

September 15, 2017

To: The UrgentLink Disaster Communications System

From: MB Public Affairs, Inc.

Re: Communications, 911 Call Center, and Electrical Service Outages Caused by Hurricane Harvey & Hurricane Irma

This memo provides information about how communications and emergency response infrastructure was affected by Hurricane Harvey and Hurricane Irma in the Contiguous United States (i.e. excluding Puerto Rico and the U.S. Virgin Islands). Hurricane Harvey made landfall in Texas on August 25, and Hurricane Irma made landfall in Florida on September 10. ([“Hurricane Harvey makes landfall as Category 4 storm near Rockport,” San Antonio Express-News, August 25, 2017](#); [“Hurricane Irma: Surge threat rises after landfall near Key West,” Miami Herald, September 10, 2017](#))

This memo primarily relies on daily reports from the Federal Communications Commission tracking the effects of Hurricane Harvey ([www.fcc.gov/harvey](http://www.fcc.gov/harvey)) and Hurricane Irma ([www.fcc.gov/irma](http://www.fcc.gov/irma)). This memo also uses data from utility companies, as well as news coverage and other online sources. Unless otherwise noted, all dates used in this memo are in 2017.

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## Key Findings

### *Hurricane Harvey – Severely Disrupted Communications Infrastructure along the Southern Coast of Texas*

- **Harvey Completely Disabled 2 Emergency 911 Call Centers:** FCC data shows that two 911 call centers in Calhoun County, TX and Portland, TX were taken completely offline by Hurricane Harvey (though service was later restored).
- **Harvey Devastated Cellular Communications along Texas' Southern Gulf Coast:** Counties along the Texas Gulf Coast south of Houston faced widespread cell tower outages due to Hurricane Harvey. In Aransas County (where the City of Rockport is located), 95% of the county's cellular towers were down for three days.
- **Harvey Knocked-Out 283,000 Landlines in Texas/Louisiana:** FCC data suggests that the impact of Hurricane Harvey on landline service was far less severe than that of Irma. Nonetheless, as of August 29, approximately 283,000 customers in Texas and Louisiana were out of service.

### *Hurricane Irma – Severely Disrupted Communications Infrastructure in Heavily-Populated South Florida*

- **91% of Florida Power & Light Customers Lost Power at Some Point during Hurricane Irma:** Florida Power & Light (FPL) is the electric utility serving about 10 million residents of the Greater Miami area and Florida's Atlantic Coast. 91% of FPL's customer accounts lost power at some point during Hurricane Irma. As of September 14 – four days after Hurricane Irma made landfall in Florida – about 25% of FPL's customers still had not had their power restored.
- **Irma Completely Disabled 15 Emergency 911 Call Centers:** FCC data shows that a total of fifteen 911 call centers in Florida and Georgia were taken completely offline by Hurricane Irma (though service was later restored).
- **Irma Knocked-Out 50% of Cellular Towers in the Greater Miami Area – the Nation's Eighth-Largest Metropolitan Area:** FCC data shows that approximately 50% of cellular towers in Miami-Dade, Broward, and Palm Beach Counties were taken offline by Hurricane Irma.
- **Irma Knocked-Out 8.25 Million Landlines in Florida, Alabama, and Georgia:** Hurricane Irma had a huge impact on wired landline telephones in Florida, Alabama, and Georgia. As of September 14, approximately 8.25 million landline telephone customers in Florida, Alabama, and Georgia were out of service.

## 911 Call Center Outages

On a daily basis, the FCC published the names and locations of “Public Safety Answering Points” ([i.e. 911 emergency call centers](#)) that were partially affected or totally taken offline by Hurricane Harvey and Hurricane Irma.

The FCC’s daily reports designate each affected call center in one of four ways. For the purposes of this memo, call centers described as “Down without a re-route” are considered to have suffered a total outage, while call centers described with the other designations are considered to have suffered only a partial outage.

- **“Down without a re-route”** – i.e. a total outage.
- **“Up without Automatic Location Information”** – i.e. the call center lost some functionality
- **“Re-Routed with ALI”** (Automatic Location Information) – i.e. the call center went down, but its calls were re-routed successfully to another call center
- **“Re-Routed without ALI”** (Automatic Location Information) – i.e. the call center went down, but its calls were re-routed successfully to another call center

### *Hurricane Harvey – Total & Partial Outage Data*

FCC daily report data shows that, during Hurricane Harvey, 28 call centers in Texas and 2 call centers in Louisiana were affected.

Of these 911 call centers, two went offline completely for a period of time (described in the FCC reports as “down without a re-route”). Both of these call centers – in Portland, TX and Calhoun County, TX – are located in the South Gulf Coast region of Texas. These two call centers are highlighted in the table below.

**911 EMERGENCY CALL CENTERS SUFFERING ANY FORM OF OUTAGE DURING HURRICANE HARVEY**

State	Public Safety Answering Point	Days Affected by Total Outage	Days Affected by Partial Outage	Total Days Affected (Total Outage + Partial Outage)
LA	Cameron Parish Sheriff's Office		2	2
LA	Cameron Parish SO		1	1
TX	Aransas County SO		5	5
TX	Aransas Pass PD		3	3
TX	Bay City PD		1	1
TX	Bee PD		2	2
TX	Beeville PD		2	2
TX	Calhoun County Sheriff	1	3	4
TX	Cameron PD		1	1
TX	Gonzales County SO		1	1
TX	Harris County Neutral SO		8	8
TX	Houston EC Training		7	7

State	Public Safety Answering Point	Days Affected by Total Outage	Days Affected by Partial Outage	Total Days Affected (Total Outage + Partial Outage)
TX	Ingleside PD		2	2
TX	Jackson County SO		1	1
TX	Kemah PD		1	1
TX	Kingsville PD		2	2
TX	Kleberg County SO		2	2
TX	Lee County SO		1	1
TX	Matagorda County SO		1	1
TX	Mathis PD		3	3
TX	Port Aransas PD		10	10
TX	Port Lavaca		2	2
TX	Portland Police Department	2	0	2
TX	Refugio County SO		9	9
TX	Richmond PD		1	1
TX	Robstown PD		3	3
TX	Victoria PD		2	2
TX	Vidor PD		5	5
TX	West Columbia PD		7	7
TX	Wilson County SO		2	2

Source: FCC "Communications Status Report for Areas Impacted by Hurricane Harvey," 8/26/17- 9/5/17

### ***Hurricane Irma – Total & Partial Outage Data***

FCC daily report data shows that, during Hurricane Irma, 33 call centers in Florida and 5 call centers in Georgia were affected.

Of these 911 call centers, 15 went offline completely for a period of time (described in the FCC reports as “down without a re-route”). These 15 call centers were all located in Florida. Two of these 15 call centers that went down were described as “Back Up” call centers.

These 15 call centers are highlighted in the table below.

#### **911 EMERGENCY CALL CENTERS SUFFERING ANY FORM OF OUTAGE DURING HURRICANE IRMA**

State	Public Safety Answering Point	Days Affected by Total Outage	Days Affected by Partial Outage	Total Days Affected (Total Outage + Partial Outage)
FL	Atlantic Beach PD		3	3
FL	Belle Glade PD		3	3
FL	Big Cypress Indian Reservation	1	3	4
FL	Broward County		2	2
FL	Broward County South Region		1	1
FL	Cape Coral PD		3	3

State	Public Safety Answering Point	Days Affected by Total Outage	Days Affected by Partial Outage	Total Days Affected (Total Outage + Partial Outage)
FL	Clewiston Police Department		4	4
FL	Collier County EOC	1	3	4
FL	Desoto County Sheriff		4	4
FL	Dixie County SO		1	1
FL	Florida Atlantic University		2	2
FL	Ft. Myers Police Department	1	3	4
FL	Glades County Sheriff	1	3	4
FL	Glades County Sheriff Back Up	1	3	4
FL	Hardee County Back Up	1	3	4
FL	Hardee County Sheriff		4	4
FL	Hendry County Sheriff	1	3	4
FL	Highlands County Sheriff	1	3	4
FL	Homestead Air Force	3	0	3
FL	Indian River EOC	1	0	1
FL	Indian River SO		2	2
FL	Lee County Backup		4	4
FL	Lee County Emergency Dispatch Center EOC	1	3	4
FL	Lee County Sheriff		4	4
FL	Manalapan PD		2	2
FL	Marathon County SO	3	1	4
FL	Miami Beach PD		3	3
FL	Naples PD	1	3	4
FL	Neptune Beach PD		2	2
FL	Ocean Reef	3	0	3
FL	Okeechobee County Sheriff's Department	1	3	4
FL	Sanibel Police Department		4	4
FL	St. Augustine PD		3	3
GA	Dawson County SO		1	1
GA	Jefferson County SO		1	1
GA	Lamar County SO		1	1
GA	Monroe County SO		2	2
GA	Putnam County SO		1	1

Source: FCC "Communications Status Report for Areas Impacted by Hurricane Irma," 9/11/17-9/14/17

## Cellular Telephone Service Outages

The FCC has released “cell site” (i.e. cellular tower) outage data for areas affected by Hurricane Harvey and Hurricane Irma. The FCC’s data shows, by county, the total number of cellular towers in the disaster zones of the two hurricanes.

### *Hurricane Harvey – Total Outage Data*

The following table aggregates the FCC’s cellular outage data for the areas affected by Hurricane Harvey. This table shows that Hurricane Harvey knocked-out 5% of cellular towers in the counties it affected (see highlighted row). These counties, defined by the FCC, are all on or near the Gulf Coast in Texas and Louisiana.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE HARVEY**

<b>Date</b>	<b>Number of Counties in Disaster Area</b>	<b>Number of Cell Sites in Disaster Area</b>	<b>Number of Cell Sites Out-of-Service in Disaster Area</b>	<b>Percentage of Cell Sites Out-of-Service in Disaster Area</b>
9/5/2017	13	4,199	73	2%
9/4/2017	13	4,199	70	2%
9/3/2017	13	4,199	102	2%
9/2/2017	64	9,611	193	2%
9/1/2017	64	9,611	229	2%
8/31/2017	55	7,804	296	4%
8/30/2017	55	7,804	329	4%
8/29/2017	55	7,805	365	5%
8/28/2017	55	7,803	364	5%
8/27/2017	55	7,804	320	4%
8/26/2017	55	7,801	315	4%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Harvey,” 8/26/17-9/5/17*

Hurricane Harvey had a much more severe impact in certain areas of Texas, as described in greater detail below.

### *Hurricane Harvey – Specific Data for Southern Gulf Coast (Corpus Christi/Rockport Region)*

The table below shows cellular outage data for six Texas counties running north to south along the Gulf Coast where Hurricane Harvey first made landfall. These counties are arranged south-to-north, with Nueces being the southernmost and Calhoun the northernmost counties. This area includes the cities of Corpus Christi and Rockport.

Specifically, the table shows the percentage of cellular towers that were out of service in each of these six counties on a daily basis. Days where over 80% of a county’s cellular towers were down are highlighted in red. Days where between 30% and 79% of a county’s cellular towers were down are highlighted in yellow.

This data shows that Aransas County (where the City of Rockport is located) was especially impacted by cellular communications failures – for four days, over 80% of the County’s cellular towers were out of service.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE HARVEY –  
6 COASTAL COUNTIES FROM NUECES TO CALHOUN**

Date	% of Cell Sites Out-of-Service in Nueces County	% of Cell Sites Out-of-Service in San Patricio County	% of Cell Sites Out-of-Service in Aransas County	% of Cell Sites Out-of-Service in Refugio County	% of Cell Sites Out-of-Service in Calhoun County	% of Cell Sites Out-of-Service in Victoria County
9/5/2017	3%	3%	21%	0%	7%	3%
9/4/2017	2%	0%	21%	0%	11%	2%
9/3/2017	2%	2%	11%	0%	11%	2%
9/2/2017	2%	2%	16%	0%	7%	4%
9/1/2017	3%	9%	21%	12%	29%	3%
8/31/2017	6%	7%	32%	31%	36%	7%
8/30/2017	8%	7%	47%	27%	14%	19%
8/29/2017	10%	21%	84%	73%	46%	16%
8/28/2017	19%	43%	95%	85%	74%	16%
8/27/2017	25%	52%	95%	85%	85%	41%
8/26/2017	39%	66%	95%	58%	41%	22%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Harvey,” 8/26/17-9/5/17*

Collectively, these six counties have a population of 576,479.

**POPULATION OF 6 COASTAL COUNTIES FROM NUECES TO CALHOUN**

	Nueces County	San Patricio County	Aransas County	Refugio County	Calhoun County	Victoria County
Pop.	361,350	67,655	25,721	7,321	21,965	92,467

*Source: U.S. Census Bureau*

***Hurricane Harvey – Specific Data for Harris County (Houston)***

The table below shows cellular outage data for Harris County (which includes the City of Houston).

Specifically, the table shows the percentage of cellular towers that were out of service in Harris County on a daily basis.

This data shows that Harris County lost a relatively low percentage of cellular towers – only about 5% at the highest point in the FCC’s data.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE HARVEY –  
HARRIS COUNTY**

Date	% of Cell Sites Out-of-Service in Harris County
9/5/2017	1%
9/4/2017	1%
9/3/2017	1%
9/2/2017	2%
9/1/2017	2%
8/31/2017	3%
8/30/2017	5%
8/29/2017	5%
8/28/2017	4%
8/27/2017	1%
8/26/2017	0%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Harvey,” 8/26/17-9/5/17*

However, a 5% outage rate in Harris County is significant, considering that the county has a population of 4,589,928.

**POPULATION OF HARRIS COUNTY**

	Harris County
Pop.	4,589,928

*Source: U.S. Census Bureau*

***Hurricane Irma – Total Outage Data***

The following table aggregates the FCC’s cellular outage data for the areas affected by Hurricane Irma. This table shows that Hurricane Irma knocked-out over 20% of cellular towers in the counties it affected (see highlighted row). These counties, defined by the FCC, are all in Florida, Georgia, and Alabama.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE IRMA**

Date	Number of Counties in Disaster Area	Number of Cell Sites in Disaster Area	Number of Cell Sites Out-of-Service in Disaster Area	Percentage of Cell Sites Out-of-Service in Disaster Area
9/14/2017	89	16,107	1999	12%
9/13/2017	89	16,107	2718	17%
9/12/2017	90	16,109	3730	23%
9/11/2017	67	14,502	3973	27%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Irma,” 9/11/17-9/14/17*

Hurricane Irma had a much more severe impact in certain areas of Florida, as described in greater detail below.



***Hurricane Irma – Specific Data for Greater Miami (Miami-Dade, Broward & Palm Beach Counties)***

The table below shows cellular outage data for the three counties in South Florida comprising the Greater Miami Area (Miami-Dade, Broward, and Palm Beach Counties).

Specifically, the table shows the percentage of cellular towers that were out of service in each of these three counties on a daily basis. Days where over 30% of a county’s cellular towers were down are highlighted in yellow.

This data also shows that the Greater Miami Area lost about half of its cellular towers when the storm made landfall.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE IRMA –  
3 COUNTIES IN GREATER MIAMI**

Date	% of Cell Sites Out-of-Service in Miami-Dade County	% of Cell Sites Out-of-Service in Broward County	% of Cell Sites Out-of-Service in Palm Beach County
9/14/2017	25%	19%	19%
9/13/2017	32%	28%	25%
9/12/2017	42%	38%	34%
9/11/2017	52%	48%	43%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Irma,” 9/11/17-9/14/17*

Collectively, these three counties have a population of 6,066,387.

**POPULATION OF 3 COUNTIES IN GREATER MIAMI**

	Miami-Dade County	Broward County	Palm Beach County
Pop.	2,712,945	1,909,632	1,443,810

*Source: U.S. Census Bureau*

According to the U.S. Census Bureau, the “Miami-Fort Lauderdale-West Palm Beach, FL Metro Area” is the eighth-largest metropolitan area in the nation (*Source: “Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016,” U.S. Census Bureau*). This means that, as a result of Hurricane Irma, the nation’s eighth-largest metropolitan area lost half of its cellular service.

***Hurricane Irma – Specific Data for the Florida Keys***

The table below shows cellular outage data for Monroe County (which includes the Florida Keys), where Hurricane Irma first made landfall in Florida.

Specifically, the table shows the percentage of cellular towers that were out of service in Monroe County on a daily basis.

This data shows that Monroe County lost a very high percentage of cellular towers – over 80% for three days.

**CELLULAR TOWER OUTAGES IN AREAS AFFECTED BY HURRICANE IRMA –  
MONROE COUNTY**

<b>Date</b>	<b>% of Cell Sites Out-of-Service in Monroe County</b>
9/14/2017	77%
9/13/2017	82%
9/12/2017	82%
9/11/2017	81%

*Source: FCC “Communications Status Report for Areas Impacted by Hurricane Irma,” 9/11/17-9/14/17*

Monroe County has a population of 79,077.

**POPULATION OF MONROE COUNTY**

	<b>Monroe County</b>
Pop.	79,077

*Source: U.S. Census Bureau*

## Landline Telephone Service Outages

The FCC has released landline telephone outage data for areas affected by Hurricane Harvey and Hurricane Irma. The FCC’s data shows only the total number of landline customers whose landlines were out of service, and the affected states. The FCC’s data does not provide cities, counties, or any other more specific geographic details.

### *Hurricane Harvey – Total Outage Data*

On August 29, approximately 283,000 landline telephone customers in Texas and Louisiana were out of service (see highlighted row). Between August 26 and September 9, no fewer than 148,000 landline telephone customers in Texas and Louisiana were out of service on any given day.

<b>LANDLINE OUTAGES IN AREAS AFFECTED BY HURRICANE HARVEY</b>		
<b>States Affected</b>	<b>Report Date</b>	<b>Landline Subscribers Out of Service</b>
Texas, Louisiana	9/5/2017	153,850
Texas, Louisiana	9/4/2017	158,086
Texas, Louisiana	9/3/2017	164,544
Texas, Louisiana	9/2/2017	197,142
Texas, Louisiana	9/1/2017	238,259
Texas, Louisiana	8/31/2017	270,139
Texas, Louisiana	8/30/2017	267,426
<b>Texas, Louisiana</b>	<b>8/29/2017</b>	<b>283,593</b>
Texas, Louisiana	8/28/2017	189,487
Texas, Louisiana	8/27/2017	148,565
Texas, Louisiana	8/26/2017	149,909

Source: FCC “Communications Status Report for Areas Impacted by Hurricane Harvey,” 8/26/17- 9/5/17

### *Hurricane Irma – Total Outage Data*

As of September 14, approximately 8.25 million landline telephone customers in Florida, Alabama, and Georgia were out of service (see highlighted row). Between September 11 and September 14, no fewer than 7.6 million landline telephone customers in Florida, Alabama, and Georgia were out of service on any given day.

<b>LANDLINE OUTAGES IN AREAS AFFECTED BY HURRICANE IRMA</b>		
<b>States Affected</b>	<b>Report Date</b>	<b>Landline Subscribers Out of Service</b>
<b>Florida, Alabama, Georgia</b>	<b>9/14/2017</b>	<b>8,258,789</b>
Florida, Alabama, Georgia	9/13/2017	8,190,407
Florida, Alabama, Georgia	9/12/2017	7,184,909
Florida	9/11/2017	7,597,945

Source: FCC “Communications Status Report for Areas Impacted by Hurricane Irma,” 9/11/17-9/14/17

## Electrical Service Outages

Where available, electrical outage data was taken from the utilities that served the areas affected by Hurricane Harvey and Hurricane Irma.

### *Hurricane Harvey – Total Outage Data from AEP Texas (Southern Gulf Coast)*

AEP is a privately-owned electrical utility serving South Texas – including the coastal area where Hurricane Harvey first made landfall.

During and after Hurricane Harvey, AEP released details of electrical outages multiple times per day. The following table shows a selection of this data. According to the data, an estimated 210,000 AEP customer accounts along the Gulf Coast lost electricity on August 26 (see highlighted row).

**AEP ELECTRICAL OUTAGES IN AREAS AFFECTED BY HURRICANE HARVEY**

<b>Daily Report Date/Time</b>	<b>Number of Accounts without Power at Time of Report</b>	<b>Cities/Areas Affected</b>
9/5/2017 7:30 AM	33,800	Aransas Pass/Rockport, Port Lavaca, Victoria
9/4/2017 9:30 AM	41,000	Aransas Pass/Rockport, Port Lavaca, Victoria
9/3/2017 10:45 AM	46,100	Aransas Pass/Rockport, Corpus Christi, Port Lavaca, Victoria
9/2/2017 3:30 PM	49,700	Aransas Pass/Rockport, Corpus Christi, Port Lavaca, Victoria
9/1/2017 4:30 PM	63,500	Aransas Pass/Rockport, Corpus Christi, El Campo, Port Lavaca, Victoria
8/31/2017 5:00 PM	82,000	Aransas Pass/Rockport, Beeville, Corpus Christi, El Campo, Kenedy, Port Lavaca, Sinton, Victoria
8/30/2017 5:30 PM	107,000	Aransas Pass/Rockport, Beeville, Corpus Christi, El Campo, Kenedy, Port Lavaca, Sinton, Victoria
8/29/2017 12:00 PM	133,600	Aransas Pass/Rockport, Beeville, Corpus Christi, El Campo, Kenedy, Port Lavaca, Sinton, Victoria
8/28/2017 11:00 AM	150,500	Aransas Pass/Rockport, Beeville, Corpus Christi, El Campo, Kenedy, Port Lavaca, Sinton, Victoria
8/27/2017 11:00 AM	190,000	Aransas Pass/Rockport, Beeville, Corpus Christi, El Campo, Port Lavaca, Sinton, Victoria
8/26/2017 4:30 PM	210,000	Aransas Pass/Rockport, Corpus Christi, El Campo, Port Lavaca, Sinton, Victoria

*Source: AEP Daily Outage Reports*

### *Hurricane Harvey – Total Outage Data from CenterPoint Energy (Houston Area)*

CenterPoint Energy is a privately-owned electrical utility serving the Houston area.

Attempts to locate detailed reports on CenterPoint Energy’s electrical outages during Hurricane Harvey were unsuccessful.

However, news coverage notes that over 800,000 CenterPoint Energy customers lost power at some point during Hurricane Harvey.

**HEADLINE: CenterPoint Energy continues to restore power to most Houston-area customers**

**Fewer than 40,000 CenterPoint Energy customers in the Houston area were still without power late Thursday — a fraction of the 800,000-plus who have been affected for some period of time since Hurricane Harvey first made landfall on the Gulf Coast a week earlier.**

*[“CenterPoint Energy continues to restore power to most Houston-area customers.” September 1, 2017](#)*

### *Hurricane Irma – Total Outage Data from FPL (Southern & Eastern Florida)*

Florida Power & Light (FPL) is a privately-owned electrical utility serving South Florida and Florida’s Atlantic Coast. All of FPL’s customers are located in areas affected by Hurricane Irma.

FPL provides reports at least once per day showing the number of its customer accounts that have been affected by an electrical outage, by county. These reports show the number of accounts with no power in each county as of the time of the report, as well as the total number of accounts in each county that suffered an electrical outage at some point during Hurricane Irma.

The following table aggregates FPL’s electrical outage data. This shows that 91% of FPL’s 4.9 million customer accounts lost power at some point during Irma.

**FPL ELECTRICAL OUTAGES IN AREAS AFFECTED BY HURRICANE IRMA**

Daily Report Date/Time	Number of Counties in Disaster Area	Number of Accounts in Disaster Area	Number of Accounts in Disaster Area without Power at Time of Report	% of Accounts in Disaster Area without Power at Time of Daily Report	Total Number of Accounts in Disaster Area That Lost Power during Disaster at any Point	% of Accounts in Disaster Area That Lost Power during Disaster at any Point
9/14/2017 9:00 PM	35	4,904,060	1,235,110	25%	4,454,610	91%
9/13/2017 1:00 PM	35	4,904,060	1,949,740	40%	4,454,610	91%
9/12/2017 12:00 PM	35	4,904,060	2,451,700	50%	4,454,610	91%
9/9/2017 8:00 PM	35	4,904,060	78,070	2%	21,0280	4%

*Source: Florida Power & Light Daily Outage Reports*

News coverage notes that FPL’s 4.9 million customer accounts cover approximately 10 million Floridians (as each Florida household with multiple residents only has one FPL customer account).

***Hurricane Irma – Specific Data from FPL for Greater Miami (Miami-Dade, Broward & Palm Beach Counties)***

FPL provides outage data broken-down by county.

This data also shows that the Greater Miami Area (Miami-Dade, Broward, and Palm Beach Counties) faced sustained power outages in the days after Irma made landfall. To wit, at noon on September 12, 52% of Miami-Dade County, 45% of Broward County, and 46% of Palm Beach County FPL customers did not have electricity (see highlighted row). Collectively, these three counties are home to over 6 million residents and make-up the eighth-largest metropolitan area in the United States. (Source: [\*“Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2016.” U.S. Census Bureau\*](#))

It should also be noted that, as of 9:00 PM on September 14 (three days after Irma made landfall), 25% of Miami-Dade County, 20% of Broward County, and 17% of Palm Beach County FPL customers still did not have power.

**FPL ELECTRICAL OUTAGES IN THE GREATER MIAMI AREA**

<b>Daily Report Date/Time</b>	<b>Number of Accounts without Power at Time of Report – Broward County</b>	<b>Number of Accounts without Power at Time of Report – Miami-Dade County</b>	<b>Number of Accounts without Power at Time of Report – Palm Beach County</b>
9/14/2017 9:00 PM	20%	25%	17%
9/13/2017 1:00 PM	34%	40%	37%
9/12/2017 12:00 PM	45%	52%	46%
9/9/2017 8:00 PM	2%	4%	1%

*Source: Florida Power & Light Daily Outage Reports*

## Key News Coverage

The following table provides key news coverage about power and communications infrastructure in the areas affected by Hurricanes Harvey and Irma. The table also provides one article each about cellular communications during Hurricane Sandy and Hurricane Katrina in prior years.

Storm	Location Discussed	Source	Date	Title	MB Summary of Article
Irma	Florida, Georgia, Alabama	<i>Arstechnia</i>	9/13/2017	<a href="#">Hurricane Irma took 7 million cable and wireline subscribers offline</a>	More than 7 million people lost cellular service during Irma and 26.4% of cell sites in Florida were not operational as of 9/12/2017. Power outages caused most of the loss of cellular service. Power is not expected to be fully restored for weeks.
Irma	South Florida	<i>Naples Daily News</i>	9/13/2017	<a href="#">Having trouble calling a loved one? 72 percent of cell sites in Collier are down, third largest outage in Florida</a>	In Collier County, FL, 72% of the cell towers were not operational due to power outages and storm damage, leaving customers without service. Monroe and Hendry Counties (FL) had 82% and 78% of cell sites not operational, respectively.
Irma	South Florida	<i>Orlando Sentinel</i>	9/13/2017	<a href="#">Hurricane Irma sends cable, cellular firms scrambling to restore service</a>	South Florida experienced a widespread loss of cellular service during and following Irma due to power outages and storm damage.
Irma	South Florida	<i>CNN</i>	9/13/2017	<a href="#">Hurricane Irma: Florida faces days without power after deadly storm</a>	FPL stated that customers on the south coast of Florida may not have power until September 22, 2017 because crews are unable to quickly fix infrastructure following Irma.
Irma	South Florida	<i>NPR</i>	9/13/2017	<a href="#">Power Outages Persist For Millions In Florida, Georgia And Carolinas After Irma</a>	As of 9/13/2017, FPL stated that 1.9 million of its customers still did not have electricity and Duke Energy said 752,401 of its nearly 1.8 million Florida customers still lacked power following Irma.
Irma	South Florida, Key West	<i>Washington Post</i>	9/13/2017	<a href="#">After Irma, Florida prepares for days — and maybe weeks — without power</a>	<p>Days following Irma, 40% of Floridians still lacked electricity and even Floridians who had electricity struggled to find cellular service. It is unclear when Key West will have power or cell service restored.</p> <p>Following Irma, people would walk through damaged streets in hopes of finding a signal. The <i>Washington Post</i> reported that one man and his wife had to walk to the nearest working cell tower to contact their family.</p>
Irma	South Florida, Key West	<i>Miami Herald</i>	9/12/2017	<a href="#">Can you hear me now? Post-Irma cell coverage spotty</a>	Following Irma, the most storm-damaged parts of Florida including Key West, Miami-Dade, and Naples continued to lack cellular service due to damaged cell towers and lack of power. Nearly all cell sites in Key West and other areas in Monroe County had no service and about 40% of cell sites in Miami-Dade and Broward counties had no service. Network carriers blamed the power outages for the continued lack of service and the inability to access damaged towers due to flooding.

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Irma	South Florida	<i>Palm Beach Post</i>	9/12/2017	<a href="#">Hurricane Irma: Don't have Internet, cable or cell service? Here's why</a>	South Florida continued to lack cellular service following Irma due to power outages. Although cell towers are required to have a battery in case of emergencies (and even some cell towers have back-up generators), flooding and debris made it difficult for carriers to refuel and repair cell towers.
Irma	South Florida	<i>Tampa Bay Times</i>	9/12/2017	<a href="#">Cell phone service still suffering around the state</a>	Wireless carriers struggled to assess damage in the days following Irma. Loss of cellular service was attributed to a continued lack of power and an inability to repair towers due to flooding and debris.
Irma	South Florida	<i>New York Times</i>	9/12/2017	<a href="#">Why getting the power back on in Florida could take weeks</a>	In the wake of Irma, FPL announced that it could take weeks to completely restore power to Southern Florida.
Irma	South Florida	<i>Miami Herald</i>	9/12/2017	<a href="#">Internet out. Cable out. What are providers saying about when services will be restored?</a>	Victims of Irma complained that even when their power was restored, their Internet was still down and were told by their service providers that Internet would not be restored for several days. If the Internet was down, that often meant business and home lines were down as well.
Irma	South Florida	<i>Miami Herald</i>	9/11/2017	<a href="#">When will power and cellphone services be restored? Patience urged</a>	Irma caused widespread cellular outages in the Miami area. These outages were largely caused by lack of power to specific cell towers – meaning some neighborhoods completely lost cellular reception. Additionally, the combined strain of fewer working towers and higher call activity has meant that the network is too busy to handle all voice calls, and cell phone carriers have recommended that customers communicate by text rather than by voice call.
Irma	South Florida, Key West	<i>Washington Post</i>	9/11/2017	<a href="#">Irma weakens to a tropical storm after knocking out power to millions in Florida</a>	FPL stated that more than half of Florida's population was without power during Irma and that it could take weeks to restore power fully due to storm damage. On 9/10/2017, residents of Key West had no cellphone service, power, or water.
Irma	South Florida	<i>Sun-Sentinel</i>	9/11/2017	<a href="#">Hurricane Irma cuts power to nearly 2 million in South Florida; FPL warns of slow recovery</a>	FPL warned customers following Irma that restoring power would be a slow and dangerous process that would take weeks.
Irma	South Florida	<i>New York Times</i>	9/11/2017	<a href="#">Irma Live Updates: Storm pushes North, but millions are without power</a>	As of 9/11/2017, 6.5 million Floridians were without power in the wake of Irma.
Irma	South Florida	<i>Wall Street Journal</i>	9/11/2017	<a href="#">In Irma, Emergency Responders' New Tools: Twitter and Facebook</a>	First responders and government officials working to help save residents relied on social media to communicate during Irma. In some cases, social media was more reliable than phone lines, especially when telephone infrastructure was taken offline. Some victims of Harvey were forced to use social media to try to get help when they were unable to reach 911.
Irma	South Florida	<i>Wall Street Journal</i>	9/10/2017	<a href="#">Irma Knocks Out Power to Millions of Customers in Florida</a>	Despite spending billions of dollars to improve Florida power infrastructure in recent years, nearly 60% of Floridians lost power during Irma. FPL warned that power may not be restored to some customers for weeks and cautioned the use of home generators due to safety reasons.



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Harvey	South Texas	<i>CNN</i>	9/8/2017	<a href="#">The mad dash to restore cell service after a major storm</a>	During Harvey and other emergencies, carriers “scrambled” to restore cell service to affected areas with a variety of measures including mobile communication centers and drones.
Irma	South Florida	<i>FCW</i>	9/6/2017	<a href="#">Agencies prep communications for Hurricane Irma</a>	As Irma approached Florida, the FCC and FEMA began communicating with network carriers to prepare for the storm including notifying amateur radio operators that radio frequencies would be available for emergency communications. Private radio operators can be a crucial link during storms when normal communication networks are disrupted.
Harvey	South Texas	<i>Corpus Christi Caller-Times</i>	9/4/2017	<a href="#">Electric power fully restored in Corpus Christi</a>	It took 10 days to fully restore power to Corpus Christi after Harvey hit the area. AEP noted that other cities did not fully have power yet.
Harvey	South Texas	<i>CNET</i>	9/3/2017	<a href="#">How the wireless carriers fared during Hurricane Harvey</a>	South Texas still experienced a loss of cellular service during Harvey despite improvements in emergency preparedness by carriers. Consumer advocates complained that cellular carriers are lightly regulated regarding back-up infrastructure.
Harvey	South Texas	<i>Fortune</i>	8/31/2017	<a href="#">Hurricane Harvey Knocked Out Cell Service. Now Calls for Backup Wireless Power Are Rising</a>	Wireless carriers have successfully fought stricter regulations to ensure that cell towers have back-up power during emergencies, especially after the FCC tried to impose more regulations following Hurricane Katrina.
Harvey	South Texas	<i>Associated Press</i>	8/31/2017	<a href="#">So far, cellphone networks have weathered Harvey</a>	Despite having better emergency preparedness, carriers still experienced a loss of cellular service during Harvey due to damage to cell towers. Carriers also struggled with the volume of calls, and some customers attempting to call emergency services could not immediately place their calls.
Harvey	South Texas	<i>Corpus Christi Caller-Times</i>	8/30/2017	<a href="#">Harvey 2017: Here's the latest on power outages in the Corpus Christi area</a>	As of 8/30/2017, 94,000 people did not have power in the Corpus Christi area.
Harvey	East Texas	<i>Beaumont Enterprise</i>	8/30/2017	<a href="#">Entergy updates outages in SE Texas</a>	Over 80,000 people in the Beaumont, TX area did not have power the morning of 8/30/2017 due to downed power lines following Harvey. Entergy stated that it was struggling to repair damaged infrastructure due to flooding and debris.
Harvey	South Texas	<i>Houston Chronicle</i>	8/30/2017	<a href="#">Power outages reported in wake of Hurricane Harvey</a>	The <i>Houston Chronicle</i> gave live updates on 8/29/2017 through 8/30/2017 on power outages in the area. As of 8/29/2017, 100,000 people in Houston still did not have power, days after Harvey first moved to the area.

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Harvey	South Texas	<i>Wired</i>	8/29/2017	<a href="#">Harvey shows progress on emergency communications since Katrina</a>	Although network carriers' emergency preparedness has improved since Katrina, their systems still experienced loss of cellular service, which prevented some customers from successfully calling 911. <i>Wired</i> noted that it was partially due to the fact that the United States has a balkanized emergency response system, based on legacy wired phone networks that can only direct calls from one physical location to a single call center. Trey Forgety, director of government affairs at the National Emergency Number Association, 9-1-1's official professional organization, stated that "Communications ranks up there with having fuel in the police cars."
Harvey	South Texas	<i>Arstechnia</i>	8/28/2017	<a href="#">Tropical Storm Harvey takes out 911 centers, cell towers, and cable networks</a>	Network carriers struggled to keep 911 call centers operational in Texas and Louisiana. Comcast noted that most of its outages were due to power failure. Even if the call centers were able to get a signal, they struggled with the volume of emergency calls.
Harvey	South Texas	<i>San Antonio Express-News</i>	8/28/2017	<a href="#">Hurricane Harvey leaves Texans without internet, phone service</a>	South Texas experienced widespread loss of cellular service during Harvey from power outages, flooding, and other storm damage.
Harvey	South Texas	<i>CNN</i>	8/28/2017	<a href="#">Battered Texas town may be without power for weeks</a>	Three days after Harvey hit the Corpus Christi area, Rockport continued to not have power or running water, and had minimal cell service.  Cell phone service was "essentially nonexistent" in Rockport following Harvey, which forced people to drive to a nearby highway and then climb overpasses to attempt to make calls. CNN also reported that a young man walked 12 miles from Rockport to Aransas Pass to try to find his family since there was no cell service for days in Rockport.
Harvey	South Texas	<i>CNBC</i>	8/28/2017	<a href="#">Texas utilities struggle to restore power as Harvey hampers progress</a>	Hundreds of thousands of Texans had lost power by 8/28/2017, with many areas not expected to have power restored for several days. CenterPoint Energy noted that it was unable to access some areas until flooding receded and electric infrastructure dried out.
Irma	South Florida	<i>NPR</i>	8/28/2017	<a href="#">Facebook, Twitter Replace 911 Calls For Stranded In Houston</a>	When individuals were not able to reach 911 during Irma, they used social media to ask for help to ask others to try to reach the police or other first responders on their behalf.
Harvey	South Texas	<i>Wall Street Journal</i>	8/27/2017	<a href="#">Cell Networks Suffer Outages in Harvey's Wake</a>	Harvey caused widespread cellular outages in South Texas and along the coast. These outages were partially caused by flooding or equipment being blown off the towers by strong winds. Networks advised their customers to limit phone calls in favor of texts and noted that landlines that use newer technology would not work.
Harvey	South Texas	<i>Recode</i>	8/26/2017	<a href="#">Before Hurricane Harvey, wireless carriers lobbied against upgrades to a national emergency alert system</a>	Network carriers have lobbied for years in opposition to efforts by the FCC to update the national wireless emergency alert system. The Republican Chairman of the FCC claims that updates to the system would provide "life-saving information," but carriers have complained that the alerts would only congest their networks.

Storm	Location Discussed	Source	Date	Title	MB Summary of Article
Harvey	South Texas	KCRA	8/26/2017	<a href="#">Power outages reported in wake of Hurricane Harvey</a>	Hundreds of thousands of Texans had lost power following Harvey, including 160,000 customers in Corpus Christi. 90,000 customers had lost power in Houston when the storm moved to the area on 8/26/2017.
Sandy	New York, East Coast	NPR	4/29/2013	<a href="#">After Sandy, Questions Linger Over Cellphone Reliability</a>	<p>About 25% of cell phones towers went down in areas that were affected by Hurricane Sandy in 2012, including all of the cell towers in Long Beach, NY. Network carriers opposed regulations mandating that all their cell towers have back-up generators following Hurricane Katrina, which exacerbated the issue of cellular service loss during Hurricane Sandy. Additionally, some areas did not have power for weeks following Sandy.</p> <p>During Hurricane Sandy, a woman was forced to walk a mile and a half to the nearest police station because she did not have cell service to notify someone that her mother had passed away.</p>
Katrina	Florida, Mississippi, Louisiana	<i>New York Times</i>	9/16/2005	<a href="#">F.C.C. Chief Offers Plan to Get Phones to Hurricane Victims</a>	About 1,000 cellular towers went down during Hurricane Katrina, causing widespread loss of cellular service.

## Notes on Methodology

All data used in this memo was taken from publicly-available sources on the Internet.

**Government Data from the FCC:** The primary source used in this memo is the Federal Communications Commission’s (FCC) daily reports on how Hurricane Harvey and Hurricane Irma affected local communications infrastructure:

- **Hurricane Harvey data:** [www.fcc.gov/harvey](http://www.fcc.gov/harvey)
- **Hurricane Irma:** [www.fcc.gov/irma](http://www.fcc.gov/irma)

These FCC reports, entitled “Communications Status Report for Areas Impacted by Hurricane Irma” and “Communications Status Report for Areas Impacted by Hurricane Irma,” provide data in the following categories:

- **“Public Safety Access Points”** (i.e. 911 call centers) affected
- **“Wireless Services”** (i.e. cellular services) affected
- **“Cable Systems and Wireline”** (i.e. landline telephone services) affected
- **“Broadcast”** (i.e. television and radio stations) affected

**Data from Electric Utility Companies:** Power outages are the primary reason why communications infrastructure fails during a hurricane – so this memo supplements the FCC’s communication infrastructure data with additional data on power outages.

Florida Power & Light has provided detailed, county-level data about outage rates on a daily basis following Hurricane Irma. This data is very easy to compare to the FCC’s county-level daily data on cellular outages.

This memo also utilizes outage data from two utilities serving areas affected by Hurricane Harvey in Texas – AEP (serving the southern Gulf Coast of Texas) and CenterPoint Energy (serving Harris County/Houston).

**News Coverage and Other Sources:** This memo includes news coverage of communications infrastructure failing during Hurricane Harvey and Hurricane Irma. This memo also includes population figures from the U.S. Census Bureau.