Town of Tolland
Technology Task Force

Report & Recommendations to the Tolland Town Council
Presented: January 8, 2013

Executive Summary

The Technology Task Force was created in July 2012 to assist the Tolland Town Council by assessing the state of the town, Board of Education and Public Safety technology infrastructure and making recommendations for changes, upgrades and improvements to those systems.

The seven members of the Task Force have met at biweekly intervals, interviewed a number of town officials, met with current and potential technology vendors and support services, reviewed the current technology infrastructure and pooled their experience and understanding of the technology issues facing the town.

This report represents their initial findings and makes a series of initial recommendations including the summary of a plan for improvements to the town's communications systems. This master plan is focused on improving day-to-day efficiency, controlling communications infrastructure costs and providing a robust infrastructure that can be kept operational during major emergencies.

The task force regards a comprehensive upgrading of Tolland's town, Public Safety and school communications systems as critical and essential. In an era where weather-related disasters may be occurring with greater frequency, and at scales that leave outlying communities such as Tolland subject to long delays in restoration of power and communications, our public services must be capable of self-supported operation. Even in ordinary times, greater efficiency in town, safety and school communications will pay dividends in resident satisfaction, public safety and control of technology costs.

The task force has five initial recommendations:

1. The town requires an increased level of IT support, including strategic IT advice and planning.
2. The town needs a redundant, secure network.
3. Critical facilities should be power redundant.
4. The town needs an improved telephony solution (related to Recommendation 2).
5. Review and maintain a technology related business continuity plan for emergency preparedness.

Additional recommendations include, but are not limited to, the following:

1. The town needs a new email/messaging solution.
2. The town, in concert with the BOE, need to develop a hardware and software refresh strategy, including stable technology funding to make it sustainable.
3. The town needs a thorough print management study performed to drive cost savings.
4. Resource and technology pooling should be encouraged wherever possible.

Details relating to the initial recommendations appear later in this report.

Summary of Current Technology Infrastructure

There are three major components to the Tolland town technology infrastructure: Town, Schools/BOE and Public Safety.

Tolland Public Safety Technology Status

The communications and technology infrastructure of the Tolland Public Safety Services is maintained and operated under a variety of special state and federal rules. The need to meet these rules and general public safety requirements has driven implementation and updates that has kept this portion of the town technology at a minimally acceptable level. At least one primary network server, which handles public safety operational and reporting needs, is near its functional end of life and needs replacement.

The communications network supporting Public Safety is fragile and provided by a mix of vendors and connectivity providers. It is not well-supported for power and communication outage situations and needs emergency support measures during extended power outages and other widespread disasters. Public Safety relies on the town telephone system, which is inadequate to task and near end of life in age, and dangerously lacks caller identification on many incoming calls. Public Safety has a complete but minimal backup power system with site generators in key locations and mobile power units available for spot backup power.

Tolland Board of Education/Schools Technology Status

The communications structures of the Tolland Schools are generally good, with a network structure and operating plan that is minimally acceptable. This situation is in no small part due to the dedicated staff of three IT professionals, who oversee the network, telephone system, servers and communication needs. The schools have a large fleet of desktop computers with an aging curve that leaves a majority of the systems at end of life and needing immediate replacement.

The connectivity between the schools is acceptable but relies on state infrastructure that is subject to usage limitations (only school- and education-related traffic is allowed to use the network and outbound connectivity). The telephone systems used by the schools are not completely compatible between sites and near end of life in technology. Tolland High School and Birch Grove Primary School have generators to provide basic power for refrigerators, communication needs, etc, but TIS and particularly TMS are lacking in this area. Tolland High School is particularly well equipped in all respects and can be configured as an emergency shelter for residents and an emergency site for town operations.

Tolland Town Technology Status

The present technology infrastructure of the town of Tolland is fragile. It is the product of multiple decades of independent choices and uncoordinated solutions, which demonstrates the need for cohesion and well communicated decision making. While some components are adequate to task, others are outdated or insufficiently sturdy for current usage levels, and few elements are at desirable levels of reliability.

The support from product and service vendors and consultants is weak and incomplete, with single systems under the supervision of two or more providers and many elements not directly maintained or monitored by any qualified person.

While short-term cost control may have been at the root of many of the individual decisions, the current infrastructure bears excessive costs in supporting outdated equipment, duplicate systems, inefficiently assigned consulting management, an over-dependence on secondary efforts of town staff. The general public may be largely unaware of various Town technology concerns, however, one of the most public examples of the aging infrastructure is seen in a very public location – The Library. Aging computers are illustrative of technology concerns in the town. These systems are operational now, but with no refresh strategy in place, we're forced to hope that private foundations continue to fund their eventual replacement and public availability. We can no longer continue to rely on donated technology and need to develop better strategies for technology investment.

The network and servers are at or near end of life and are not configured for expedient relocation in the event of an extended power outage or other disaster. The telephone system is aging and whether through age, configuration or system faults or lacks in user training, is difficult to use and erratic in operations such as handling call transfers. It lacks many basic modern business telephone features and has no provision for easy relocation of extensions or even department lines as may be necessary in extended power outage and disaster situations.

Details of the Primary Recommendations

1. The town requires an increased level of IT support, including strategic IT advice and planning.

Concerns:

Presently, the town's IT support is a contracted 24x7 break/fix service with a town employee working as level 1 Tech Support and contractor liaison. There is little, if any, long-term strategy/planning associated with this model.

The Tolland Technology Task Force believes that the present model is not sustainable. It is reactive, where decisions are made because something breaks rather than deciding based on its place in the evolution of a strategy.

Recommendation:

The task force recommends pursuing support options ranging from shared resource with the BOE, sharing a resource with another town, hiring an individual IT technologist for the town, or pursue an increased level of contracted services, including strategic IT advice and planning.

Justification:

Having an IT resource handle technology related issues for the town allows town employees to focus on their actual responsibilities. There is cost savings associated to this efficiency gain, but also performance improvements resulting from resolution of most of the departmental complaints which the task force has discussed with the various departments (see heat-map exercise included as an attachment for examples).

2. The town needs a redundant, secure network.

Concerns:

The Town's "network" exists in name only. Each facility has its own ISP connection and connectivity between facilities goes out onto the ISP network and back into a different facility via VPN (Virtual Private Network) technology.

This "network" is costly (each "drop" is its own monthly ISP cost), and it is not redundant or secure in any meaningful way. A modem failure in an individual facility takes it offline until replacement. When a critical facility, such as the Town Hall, encounters a modem failure it can affect ALL town facilities, communications, and services.

- A modem went down from a lightning strike recently resulting in a town-wide email and emergency services notification outage until the modem was replaced.

Recommendation:

Immediately, the Town should invest in a 4G backup modem for the Town Hall. The antenna is already in place as part of Hurricane Sandy preparations.

- Public Safety loaned the Town Hall the use of a spare 4G modem to prepare for Sandy but it is no longer available for Town Hall use.
- This is a "low cost" short-term redundant solution until a long-term, permanent solution can be integrated.

Long term, the Technology Task Force recommends the installation of a municipal network connecting all Town facilities to each other. The option that seems to make the most sense is dark fiber (fiber that is already in the ground or installed, but not yet active).

- The Task Force further recommends this network to be connected to the existing BOE network, allowing information sharing and business continuity between these two municipal bodies for a number of practical reasons, the most important being safety, failover, and redundancy.
- Fiber is preferred due to the fact that it only needs the access points to remain powered in order to remain functional, it is high speed, it is secure, and available.

Justification:

A network such as this should cost in the range of $200-300,000 up front, depending on hardware and facility choices. Costs include a one time 20 year lease of dark fiber, yearly SLA maintenance fee, and hardware to enable the efficient use of the network.

The project is almost a break even over its 20 year lifespan when considering only those savings associated to ISP related expenses (See Reference Information for details). Immediately, ISP expenses are reduced from a "drop" per site to two "drops" town-wide. Long term, telephony and audio/visual changes will increase cost savings, perhaps significantly.

Public safety concerns addressed through the installation of a network such as this are difficult to put a price on, but the network would increase public safety by resolving technological issues that are specifically related to availability and lack of network redundancy. The network will also serve as a foundation for improved services and capabilities.

3. Critical facilities should be power redundant.

Concerns:

Specific Town and BOE facilities are not yet power redundant.

Recommendation:

Power redundancy is a priority concern for the following facilities (in this order):

- Tolland Town Hall – Backup generation is close to operational as of the date of this report.
- Tolland Middle School – Backup generator is listed in the BOE Capital plan.
- Tolland Intermediate School – Backup generator is listed in the BOE Capital plan.

Justification:

Town Hall: Without power, the town's email and emergency notification systems are impacted.

- We're not talking about losing “eblast” - We're talking about losing the ability to communicate with emergency personnel.
- Town phone systems in all facilities may be affected as well (including Emergency Services, Highway Garage, etc).

Tolland Middle School: TMS is where the Board of Education network's ISP connection is located. The networking equipment in this location needs backup power in order for their fiber network to remain functional in a worst-case situation. This site has been flagged for a large-scale generator (to support the IT needs and also for refrigeration needs as an emergency preparedness measure), but a small IT grade portable unit would suffice for IT specific needs.

Tolland Intermediate School: This site has been flagged for a large-scale generator (to support the IT needs and also for refrigeration needs as an emergency preparedness measure), but a small IT grade portable unit would suffice for IT specific needs. TIS supports the network used by the BOE offices and Parker school, so the IT related impact affects the BOE in an emergency situation but is less critical than the TMS and Town Hall generation needs.

4. The town needs an improved telephony solution (related to Recommendation 2).

Concerns:

The present system is aging and whether through age, configuration or system faults or lacks in user training, is difficult to use and erratic in operations such as handling call transfers. It lacks many basic modern business telephone features and has no provision for easy relocation of extensions or even department lines as may be necessary in extended power outage and disaster situations.

Recommendation:

The town should pursue the integration of an improved telephone solution. A physical network would allow the town to explore VOIP (or other telephone solution) technology. A solution which Town and BOE can implement together, would be ideal.

Justification:

An improved telephony system would resolve significant operational and public safety concerns in addition to cost savings potentially available by leveraging technology such as VOIP. For the sake of public safety, we need a system in place, which allows the Town to function even in a worst-case scenario. Cost savings in this category are unknown at this time, but are suspected to be significant.

5. Review and maintain a technology related business continuity plan for emergency preparedness.

Concerns:

Recent weather-related incidents prove the value of emergency preparedness. Being able to be responsive to the needs and expectations of town residents impacts both personnel and technology systems.

The town is still exposed to technology related redundancy concerns and we should document and understand our limitations and how to best handle them. Planning will better prepare town staff and emergency operations to deal with outages and issues if they arise. We continue to make improvements, but this plan will assure we're even more proactive and prepared to deal with the next event.

Recommendation:

The Technology Task Force recommendation is to be sure we have well defined policies and procedures for technology failover, redundancy, and availability to assure business continuity for town, emergency, and BOE operations. We should highlight expected behavior for all types of emergencies, what redundancy is in place today, what gaps exist, and who is responsible for assuring business continuity in all technology related aspects of Town and BOE operations.

- Plans may already be part of the existing emergency preparedness guidelines in place today.
- Plans should be reviewed at a regular basis, tested, and well communicated to all vendors, and responsible parties.
- Plans should be updated whenever a technology change is made.

Justification:

This is an insurance policy. It is better to detail problems with our infrastructure and solutions before we deal with a major emergency situation and discover that something has failed.

Tolland Technology Task Force

Appointed June, 2012; Re-appointed November, 2012

Members:

Nick Cook
Josh Freeman, Tolland Town Council
James Gifford
Peter Ginthwain
Julie Kirk
John Livingston
Andy Powell, Tolland Board of Education

Liaisons to the Technology Task Force:

Barbara Pettijohn, Director of Library Services
Doug Racicot, Assistant Public Safety Director
Adam Sher, IT Director, Board of Education
Chris White, BOE

Reference Material

- Heat-map exercise identifying town technology issues and concerns (separate document).
- Fiscal Summary of current ISP and Voice expenses for the town, as well as cost to integrate network:

Current ISP related expenses (vendor = Comcast)			
Facility	**Monthly**	**Yearly**	**Over a 20 year life:**
Facilities Garage	$102.00	$1,224.00	$24,480.00
Senior Center	$102.00	$1,224.00	$24,480.00
Tolland Fire (4 facilities)	$477.95	$5,735.40	$114,708.00
Troopers	$145.25	$1,743.00	$34,860.00
Town Hall and Library	$115.95	$1,391.40	$27,828.00
Highway Garage	$102.44	$1,229.28	$24,585.60
Total	$1,045.59	$12,547.08	$250,941.60

Opportunities for additional savings (Vendors = AT&T, Earthlink, & Comcast)			
A) Tolland Fire Towers, Pump Stations, etc	$970.71	$11,648.52	$232,970.40
B) Current Telephony Expenses	$2,362.06	$28,344.72	$566,894.40
C) Current Cable TV Expenses	$107.73	$1,292.76	$25,855.20
Total	$3,440.50	$41,286.00	$825,720.00

A) These facilities require a line of some sort for remote monitoring. A fiber interconnect could be run for these connections but has not yet been estimated or included as a priority facility at this time.
B) Current expenses are for line charges and long distance and represents the biggest areas for cost savings if the network can support a more efficient and effective solution.
C) All cable TV should be able to be consolidated town-wide with modest hardware investment and a network.

Initial estimate for Fiber Installation – Priority Facilities			
Facility	**Lease term**	**Yearly Main. Fee**	**One Time Lease Rate**
Station 440 107 Plains Road	20	$600.00	$23,800.00
Station 340 247 Gehring	20	$600.00	$34,300.00
Station 140 64 Cyrstal	20	$600.00	$23,800.00
Fire Training Center 191 Merrow Road	20	$600.00	$13,300.00
Trooper Office 749 Tolland Stage Road	20	$600.00	$10,600.00
Senior Center 674 Tolland Stage Road	20	$600.00	$13,300.00
Highway 118 Old Post Road	20	$600.00	$13,300.00
Facilities 120 Cider Mill Road	20	$600.00	$13,300.00
Year 1 Total *		$4,800.00	$145,700.00
20 Year Costs:	**$241,700.00**		

* Year 1 also requires the purchase of networking hardware to enable the network to function. Anticipate total capital investment of $250-300k to be able to obtain data and voice cost savings.