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TravInfo Evaluation: Institutional Element Phase 2 Results

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Phase 2 Results**

March, 1996

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ABSTRACT

TravInfo is part of the Federal Highway Administration (FHWA) Field Operational Test (FOT) program. It aims to develop a multi-modal traveler information system for the San Francisco Bay Area, combining public and private sector talents. This report presents the results of year two of the institutional evaluation, which is part of the overall TravInfo evaluation. Nineteen core participants were interviewed, including all of the Management Board and most of the Steering Committee members and project staff. Separately, twenty Advisory Committee members were interviewed. The second year was dominated by TravInfo implementation issues, chief among which were: resolution of public/private controversies in the design of TravInfo and the attempt to ensure the completion of Caltrans' Traffic Operations System (TOS) for meeting the TravInfo schedule. Based on the interviews, the partners thought that the TravInfo organization has been effective at resolving both of these issues.

Keywords: Advanced Traveler Information Systems (ATIS), Field Operational Tests, Institutional Evaluations.

EXECUTIVE SUMMARY

TravInfo is part of the Federal Highway Administration (FHWA) Field Operational Test (FOT) program. It aims to develop a multi-modal traveler information system for the San Francisco Bay Area, combining public and private sector talents. TravInfo is governed by a public sector Management Board, representing the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), and the California Highway Patrol (CHP). The Management Board has established an Advisory Committee with strong representation from the private sector to assist in the design and execution of TravInfo. TravInfo is a unique FOT in that its success depends on the joint efforts of the public and private sectors. As a result of the large number of participants, and their diverse backgrounds, TravInfo is an unusually complex project to manage.

The evaluation project as a whole includes four elements: institutional, technology, traveler response and network performance. The institutional element, of which this working paper is a part, investigates the effectiveness of the public/private partnership and key organizational issues which are important in the execution of the field operational test.

This paper presents the results of year two of the institutional evaluation, and is the second of three institutional evaluation reports. Nineteen core participants were interviewed, including all of the Management Board and most of the Steering Committee members and project staff. Separately, twenty Advisory Committee members were interviewed. Finally, this report documents direct observations from Steering Committee and Management Board meetings.

The second year was dominated by TravInfo implementation issues, chief among which were: resolution of public/private controversies in the design of TravInfo, the attempt to ensure completion of the Traffic Operations System (TOS) for meeting the TravInfo FOT schedule. The majority of the partners agreed that the TravInfo organization has been effective at resolving both of these issues. The interviewees felt that TravInfo strengthened the public/private partnership by establishing a clear and balanced vision for the public and private sectors. The TravInfo concept gives the public sector responsibility for data collection and operation/supervision of the database and the private sector responsibility for developing products and services to disseminate information to travelers. This vision has helped delineate the explicit boundary between public and private responsibility with respect to such issues as data broadcasts and data processing.

Finally, the TOS procurement has elicited weaknesses in TravInfo's early decision to put reliance on the TOS as the primary public data source, instead of proceeding along a more independent and diversified path.

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1. BACKGROUND

TravInfo is a public/private partnership aimed at enabling wide-spread dissemination of real-time information on transportation conditions and travel options throughout the San Francisco Bay Area. A fundamental premise of the TravInfo project is that a public surveillance and database system, designed to open-architecture standards, will be an effective stimulus for private sector innovations in Advanced Traveler Information System (ATIS) technologies and, ultimately, for their deployment. A unique aspect of TravInfo will be its open-access database that allows companies to retrieve the data and re-package it for ultimate dissemination to travelers, both through broadcast means and via products developed by “Value-Added-Resellers” (VARs).

TravInfo is a Field Operational Test (FOT) funded by the Federal Highway Administration (FHWA). Its objective is not only to provide benefits to Bay Area travelers, but also to stimulate the deployment of privately offered traveler information products and services. The FHWA intends to make the results of this test accessible to others across the nation, who may wish to engage in similar enterprises. To achieve this aim, California PATH was commissioned to perform an independent evaluation of the test (Hall, et al, 1995a; Yim, et al, 1995).

The evaluation of TravInfo consists of four major elements: (1) institutional, (2) technology, (3) traveler response, and (4) network performance. The purpose of the institutional evaluation is to assess TravInfo's success in overcoming barriers to joint public/private ventures, and to assess the effectiveness of the TravInfo organization. The institutional aspects of the TravInfo project will be evaluated in three waves, based on interviews in the summers of 1994 and 1995, and fall of 1996.

This paper documents the second phase of the institutional evaluation of the TravInfo public/private partnership. The purpose of this working paper is to compile and summarize data collected from interviews with TravInfo partners and from direct observations at TravInfo meetings. The first phase of the institutional evaluation was completed in the summer of 1994. Its results were documented in the PATH working paper *TravInfo Evaluation: Institutional Element Phase 1 Results* (Hall, et al, 1995b). The Phase 1 report includes a detailed account of the formation of TravInfo and its organizational design. The second phase of this institutional evaluation reflects the second year of the TravInfo Field Operational Test. It is intended as a mid-way progress report. The third and final phase will be completed in the fall of 1996, and will include an assessment of the TravInfo organization over its entire history.

1.1 Institutional Evaluation Objectives and Measures of Effectiveness

The success of TravInfo depends largely on the effectiveness of its partnership organization, including its ability to guide a large and complex project as well as its ability to fairly resolve inter-organizational conflicts. The objectives of the institutional evaluation are to:

- Assess the effectiveness of the organizational structure and the management approach in meeting project goals and schedules.
- Measure the extent to which the TravInfo organizational structure facilitates active involvement and cooperation among public agencies and between public and private institutions.

- Along with the VAR study (Loukakos, et al, 1996), document the effects of TravInfo on the ATIS industry, including new business opportunities, changes in organizational philosophy, and ability to develop products along common interface standards.

By its nature, the institutional element does not lend itself to quantitative measures of effectiveness. Instead, the focus is on documenting the institutional history of the project, identifying the problems encountered, the methods used for resolving problems, the chronology of major decisions, and the changes that took place in the organization over the duration of the FOT. Specifically, this Phase 2 report concentrates on the resolution of the project issues that were identified during the Phase 1 interviews, along with new issues that arose in year two.

1.2 Report Outline

In Section 2, a brief history of the TravInfo project is presented. Included are highlights of the first year, together with an overview and background for the TOS problem that occurred in year two. Section 3 provides the study design for interviews with Management Board (MB), Steering Committee (SC), and Advisory Committee (AC) members, as well as with the project staff. The findings of the interviews are reported in Section 4 and Section 5. Finally, an assessment of findings is provided in Section 6.

2. TRAVINFO HISTORY

In 1992, TravInfo was conceived by a group of Bay Area individuals, active in IVHS America (now ITS America). Their vision was to develop, as a public/private partnership, an open access database containing dynamic information on travel conditions. That database would support the development of information products through Value-Added-Resellers (VARs) and support the public's need to obtain current and accurate travel information through a range of media. TravInfo officially began in June of 1993 and was funded in July of 1993 through the Federal Highway Administration's (FHWA) Field Operational Test Program (FOT).

TravInfo is being implemented through a partnership of public agencies, research institutions, and private firms. The system engineering consultants, TRW, completed the architecture definition for the initial system within the first year of the FOT. The system architecture was approved by the MB in May of 1994. In May of 1995, close to the end of the second year of the FOT, TRW completed the design for the first phase of the Traveler Information Center. The TravInfo system is scheduled to go on-line in the spring of 1996 before the end of the third year

Table 1. TravInfo Chronology

Events Prior to Start of FOT

April 92	First meeting of TravInfo ad hoc committee to create FOT proposal.
October 92	TravInfo proposal submitted to FHWA.
April 93	First Advisory Committee meeting - AC charter presented.
May 93	Management Board selects Steering Committee.
June 93	Steering Committee meeting: Working Groups formed.

First Year FOT Events

July 93	TravInfo funded and officially begins.
October 93	System architecture design consultant contract signed.
February 94	Evaluation Oversight Team formed by the project partners.
March 94	Participant Agreement approved by the Management Board.
May 94	System Architecture approved.

Second Year FOT Events

August 94	Additional funding for TravInfo provided by FHWA. Governor's Executive Order W-103-94 enjoins all state agencies from signing "sole-source" contracts.
September 94	Caltrans does not approve the Amendment # 2 to the JHK TOS Development Contract because of Executive Order W-103-94.
November 94	Mini-TOS and light infrastructure concepts approved by MB as alternate strategy to the TOS.
March 95	Management Board decides to proceed with wireless data broadcast system (DBS).
May 95	JHK mini-TOS contract signed. The first phase of the Traveler Information Center (TIC), scheduled to go on-line in April 1996.

of the FOT and will be operated for two years. See Table 1 for a project chronology.

2.1 First Year Issues

The outstanding issue in the first year was to define precisely the responsibilities of the public and private partners pertaining to collection, fusion, and dissemination of TravInfo data. More specifically, the concerns were: 1) the existence and form of a wireless broadcasting system for communicating with ATIS devices; 2) the degree to which TravInfo should process data prior to dissemination; 3) the provision of direct modem access to the TravInfo database for individuals; 4) whether TravInfo would compete unfairly with the private sector.

For the duration of the FOT, TravInfo will:

- Compile data from a variety of sources including: Caltrans Traffic Operations System (TOS), incident reports from local cities, counties, and transit operators, the MTC transit database, the Freeway Service Patrol Monitoring System and the California Highway Patrol CAD System (this list is not exhaustive).
- Integrate these data sources into a comprehensive database.
- Seek additional data sources.
- Disseminate data to VARs through the Landline Data System of the Traveler Information Center (TIC).
- Disseminate the database to end users directly through the Traveler Advisory Telephone System (TATS).

The private partners will:

- Add value to the publicly provided database. This can include the addition of privately collected data, translation of the database into easily understood formats such as graphic displays, and repackaging of the data to serve consumers in various market niches, e.g., commuters, truckers, tourists, transit agencies, fire departments, etc.
- Develop and support consumer products and services such as in-vehicle navigation systems, cellular phones, kiosks, etc.

The second issue was cooperation between public agencies. Public-public cooperation is necessary in the development of TravInfo policies that are agreeable to both local and regional jurisdictions. An issue of great concern was the need for participation from Bay Area public agencies, especially from local government and transit authorities. Participation from these agencies may be essential to acquiring data for TravInfo on local streets and transit. Only two cities and one transit agency have been active while others have shown only peripheral interest in the first year of the FOT.

The third issue pertained to the possible tort liability of TravInfo regarding use of the content of the database by registered participants. The issue was whether registered participants that access the database might attempt to hold TravInfo liable in the advent of erroneous, unreliable or lost TIC data. TravInfo shielded itself from such a possibility by including disclaimers of liability and data warranty in the terms and conditions of the Registered Participant Agreement. Any public or private entity wishing to use the database must thus agree to the condition that TravInfo provides no warranty for the data and that it cannot be held accountable in any way for any type of data problem that might occur. Another important legal issue concerned the property rights of private companies providing information to TravInfo. The fact that the TravInfo database is in the public domain is problematic if the information is originally gathered from a private source.

2.2 Major Second Year Events

The dominant issue during year two of the FOT was the delay of the TravInfo schedule because of the delay of Caltrans' Traffic Operations System (TOS). The TOS consists of an update and expansion of Caltrans' District 4 freeway instrumentation with loop detectors and closed circuit TV (CCTV) cameras. When the TOS is implemented, it will be the primary public source of traffic data for TravInfo. Among the chief concerns were that the delay of TravInfo may: 1) discourage VARs from developing products and services using the TravInfo database, 2) lessen the momentum that is essential to the success of TravInfo, and 3) require additional funding and in-kind contributions.

The TOS delay was caused by the Governor's Executive Order (W-103-94) of August 1994 which prohibits "sole-source" contracts unless there is a state emergency or unless public health and safety are affected (See Appendix A). The executive order was issued before Caltrans could award a sole-source contract to JHK, a traffic engineering firm, for the completion of the TOS.

To compensate, the TravInfo partners developed an alternative strategy in November of 1994 based on the idea of a "mini-TOS" (a scaled-down version of the TOS). Furthermore, to correct for the limitations of the mini-TOS itself, TravInfo developed a multi-step strategy. First, TravInfo will use a light infrastructure composed of fleet data sources, video surveillance and Freeway Service Patrol vehicles. Second, TravInfo will have additional data provided by the future TIC operator, as called for in the RFP for TIC operations. Finally, loop detectors will continue to be added by Caltrans throughout the FOT to expand the network.

The mini-TOS contract was executed between MTC and JHK with the approval of Caltrans in May 1995. The mini-TOS was supported by local funds. At that time, the mini-TOS was scheduled to be on-line in January of 1996 and TravInfo was expected to be operational in the Spring of 1996, about one year later than originally planned. The major concern with the mini-TOS was whether the scaled-down version of the TOS could fully satisfy the needs of VARs and end users.

Accomplishments of Working Groups in Year Two: The working groups evolved during the second year of FOT as the need for new expertise arose in the development and implementation of TravInfo. A wide range of expertise was drawn from the private partners specifically to help prepare the Participant Agreement and to assist TRW in the design of TravInfo. The *architecture working group* assisted TRW in the development of a TravInfo architecture definition. The *legal and institutional working group* produced the initial draft of the Registered Participant Agreement. The *technology working group* produced a database which contained information on potential private partners. The *user/marketing group* developed a definition of the user of TravInfo ranging from the end user traveler to the Value-Added-Reseller (VAR).

3. STUDY DESIGN

The Phase 2 study consisted of direct observations at MB/SC and AC meetings and two series of interviews covering:

- 1) Key project participants, including members of the Management Board and Steering Committee, and key staff members at MTC and SRI (referred to as the MB/SC study).
- 2) Peripheral project participants, belonging to the Advisory Committee, but not to the Management Board or Steering Committee (referred to as the AC study).

The findings of the first series represent the inside perspective of those who have been active in the TravInfo project, while the findings of the second series represent more of an outsider perspective. The interviews were administered over the course of a three month period during the Summer of 1995. This was approximately two years after the formal start of the project, but over three years after the project was conceived.

The specific objectives of the second wave of interviews were to:

- Assess the effectiveness of the partnership in resolving key issues and overcoming barriers.

- Elicit opinions on the performance and responsibilities of the SC, MB, AC and the TravInfo partnership organization as a whole.
- Identify institutional, technical, and legal barriers to the implementation and subsequent operation of TravInfo.
- Assess motivations for participating in TravInfo and perceptions of the benefits of TravInfo.

The study findings are presented in two parts: MB/SC first and AC second. The AC section (Section 5) focuses on the differences from the MB/SC group.

3.1 MB/SC Study

The interview format was semi-structured, including a fixed set of open-ended questions along with more spontaneous probe questions (Appendix B). The questions were put into four categories: 1) the key issues that arose in year one and their resolution, 2) the performance evaluation of the TravInfo partners, 3) the assessment of institutional and technical barriers to remove, and 4) the changes in the perception of TravInfo.

A total of 21 core participants were contacted, of whom 19 responded, representing 17 organizations that are active in TravInfo (Table 2). The interviews were administered by the PATH evaluators mostly in person but occasionally by phone. Interviews typically lasted 60 to 90 minutes.

Table 2. MB/SC Study Participants

Management Board Participants

Jackie Landesman	FHWA
Joel Markowitz	MTC
Mary Ann Marubashi	CHP
Jim McCrank	Caltrans -- District 4
Bob Ratcliff	Caltrans -- New Technology (ex officio)
Stewart Taylor	FTA (ex officio)

Steering Committee Participants

Kristen Castagno	SamTrans
Tom Clausen	City of Concord
Donald Dey	City of Menlo Park
Craig Gardner	Gardner-Rowe Systems Inc.
Amy Hart	Navigation Technologies
John Hirten	Rides for Bay Area Commuters
Doug Lutgen	California State Automobile Association
Joan Ravier	Metro Traffic Control
William Spreitzer	General Motors
Larry Sweeney	Etak
Steve Wollenberg	FastLine

Project Staff Participants

Melanie Crotty	MTC
Roy Stehle	SRI

3.2 AC Study

The interview format for the AC study was somewhat more structured, but still largely composed of open-ended questions (Appendix C). The same categories were covered as for the MB/SC study although in a slightly more condensed form: 1) key Issues and their resolution, 2) performance and responsibilities of partners, and 3) perception of TravInfo.

Attempts were made to contact 36 people among over 200 AC members. The selection criteria were AC members who were not on the MB or SC and who showed an interest in the project by attending at least one AC meeting over the last year of the project. PATH generally attempted to contact AC members who were present at more than one meeting, based on the assumption that more involvement translates into more familiarity with the project. 34 AC members were reached. Of these, 7 were screened out because they were not at all familiar with the project and could hence provide little valuable information. Of the remaining 27 people, 20 (or 74%) agreed to participate. Interviews were conducted by telephone and typically lasted 20 minutes.

4. MB/SC STUDY FINDINGS

More than three quarters of the MB/SC members expressed continued support for the TravInfo project, generally stating that the original goals were still valid and that the partners were working toward a common goal. Many participants viewed this project more as a step toward a major ATIS implementation than as a testbed and saw the economic objectives (including job growth and the vitality of participating companies) as the stronger force as opposed to the transportation objectives (including reduction in traffic congestion and travel time). The conflicts between public and private sectors in year one have been resolved by clearly defining the public and private sector roles.

More than three quarters of the interviewees agreed that the organization has been generally effective. Nonetheless, four members said that the TravInfo organization did not perform as efficiently as it could, particularly in dealing with the TOS issue; they asserted that TravInfo should have looked into diversified data sources in anticipation of the TOS delay. On the other hand, since the immediate cause of the TOS delay was beyond the control of TravInfo, many MB/SC members believed that TravInfo, as originally and presently organized, did as well as could be expected, given the constraints imposed by the state policies.

Almost all the interviewees agreed that the most serious issue that has confronted TravInfo to date has been the state procurement policy which prohibits the signing of sole-source contracts with outside consultants to complete the TOS. TravInfo has nonetheless been viewed as successful in meeting this challenge by developing an alternate solution in the form of a mini-TOS and various data sources.

4.1 Key Issues and Their Resolutions

The MB/SC members were asked about the resolution of five key issues:

1. Wireless broadcast of information
2. TravInfo data processing prior to dissemination
3. Provision of direct modem access for individuals to the TravInfo database
4. Potentially unfair competition of TravInfo with the private sector
5. Implementation of the Caltrans TOS

1. Wireless broadcast of information

DBS in year one: This issue was whether TravInfo should provide its own subcarrier signal or whether it should rely on existing private FM subcarriers. This was the most controversial issue in year one. The original TravInfo concept was to provide free broadcasts of travel information, including traffic conditions and transit services, via FM or TV subcarriers or similar media. FM subcarrier data service companies could potentially use the TravInfo database in conjunction with other service features such as paging and differential GPS (Global Positioning System) corrections. The concern was that TravInfo would be in competition if it established an entirely new FM subcarrier dissemination service, free of charge. There had also been debate as to whether wireless Data Broadcast System (DBS) should even be part of the TravInfo project.

DBS in year two: The MB decided to proceed with the wireless data broadcast based on the Design Working Group's recommendation to implement the TravInfo DBS, which was unanimously approved by the Steering Committee. The general consensus among the MB/SC members was that it is not the purpose of the public sector to compete with the private sector in data dissemination. The MB/SC members more familiar with the issue felt that commitment to a wireless broadcast of information would most likely be limited to the duration of the FOT. While the MB established the basic direction for the DBS in year two, there were still unresolved issues including the design of the DBS and funding.

TRW issued a Request for Proposals (RFP) for the design of the DBS. It was withdrawn because: 1) the funding for the DBS contract was not finalized, 2) the standards for high speed FM subcarriers for TravInfo had not been established, and 3) the vendors were not offered enough time to review the RFP. Several interviewees suggested that the MB postpone the design of the DBS until the National Association of Broadcasters (NAB) defines high speed FM subcarrier standards for projects like TravInfo. In the event that the NAB should not develop a standard before the TIC becomes operational, the majority of the MB/SC members believed that the MB should go forward with an existing sub-carrier and existing standards. Two thirds of the MB/SC members believed the issue was not resolved yet.

2. TravInfo data processing prior to dissemination

The degree to which TravInfo should process data prior to dissemination was one of the issues debated in year one. This issue has been largely resolved in year two. The MB/SC members in year one expected that the public sector would collect and store information and the private sector would disseminate it to end users. The opinion of the private sector partners at that time was that the public sector should provide a minimum level of direct public access to the information.

All the MB/SC members in year two indicated that they still believed in a clear division of responsibilities between the public and private sectors as far as data collection and dissemination were concerned. An issue of great concern, however, was the extent to which TravInfo should process and fuse data before dissemination to VARs. This issue represented an unclear boundary between the responsibilities of the public sector and those of the private sector. While recognizing that some degree of processing by TravInfo is necessary, the interviewees stated that it is not immediately obvious what limits should apply to this processing, to prevent a possible infringement on the agreed-to boundaries of the private domain. The MB arrived at the following consensus and resolution:

- The data available through TravInfo will undergo a “minimal level” of processing, defined as that necessary to screen data, to ensure standard quality, and to fuse it. TravInfo will also provide comparative travel times and advice about alternate routes, but at an aggregate level.

- The private sector will carry out all of the processing beyond the minimal level performed by TravInfo, and will disseminate and deliver data to end-users.

While a few interviewees stated that the exact degree of processing done by TravInfo could not be determined until it becomes operational, approximately 90% of the MB/SC members expressed satisfaction with the resolution to the problem.

3. Provision of direct modem access to the TravInfo database for individuals

The issue of direct modem access for the general public also arose out of defining public and private responsibilities. Debate on this element reflected clear differences in views. The public sector view was that because public funds financed the TravInfo database, the public should be able to use it at no charge. The private sector felt that free access to the TravInfo database might create competition with private companies, in conflict with the goals of the public/private partnership.

The MB/SC members stated that they were able, through cooperation and discussion, to reach a compromise solution agreeable to all parties. Access to the TravInfo database would be offered to registered participants only, whether they be companies or individuals. The interviewees thought this approach was acceptable for the following reasons:

- The private sector was content because public access would be limited and private commercial interests would thereby be protected.
- The public sector, represented by the MB, was also satisfied because it has provided, in principle, a mechanism for anyone to have access.

Three members from the MB, however, said it was still unclear whether this approach would lead to a completely satisfactory and workable situation. In their opinion, the exact demand for the service is still unknown. Thus, while the public and private sectors were able to find common ground on this issue and elaborate an arrangement in accord with their respective interests, three members of the MB expressed concern that the resolution is conditional upon the extent of usage of the database by registered participants. If too many individuals become registered participants and access the database, these members fear the service could become overloaded.

4. Potentially unfair competition of TravInfo with the private sector

The main concerns of the private sector partners in year one were the potential conflicts between public and private sector interests, specifically in the Traveler Advisory Telephone System (TATS), the LDS (Landline Data System), and the DBS. The chair of the SC called for the resolution of these potential conflicts in a cooperative manner. More than three quarters of the MB/SC members felt that the issue of TravInfo's potential unfair competition with the private sector was now resolved through debate and consensus building, one of the major strengths of the TravInfo partnership.

More than three quarters of the members agreed that it was not the purpose of the public sector to compete with the private sector; they also agreed that TravInfo's MB clearly recognized this. While four MB/SC members, one of whom was from the private sector, felt it was too early to assess the extent to which TravInfo would compete with the private sector, the majority of interviewees believed that the direction taken by the MB in the resolution of most issues, including TATS and DBS, clearly indicated that the relationship sought, and most likely achieved, would be complementary rather than competitive.

5. *Implementation of the Caltrans TOS*

The delay of the TOS was the overriding issue in year two. It threatened the TravInfo project with a significant delay in its implementation. Close to three quarters of the MB/SC members felt that a quick resolution of the TOS problem was beyond TravInfo's control, as originally and presently organized. These MB/SC members stated that the TravInfo organization did its best to meet this challenge and that it developed an effective strategy given the limited resources available to it, together with the wider organizational and policy constraints that caused the TOS problem. The alternative approach, consisting of the mini-TOS and supplementary sources of information, has also been difficult to implement; one fifth of the MB/SC members expressed uncertainty as to whether the data quality and coverage of the mini-TOS will be adequate for all the parties, particularly the VARs.

The interviews reveal, however, that the TravInfo organization is fully aware of the data coverage limitations of the mini-TOS, at least in the initial phase of the FOT. As a remedy, it developed the light infrastructure concept and included in its TIC operations RFP that the company running the TIC provide substantial complementary data. Despite expressions of frustration with the complications encountered, close to three quarters of the MB/SC members stated that TravInfo has handled the issue effectively and that resolution of the TOS problem will most likely be satisfactory. There were no significant differences in responses between MB and SC members. The MB/SC members thought TravInfo had effectively salvaged the project by developing a workable three-tier alternative strategy; the mini-TOS, data supplement with light infrastructure, and enhancement by the TIC operator and, eventually the "full-blown" TOS.

The concerns expressed by the interviewees were:

- Excessive reliance by TravInfo on the Caltrans TOS as its source of information. Several MB/SC members felt that TravInfo had put "all its eggs in one basket" and that if TravInfo had not centralized its data collection, the TOS issue would not have so severely affected the project.
- Inadequacy of the TravInfo organization in meeting the TOS challenge. Some members felt that the TOS issue could have been entirely circumvented had TravInfo been organized differently from the very beginning. Most noticeably, some felt that TravInfo, as originally and presently organized, lacked "political weight" and that by also including as MB members, people higher up at Caltrans and FHWA, the TOS problem could have been averted entirely.
- Slowness of the Caltrans organization in reviewing and approving contracts. Some members expressed frustration with the lengthy contractual process at Caltrans, which requires review and approval in many different departments as well as audits for all contracts above \$50,000. Some felt this compounded the TOS problems by causing further delays.
- Inadequacy of the TIC data coverage. Several members expressed concern that the mini-TOS does not provide sufficient coverage of certain segments of the freeway system. The private sector SC members were more concerned with this than were the members representing the public sector.

- Difficulty in implementing even the mini-TOS for a variety of reasons, chief among which are: 1) the lack of clear communication between Caltrans and JHK, which originated with the cancellation of the TOS contract and was reinforced by the subsequent closure of JHK's operations in the Bay Area; 2) technical complexity of coordinating the work between Caltrans, JHK and TRW. Caltrans is responsible for the field technology, and JHK is designing the mini-TOS software for receipt of the Caltrans field data, which will then be transferred to the TIC through TRW-designed software. The coordination of these three different technological aspects of the project is complex, and has not proceeded as rapidly as was originally anticipated.

Despite these institutional barriers, close to three quarters of the interviewees felt that an appropriate course of action had been taken and that TravInfo was now moving in the right direction. Most of the MB/SC members seemed confident that the project was now well on course, the primary remaining concern being to keep TravInfo on schedule.

4.2. Institutional, Technical and Legal Barriers

The MB/SC members were divided as to whether major institutional, technical and legal barriers still exist for the implementation and subsequent operation of TravInfo. Approximately half the interviewees, members of both the MB and SC, felt that there were no major barriers present to hinder the advance of the TravInfo project, aside from one or two issues qualified as minor. The other half cited a number of problems which they considered potential barriers, either for the implementation or the operation of TravInfo. The barriers identified by these MB/SC members are summarized as follows:

- *Institutional barriers*
 - The TOS delay.
 - The slowness of the public agencies in contract review and approval.
 - The lack of political backing for the TravInfo project.
 - The question of whether the VARs would develop TravInfo products and services.
- *Technical barriers:*
 - The difficulty in implementing the mini-TOS.
 - Proceeding with work on the Data Broadcast System
 - Selection of the appropriate standards and protocols for traveler information retrieval and dissemination.
- *Legal barriers:*
 - The Governor's Executive Order of "no sole-source contracts."
 - Addressing liability issues in the event of a system failure.
 - Protection of intellectual property rights.

In the eyes of the MB/SC members, the institutional issues seem to constitute the more serious barriers. Yet, while these issues, combined with the technical and legal challenges, are significant, none of them are perceived by the interviewees as insurmountable. In fact, not all members identified the problems that TravInfo encountered as major barriers; half of them did not identify any major barriers. This represents a significant difference from the year one results, when almost all the members identified one or more major barriers. Several of the concerns mentioned in year one, such as a lack of transit participation, an absence of products designed to access TravInfo data and a lack of means to collect information on arterials, were not mentioned in year two. In addition, the year two results indicate that there is consensus that most of the difficulties are being resolved and that TravInfo is now moving in the right direction.

4.3 Performance and Responsibilities of Partners

This part of the MB/SC study dealt with the performance and responsibilities of the partners. This section was subdivided into three major parts: 1) the performance and responsibilities of the SC, 2) performance and responsibilities of the MB and 3) efficiency of the TravInfo organization as a whole.

Steering Committee

Over three quarters of the interviewees felt that the SC had been quite effective over the second year of the FOT. It was generally felt that while the SC did not have as much work to perform over the second year, the SC members remained actively involved in the organization and had managed to retain private sector interest in the TravInfo project. Close to three quarters of the interviewees agreed on most other elements pertaining to the SC:

- Working groups were generally perceived as very successful and as crucial for the implementation of the entire project as they were in year one. While minor concerns were voiced, most interviewees agreed that a substantial portion of the general TravInfo work was being performed by the working groups.
- Interviewees were also quite satisfied with the SC's decision-making, although they believed few decisions were actually required of the SC, as its role was more to recommend than to make decisions.
- There was consensus that the SC was generally addressing the appropriate issues.
- The interviewees indicated that the SC could improve outreach to the AC, although most of them thought this was not the role of the SC but rather of the MB or the project manager.
- Finally, interviewees thought the SC's original role of directing the AC activities and developing recommendations for the MB was still appropriate. MB/SC members had no significant organizational or operational changes to suggest for the SC. A few members thought the SC membership could be broadened to include transit and trucking interests

The above elements represent a noticeable difference from year one when most interviewees felt improvement was needed in meeting efficiency and decision-making. Thus, overall, interviewees were quite satisfied with the way the SC had evolved and with its performance.

Management Board

A little more than three quarters of the interviewees stated that the MB had been fairly effective over the second year, given the major procurement problem. As in year one, half the SC members did not have opinions on the MB. While a sizable majority of members were supportive of the MB's performance, concerns were also expressed:

- An excessive reliance by the MB upon MTC leadership. More initiative on the part of other MB members, some felt, could have enhanced the MB's effectiveness and the project in general.

- Lack of support from high level public officials, particularly in meeting the TOS challenge. Several members stated that involvement of public officials at the highest levels would have greatly helped the project.

On the positive side, three quarters of the interviewees felt that the MB had been effective in the following ways:

- The MB was able to make decisions in a timely way in order to deal with the TOS issue and to generate an alternative approach.
- The MB was addressing the appropriate issues.
- The MB members' attendance at the AC and SC meetings strengthened the relationships between the partners.

Other than recommending that higher level government officials be recruited to the MB, no major organizational or operational changes were suggested by the interviewees. The interviewees also believe that the MB has taken an active role in making major decisions (such as the TravInfo system architecture and alternative solutions to the TOS problem) in year two, in contrast to the more passive role that it played in year one.

4.3 Perception of TravInfo

The perception of TravInfo in year two was unchanged when compared with that of year one. On the whole, the MB/SC members believed that TravInfo would provide system benefits, mostly in the area of reductions in non-recurrent congestion, and related reductions in fuel consumption, emissions and accidents. The primary effects of TravInfo will be on Bay Area travelers with an increased awareness of travel options and on VARs with business opportunities for ATIS devices and services. While the MB/SC members recognized the importance of transit usage, they were skeptical that TravInfo would have an effect on transit ridership. The other positive impact cited was reduced stress and anxiety for those commuters able to acquire traveler information.

Making similar responses to those they made in year one, most interviewees did not believe that TravInfo would change their organization significantly. However, people in the private sector thought that TravInfo was a good forum in which to establish business partnerships and that it offered opportunities to gain information on the regional market, as well as on ATIS product development. Individuals were involved in TravInfo for a variety of purposes, including learning more about potential customers in the public sector and protecting market interests, and, for the public sector side, promoting economic growth and mobility.

5. AC STUDY FINDINGS

As in year one, three quarters of the AC members believed that TravInfo has been an effective organization and that the partners are working toward a common goal set. However, their belief in TravInfo was not as strong as that of the MB/SC members. Most of the AC members interviewed were new; only three of the original members remained, and they stated they did not know how the MB and SC performed. Close to half the AC members indicated that they would like to see TravInfo operational in a timely manner and were somewhat disappointed with the delay of the TravInfo schedule.

5.1 Key Issues and their Resolution

When asked about the five key issues raised in year one and their resolution, the AC members responded as follows.

1. *Wireless broadcast of information*

Three quarters of the AC members were aware of the wireless broadcasting issue. Half of these did not know whether it had been resolved and the other half, like the majority of the MB/SC members, thought it had not been resolved yet. Most interviewees did not know exactly why the issue was still unresolved. A few stated, however, that there was an agreement to proceed with the wireless but that the design had not been specified yet.

2. *TravInfo data processing prior to dissemination*

A little more than half of the AC members did not know whether the TravInfo data processing question had been resolved. The others were evenly split as to whether there was a resolution or not. In this regard, they differed from the MB/SC members who mostly thought that this issue had been resolved. Those who believed the issue to be still open stated that the degree of processing by TravInfo could not be known until it became operational. The interviewees who thought the question was closed expressed similar views to those of the MB/SC members.

3. *Provision of direct modem access to the TravInfo database for individuals*

Three quarters of the interviewees were aware of the direct modem access issue. All of the AC members who were knowledgeable about developments concerning the issue thought, like their MB/SC counterparts, that it had been resolved. The AC members' explanation was the same as that of the MB/SC members; only registered participants will have access to the TravInfo database.

4. *Potentially unfair competition of TravInfo with the private sector*

All members of the AC, aside from two, stated they aware of the issue. Concerns about the issue of unfair competition were essentially identical to those of the MB/SC members. Three quarters of the interviewees generally felt that the relationship between the public and private sectors would be more complementary than competitive.

5. *Implementation of the Caltrans TOS*

Three quarters of the AC members stated they aware of the issue. Of these, two thirds thought that the TOS issue had not been resolved yet. Unlike the MB/SC members, they did not seem confident that the problem would be resolved satisfactorily in the near future. Most of them seemed unaware of the alternative light infrastructure strategy. Essentially, the interviewees thought the issue was not resolved because the TOS would not be implemented. The chief criticism of the AC members was that the mini-TOS would not collect as much information as the TOS. They were concerned that the TIC data coverage would be insufficient and that this would limit the desirability of the TravInfo database and hence would limit private sector participation.

Other issues or concerns mentioned by the AC members include:

- Delays in the implementation of the TIC.
- A lack of attention to the end-users.

- A lack of interest from VARs not responding to the FOT.
- A need for marketing TravInfo.
- Unnecessary duplication of information at meetings.

5.2 Performance and Responsibilities of Partners

Two thirds of the interviewees described the AC as “somewhat effective.” The chief criticism was that turnover in membership required repetition of information, which made meetings longer and generally slowed progress. A few felt that the lack of continuity and the varied membership made it hard to give a general direction to the work. Some also thought that the AC members were not very involved in the project and that in reality little advising was done. On the positive side, people thought that the working groups were effective and that there generally was a good level of coordination in the work of the members. Some interviewees also felt that the AC was a good forum in which to keep TravInfo informed about the VARs and the private sector, and that it allowed for interaction between the public and private sectors.

Close to three quarters of the interviewees were unfamiliar with the SC and could not respond to questions about it. Those who had an opinion felt that the SC was fairly effective in general and that it was very effective in its representation of the AC. A few, however, thought that the AC and SC membership should have included end-users and that the SC had its own corporate agenda, which was not that of the AC.

Three quarters do not know about the performance of the MB. The few who had an opinion thought the MB had been fairly effective in that it had salvaged the project in the face of the TOS problem.

As far as the TravInfo organization is concerned, three quarters of the interviewees described it as somewhat effective. The chief concerns were:

- The TOS problem and the delays it caused.
- The marketing of TravInfo.
- Need for a focus on end-users.
- Insufficiency of mini-TOS data coverage.
- Too much focus on highways and little integration of public transit into the TravInfo concept.
- Reiteration of information.
- Lack of political support at Caltrans headquarters in Sacramento.

On the other hand, the AC members felt that TravInfo was quite successful in the following areas:

- Gathering participants and setting up an efficient public/private partnership.
- Designing the interface.
- Putting the LDS on line.

Three quarters of the people did not suggest any organizational changes. Those who did mentioned four elements:

- More participation in the end-user working group.

- More political support from Caltrans headquarters in Sacramento.
- Inclusion of transit in the TravInfo concept.
- More marketing for TravInfo.

5.3 Perception of TravInfo

The AC members were involved in TravInfo for a variety of reasons, chief among which were: testing the ITS market, learning about public/private partnerships, improving air quality and traffic conditions and developing business plans as well as products.

Interviewees unanimously stated that TravInfo had no effect on their organization, aside from three individuals who said it had increased ATIS awareness. More individuals (a total of 7 out of 20) stated that they anticipated change in their organization because of TravInfo, but most often the potential change was described as minor.

The AC members mentioned several TravInfo changes they would like to see implemented. The most important, mentioned by about half the interviewees, was simply that it become operational. Other concerns were: better data coverage, implementation of DBS, staying on schedule, provision of alternate data sources, and focusing more on transit.

For half the interviewees, involvement in the project over the last year had decreased. The reasons for this were varied and included: delays in the implementation of the TIC, reorganization within their firms and the shifting of priorities, as well as a lack of time. For a quarter of the members, involvement in the project had not changed and for another quarter it had increased, generally because they were new to the project.

6. CONCLUSIONS

In the first year of the FOT, organizational issues, principally defining the exact scope of SC and working group responsibilities, were paramount. The second year was dominated by issues pertaining to the resolution of public/private controversies and the delay of the TravInfo schedule due to the TOS procurement policy. Based on the interviews and observations at MB and SC meetings, it is clear that the TravInfo organization has been effective at resolving both of these issues.

TravInfo effectively strengthened the public/private partnership by establishing a clear and balanced vision for the public and private sectors. The TravInfo concept gave the public sector responsibility for data collection and operation/supervision of the database and the private sector responsibility for developing products and services to disseminate information to travelers. Having this clear vision has helped delineate the exact boundary between public and private responsibility, with respect to such issues as data broadcasts and data processing.

The Steering and Advisory Committees also provided an open forum for resolving these issues. In its first year, the Steering Committee was criticized for inefficiency and lack of focus. In the second year, it appears that the Steering Committee has found its focus through narrowing its scope to resolving public/private issues.

Finally, the delay of the TOS was affected by a rigid procurement structure that did not provide the flexibility needed to resolve problems quickly and efficiently. In hindsight, this calls into question whether TravInfo should have relied on the TOS as the primary public data source, instead of proceeding along a more independent and diversified path.

Despite the significant procurement problem created by the Executive Order prohibiting sole-source contracts, TravInfo managed to obtain approval of the mini-TOS contract. Concerns were voiced by some interviewees, particularly the AC members, regarding the mini-TOS data coverage. However, TravInfo developed a multi-tiered strategy to provide data to compensate for the limitations of the mini-TOS. First, TravInfo will use a light infrastructure composed of fleet data sources, video surveillance and Freeway Service Patrol vehicles. Second, TravInfo will have additional data provided by the future TIC operator, as called for in the RFP for TIC operations. Finally, loop detectors will continue to be added by Caltrans throughout the FOT to expand the network.

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APPENDIX A:

GOVERNOR'S EXECUTIVE ORDER W-103-94 OF AUGUST 1994

In May of 1989, the Department of Motor Vehicles awarded a contract to Tandem Computers to convert its databases to a relational format. Four years later, with \$14 million spent and the work still uncompleted, DMV terminated the project. In response, the Governor issued an executive order that prohibited all state departments from awarding sole-source contracts:

“No “sole-source” contracts or procurements, as defined by State law, are to be authorized for the State of California, except in the case of State Emergency, or where public health and safety so requires.

- a) To ensure that these conditions are met, and that accountability for such decisions is at the highest possible level, any and all “sole source” contracts entered into by the State of California shall, without exception, require the express written approval of the Cabinet-level Agency Secretary with jurisdiction over the contract, as well as the Department of General Services.
- b) Departments which do not report to a Cabinet Agency shall require express written approval by the highest ranking full-time employee of the organization.”

**APPENDIX B:
MB/SC SURVEY INSTRUMENT: WAVE 2**

Objective 1. Key Issues and Their Resolution

To assess the organization's effectiveness in resolving key issues and overcoming barriers.

- a) A key issue that arose in last year's survey was the form and existence of a wireless broadcasting system for communicating with ATIS devices. How has this issue been resolved?

Has the resolution been satisfactory? (and why)

- b) A second key issue was the degree to which TravInfo should process data prior to dissemination (e.g., computing shortest travel time paths). How has this issue been resolved?

Has the resolution been, satisfactory?

- c) A third key issue was the provision of direct modem access to the TravInfo database for individuals. How has this issue been resolved?

Has the resolution been satisfactory?

- d) A fourth key issue was whether TravInfo would compete unfairly with the private sector (such as Metro Traffic and Shadow Traffic). How has this issue been resolved?

Has the resolution been satisfactory? (and why)

- e) Over the last year, Caltrans' ability to implement its TOC has become a major issue. How has this issue affected the project?

Has TravInfo handled this issue adequately? (and how)

What is the most appropriate course of action at this time?

f) What other conflicts or issues have arisen over the last year?

How have they been resolved?

g) At this point in time, what are the major institutional, technical, and legal barriers for both the implementation and the subsequent operation of TravInfo?

Objective 2. Performance and Responsibilities of Partners

To elicit opinions on the performance and responsibilities of the Steering Committee Management Board and the TravInfo organization as a whole.

a) How effective has the SC been over the last year?

How successful are the working groups?

How effective is the SC in making decisions?

Is the SC addressing appropriate issues?

How effective is the SC in outreach to the AC?

b) Can you suggest any changes in the organization or operation of the SC?

c) How effective has the MB been over the last year?

How effective is the MB in making decisions?

Is the MB addressing appropriate issues?

How effective is the MB in outreach to the AC and SC?

How effective is the MB in outreach to the AC and MB?

d) Can you suggest any changes in the organization ,or operation of the MB?

e) How effective has the TravInfo organization as a whole been in performing its duties?

f) Can you suggest any organizational changes?

Objective 3. Perception of TravInfo

To assess the motivations for participating in TravInfo, and perceptions of the benefits of TravInfo.

a) Last year, you stated that the goals of TravInfo should be [fill in]. goals are still the right goals?

b) Do you believe that TravInfo is working toward these goals?

c) Do you believe that TravInfo will have a significant impact on the following situations ?

State as positive, negative or no change, describe how significant and justify.

- ___ usage of public transit
- ___ recurrent congestion
- ___ non-recurrent congestion
- ___ air pollution
- ___ public knowledge of travel options
- ___ safety or accidents
- ___ development of new travel information products and services
- ___ other, please specify

d) Has TravInfo affected your organization? What is the extent of that change? Why?

If no: Do you anticipate any change in your organization because of TravInfo? What will be the extent of change in your organization? Why?

e) What is your interest in TravInfo, and why are you involved?

f) Over the last year, has your involvement in the project increased, decreased or stayed the same (and why)?

g) Do you have any remaining concerns or comments on TravInfo?

Company information

Name of the company _____

Named of person interviewed _____

Address _____

Telephone number _____

Type of organization _____

Type of products _____

Number of employees _____

**APPENDIX C:
AC SURVEY INSTRUMENT: WAVE 2**

Scripted Introduction

The University of California is conducting a second wave of surveys of TravInfo Advisory Committee members, to assess the project's effectiveness in overcoming barriers to public/private ventures. Information that you provide will be used to improve TravInfo, but your individual responses will be kept confidential.

[ASK FOLLOWING QUESTIONS FOR NEW AC MEMBERS ONLY—IF PERSON RESPONDED LAST YEAR, SKIP TO OBJECTIVE 1. IF PERSON IS NO LONGER AT ORGANIZATION, ASK FOR REPLACEMENT, ALONG WITH CURRENT PHONE NUMBER OR ORIGINAL MEMBER. CONTACT BOTH PERSONS]

Background

Before we begin, how would you rate your familiarity with TravInfo:

1. Very familiar
2. Somewhat familiar
3. Not at all familiar

Have you attended any meetings of the TravInfo Advisory Committee?

1. Yes (if yes, how many) _____
2. No

Have you attended any meetings of the Steering Committee?

1. Yes (if yes, how many) _____
2. No

Have you attended any meetings of the Management Board?

1. Yes (if yes, how many)
2. No

IF NOT AT ALL FAMILIAR AND HAS NOT ATTENDED MEETINGS TERMINATE

Objective 1. Key Issues and Their Resolution

To assess the organizations effectiveness in resolving key issues and overcoming barriers.

- a) A key issue that arose in last year's survey was the form and existence of a wireless broadcasting system for communicating with ATIS devices. Are you aware of this issue?

1. Yes

2. No

If yes, has this issue been resolved to your satisfaction? (explain)

b) A second key issue was the degree to which TravInfo should process data prior to dissemination (e.g., computing shortest travel time paths). Are you aware of this issue?

1. Yes
2. No

If yes, has this issue been resolved to your satisfaction? (explain)

c) A third key issue was the provision of direct modem access to the TravInfo database for individuals. Are you aware of this issue?

1. Yes
2. No

If yes, has the issue been resolved to your satisfaction? (explain)

d) A fourth key issue was whether TravInfo would compete unfairly with the private sector (such as Metro Traffic and Shadow Traffic). Are you aware of this issue?

1. Yes
2. No

If yes, has the issue been resolved to your satisfaction? (explain)

e) Over the last year, Caltrans' ability to implement its TOC has become a major issue. Are you aware of this issue?

1. Yes
2. No

If yes, has the issue been resolved to your satisfaction?

f) What other conflicts or issues have arisen over the last year?

How have they been resolved?

Objective 2. Performance and Responsibilities of Partners

To elicit opinions on the performance and responsibilities of the Steering Committee, Management Board and the TravInfo organization as a whole.

a) How effective has the AC been over the last year?

1. Very effective
2. Somewhat effective
3. Not at all effective
4. DK

Can you point to any successes or failures?

b) How effective has the SC been over the last year?

1. Very effective
2. Somewhat effective
3. Not at all effective
4. DK

Can you point to any successes or failures?

c) How well do you think the SC represents the Advisory Committee?

1. Very well
2. Somewhat
3. Not at all
4. Don't know

Can you identify gaps or imbalances in the current membership?

d) Can you suggest any changes in the organization or operation of the SC?

e) Over the last year, how effective has the MB been in performing its duties?

1. Very effective
2. Somewhat effective
3. Not at all effective
4. DK

Can you point to any successes or failures?

f) Can you suggest any changes in the organization or operation of the MB?

g) How effective is the TravInfo organization as a whole?

1. Very effective
2. Somewhat effective
3. Not at all effective
4. DK

Can you point to any successes or failures?

h) Can you suggest any organizational changes?

Objective 3. Perception of Travlufo

To assess the motivations for participating in TravInfo, and perceptions of the benefits of TravInfo.

a) What is your interest in TravInfo, and why are you involved?

b) Do you believe that TravInfo is working toward the right goals?

1. Yes
2. No

If no, ask what goals it should work toward

c) Has there been any change in your organization because of TravInfo?

1. Yes
2. No

If yes, what was the extent of change, and why?

d) Do you anticipate any change in your organization because of TravInfo?

1. Yes
2. No

If yes, what will be the extent of change, and why?

e) What changes would you like to see in TravInfo?

How would this affect your involvement?

ASK YES/NO QUESTIONS IN f-h IF NOT ASKED AT START OF INTERVIEW

f) Have you attended any AC meetings over the last year?

1. Yes --- How Many?
2. No

If yes -- what is your impression of these meetings?

g) Have you attended any SC meetings over the last year?

1. Yes --- How Many
2. No

If yes -- what is your impression of these meetings?

h) Have you attended any MB meetings over the last year?

1. Yes --- How Many?
2. No

If yes ~ what is your impression of these meetings?

i) Over the last year, has your involvement in the project increased, decreased or stayed the same

1. Increased
2. Decreased
3. Stayed the same

If 1 or 2, why?

j) Do you have any remaining concerns or comments on TravInfo?

Company information

Name of the company _____
Named of person interviewed _____
Address _____
Telephone number _____
Type of organization _____
Type of products _____
Number of employees _____