## FDOT Roadway Wind-Speed Monitoring

Florida Department of

#### In 2012 FDOT began monitoring wind speed conditions in real-time on approximately 20 critical roadways in the Jacksonville, Florida area

- The information is available in the FDOT traffic management centers around the state and shared with local public safety agencies
- During the 2012 Hurricane Season two tropical storms hit Jacksonville and the wind speed monitoring system supported the FDOT and public safety response
- The FHWA has named the project a "Best Practices" transportation tool for state DOTs

# How it works

 FDOT has worked with the National Oceanic and Atmospheric Administration (NOAA) to win approval to use their satellite-based "Data Collection Service" (DCS) to deliver wind speed sensor data







# Significant Cost Savings

- Equipment/Installation Cost ~ \$10,000 per site
- No operational costs for receiving sensor data via NOAA satellite service
  - Using cellular modems at 100 sites would cost:
    \$5,000 a month / \$300,000 over 5 years
- No distribution costs for delivering data via the FDOT microwave network
  - Installing dedicated data communication circuits from the satellite ground station database to 8 locations such as TMCs would cost:
    - \$8,000 a month / \$480,000 over 5 years

# Data Integrity

- The FDOT ground stations at Lake City and Tallahassee receive the wind speed data directly from the GOES satellite.
- Dissemination to FDOT TMCs is via FDOT's redundant and resilient enterprise microwave and fiber network
- The internet has proven unreliable during severe weather events but this system does not rely on it to deliver wind speed data to the TMCs.
- Many TMCs have public safety representatives present during emergencies, reducing further the reliance on the internet for even partner agencies to receive wind speed information.

# The Data

- Each site sends in wind speed data as often as once an hour or when a preset threshold is crossed.
- · Data that will be transmitted will include specific wind statistics: Mean, Std. Dev., etc.
- · Data transmissions for wind speed threshold alarms will be sent multiple times to ensure successful communications.
- Transmissions are limited in size.

Wind Speed Data Website: Displaying Original 20 Wind Sensors in Jacksonville FL area

FDOT High Wind Report Last Updated 15/09/2012 09:22:40												
But	Patterniti	and a	COLOR TO COL	County	Steeriline.	Report Time	day lama	Autor	. we be	(Gand Spinst)	1002	
1	PDeepoosi	uith 300	Terrentitie	frances	16/06/09/2	99-00-00	- A.	1.8	MV.		61	
2	POMIDIC	Frankround	designments :	Danet	10010912	10.00-02		42	21		20	
	PONLIPS	Bush Bird	distance lie .	Durpl .	18494-CHFE	08-00-10	- 8	14		4		
4	PERMIT	J18-Meridian	Jacksonville.	Danal	10060612	08-00-82	1	1.8	- 24	- 1		
.8	PC0686 04	View	View faarin	Builder	18000012	38-88-82	T	1.8	- 64		16	
8	POREHEC	Buildenen	darken eine	Danet	10000012	20-00-00	-1	14	- 08			
1	PORCHIPE	Bridge address	Witegester .	Builderer	10000012	08-00-14	M	1.0		- 11	NG.	
4	POSSAGE	Durnes Point	-automotion	Gurlat	10060012	100.08-02	. 11	38	1.1	- 24	16	
	TOOMALS.	DEIH	H-Department -	Builded .	Telepoons.	08.08-12	1	14	WW.	. 4	84	
**	PONCOC	Marin Dire	dailane rite	Danat	10/00/00/2	10-10-12		44	- 18	10	10	
+4	7046066	Dome's total	Planting March	(Day)	INVESTIGATE 1	00-04-42	1.8	10	NW .	- 16	-	
44	FD00P494	100 100	Concertification	it-laters	18/06/3812	08-06-62	1	1.0	16	24		
10	PCenses.	Puller Klennik	-intertoile	Burel	Telepoint.	88.07.08		6/8	818	610	611.8	
-10	POMUTE	and a	dalastel	florest	10/00/01/2	49-47-12		.10	- 18	- 89		
-14	PD44307E	Bala Breat	Jackson Jile	Queal .	Interesting 1	00-00-00		84	- 94 - 1			
÷5.	FDE-1786	Plant	Jasééenville	Owned	18/96/812	99-99-25	46	1980	410	- 680	.58	
11	PDH476	Kathava	Antestolia	Ser.	10000013	10.01-10	· · · b · · · ·	8.8		- A		
**	101040	100 Total Privat	delettin .	(laiet)	10/06/0010	10108-00		44	alar'			
18	(COA441N)	& LINULDED	Antennille .	Quiat	Intelaction (2)	10112-00	1	10	- 100	10	NV	
16	POINTING	\$1460.000	Januar-Jila -	Owned	18/06/01/2	991645		1.0		- 28	16	
.88	POBABBAA !	146110	denteratorile .	Barat	184000042	0010-00	- 4	4.6			84	
88	POGLAMM	100.040	Fire Adda	B address	INNER CONTRACTORS	491040						

#### **Project Status**



- Two ground stations installed 2012-2013.
- Ground Stations updated 2016.
- 25 additional sites installed in the Florida Keys in 2016



First Installation: Atlantic Blvd, Jacksonville, Florida 8/16/2011

# **FDOT Wind Speed Sensor Sites**

- · Using lessons learned from the initial Jacksonville deployments and to save costs the FDOT selected existing concrete pole locations close to strategic Keys bridge sites
- · The following table lists the deployment sites in the Keys



Florida Kevs: Wind Sensor Location List

Sta Native	Location Decorption	Mile Market	Pole Stage	Polo Buigtr Adminis Ground Larvel (Face)
1	CCTV Pole	121-43	Round	
1	CCTV Pete	151-14	Square	19.
- 3	CCTV Inte	- IBL - 14	Rought	79 -
4	OCTV Pda	181-18	Reemi	34
1	CCTV Pete	051+194	Round	61
*	CCTV Pete	1051-252	Round	93
	CCTV Pela	101 - 11	Round	19
	CCTV Pole	101-113	Round	10
	COTV-Mee	101-14	Road	10
10	CCTV Pole	1882 - 393	Sceni	49.1
11	COTV Pole	011-48	Estati	100
11	CCTV Pela	UIL - 10	Round	13
12	CCTV.Pile	011-39	Round	34.
. 14	OCTV Puls	USt - 62.8	Round	996
15	CCTV Pale	1211-340	Rosal	60
14	CCTV/Pele	1017-21.8	Rend	398.
17	EUTV Ne	UH + 17	Norpel	34
18	CCTV Pile	011-10	Round	28-
10	CCTV Inte	$131 \pm -18.1$	Sound	81
-20	CCTy Jule	151 - 91	Square	14
11	ECTV Pube	1911-110.8	Round	14
- 23	CCTV Net	101 - 107.8	Round	79
-73	CCTV Pela	UNI - 132	Renal	11
. 24	CCTV Pole	181-1211	Round	18
- 15	OCTV Puls	C\$803-47	Round	108