

Funding ITMS

*Alan Clelland**

INTRODUCTION

The successful implementation of any traffic management system is a combination of several factors such as sound design, well managed implementation and competent operation and maintenance. A common thread through all these activities is the availability of adequate funding for every stage of the project. Yet, while much has been written to assist the engineer in all these project tasks, little is offered to help in securing the all important funding.

This was recognized by the then Orange County Transportation Authority when it commissioned a study for a Traffic Operations Center (TOC) for the county's freeways. The freeways fall into District 12 of the California Department of Transportation (Caltrans). As well as a thorough analysis of TOC operations and Traffic Operation System (TOS) alternatives, the study included an investigation of potential funding sources.

This paper aims to provide some insight into pursuing the funding of integrated traffic management systems and is based upon the results of the funding opportunities analysis carried out as part of the TOC study (1). The characteristics of the Orange County system are described with respect to integrated traffic management system components. This is followed by an overview of general aspects of the pursuit of funds and a description of those funding sources identified by the study as being applicable to the implementation, operation, and maintenance of the complete Traffic Operations Center (TOC). All aspects of project funding are addressed, including operations and maintenance.

The funding sources are categorized as:

- Locally generated
- State-based funding
- Federal sources

While some of the sources described are obviously specific to Orange County, it is anticipated that there will be available local parallels in many regions. The intention is to draw attention to funding sources which may not be traditionally available to traffic operations projects.

THE ORANGE COUNTY TRAFFIC OPERATIONS CENTER

Up until the late 1980s, the freeways in Orange County came under the jurisdiction of Caltrans District 7, headquartered in Los Angeles. The rapid growth in Orange County coupled with an equally rapidly expanding freeway network led to the formation of Caltrans District 12 for the county. With the locating of the Caltrans District 12 offices in the Santa Ana facility, came the reservation of limited space for a Traffic Operations Center. However, the district's freeways are still monitored by the Semi-Automated Traffic Surveillance System (SATMS) located in the District 7 TOC. Similarly, District 12's full matrix changeable message signs (CMS) are controlled by District 7's CMS central.

* Alan Clelland is Associate Vice President of JHK & Associates in Pasadena, California.

District 12 produced a 10-year Traffic System Management Plan in 1989 which identified the expansion of the freeway surveillance and CMS and introduced elements such as closed circuit television (CCTV) and highway advisory radio (HAR).

One of Orange County's major cities is Anaheim which is the home of several special event generators such as Disneyland, the Anaheim Stadium and the Convention Center. The city has been successful in developing and implementing a Traffic Management Center with such system elements as a centralized traffic management system (TMS), CCTV and CMS.

The need for access to freeway conditions as part of event management in the city has led to the installation of an intertie between the Caltrans District 7 TOC and the Anaheim TMC (2). Freeway conditions and CMS status are transferred from the TOC to the TMC for display on real-time high-resolution graphics displays. District 12 receives the data for similar display via the Anaheim TMS through a TMC to District 12 TOC intertie. This intertie also allows Caltrans District 12 access to Caltrans traffic signal controllers operating under the Anaheim TMS through a remote terminal support capability. Recent projects in the Anaheim Stadium area will add the capability of transferring video images on this intertie and providing for the integrated operation of CMS and HAR motorist information systems between Caltrans and Anaheim operations personnel in several areas of the city.

The TOC study identified future Caltrans operations as being coordinated with other cities such as Irvine and Santa Ana as well as the forthcoming Transportation Corridors Agency (TCA) toll roads (see below). Amid all this activity, the SATMS and CMS central equipment is rapidly approaching end-of-life, causing District 12 to analyze options for replacement and implementation of its own TOS and CMS central.

FUNDING PREPARATION

Clearly, the developing District 12 TOC and its associated TMS fall into the category of an integrated traffic management system (ITMS) comprising diverse system elements complicated by the coordination of several independent operating agencies. This, however, is likely to become an increasingly common construct in urban traffic management projects; freeway and surface street agencies will develop the need to coordinate their operations to mitigate the impact of recurring and non-recurring incidents and maintain mobility on their facilities.

How then should these agencies best pursue the securing of funding to support such projects? This section suggests key components for a successfully funded TMS as a prelude to the identification of specific funding opportunities.

Development of an Action Plan

An ITMS will be comprised of either multiple system components or multiple agencies or both. It is inevitable, therefore, that the design and implementation of the ITMS will not occur in one major step, but in a piecemeal fashion. Individual agencies will get separate funding and individual components will come on-line independently. It is essential, however, that there exists an overall implementation plan which forms the blueprint for ITMS implementation.

This Action Plan identifies the system components, their interdependence, costs and responsibility for implementation. With this information, the pursuit of funding can be focused to address ITMS

elements at appropriate points in the program and avoid premature deployment and incompatible activities. Equally important, this should also avoid "gaps" in the system at agency or sub-system interfaces.

It is also recommended that, in the case of multi-agency projects, one agency takes a lead role in managing the overall ITMS implementation and coordinating activities. This may be very much a secretarial role in arranging meetings, setting agendas and distributing minutes of meetings but these provide an essential framework for project implementation. An excellent example of this has been the Katella Avenue Signal Coordination Project (3).

Phased Implementation

The complexity of an ITMS demands that a phased implementation approach is followed. This means that system components are identified which can be implemented and brought on-line independently. In this way, component functionality is confirmed prior to integration. Any problems arising during integration are automatically reduced in complexity.

An additional advantage is that the incremental benefits of the system components can be experienced. Through phased implementation, the ITMS will progress as a series of successful steps; this will generate support for the project as a whole and help support the securing of funds for successive stages of the program.

Targeted Applications

Successful funding applications are those which are targeted at the most appropriate funding source for the project element to be funded so that the application can score highly against the selection criteria. This basic fact is often overlooked under the pressure to secure funds and submit applications on time. As stated above, the availability of an Action Plan will assist the matching of the targeted fund to the most appropriate element.

Leveraging

This can be summed-up by the phrase "Big oaks from little acorns grow." It may prove difficult or even impossible to totally fund an ITMS because of the magnitude of the program and the diversity of system elements, hence the need to target individual elements for implementation. However, as it can be shown that any given element forms part of a coherent, integrated plan, funding from one source can be used as leverage to gain funding from another.

Consider the case of an agency which has access to a limited amount of local funds, e.g. \$100,000 of city monies which could be used to fund a small element of the ITMS Action Plan. This can be used to support an application for state funds and gain an advantageous position by asking for a reduced state match, for example \$400,000 at an 80:20 state to local match. The total \$500,000 can then be used as leverage for a similar federal matching arrangement, resulting in a total funding of some \$2 million.

FUNDING SOURCES

Locally Generated

Transportation Corridors Agency (TCA)

The TCA has been established specifically to construct three toll road facilities within Orange County. The combined facilities total approximately 65 miles of new construction. Funding for the construction is to come from two primary sources: dedicated developer fees and tolls. After the facilities are constructed, they will be turned over to Caltrans for continuing operation and maintenance. TCA projects are to be implemented over a 7-year time period, with the first section available in 1993. There is some uncertainty with the funding, because of the dramatic slow down in development in the county. However it is expected that development will accelerate when the economy strengthens and that the funding will ultimately be available.

Opportunity — The plan for the TCA facilities includes a complete traffic operations system. This includes all of the features identified as needed for the District 12 TOC. A fiber optic-based communications network is to be provided to support the TOS and the toll collection system. The toll collection system is to emphasize automated collection using AVI technology. The TCA program, as defined in their concept plan for traffic management, includes a traffic control center and all related system software, system integration, and operational planning services. The TCA feasibility study identified a total cost for the traffic management system of \$70–75 million, including a significant value for the TOC and related services.

The TCA funding, then, could be used to build the TOS infrastructure on the new roadways that they construct. Funds could also be made available to assist in developing the traffic operations center in lieu of building a separate facility.

Constraint — The TCA funds cannot be used for infrastructure outside their roadways. Also, timing of availability of funds is questionable given current development conditions. It is also likely that the funds will not be available for continuing operations and maintenance, although some latitude might be available and should be considered.

Measure "M" Funds

Measure M, a one-half cent local sales tax increase to fund transportation improvements, was passed by Orange County voters in November, 1990. Over the next 20 years, revenues from this tax are projected at \$3.1 billion. As part of this ballot measure, the Orange County Transportation Commission (OCTC) developed a 20-year Master Plan which allocates Measure M Revenues toward specific projects in the categories of Freeways, Streets and Roads, and Transit (including rail). The implementation of this spending plan will be supervised by a Citizens Oversight Committee and any changes must be approved, in advance, by this group. Funds were to become available in July, 1991.

Despite having received approval from Orange County voters, Measure M is currently undergoing a legal challenge that was filed by several groups who opposed the measure during the campaign. This has delayed the availability of the funds.

Based on the existing Measure M funding split between freeways (43 percent), local streets and roads (32 percent), and transit (25 percent), it is possible that part of these revenues could be used to construct

and maintain a TOC. In addition, any funds spent on a TOC would benefit from a public perception that improved traffic flow on regional freeways provides the greatest overall benefit for the largest number of drivers.

Several segments of existing freeway are to be partially funded for reconstruction with Measure M funds. The infrastructure for the TOS would be expected to be included in the reconstruction projects and the Measure M funds might be applied on a pro-rata basis to this element. It might also be feasible to use a pro-rata portion of the funds for elements of the TOC.

Opportunity — Measure M funds can be used on the facilities identified in the program.

Constraint — Funds may only be used for identified sections of roadway with any deviation approved by an oversight committee. The funds do not appear to be available for continuing operations or maintenance, however there is a category for “maintenance and operations” noted in one element of Measure M. The allowance of use funds for these purposes needs to be examined further. (As a note, the one-half cent sales tax measure in Los Angeles County is funding the continuing tow services on the more congested freeways.)

Privatization Projects

There are two “privatization” projects being developed in the Orange County area. The first, covers a toll and HOV facility for a section of SR-91 from SR-55 to the Riverside County Line. The facility is to provide two lanes in each direction, reserved for toll and HOV vehicles. Toll collection is to be by fully automatic means.

The privatization project will include funds for a traffic management system. The working budget provides for the communications network and related infrastructure for the new facility. In general, the infrastructure covers only the new lanes, however, it is also adequate to provide for most of the SR-91 facilities. Additional detection and signing will be required.

Opportunity — The SR-91 project may significantly reduce the cost for the TOS for all of SR-91. This should be treated as a “given” in developing the funding program. Also, the project is expected to generate significant funds for capital recovery (payback in 7 to 10 years). The potential for “charging” the project for operations and maintenance should be considered. Also, the project should be considered for funding of a pro-rata share of the operations center.

Constraint — The area of coverage is limited and funds can be used only for the affected area.

The second privatization project, known as the Santa Ana River Viaduct, involves the construction of a facility in the right-of-way of the Santa Ana River. The link, to be built as a toll facility, significantly improves access to southern Orange County and provides a connector to the TCA projects. Agreements for the project are not as far along in development as the SR-91 project. It would be expected that all TOS-related items will be directly integrated into the project and be paid for by the project. In this sense, the project does not “add” to the initial cost of the TOS. It does add cost to the continuing operation and maintenance of the system by adding mileage and equipment.

At the same time, this project is on a new alignment and does not replace or supplement the need for any planned TOS facilities. Therefore, there is no potential cost savings to the TOS associated with this project.

Opportunity — The project can provide TOS features for the new facility. Further, the project should be examined to determine its potential for contributing to continuing operations and maintenance, particularly since the initial capital investment does not offset any planned investment in the TOC. The project may also be considered for contributing to the initial cost of the operations center on a pro-rata basis.

Constraint — The project involves a new roadway and funding is generally applicable to the new facility only.

Orange County Unified Transportation Trust (OCUTT)

OCUTT funds are those monies which have accumulated, *as interest, since 1985*, on a “transit savings account” of approximately \$85 million. This transit savings account has resulted from OCTC’s and the Orange County Transit District’s (OCTD) annually setting aside a portion of the Local Transportation Funds (LTF), which has been earmarked for the eventual construction of a barrier-separated high-occupancy vehicle (HOV) lane, or transitway, throughout central Orange County.

The OCUTT program is administered by OCTA, with half of the money being spent on local streets and roads, and half on other types of projects such as state highways, freeways or superstreets. This year’s OCUTT account is projected to be about \$8.5 million. Agencies eligible for OCUTT funds include the county of Orange, the cities, and Caltrans. Also, each year, the funds contained in the streets and roads component of the OCUTT program are directed toward a specific aspect of local jurisdiction needs, with last year’s focus on signal coordination, and this year’s focus on road rehabilitation and reconstruction.

The OCTA is currently planning to divert the OCUTT, to fund a Commuter Rail Endowment Fund. Based on current subsidy levels, this would use approximately \$5.4 million.

Opportunity — Diverting a portion of OCUTT funds may be an option for fast-tracking the expansion of the Phase I TOC. Continuing funding at a relatively low level may also be possible, especially in the emphasis area of interties with local agencies.

Constraint — The funding levels are relatively low and significant demands exist for the funds.

Local Motor Vehicle Registration Fee

In 1990, the California Legislature passed a motor vehicle registration fee increase (Sher-AB 2766), to be assessed to drivers in the South Coast Air Basin, to provide funding for mobile source air quality mitigation programs within that area. Beginning April 1991, an add-on fee of \$2.00 per vehicle will be assessed annually, with the fee being increased to \$4.00 in 1992. Forty percent of this revenue will be allocated to SCAQMD, 30 percent to local governments on a per capita basis, and the remaining 30 percent toward a “discretionary fund.” Any type of project, whether sponsored by government or by the private sector, having some direct connection with air quality would be able to compete for the revenues within this discretionary fund.

It is estimated that with the \$4.00 per vehicle fee, by FY 1993–94, *Orange County vehicle registration alone* should generate about \$8.3 million towards the discretionary fund. Orange County,

however, will not be the sole benefactor of this revenue stream, as the funds will be divided, per legislative formula, to fund both regional and local projects.

With the direct relationship between the TOC and air quality, there should be a strong case for pursuing the discretionary element of these funds. There is also a possibility that authorization will be given to local agencies to increase these fees. Consideration should be given to establishing an annual fee dedicated to supporting continuing operation and maintenance of the TOS.

Opportunity — The funds could be used for any element of the project, especially where a direct benefit to air quality is apparent. Further, given the continuing nature of the funds, opportunities may exist for funding of a portion of the continuing operations costs. This would appear especially appropriate for the elements of tow services, incident management, and traveler information systems.

Constraint — The funding levels are not large, given the likely demands. Also, a clear tie to air quality improvement must be made.

State Funding Sources

State Gas Tax Funds (General)

The state of California levies a gas tax on each gallon of fuel sold. The gas tax is dedicated to transportation improvements, with Caltrans and local agencies as the recipients. The tax has recently been raised from 9 cents per gallon to a programmed 18 cents per gallon. Five cents of the new tax increment is in effect and an additional cent will be added each year until the full value is reached. The new tax increment includes special funding for “TSM” and “Congestion Relief” programs and are discussed separately.

The gas tax fund has classically been the major source of funding for the California freeway system. It is used to “match” federal funds for selected major projects. It is also the funding source for continuing operations and maintenance. Prior to the recent increase, the funds were stretched to the limit to provide continuing operations and maintenance and to match federal funds. Significant cut-backs in Caltrans spending were expected if the new funds were not made available.

As matching funds, the gas tax monies will play a direct role in the implementation of the TOC. Any project financed from federal and/or Measure M sources will be expected to provide the TOS infrastructure needed for that roadway segment. Additionally, under current constraints, the bulk of continuing operations and maintenance costs are likely to come from these funds. (Note that currently federal funds cannot be used for operations and maintenance. However, that may change with the new Surface Transportation Act.)

The gas tax funds are subject to annual budgeting and to a 7-year capital funding plan. The capital funds are administered through the Statewide Transportation Improvement Program (STIP) which is built from project requests at the regional level. Competition for the funds is fierce. With the introduction of the TSM funding program, it is more difficult to receive funding for TOS projects from the general gas tax fund, at least for the capital construction portion.

Opportunity — The gas tax funds are an obvious source of funding for portions of the TOC project and for some or all of continuing operations and maintenance. This is especially true for the elements to be included with major construction projects.

Constraint — Competition for the funds is severe and the availability of the TSM funds makes it more difficult for TOS projects to compete. Even with the increases in the gas tax funds, total funds may be stretched, given all of the projects that are in queue for funding.

Transportation Systems Management (TSM) Program

The recently established Traffic Systems Management (TSM) Program of the gas tax fund seems to hold great promise as a possible funding source. The TSM Program guidelines that were established by the California Transportation Commission (CTC) in October 1989, define the appropriate uses of these funds to be “*those projects designed to increase the number of person-trips which can be carried on the highway system without significantly increasing the design capacity of the highway system...*” According to the CTC guidelines, eligible project types specifically include “*traffic flow improvements such as computerized synchronization of traffic signals and intersection improvements on conventional arterial roads and TV surveillance, computerized message signs, and traffic operations centers on freeways*”; also mentioned are “*traffic metering systems, including meters on freeway on-ramps, freeway-to-freeway connectors, and freeway mainlines.*” Further, “*demonstration projects to implement research and development in the field of traffic operations control systems*” are also identified as an appropriate use.

The California Streets and Highways Code requires Caltrans to submit a TSM plan to the CTC on December 1 of each year. This plan is required to contain a priority list of projects compiled from Congestion Management Programs (CMPs) throughout the state. These CMPs are required to be prepared annually by all counties with at least one urban population center of 50,000 or more persons. Candidate projects are recommended each year by Caltrans’ headquarters (from applications submitted through Caltrans’ district offices) and funds are awarded through a competitive process, based on availability, need and project merit. *Total annual statewide funding for this program is forecast to be approximately \$100 million.*

The TSM program currently operates on a 1-year funding cycle and projects are not required to have been included within the STIP. In fact, because the program was intended to provide for short-term funding, projects that have already been included within the STIP are no longer eligible for TSM funding. In addition, monies *cannot* be awarded to projects which are not yet ready to encumber funds. As a result, when funds are being requested from multiple sources, it is difficult for agencies to coordinate the timing of the receipt of funds from all sources so that they are in a position to receive and *encumber* a TSM funding award. To remedy this situation, in December 1990, the CTC recommended that the California Legislature reorganize existing TSM policies to reflect a multi-year funding program.

TSM funds have been awarded to several projects in Orange County that directly reflect opportunities under this program. Caltrans District 12 has received approximately \$0.5 million for the initial stage of the TOC and over \$5 million for implementation; the city of Anaheim has received approximately \$2.5 million for two projects in the SR-57 corridor and over \$3 million for the SR-91 corridor; finally, the city of Santa Ana has received over \$5 million for a series of projects which will enable the implementation of an ITMS over a significant percentage of the city.

Much of the city TSM project funds will include the freeway elements of TOS as well as integrated corridor control on the surface streets. Other local agencies applied for TSM funds that would benefit the TOS and may receive funding at a later date. Also, it is expected that Caltrans will continue to apply for funding for the TOS under the TSM program.

Opportunity — TSM funding would appear to be a major source for near term funding of elements of the TOC and should be aggressively pursued. This will be especially important if the TSM funding program moves to a multi-year program, allowing for planned implementation. Funding can apply to all elements of the project.

Constraint — The current 1-year cycle makes it very difficult to plan around the funding. Also, the funding does not appear applicable to operations and maintenance costs.

Flexible Congestion Relief (FCR) Program

As with the TSM Program, the Flexible Congestion Relief Program was established in 1989. CTC guidelines, adopted in June, 1990, identify "traffic flow improvements" as an eligible expenditure under this annual statewide program. Projects are nominated through OCTA, working in concert with Caltrans to complete a Project Study Report defining project scope and costs. No local funding match is required, but because of county bidding limits, very high cost project applications must be shown as being divided into phases. Conceptually, this has already been done within the TOC draft implementation plan. Applicant projects should also be consistent with the RTIP, the STIP, and regional and state air quality management plans. CTC estimates the fund to be approximately \$300 million per year.

Opportunity — The congestion relief funding provides some opportunity for use in the TOC program. However, the opportunity appears limited given the availability of the TSM program.

Constraint — The funding for the program is limited and the competition is significant.

Caltrans IVHS Research

Caltrans has received funding to conduct IVHS research projects and has requested proposals from the various districts. District 12 and the University of California-Irvine led a multi-agency team and submitted a program for the region. The project, oriented toward a test bed for IVHS, is receiving strong support and \$7 million or more is being considered for funding over a 3-year period. The project includes elements that can support initial operations center implementation and interties to other agencies. The project will also provide some of the TOS infrastructure on the test bed area. Funds could be available as early as July, 1991.

Opportunity — The IVHS research funds are directly supportive of the overall TOC program and would allow for early implementation of critical support elements of the Caltrans traffic operations center. Limited infrastructure can also be provided.

Constraint — The funds are intended directly for research and development application so the majority of the funding will be used in that manner. The impact on the TOS is not substantial in terms of overall cost, however the early funding is significant.

SB 565 (Bergeson)

Under the California Streets and Highways Code, Section 2557, a \$1.00 supplemental vehicle registration fee may be imposed on vehicles registered within a county to fund a motorist aid (callbox)

system on freeways, expressways and connecting highway routes within that county. This revenue source is currently used to fund Orange County's callbox system.

Senator Bergeson (Newport Beach) has introduced a proposal to *expand the permitted uses of this existing fee* to include traffic operations and safety improvements. The current proposal requires that approval for these ancillary uses would have to be secured from Caltrans and the CHP. Possible candidates for funding would include, but not be limited to, motorist service patrols, changeable message signs, TOCs, and CCTV cameras for traffic surveillance.

Opportunity — It appears that these funds could be used for both the TOC proper and for field equipment (CCTV cameras, CMS, etc.).

Constraint — The initial purpose of these fees was to fund the cellular phone call box system. Until the system installation is complete, it seems unlikely that funds would be diverted to other uses.

Petroleum Violation Escrow Account (PVEA)

Under existing federal law, funds in the Petroleum Violation Escrow Account (PVEA) funds have been dispersed to the state by the federal government and deposited in the Federal Trust Fund. PVEA monies have been used in the past to fund statewide programs to relieve traffic congestion, such as vanpool grants and loans. Existing state law, however, does not provide for Smart Corridor-type optimized signal timing and corridor demonstration projects. Recently specific bills have been formulated to require county transportation commissions, using funds allocated by the CTC, to coordinate Smart Corridor demonstration projects on the state highway system. The bills would further require local transportation commissions to report on these projects to the Legislature.

In the last legislative session, two such bills went before the state senate for the appropriation of over \$6 million of these PVEA funds to the CTC for allocation to these corridor demonstration projects. Unfortunately, competition for PVEA funds resulted in only \$1 million being allocated, and that to the Santa Monica Smart Corridor project.

Opportunity — Future proposals could be formulated to provide some funds for implementing suitable corridor projects which might include portions of the TOC.

Constraint — Significant competition from the urban counties in the state is to be expected. Because the corridors also include surface streets, some of these monies will be allocated to the cities involved.

Federal Highway Administration (FHWA) Funds

Intermodal Surface Transportation Efficiency Act (ISTEA)

The Highway Trust Fund, administered by FHWA under the Surface Transportation Act (STA), provided a major element of funding for freeway construction. Interstate reconstruction projects include as much as 90 percent FHWA funds and selected traffic management projects are funded at the 100 percent level. In all reconstruction projects, the TOS elements were eligible for funding as part of the project. Special projects covering TOS elements were also eligible for direct funding. Federal funds could also have been used for the TOC. The STA was in effect through September, 1991 and was essentially obligated for current projects in the STIP.

In addition to funding for the freeway projects, the STA included a category of urban funds, generally used for traffic management improvements on local streets. These funds also allowed a preferential match (100 percent) for traffic management projects. This funding base was generally committed by each local agency and would not generally be used for a freeway TOC.

Congress has recently passed the replacement for the STA, the Intermodal Surface Transportation Efficiency Act (ISTEA) and which is a significant departure from the older programs. President Bush signed the act into effect on December 18, 1991.

ISTEA comprises several funding programs ranging from air transportation to research and other papers in this symposium promise to analyze the total act in detail. However, the act includes several sources which are of direct interest to the funding of ITMS:

- Surface Transportation Program
- National Highway System
- Congestion Mitigation and Air Quality Improvement
- Intelligent Vehicle-Highway Systems Research Funds

ISTEA is very promising for projects such as ITMS. Where the federal portion of general matching has been reduced to 60 percent, traffic management projects are at the 90 percent level. Instead of using a "cost to complete" analysis, the new act requires a cost-effectiveness analysis and TOS projects generally score very well in this regard. As agencies will have to develop congestion management plans as part of ISTEA, California agencies will have a head start because of the current state requirements. TOCs are generally seen as an integral part of an overall congestion management plan, further supporting the project.

ISTEA will continue to support major reconstruction projects, such as along I-5 and the TOS infrastructure will directly qualify for funding as part of the projects. ISTEA also considers a new network of "streets of national significance" that will allow direct federal funding on a network of approximately 160,000 miles, with emphasis in urban areas, again an indication that urban congestion will be an emphasis area.

Another major new element of the act is the opportunity to use federal funds for operations and maintenance. The current draft provides for funding of a two year "start-up period" where matching funds would be available. The appears to be some movement to allow continuing matching, at least for the operation of traffic management systems. Although it is too early to tell the final direction, it is likely that some funding will be available, at least for two years of initial operation.

Opportunity — ISTEA continues all of the features of the existing STA relative to TOS implementation and is an obvious source for funding a portion of the project. The new features of the bill make it an even better and more likely source. The opportunity also exists for operations and maintenance support.

Constraints — The act remains non-specific in several areas regarding criteria for funding, assessment of projects and managing agency. This is likely to fuel competition for the funds and promote extensive lobbying efforts.

FHWA IVHS Research and Operational Field Tests

There has been significant interest at FHWA in moving the IVHS program forward. As an indication of this interest, the 1991-92 obligation for FHWA includes \$20 million earmarked for research and field testing of IVHS, up from approximately \$4 million in the previous year. As part of ISTEA, \$94 million for this fiscal year has been appropriated and the amount will increase to \$113 million per year in the remaining 5 years of the act.

The special IVHS funding (although part of ISTEA) is not tied to a distribution formula, but will be made available to the most promising projects. The research activities are to be a smaller part of the total, with emphasis placed on actual field observations and test. With Caltrans' strong interest in IVHS and all of the on-going activities in the state, it is expected that California will receive a fair portion of the funds. The work in Orange County offers an opportunity to qualify for a portion of the IVHS funds, especially in areas that are more innovative and technology based. The IVHS funds are not intended to create the basic infrastructure, but to support continuing development.

Opportunity — Funding could be provided for testing of technology, development and testing of innovative features such as expert systems, and related developments. Although the actual funding might not be at a high level of dollars, the added visibility afforded by being a test site increases the attractiveness of the overall program and increases the likelihood of other funds being available.

Constraint — In general, the funds are not intended to replace direct implementation funds and may not reduce the commitments required from other sources.

SUMMARY

Table 1 summarizes the funds that might be used for an ITMS such as the Orange County TOC project. As can be seen from the table it is very likely that a large variety of funding sources will prove applicable to such a program. However, efficient program development and the aggressive pursuit of funds will remain key to the successful implementation of any ITMS.

ACKNOWLEDGEMENTS

The author thanks the Orange County Transportation Authority for permission to present this work. The majority of the TOC study was carried out under the direction of the late Jim Kell who made a major contribution to the study; acknowledgements also go to Glenn Havinoviski and Jack Kay of JHK for their efforts in the Final Report and to Dean Delgado of the OCTA for his support and assistance.

Table 1

Source	Use			
	TOC	TOS	OPS	MNTNC
Locally Funded				
Transportation Corridor Agency	✓	✓	●	●
Measure M	●	✓	—	—
SR-91 Privatization	●	✓	—	—
Santa Ana River Viaduct Privatization	●	✓	●	●
OCUTT	—	—	—	—
Vehicle Registration Surcharge	●	●	✓	●
State Funded				
California Gas Tax (General)	✓	✓	✓	✓
TSM Program	✓	✓	—	—
Congestion Reduction Program	●	—	—	—
Caltrans IVHS Research	●	●	—	—
Federally Funded				
ISTEA	✓	✓	●	●
IVHS Research and Field Testing	●	●	—	—

Legend:

- ✓ = Significant Opportunity
- = Limited Opportunity
- = Little or No Opportunity

REFERENCES

1. JHK & Associates. *The Orange County Traffic Operation Center Study*. Final Report to the Orange County Transportation Commission, October 1991.
2. G. Damico and D.W. Dey. "The Caltrans-Anaheim Intertie." IVHS America Annual Meeting, Newport Beach, California, May 1992.
3. Institute of Transportation Studies, UC-Irvine. *The Katella Avenue Signal Coordination Project Evaluation Report*. Report to the city of Anaheim, California, January, 1992.