Response to Call for Papers

Command, Control and Communications: Assessing the New Technologies

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Abstract

Today's Fire Services must be able to train for, organize, and execute complex operations. To do this effectively requires a solid Command and Control (C&C) environment.

The practice of Fire Command has been "people-based" and pragmatic. History is important and traditions are strong. Radios in apparatus freed Chiefs from having to travel in order to communicate. Dramatic change came when portable radios entered service. Before then, the traditional "command position" for the Chief at a fire was inside the building, alongside the companies he was directing. Communications between the Chief and company officers were face-to-face.

Modern departments and the procedures and tactics used by Chief Officers today are different from those of the past. They contain expertise of unprecedented quality, sophisticated technologies and a supporting infrastructure that allows rapid and flexible actions. Command and Control must reflect these characteristics.

There are three dimensions to Fire Command and Control:

- Strategic
- Operational
- Tactical

Each dimension has distinct technologies available, which ideally should be complementary to, and integrated with each other.

Strategic decisions can be supported by mature and well understood technologies. Records Management Systems (RMS) usually supply the type of data required for analysis. Assistance from Universities or other research institutions is practical because the decision reached and its implementation are rarely time-critical. By their nature, progress on strategic issues is often measured in years. Manpower deployment, station location and apparatus mix are typical problems addressed.

From the operational perspective, Computer-Aided Dispatch (CAD) systems are often referred to as Command and Control systems. There is credibility to this description since these systems usually provide functionality for Staffing/Rostering, Incident Handling, Unit Recommendation and Status Keeping. These can arguably be described as cornerstones of C&C.

At the tactical level, the availability of immediate, accurate location and unit information to the Incident Commander through wireless data communications from the fire-ground presents information not previously available in the areas of Accountability and Incident Management.

Bringing Wireless Mobile Workstations equipped with Global Positioning System-based (GPS) Automatic Vehicle Location (AVL) to the Fire Service provides tremendous benefits at the Operational and Tactical level, and some at the Strategic level. For maximum impact, a robust Voice and Data Communications environment must exist, along with a fully integrated, feature-rich CAD system.

This paper focuses on the wireless mobile component of the project, with ruggedized laptops installed in all front-line apparatus. Practical considerations for implementation within a major municipal fire service are discussed.

- Ruggedized laptops vs. competing technology
- Operating System, lock-down
- Software
- Mounting, installation
- Power
- GPS/AVL in the Fire Station and downtown – signal loss, multi-path fading
- Data Radio infrastructure – private/public, dedicated/shared with voice
- Updating software, maps
- Proof of Concept and Pilot projects

The 1998 amalgamation of the City of Toronto, resulting in a single Fire Service - the fifth largest in North America - created a unique opportunity to cross this technological divide. Rather than incremental evolution, it allowed for a revolution in Fire Command and Control communications.