

# SMART

## Operational Field Test Evaluation: Institutional Issues Report

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*FINAL REPORT*

June 1997

**The  
University of  
Michigan**



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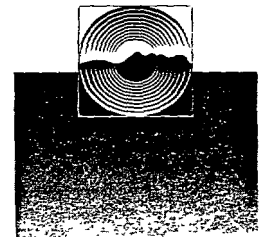
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*This report presents the results of the University of Michigan evaluation team's Institutional Issues report on SMART's deployment of advanced public transportation systems within paratransit operations. This report also stands as one of the deliverables listed in the Statement of Work for the evaluation.*

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## Executive Summary

Implementation of Intelligent Transportation Systems (ITS) in Southeastern Michigan offers an opportunity to enhance public transit and increase regional mobility. However, the needs that ITS technology will be designed to meet, and the manner in which it will be used, will be largely determined by the institutional context in which it is deployed. In this report, “institutional issues” are those organizational, political, and social factors that affect the implementation of ITS technologies. In the last three years the Suburban Mobility Authority for Regional Transportation (SMART) has begun the process of ITS implementation. This report considers the impact of three institutional issues on the deployment of ITS including: (1) decentralization of community transit, (2) the relationship between SMART and the Detroit Department of Transportation (DDOT), and (3) the organizational structure and management of SMART.

Data sources for this report include interviews with SMART management personnel, interviews with representatives of public and private organizations that work with SMART, planning reports, and newspaper articles.

The findings illuminate the economic and political considerations that led SMART to pursue a policy of decentralizing community transit. Decentralization will increase the challenge of using ITS to create an integrated regional transit system. While decentralization may enable SMART to tailor services to the needs of individual communities, regional integration will require active coordination and cooperation among these localities. Ensuring regional mobility will also require active coordination through cooperation or merger between SMART and DDOT which primarily operates in the city of Detroit. Significant social, political, and economic obstacles will have to be overcome for any coordinated joint activity between DDOT and SMART. Small steps toward increased cooperation, such as coordination of certain routes or purchase of compatible software, may be more likely to succeed and create a precedent for greater cooperation in the future. Finally, the prospect of these changes has raised the concern of the unions who will clearly play an important role in the implementation of ITS, and management will need to address workers’ fears about changing job definitions.

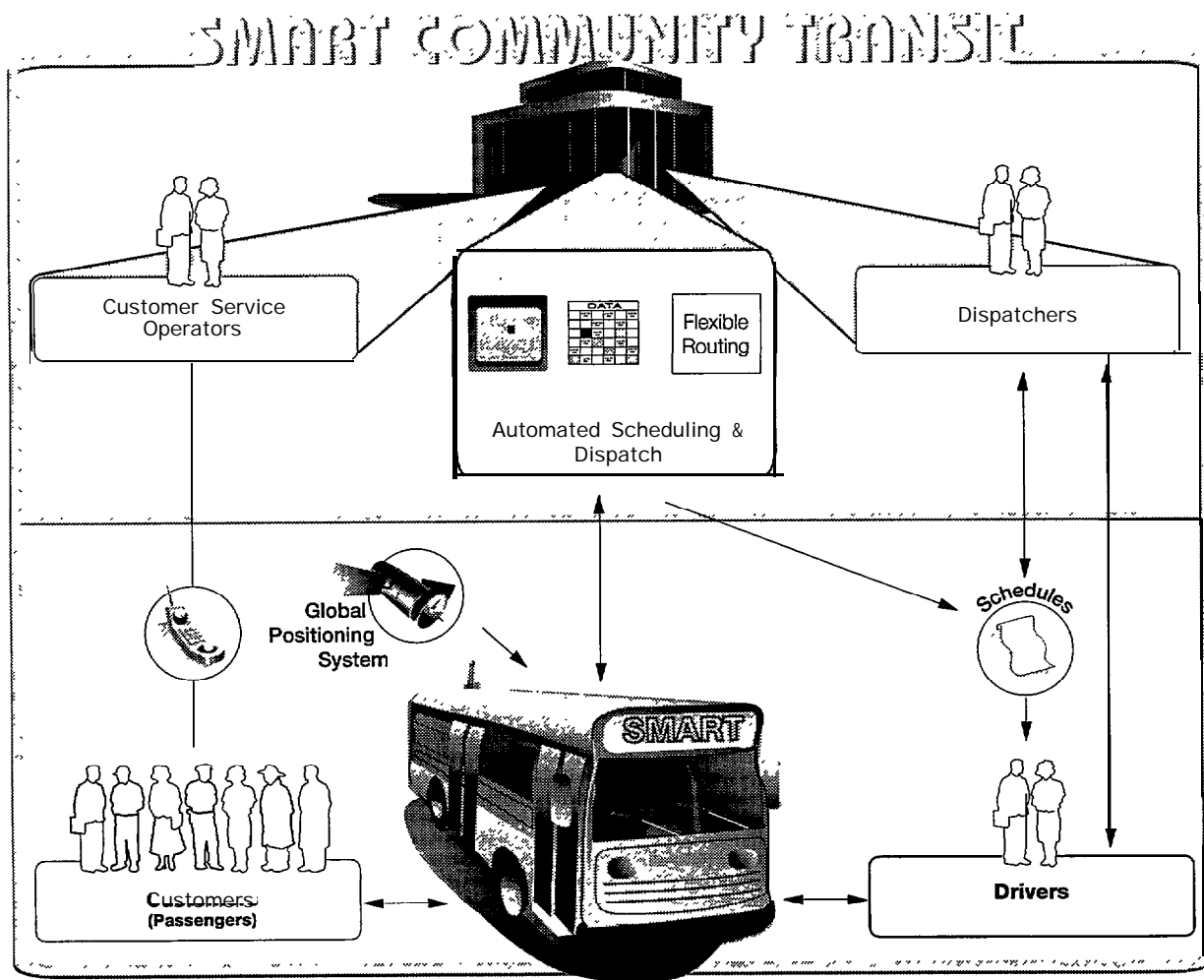
*The authors wish to acknowledge the numerous agency and private sector representatives who participated in the various interviews.*

# Introduction

The Suburban Mobility Authority for Regional Transportation (SMART) of Southeastern Michigan is among the first transit agencies in the U.S. to deploy advanced public transportation systems (ARTS) within its paratransit operations. In this project, SMART will deploy both automatic scheduling and dispatch (ASD) software and automatic vehicle location (AVL) with the goal of improving mobility throughout the region. As shown in Figure 1, SMART's deployment affects all aspects of paratransit--which they call Community Transit--operations.

The evaluation of such ITS programs often focuses on technical aspects of the systems themselves, or on their consequences for transportation operations and level of service. Yet it may be that non-technical issues are even more influential on the outcomes of ITS projects. For example, the degree of decentralization of paratransit services is an important determinant of communications needs and the role of ITS in SMART's operation. In the context of this report, these "institutional issues" are those organizational, political, social, and legal factors that may impact the implementation and use of ITS technologies. The report considers institutional factors that affect SMART's current use of ITS as well as future development of ITS.

Figure 1. SMART's APTS System for Community Transit



## Methodology

The University of Michigan conducted 15 interviews of individuals familiar with issues associated with the SMART deployment of ITS: four SMART management personnel, five representatives of public organizations, and three members of private organizations (one person was interviewed on three separate occasions). SMART personnel were selected based on their knowledge and involvement with the ITS project, while other individuals were chosen for their expertise with ITS or their involvement with the planning and funding of regional transit.

The confidential interviews generally lasted between twenty and sixty minutes and were conducted in person or by telephone. The substance of the interviews ranged from questions regarding the impact that ITS implementation has had on the relationship between SMART and other organizations to more general questions regarding decentralization and regional transit. In general, interviews were structured so as to best understand both organizational and individual perspectives on issues relating to SMART's deployment of ITS. Secondary sources included planning reports obtained from SMART, the Metropolitan Area Coalition (MAC), and the Road Commission of Oakland County (RCOC), as well as articles from local newspapers.

The findings center on three sets of issues:

1. issues relating to local funding and support, regional integration, modes of ITS usage, centralization within decentralization
2. issues relating to cooperation or merger with the Detroit Department of Transportation (DDOT), barriers to merger (union obstacles, social and political factors), increasing opportunities for cooperation or merger
3. issues relating to organizational structure, union-management relations, changing priorities, relations with other organizations, uncertainty of future federal support

## Decentralization of the System

SMART provides linehaul and paratransit services for three Michigan counties, Wayne, Macomb, and Oakland, which comprise Southeastern Michigan. The linehaul services operate on fixed routes and schedules providing both intra and inter-county transportation throughout the metropolitan area. Paratransit, by contrast, is composed of smaller vehicles that operate flexible schedules and often serve special populations (i.e. the elderly and the handicapped), though service is not limited to these groups. In the paratransit system, which SMART calls Community Transit, customers call to arrange for specific trip times, as well as pick-up and drop-off locations. The paratransit system can complement the linehaul system by enabling riders in low density suburban areas to travel back and forth between linehaul stops, or it can simply provide transportation within a particular area. Currently, SMART schedules and dispatches paratransit service out of its Troy (Oakland County), Michigan, terminal, though paratransit vehicles depart from all four SMART terminals. In addition, dial-a-ride service in Pontiac is scheduled and dispatched from the Pontiac terminal. The trips provided by SMART and its purchase of service providers (subcontractors) amount to nearly 3,000 per day.

Following SMART's 1995 electoral success in securing a local property tax millage, SMART management decided to pursue decentralization of the paratransit operation. Under the decentralization plans, more cities and townships in the region would assume authority over the paratransit services within their localities. The exact level of control to be adopted by localities likely will be decided on a case-by-case basis, with a "menu of options" available to select from. For example, one locality might opt to hire its own drivers and conduct its own scheduling through remote access to SMART's ASD system, while SMART would retain responsibility for vehicle maintenance and procurement for the same. Although the details of the decentralization plan are subject to continuous evolution, it seems

likely that decentralization will have profound consequences on how SMART will function throughout the metropolitan area and how it will use ITS technology. In the section that follows, we consider the effect decentralization will have on local service, the impact it is likely to have on a regional mobility, and how the use of ITS technology will both contribute to decentralization and be affected by it.

Perhaps the primary rationale for decentralization is that it will result in services more tailored to the needs of individual communities. SMART hopes that better local services will increase its public approval and political support in the areas that it serves. Such support is necessary for SMART to win renewal of its property tax millage in August, 1998. The decentralization plan is also based on management's belief that SMART can "work with the communities for the definition of service in their own area," which will result in better paratransit services than SMART currently offers in its more centralized system. In Harrison Township, for example, services could be designed to meet seasonal demands for transportation to the beach front, while in other communities the specific needs of older adults or local workers could be addressed. In all areas, the goal would be to provide paratransit services consistent with the nuances of local need.

SMART management hopes that decentralization will result in increased political support for SMART in the communities in which it serves. A key ingredient to this political support is that SMART will not disrupt the specific services that local politicians have provided for their constituents. As one official explained, "paratransit service that is provided by many communities gets very political. The mayor of X would like to operate the bus for senior disabled residents because in election time he will get more votes." The support of local officials would provide much needed financial stability and would create a base from which paratransit could be developed. This strategy was stated succinctly by one SMART administrator: "People are more apt to raise supplementary dollars if they feel they have some ownership in it."

Potential benefits notwithstanding, decentralization could have a large impact on the way that ITS is used in the region, and there are concerns that under the decentralization plan ITS will not be used to facilitate an integrated regional transit system. Several critics voiced fears that instituting locally based paratransit systems with separate scheduling and service facilities will lead to a series of disparate transportation systems lacking any meaningful connection to each other. Indeed, in a decentralized system, cross-county transportation could be difficult and inefficient, unless SMART and the localities make concerted efforts to share data and coordinate their services and passenger trips. In the absence of ITS, decentralization would appear to be unthinkable, and even with ITS coordination of local services is not guaranteed.

Advanced scheduling and dispatching (ASD), as well as automatic vehicle location (AVL), can be used to help coordinate the activities of relatively autonomous local units. Using these technologies, trips scheduled locally would still be booked using a single, regional scheduling and dispatch system, with localities accessing the system via a computer network system. Thus, even local scheduling can be arranged to account for transfers with other paratransit vehicles and with regional (SMART operated) linehaul operations. For example, a resident of Bloomfield Township who requires a trip to a doctor in Southfield would need local service in Bloomfield Township to link with local service in Southfield. The success of this concept rests on cooperative scheduling, accurate vehicle tracking, precise coordination of the vehicles involved in transfers, and a firm commitment from local communities to make such trips happen.

Let us take another example to illustrate how essential coordination is for regional travel. A resident of Harper Woods who wishes to travel to a job in Southfield could take the Harper Woods Dial-a-Bide to Eastland Mall, then transfer and take the linehaul service to Northland Mall, then transfer again and take Community Transit for the remainder of the trip to the Southfield job site. In the absence of coordination between the two paratransit systems and the

linehaul, this traveler would need to make two separate paratransit arrangements in order to arrive at his or her Southfield workplace, while at the same time insuring that these arrangements match the linehaul schedule. Clearly, coordination of schedules and vehicles will be a vital component of maintaining regional integration and mobility.

The new scheduling and dispatching system Trapeze TM-QV is designed to support this type of highly coordinated, inter-community travel by providing local access to the regional scheduling and dispatching software. The rider in the example above would be able to make a single call to the local Dial-a-Ride operator in Harper Woods and be able to request a trip all the way to Southfield. Given on-line access to regional trip scheduling, the local operator would be able to book a paratransit trip to the nearest linehaul stop at the appropriate time for a transfer and, ideally, also schedule the last leg of the trip from the Northland mall to the Southfield work site.

Numerous parties would like to see the introduction of ITS into the region as a tool for empowering SMART to create a sophisticated regional system. These advocates envision a system decentralized to foster a closer match between local needs and services, yet sufficiently coordinated to enable transportation across community boundaries. Advocates of this vision argue that ITS would be better used if it increased regional mobility, thereby fostering a more regional economy by enabling people to travel further for jobs as well as economic, social, and medical services. Others, however question the ability of ITS, or any technology, to provide coordination within a decentralized system. A transportation official expressed great concern that these benefits might be lost in a decentralized system:

“When you allow every local community to do their own thing, it doesn’t afford any regional integration, and life does not end at the boundary of the city. Hospitals, shopping centers are regional, and you get into a huge fight when you let the local community decide. A regional authority has the responsibility to draw up a regional plan... [Otherwise] buses are not reliable, unsafe, and not

maintained. This is what happened 20 years ago. Maybe they will learn from history.”

Finally, these same critics argue that a regionally based system is likely to be more efficient, with fewer transfers and less duplication. Local authorities may lack the expertise needed to use the resources wisely, and SMART may not be able to hold localities accountable or prevent abuses. Indeed, even an accurate accounting of expenditures may be difficult for individual localities to obtain, and SMART has not yet instituted measures to account for efficiency of services in local areas. SMART should be given increased fiscal authority and operational responsibility to provide a more efficient regional system

## Maximizing Community Resources

An additional component of the SMART decentralization strategy is the coordination of autonomous transit providers that exist in each community. Currently in Southeastern Michigan there are more than 200 private providers and agencies that cater solely to specific clientele. Such providers, who serve groups ranging from church members to youth groups, operate only at partial capacity, and are restricted by the demands of their customers. Consequently, many transit vehicles are employed for just a few hours each week. SMART views these under-used vehicles as a resource for expanding the total quantity of service available in the region. A publication by the organization Metropolitan Affairs Cooperation (MAC) refers to the current state of chaos that defines the Michigan suburban paratransit system:

“There is a fleet of small transit vehicles operating in Southeast Michigan... but their services are only available to specific eligible people, often resulting in virtually empty vehicles. These transportation providers pretty much operate in isolation from one another. The result is a confusing maze of services through which few potential riders can navigate.”



SMART proposes to address this situation by coordinating the activities of the numerous providers and agencies that exist in each community such that local transportation resources would be maximized. In this scenario, SMART would provide additional resources to private providers at times when their demand is heaviest, and in return, SMART would use providers' vehicles at times when they are not in use. This plan, still in the negotiation stage, has the potential to rationalize local transit, but it would require the sharing of private resources and a substantial degree of coordination. SMART officials believe, however, that such coordination has been made technically possible by ITS technology. The level of cooperation among the communities is less certain.

## Conclusion

There are several important questions regarding SMART's decentralization plan and the manner in which it will affect the use of ITS. First, will decentralization actually result in services more in tune with the needs of individual communities and will residents be more satisfied with SMART as a result? While local authorities may be more aware of the needs of residents, it remains to be seen whether the decentralized system can provide the services needed to meet these needs. The ability of SMART to work with local officials to design good local systems and to develop the technical capacity to efficiently operate such a system will affect the extent to which residents are willing to maintain their financial support of SMART.

Second, what impact might plans for decentralization of paratransit service have on aspirations for the creation of a truly regional transit system? SMART faces a serious challenge in using ITS technology in a way that gives localities more control while maintaining a high degree of regional coordination. Some observers fear that the increased attention to local needs will limit regional coordination that benefits both the economy and the more vulnerable segments of the population. It is not clear, however, that the population is committed to supporting a regional transportation system. Support for such a system is particularly weak in the peripheral areas of the three counties, where traffic congestion is less problematic and private automobile ownership the norm. In this sense, SMART is constrained because it operates within a political system designed to restrict regional authority, and localities may resist efforts to reduce local autonomy. Thus, some have concluded that as long as SMART is dependent on local taxes for funding, high levels of regional coordination may be difficult to achieve with or without ITS.

Third, will the scheduling, dispatching, and vehicle location systems provide any practical support for coordination among locally autonomous community transit operations? SMART has been challenged to coordinate linehaul and paratransit with centralized authority. There is reason to question whether new technology can make a difference in support of coordinating adjacent contiguous transit services or community transit with linehaul.

## The Relationship Between DDOT and SMART

Southeastern Michigan is home to two major transit agencies that operate service within the city of Detroit and its suburbs in Wayne, Oakland, and Macomb counties. Until recently, SMART has provided linehaul services between the suburbs and the city, while the Detroit Department of Transportation (DDOT) has provided services within Detroit. Recently, however, these boundaries have begun to blur, as SMART has expanded its services within the city and DDOT has extended service into the suburbs. Despite the expanded services of both agencies, there is widespread support for increasing the integration of transit provided by DDOT and SMART. A number of observers have noted that ITS can be an important technological tool to enhance such cooperation. For example, ITS can facilitate use of the same scheduling software and sharing of data. Yet despite this general support for cooperation, there exist competing ideas on how this integration should be carried out. Ideas include: a total merger of SMART and DDOT, a merger implemented in phases, and increased cooperation that would fall short of an actual merger. Each of these three approaches to merger are discussed in the following section, followed by a discussion of the barriers to merger.

### Total Merger of DDOT and SMART

Some of the officials who participated in this study suggested that a total merger between SMART and DDOT could result in greater efficiency, as well as increased convenience for travelers. Some critics claim that it is not uncommon for both SMART and DDOT to serve the same geographic area, with neither filling their busses to capacity. More recently, however, the two agencies have begun to cooperate on linehaul scheduling and routing. Potential benefits of such coordination are great, and include reduction of headways for waiting passengers, improved spacing of transit arrivals to better match the pattern of traveler demand, reduction in numbers of transfers required of the passenger, and expanded range of service types, including both local and lim-

ited stop service. To a large extent, cooperation in service design can be accomplished independent of merger, though merger might be expected to expedite efficient linehaul routing and planning.

Another important benefit that could be realized from a total merger is greater investment in planning to better exploit ITS. Currently, both SMART's and DDOT's budgets limit investment in planning that is instrumental in developing innovative ways of using ITS. One commentator noted that SMART's investment in planning and development is considerably less than that of other public transportation agencies, and that recent cutbacks have further aggravated this situation. A merger between DDOT and SMART that leads to a more efficient use of planning and development resources could result in a regional transit agency with a greater capacity to plan for and invest in long term strategies for system wide improvements.

Finally, total merger advocates claim that ITS technologies could facilitate a merger between the two systems. Total merger holds the potential of achieving administrative efficiencies between the two systems, including streamlined maintenance, reduction of deadhead, or "out of service" time, and economies of scale associated with joint purchasing and administration. Similarly, achieving consistency between the systems in union rules and procedures could streamline service provision and system administration and maintenance. Recently, both DDOT and SMART purchased similar computing packages that could expedite the merger process in terms of planning and scheduling services.

### Phased Coordination

Supporters of this strategy argue that a total merger of DDOT and SMART is overly ambitious at this time, and that coordinating smaller components of the operations is more likely to succeed. They also emphasize that a total merger has been discussed for at least thirty years without much meaningful progress, and that modest short-term goals are more likely to lead to a more coordinated system in the long run. Consequently, some have suggested that

the first phase should aim to integrate the maintenance sectors of DDOT and SMART so as to reduce duplication and free resources for other departments within both agencies. Alternatively, a recent proposal, with implementation scheduled for September 1997, suggested the coordination of six different routes, including the sharing of scheduling and ridership data and integration of service. According to this plan, a single scheduling system operated by the same software will improve overall service on these routes by providing consistent service throughout the day. Currently, a DDOT bus may be immediately followed by a SMART bus, after which neither will provide service for an extended period of time.

## Barriers To a Merger

Despite the apparent benefits of a merger (total or partial), there are several factors that impede efforts toward this end. These barriers, which are discussed below, include: conflicting union arrangements, lack of political support needed to fund a unified regional transit service, and SMART and DDOT's different funding sources.

The employees of both SMART and DDOT belong to many different unions. For example, mechanics, paratransit drivers, linehaul drivers, and dispatchers all belong to separate unions that have made different arrangements with SMART and DDOT regarding pay, working conditions, hours of work, and pension plans. Any attempt at an even limited merger would have to reconcile different arrangements made by the unions of the units in question. A larger scale merger would unleash an even greater number of sensitive union issues. Of particular difficulty will be distributing work between the two drivers unions on the combined routes. On the other hand, the *Detroit News* quoted Wendell Cox, a mass transit consultant and one of the initial designers of SMART, as saying that a merger could increase union power. "If they were to have a strike," he argued, "they would shut down all the transit in town. If they have a strike at one of the two agencies, some of the transit is still operating" (*Detroit News*, April 4, 1996).

Some of the wealthier areas in the Detroit region believe that a proposed merger between DDOT and SMART is tantamount to a suburban subsidy of the Detroit transportation system and have therefore resisted these efforts. Such communities, which tend to be those further away from Detroit, have preferred to consider the cost-benefit of the merger from a local perspective rather than a regional one. Oakland County Executive L. Brooks Patterson was quoted in the *Detroit Free Press* as saying that he is uncertain about the wisdom of a merger and that he is "...not sure if big is necessarily better" (June 1, 1996). Likewise, a *Detroit News* editorial also questioned the desirability of a merger, arguing that "the notion that bigness and centralization equates with efficiency is a dubious one" (Feb. 26, 1995). This suburban resistance represents a serious political obstacle for merger advocates, and efforts need to be made to overcome this sentiment if a merger is to be implemented. One observer noted that in some cases the extent of cooperation between Detroit and the suburbs has been more a function of personal relationships between local politicians than of structural or institutional factors.

The instability of SMART's revenue flow further jeopardizes merger plans. Unlike DDOT, which receives a percentage of Detroit's general budget, SMART historically has lacked a local source of funding. In 1995, however, SMART obtained from the voters approval for a local property tax millage. Under this arrangement, SMART depends upon local politicians to place their millage on the ballot and on the voters for approval. Indeed, many communities including Detroit, opted out of the SMART system in 1995 rather than approving a property tax levy. Thus, even if a merger were to be implemented, the long-term stability of the regional transit system could be weakened by the constant threat that suburban localities would cut off funds. Indeed, a merger without a unified source of local funding may well be impossible.

## Conclusion

Although ITS adds to the increasing momentum for cooperation between DDOT and SMART and might help to facilitate a merger, structural and social barriers to implementation that lie outside the realm of ITS remain. As a former SMART employee and ITS advocate remarked, “the technology of ITS is supportive of the merger, but the technology is not itself the answer.” Structurally, complicated union arrangements and varying work and quality standards would need to be reconciled, and difficult compromises would need to be reached between the two agencies. Yet perhaps even more serious are the social and cultural obstacles. More than most other metropolitan areas, Detroit and the surrounding suburbs are racially divided. Rather than a tradition of cooperation, there exists a history of conflict, fear, and mistrust between the city and the suburbs, with little precedent for unified action. Plans for a merger of DDOT and SMART are based on ideas about increased regional integration, as well as a regional perspective about the economy and the general development of the area. For many suburban and Detroit residents, success in this area will require a change in mentality -- a change that has been slow in coming. Until this occurs, it will be difficult to muster broadly based political support for a merger of DDOT and SMART. Fortunately, many recent developments (e.g., positive relations between first-

term Detroit mayor Dennis Archer and suburban leaders, GM’s commitment to downtown Detroit) provide reason for optimism.

**Increased Cooperation** - It may be for these reasons that some people are calling for increased cooperation between DDOT and SMART, rather than any sort of merger. Such cooperation could use ITS technology to facilitate the sharing of data and the coordination of routes and transfer points. Advocates of increased cooperation argue that while the potential level of integration accomplished through cooperation are less than that of a merger, enhanced cooperation is more politically feasible with a greater likelihood of success. Furthermore, they point to the success of similar efforts between the suburbs and cities of San Francisco and Chicago, where separate city and suburban transit systems are able to work together and cooperate. Taking a different perspective, a representative of an outside organization that supports a regional transit system argued that increased cooperation or merger would be expedited if an external council composed of political, business, and labor leaders would dictate the necessary changes to both DDOT and SMART, rather than waiting for the two transit agencies to reconcile their differences on their own.

# Organizational and Management Changes

## Changing Organizational Structure

The implementation of ITS technology has created pressure for changing the organizational structure of SMART. SMART's current effort to provide service designed to meet the distinct needs of individual communities is hindered by an organizational structure that was designed to achieve different goals. Yet, while current thinking suggests that the new goals should dictate the nature of organizational change, SMART's goals are, in part, determined by its customers, who have different needs. Thus, SMART faces a challenge in understanding the complex nature of consumer needs, harnessing the appropriate technology to meet those needs, and structuring the organization so as to efficiently implement the technology. One observer commenting on the need for this organizational change stated that "the idea is to consider the customer and the service. What kind of service does the customer want, what is the technology for that, and then looking at the organization and reorganizing job functions."

One plan for restructuring would involve dividing the organization into geographic units within which would operate both paratransit and linehaul buses. This plan seems to acknowledge that SMART operations will vary from place to place, and within each area there will be a need to coordinate different types of services. Said one SMART official, "You try to look at every transit system in every place differently, the density of development, the demography of the riders, the history of transit, [whether this is an] area where people depend on transit."

## Management and Union Relations

The implementation of ITS will also create a new set of issues to be reconciled between the unions and SMART management, whether there is merger or not. Several commentators remarked, for example, that drivers are wary of a technological system like automatic vehicle location that will allow management to track their every move and

may pressure the union to resist such an encroachment on their autonomy. Furthermore, the unions will need to find a way to cope with the need for workers to learn new skills and the realization that some workers may be considered inadequate to meet the new demands of ITS technology. As a representative of the paratransit drivers' union did not agree to be interviewed for this report, the view from within their union can not be reported. As has occurred in other industries, however, new arrangements between union and management may play a central role in meeting SMART's new agency goals.

Reconciling changes with the many unions involved slows the pace and extent of change. All of the unions are charged with the task of protecting their workers, and are suspicious of change, fearing that it could result in layoffs, reduced pay, or a weakening of union power. One such case that has recently surfaced regards a clash with the drivers' unions concerning the rerouting of transit vehicles. In this case, ITS enabled SMART to institute a flexible routing system, which changes as people's needs shift, but the two drivers' unions (linehaul and paratransit) have both laid claim to the routes, arguing that the jobs should go to their drivers. Currently, union rules and regulations are based on the size of the bus and not the type of service. This type of arrangement in a flexible ITS may prove to be overly constraining and impractical. Full implementation of ITS-based flexible routing depends on a reconciliation between the two unions and the management; otherwise success in this area may lead to resentment and problems elsewhere.

## Changing Priorities

The passing of the millage in several elections in May and June 1995 provided SMART with additional revenues, as well as wider acceptance in many communities throughout the metropolitan area. This acceptance, however, brought with it new responsibilities, pressures and financial commitments. Such obligations have forced SMART to divert limited staff resources toward putting new services on the road in the communities in which the millage passed. Some SMART officials view this move as

an obligation to the communities, and as the best way to ensure that the millage will pass in future elections. Within this context, intelligent transportation systems plans were somewhat deemphasized as they are properly viewed within SMART as a means to the end of administrative efficiency and service improvement. Thus, political exigencies and the lack of a staff member dedicated exclusively to ITS implementation, coupled with technical difficulties, have pushed the implementation of ITS a year or more behind schedule. Given adequate staff resources, however, ITS could emerge as a central element in SMART's strategic plans for securing public acceptance through decentralization and improvement of transit service.

At the same time, the perception of some other officials involved in regional transportation issues remains that SMART has lessened its commitment to ITS implementation. Improved communication with SMART's regional partners, coupled with the post-millage reallocation of resources to ITS may allay concerns regarding the future of the organization's ITS plans.

## Cooperation With Other Agencies

ITS technology provides an opportunity for cooperation between regional transportation and traffic organizations. One approach for this type of cooperation was developed by the Road Commission for Oakland County (RCOC) in 1993. Under this plan, SMART was to provide the RCOC with up-to-the-minute traffic information gathered by buses equipped AVL, thereby enabling the RCOC to distribute this information to travelers via the internet and other channels of communication. A representative spoke of the plan's potential:

“We talked about interfacing in a variety of ways such as sharing data and information, and helping each other on a technical basis. We made plans that our comprehensive

transportation information management system will include a variety of data collected by SMART and transferred to us.”

Implementation of this plan involved cooperation between SMART and RCOC in conceptualizing the system plan, developing system requirements, and tracking the traffic information between organizations. While RCOC was responsible for developing the traffic information management system, SMART was responsible for implementing the AVL on its buses, processing the data, and providing the means for transmitting the information to RCOC. From SMART's perspective, however, RCOC's initial plan for data transfer placed too high a demand on SMART drivers, with a strong potential for negative impacts on service quality, and perhaps on safety. Meanwhile, planning for the millage election placed enormous time demands on key SMART staff, diverting some attention away from ITS projects'. While this may have caused some delays for RCOC, continued discussions appear to have resulted in a data-sharing implementation plan acceptable to SMART, RCOC, and RCOC's integrator. As of Spring 1997, SMART is moving ahead with ITS implementation (the ASD system is about to be upgraded and the AVL implementation in the vehicles is near completion), with ITS viewed as an important component of SMART's new decentralized service plan and the focus of cooperative efforts with DDOT.

## The Uncertainty of Federal Support

The Federal Highway Administration (FHWA) provides SMART with 80 percent of its ITS budget. Congress earmarked these funds (12.5 million dollars) for a two-year period, and despite the FHWA's commitment to ITS, there is little chance that FHWA will continue to provide this level of funding for ITS to SMART. Thus SMART faces some uncertainty regarding the future of new capital investment in ITS beyond that which is currently funded. While bud-

1. A number of staff changes near the time of the millage election and thereafter also may have contributed to some redefinitions of priorities within SMART. This situation, however, had no effect on SMART's available funding for ITS, as such funding derives from federal grants earmarked for ITS.

gets appear sufficient for most currently planned capital improvements as well as their subsequent maintenance, some plans — e.g., voice annunciation on board buses — will require development of additional revenue sources, or diversion of other funds. SMART staff hopes that the organization will be in a position to benefit from Michigan’s recent gasoline tax increase, though this is by no means assured. However, SMART must also prepare for a situation in which it will be forced to compete for funds with other agencies that use ITS technology. In this case, SMART could potentially receive funding equivalent to the current level, funding below the current level, or a cessation of federal funds designated for ITS operation. A representative of the FHWA spoke of the difficult dilemmas that may await SMART in the event that federal ITS funding is significantly reduced:

“They will have to make a very hard decision whether they are going to use some of their other funds which come from the Federal Transit Administration to implement ITS projects as opposed to making capital improvements in their bus system and other investments which they need to make each year to continue their basic operation.”

## Conclusion

Along with the great potential that ITS offers to regional transportation, it has also introduced some uncertainty into SMART and the organizations that interact with SMART. For the unions and the workers they represent, ITS innovation puts into question the nature of future work requirements and the stability of previous deals that have been made with management. Even the structure of the unions may not be optimally designed to represent workers’ interests given the nature of change created by ITS. Likewise, plans for cooperative information sharing between SMART and RCOC remain partially unimplemented, though SMART has recently authorized expenditures for integration with RCOC’s systems. Clarifying expectations and ensuring regular and timely sharing of information promises payoffs both in terms of the working relationship between the two organizations and in terms of their ability to use information to improve service delivery. Finally, ITS forces SMART to meet the challenge of uncertainty in planning for the future. SMART has already made difficult decisions regarding the shifting of focus from ITS implementation to local service provision. Now, SMART must plan for a future in which funding for future ITS capital improvements is not guaranteed.

## General Conclusions

Numerous people working in different capacities have commented that the emergence of ITS has opened the door for the development of a regional transit system that can transport people efficiently throughout the entire Detroit metropolitan area. The increased mobility of the workforce would benefit businesses and workers alike, enhancing the competitiveness of the region. Consumers would enjoy greater access to a wider variety of retail centers, and cultural centers would enjoy larger audiences. For those already using public transportation, the quality of life would improve as service increases, transfers become less frequent and travel time drops. Furthermore, commitments at both the federal and state level to moving welfare recipients into the workforce further underlies the need for improved regional transit.

There are several institutional issues, however, that must be resolved before this vision can be realized. SMART must find a way to achieve sustained financial support from suburban communities without sacrificing efforts to create a more integrated regional system. DDOT and SMART, the two major transit providers, will have to overcome past tensions and work cooperatively to enhance regional mobility. Unions and management will have to adapt to new work arrangements needed to make the most productive use of ITS technology, and employers will need to find ways to assure the unions that the workers' interests will be protected. Finally, suburban and city residents must overcome previous hostilities and find ways to work together in the creation of a more highly coordinated transit system.

## Lessons Learned

### 1. **APTS technologies can enable new systems for delivering transit services tailored to regional and community needs.**

Advanced scheduling-and-dispatching software and AVL provide the technology needed to support community-based paratransit. However, the character of a decentralized community transit system will be determined largely by social, political, and economic forces that must be carefully considered.

While ITS can enable local service in tune with community needs, careful planning will be needed if local services are to be sufficiently coordinated so as to increase regional mobility. Attention must be paid to matters concerning the sharing of ridership and scheduling data, as well as the manner in which communities will negotiate these and other issues related to the coordination of services. In the absence of careful planning it seems probable that decentralization will come only at the cost of reduced regional integration.

Currently, discussions concerning the implementation and design of local services are still in preliminary stages, and it is difficult to anticipate what agreements will be reached. Yet even if communities demonstrate the political will to coordinate, it seems clear that they will need considerable help in exploiting ITS to achieve integration. Significant technical assistance from SMART, for example, may be needed to train local customer service operators and to solve hardware and software problems when they arise.



**2. Interjurisdictional barriers may continue to impede progress toward merger despite the enabling technology.**

ITS can potentially facilitate increased coordination between SMART and DDOT, but it cannot solve the social and political barriers that have prevented progress on this issue for more than twenty years. However, there does appear to be some small progress in the fostering of cooperation between the two agencies. These advancements lend credibility to the claim that informal cooperation on specific issues may be more practical than merger, and more likely to bring actual change. Furthermore, given the history of mistrust between Detroit and the suburbs, establishing a new precedent of cooperation, even with minor accomplishments, represents an important step forward. Actual merger, complicated now by funding issues connected to the SMART millage, may not even be necessary to achieve desired service and efficiency improvements.

**3. Implementation of ITS may foster organizational changes that conflict with existing practices and work rules; unions, in particular, may resist such changes, and management will have to reconcile these issues with the unions.**

SMART's success in securing a local property tax millage has forced it to place a premium on customer service and satisfaction in those communities in which the millage passed. This shift in priorities has caused important changes in SMART's internal structure, its relationship with labor unions, and with other organizations concerned about transit. Clearly, the labor unions are key figures in the future of SMART and will affect the way in which ITS is used. ITS technology seems likely to alter traditional job definitions and to blur the rigid boundaries between linehaul, paratransit, and other types of service. The unions appear to be suspicious of these changes and their cooperation is not guaranteed. It is imperative that management find ways to include labor in the discussion of future plans and that concerted efforts be made to increase workers' understanding of relevant issues.