

Aggus & Franklin Technology Consulting

Consultant Casebook - Municipality of Esquimalt

By Peter Aggus

TMC was asked to look at an aged telephone system, an analog Mitel SX100, which served a number of buildings for the Township. In particular, we were asked to recommend the most economical solution to upgrade the technology and include features like voicemail and advanced call handling options.

Geographic Layout

The township is centred on the **Municipal Hall** building, which is where the old SX100 PBX was located. Adjacent to this building is the **Public Safety Building**, which houses the Police and Fire services.

Closer to Victoria are two recreation facilities – the main **Recreation Centre**, which includes a swimming pool; and the **Archie Browning** sports arena complex, which houses the ice rink.

On the other side of the Municipal Hall, close to the Esquimalt Dockyard, is the **Public Works Yard** – a relatively new site.

The terms of reference for the project were to address the needs of the Municipal Hall and the two recreation buildings. The Public Works Yard, being fairly new, is equipped with a modern NorStar key system – which is adequate for their current needs. The Public Safety Building has an older NorStar key system, which was considered adequate for now and something which could be addressed in a later upgrade phase.

Underground Duct

Current communications services between the Municipal Hall, the Public Safety Building and the two recreation buildings are carried in buried conduit. Plans exist for the extension of this conduit at some later stage to link with the Public Works Yard.

The telephone cable used is internal grade PVC sheathed stock. For applications which might be exposed to water, PVC is not a suitable jacket material because it allows moisture to permeate over an extended timeframe. This will lead to eventual

insulation failure, and is a maintenance liability.

The correct cable for underground installations, such as this one, is sheathed in harder, less permeable Polyethylene. It also has aluminium moisture barrier under the sheath and the air-space inside the cable is pressure filled with petroleum jelly.

Apart from the telephone cables, the duct also contains multi-strand fibre-optic cables. These are full external grade cables and currently only serve the data needs of the Local Area Network. Fibre also has the advantage that it is not subject to insulation failure even if it did get damp.

Needs Analysis

Meetings with the end-users mapped out a set of feature requirements, including voicemail and auto attendant facilities – all of which can easily be supplied by a range of modern telephone systems.

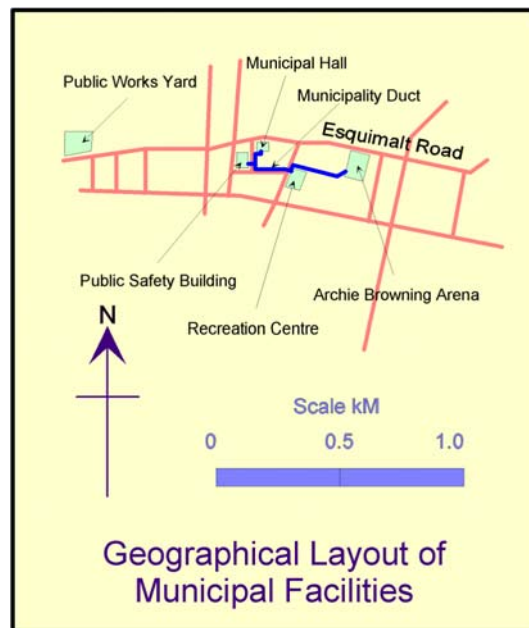
The key requirements included planning for the future, so that the investment would be good for a considerable time. This meant looking beyond the short term needs expressed in the terms of reference, to what might become a future “phase 2” project.

Planning for the future suggested that the main telephone system should not be located in the Municipal Hall, since that building was not constructed to modern seismic standard and would likely be the subject of major reconstruction work at some stage in the imminent future.

Cable Options

Two options were considered with the suppliers who responded to the RFP.

Firstly the old cable could be pulled out and replaced with new jell-filled cable.



Secondly use could be made of the spare fibre pairs to build an inter-site network linking remote switches.

The chosen solution was offered by Delphi Solutions, using the Mitel SX200 EL product. Their bid avoided any re-cabling cost by using the existing fibre capacity.

The SX200 EL

Mitel opted for a novel architecture for the “Light” range of PBX products. Instead of conventional wiring harness backplane construction, they designed a system where the shelf units communicate with each other over a pair of optical fibres.

The aim of the “Light” architecture was to move the shelf serving a group of locals away from the PBX room into the wiring closet close to the locals. This saves expensive multi-pair copper backbone cables, and is particularly cost-effective where the home run from the wiring closet is very long – such as on a multi-building campus.

The Delphi bid for this project used SX200EL remote nodes in each building, linked by existing underground fibre back to a central switch node.

Although the SX200EL architecture was more expensive than conventional systems, the savings on cabling more than offset this additional cost. Full marks to Mitel for an innovative design.

The Main Node

Building considerations at the Municipal Hall ruled out the use of that location for siting the new PBX main node. The Recreation Centre was considered as an option, but the likely extension to the Public Works Yard suggested that a more central location would actually be the Public Safety Building.

This building is fully up to modern seismic standard and also has the added bonus of a generator backed power supply.

The flexibility of TMC’s planning process was put to the test to include the late addition of limited services to locations in the Public Safety Building.

Digital trunk services were installed to the Public Safety Building, using BCTel’s MegaLink ISDN product. This allows more efficient planning of trunk allocation, with Direct-In-Dial (DID), out-trunks, and existing inbound numbers to share a common pool of

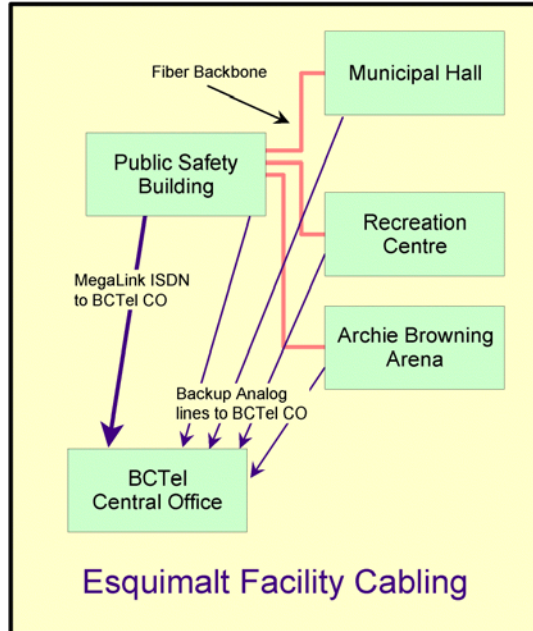
trunks.

The system has been configured to present separate public interfaces for calls to the different departments. As a result, a single phone system appears like several separate systems - each with local attendants and call handling options. Outbound calls even carry Caller ID specific to the originating department.

Voicemail

A key requirement identified by the users was for voicemail. The installed system has a fully-featured voicemail and auto attendant system which is designed to assist callers in their dealings with the Township.

The auto-attendant system provides a full 24-hour service and give backup support when any of the attendants is overloaded. The aim, however, has been to keep calls to main numbers away from automated systems as far as possible to give a better public image. The automated option, however, is available for frequent callers. It also supports timetable systems and provides the platform for considerable future growth in automated booking and reservation services.



911 Service

The final piece of the jigsaw was to provide a single phone line to each remote node. This allowed the inclusion of two safety features into the design.

Firstly the loss of the fibre backbone would not isolate the remote node. Emergency calls could still be made via this locally-connected service.

Secondly, outbound 911 calls can be presented to the 911 service with the correct building location. Without this feature, 911 calls would enter the BCTel network via the MegaLink trunk and would be announced to the 911 service as originating from the main node. This could lead to an ambulance called from the Rec Centre, being misdirected to the Public Safety Building some distance away. In the longer term, other solutions are being developed for this increasingly common problem.

Conclusion

The Township now has a state-of-the art telephone system, designed with the needs of its users (staff and callers) as a first priority.

The system is flexible and has been built to be capable of easy expansion to cope with future needs.