



CITY OF KNOXVILLE

Connected School Zones

City of Knoxville

At a Glance!!!

- ▶ 142 flashing school beacons
- ▶ 324 indicator Yellow LED (Light emitting diode) Modules for school zones
- ▶ 150 cabinet locations
- ▶ About 75% complete with initial installation

School Zones

▶ The Past

School Year

- ▶ Program each school clock at local cabinet location
- ▶ Laptop and cables required for programming
- ▶ EEPROM was capable of holding one year of data
- ▶ Approximately 8 weeks to complete programming and install in the field
- ▶ Any schedule changes were an additional 2 weeks after school began
- ▶ No overrides for weather days or other days not scheduled unless every location was manually turned off

Summer School

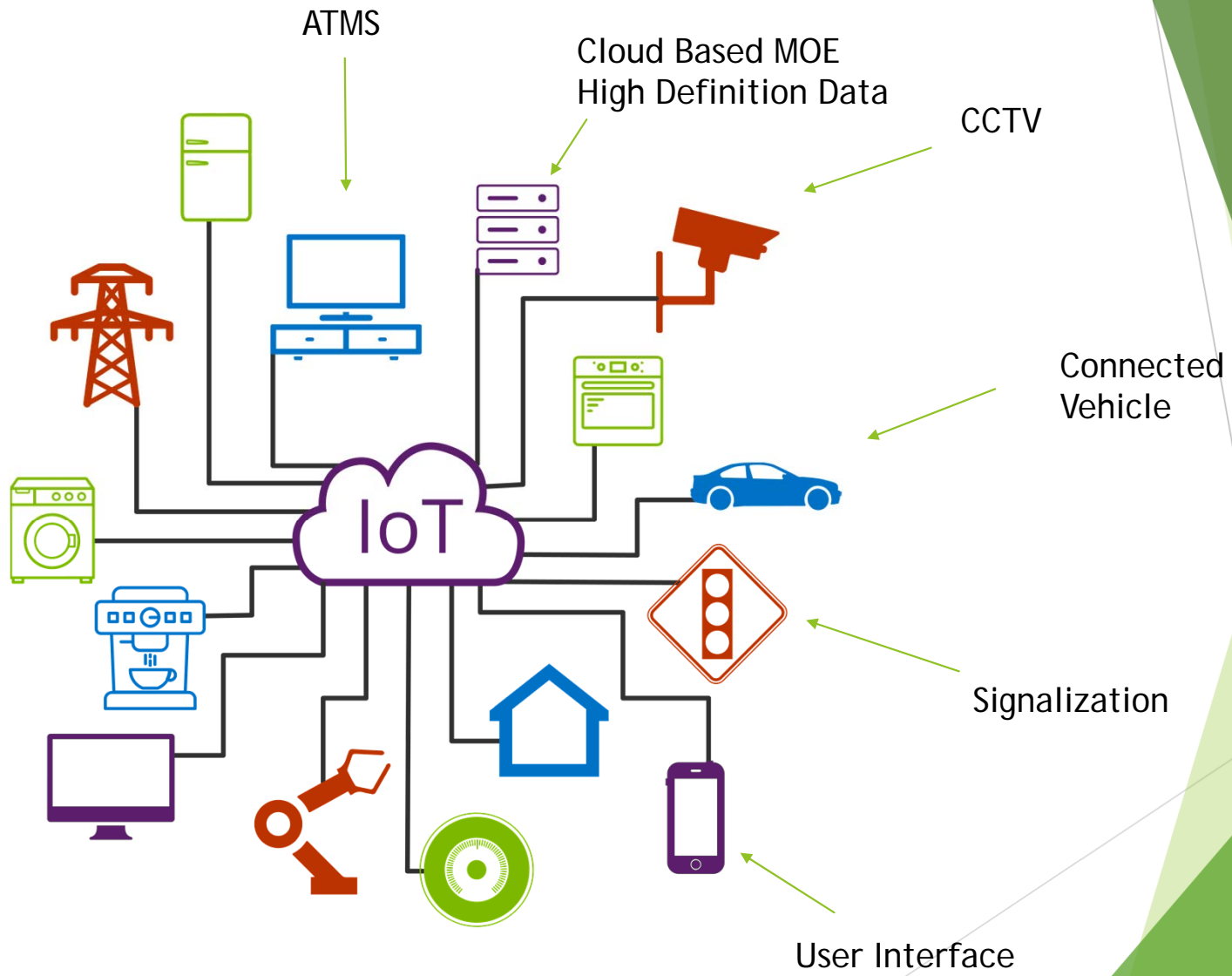
- ▶ Approximately 1 week to complete programming and field work
- ▶ Schedule changes occurred 3 days after start

In the field

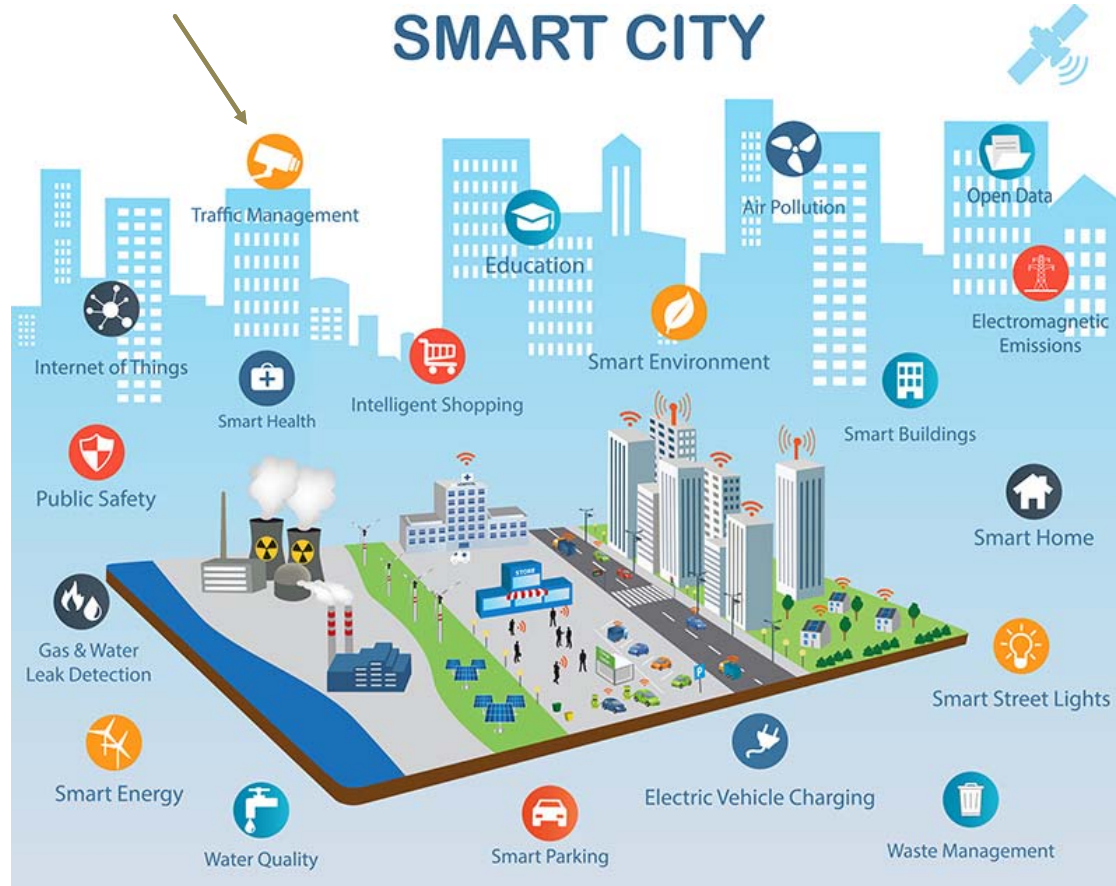


Challenges

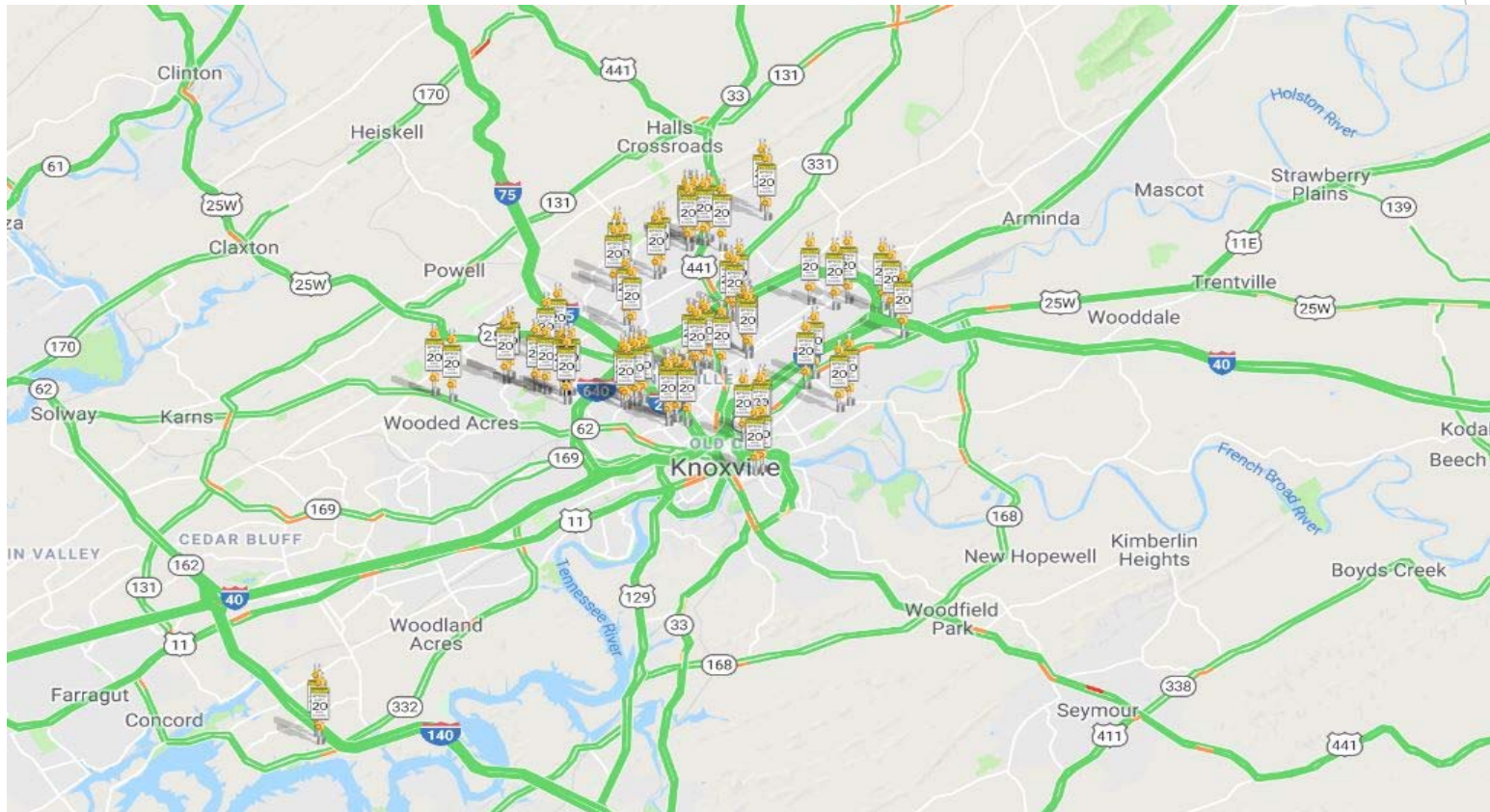
- ▶ No way to know if the LED's came on
- ▶ No way to know if a LED was bad or burnt out
- ▶ Power outages
- ▶ Time clock drift
- ▶ Man Hours
- ▶ No logs for reporting



Transportation



The Future of Connected School Zones



Connected School Zones

▶ The Future

School Year

- ▶ Cellular Communications and GPS
- ▶ Programming can be completed virtually anywhere and in less time
- ▶ Secured always connected web portal
- ▶ Additional alternate programs can be created
- ▶ Devices can be programmed with PC, Laptop, Tablet, or Phone with no cumbersome cables or connections
- ▶ Overrides can be accomplished by the “flip of a virtual button”
- ▶ Beacon On/Off acknowledgement
- ▶ Power Issues and alerts
- ▶ Additional features like; health status, voltages, and indicator status



System Observation

Current Error Status : **OK**
 Timezone : -5 Hours
 Time Since Last Contact : 19 Minutes 0 Seconds
 2/21/2018 10:50:06 AM

	Now	Min	Max	Avg
AC Voltage (V)	116.7	114.6	118.9	116.6
Monitor Battery (V)	14.2	14.2	14.2	14.2

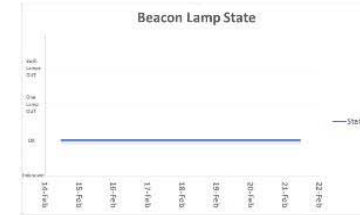
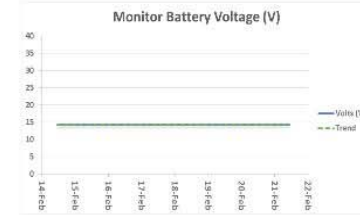
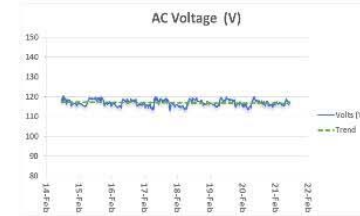
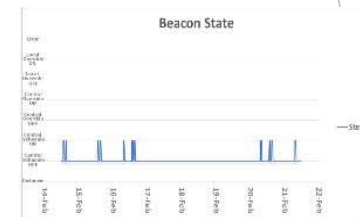
	Status
Cabinet Door	Closed
Beacon Status	Central Schedule - OFF
Lamp Status	OK

	Status
Beacon Control	<input type="radio"/> On <input type="radio"/> Off <input checked="" type="radio"/> Schedule

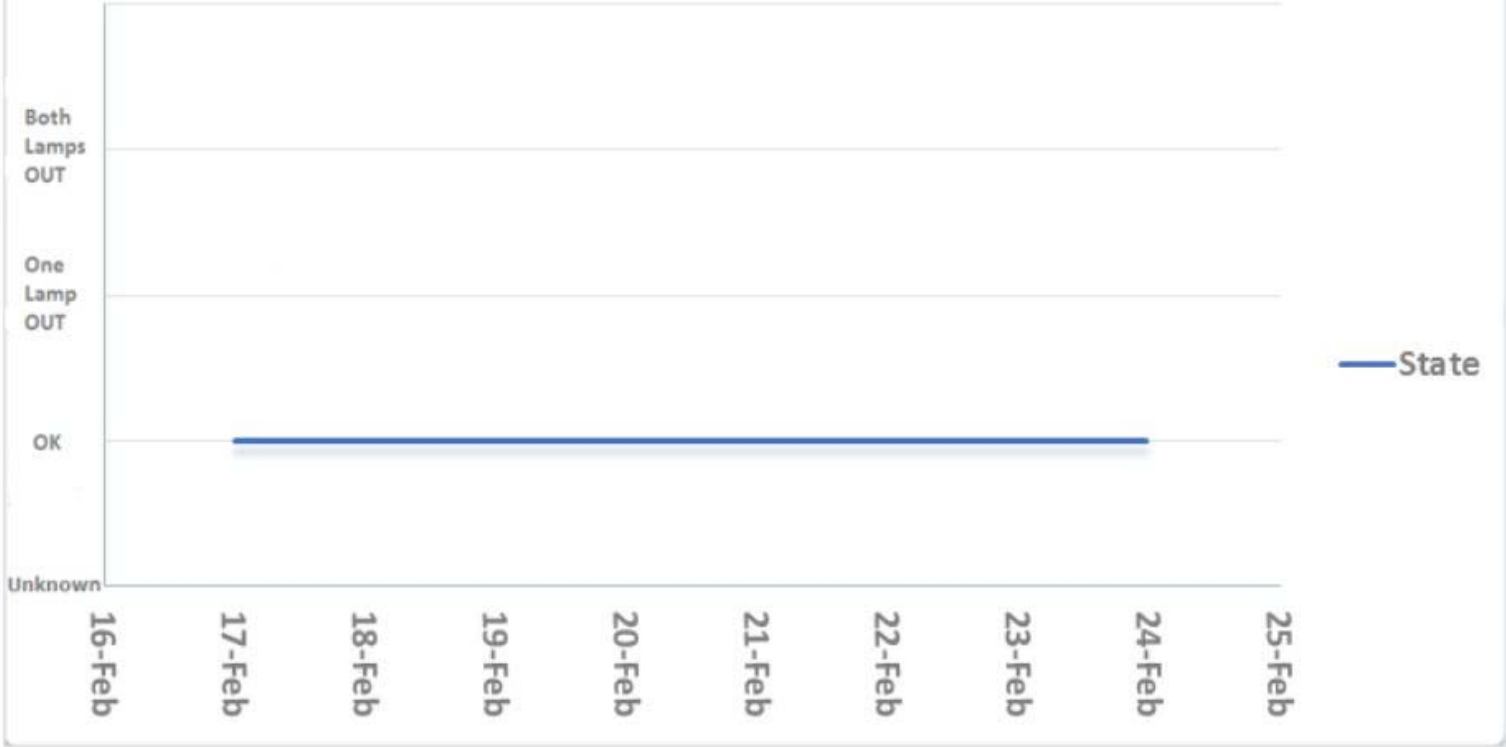
Next Scheduled Event...

Time	Schedule
1:00 PM Wednesday, February 21, 2018	Beacon ON
1:45 PM Wednesday, February 21, 2018	Beacon OFF
2:40 PM Wednesday, February 21, 2018	Beacon ON
3:25 PM Wednesday, February 21, 2018	Beacon OFF
7:05 AM Thursday, February 22, 2018	Beacon ON
7:50 AM Thursday, February 22, 2018	Beacon OFF
1:00 PM Thursday, February 22, 2018	Beacon ON

[[More Details](#)]



Beacon Lamp State



Reports

glance

School Beacon Event Log

Filter

From: [February 19, 2018 12:00 am](#) To: [February 21, 2018 11:59 pm](#)

Device:



Date	Day	Time	Status	Schedule
February 21, 2018	Wednesday	7:50:04 AM	OFF	Central
February 21, 2018	Wednesday	7:05:02 AM	ON	Central
February 20, 2018	Tuesday	3:55:04 PM	OFF	Central
February 20, 2018	Tuesday	3:10:01 PM	ON	Central
February 20, 2018	Tuesday	1:45:02 PM	OFF	Central
February 20, 2018	Tuesday	1:00:03 PM	ON	Central
February 20, 2018	Tuesday	7:50:02 AM	OFF	Central
February 20, 2018	Tuesday	7:05:04 AM	ON	Central
February 19, 2018	Monday	12:26:33 AM	OFF	Central

Statistics

BUSINESS	DEVICE	SYSTEM VOLTAGE (AVG)			SOLAR ARRAY VOLT (AVG)			AC VOLTAGE			MONITOR BATTERY		LAMP	CELL SIGNAL	Comm Reliability %
		MIN	MAX	STATE	MIN	MAX	STATE	MIN	MAX	STATE	MIN	MAX			
ONLINE	E_Summit Hill_WB (5418)							118.66	122.35	GOOD	14.25	14.30	OK	-81	100%
Knox Group Plan 4: Lonsdale Elem															
ONLINE	E_Burnside_NB (5421)							117.98	122.64	GOOD	14.24	14.30	OK	-95	100%
ONLINE	E_Burnside_SB (5422)							119.29	123.27	GOOD	14.30	14.32	OK	-73	100%
ONLINE	E_Louisiana_EB (5423)							114.72	121.57	GOOD	14.14	14.19	OK	-85	100%
ONLINE	E_Louisiana_WB (5424)							118.32	122.55	GOOD	14.08	14.12	OK	-79	100%
Knox Group Plan 5: Vine Mid															
ONLINE	M_ML_King_WB (5426)							120.99	125.32	GOOD	14.33	14.39	OK	-81	100%
Knox Group Plan 6: Richard Yoakley Alt															
ONLINE	A_Washington_Pk_WB (5428)							117.54	122.40	GOOD	14.30	14.35	OK	-69	100%
Knox Group Plan 6: Ridgedale Elem															
ONLINE	E_Western_EB (5429)							118.03	122.89	GOOD	14.25	14.32	OK	-77	100%
ONLINE	E_Western_WB (5430)							117.88	122.50	GOOD	14.23	14.27	OK	-87	100%
Knox Group Plan 7: Sam E Hill Elem															
ONLINE	E_Delaware_EB (5431)							118.46	122.98	GOOD	14.30	14.36	OK	-89	100%
ONLINE	E_Delaware_WB (5432)							118.46	123.03	GOOD	14.24	14.35	OK	-89	100%
ONLINE	E_Minnesota_EB (5433)							118.95	122.55	GOOD	14.36	14.43	OK	-87	100%
ONLINE	E_Minnesota_WB (5434)							117.39	121.82	GOOD	14.19	14.25	OK	-85	100%
Knox Group Plan 8: Fulton High															
ONLINE	H_Woodland_EB (5435)							116.66	121.14	GOOD	14.30	14.35	OK	-75	100%
Knox Group Plan 9: Austin East High															
ONLINE	H_ML_King_EB (5437)							115.50	121.14	GOOD	14.24	14.30	OK	-87	100%
ONLINE	H_ML_King_WB (5427)							118.56	122.30	GOOD	14.33	14.38	OK	-97	100%

- ▶ AC and Internal battery status
- ▶ Cell Strength
- ▶ Lamp Status

Future Opportunities



Future Opportunities

- ▶ Audio Alerts in Connected Vehicles with the Vulnerable Users in mind
- ▶ Radar Applications for Speed detection for ATMS monitoring
- ▶ Work with ATMS platforms to reduce congestion at signalized intersections near school zones and farther

Connected School Zones

▶ Questions or Comments

▶ Contact Info

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