



## Sharing Software and Telecommunications Resources

By Rick Schmidt  
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Many cooperatives are already working collaboratively on study projects such as business cases, benchmarking studies, and even the technology procurement process. But some cooperatives realize that there are also benefits to sharing assets such as tower sites, mobile communication systems and software such as Meter Data Management.

It is estimated that fewer than 50 percent of shared projects have involved the deployment of a shared technology. Sharing infrastructure may add a layer of complexity to your project, but the benefits (not only of the shared ownership of assets but also of the shared cost of resources for procurement and post -deployment maintenance) may be well worth the extra effort.

Look for these characteristics in the evaluation of potential sharing opportunities:

- ✓ Technology early in the lifecycle and immature
- ✓ Software with high centralized costs that can be shared
- ✓ Technology with a complicated deployment plan or capability for shared post-deployment support

### Why consider sharing?

Sharing can minimize cost and risk. Many procurement projects can result in a stronger business case when the assets are being shared among several cooperatives. In addition, joint ownership can result in lower financial risk by leveraging economies of scale to reduce costs. The benefits of shared expertise for the post-deployment maintenance costs can be significant. When technology is being deployed across several cooperatives, testing costs of the functionality, security, and common integration can all be shared, ultimately making technology advancements attainable for small cooperatives that often could not have moved forward while working alone. Other areas of cost savings come from shared consulting costs, thereby reducing the burden on each cooperative for design and procurement work. Joint programs like load management, particularly when the G&T acts as the single point of administration, can benefit from participation of all distribution cooperatives (rather than a single co-op going it alone). Sharing comes into play with the joint creation of the program design, strategies for customer incentives, and the creation of the marketing materials.

### Recognizing Shared Opportunities

Cooperatives have been sharing communications and IT-related infrastructure for years, but some types of automation technology are better suited to sharing endeavors than others. So, what's a best bet?

The following technologies have been and continue to present good options for sharing:

- Supervisory control and data acquisition (SCADA) communication
- Land mobile radio (LMR)/mobile voice
- Communications backbone technologies and tower sites
- Load management

There are several emerging technologies with solid sharing potential, such as meter data management (MDM) systems, mobile communications infrastructure, and load management (LM) provided by advanced metering infrastructure (AMI). Figure 1 illustrates the potential operating and capital cost savings afforded by sharing proven, as well as emerging technologies. Those appearing in the top right quadrant are the "Best," meaning that they offer the highest of both operating and capital savings.

Mobile voice and backbone communications, for example, have been successful joint project endeavors for cooperatives due to the overall complexity, costs, sophistication, and knowledge needed to deploy and maintain the systems, as well as the overall capital and operating costs saved by sharing.

By contrast, AVL has less to offer because the overall costs to deploy this type of system are already quite low.

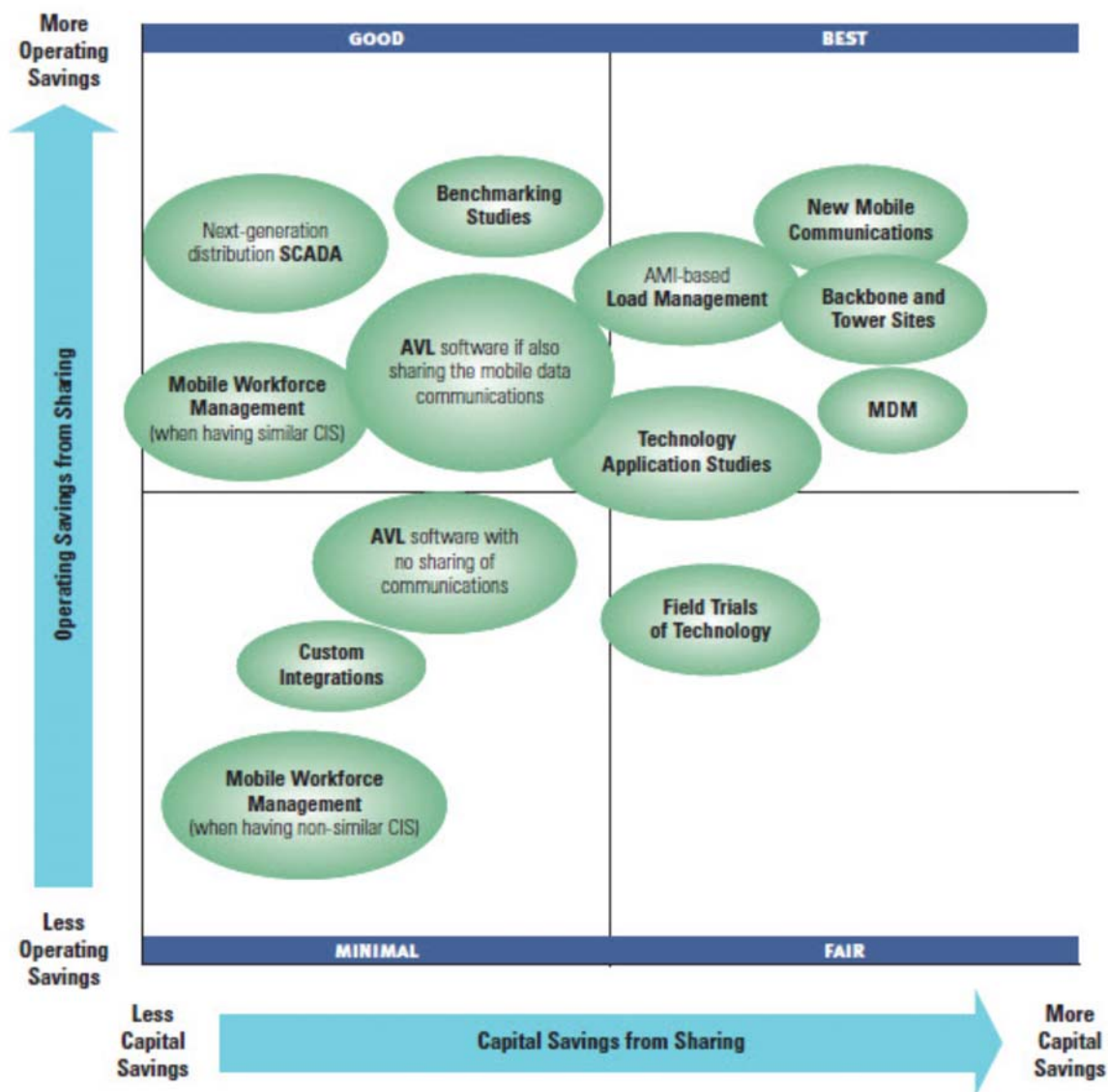


Figure 1. Potential operating and capital cost savings

### Opportunities for Sharing

Here, we’ll talk about some of the opportunities that reap the most reward (those that appear in the “Good” and “Best” quadrants of the figure) and introduce a high-level project plan for getting your (successful) joint project underway.

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**New Mobile Communications—Land Mobile Radio (LMR)** Starting primarily in the mid-1990s, several neighboring distribution co-ops or G&Ts and their member co-ops began deploying shared mobile voice systems. The G&T required mobile communication needs for their employees. Likewise, within the same service territory, member co-ops also required mobile communications; therefore, the overlap of service territory often became a key “driver” for sharing a radio system. For mobile radio systems, communication tower sites are needed and in many cases some type of third-party backhaul communications is required to transport the mobile voice traffic from the towers to the various dispatch centers. Because of that, the backhaul communication assets are also commonly shared among the G&Ts and member co-ops.

**Supervisory Control and Data Acquisition (SCADA) System** The most typical approach for shared SCADA is for the G&T to offer the distribution co-op access to the SCADA system. The distribution co-op would then have remote view access and sometimes control access to their reclosers and regulators. The second most common approach is for several neighboring co-ops to work together in the procurement phase to select a common SCADA vendor.

**Load Management (LM) and New Demand Response** Over the past 20 years, G&Ts have commonly created a LM program for their member cooperatives. The G&T has most often taken the lead role in these programs and served as the program administrator. The G&T would normally oversee the build-out of the LM communications infrastructure, determine the appropriate times to conduct the load control event, and be accountable for the maintenance of the program. Quite often, the distribution cooperative would be accountable for marketing the program as well as paying the costs of consumers’ LM equipment located at their homes and the installation. G&T versus distribution cooperative-owned assets and support responsibilities differ from project to project. In some situations, the distribution cooperative has managed and purchased its own LM program with no involvement from the G&T or other neighboring cooperatives. In many situations, the wholesale energy rate billed by the G&T is driven by the cost structure during peak demand periods or peak cost periods (these are not always the same). Therefore, when the G&T’s costs are lower, these lower costs can be passed on to the member cooperatives.

**Backbone Communications** A key area that has saved significant money for co-ops is the transport of substation data over a common shared data line used by both the G&T and the member cooperative for a variety of applications. In the future, the backbone will also play a vital role for new smart grid programs that require two-way data connectivity.

**Tower Sites** Tower investments are beginning to play a vital role in the overall strategic vision for new automation programs. There are several types of tower assets that can be shared; for example, data provided over a microwave or fiber link, space on a tower, or shelters at a tower site.

In the past, the high cost of building tower sites was hard to justify. A site with a sturdy 400-foot tower and room for expansion can cost upwards of \$250,000. Additionally, environmental issues and aesthetic landscape objectives are making it harder to receive approval for new tower permits. But with the cost to

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lease tower space on existing structures greatly increased and the need for wireless infrastructure making space a premium, owning the towers and sharing them among the G&T and its members is very important. New mobile communication deployments and fixed data infrastructure for AMI, SCADA, distribution automation (DA), and demand response are all on the rise, and towers are vital for these programs.

**Automatic Meter Reading and Advanced Metering Infrastructure (AMR/AMI)** Research suggests that some co-ops have shared drive-by AMR infrastructure but no cooperatives sharing an entire system were identified during the research for this report. The three main PLC AMI vendors are not aware of any shared AMI systems for traditional metering purposes. But the AMI system has been shared for LM purposes in some joint-use projects.

Given that the majority of PLC AMI infrastructure costs are around \$25,000 per substation and about \$115 per consumer for meters, modules, and installation, over 90 percent of the costs are incremental to each co-op. Some costs are centralized for the server, database, and the overall management of the program. It has been much more common to outsource the labor resources for the maintenance of the server/database portion of the AMI than to have the software/hardware of the server hosted by the AMI vendor. We have not found a case where the G&T hosts the entire AMI server/software.

Fixed wireless AMI is growing in popularity, and with it comes the opportunity to sharing the core wireless infrastructure located at towers. Using AMI as demand response technology presents opportunities for sharing LM server/software infrastructure, employee expertise in running an LM program, and resources to maintain the infrastructure. New third-party or custom software and database applications are expected to be developed to complete ongoing studies with transformer sizing, line-loss investigation, voltage monitoring, and other programs.

**Mobile Workforce Management (MWM)** One new approach to sharing MWM software involves following the generation and transmission cooperatives (G&T) supervisory control and data acquisition (SCADA) model, which involves locating the SCADA master at the G&T and giving the distribution co-ops access to the SCADA data for their respective substations. For MWM, this would involve storing the MWM software centrally and then routing the data to each respective participating co-op. Many G&Ts have a fiber and/or microwave networks already in place between the G&T and distribution cooperative. This network can be used to transport the MWM data from the centralized MWM server in much the same way as the SCADA topology is often set up.

**Load Management (LM) Program** Most G&T companies typically include distribution cooperative members while also serving major loads directly. The division of ownership between the G&T and the members for LM varies. Ownership is more typically structured as follows:

- Distribution cooperatives are traditionally owners of: (1) marketing to potential subscribers, (2) the cost of the LM device at the member's home, and (3) installation of the device at the member's home.

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These costs are structured to be offset by lowering the co-op's wholesale demand cost from their G&T.

- The G&T is traditionally the owner of: (1) the core infrastructure to transport the LM signals from its main office over a wireless network and into the subscribers' homes (most often comprised of privately owned VHF paging technology, commercial paging technology, or older one-way PLC), and (2) the program administrator to manage the database of subscribers.

Like AMI systems, an LM program works best with two-way communication between remote ends. One practical approach is to set up procedures, methods, program rules, rates, and so on to use the core AMI technology that the distribution co-op already has or may be planning to add in the next few years.

**Mobile Communications** Several G&Ts and their members, and sometimes neighboring distribution co-ops, have built a common mobile voice system. A mobile voice or data system is a successful asset to share among several neighboring co-ops for several reasons. Because of the time it takes for a replacement system to be designed, procured, and implemented, in the face of the looming narrowbanding deadline (January 1, 2013), sharing a future radio system often makes sense. If the backbone network is already in place, it can be leveraged and also shared for a future mobile voice and/or mobile data system. Many co-ops want to deploy an AVL and mobile service order program but lack the mobile data infrastructure. It is expected that in the next few years, many co-ops will be building a shared private mobile data system.

### Getting Started

Some of the first steps for moving forward, regardless of what type of software, hardware, or skills you elect to share, are described below.

1. *Create a common vision and charter.* Creating a common vision and charter manages the expectations of participants and is the first step of a successful project. To build a common vision, define the critical unknowns such as: (1) What are the financial benefits of building a single shared system versus each of the prospective co-op members building its own? (2) Would participants be better off sharing a common system (and the associated staff to update and maintain it) or should each co-op purchase and build its own system? (3) What economies of scale might a shared system provide?
2. *Select/assign a project manager.* This task can be a challenge when a small group of co-ops elects to move forward with a shared project. Many individuals are uncomfortable taking the lead role while meeting with their peers. When this happens, it may be easier for the participants to vote in a project manager to lead the team. Sometimes an outside facilitator or outside project manager can be useful.

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3. *Define early on where the synergy exists.* Early on in the project, begin to make assumptions about the benefits of working together as a team. As the project advances, review their accuracy and make modifications as needed. Define the aspects of the project that reap the most rewards when shared.
4. *Establish opt-out strategies.* Giving participants a way to opt out of a joint project is a key success factor. There is nothing wrong with opting out of a joint project, and it is not in anyone's interest to place pressure on participants to stay in if they determine that staying in is not in their co-op's best interests.
5. *Establish an infrastructure governance approach.* Also, early on in the project, begin to define operational and cost-sharing rules, such as (1) how upfront capital costs will be split, (2) who will be responsible for the project management during the deployment phase, (3) who will complete maintenance and how, (4) how post-deployment costs will be shared and split, and (5) whether a joint committee will make post-deployment decisions on overall system maintenance procedures, and so on.
6. *Create security and interoperability plan.* Assess the security and interoperability needs (which depend on what type of asset or system is shared), and create a plan during the conceptual design, detailed design, and then deployment stages. One important advantage of a joint project with a strong security team is that it places less responsibility on the individual co-op (which may not have appropriate security resources) and more responsibility on the shared deployment team.

One substantial benefit of a shared bidding/procurement project is writing a common request for proposal (RFP) to solicit vendor bids. A joint RFP can result in a single contract among several participants with shared infrastructure, or separate contracts for each of the participating co-ops with or without shared infrastructure.

### Lessons Learned

Some of the barriers to initiating shared projects include fear of losing full control over the project's planning and implementation process, lack of readily available financial tools to estimate fair cost-sharing models, concern that the other participants may provide less than desired support post-deployment, and the perception that it would get progressively more difficult to change course or opt out. Some participants will join in during the assessment phase to simply learn from the group. Often a consultant is involved or other project leaders with specialized knowledge. Some participants opt out prior to committing to deployment.

In spite of these hurdles, co-ops have ventured into shared technology infrastructure partnerships and in many cases have emerged successfully, giving them the confidence to attempt further levels of sharing in other related areas.

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### Also of Interest

#### CRN's Shared Software and Telecommunications Project

<https://www.cooperative.com/about/NRECA/CRN/Results/Pages/SharedSoftwareandTelecommunicationsProject.aspx>

### About the Author

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