INTEGRATING TRANSPORTATION INFORMATION SYSTEMS WITH CABLE COMMUNICATIONS

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There are numerous benefits that accrue to the cable operator, the subscribers, the transportation provider, and the local and national governments through the utilization of cable communications for transportation and traffic information dissemination, system management and control. Transportation information can be dispensed at the subscriber's home, at bus stops, major terminals, tourist, convention, and shopping areas, etc. The format and catagories of information is determined after an evaluation of the transportation user needs, the cable and transportation system technology, the institutional and regulatory climate, and the funds available. The cable system can also be used to manage and control the transportation system, i.e., by control of traffic flow, computerized signalization, ramp access control, traffic advisory and vehicle locator systems, as well as for internal management data transmission and report generation.

INTRODUCTION

Several factors make the early 1980's a propitious moment to inject telecommunications technology into transportation systems. The first is the technology; for the cable operator it is character generators, videotext, and teletext; for the transportation system the new technology involves vehicle locator devices and computer data bases. The second factor involves franchise applications. Applications for even the smaller communities now include a second "institutional" trunk. Local officials are overcoming the awe of these huge capacities and are beginning to demand that the operator or petitioner provide applications that will utilize the technology. The third and perhaps the most important factor involves fuel conservation. The fuel savings that arise from the injection of telecommunications into transportation systems are substantial. The U.S. Departments of Energy and Transportation are beginning major initiatives into the conservation of transportation energy through the use of telecommunications.

BENEFITS OF CABLE INFORMATION SYSTEMS

Gaining from these efforts are the cable operator, the subscriber, the transportation operator, and the local and national governments.

Cable system operators benefit in several ways. Increased sales and reduced churn should result from the addition of a significant new information channel. Also possible are revenues from leased lines used to manage such roadway functions as computer coordinated signalization, roadside safety signals, traffic sensors, ramp monitoring, etc.(N.Y.C. has budgeted $40,000,000 over the next five years to computerize traffic controls on 6,000 intersections.)

Public relations and political credits will go to the operator who can proudly point to the new "public service" being operated over the cable system. These credits will accrue to a greater or lesser extent depending on whether it is "free" access channel information, advertiser supported or municipal leased lines.

At franchise renewal time these offerings can be an attractive inducement to the franchisor to continue with the current operator based on this demonstrated cooperative effort.

Similarly, when rate increase applications are submitted, the existance of a new municipal service can have a soothing effect on the expected public outcry.

A final operator benefit arises through the demonstrated vitalness of the cable system. When the cable communication system provides essential community services, i.e. traffic control, the system must generate adequate revenues to guarantee its continued operation in top working order.

Subscriber benefits. By making transportation more available, and by reducing traffic and congestion, the subscribers travel is made more enjoyable and safer. A general improvement to the quality of life should be realized in a community that makes a substantial commitment to the improvement of transportation through communications technology.

By providing information on traffic conditions, fuel prices and availability, and public transportation schedules and routes, the cable system provides the subscriber with information that can be used to reduce transportation expenditures.

Local government benefits. The improved availability of information on bus, train, plane and taxi services will allow more predictable and coordinated service to be offered by the locality. Improved information on vehicle location, and road and traffic conditions, should enable both better management and improved service.

Improved service translates into more ridership and increased revenues.

Improved information should allow the transportation facilities to be more evenly utilized, reducing the need for construction projects aimed at traffic reduction, and the need for additional transit vehicles that congestion and bunching requires.

Public acclaim will go to the municipal official who arranges and/or implements this improvement.

A general improvement to the quality of life should make the community more livable and productive- suitable for business settlement or expansion.

Finally, the local governments transportation planning process will be improved through the information available through the cable system.

National gains. The substantial energy savings that will result from the utilization of cable can reduce our dependance on foreign oil and have a salutary affect on our balance of payments and inflation rate.

It is unlikely that all of the above described benefits will occur in a particular community. They do however, provide an indication of the breadth of the potential beneficiaries.

INFORMATION TECHNOLOGY AND SERVICES

Cable systems can be utilized to provide transportation information in two broad catagories: plane, train, bus, taxi and other mass use transportation information, and traffic control and management systems.

The type of information services that can be applied in either area is dependent upon the technologies of the cable system and the transportation provider.

The technology that a cable operator can use varies from a simple video blackboard of commonly called numbers, to the incredible capabilities that videotext systems allow.

The simplest and most basic form of information is presenting commonly called transportation #'s via a fixed camera on a display board. An audio traffic advisory can be readily added to this video presentation.

The next step in developing a system involves the use of character generators. Varying in price from under $1,000 to over $50,000, these specialized word processors can provide from four pages to an unlimited amount of information. The main limitation of this equipment is the patience of the viewer. Although these machines can provide over 2,000 pages of information, the subscriber has no control over when or for how long the desired information will be on the screen. (Speed reading is essential with this technology.) Through the creative use of such options as varying color characters, video graphics. font intermix, animation, word flash, character flash, etc., can expand this technologies usefulness.

Through the use of teletype input available on the more advanced models, the information can be kept up-to-the-minute with regard to schedule changes or traffic delays.

The cable system architecture also has a bearing on the pertinance of the information provided. If the trunk lines can be designed to follow the transit routes, subdistricting can provide more detailed local bus, train, etc., routes and schedules.

Teletext is the transmission, either over the air or through a cable, of large quantities of information(up to 1,000 pages). By the use of a special adapter, the subscriber can select the page that is of interest and display it on the screen for as long as desired. With this system it is possible to sift through current data(updated every three minutes) on plane, train or bus schedules. The British Ceefax and French Antiope are operating teletext systems which incorporate transportation information. This technology is presently being tested by CBS at KMOX-TV, St. Louis and by KSL-TV, Salt Lake City.

The most advanced- and of course the most expensive-technology for transportation information is the two-way videotext. Developed by the British Post Office,

this requires an adapter not unlike that used in teletext. As this is a two-way system, the technology allows the subscriber to transmit data to make or cancell reservations.

Hybrid systems. The use of teletext in conjuction with telephone lines provides the same reservations making capacity as with videotext. Teletext does not, however, have the same volumn capacity as the computer retreivable videotext.

The desirability of schedules and rates is strongly related to their accuracy. As a result of prodding from the Urban Mass Transportation Administration, local transit officials are developing the computer data bases that have long been available to airlines. Interstate bus and train operators have also been developing these data bases. Both have demonstrated a desire to put this information on-line for riders.

A significant improvement to the accuracy of the schedules can be achieved through the use of vehicle locator devices. Through computer interface these allow the constant update of transit schedules. Early results from the Teleride system in Toronto indicates that utilizing this equipment has resulted in shorter waiting times, reduced passenger uncertainty and irritation, and consequently increased ridership and system revenues.

Schedule and route information of this type can be provided to the subscriber at the home, or to the public at terminals and tourist areas. General Motors is now experimenting with public video displays in Cincinatti, with its TIS system.

The second major area for utilizing cable-management and control devices. For many years traffic departments have sought to improve vehicle flow through the coordination of traffic controls via telephone lines. Since 1974, Columbus, Ohio has been using a Tocom, Inc. control system to improve vehicle speeds, reduce stop-and-go situations. As a consequent benefit, increased fuel consumption and reduced air pollution have resulted.

There are several control areas in which cable can be used.

Area-wide signal coordination involves the placing of remote sensors on streets and feeding vehicle count and traffic flow information, via cable, to a control center. A traffic ranger, sitting in a distant control room, monitorsand adjusts the system via switching and route alteration. A slo-scan TV can be used in conjuction with these controls.

By establishing a wayside traffic advisory system, traffic can be diverted to less conjested routes. Signs indicating speed, road conditions and weather advisories, detours, etc. can be controlled by the Traffic Ranger through the cable system.

Highway ramp management. By monitoring and controlling access to highways, considerable improvements in travel time can be achieved. In Dallas, Texas this system reduced travel time by 30%, increased speed by 32%, and reduced accidents by 18%.

Automatic vehicle locators are operable over cable and provide location information on buses and other transit vehicles. The location information is translated by computer into arrival time, and transmitted through the information system with up-to-the-minute data.

A TRANSPORTATION CHANNEL-YES/NO? HOW?

The desirability of a transportation channel will depend on several factors: the extent of the perceived transit/traffic problem; ease of use of the technology; the capacity and effectiveness of the proposed technology; and the regulatory, institutional and financial barriers.

Before incorporating transportation information on a cable system the following should be answered:

What are the information needs of the area?

Are there traffic or transit delays which will be meliorated by a control system?

What are the perceived needs of the community?

What technology is available to the cable operator?

What technology and information systems are available to the transportation operator?

Who is to take the lead in developing the system?

Who is best able to operate the system?

Are the traffic and transit officials in agreement with the system concepts?

What will be the cost of the system, and more importantly, who will pay the development and operating expenses?

Can sponsors be found, e.g., travel agencies or airlines?

What changes to the transportation system will result from implementing the system, e.g., will bus revenues be reduced by the development of an effective taxi group

riding system?

Conversely, will good bus service drive the taxi out of business?

In what public areas should the transit information be displayed-bus stops, terminals, tourist and convention areas?

The answers to these questions will differ in each community. Only after these questions have been answered to the satisfaction of all parties should the development of the channel begin.

The initial step in implementing the channel should be small. The blackboard approach described earlier is the simplest and safest approach. Let the system grow incrementally.

When the system is new, careful planning can provide excellent results. When possible be sure to run the trunk within reach of the major roadways. Evaluate if subdistricting willallow improved information delivery. Check the proceedures and determine if interconnection with adjacent or nearby systems is required or advisable.

CONCLUSION

With the recent developments in CATV and transportation technology, and the federal government awakening to the fuel conservation possibilities of utilizing telecommunications to improve transportation efficiency, the opportunitynow exists for the cable operator to provide a vast array of transportation information and management services. Only CATV can deliver on all of the potential applications. However, if the opportunity is not taken, other technologies will move in. The Knight-Ridder experiment in Coral Gables, Florida is capable of handling most of the functionsdescribed above. Viewdata has been licensed to GTE. CBS is experimenting with teletext. Combined these technologies can duplicate the role of cable in transportation.

By moving boldly into these areas the cable operator can benefit both financially and politically. However, action must be taken soon or the area will be preempted.

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