

## **MIS Case Study: I-94 Rehabilitation Project - Detroit, Michigan**

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### **Abstract**

ISTEA includes specific requirements for inclusion in studies of Major Investment Projects in Metropolitan Planning Areas. The State of Michigan initiated a Major Investment Study (MIS) in October 1994 for the redesign and reconstruction of a 7 mile long section of I-94 from the I-96 (Jeffries) Freeway Interchange easterly to its interchange with Conner Avenue. This section of I-94 serves a number of areas of special importance in Detroit, including the downtown business area, Wayne State University, the New Center, the Cultural Center, the Medical Center, and the City Airport. This section of I-94 is also an integral link in the entire Detroit Freeway System and includes interchanges with the I-96 (Jeffries), M-10 (Lodge), and I-75 Freeways, as well as major Detroit thoroughfares. It must also be emphasized that I-94 carries a high volume of commercial traffic, and constitutes a significant trans-continental and international trade route throughout its entire length.

To achieve consensus building, the MDOT established an Interagency Coordination Committee (ICC) which includes representatives of MDOT, FHWA, FTA, SEMCOG, the City of Detroit, and Wayne and Macomb Counties. This committee is chaired by the MDOT Project Manager and maintains an active role in project decision making. In response to MIS requirements for justifying the addition of general use lanes for improving mobility, the study includes evaluation of potential for Special Use Lanes for the exclusive use of High Occupancy Vehicles (HOV), trucks, or other combined special uses. A great effort is involved in this project in the area of Public Involvement and Public Information, and many avenues of communicating information and receiving public input are being employed.

A very ambitious schedule of 30 months was set for the completion of this study. Maintaining this schedule requires aggressive project management and a firm commitment to remain within the limits of the project scope. The most pressing need for maintaining the project schedule is caused by the advanced state of deterioration of the Dequindre Yard Bridge, requiring its replacement. This is one of the largest bridges in Michigan, carrying I-94 over the Dequindre Rail Yard.

Major issues on this project include: 1.) Balancing the need to proceed quickly with the need for a thorough development and analysis of alternatives for the redesign of the entire study section and conformance to MIS requirements; 2.) Balancing conflicting goals of selecting the best alternative and minimizing displacements; 3.) How great a percentage of the entire MIS effort on a major urban project should be expected to be concerned with public involvement/public information; 4.) Producing recommendations that are specific enough for final design to commence while retaining enough flexibility to meet changing situations that cannot yet be anticipated. The paper will examine these issues and other major study elements, the degree to which they are, or are not, being successfully addressed through the MIS process, and areas for possible improvement of the MIS process.

The present Surface Transportation Act, ISTEA, specifies certain specific requirements for projects that qualify as Major Investments in metropolitan planning areas. The Act also outlines special requirements for Major Investment Studies (MIS) related to these projects.<sup>1</sup>

Very briefly, compliance with MIS requirements requires special attention to at least three main areas. First, major project decisions are to be made by consensus of the involved jurisdictions and the MPO, as well as the State DOT, the Federal Highway Administration (FHWA), and the Federal Transportation Administration (FTA). Second, the study of alternatives must include a complete treatment of alternatives that improves the mobility of people and goods, while alleviating the need for additional general use lanes. Third, the study must include a pro-active public involvement/information program that brings public input into the decision making process as much as possible. The Michigan Department of Transportation (MDOT), already includes these elements in their Early Preliminary Engineering (EPE), or Phase I, studies, because they are required by the National Environmental Protection Act (NEPA) process. ISTEA now requires more far-reaching, and well-articulated efforts in these three areas for MIS projects, than may have been customary in the past to satisfy the NEPA process alone. MIS documentation can be submitted in a separate report to the FHWA, or combined with the Environmental Impact Statement.

The State of Michigan initiated its first MIS Study in October 1994, and it is presently still underway. This project is the redesign and reconstruction of a 7 mile long section of I-94, from the I-96 (Jeffries) Freeway Interchange easterly to its interchange with Connors Avenue, which constitutes a key link in the Greater Detroit Area Freeway System.

### **The Detroit, Michigan I-94 Project**

The Greater Detroit Area Freeway System is a network that includes a number of aging freeway sections, some of which were constructed in the 1950's. Deficiencies on some of these sections have reached a point, beyond the curative powers of maintenance procedures, requiring complete reconstruction. Recognizing this, (MDOT), cooperatively with the Southeast Michigan Council of Governments (SEMCOG) and Wayne County, completed a planning study of the Greater Detroit Area Freeway Network to identify and prioritize freeway sections in most need of improvement. The results of this study identified I-94 as the Detroit area freeway with the highest priority for improvement. The first section of I-94 selected for rehabilitation is the previously identified 7-mile section through Detroit. This section was selected for the initial improvement study because of its location, service functions, and connections with other elements of the freeway network. In order to complete this study in a timely manner, the MDOT has retained the services of a consultant team led by Parsons Brinckerhoff Quade & Douglas, Inc. as the prime firm.<sup>2</sup> The Phase I costs of this study will be in excess of \$7 million and ultimate construction costs are expected to approach \$1 billion.

This section of I-94 serves a number of areas of special importance in Detroit, including the downtown business area, Wayne State University, the New Center Area, the Cultural Center, the Medical Center, and the City Airport. This section of I-94 is also an integral link in the entire

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1. Reference should be made to ISTEA and other related documentation for a complete definition of Major Investment Projects and requirements for Major Investment Studies.
  2. Member firms of the consultant team include: Parsons Brinckerhoff Quade and Douglas, Inc.; HNTB Engineering and Architecture, Inc.; Snell Environmental Group, Inc.; Jay Gregory & Associates Consulting; Engineering Associates, Inc.; Great Lakes Research Associates, Inc.; Charlevoix Abstract & Engineering Co.; Cole Financial Services, Inc.; Tucker, Young, Jackson, Tull, Inc.; PR Associates, Inc.; PR Networks, Inc.; and Moore and Associates, Inc.

Detroit Freeway System and includes interchanges with the I-96 (Jeffries), M-10 (Lodge), and I-75 Freeways, as well as major Detroit thoroughfares. It must also be emphasized that I-94 carries a high volume of commercial traffic, and constitutes a significant trans-continental and international trade route throughout its entire length. This multiplicity of function makes this section of I-94 a linchpin of the Detroit Freeway System. Accordingly, the project must include the redesign and reconstruction of the major freeway to freeway interchanges at I-75 and M-10 (Lodge Freeway).

This section of I-94, with the above stated interchanges, provides a connection for commercial and private trans-continental traffic to the two Detroit \ Windsor border crossing facilities. This last point is extremely significant because of the high volume of international trade between the US and Canada, as well as Atlantic Trade at these boarder crossing facilities. The volume of international trade at the Detroit / Windsor border is nearly comparable to the trade at the Mexico / Texas and Mexico / California borders combined. Additionally, I-94 is doubtlessly of service to a substantial volume of Michigan / Mexico trade in Auto Parts and Agricultural Produce.

Traffic analyses to date, has included origin-destination studies, existing traffic counts, and traffic forecasts for the year 2015. The SEMCOG Tranplan Model was used to help with distribution to establish existing traffic patterns, and to provide traffic simulation for forecasting peak period and peak hour volumes. The model predicted a growth in traffic volumes of approximately 20% between 1996 and 2015. The Origin-Destination study indicated that approximately 90 percent of the existing traffic was traveling through the study area while the remaining 10 percent had an origin and/or destination within the areas served by the study section of I-94. It is anticipated that these percentages of trip types could change dramatically in the future with the development of the special interest areas and economic empowerment zones adjacent to the seven mile study section of I-94.

Since this study has begun, the Federal Government has been considering the establishment of a special International Trade Route linking the United States and its two NAFTA Trading Partners, Canada and Mexico. This section of I-94, for reasons outlined above, would form a logical and crucial link in that corridor.

This section of I-94 passes through areas in Detroit that have been declared to be economic empowerment zones. A coordinated effort is being made by the involved units of government, the MPO, and other key interest areas, to ensure that the final design of this section of I-94 is compatible with plans for the economic redevelopment of these zones.

Initially, a very ambitious schedule of 30 months was set for the completion of alternative development, evaluation, and selection, as well as environmental clearance for the redesign of the I-94 Freeway. The attempt to maintain this schedule has required aggressive project management and a firm commitment to remain within the limits of the project scope of work. The major reason for setting this ambitious schedule is the deteriorated condition of the structures included in the I-94 study section. There are approximately 65 bridges over this 7 mile long section of freeway. The most pressing need, however, is the replacement of the Dequindre Yard Bridge. This is one of the largest bridges in Michigan, carrying I-94 over the Dequindre rail yard. Replacing this structure, while adhering to traffic maintenance requirements, will require the realignment of the section of I-94 immediately east of the I-75 Interchange. The advanced state of superstructure deterioration of this structure, and the complicating traffic maintenance requirements of this section, demands a

timely completion of the I-94 EPE study so that design of this section can begin. This need to proceed quickly must always be balanced by the need for a thorough development and analysis of alternatives for the redesign of the entire study section of I-94. The option of combining the MIS documentation with the EIS has been adopted for this study.

### **Project Conformance To MIS Objectives**

To achieve consensus building, the MDOT established an Interagency Coordination Committee (ICC) which includes representatives of the MDOT, the FHWA, the FTA, SEMCOG, the City of Detroit, and Wayne, and Macomb Counties. This committee is chaired by the MDOT Project Manager and has enjoyed the direct participation of high ranking decision makers from its member agencies. The purpose of the ICC is to provide project oversight and to reach consensus on major project decisions. This committee remains very active in the project, and convenes on a monthly basis, and more often when issues require. The ICC has reached consensus on the goals and objectives of the study, the public involvement and public information plan, and the range of alternatives to be pursued. The committee has also reviewed input resulting from the public information process.

To satisfy the requirement of examining alternatives to the addition of general use lanes for improving mobility, the study includes an evaluation of potential special use lanes for the exclusive use of High Occupancy Vehicles (HOV), trucks, or other combined special uses. I-94 presently consists of three lanes in each direction. Traffic Studies, counts, Origin-Destination Studies, and traffic demand forecast modeling have indicated a need for four general use lanes in each direction. Therefore, special uses would have to be provided by a fifth lane in each direction. Various alternatives have been considered that would provide for such a cross-section.

A great effort is involved in this project in the area of Public Involvement and Public Information, and many avenues of communicating information and receiving public input are being employed. Approaches being used include well publicized public information meetings, formation of a Citizens Advisory Group, many outreach meetings with neighborhood, focus, and special interest groups, citizen surveys, newsletters, and media news releases and interviews. This project continues to be a Public involvement success and enjoys a high degree of cooperative involvement of City of Detroit officials, including the Mayor and Deputy Mayor.

### **Effectiveness Of MIS Related Efforts**

The ICC has been successful since its inception. Disagreements are expected, and as they occur, the ICC has learned to deal with them constructively. Varying points of view are articulated and consensus on acceptable solutions are sought. The successful functioning of this committee is paramount to the success of the study. There were issues encountered at the outset of the study relating to contact protocols between the MDOT and Consultant team members with City of Detroit officials, and personnel from City departments. Distinctions had to be drawn between working meetings with and meetings with Detroit officials on policy issues and meetings with City department personnel on technical issues. Issues such as this can also be resolved within the ICC. A committee such as the ICC can be used as a forum for resolving issues between participating agencies before they become more serious problems that could potentially cripple the ability to work cooperatively on the project.

After approximately 24 months The ICC has reached agreement, at least in principle, on the gen-

eral alternative for the new I-94. This plan features a five-lane freeway cross-section with retaining walls over most of the length of the project. Areas where grass slopes might be feasible and desirable are to be explored. The plan also includes three-lane, one-way continuous service drives on each side of the freeway. This plan features a cross-section with all ten freeway lanes at the same elevation. Previously, the only way a fifth lane in each direction would be possible was to elevate these lanes for approximately two and one-half miles. This is the only way to make these lanes continuous through the M-10 (Lodge) and I-75 Interchanges as they are presently configured. These interchanges were designed and built in the late 1950's and feature a tight design with many left-hand entrance and exit ramps. Initially it was assumed that redesign and reconstruction of the interchanges was not to be included in this study. Over time, however, it became the consensus of the ICC that an alternative that included all future lanes at the same elevation as the existing lanes, and the redesign of the interchanges to accommodate these lanes, was greatly preferable to all other alternatives. This would require the redesign of the interchanges which would provide the opportunity to develop a modern design with all right-hand entrance and exit ramps.

There were negative implications of such an alternative that had to be addressed. The redesign of the interchanges would require significantly more right-of-way and displacements than would have been the case with the elevated alternative. This impact had to be addressed with the City of Detroit which is understandably sensitive to the displacement of residences and businesses in the city, and Wayne State University which is a public institution and the largest real estate holder that would be impacted by the redesign of the M-10 Interchange. There were also major negative impacts of such an alternative to the ultimate project construction cost and to the cost and schedule of the Phase 1 Study. These impacts had to be addressed with MDOT management.

The City of Detroit and Wayne State University have both agreed in principle that the advantages of the new alternative would outweigh the negative impacts, and should therefore become the preferred course of action. This agreement is contingent upon efforts to minimize the negative impacts and to mitigate those that remain. Mitigation will take the general form of doing whatever is possible to relocate displaced families and businesses within the City of Detroit. The decision faced by MDOT management was not an easy one because of the scarcity of transportation funds in general, coupled with the enormity of costs for this project, and this alternative in particular. At a time when funds are very tight for maintenance and preservation of the existing system, it is very difficult to find additional funding for future major improvements. In spite of these concerns, MDOT management has committed to the development of the new preferred alternative, which includes redesign of the two freeway interchanges. The ICC prevailed, therefore, in their recommendations to pursue this new alternative.

Funding for implementation of this project, will doubtlessly require construction in a number of stages. Construction of the ultimate stage may require special funding, such as funds for development of international trade routes, or other special needs. The MDOT, as well as the City of Detroit, and SEMCOG have requested such funding.

As mentioned earlier, one of the disadvantages of pursuing this alternative, which includes the redesign of the M-10 and I-75 interchanges, is the impact on the cost and schedule of the project. These are two of the greatest challenges of Project Management and the Project Manager and MDOT management initially had some degree of reluctance to embrace the pursuit of this new alternative. This alternative will require the addition of new items to the contracted scope of services and will require the extension of the existing scope of services to cover an expanded study

area. The area of study needed to be significantly expanded, both north and south, along the M-10 and I-75 Freeways. This additional work will definitely require an extension of the duration of the study project. Work could not proceed on these items until a contract amendment was successfully negotiated and approved.

The public involvement/ public information process has been quite successful in reaching large numbers of citizens with project information and, in obtaining citizen interest and input. This effort has included the support and active participation of the City of Detroit. Public informational meetings are very well attended. There continues to be a large demand for neighborhood and outreach meetings. There has been no opposition expressed to date to this improvement project. The need for the project has been generally accepted by all involved agencies and jurisdictions, citizens in the corridor, and I-94 users. The main issues to be resolved for final acceptance include impacts on existing residential and business communities and on planned land uses. Impacts include not only the extent of additional right-of-way requirements, but vehicle and pedestrian access as well. MDOT and the consultant team are making efforts, in cooperation with the City of Detroit, to gain an enhanced awareness of planned future land developments in the corridor, especially as they relate to the Detroit economic empowerment zones. Resolution of these issues will be incorporated in the processes of the expanded public involvement schedule and the engineering and geometric of the new alternative.

One major reason for success in convincing the public of the need for the rehabilitation of I-94 has been the very well publicized support provided by Detroit Mayor Dennis Archer and MDOT Directors Patrick Nowak and Robert Welke. These public leaders have provided their full support for this project through media statements and appearances, public information videos, and project newsletter articles. The importance of support at this level for a public works project of this magnitude can not be overstated.

One of the major areas of concern throughout this study has been the viability of providing special use lanes. This concern is driven by two factors. The first is that since this is an MIS Project, a thorough analysis of alternatives to additional general use lanes is required. In this regard it should be noted that the air quality status of Southeast Michigan has been a concern. At the initiation of the study in late 1994 Southeast Michigan was classified as a non-attainment area for air quality. This alone was a driving force in including Transportation Demand Management (TDM) options in the study of alternatives. More recently, southeast Michigan has been reclassified as an air quality attainment area. This reclassification has reduced the urgency of considering TDM options but it by no means totally eliminates the wisdom of including them in whatever is selected as the final alternative.

The second factor driving the consideration of special use lanes is the very real potential for inclusion of this section of I-94 in an International Trade Route. I-94 connects to the Detroit, Michigan/Windsor, Ontario border crossing facility, the Ambassador Bridge, via its interchange with I-75. I-94 also connects to the Port Huron Michigan/Sarnia Ontario border crossing facility, the Blue Water Bridge. Border crossing traffic volumes continue to increase. Over 9 million vehicles crossed the U.S./Canada border in 1994 at the Ambassador Bridge alone. This Detroit/Windsor border crossing facility is the most heavily used single border crossing facility for U.S./Canada Trade. International trade crossing at this site accounts for nearly one-half of all trade crossing the U.S./Canada border and rivals that of the U.S. and Mexico in Texas and California combined. The importance of I-94 to International trade in North America cannot be overstated. Michigan leads

the U.S. in trade with Canada and is one of the leading states in trade with Mexico.

In light of the importance of I-94 to International Trade and the prudence of considering TDM options, consideration needs to be given to not only providing special use lanes, but perhaps multiple use of special use lanes. Consideration will be given to the possibility of using these lanes as HOV during peak hours and truck lanes during off peak hours. Intelligent Transportation Systems (ITS) and Automated Highway Systems (AHS) will also be explored to aid in managing congestion and in pursuing state of the art technology for providing a “seamless border” for international trade traffic. Studies are also underway to provide multi-modal rail connection points for I-94 in the Detroit area.

## **Evaluation Of The Impact Of MIS Requirements**

### *Inclusion Of Impacted Jurisdictions and the MPO in the Decision Making Process*

The MIS requirements in ISTEA have, on balance, had a positive impact on this project to date. First, it helped to make the ICC a reality and a success. To be certain, such a committee would have most likely been formed for this project with or without ISTEA. However, its makeup, role, and acceptance as a consensus building body by officials of its member agencies and governmental units, would be questionable. The MIS requirement of ISTEA helps to define the role and the importance of this committee. The author is convinced that these requirements have been invaluable in bringing together a committee of such high ranking representatives thus ensuring its success. One of the great successes of the ICC is that it has allowed MDOT, the City of Detroit, Wayne County, and SEMCOG to pursue the issues and common goals of this project while minimizing “spillover” effects or distractions by other, sometimes divisive political issues. While the ICC has not been a perfect insulation from outside political issues, it has been enough so that this study can continue to progress. The author is also convinced that, without the success of the ICC, there would be no chance for the success of the study in reaching an acceptable conclusion. An acceptable conclusion could be defined as one that would provide for a modern urban freeway, an international trade route, and a facility that would contribute to the development of the economic empowerment zones surrounding I-94.

### *Public Involvement/Information*

It is a fact that, with or without the MIS requirements of ISTEA, the I-94 rehabilitation study would have had an extensive public involvement/public information effort. This effort would have been impressive by MDOT past practices, and MDOT has always had a very comprehensive public information program. It is also true, however, that the MIS requirements articulate the need for an extensive public involvement/information effort. The amount of the contract initially devoted to public involvement/information was soon found to be inadequate. The contract was amended soon after its initiation in order to provide for an increase in this effort. The current amendment has increased the cost of all phases of the study so the cost allocated for the public involvement/information effort has again increased. The MIS requirements have helped to legitimize such unprecedented public involvement/information costs in a period of uncertainty for transportation funding.

As mentioned earlier, this effort has included many forums including the formation of a Citizens Advisory Group that includes neighborhood and citizen interest group leaders, making informational presentations at neighborhood, church, and special interest groups meetings as part of a neighborhood outreach program, well publicized and well attended public informational meet-

ings, newsletters, a citizen opinion poll, and eventually, a formal public hearing. The demand for speakers to go out to citizen and business group meetings has been tremendous and this has been an excellent vehicle for reaching large numbers of citizens.

One factor that has contributed greatly to the success of the public involvement/information program has been the active cooperation and participation of the City of Detroit at major public meetings and some neighborhood meetings as well. This participation was arranged during contacts set up through the context of the ICC, and by special efforts of the sub consultant responsible for the Public Involvement effort. To the extent that this cooperation and participation was made possible through the working of the ICC, the success of the public involvement/information effort can largely be attributed to the MIS requirements.

### *Multimodal Considerations*

To be sure, modal and technology alternatives to providing more capacity in the form of general use lanes would be a part of the I-94 rehabilitation study with or without the requirements of MIS. It is also fair to say, however, that when Southeast Michigan was reclassified as an air quality attainment area, there may not have been the urgency to pursue such options. The provision of special use lanes for exclusive HOV use, heavy commercial vehicle use, and the provision for advanced technology for Intelligent Transportation Systems, are all very much a part of the I-94 study. This remains true even though traffic studies thus far indicate that success for an HOV lane on this seven mile section alone are questionable. Rather than accepting these findings as a fatal flaw, MDOT has commissioned a study of HOV viability for the freeway network in Southeast Michigan. One would have to assume that MIS requirements, along with International Trade Route considerations, play an important part in driving this effort. In context, it must be remembered that Michigan has never implemented a HOV lane to date. Implementation here would be precedent-setting in a state that rightfully takes pride in its leadership role in manufacturing of automobiles and commercial vehicles.

Additionally, studies are underway to implement a modal transfer facility that would provide access between I-94 and I-75 and the Junction Yard rail center. This would facilitate modal transfers in Detroit for national as well as international trade.

### **Observations Relating To MIS Requirements Based On The I-94 Study**

Reaching consensus for a major public works project within a group such as the ICC takes time. An extensive public involvement/information program also takes time. All conflicting goals and objectives must be articulated so that truly acceptable solutions can be reached. Reaching agreement in stages, from goals and objectives, general alternatives, to specific details is imperative. Time allotted for the study must take into account a reasonable time for a committee like the ICC to work through its purpose and reach consensus. In retrospect, 30 months was not sufficient to accomplish success. For many projects, such as this one for urban freeway renewal, time is the most important factor because of the critical state of deterioration of the existing facility. If at all possible, however, it is important to allow time for the difficult effort of consensus. This may even require that some major maintenance work proceed even if some of this work might have to be removed before its lifetime is completed. To be certain, these are difficult decisions to make since they involve the expenditure of scarce resources.

It is imperative that a thorough understanding of MIS requirements be established initially for all

study participants. This includes consultants when applicable. When consultants are employed, MIS requirements must be articulated in the Scope of Services for the consultant contract. For the I-94 Project, it was very helpful that the prime consultant firm was very cognizant of MIS requirements.

It is imperative that the action plan for public involvement/information be established at the outset of the study, and that the plan is universally accepted. This project required a multifaceted approach which includes media appearances and informational spots, project newsletters, public meetings, and outreach efforts such as seeking out and attending neighborhood and interest group meetings. For the I-94 Project, It was extremely helpful that the consultant team that was selected, included a public information firm, Jay Gregory and Associates, that was familiar with city government and neighborhood and business groups, and had much prior experience with public involvement in Detroit. The enormity of the public involvement/information required of a project such as this one must not be underestimated. That was the case on this project initially and corrections had to be made. These requirements must be continually reassessed. State DOTs with urban MIS projects may be experiencing, as MDOT is, a higher percentage of project costs devoted to public involvement/information than was the case on previous projects.

Major project decisions are made in the context of the ICC that sometimes have major cost and project scope implications. These are decisions that MDOT has a part in, but not total control over. It is imperative that these decisions are periodically reviewed and approved by MDOT management. This is doubtlessly true for other ICC represented agencies as well. The management and/or political leadership of participating jurisdictions or agencies should never be surprised by ICC recommendations.

## **Conclusion**

The MIS requirements certainly helped to articulate many of the elements that are required for the success of this study. Yes, there would have been a large public involvement/information effort with or without MIS requirements, there would have been some effort towards intermodal connections, special use lanes, and ITS technology, and there would probably have been an ICC. On the other hand, the public involvement/information effort may not have been so great as it has been, and continues to be, and there may have been greater reluctance to devote the percentage of total phase I cost and time to this effort. There may not have been the well publicized support for this project by city and state leaders and the MPO, and selling the need for the project to impacted citizens and businesses may therefore have been much more difficult.

Without the MIS requirements, the interest in developing special use lanes to play a role in increasing mobility may have waned after the change in air quality status for Southeast Michigan. Additionally, while the ICC would probably have existed, it was the MIS that really defined its role and the role of its members.

There were some misgivings at state DOT level at the outset, since the MIS section of ISTEA articulates requirements that MDOT, and doubtlessly most state DOTs would follow on major urban projects anyway. These misgivings were dispelled early in the study when it became apparent that these requirements were more of a help than a hindrance. If MIS does nothing else positive, it plays a major role in legitimizing project procedures and expenses and provides a standard for performance of the required elements of the study.