Volusia County Road & Bridge and Drainage

Asset Management
Volusia County (FL) Public Works



About Volusia County, FL

- Population 494,000 (2010 census)
- 400+ employees in the Public Works Department
- Started using Lucity in October 2007

Road & Bridge/Stormwater Traffic Engineering Coastal Utilities Solid Waste Mosquito Control

- ArcServerWeb map (EMS)
- Road & Bridge/Stormwater Assets Maintained in Lucity and GIS
 - 1,047 centerline miles of roadway
 - 274 miles of sidewalks
 - 49 bridges
 - 160 miles of open channels
 - 323 miles of roadside ditches
 - 8,224 drainage structures
 - 200+ miles of storm pipes
 - 269 retention ponds



Road & Bridge Background

PRIOR TO OCTOBER 2007:

- Data stored on a mainframe (called TIS)
- No mapping
- Very little drainage inventory information
- Work orders tied to entire lengths of roads
 - Difficult to search for specific segments
 - Details & notes in work orders were very vague



The Transition to GBA/Lucity

- Hired LA Consulting to evaluate the Public Works program
- Huge effort put into data collection
- Video Van was very helpful in gathering data
 - County "videoed" all county maintained roads in 2006
 - Images from Video Van were used to identify assets
- Hired Southeastern Surveying to survey canals

Volusia County

- Each division has superusers to manage data
- Superusers continually managing records in Lucity and updating assets in GIS

Improved Work Orders

- Updated and Improved Unit of Measure
 - Retention area maintenance (mowing) = acres, roadside
 ditch clean = linear feet, street sweeping = curb miles, etc.

More tasks

- Previously only had a few vague tasks
- Now tasks are associated to assets:
 - Retention areas: Maintenance, repairs, spraying
 - Drainage pipes: Installation, cleaning, repairs
 - Drainage structures: Installation, cleaning, repairs
 - Canals: Mowing, spraying, cleaning
 - Roads: Swale construction, roadside ditch cleaning and spraying



Yearly Plan

- Plan work for the upcoming year
- Two week schedule meetings
- Productivity reports
 - Review monthly with supervisor and division director
 - Look at Average Daily Production (ADP) and cost
 - High or low ADP can either be an abnormal work order or maybe the plan needs to be adjusted
- Look at Routine vs Response Maintenance



Productivity Report

5/16/2018 7:25 AM

Drainage

Work Status Detail Report October - September FY 2018

_																		
			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	St	mmary Tota	is.	
2303 L	ROADSIDE DI UOM wear Feet	TCH CLEAN/MECHANI Plan Lebor Deys: Actual Lebor Deys: Actual ADP: Actual Unit Cost:	93.7 74.7 326.5 \$1.89	83.7 74.3 289.9 \$1.85	83.7 65.9 399.0 \$1.43	83.7 59.6 286.5 \$1.79	83.7 90.6 360.0 \$1.52	93.7 105.8 297.8 51.68	93.7 88.2 316.5 \$1.70	83.7 28.5 317.9 \$1.74	83.7 0.0 0.0 50.00	83.7 0.0 0.0 50.00	83.7 0.0 0.0 \$0.00	83.7 0.0 0.0 50.00	Labor Days Plan:1,004. Actual: 587.		230 0 324 0	92.1 \$2.1 \$1.6
2304	UOM Acres	REA CONSTRUCTION Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 30.00	0.0 0.0 0.0 \$0.00	0.0 10.5 0.0	0.0 0.0 0.0	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	Labor Days Plan: 0.1 Actual: 10.5		0.0 0.0	Unit Cost \$0.00
2306	MECHNICAL O	Plan Labor Deys: Actual Labor Deys: Actual Labor Deys: Actual ADP. Actual Unit Cost	1.4 1.9 2.1 \$224.91	1.4 0.2 10.0 \$57.90	1.4 1.0 0.0 \$0.00	1.4 3.0 1.3 \$327.46	1.4 1.0 2.0 \$271.40	1.4 1.4 2.1 \$272.71	1.4 2.0 19.0 \$30.84	1.4 0.0 0.0 \$0.00	1.4 0.0 0.0 50.00	1.4 0.0 0.0 \$0.00	1.4 0.0 0.0 50.00	1.4 0.0 0.0 50.00	Labor Days Plan: 16. Actual: 10.		3.0 5.0	Unit Cost \$227.38 \$101.04
2307	HAND CLEAN UOM Each	DRAINAGE BOX Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost.	6.1 0.6 6.3 \$76.15	6.1 0.0 0.0 50.00	6.1 3.1 2.0 \$228.29	6.1 13.0 14.1 \$27.28	6.1 2.6 33.8 \$10.77	6.1 7.5 7.1 \$60.60	6.1 12.5 18.4 \$17.33	6.1 6.0 30.0 \$11.70	6.1 0.0 0.0 \$0.00	6.1 0.0 0.0 \$0.00	6.1 0.0 0.0 50.00	6.1 0.0 0.0 50.00	Labor Days Plan: 72. Actual: 45.		30.0 16.4	910.3 \$22.8
2309	UOM Hours	Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	18.1 56.4 \$40.29	18.1 17.5 \$55.62	18.1 12.1 \$121.15	18.1 5.8 \$91.07	18.1 12.6 \$95.03	18.1 4.3 \$120.30	18.1 16.4 \$100.49	18.1 0.0 \$0.00	18.1 0.0 \$0.00	18.1 0.0 80.00	18.1 0.0 \$0.00	18.1 0.0 \$0.00	Labor Days Plan: 217. Actual: 127.	Work Qty 2 2.172.0 1,270.5	ADP	984.1 \$68.3
2311 L	DITCH CLEAN UOM inear Feet	I/MECHANICAL NO HA Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	6.9 0.0 0.0 \$0.00	6.9 0.0 0.0 \$0.00	6.9 5.0 303.4 \$3.26	6.9 14.0 333.3 \$3.07	6.9 24.8 251.2 \$3.85	5.9 5.2 168.3 \$7.13	6.9 13.6 211.2 \$6.03	6.9 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	6.9 0.0 0.0 \$0.00	6.9 0.0 0.0 \$0.00	6.9 0.0 0.0 \$0.00	Labor Days Plan: 82. Actual: 62.		460.0 258.1	92.5 \$4.14
2312	DITCH CLEAN UOM mear Feet	INGMECHANICAL - H. Plan Lebor Days: Actual Lebor Days: Actual ADP: Actual Unit Cost	28.7 68.8 401.4 \$1.05	28.7 69.2 251.3 \$2.94	28.7 44.5 283.8 \$2.39	28.7 42.7 414.3 \$1.76	29.7 21.1 144.8 \$4.98	28.7 24.1 42.6 \$19.01	28.7 34.1 181.9 \$3.95	28.7 0.0 0.0 \$0.00	28.7 0.0 0.0 50.00	28.7 0.0 0.0 \$0.00	28.7 0.0 0.0 \$0.00	28.7 0.0 0.0 50.00	Labor Days Plan: 344. Actual: 304.		ADP 182.8 281.2	Unit Cost \$3.8 \$2.5

Unit Cost = Cost / Quantity

ADP is not calculated if a task has a UOM of Hours as this does not provide.

FLORIDA

Productivity Report

5/16/2018 7:25 AM

Drainage

Work Status Detail Report October - September FY 2018

			Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep		Sum	mary Total	2	
1205	HAULING MAT	Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	2.4 5.0 4.4 \$145.55	2.4 3.6 3.3 \$188.97	2.4 3.0 4.7 \$344.10	2.4 10.6 2.8 \$286.59	2.4 19.6 3.0 \$351.16	2.4 5.4 4.6 \$114.20	2.4 7.5 5.1 \$124.92	2.4 0.0 0.0 50.00	2.4 0.0 0.0 \$0.00	2.4 0.0 0.0 \$0.00	2.4 0.0 0.0 \$0.00	2.4 0.0 0.0 \$0.00	Plan: 3	29.3 54.7	Work Gry 117.0 199.0	4.0 3.6	Unit Cost \$201.8 \$232.4
4207	CLEAN CURB	& GUTTER MECHANIC Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	21.7 15.3 8.2 \$89.54	21.7 14.4 5.7 \$129.51	21.7 21.0 13.5 \$55.36	21.7 25.8 12.6 \$61.09	21.7 23.4 7.5 \$100.96	21.7 6.4 15.0 \$61.23	21.7 26.1 15.9 \$47.09	21.7 8.3 4.0 \$175.04	21.7 0.0 0.0 50.00	21.7 0.0 0.0 \$0.00	21.7 0.0 0.0 \$0.00	21.7 0.0 0.0 50.00	Plan: 20	bor lays 60.3 40.7	Work Qty 2,082.0 1,537.4	8.0 10.9	Unit Cost \$92.60 \$68.60
4209 L/	INSTALL DRA	PIPE Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	51.8 52.5 10.1 \$69.52	51.8 102.2 2.2 \$240.83	51.8 66.5 7.3 \$84.55	51.8 103.4 6.0 \$102.19	51.8 97.4 6.2 \$92.63	51.8 36.0 4.1 \$198.72	51.8 68.2 7.8 \$94.41	51.8 0.0 0.0 \$0.00	51.8 0.0 0.0 50.00	51.8 0.0 0.0 \$0.00	51.8 0.0 0.0 \$0.00	51.8 0.0 0.0 50.00	Plan: 63	ays 22.0 26.2	Work Qty 3,110.0 3,142.9	5.0 6.0	Unit Cost \$140.84 \$106.12
1210	REPAIR DRAII UOM Repairs	NAGE SYSTEMS Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	41.7 21.2 0.7 \$8,621.91	41.7 24.7 0.2 \$1,766.07	41,7 24,1 0,5 \$7,187,92	41.7 31.0 0.5 \$1,004.85	41.7 22.2 0.9 \$631.52	41.7 42.1 0.3 \$1,855.18	41.7 63.0 0.3 \$2,658.23	41.7 4.3 0.9 \$499.49	41.7 0.0 0.0 \$0.00	41.7 0.0 0.0 \$0.00	41.7 0.0 0.0 50.00	41.7 0.0 0.0 50.00	Plan: 45	ays 99.9 32.4	Work Qty 250.0 100.0	0.5 0.4	9902.5 \$3,185.1
1215 Sq	SWALE MAINT UOM uare Foot	FENANCE Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00		o.0	Work Qty 0.0 0.0	0.0 0.0	Unit Cost \$0.00
4217 Li	SWALES CON UOM near Feet	STRUCTION Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	0.0 1.5 66.7 \$13.59	0.0 6.9 14.5 \$26.17	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 30.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 50.00		0.0 8.4	0.0 200.0	0.0 23.8	Unit Cost \$0.00 \$19.88
1218 Li	SHOULDER R UOM near Feet	EPAIR-MECH Plan Labor Days: Actual Labor Days: Actual ADP: Actual Unit Cost:	0.0 0.7 456.9 \$1.25	0.0 0.0 0.0 \$0.00	0.0 7.8 191.7 \$3.24	0.0 3.9 192.8 \$2.82	0.0 2.3 440.9 \$1.55	0.0 44.8 24.5 \$42.14	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 \$0.00	0.0 0.0 0.0 50.00	0.0 0.0 0.0 \$0.00	0.0	Plan:	o.0 59.5	Work Gity 0.0 4,662.1	0.0 78.4	Unit Cost \$0.0 \$11.8

Unit Cost = Cost / Quantity ADP = Quantity / Labor Days

ADP is not calculated if a task has a UOM of Hours as this does not provide
any beneficial information. A worker does it day of work in 1 labor day.

Routine Maintenance

- Certain tasks are scheduled every year
 - Retention area maintenance: 6 times a year
 - Street sweeping: 6 times a year
 - Chemical weed control: 3-4 times a year
- Supervisors used to select assets from map
- Now templates are used
 - Work Orders are created with select assets
 - Auto-generated



Response Maintenance

- Some tasks are planned but locations aren't specified
 - Drainage repairs
 - Inlet/pipe cleaning
- Call comes in asset maintenance is verified
- If County maintained, a request is created
 - Supervisor inspects the problem
 - If work is necessary, supervisor creates WO
 - If no work necessary, supervisor adds comment to request and changes status to No Work Necessary

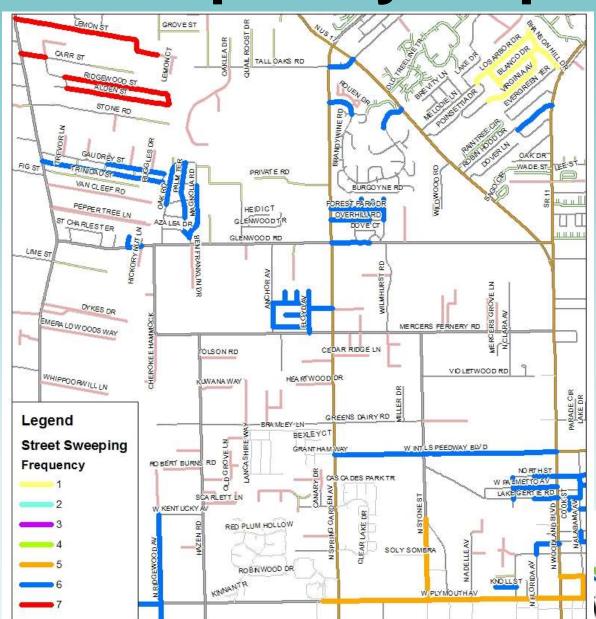


Frequency Map

- Run frequency in Lucity using task and dates
- Viewing the frequency info on map allows you to see where you might be missing or overdoing scheduled maintenance
- Helps to find problem areas
- Also another version of QA/QC



Frequency Map

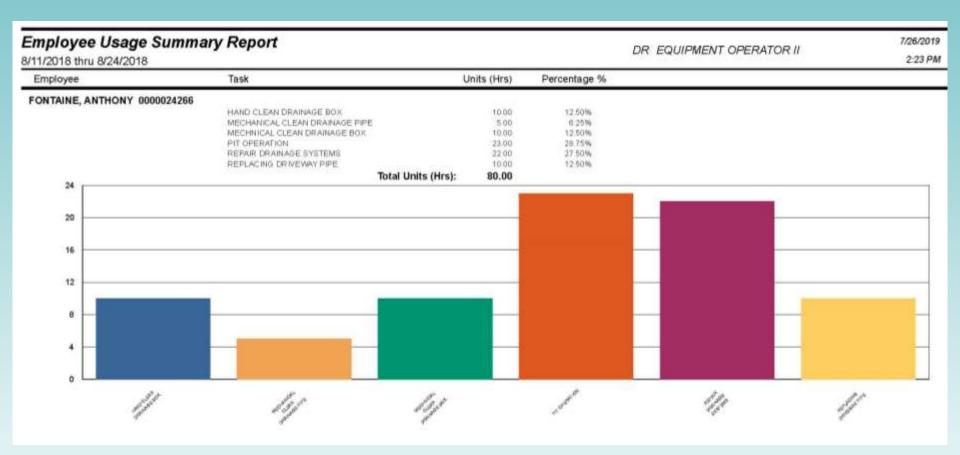




Several reports available to pull data

Task Summary Report rainage Task FY 17/18					7/18/201 2:24 PI
Task		**WOs	Units	*Total Cost	*Avg. Cost/Unit
2303 ROADSIDE DITCH CLEAN/MECHANICAL		44	368,736.00	\$628,114.24	\$1.70
2311 DITCH CLEAN/MECHANICAL NO HAUL		24	65,242.80	\$144,161.90	\$2.21
2312 DITCH CLEANING/MECHANICAL - HAUL		48	128,830.30	\$381,209.95	\$2.96
4207 CLEAN CURB & GUTTER MECHANICAL		45	3,175.94	\$178,170.46	\$56.10
4209 INSTALL DRAINAGE PIPE		54	6,050.25	\$588,968.08	\$97.35
	Totals:	206	-	\$1,920,624.64	







	e Usage Summa ru 8/24/2018	ry Report					DR EQUIPM	ENT OPERATOR III	7/26/20 2:25 F
mployee		Task			Units (Hrs)	Percentage %			
IBBERLY,	WILLIAM 0000023012	MECHANICAL OL REPLACING DRI	ECHANICAL NO HAUL RIALS LEAN DRAINAGE PIPE NEWAY PIPE H CLEANMECHANICAL		3 80 10 00 19 50 9 50 4 00 22 50 5 80 5 80	3 82% 12 74% 24 84% 12 10% 5 10% 28 88% 6 37%			
24 -		1 KANTING	Tot	al Units (Hrs):		0.07%			
20							4	-	
16									
12									
4									
0				_		4			la la
	11	1/1		11		1	//	p. of	
	/	30	-	00		,	3	/	



Road Centerline Costing Report

Excludes Traffic Engineering Study Related Work

From 10/1/2017 thru 9/30/2018

Control IDs in order entered as parameter(s):

008611,008638,008637,008625,011554,008607,008613,0 08614,008609,008626,008624,036903

Drainage

CLEAN CURB & GUTTER MECHANICAL TOTAL 10,570.40 ROADSIDE DITCH SPRAYING TOTAL 1,970.95

> ROAD AND BRIDGE 12,541.35

> > 186,505.29

Drainage Total: \$12,541.35

Road and Bridge

BRUSH CUTTING-HAND TOTAL 2,049.82 CLEAN CURB AND GUTTER - HAND TOTAL 2,992.67 FLAT MOWING TOTAL 169,095,14 LITTER REMOVAL TOTAL 7,304.68 QUICK KURB/DELINEATOR INSTALLATION TOTAL 1,458,28 REQUESTS FOR SERVICE TOTAL 2.368.01 ROAD & BRIDGE ASSET INSPECTION TOTAL 204.52 SIGN INSTALLATION/REPLACE TOTAL 289.22 SIGN MAINTENANCE TOTAL 742.95 COUNTY OF VOLUSIA - TRANSPORTATION TRUST

Road and Bridge Total: \$186,505.29

Grand Total: \$199,046.64



09/04/17 to	- CAT A (DEBRIS 09/11/17 if meeting tasks excluded	S REMOVAL)					Tru	vings Benefit Raties reportlation Trust Mosquittle Contins General Countly	67.88% (DI.78%) 60.96% (DZ.88%)	20/2-13/21/ 62/19/(16/60 20/3-13/6(16/60 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-13/21/ 20/2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2-2	0 86429166	(24)	Volusia Erulamo etiano	Road and Bridge Country Florida ton other December Design the autom
Group	Resource Code	Resource Name		Heg Hes	OT	Equip Hrs	Matierial Ony	Emp Hr Ratio	Uniti Costi	Labor	Equip Costi	Matterials Costi	Continuation Costi	Total Cost
Asset ID1	Anst 02	THE MANAGEMENT OF THE PROPERTY OF	Accet Detail	-						Lat/Lo	1191	Community		npletion Date
001890	300270 - 0.375		WIDHIBOHST - Prom	NBOUN	DARY AV	To STEWART W	,			0.01000000	-81"19"14.889		7777	89/12/2017
001797	100771-0		STEWART AV - From 9								-81" 19" 17.204			19/12/2017
001999	300771 - 0.126		STEWART AV - From Y	WRICHA	W To W C	HURCHST				29" 1" 48.79/"	-81" 39" 17.019	P DELAND		69/12/2017
(02904	200271 - 6.188		STEWART AV - From V	W CHURC	DHST TOW	WISCONSIN A	w.				,-85° 19' 17' A17			89/12/2017
009643	100771-0-291		STEWART AV - From V								81"19"17-326			09/12/2007
005643	300790 - 0 200790 - 0.188		CRANLEIGH AV - From CRANLEIGH AV - From				PARE:				-81'19'22,167 -81'19'14.641			09/12/2017
005696	100793 - 6.347		3 REGEWOOD AV - H					5			-81°20°24.868			09/12/2017
005695	300793 - 0.862		5 RIDGEWOOD AV - R	NO COLUMNIC		The state of the s					-81" 20" 25 A17	100000000000000000000000000000000000000		19/32/2017
003476	100798-0.124		W.EUCUDW-Rom	OLD NO	W YORK AN	To SIGRAND A	W				-85" 20" 46.075			194712/2017
001262	100898-0		(EANETTE DE - Provi	MA SOUTH	MALL SECTION	more and a second					-81139729.388	DELAND		09/12/2017
CONTRACTOR DESCRIPTION OF THE PERSON OF THE	RUSH REMOVAL	the roads due to Hurrica	ine Irma. Cleaning Mi	oeds / I	nitiai pus	n after hums	ane imia Majo	r Thoroughtares	and Seconda	ny Roads				
Employee	0000016540 ==	BRANCH, JAMES M		5.00				\$16.37	\$27.39	\$246.52				\$246.52
Equipmenti	178455 (8901)	FORD 9350				9,00			\$12,30		\$110.70			\$110.70
Employee	0000016176	BOGAN, IAMES R		8.50				\$16.97	\$29.39	\$241.01				\$341.91
Equipmenti	159231 (9297)	GRADALL KUX100		124		2.50			\$105.46		5899.41			\$896.41
Employee	0000023839 *5	LOPEZ-HEYES, MICHAEL		8.50				\$14.63	\$24.48	\$208.09				\$200.09
Equipmenti	161446 (9394)	GMT 950G				850			\$59.30		\$504.05			\$804.05
Employee	0000024172 ==	FFTZGERALD; JESSE 3		8,50				\$11.63	510.46	\$163.39				\$165.39
Employee	0000022429 ***	LEARY, AARON		830				\$12.04	\$20,14	\$171.18				\$171.18
Equipmenti	195500 (9002)	GMCS/ERRA 2500				8.50			\$17.65		\$150.03			\$150.03



Maintenance Data Uses

- Work Planning/Budget
- Community Rating System
 - Document flood prevention activities
 - Volusia County's rating is a 5, equates to a 25% reduction in flood insurance costs
- NPDES Permit
 - Document nutrient removal activities (iestreet sweeping, ditch cleaning, etc.)

Planning Example

											Dra	inage	Work	Plan	FY 18	/19														
Total Dwy (1730 195)	1210	1730	3790	1790	1790	1 1220	2780	1790	1790	1730	1730	1730	1.730	4780	1675	1710	1730	1790	1730	1630										_
Task and Resource (44 Employees) TW III = 1 TW III = 3 Super III = 5	1730	1730	100	1/10	1/30/	1730	1730	1790	5	ACRO	1730	1/30	1730	1730	1075	6	1,130	27.00	N.	1030										
Super II = 1 EO III = 14 EO II = 8 EO I = 8 CST = 4	Sill (McGen)	DV1 (Name)	FOII Footman	S III (Parker)	(4019) (E 03	EO III (Evens)	TW II (Verays)	80 il (Fontaine	TW III (Tarborou	EO III (I Luther)	BO III (Jackson)	EO II (Alvanez)	E0 I (Peters)	S III (Lindsay)	EO III (Dockery	CST (Weodruf	CST (Blahop)	S III (Branch)	EO III (Dubbert	(Aqsoog) III (Boospy)	DAY LABORS	ANNUAL TASK HOURS	Annual Work Quantity	CHEW	CREW DAYS	CHENNISE	LABOR DAYS	Dennie Committee	Projected Days	3 year ang days
0101.5UPERM5K0N (HRS)	350			550					450		-	-		300				450				2,500	2,500	30	250.00	- 1	250.00	229.00	274.50	278.00
0102 MILLTING (HRS)	100	10	10	58	10	10	10	10	100	10	10	10	10	-40	10	10	10	40	10	10		745	745	10	74.50	1	74.50	55.00	66.00	80.00
0303 TRAIMING (HRS)	40	10	10	40	20	20	. 20	20	40	10	10	10	10	40	20	-40	40	20	10	10		1,230	1,210	2.0	123.00	- 2	123.00	187.00	218.40	189.00
2008 DITCH INSPECT/SURIVEY (IVII)	1						-		50	10	10			225		45	190	40	20	20		820	820	20	82.00	- 1	82.00	79.00	94.80	96.00
2010 RETENTION AREA MAINT (AC)														135	1530	265					2907	6,477	1,295	3.8	340,89	.1.9	647.70	632.00	75R.40	568.00
2202 ROW SPILAYING (AC)	9 3						3							7			120			- 8		315	255	. 5	31.50	1	51.50	61.00	73.20	21.00
2205 RETENTION AREA SPRAYING (AC)	11-5						- 1						10.00			125	370					855	1,368	16	85.50	- 1	85.50	43.00	11.60	71.00
2206 RETENTION AREA SURVEY (EA)								$\overline{}$						140		-	80				$\overline{}$	300	600	20	30.00	1	30.00	15.00	18.00	28.00
2301 ROADSIDE DITCH SPRAYING (AC)	17															1000		1				2,000	1,600	12	133.33	1.5	205.00	111.00	133.20	131.00
2302 DITCH CLEAN - HAND (LF)	7. 5	- 0									40		40	70		190	150	20	50	- 50		1,280	64,000	1000	64.00	- 2	125.00	63.00	75.60	255.00
2303 ROADSIDE DITCH CLEAN/WECH (LF)	1 1													1	- 1	-	-	80	1100	1360	2470	12,010	276,230	1035	266.89	4.5	1201.00	976.00	1171.20	808.00
2306 MECH CLEAN DRAIN BOX (EA)						40																160	45	- 6	8.00	- 2	16.00	16.00	19.20	16.00
2307 HAND CILAN DRAIN BOX (EA)	8 2			10		30	30	30										1				460	1,380	30	46.00	2	46.00	68.00	81.60	52.00
2309 PIT OPERATION (HII)	40.00	1.0	10				200	-	:40	400	200		240									1,730	1,730	10	173.00	1	173.00	170.00	204.00	221.00
2311 DITCH CLEAN/MECH NO HAUL (LF)									30	115	180		115									795	36,570	460	79.50	1	79.50	110.00	132.00	77.00
2312 DITCH CLIAN/MECH HAUL JUFI	-							=	30	835	930	600	935									5.035	85,595	731	117.09	4.3	503.50	415.00	303.60	558.00
2313 CHEM DITCH MAINT (LF)	0.5									-							720	4				1.610	1,795,955		161.00	1	161.00	94.00	112.80	108.00
2315 HOW MOWING FLAT [UF]												1060					-					1,060	1,378,000	-	106.00	1	106.00	73.00	87,60	110.00
2316 ROW MOWING SLOPE (LF)												1000							250	100		1,070	64,200	600	107.00	- 1	107.00	60.00	72.00	134.00
6106 INSTALL CATCHSASIN/INLET (LA)	30	- 30	30																	-		550	17		11.00	- 5	55.00	29.00	34.80	76.00
4207 CLEAN CURB & GUTTER MECH [CURBMG	-	-	-					1500				_										2,680	2,152	- 4	269.00	-	269.00	210.00	252.00	239.00
4209 INSTALL DRAIN PIPE (LF)	550	825	825		_																	7,460	3,730	29	149.20	- 1	746.00	819.00	982.80	866.00
4210 REPAIR DRAIN SYSTEM (REPAIR)	30	40		40		290	1420	120													-	8,640	212	- 1	232.00	- 1	464.00	365.00	438.00	461.00
4219 MICH CLEAN DRAIN PIPE (IF)		-	-			1250	276.00	120														5,000	100.000	400	THE RESERVE OF THE PERSON NAMED IN	3	500.00	414.00	496.80	459.00
4230 INSTALL EXPLITATION TRENCH (LF)	450	465	655	-		44.00		-													-	5,520	3,312	30	110.40	- 6	552.00	482.00	578.40	414.00
4500 REPLACE DRIVEWAY PIPE [U1]	30	80	80																50	50		1.030	724	35	20.60	- 7	103.00	85.00	102.00	217.00
7802 RETENTION POND RESTORATION (AC)	30														100			1	-	- 30		200	4	0.4	10.00	2	20.00	0.00	0.00	28.00
7806 DITCH RESTORE/EHOSION REP (LF)							- 6		100	300	300	-	300		81/0/					- 6		1,600	14,400		32.00	- 6	160.00	135.00	162.00	196.00
7809 SW CCTV [LF)					1550				900	300	300		300									3,100	124,000	800	155,00	- 1	310.00	249.00	298.80	187.00
7813 DRAINAGE STRUCTURE INSPECTION (LA)				- 65	100													3				735	3,675	50	73.50	-	73.50	14.00	16.80	49.00
7899 SW REQUEST FOR SERVICE (EA)	45			100	400	100			80					135				720				380	464	30	58.00		58.00	51.00	61.20	46.00
9935 FELD SUPERVISION (HIII)	45	_		850					750					575				850				3,210	3,210	20	321.00	-	321.00	270.00	324.00	186.00
** Each person must have 173 Days	49			9.30					730					2/3				030				3,210	5,419	20	321/00	-	321.00	270.00	324,00	200.00
Crew ADP X Crew Days = Annual Work Quantity																														
Task Hours / 10 ~ Labor Days					-			_					-							-										
Lattor Day /Cnrw Size = Cnrw Days		_											_																	



CRS Data Example

Requested Work Form 10/2/2018 1:23 PM Request Received: PublicWebUser 1/10/2018 9-17 AM 1/24/2018 12:01 PM Status: WO Completed 18-00425 Priority: Supervisor: PARKER, LESLIE Follow-up: Requestor Name: KATHLEEN DAVIS Phone #: 386-214-9459 Business: Account #: Address: 359 WATER OAK LN Parcel #: ORMOND BEACH 32174 Home Phone: 386-214-9459 Work Phone: Phone 1: Phone 2: 386-214-9459 Location Affected Utilities Address: 359 WATER OAK LN PIPE 012575 ORMOND BEACH Problem: Flooding Category: Pipes and Culverts Cause: Parcel:

General Location: CHEROKEE

Information for Work Order

Here is my issue. I live on the corner of Water Oak and Cherokee. Every time we have a heavy rain the street flood in the corner of these streets and comes up my driveway. We?ve had cars stuck there for days, water splashing almost into my garage etc.

The issue is the drain is getting filled up with leaves, etc. I?ve had to go our on numerous occasions and clean it out to get the water to go down. This is very dangerous, I?ve almost been hit by cars, I?ve had to do this in thunderstorms, etc. I?m not sure why I am having to maintain this drain. It seems to get clogged once a week. Maybe there is another solution.

It was so bad this morning I could not get out of my driveway and had to drive over the lawns to get out to take my children to school and for me to go to work.

I am hoping some one could get back to me with some kind of solution to this on going problem.

CRS Data Example

	er Number: 18-0101	9					10/2/2018	1:23 F
Category: St	ructures		21	Priority:				
roblem: Fl	ooding		- 3	Crew:	Structure Main	t Crew & Eq		
lause: 51	ORMWATER		- 3	Supervisor:	PARKER, LES	LIE		
tain Task: Ri	PAIR DRAINAGE SYSTE	MS	- 9	Status:	Complete			
Vork Order Start Da	te/Time: 1/11/20	118	- 1	Work Order En	d Date/Time:	1/11/201	18.	
ally Units:				Unit of Measur	e: Repairs			
Requester Inf	ormation							
Name:	ormanon —	Phone #:	Addre	9881	Hom	e Phone #:	Work Pnon	e#:
KATHLEEN	DAVIS	386-214-9459		WATER OAK	The second second	214-9459		
was so bad this m or me to go to work	 It seems to get clogged orning I could not get out ne could get back to me w 	of my driveway and had t	o drive ove	r the lawns to	get out to take m	y children to sch	ool and	
ask Start Date/Time	With States of	in some and or souther		End Date/Tim	e: 1/11/2	018		
ask Code:	4210	Task Des	cription:	REPAIR D	DRAINAGE SYS	TEMS		
Employee Number 0000018378 0000024356	Employee Name VERWYS, MARTIN E WOODY, ZACHARY				Hours 10.00		VDE BOR RATE	
		55			10.00	DTT LA	BOR RATE	
Equipment Code 176529 176530 176538	Equipment D CAT MINI EX FLATBED TR FORD F550	escription CAVATOR			Hours 10.00 10.00 10.00	DTT LA	BOR RATE	

4.00

2.00

50.00

2.00

Each

Each

Each

Each

20- LB PAIL, HYDRAULIC CEMENT

GRATES STEEL 27 3/4"X 35 1/2"

BRICKS CLAY 3 HOLE

SLABS, TOPS (4'X4')

R-21030014

R-89021001

R-13508001

R-21036003



NPDES Data Example

k/Resource Sumi	mary Report			1/23/20 1:15 F	
ask Resou	rce		Units	*Total Cost	
207 CLEAN CURB & GU Employee	TTER MECHANICAL -				7
0000015773	HUFFMAN, DANIEL J		2.00	\$83.06	
0000018378	N - 1047-01-01-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-		8.00	\$315.10	
0000020908			1.00	\$27.55	
0000021930	14 - 4-5-17-17-17-17-17-17-17-17-17-17-17-17-17-		988.75	\$32.624.57	
	ELLINGWOOD, PETER		50.00	\$1,801.67	
000002310			1.00	\$23.78	
	LUTHER, DIL		8.00	\$247.78	
0000023743			1.00	\$23.43	
	FONTAINE ANTHONY		1,408.25	\$43,532.62	
DL-PACE-RE	3 - 4 14 3 1 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1		1.00	\$11.58	
			2,469.00	\$78,691.14	
Equipment	w supposer, respectively.		777441	A44117474	
165629			1.00	\$1.25	
16823	ST THE COLUMN THE PROPERTY OF THE PARTY OF T		1.00	\$27.53	
17485			20.00	\$195.60	
176529			8.00	\$73,36	
176530			8.00	\$10.00	
17653	N - 0 14 FE 15 FE 17 TO TO TO 15 E 15		8.00	\$72.24	
177446			1,382.25	\$61,936.06	
17842	1) - J. M.		2.00	\$12.56	
179904			1.00	\$9.03	
19421			988.75	\$45,072.69	
195567	KENWORTH FLATBED		8.00	\$72.24	
			2,428.00	\$107,482.57	4
Material D-0100	DEBRIS		2.800.00	\$0.00	
R-Water DE	The state of the s		43,425.00	\$0.00	
R-WaterDELAND	WATER - CITY OF DELAND		9,190.00	\$0.00	
R-WaterOE	WATER - CITY OF ORMOND BEACH		1,350.00	\$0.00	
R-WaterPC	경우 어떻게 되었다. 아무리 아무리 지난 말이 되지 않아 있다면서		1,275.00	\$0.00	A 2
R-WaterVO			5,195.00	\$0.00	
		38	63,235.00	\$0.00	
6-1		Task Total:	68,132.00	\$186,173.71	
		Grand Total:	68,132.00	\$186,173.71	ia Coun

Capital Improvements vs Increased Maintenance

Capital Improvement Projects

<u> </u>		
	Cost/lb TN	Cost/lb TP
	Removed	Removed
Retention/Detention Ponds	\$1,100-4,600	\$10,000-21,000
Stormwater Treatment Boxes	\$300-1,000	\$1,000-2,500
Bioswales	\$300	\$2,600
<u>Maintena</u>	ance Activities	
	Cost/lb TN	Cost/lb TP
	Removed	Removed
Street Sweeping	\$220	\$350
Open Channel Cleaning	\$4	\$11
Roadside Ditch Cleaning	\$13	\$32
Pipe Cleaning	\$80	\$200
Structure Cleaning	\$11	\$28

Questions?

