

Technology and Intermodal Transportation: Priority Corridor Planning and Operations

Belle Cole, *PMR Group, Inc.*

This case study is about a model for addressing workforce needs in the advanced transportation industry, especially in what is now being called advanced transportation systems (ATS), although I will continue to refer to it by the more commonly recognized acronym, ITS. The model is the California Advanced Transportation Training Alliance (CalSkills). It is an efficient and cost-effective way for the state of California to respond quickly to major obstacles, key shortages confronting an emerging industry.

What are the main features of this model going to be? What are the desired outcomes? What are its unique contributions and challenges? How will it be used to address the training needs of ITS deployment initiatives such as the Southern California priority corridor? Let me begin to answer these questions by telling you about the CalSkills organization, which will put things in context.

As you know, ITS is the basis of an emerging industry that will support a domestic market the value of which was recently estimated at \$400 billion over the next 20 years, \$300 billion of which is in the consumer industry, and will generate new jobs commensurate with that stream of revenue. ITS is basically the application of technologies such as those for advanced communications and control, information processing, and electronics to transportation systems to make these systems more efficient.

ITS makes it possible to receive accurate real-time information on optimal routing and traffic directions, to provide for collision avoidance and warnings, to generate automatic incident detection and emergency notifi-

cation, to automate guidance of vehicles, to permit remote monitoring of traffic conditions and control of signals, and to provide for centralized management of fleet and public transit vehicles.

CalSkills has learned that the technology areas for these systems include computers, sensors, videoprocessing equipment, communications equipment, vehicle components, and systems that cut across a core of occupations that have been talked about by two previous speakers from industry—communications, data processing, electronics, and traffic management. There appears to be a continuing shortage of people with necessary skills to design, manage, and maintain these systems. These skill shortages are showing up in other growth industries as well, including the multimedia and entertainment industries, which are other key industries in California. I learned yesterday from a report in the *Los Angeles Times* by an economist who writes frequently about high-tech industries that there are right now something like 190,000 information-based jobs that need to be filled, many of which are in these industries. The objective of CalSkills is to respond to industry needs because the planning, design, implementation, operation, and maintenance of ITS require that well-trained professionals have skills in these areas.

For the first time that I know of in California, an economic development project called Project California, a public-private partnership looking at ways to advance the ITS industry in California, devoted attention to human resource needs. If this industry was going to create 400,000 new jobs over the next 10 years, about half estimated to be in the field of ITS and the remainder

in the areas of alternative fuel vehicles and rapid rail, what would this workforce look like? What kinds of skills are these people going to need? What are the demand occupations? Who is doing the necessary training to provide the kinds of skills that are needed, and how do you bring about the match between the trainer and the industry?

CalSkills was created as part of Project California to consider these questions. It has now evolved into a public-private partnership with a board of trustees from the ITS industry and also from government agencies interested in training to deal with the urgent workforce needs of this growing industry. It is intended to enable this industry to respond to what we call "unmet training needs." It is not interested in looking at what most professional schools and universities are doing in terms of providing people in the engineering field, but rather at what these companies need at this point in time.

Some companies, if they are large enough, will have their own internal training programs that will enable them to get their people to the point where they can carry out some of these new complex functions. However, many firms, especially medium-sized and small firms, are unable to do that. The service we are providing really is geared toward the needs of industry, particularly small to medium-sized industry.

This initial effort, especially with emerging industries like the ones we were looking at, required understanding what the industry is, where it is located, what the technologies are, and what the firms are. As a way of understanding the unmet training needs, some industries are very well documented, but when we looked at the industries in California in which we were interested, we discovered that very little information was available. Therefore, we produced a report, which could be made available to anybody interested in the ITS and electric vehicle industries, to look at these technology areas. It was done not just out of interest, but because in order to look at workforce needs, you have to understand where the firms are—who you need to talk to—especially since we were trying to define those needs in a way that covered more than one firm, that covered a segment of the industry.

The first task was to examine the unmet training needs. Once that was done, we came up with a list of about 22 demand occupations that seemed to cut across the industry for professional, technical, and workforce skills and needs. With that came the process of determining what occupations we would be able to look at, recognizing that this was a small effort looking at a big question. A filtering process had to take place. If you want to develop a training program, you need to have to set priorities: which needs are the most important and are not being met in the usual ways. This required soliciting the informed judgment of people in the industry and outside experts. Using this methodology, we were

able to come up with four or five occupations that we put on a fast track. We did a skills analysis of a couple of those occupations and came up with the signal system technician. It is interesting that our effort indicated the strong need for these technicians, and, independently, the Los Angeles County Metropolitan Transportation Authority (MTA) came up with this need as well. We were able to join forces so that we could take advantage of their workshops and their need for a community college program.

Once you know what the need is, who is doing this kind of training? We had wonderful participation from the major extension programs from principal universities around the state, as well as community colleges, the state system, and proprietary trainers. We learned who could do what. The problem did not really seem to be a question of people being able to do the training, but rather of matching the company or companies and the people to be trained. A training program was identified consisting of an identified occupation or set of skills, specifications for curriculum development, an eager qualified provider, employers with real jobs, trainees (either existing employees or potential new hires), and funding arrangements. Therein enters the brokerage role of CalSkills. In the process, we identified over 200 firms and potential entrants into this industry; these were firms many of which have real obstacles to progress because of personnel and skill shortages.

It is almost like job development. Once you decide on the occupation, you need to look very carefully at what is required in developing it. I looked at the list provided and realized that to do the kind of work we would do, you needed to talk to the people in the company and maybe other companies to get a good feel for what the training program would have to include and then identify providers. CalSkills does not do training, but rather pulls together the right people. The essence of the brokerage component is to get the firm and the trainers ready to work together and to find a funding source. Various demand occupations and skills came out of the program—different types of engineers, project managers, systems engineers, manufacturing-related skills, and business skills for small and medium-sized firms.

Signal system technician was the highest priority of the demand occupations. It required consultation with employers, unions, and educators. The most interesting feature of this was the difficulty and yet the excitement of actually finding a community college that really wanted to author a certification program. Long Beach City College already had a strong program in electronics, and this specialty was one they were willing to develop. As a result, the program will be used in the other 107 community colleges throughout the state.

In addition to development of the required curriculum, another component is drawing together experts

from the public and the private sectors to define the type of program to be taught. What was going on at MTA was a "specializations" program. We defined the areas to be taught as "advanced fundamentals," which included digital control and technology, fiber optics technology, microprocessors, fundamentals of computer programming, modem and network communications, and testing equipment, both documentation and test results.

Another category we have been looking at is ITS project manager and the skills needed for that job, specifically, budget planning, contract negotiations, marketing and sales, team leadership and consensus management, knowledge of several fields of engineering (civil, mechanical, materials, electrical), and software engineering and development. For people who do systems integration, we discovered that the need for ITS project managers was absolutely foremost on their minds. Other required skills areas included continuous process improvement (CPI), including workflow analysis, process definition, and statistical process control, as well as technical and proposal writing and public speaking and presentation skills.

For case study purposes, you need to ask the question, What will it take to continue and expand this effort? There are real lessons for other communities and states that want to organize and carry out a project like this. What we regard as the unique contributions of CalSkills include anticipation of workforce needs, detailed matching of needs with training, speed and flexibility of delivery, lower costs achieved through economies of scale and leveraging of public funds, improved quality by matching provider with need, assistance to small and medium-sized firms with collab-

orative training efforts, and response to professional capacity building for California.

The Southern California Priority Corridor is the site of numerous leading-edge research planning and deployment activities using ITS. It is one of five or six major ITS deployment projects of both the federal government and the California Department of Transportation (CalTrans). The corridor is one of four identified under ISTEA. The major characteristics demonstrate that it is clearly as intermodal as a project can be. It integrates and deploys ITS infrastructure in urban areas of six counties from Ventura County down to the U.S. border with Mexico at San Diego. It links several CalTrans regional operations (Advanced Traffic Management Systems) and creates a framework for information distribution to travelers (Advanced Travel Information Systems). It creates systems to communicate between information systems operated by regional transit agencies and commuter passenger rail systems (Advanced Passenger Train Systems). It also integrates ITS projects into Showcase, which is a "system of systems." Finally, it creates a commercial vehicle operation (CVO) information corridor from the U.S.-Mexican border to the Inland Empire.

In closing, I want to point out that CalSkills is an information clearinghouse for different services and information involving all the different forms of transportation. With respect to training and education, we see it as meeting immediate, short-term, and longer-term workforce needs as they now occur. It does not matter whether it is intermodal or one mode, because the strategy is to look at the need. If the need is intermodal, that is what we address and that is where we try to get the training.