

NJDOT G.P.S. System Overview. A basic approach to asset tracking and reporting.

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Introduction

- Why did NJDOT decide it needed G.P.S.
- Choosing the right G.P.S. system
- System Architecture
- Basic Functionality
- Advanced Functionality overview (Bells and Whistles, how many do you need)
- Expectations of the system
- The Good, the Bad, and the Ugly

Blizzard of 12/26/2010



Complete road closures and over 550 private vehicles had to be towed off the state roads
Where were the crews and how could this happen

Antiquated two way radio system



Background

The justification:

- Better allocation and control of NJDOT resources; especially during a snow event
- Ability to "playback" the location of our resources
- Improved radio communications
- Improve the collaboration with NJSP and other state agencies in an emergency
- Capitalized on the NJSP new state wide "P-25" communication system that was being installed by Motorola.



State owned GPS enabled vehicles and devices "MARVLIS" server NJ State Police network End Users (NJ DOT Operations; NJSP; etc.)



"MARVLIS" System Architecture

Radio Control Head







Photos of the hardware installed in NJDOT's fleet of vehicles



Antenna

GPS and Cell Locator Devices

P-25 700/800 MHz Radio



MARVLIS Basic Functionality

- <u>Web-based</u>. No end-user software required. Only a web browser
- Navigation: Zoom in/out; East/West North/South
- Hover Over Icon: displays type of vehicle; direction; speed; time of update
 - Dump trucks update about every 32 seconds
 - Contractor radios update about every 120 seconds
- <u>Dump Truck Icon</u>: red square to show plow up/down; spreader on/off; lights on/off; dump body up/down
- <u>"Stopped Vehicle" Indicator:</u>
 - When a vehicle stops physically moving for at least 15 min, the icon will turn into a circle with quarter sections ticking down to 60 min



MARVLIS Basic Functionality

- <u>Search for a Vehicle</u>. Allows a user to find the current location of a vehicle
- <u>Playback Feature</u>. Allows a user to replay the route a vehicle took for a select period of time
- Location Report. Allows a user to extract the exact locations a vehicle was in for a select period time. Can be exported to Excel.



Marvlis Advanced Functionality



Near Real Time G.P.S. Map View





Real spreading data needed or not?

Latitude	Longitude	Direction Date	Time	Date_TimeTruck_Na	n Road_Tem Air	Temp Speed	l Di	istance Mode	Blast_Pa	s Granular	Gran_Rate Gran	_Lbs M	eas_Gra S	Spinner Prewet	PWet_Gal Pwe	t_Rate Mea	s_PweWarning
40.92759	-74.9144	74 12/14/10	09:30:54	12/14/10 0 TD10907	23	24	13	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92807	-74.9122	73.5 12/14/10	09:31:55	12/14/10 0 TD10907	23	24	1	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92856	-74.91	73.5 12/14/10	09:32:56	12/14/10 0 TD10907	21	24	13	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92873	-74.9093	73 12/14/10	09:33:57	12/14/10 0 TD10907	19	24	12	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92975	-74.9047	74 12/14/10	09:34:58	12/14/10 0 TD10907	18	24	15	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.93003	-74.8997	98.5 12/14/10	09:35:59	12/14/10 0 TD10907	19	24	15	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92992	-74.8991	105.2 12/14/10	09:37:00	12/14/10 0 TD10907	19	24	5	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92951	-74.8968	103.2 12/14/10	09:38:01	12/14/10 0 TD10907	21	23	16	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92895	-74.89	93.2 12/14/10	09:39:02	12/14/10 0 TD10907	19	24	21	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92652	-74.8823	125.7 12/14/10	09:40:03	12/14/10 0 TD10907	29	24	22	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92531	-74.8801	124.5 12/14/10	09:41:04	12/14/10 0 TD10907	23	24	12	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92408	-74.8773	116.4 12/14/10	09:42:05	12/14/10 0 TD10907	22	24	16	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92371	-74.8762	111.9 12/14/10	09:43:06	12/14/10 0 TD10907	25	24	12	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92267	-74.8703	96 12/14/10	09:44:07	12/14/10 0 TD10907	22	24	16	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92241	-74.8665	95.7 12/14/10	09:45:08	12/14/10 0 TD10907	30	24	21	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92218	-74.8637	95.5 12/14/10	09:46:09	12/14/10 0 TD10907	27	23	3	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.9218	-74.8582	95.5 12/14/10	09:47:10	12/14/10 0 TD10907	21	24	23	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92087	-74.8508	107 12/14/10	09:48:11	12/14/10 0 TD10907	25	24	22	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91894	-74.8429	101.9 12/14/10	09:49:12	12/14/10 0 TD10907	31	24	26	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.9189	-74.8409	86 12/14/10	09:50:13	12/14/10 0 TD10907	31	24	0	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91941	-74.8381	75.4 12/14/10	09:51:14	12/14/10 0 TD10907	21	24	20	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91925	-74.8312	116.4 12/14/10	09:52:15	12/14/10 0 TD10907	26	24	22	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91722	-74.8245	91.4 12/14/10	09:53:16	12/14/10 0 TD10907	22	25	21	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.9178	-74.8177	94.2 12/14/10	09:54:17	12/14/10 0 TD10907	20	24	22	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91747	-74.8158	109 12/14/10	09:55:18	12/14/10 0 TD10907	19	24	2	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91676	-74.8091	79.2 12/14/10	09:56:19	12/14/10 0 TD10907	24	24	43	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92313	-74.7962	78.5 12/14/10	09:57:20	12/14/10 0 TD10907	21	24	49	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.92081	-74.7815	153.6 12/14/10	09:58:21	12/14/10 0 TD10907	31	24	58	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91557	-74.7653	104.2 12/14/10	09:59:22	12/14/10 0 TD10907	29	24	59	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.91215	-74.7481	84.2 12/14/10	10:00:23	12/14/10 1 TD10907	20	24	56	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.90949	-74.731	118.4 12/14/10	10:01:24	12/14/10 1 TD10907	22	24	58	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.89911	-74.7192	156.9 12/14/10	10:02:25	12/14/10 1 TD10907	28	24	55	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.89074	-74.7087	104 12/14/10	10:03:26	12/14/10 1 TD10907	19	24	47	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.88854	-74.6978	70.7 12/14/10	10:04:27	12/14/10 1 TD10907	36	24	1	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.89303	-74.6978	49.5 12/14/10	10:05:28	12/14/10 1 TD10907	28	24	14	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
40.89312	-74.6973	100.2 12/14/10	10:06:29	12/14/10 1 TD10907	28	24	0	0 AUTO	Normal	SALT	150	0	254	2.5	0	0	0
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The eye in the sky near real time road conditions SITREP

- Crews call the REOC every 2 Hours to report the current road conditions
- REOC staff inputs data for visual awareness





What to Expect

- Union push back
- Employee push back
- Tampering with the system
- Speeding, Speeding and more Speeding
- Increase in discipline
- Increased productivity
- Increased resource management
- Decrease in inappropriate vehicle usage
- OPRA requests, get your DAG or IG to set policy against



Thank You

An open Q&A session will take place at the end of the G.P.S. session event?

