	295	189	177	154	119	137	160	20	48	6	7	6	3	
T 04		0	1	2	8	197	150	5	49	164	201	227	194	187	211	194	169	250	-15	17	24	8	2	0	
W 05		0	0	0	6	155	103	7	43	145	187	186	179	188	188	187	150	252	-15	14	10	11	1	-1	
T 06		1	1	2	10	142	86	15	39	124	190	166	159	197	143	152	192	258	-8	23	13	9	7	2	
F 07		1	-1	2	7	180	172	-39	42	83	184	209	159	140	153	208	206	301	-45	26	13	21	9	6	
S 08		2	4	4	13	165	246	-54	35	129	207	251	277	237	299	299	245	73	109	27	6	5	5	3	
S 09		3	3	0	6	46	108	-22	33	126	173	175	241	203	190	148	142	86	48	3	-4	1	0	0	
M 10		0	0	0	1	43	102	14	43	147	285	375	391	269	196	196	228	297	-8	28	3	7	5	2	
T 11		0	1	0	11	161	289	-44	46	169	246	270	218	192	200	210	206	268	-57	15	7	13	6	1	
W 12		2	0	2	10	128	174	-13	29	97	157	207	170	154	160	164	184	213	-15	10	5	7	4	1	
T 13		1	0	2	4	49	71	12	21	53	85	134	164	131	149	104	107	75	79	6	6	6	0	0	
F 14		0	1	1	8	104	261	-36	46	110	184	243	197	202	184	172	180	268	-3	14	9	10	9	7	
S 15		1	1	2	7	106	301	-23	13	98	197	237	246	248	272	249	290	333	-52	28	10	7	2	1	
S 16		0	1	4	6	77	249	-7	17	62	98	155	168	161	156	137	140	89	38	9	2	3	1	0	
M 17		1	1	0	6	69	210	-30	20	101	189	171	153	151	126	134	200	185	-7	0	13	5	6	1	
T 18		0	0	0	0	19	75	-7	17	46	92	101	100	87	76	64	71	45	17	0	0	0	0	0	
W 19		0	0	0	2	23	95	2	2	52	163	187	139	143	199	175	186	144	31	11	16	9	5	1	
T 20		1	0	0	5	60	195	-34	9	61	92	103	72	101	91	86	116	23	27	2	1	1	0	1	
F 21		1	0	0	0	3	10	3	7	18	24	47	46	44	47	59	44	28	11	1	0	1	0	1	
S 22		1	0	0	0	3	23	15	7	33	39	94	112	76	96	72	55	47	20	0	3	9	4	1	
S 23		0	0	0	1	7	100	17	29	108	130	190	125	136	94	87	97	36	34	4	2	1	4	0	
M 24		-1	0	0	2	23	119	-11	23	48	72	71	75	76	72	71	62	30	28	2	1	4	7	-1	
T 25		0	0	0	1	10	71	-3	21	43	65	66	57	50	37	56	41	27	17	2	3	3	-1	0	
W 26		0	0	0	0	2	34	4	6	16	38	55	44	47	42	43	60	30	26	0	3	3	-2	1	
T 27		0	0	1	0	8	67	7	19	22	44	48	46	60	48	44	57	18	22	1	1	0	0	2	
F 28		0	0	0	1	1	6	1	0	4	5	20	22	15	15	15	10	5	4	0	0	3	2	2	
S 29		0	0	0	0	1	32	4	18	16	69	75	77	46	86	48	28	20	11	0	3	6	1	1	
S 30		0	1	1	2	2	60	9	13	24	43	59	52	47	40	46	38	17	12	2	0	0	0	0	
M 31		0	0	0	0	2	29	2	4	5	11	17	15	17	30	19	28	9	9	1	0	2	1	1	

**Table 11: Number of Hours Per Month June – October 2016
with Traffic Accumulations on Cadillac Mountain Greater Than 160, 200, and 250.**

Accumulation	June	July	August	September	October
>160	32	155	208	144	113
>200	6	75	121	68	53
>250	2	26	40	22	23

TRAFFIC COUNTS AND CADILLAC SUMMIT ROAD CLOSURES

2015

Park rangers were forced to close the Cadillac Mountain summit road seven times on five days in the summer and fall of 2015. All closures were between 10:00 a.m. and 5:00 p.m. None occurred at sunrise or sunset and none occurred around holidays, and we do not know if closures may have been warranted at these times. The road was closed on three days in August and one each in July and September. Closures were for 17, 21, 22, 35, 43, 44, and 60 minutes (total closure time= 242 minutes). The average closure time was 39 minutes. Records of closure, especially timing, were determined from radio call logs. Cadillac Summit Stewards noted two other closures in their report (Ellis et al 2016), but there was no radio call record of closures for August 9 and 26, and they are not included here.

Table 12 shows the 2015 closures with dates, times, and traffic counts from 9:00 a.m. to 5:00 p.m. Reduced traffic counts show up after six of the seven closures and are highlighted in bold. On July 22 and September 12 (2nd closure) there were high volumes of traffic before the closure. But the most striking result is the lack of consistency between traffic data and closures, even given our cautionary notes about hourly traffic data. September 12 was the date of the evening star party on Cadillac Mountain and the road closed again at 5:30 p.m. to prepare for the event. There was significantly more traffic on many other days when there were no road closures.

**Table 12: Dates and Times of Cadillac Summit Road Closures in 2015
with Ascending Traffic Counts.**

Date ¹	Closure Time(s)	1000 ²	1100	1200	1300	1400	1500	1600	1700	Daily Total ⁴
7/22/15	1300-1400	185	349	328	239	21 ³	236	227	221	2,609
8/5/15	1200-1235	186	212	241	66	177	223	201	170	2,258
8/24/15	1400-1417, 1513-1535	63	116	160	179	189	246	164	200	2,040
8/27/15	1030-1051	237	135	307	214	238	180	161	164	2,436
9/12/15	1323-1407, 1614-1657	126	194	235	271	80	312	256	65	1,958

1. Newspaper accounts of closures were: Mount Desert Islander 8/12; Bangor Daily News 9/16.

2. Traffic counts are for the preceding hour, in this case 0900 – 1000.

3. Numbers in bold indicate where traffic counts were clearly reduced due to the closure.

4. Ascending traffic.

2016

In 2016, park rangers closed the Cadillac Summit Road ten times on nine days in the summer and fall. All closures were between 12:00 p.m. and 8:00 p.m. One occurred at sunset (7:48 p.m.) and one occurred during a holiday (July 3). The road was closed on two days in July, three days in August (twice on August 8), and four days in September. Closures were for 81, 65, 23, 35, 20, 8, 24, 26, 40, and 54 minutes (total closure time=376 minutes, or 6 ¼ hours). The average

closure time was 38 minutes. Table 13 shows the 2016 closures with dates, times, and traffic counts. We looked at the temperature range (4:00 a.m. to 8:00 p.m.), precipitation, wind speed range, and skies on these dates and found no connections (Appendix 5).

Table 13: Dates and Times of Cadillac Summit Road Closures in 2016 with Ascending Traffic Counts.

Date	DOW	Start	End	Length	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700-1800	1800-1900	1900-2000
7/3/2016	Sun	1336	1457	81	135	235	307	268	173	1	226	240	224	230	170
7/19/2016	Tue	1200	1305	65	160	237	220	106	227	220	175	170	135	117	216
8/2/2016	Tue	1244	1307	23	127	216	228	173	168	206	183	151	152	155	189
8/8/2016	Mon	1256	1331	35	112	208	262	205	102	214	200	171	179	169	136
8/8/2016	Mon	1933	1953	20	112	208	262	205	102	214	200	171	179	169	136
8/17/2016	Wed	1745	1753	8	68	155	209	217	189	191	198	150	148	178	139
9/12/2016	Mon	1131	1155	24	156	255	161	233	200	188	193	159	134	97	17
9/20/2016	Tue	1439	1505	26	55	112	126	158	242	175	265	161	128	68	8
9/21/2016	Wed	1107	1147	40	225	301	141	250	239	241	206	175	232	110	23
9/27/2016	Tue	1644	1738	54	45	90	124	131	121	141	153	86	34	29	3

1. Numbers in larger, bold font represent the hour before and the hour of the closure.

BICYCLE TRAFFIC

Table 14 shows *uphill* bicycle traffic counts for September and October 2016. Mean traffic was 41 in September and 26 in October. Saturday 9/17/16, the car free morning, was the busiest day in the fall. A few local riders do laps in the early morning after sun rise when traffic is light, and this is at least partly what makes 7:00 a.m. to 9:00 a.m. the busiest hours of the day.

Table 14: Uphill Bicycle Counts on Cadillac Mountain for September and October 2016.

Month	Total	Mean	Median	Peak Daily/Date/Day	Peak Hourly/Date/Day
September	1196 (n=29 days)	41 ¹	42	129 9/17/16 ² Sat	34 9/17/16 ² Sat
October	792 (n=31 days)	26	25	69 10/2/16 Sun	28 10/2/16 Sat

1. A few (3-5) local riders ascend the summit road multiple times in a row on most mornings, often doing 5 or more laps. Every lap is counted.

2. This was car free day. The peak daily and hourly traffic counts excluding this day were 69 (Fri Sept. 2) and 15 (Thu Sept. 8).

Mean *downhill* bicycle traffic was 40 September and 26 in October, suggesting that using either uphill or downhill traffic provides a consistent estimate, and an accurate one given our validations of bicycle traffic.

SUMMARY AND RECOMMENDATIONS

The Cadillac Summit Road data in 2016 confirms much of what we already know about traffic and the number of visitors from previous years. Sunrise, sunset, holidays, July 25 to August 31, and 10:00 a.m. to 5:00 p.m. are the busiest times. In August, the only lull in traffic on a sunny day is the few hours after sunrise. The busiest day on the year was Sunday July 3, 2016 when 2,830 vehicles climbed Cadillac Mountain even with an 81 minute road closure in the early afternoon.

As in 2015, we could find no connection between closure of the road and hourly uphill traffic counts. There were still many days and hours of high traffic without closures, suggesting that if the number of vehicles is managed, closures can be avoided and many visitors can enjoy all the

summit offers. This is not to suggest that the resource impacts or visitor experience under this level of use is acceptable.

Length of stay data from a 2009 visitor survey of Cadillac Mountain visitors conducted by the Park Studies Laboratory at the University of Vermont (UVM 2011) showed that for visitors who found a place to park, the mean and median length of stay were 45 and 40 minutes respectively. That these numbers are under one hour suggests a reason why congestion on Cadillac Mountain is not worse—turnover is quick. But it would be valuable to know how much of this fast turnover on the busiest day (e.g. October 3, 2015) is due to vehicles simply giving up on finding a parking space and driving back down within an hour. Anything increasing the length of stay at the summit will increase congestion.

The FOTSC traffic counter is now out of service. Validations show that the portable JAMAR traffic counter is providing good data on daily and hourly use of Cadillac Mountain.

In the future, a new permanent traffic counting site is needed in a better location than the FOTSC site. A better site would allow us to collect hourly data and classification data we can rely on. The portable counter site is a good one if power can be made available. Near real-time data as was intended for the ITS system would be a bonus. As the Transportation Plan evolves, we should be better able to determine if traffic monitoring needs differ from the current program.

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APPENDIX 1: TRAFFIC COUNTER VALIDATIONS FOR VEHICLES AND BICYCLES

Vehicles		Vehicles					
Cadillac Summit		Up			Down		
Date	Time	Observed Count	Jamar Count	Percent	Observed Count	Jamar Count	Percent
7/5/2016	1400-1500	191	187	97.91%	249	251	100.80%
7/13/2016	1400-1500	164	170	103.66%	160	157	98.13%
8/2/2016	1400-1500	188	206	109.57%	204	182	89.22%
9/2/2016	0700-0800	13	11	84.62%	13	9	69.23%
9/2/2016	0800-0900	39	39	100.00%	15	15	100.00%
9/5/2016	0700-0800	21	22	104.76%	39	40	102.56%
9/5/2016	0800-0900	62	61	98.39%	28	29	103.57%
10/20/2016	0800-0900	27	24	88.89%	26	26	100.00%
10/26/2016	1400-1500	34	33	97.06%	45	43	95.56%
10/26/2016	1500-1600	47	47	100.00%	37	37	100.00%
	Total	786	800		816	789	
			Mean	98.49%		Mean	95.91%
		Overall %	101.78%		Overall %	96.69%	

Bikes							
Cadillac Summit		Up			Down		
Date	Time	Observed Count	Jamar Count	Percent	Observed Count	Jamar Count	Percent
9/2/2016	0700-0800	13	11	84.62%	6	7	116.67%
9/2/2016	0800-0900	12	11	91.67%	18	18	100.00%
9/5/2016	0700-0800	14	11	78.57%	4	4	100.00%
9/5/2016	0800-0900	16	13	81.25%	15	15	100.00%
10/20/2016	0800-0900	4	3	75.00%	2	5	250.00%
10/26/2016	1400-1500	1	2	200.00%	1	4	400.00%
10/26/2016	1500-1600	0	0	#DIV/0!	0	0	#DIV/0!
Total	9/2 and 9/5	55	46	9/2 and 9/5	43	44	
		Mean	9/2 and 9/5	84.03%	Mean	9/2 and 9/5	104.17%
Bikes							

Jamar_Cadillac_Mt_Validation_2016.xlsx

APPENDIX 2: JAMAR TRAFFIC COUNTER CHEAT SHEET

Jamar Tips and Work Flow

Remember—Download Flash Drive from Green Screen. It probably makes sense to delete the flash drive after processing data to avoid confusion on the next download.

1. There are two kinds of tf2 files, Basic and Volume. The Basic file is for all kinds of analyses and a fresh look at your data. The Volume file is what you will use to create the consolidated file below. Dump (dmp) files should also be saved.

When you first open a file, it will be a Basic file. Select Save and Process. When the Untitled Per

Vehicle Sorting from Basic Data window pops up, Select the radio button Save as a Temporary File... This saves the Basic file. Use “b” for Basic at the end of the file name. Select Process in the next window and you get the Volume spreadsheet. Select File Save and use a “v” at the end of the file name. Now you have saved the same tf2 file as Basic and Volume for easy future access.

You can change the From/To dates and times in the Basic file for a report. You may want to do this if you “lose” an hour of data between separate count files—it is there.

2. To combine data from successive counts, you should create identical Volume Count files with “combined archive” in one name and “combined working” in the other. You can start this by using the first count file for a site and saving it under a new “combined archive” name. Then do not use this archive file except to update data or change data, and if you do you must save the working file anew. You’ll soon see why.

In the combined archive file you must create new one-hour intervals below your existing data that will be populated with zeroes. This is OK. Use the Insert command. Open the new tf2 file and the combined file at the same time. Highlight the columns you want from the new tf2 file, including the column headers Direction 1 etc. Then copy them and paste them into the combined file.

Every time you add to your combined archive file you must save the working file again to include new data.

Note that if you end a count in the middle of an hour, there will be two counts for that hour that must be added together and entered manually into your combined file in the appropriate hour. Do this in the archive file and save it as a working file again. This may one of the few times you open the archive file. To simplify, counts should be ended (counters downloaded) at the end of an hour—they take a few minutes to Download to the flash drive—and it’s OK if the Download extends into the next hour. In most cases, any data loss of cars going by while Downloading and starting a new count is nothing to worry about losing.

3. The combined “working” file is the only place to create the 1 Month Detail (Summary) Report. If a traffic counter is recording two lanes in opposite directions (Direction 1 and Direction 2), the only way to get this report is to temporarily delete each lane one at a time, run the report and **NOT SAVE** the file when you close it. You will reopen it to do the same report for the second lane. This is why there is an archive and a working file!

So if you have your combined file open, delete one column, and select File. Print. If a recalculate window pops up Select Yes. A Volume Report window pops up. You must select an ending date as the last date for which you have real numerical data (last day of month will also work). If you have created many intervals and entire months have zeroes for count data for which new real numerical data will be copied

and pasted later, the software cannot handle it. Alternatively, only create enough (one hour) intervals each time you are ready to add real data.

Select Preview. Another window pops up. Select Apply and Exit. Sometime these two windows pop up in reverse order. Go figure.

In either case your report should then appear. You can save it to Excel, but the Day of Week calculations below the Table will not transfer to Excel. Right click on each Tab in Excel to unprotect them, one at a time. Do what you wish and **DO NOT SAVE** the tf2 file. Repeat for the other Direction. And **DO NOT SAVE!**

And here is another important Excel note. I don't know yet if the newest software update I downloaded (~1/17) corrected this. The Excel files omit the 31st day of all months with 31 days! How stupid is that, that no one caught this until me!!!

4. Per Vehicle Data. This can be viewed from your original Basic count files. Open a Basic tf2 file. Select Save and Process. In the Untitled Per Vehicle Sorting from Basic Data window, select the View Database header. Here are the real details: date, time stamp, lane, axles, length, speed, and gap for every vehicle.

Note: Downloading to flash drive uses battery power from traffic counter. If batteries are low it cannot power the download. Smaller flash drives (2-4-8) take less power. Batteries must be replaced by manufacturer. You may have to bring counter in and download to direct to computer. (Bill G has connecting USB cord.) If so, commands work best in a certain order. Open software, then turn on counter. Use tab refresh download. Make sure counter does not go to sleep.

2nd Note: Jamar traffic counters are programmed through the Utilities menus for the distance between tubes, usually 2 feet if separate tubes are used as on Cadillac Mtn, but 4.33 inches (not 4 inches) for use of the EZ Mat. When reprogramming the Traffic Counter, enter 03 for 0.3 feet.

3rd Note. For the Cycles Plus counter, at the first process screen, you must select Modified Scheme F with Bikes from the drop down menu. It is at the very bottom of the list. This puts bicycles in as a check box under the Classification menu on the same screen. Under the Modified Scheme F, there is a Bike checkbox for Classification but it is for Motorcycles!! This doesn't matter for the regular Jamar Apollyon Traffic Counter, so you can use the "With Bikes" scheme for them if you want.

4th Note. For motor vehicles, I process data for all classifications except bikes, and bikes. I do each separately. You can do it other ways if you want to analyze all the classifications. I don't want to do that now.

5th Note. Always check the box for Advance Data Processing.

6th Note. Any time you upgrade the software, you might delete the Manifest file to gain access rights. Otherwise you need an IT administrator. Yikes.

JUNE

2016AccumulationCountCadillac.xlsx

APPENDIX 3: VEHICLE TRAFFIC COUNTS UP CADILLAC MOUNTAIN

JULY

Acadia National Park 2016 Cadillac Summit Road Vehicles Only Up													Page 2														
													Station ID:														
													Site Code: Cadillac Summit														
													Date Start: 02-Jun-16														
													CadSummitRdVehOnlyVolCombine														
													Date Printed: 20-Dec-16														
													Latitude: 0' 0.0000 Undefined														
UP																											
01-Jul-16																									Daily		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total		
F 01	0	0	3	24	234	4	4	20	36	91	125	129	147	129	143	122	136	111	91	159	42	5	2	1	1758		
S 02	0	1	0	2	37	6	1	9	38	85	161	184	200	205	179	175	215	166	178	300	26	18	21	12	2219		
S 03	4	1	2	62	312	11	9	26	60	135	235	307	268	173	1	226	240	224	230	170	89	20	17	8	2830		
M 04	2	5	1	52	258	8	4	19	56	88	154	168	168	150	146	124	152	103	125	134	76	14	7	10	2024		
T 05	2	2	0	16	89	6	8	17	26	96	169	192	233	223	187	196	135	120	128	162	68	8	5	3	2091		
W 06	3	0	2	30	213	13	6	24	59	141	169	249	222	168	179	168	157	125	111	128	34	5	3	0	2209		
T 07	0	0	0	14	70	7	2	18	34	74	117	126	105	115	77	73	54	33	25	6	1	0	2	1	954		
F 08	0	0	0	4	43	2	6	16	38	129	216	233	223	225	216	199	191	107	80	39	7	1	0	1	1976		
S 09	0	0	0	5	55	2	7	9	19	57	113	164	117	162	161	145	148	120	75	65	17	5	5	2	1453		
S 10	1	1	0	0	18	5	0	8	16	31	76	94	82	76	74	84	95	59	60	48	14	2	1	4	849		
M 11	0	1	0	8	88	8	14	33	90	192	260	266	227	225	188	190	155	128	119	150	44	16	14	3	2419		
T 12	4	2	2	27	215	4	8	26	63	136	175	193	195	185	191	159	118	106	88	148	31	8	7	2	2093		
W 13	1	0	2	30	208	6	5	23	48	101	165	182	152	180	170	148	150	120	143	191	43	12	11	8	2099		
T 14	2	0	2	16	177	11	9	27	33	101	156	175	173	132	165	140	121	82	78	45	11	1	1	0	1658		
F 15	0	0	0	5	56	2	9	16	51	114	193	179	167	134	172	148	118	97	103	178	49	16	9	6	1822		
S 16	0	0	2	10	171	9	9	23	45	90	151	178	167	149	164	152	127	103	130	160	43	12	15	1	1911		
S 17	1	2	3	15	113	8	3	6	25	59	116	134	134	157	168	188	165	122	127	145	27	9	3	0	1730		
M 18	0	0	0	5	75	5	4	12	38	67	133	203	195	215	159	172	120	112	71	82	23	12	0	3	1706		
T 19	0	0	2	12	162	12	8	26	71	160	237	220	106	227	220	175	170	135	117	216	49	27	18	8	2378		
W 20	2	2	0	34	309	12	6	27	49	122	177	204	168	197	197	163	114	114	137	210	40	23	21	5	2333		
T 21	0	0	0	22	201	10	16	22	62	91	169	238	172	166	143	142	141	87	138	175	20	13	5	2	2035		
F 22	1	2	2	9	155	30	7	15	49	125	170	167	171	149	130	124	109	99	91	160	31	11	14	6	1827		
S 23	0	2	2	10	65	9	5	12	55	113	167	179	160	165	167	150	134	119	94	117	28	13	11	4	1781		
S 24	1	1	1	10	237	16	10	22	58	132	169	209	187	176	172	203	135	116	100	222	35	17	9	2	2240		
M 25	2	0	0	6	180	21	16	14	35	111	178	216	197	194	179	166	151	138	116	78	16	3	3	3	2023		
T 26	0	0	1	3	78	21	7	21	25	65	160	239	237	178	183	172	140	136	166	185	41	5	10	6	2079		
W 27	0	3	2	15	332	34	13	16	66	157	213	205	181	179	209	149	170	111	160	249	43	34	23	4	2568		
T 28	0	1	1	11	238	19	5	23	65	120	198	205	174	145	164	170	126	102	77	132	21	4	1	1	2003		
F 29	1	0	2	1	95	29	9	18	34	82	128	184	160	145	156	125	122	97	71	75	19	5	2	10	1570		
S 30	3	0	2	10	180	48	13	19	65	138	222	238	199	162	193	157	149	125	138	199	52	29	13	8	2362		
S 31	5	0	5	11	138	29	7	22	54	103	157	183	180	170	188	175	134	90	123	156	49	8	4	2	1993		
Total	30	26	34	468	4664	378	223	567	1409	3203	5072	5860	5287	5086	4853	4705	4258	3417	3367	4328	1040	348	253	124	60993		

2016AccumulationCountCadillac.xlsx

APPENDIX 3: VEHICLE TRAFFIC COUNTS UP CADILLAC MOUNTAIN

AUGUST

Acadia National Park 2016 Cadillac Summit Road Vehicles Only Up													Page 3												
													Station ID:												
													Site Code: Cadillac Summit												
													Date Start: 02-Jun-16												
													2016CadillacSummitRdVehOnlyV												
													Date Printed: 20-Dec-16												
													Latitude: 0' 0.0000 Undefined												
UP 01-Aug-16																									Daily
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
M 01	1	0	1	4	96	35	5	19	47	97	170	229	186	169	187	150	132	121	90	62	13	1	0	1	1816
T 02	1	2	1	7	112	38	5	21	42	127	216	228	173	168	206	183	151	152	155	189	31	43	12	12	2275
W 03	4	1	2	14	326	79	6	22	60	148	186	223	186	176	177	176	129	128	154	188	39	29	18	6	2477
T 04	3	2	8	8	233	66	7	16	51	131	206	184	192	176	147	198	140	138	167	174	35	24	24	5	2335
F 05	0	1	0	7	198	70	10	29	53	103	185	188	162	184	174	179	146	119	130	171	19	23	16	4	2171
S 06	3	3	2	10	93	48	10	10	58	115	178	182	183	144	163	169	145	120	142	156	29	17	4	9	1993
S 07	3	3	1	3	184	98	8	23	52	110	172	199	214	202	228	184	160	129	170	184	22	20	17	6	2392
M 08	2	2	0	6	161	88	15	16	54	112	208	262	205	102	214	200	171	179	169	136	31	27	18	9	2387
T 09	3	0	2	9	172	98	11	27	53	142	189	205	241	197	197	165	198	128	169	124	20	15	17	4	2386
W 10	5	3	0	5	168	90	4	22	62	144	153	200	190	165	179	149	101	79	55	25	3	2	0	3	1807
T 11	1	3	0	5	68	79	11	14	47	106	210	234	241	265	243	188	211	173	201	178	41	61	55	43	2678
F 12	32	11	9	22	136	101	6	34	57	115	190	192	184	192	135	134	133	118	136	120	20	20	8	4	2109
S 13	1	1	1	6	34	56	1	7	25	114	146	155	154	150	144	134	146	113	82	41	9	2	0	1	1523
S 14	0	0	0	1	18	24	4	10	26	79	158	201	245	202	174	173	196	144	194	120	14	12	7	2	2004
M 15	0	0	2	0	66	114	10	9	45	103	193	263	220	196	213	184	174	132	219	158	15	15	6	2	2339
T 16	1	1	0	4	119	115	4	26	52	137	240	235	214	180	191	156	184	110	101	35	5	1	1	0	2112
W 17	0	0	0	0	14	19	6	5	19	68	155	209	217	189	191	198	150	148	178	139	34	12	5	2	1958
T 18	0	0	1	2	125	226	7	22	59	114	226	235	211	192	172	192	149	128	232	139	20	25	18	8	2503
F 19	4	0	0	5	129	214	16	26	36	118	175	204	209	170	168	155	134	112	251	144	17	20	13	3	2323
S 20	1	1	3	2	79	175	9	14	44	107	177	176	204	171	178	167	169	158	230	149	20	13	8	5	2260
S 21	1	0	1	2	59	176	12	14	54	115	171	212	198	186	199	191	140	126	94	46	7	6	0	0	2010
M 22	1	0	0	0	1	18	6	4	22	41	71	85	138	193	224	197	227	193	258	96	19	20	12	5	1831
T 23	0	1	1	1	94	232	11	16	73	141	192	261	245	199	178	183	160	166	233	83	18	39	15	3	2545
W 24	0	1	0	3	84	209	8	18	62	122	176	215	180	147	166	178	146	146	204	67	16	9	10	1	2168
T 25	1	1	1	3	75	205	14	14	64	115	202	177	220	174	181	168	155	153	181	49	10	12	2	0	2177
F 26	2	1	0	0	37	117	7	17	51	107	140	162	166	137	145	151	127	136	242	107	20	24	12	3	1911
S 27	3	0	0	2	81	245	13	20	56	135	199	202	196	191	185	174	169	152	276	98	27	25	16	5	2470
S 28	3	0	2	6	49	192	11	13	52	133	186	193	172	178	168	147	141	117	160	49	9	7	9	0	1997
M 29	0	2	0	0	22	105	6	17	31	71	157	168	161	163	127	164	113	127	193	53	27	14	14	5	1740
T 30	1	0	1	0	55	207	13	11	41	102	142	136	147	110	122	135	105	104	158	32	11	8	9	4	1654
W 31	0	1	0	0	33	118	7	11	42	75	142	132	129	124	102	82	96	97	109	32	6	9	3	1	1351
Total	77	40	39	137	3088	3539	256	516	1448	3372	5369	6015	5854	5268	5376	5122	4602	4049	5224	3312	601	546	346	155	64351
	154	80	78	274	6176	7078	512	1032	2896	6744	10738	12030	11708	10536	10752	10244	9204	8098	10448	6624	1202	1092	692	310	128702

2016AccumulationCountCadillac.xlsx

APPENDIX 3: VEHICLE TRAFFIC COUNTS UP CADILLAC MOUNTAIN

SEPTEMBER

Acadia National Park 2016 Cadillac Summit Road Vehicles Only Up																									
Page 4																									
Station ID:																									
Site Code: Cadillac Summit																									
Date Start: 02-Jun-16																									
acSummitRdVehOnlyVolCombine																									
Date Printed: 20-Dec-16																									
Latitude: 0' 0.0000 Undefined																									
01-Sep-16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Daily Total
T 01	1	0	1	0	22	84	5	13	28	79	119	0	126	96	122	108	113	112	164	30	15	11	8	1	1258
F 02	5	0	1	2	30	168	9	11	39	81	121	158	154	129	146	136	116	131	186	43	6	21	14	6	1713
S 03	2	0	1	4	61	264	4	11	57	124	167	202	232	192	194	182	209	274	391	70	23	36	26	11	2737
S 04	4	5	0	7	71	430	17	20	61	129	248	258	230	242	276	234	147	4	2	10	38	28	24	10	2495
M 05	4	2	3	2	49	316	20	22	61	129	195	198	152	153	171	139	172	145	149	20	6	1	0	1	2110
T 06	0	0	0	0	11	81	5	4	12	60	85	71	98	102	128	124	115	107	117	14	5	8	6	1	1154
W 07	0	0	0	0	10	97	11	9	34	100	176	193	166	195	207	173	156	175	181	17	15	6	1	0	1922
T 08	0	1	0	1	2	89	7	12	15	56	106	149	111	118	120	72	55	44	13	1	1	1	1	0	975
F 09	1	0	1	0	9	59	9	13	58	143	216	259	233	190	177	172	134	169	161	25	15	20	12	3	2079
S 10	2	0	1	2	30	243	19	19	70	139	191	167	169	188	11	5	0	3	3	3	1	2	2	1	1271
S 11	0	0	0	0	9	61	17	20	63	110	156	142	120	136	140	189	181	208	138	19	12	8	4	0	1733
M 12	0	1	1	0	24	167	12	18	66	158	258	164	231	195	187	191	158	135	97	17	9	4	2	0	2095
T 13	0	0	0	4	33	192	12	18	68	156	202	196	196	170	148	168	128	148	126	18	11	8	0	0	2002
W 14	0	1	0	1	22	138	13	15	56	118	182	193	123	116	113	86	49	51	37	2	1	1	2	0	1320
T 15	0	0	0	0	17	116	17	25	61	152	163	198	180	155	178	150	117	155	115	18	13	9	2	0	1841
F 16	0	0	1	0	21	201	16	16	44	125	153	172	180	160	146	155	135	181	134	24	15	9	0	0	1888
S 17	0	0	0	0	0	0	0	2	3	1	11	2	269	243	260	222	240	159	110	7	6	5	5	3	1548
S 18	0	2	0	0	4	47	29	9	30	47	98	123	123	147	158	166	142	113	70	1	5	3	1	0	1318
M 19	1	0	0	0	1	23	12	5	7	48	93	128	110	93	103	74	50	42	28	3	2	0	1	0	824
T 20	0	0	0	0	1	50	21	12	29	55	112	125	156	241	175	258	163	126	67	8	8	5	6	2	1620
W 21	0	0	0	0	15	189	40	31	116	222	302	140	250	239	238	207	175	229	107	23	16	19	3	2	2563
T 22	2	1	0	3	19	232	60	24	57	121	192	166	176	146	166	132	161	177	82	18	17	7	3	4	1966
F 23	0	0	1	0	0	36	18	3	31	70	102	121	114	96	86	95	97	138	80	13	11	16	9	3	1140
S 24	2	2	0	2	21	200	51	22	72	187	244	243	222	228	212	213	194	196	104	18	15	9	11	12	2480
S 25	4	0	0	0	6	156	72	21	55	125	186	209	189	155	161	145	138	150	58	11	19	12	9	0	1881
M 26	1	1	1	1	7	153	54	10	50	150	208	213	218	175	214	190	186	208	75	15	11	4	0	2	2147
T 27	1	0	0	0	3	23	25	12	29	45	91	120	130	121	141	152	86	34	29	3	3	1	0	0	1049
W 28	1	0	0	0	2	62	50	12	36	128	236	209	220	179	174	196	181	198	52	7	6	3	6	0	1958
T 29	2	0	0	0	6	163	60	13	38	116	174	189	143	142	139	145	157	189	43	19	16	5	3	2	1764
F 30	1	3	0	0	4	141	62	11	39	100	164	157	130	125	166	146	114	151	43	3	7	14	4	1	1586
Total	34	19	12	29	510	4181	747	433	1385	3274	4951	4865	5151	4867	4857	4625	4069	4152	2962	480	328	276	165	65	

2016AccumulationCountCadillac.xlsx

APPENDIX 3: VEHICLE TRAFFIC COUNTS UP CADILLAC MOUNTAIN

OCTOBER

Acadia National Park 2016 Cadillac Summit Road Vehicles Only Up														Page 5															
														Station ID:															
														Site Code: Cadillac Summit															
														Date Start: 02-Jun-16															
														CadillacSummitRdVehOnlyVolCombinedV															
														Date Printed: 20-Dec-16															
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2016AccumulationCountCadillac.xlsx

APPENDIX 4: VEHICLE TRAFFIC COUNTS DOWN CADILLAC MOUNTAIN

JUNE

			Acadia National Park												Page 1																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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2016AccumulationCountCadillac.xlsx

APPENDIX 4: VEHICLE TRAFFIC COUNTS DOWN CADILLAC MOUNTAIN

JULY

Acadia National Park													Page 2															
2016 Cadillac Summit Road Vehicles Only Down													Station ID: 31594															
													Site Code: Cadillac Summit															
													Date Start: 02-Jun-16															
													lacSummitRdVehOnlyVolCombine															
													Date Printed: 20-Dec-16															
													Latitude: 0' 0.0000 Undefined															
01-Jul-16																										Daily		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total				
F 01	1	0	0	3	245	19	6	15	46	67	120	145	158	127	148	132	133	96	88	188	15	4	1	1757				
S 02	1	0	0	7	31	2	6	13	36	81	143	181	183	223	198	188	193	173	120	380	29	22	18	2228				
S 03	8	3	0	7	346	32	15	33	58	120	206	249	235	199	125	191	244	191	137	318	66	19	16	2818				
M 04	7	2	0	3	0	291	26	10	21	47	89	128	188	170	144	157	146	127	100	53	67	169	83	8	2036			
T 05	5	2	1	0	0	105	7	13	12	33	92	159	186	219	251	200	182	155	129	91	203	33	16	8	2102			
W 06	4	2	1	1	1	204	42	18	22	52	136	158	221	216	208	185	177	169	130	96	146	17	2	1	2209			
T 07	0	0	0	0	4	86	4	8	25	54	80	132	118	119	93	82	61	41	32	11	1	2	1	1	955			
F 08	1	0	0	0	5	43	2	11	30	78	132	203	235	191	203	240	197	197	119	75	16	4	0	0	1982			
S 09	0	1	0	1	3	54	6	6	14	24	83	140	142	129	152	171	142	140	108	79	42	7	8	0	1452			
S 10	0	1	0	0	1	17	1	6	12	24	60	77	90	89	70	86	79	79	55	61	33	1	3	3	848			
M 11	1	0	0	0	19	77	15	13	43	90	187	239	223	231	250	206	196	164	120	94	198	22	23	7	2418			
T 12	4	3	3	0	2	234	12	14	21	61	123	158	197	218	204	192	162	120	81	75	190	20	9	3	2106			
W 13	2	0	1	0	3	216	22	12	17	51	96	149	185	176	157	185	157	152	133	101	229	26	13	9	2092			
T 14	5	2	0	0	1	193	15	14	19	51	105	176	133	186	164	137	176	107	91	68	20	6	1	0	1670			
F 15	0	0	0	1	2	53	11	8	17	55	113	155	192	180	164	173	131	111	96	59	227	37	24	4	1813			
S 16	3	1	0	0	1	164	26	13	28	46	80	150	179	187	159	154	150	119	106	81	216	34	14	6	1917			
S 17	3	0	1	2	0	117	20	3	13	30	50	140	124	133	134	177	188	172	106	155	150	14	7	1	1740			
M 18	1	1	0	0	0	71	12	5	15	32	67	116	208	192	239	184	173	117	110	56	79	24	5	2	1709			
T 19	3	0	1	0	0	172	17	9	21	73	125	198	211	186	205	220	175	180	133	70	267	65	20	18	2369			
W 20	1	1	0	2	1	330	25	18	20	48	102	160	211	155	219	200	177	131	89	95	266	40	22	17	2330			
T 21	2	0	0	0	1	209	22	12	23	56	95	142	222	204	176	149	167	135	80	85	230	20	7	6	2043			
F 22	1	2	0	0	2	172	18	10	16	52	124	160	160	161	167	139	124	120	88	66	191	17	22	5	1817			
S 23	5	1	2	0	3	76	8	4	18	54	97	178	168	188	153	164	145	156	105	68	162	13	14	7	1789			
S 24	0	1	2	3	1	240	28	6	25	58	127	174	190	189	180	202	182	131	111	59	266	34	18	12	2239			
M 25	2	1	0	1	0	159	46	11	14	41	101	187	190	201	212	204	171	138	124	116	89	14	4	1	2027			
T 26	3	0	0	0	1	59	40	11	18	26	71	154	218	225	232	145	178	155	115	114	269	19	4	10	2067			
W 27	6	0	2	0	0	321	58	19	12	79	127	202	184	213	200	192	172	146	116	87	321	33	50	22	2562			
T 28	4	1	0	0	1	221	47	8	23	66	118	181	192	193	153	179	189	101	93	72	158	12	3	1	2016			
F 29	2	0	0	1	0	86	41	10	13	34	72	127	177	160	162	148	137	121	90	49	107	11	7	1	1556			
S 30	4	1	4	1	2	183	61	14	20	65	130	190	222	231	206	183	170	129	128	82	287	19	27	11	2370			
S 31	5	2	3	2	0	148	33	10	22	58	83	153	174	169	200	202	172	139	82	72	222	27	12	6	1996			
Total	79	26	18	16	71	4775	685	313	593	1520	3050	4802	5541	5518	5406	5125	4815	4183	3248	2463	5316	823	452	199	61033			

2016AccumulationCountCadillac.xlsx

APPENDIX 4: VEHICLE TRAFFIC COUNTS DOWN CADILLAC MOUNTAIN

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Acadia National Park													Page 3																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									</
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2016AccumulationCountCadillac.xlsx

APPENDIX 4: VEHICLE TRAFFIC COUNTS DOWN CADILLAC MOUNTAIN

SEPTEMBER

Acadia National Park														Page 4													
2016 Cadillac Summit Road Vehicles Only Down																											
														Station ID: 31594													
														Site Code: Cadillac Summit													
														Date Start: 02-Jun-16													
														CadSummitRdVehOnlyVolCombine													
														Date Printed: 20-Dec-16													
														Latitude: 0' 0.0000 Undefined													
DOWN	01-Sep-16																								Daily		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total		
T 01	0	0	1	0	0	0	103	11	10	14	61	0	119	138	119	136	114	97	73	203	29	15	15	4	1262		
F 02	3	1	1	0	0	9	191	9	15	27	85	125	151	132	135	173	138	116	77	238	30	20	15	9	1700		
S 03	8	0	0	0	2	6	294	28	14	49	108	153	193	207	226	195	193	177	153	557	57	44	32	22	2718		
S 04	9	0	2	4	4	3	439	76	32	54	110	206	264	221	257	275	209	195	25	12	15	37	29	19	2497		
M 05	6	3	2	1	0	3	355	40	29	57	113	195	204	150	161	179	138	167	79	233	10	4	0	1	2130		
T 06	0	0	0	0	1	5	85	6	6	24	71	73	75	92	121	125	112	116	67	138	12	8	6	5	1148		
W 07	1	0	0	0	0	2	98	12	13	39	88	164	192	180	195	215	173	169	90	260	13	14	2	0	1920		
T 08	1	0	1	0	0	3	86	14	11	18	77	118	132	106	126	121	66	48	33	5	5	1	0	0	972		
F 09	0	0	0	1	0	9	56	9	29	51	130	207	241	249	225	185	172	111	80	247	27	21	20	9	2079		
S 10	5	0	0	1	2	1	267	22	26	59	131	178	177	182	156	30	8	0	10	2	7	2	2	1	1269		
S 11	0	0	0	0	1	6	68	16	41	94	133	140	130	118	95	137	184	192	131	213	19	12	4	2	1736		
M 12	0	0	0	1	0	0	189	13	25	64	149	194	218	215	195	208	198	143	80	163	15	8	2	3	2083		
T 13	0	0	0	0	0	0	217	24	20	54	142	197	217	202	167	163	163	128	111	143	26	9	3	1	1987		
W 14	0	0	0	0	0	1	148	25	20	56	122	164	173	157	130	159	48	49	55	21	2	2	0	2	1334		
T 15	0	0	0	0	0	0	134	18	29	60	117	175	195	199	177	176	150	89	120	169	16	15	4	2	1845		
F 16	0	0	0	0	0	0	199	38	10	50	110	144	194	186	166	162	151	124	135	170	21	18	3	0	1881		
S 17	0	0	0	0	0	0	0	1	1	1	4	4	60	209	269	294	246	214	152	58	5	7	2	3	1530		
S 18	2	1	1	0	1	2	76	8	17	32	75	103	131	121	129	154	145	148	105	62	4	4	2	1	1324		
M 19	0	0	1	0	0	0	30	5	7	4	59	103	136	111	85	107	73	42	36	21	5	3	0	0	828		
T 20	0	0	0	0	0	0	36	30	18	34	58	124	113	134	223	235	253	142	161	28	8	9	5	5	1616		
W 21	1	0	0	0	0	0	164	76	35	105	189	235	217	255	258	258	183	149	263	100	31	25	10	3	2557		
T 22	2	1	1	0	0	0	238	73	31	65	104	174	171	172	169	160	148	130	211	55	30	18	5	2	1960		
F 23	1	0	2	0	0	0	42	11	13	34	74	136	136	117	84	74	84	82	176	21	16	14	15	4	1136		
S 24	3	2	1	0	0	1	221	56	38	87	166	234	248	231	243	225	177	146	220	23	50	31	19	58	2480		
S 25	15	2	1	1	0	1	196	44	25	62	132	193	185	195	180	162	134	135	162	26	17	15	14	2	1899		
M 26	2	1	2	0	0	2	182	33	16	50	122	201	211	205	207	220	202	152	276	26	25	7	2	2	2146		
T 27	1	1	0	0	0	0	41	12	11	42	69	98	102	128	151	124	152	40	56	7	6	2	0	0	1043		
W 28	1	0	0	0	0	2	102	10	23	32	140	212	215	223	186	185	193	132	270	19	7	6	4	5	1967		
T 29	0	2	0	0	1	0	191	38	13	49	100	168	167	169	160	149	150	89	250	23	21	13	5	4	1762		
F 30	0	2	2	0	0	1	162	46	13	49	91	149	150	159	119	181	137	109	169	17	6	9	13	2	1586		
Total	61	16	18	9	12	57	4610	804	591	1416	3130	4567	5117	5163	5114	5167	4494	3631	3826	3260	535	393	233	171			

2016AccumulationCountCadillac.xlsx

APPENDIX 4: VEHICLE TRAFFIC COUNTS DOWN CADILLAC MOUNTAIN

OCTOBER

Acadia National Park 2016 Cadillac Summit Road Vehicles Only Down														Page 5																						
														Station ID: 31594																						
														Site Code: Cadillac Summit																						
														Date Start: 02-Jun-16																						
														CadillacSummitRdVehOnlyVolCombinedV																						
														Date Printed: 20-Dec-16																						
														Latitude: 0° 0.0000 Undefined																						
Down	01-Oct-16																									Daily										
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total											
S 01	1	1	0	0	0	1	118	65	20	35	116	146	169	186	176	191	175	143	121	4	4	3	6	0	1681											
S 02	1	1	0	0	0	2	21	15	16	45	135	201	252	166	122	127	113	84	71	4	3	1	0	0	1380											
M 03	0	0	1	0	0	2	85	50	32	104	192	219	262	246	238	203	129	107	180	15	15	10	4	2	2096											
T 04	1	0	0	1	0	0	172	146	41	66	156	181	214	209	204	210	209	131	240	27	8	21	7	2	2246											
W 05	0	0	0	0	0	0	134	99	27	59	137	172	193	193	201	181	183	112	246	28	20	8	5	2	2000											
T 06	0	1	0	0	0	1	134	91	26	42	114	183	173	162	210	169	160	145	249	18	14	14	5	2	1913											
F 07	0	1	1	0	2	2	114	165	20	65	92	159	187	164	198	181	187	130	306	29	25	9	15	9	2061											
S 08	5	1	1	2	2	0	90	253	33	49	109	208	242	259	245	291	281	351	113	9	5	7	3	1	2560											
S 09	0	0	1	3	0	1	17	119	31	51	168	252	203	222	196	197	150	110	12	0	6	0	0	0	1739											
M 10	0	0	0	0	0	1	34	102	36	76	184	319	303	296	321	270	199	159	283	12	9	7	4	0	2615											
T 11	1	1	0	0	0	2	86	286	38	66	144	198	231	229	232	223	210	136	292	18	11	9	6	0	2419											
W 12	0	1	1	0	3	1	79	170	36	52	104	132	189	182	194	189	142	135	207	11	9	3	4	2	1846											
T 13	1	0	1	0	0	2	53	76	19	41	88	110	113	144	134	171	134	136	21	7	9	1	2	1	1264											
F 14	0	0	0	2	2	1	35	259	39	76	126	183	217	189	228	192	178	139	244	17	16	15	5	5	2168											
S 15	4	1	1	1	0	0	48	294	40	32	101	187	210	232	262	280	245	216	352	26	11	5	4	5	2557											
S 16	2	0	1	0	2	1	28	232	44	45	90	132	153	154	174	177	140	123	46	4	6	1	0	2	1557											
M 17	1	1	0	0	0	0	17	205	34	51	100	164	152	157	164	151	138	147	166	25	11	13	2	0	1699											
T 18	0	0	0	0	0	0	4	79	18	31	75	113	92	102	116	104	57	32	6	0	1	1	0	0	831											
W 19	0	0	0	0	0	0	0	78	26	33	71	152	170	155	158	186	176	193	122	18	12	16	5	3	1574											
T 20	2	0	0	0	0	0	4	189	26	27	67	79	98	83	100	114	87	118	24	2	0	0	2	0	1022											
F 21	0	0	0	0	0	0	3	13	7	13	36	44	57	44	47	50	53	30	4	0	1	0	2	0	404											
S 22	1	0	0	0	0	0	1	13	17	14	55	90	108	118	74	66	77	49	8	2	6	4	1	0	704											
S 23	0	0	0	0	0	1	3	102	27	61	172	133	166	131	127	91	82	96	13	1	0	2	0	5	1213											
M 24	0	2	0	0	0	0	0	120	15	36	58	71	71	74	74	72	83	81	9	0	1	2	1	4	774											
T 25	1	0	0	0	0	1	0	72	8	27	54	74	64	56	66	39	51	43	11	3	0	1	4	0	575											
W 26	0	1	0	0	0	0	2	36	5	17	33	43	52	46	43	37	45	64	11	1	1	2	4	0	443											
T 27	0	0	0	0	1	0	0	67	8	28	36	51	52	41	57	59	44	59	12	0	1	1	2	1	520											
F 28	0	0	0	0	0	1	1	6	1	1	10	20	27	17	14	13	8	4	0	1	2	0	0	0	126											
S 29	1	0	0	0	0	0	2	38	4	28	40	83	74	83	54	77	46	24	2	0	3	2	2	0	563											
S 30	0	0	0	1	0	0	5	67	11	15	42	54	59	47	45	45	44	33	3	1	0	0	0	0	472											
M 31	0	0	0	0	0	0	30	1	1	10	13	16	16	21	20	31	14	25	6	1	2	0	2	1	194											
Total	22	12	8	10	12	20	1290	3507	705	1286	2905	4153	4553	4387	4474	4356	3826	3330	3374	283	210	158	95	46	43216											

2016AccumulationCountCadillac.xlsx

APPENDIX 5: CADILLAC MOUNTAIN SUMMIT ROAD CLOSURES INCLUDING WEATHER ANALYSIS

Cadillac&OceanDrClosures20152016.xlsx

Cadillac Summit Road Closures and Traffic Counter Data																						
						Uphill	Traffic										Time of	4a-8p	4a-8p			
Date	DOW	Start	End	Length	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700-1800	1800-1900	1900-2000	Sunset	Temp Range	Wind	Precip	Skies		
7/3/2016	Sun	1336	1457	81	135	235	307	268	173	1	226	240	224	230	170		52-75	15 to 20	0	Clr to partly cldy		
7/19/2016	Tue	1200	1305	65	160	237	220	106	227	220	175	170	135	117	216		61-72	3 to 5	0	MC		
8/2/2016	Tue	1244	1307	23	127	216	228	173	168	206	183	151	152	155	189		63-73	6 to 11	0	Overcast		
8/8/2016	Mon	1256	1331	35	112	208	262	205	102	214	200	171	179	169	136		59-75	12 to 17	0	Clr to mostly cldy		
8/8/2016	Mon	1933	1953	20	112	208	262	205	102	214	200	171	179	169	136	1948	59-75	12 to 17	0	Clr		
8/17/2016	Wed	1745	1753	8	68	155	209	217	189	191	198	150	148	178	139		63-73	13 to 30*	0.9 early am	Overcast		
9/12/2016	Mon	1131	1155	24	156	255	161	233	200	188	193	159	134	97	17		50-70	7 to 19	0	Clr		
9/20/2016	Tue	1439	1505	26	55	112	126	158	242	175	265	161	128	68	8		63-70	3 to 15	0.1 at 5am	Overcast		
9/21/2016	Wed	1107	1147	40	225	301	141	250	239	241	206	175	232	110	23		64-77	10 to 18	0.1 at 1am	Clr		
9/27/2016	Tue	1644	1738	54	45	90	124	131	121	141	153	86	34	29	3	1820	54-59	4 to 23*	Hvy rain 7a-9a	Overcast		
			Total	376																		
			Mean	37.6																		
																*Winds were high early, lower late pm and sunset						
Temp and Precip from McFarland Hill. Winds from Cadillac (mostly) and represent the range of the mean hourly wind speeds. Skies from BH Airport.																						
Hour of closure and hour before closure are in bold and bigger.																						
There were many days in August with 2-5 hours in a row of more than 200 vehicles per hour																						
Sunrise 5a - 6a Sep 3, 4, 5: uphill counts 264, 430, 316 respectively, no closure																						
Sunset Sep 3: 5p-6p, 6p-7p, traffic counts were 276 and 390 respectively																						
Sat Sep 17: after Bike Acadia starting at noon: 269, 241, 263, 222, 241 vehicles per hour, no closure										55-68 deg, 7 - 13 winds, clear												
Sat Sep 24: 7 hours straight during day with 200 plus vehicles per hour (night sky weekend), no closure										45-59 deg, 12-20 winds, Clear to mostly cldy												