FINAL
APPENDIX IV-B

TRANSPORTATION CONTROL MEASURES

NOVEMBER 1996

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TRANSPORTATION STRATEGY

TRANSPORTATION STRATEGY

The Transportation Strategy for the 1997 AQMP is part of a comprehensive vision to improve air quality by reducing emissions from mobile sources while enhancing mobility by decreasing congestion levels. The measures proposed in this section are not stand alone strategies, but instead are interdependent in order to achieve the anticipated emission reductions. This strategy contains commitments to implement transportation improvements contained in the Regional Transportation Plan adopted in 1994 which reduce mobile source emissions. The Transportation Strategy continues the blueprint contained in the 1994 State Implementation Plan submitted to EPA.

THE CHALLENGE FOR MOBILE SOURCE EMISSION REDUCTIONS

Although emissions from on-road vehicles will decrease from 647 tons/day of VOCs in 1993 to 163 tons/day in 2010, on-road mobile sources will still comprise almost 20% of the total emissions inventory. Thus, to attain the national ambient air quality standards, we need to continue to focus on reductions from other emission source categories as well as mobile sources.

Attainment of federally mandated air quality standards may only be achievable with aggressive use of advanced transportation technologies and new market-based programs. Along with these innovative approaches, more traditional infrastructure improvements, system management and information services are being pursued within the context of a broad vision of the region's future. This vision integrates air quality, mobility and economic development goals described in SCAG's Regional Comprehensive Plan and Guide. The transportation strategy is intended to maximize the emission reductions from congestion relief that can reasonably be expected to be achieved from mobile sources.

IMPLEMENTATION PROGRAM FOR THE STRATEGY

SCAG's adopted transportation plan includes transportation improvements, advancement of transportation technologies, market based transportation pricing and livable communities. An additional measure - Stage I episode plans - is also included for further study.

As shown in Table 1, over the past twenty years, both population and employment have increased substantially. During this same time period, the absolute number of home-to-work vehicle trips increased by 17 percent. While the percentage of people driving alone corresponds to the increase in home-to-work trips, the percentage of people ridesharing outpaced the rate of increase in trips made between home and work. The rate of increase in people riding transit has not, however. increased as rapidly as the rate of increase of

trips between home and work. These trends were due both to changed travel habits and in response to the travel alternatives available.

TABLE 1

TRANSPORTATION SYSTEM TRENDS

DATA	% CHANGE: 1976-1994
Population	42%
Employment	37%
Drive Alone	17%
Shared Ride	20%
Transit	13%
TOTAL HOME-TO-WORK TRIPS	17%

Over the next twenty-five years, significant increases in population (44 percent) and employment (44 percent) are also expected to occur. The transportation strategy calls for providing significant levels of investment in infrastructure, system management and travel alternatives to help manage the increased demands on the existing transportation system.

A summary of implementing actions and agencies is contained in Table 2. Table 3 notes the applicable enforceable commitments, emission reductions and monitoring systems. A more detailed explanation of the specific measure components is contained in the following sections.

TABLE 2

Implementation Actions and Agencies

MEASURE		IMPLEMENTATION ACTION(S)	IMPLEMENTING AGENCY
TCM-01 Transportation Improvements	HOV Lanes	Through RTIP, program and implement HOV projects (& pricing alternatives), park & ride lots/intermodal facilities	SCAG, CTCs, Caltrans
	Transit/ Systems Management	Through RTIP, program and implement) transit improvements, Urban Freeway System Management Improvements, smart corridors TSM programs, railroad consolidation programs, CMP-based demand management strategies, vanpool programs, telecommunications facilities, demonstration programs, and bicycle and pedestrian facilities.	SCAG, CTCs, Caltrans, Transit Operators, Local Governments
	Information Services	Through RTIP, program and implement marketing information services for employers and activity centers to encourage shared rides and transit use, and transit pass centers.	SCAG
ATT-01 Telecommunications		Increase usage of telecommunications products and services in daily business, educational and personal activities. Targets 6.8% decrease from 1990 levels in 2010 H-W trip equivalents.	SCAG/SCAQMD/ Partnership/Local Gov'ts/ Subregions
ATT-02 Advanced Shuttle Transit		Introduction of technology-enhanced "smart" vehicles to provide consumers a choice between automobiles and "smart shuttles". In combination w/ "traditional transit", targets a 10% mode split.	SCAG/SCAQMD/ Partnership/Local Gov'ts/ Subregions
ATT-03 Zero-Emission Vehicles/Infrastructure		Enhance market penetration of zero-emission vehicles and aggressive deployment of infrastructure. Facilitate State ZEV mandate and market-enhanced levels of vehicle sales.	SCAG/SCAQMD/ Partnership/Local Gov'ts/ Subregions
ATT-04 Alternative Fuel Vehicles/Infrastructure		Enhance market penetration of alternative fuel vehicles along with aggressive deployment of refueling infrastructure. Facilitate state program actions and market-enhanced levels of vehicle sales.	SCAG/SCAQMD/ Partnership/Local Gov'ts/ Subregions
ATT-05 Intelligent Transportation Systems		Apply Advanced Traffic Management and Advanced Traveler Information Systems to reduce fuel usage and emissions, improve travel time and safety, and support transit-user information and patronage. Facilitate 5% improvement in roadway vehicle capacity.	SCAG/SCAQMD/ Partnership/Local Gov'ts./Subregions
FSS-02 Market Based Transportation Pricing		Further Study. Implement pricing policies to reduce congestion and emissions from vehicles.	State and/or Local Agencies

TABLE 3

Enforceable Mechanisms, Emission Reductions and Monitoring Systems

MEASURE		ENFORCEABLE MECHANISM			EMISSIONS REDUCTIONS*		MONITORING SYSTEM
		Public Funding	Public Approval	State Law	% VOC	% NOx	
TCM-01 Transportation Improvements	HOV Lanes	☐			19%	19%	Timely implementation (for conformity); funding priority given to TCMs by Transportation Commissions/SCAG.
	Transit/ System Management	☐			16%	18%	Timely implementation (for conformity); funding priority given to TCMs by Transportation Commissions/SCAG/Local Governments.
	Information Services	☐			10%	13%	Statistically significant random sample survey of actual transportation trip-making.
ATT-01 Telecommunications		☐	☐		19%	21%	SCAG, SCAQMD, Partnership and Cluster action minutes; telecom. Product sales; deployment plans.
ATT-02 Advanced Shuttle Transit		☐	☐		17%	13%	SCAG, SCAQMD, Partnership and Cluster action minutes; adoption of design and safety requirements for support infrastructure and operations; deployment plans.
ATT-03 Zero-Emission Vehicles/Infrastructure		☐	☐		----	---	SCAG, SCAQMD, Partnership and Cluster action minutes; adoption of policies, resolutions, ordinances, building and safety codes, and streamlined permitting requirements for support infrastructure design. Fleet conversion to ZEVs; public charging infrastructure; deployment plans.
ATT-04 Alternative Fuel Vehicles/Infrastructure		☐	☐		----	---	SCAG, SCAQMD, Partnership and Cluster action minutes; adoption of streamlined permitting requirements for support infrastructure; AFV fleet conversion.
ATT-05 Intelligent Transportation Systems**		☐	☐		19%	16%	SCAG, SCAQMD, Partnership and Cluster action minutes; RTIP Expenditures.
FSS-02 Market Based Transportation Pricing					----	---	Further Study.

Based on the strategy contained in the 1994 Regional Mobility Element and included in the 1997 AQMP as part of the RME. Percentage contributions of each measure to the overall emission reductions are based on EMFAC 7F. These numbers will be updated using EMFAC 7G when the most recent version is provided to SCAG by the District.

** Emission reductions from both public sector and private sector actions to implement ITS technologies are identified under ATT-05 because it is impossible to separate analytically the benefits of the two ITS components separately. Public sector actions and commitments through the RTIP are identified under TCM01 and primarily supportive private sector activities are noted under ATT-05.

Enforceable Commitments

Measures in and implemented as part of an air plan must be enforceable, quantifiable, accountable and replicable. Because many of the transportation measures do not fit the traditional regulatory framework, appropriate market means of meeting the enforceability criteria are identified for the measures in the Plan.

In Table 2, the appropriate means of ensuring enforceability for each of the transportation strategy's measures is summarized: Public Funding, Private Funding, Public Approval or State Law. Public funding, such as the funds programmed through the Regional Transportation Improvement process, is the mechanism through which transportation infrastructure, projects and programs are funded. Private funding which contributes to the creation or acceleration of markets is also an important component in ensuring that implementation actions occur. This is exemplified by market means of enforceability embodied in Memoranda of Understanding such as those negotiated between the Air Resources Board and vehicle manufacturers to bring zero-emission vehicles and their equivalents to market provide a means of ensuring implementation actions. Although other technologies may necessitate refinements in institutional mechanisms to assess market predictability, the fundamental components already exist. Marketing studies such as those performed for rideshare programs by Chico State, surveys and other statistical data track market trends. In addition, the Southern California Economic Partnership has served as a valuable forum for private and public partners to assess market trends. Review or oversight panels such as the Mobile Source Review Committee have also served an important role in helping link market trends, funding and private and public sector expectations.

Public approvals like those which occur through the Public Utilities Commission and local agencies have long provided surety in the on-going operations of telecommunications firms, utilities and transportation franchises such as taxicabs. Deployment plans for other technologies could provide similar benchmarks to guarantee implementation occurs. Finally, state law like the zero emission vehicle mandate helps establish targets and assurances that implementation actions will take place. Further detail on specific enforceability mechanisms is provided in the discussion of the specific measures.

Each subsequent transportation plan and Regional Transportation Improvement Plan (RTIP) provide increased implementation definition for the region's transportation system. Thus, a further details and action plans for the implementation of the transportation strategy will be incorporated into the Regional Transportation Plan scheduled for adoption in June 1997.

Monitoring System

Federal law requires that funding priority be given to Transportation Control Measures in developing the transportation improvement program. The region's long-range transportation blueprint, Regional Transportation Plan (RTP), and the shorter-term programming needed to fund the improvements, the Regional Transportation Improvement Plan (RTIP) form the cornerstone for improving transportation. Assessing consistency of the emission reductions associated with the RTP/RTIP mobility based strategies--with the appropriate mobile source emission budget contained in the applicable SIP or submitted emissions budgets -- serves as the basis for determining reasonable further progress and timely implementation of this TCM. The RTP's and RTIP's federally funded projects and programs will be the basis for an enforceable commitment for this TCM. Therefore, the timely implementation of TCM-01 report will continue to serve as one of the methods of monitoring transportation improvement impacts on air quality. In addition, based on the methodology developed by Caltrans and currently in use by all rideshare agencies throughout the state, an annual survey to assess changes in travel behavior will be conducted.

Emission Reductions

An estimate of the percentage of emissions reduced by each of the measures contained in the transportation strategy are included in Table 3 for illustrative purposes. When crediting the emissions reductions associated with these measures in the AQMP, however, the emissions reductions are "bundled" with the RME to account for synergy between the measures and eliminates potential overlapping emissions.

TCM-01 TRANSPORTATION IMPROVEMENTS

This measure updates TCM-0 1 in the 1994 AQMP. TCM-01 includes three categories of transportation improvement: high occupancy vehicle improvements, transit/system management and information services. Not included in this measure are transportation projects and programs which are exclusively funded through local funds which are not included in the RTIP. The enforceable commitment for this measure is to fund and implement the first two years of the seven year Regional Transportation Implementation Plan (RTIP). The remaining five years of the RTIP delineates the expectations in project scope and design for the remaining period of the RTIP. Between the end of the RTIP and the year 2010, the Regional Transportation Plan (for this AQMP, the 1994 Regional Mobility Element) provides the foundation for the programs and projects expected to be in place by that date and for which funding was anticipated to be made available through the RTIP process. During this latter timeframe, although the specific mix of projects to be funded with RTIP dollars may ultimately change, the emission reductions anticipated

from these projects set a key benchmark in determining the transportation contribution to a mobile source emission budget and associated conformity.

High Occupancy Vehicle (HOV) Improvements

Capital improvements which reduce emissions include: HOV projects, and their pricing alternatives; and park and ride lots/intermodal facilities.

Transit/System Management

Managing the system as follows also improves both congestion and reduces emissions: bus, rail and shuttle transit improvements; bicycle and pedestrian facilities; Urban Freeway System Management improvements; Smart Corridors System Management programs; railroad consolidation programs such as the Alameda Corridor; Congestion Management Plan-based demand management strategies; county/corridor-wide vanpool programs; telecommunication facilities/satellite work centers; seed money for transportation management associations; and TDM demonstration programs/projects eligible for programming in the RTIP.

Information Services

By targeting individuals who travel to and from employment sites and other activity centers (e.g., airports, schools, shopping centers and special event centers) and providing them with information specifically tailored to facilitate use of alternate travel modes, vehicle travel and the associated emissions can be significantly reduced. Providing information services offers an innovative way of reducing vehicle emissions when combined with facility improvements, service enhancements, product development, extensive education, marketing, and promotion.

Potential actions to reduce congestion and emissions through individual efforts include: promoting multi-modal strategies to maximize all options available to commuters; targeting peak period trips for reduction; marketing and promoting the use of HOV lanes to the general public; marketing and promoting rail lines to the general public; educating the public regarding cost, locations, accessibility and services available at park and ride lots; promote and market vanpool formation and incentive programs; promoting ridematching through the Internet and other means of making alternative travel option information more accessible to the general public.

Enforceable Commitment

The first two years of constrained projects in the RTIP will be used as the enforceable commitment. As the biennial element of the RTIP is revised, the list of constrained

projects will be updated. The list of constrained projects will "roll forward" and the enforceable commitment will automatically be revised to encompass the first 2 years of the constrained projects contained in each new RTIP. In projecting the long-term (2005, 2010, 2020) impacts which could be ascribed to this measure in the Plan, however, the facilities proposed to be built in the long-term timeframe and programs as they exist today serve as the basis for modeling travel and emission impacts.

Advanced Transportation Technologies

Advanced transportation technologies hold great promise to both decrease congestion and improve air quality. Accelerating the deployment of the following five technologies are considered to offer the largest return on investment: telecommunications; smart shuttle transit; zero emission vehicles; alternative fuel vehicles; and intelligent transportation systems.

Southern California Economic Partnership

In 1994, the Southern California Association of Governments and the South Coast Air Quality Management District created the Southern California Economic Partnership (the Partnership.) As a non-profit organization, the Partnership was established with the specific mission of developing deployment plans for each of the technologies and accelerating the implementation of the advanced technologies throughout the region. Composed of both public and private sector partners, the Partnership provides an important forum for collaboration on technology deployment activities. Continued alliances between the private and public sectors will be necessary to fully implement the action plan for technology deployment.

The Partnership, through its public/private participatory structure is uniquely capable of providing networking and guidance to those parties interested in the deployment of advanced transportation technologies throughout Southern California. Stakeholder "cluster group" meetings on each technology are held on a regular basis, usually at the SCAG or AQMD offices, to discuss implementation barriers and assist in the deployment and marketing strategies. It has in effect become a clearinghouse of ATT information and progress.

To aid Southern California Cities and counties in ATT deployment, The Partnership has developed "Model City Starter Kits" for each of the technologies. These books provide goals and objectives, implementation worksheets, model policies, model resolutions, building codes, product/service technology updates, infrastructure suggestions and requirements, training and safety requirements, case studies, funding opportunities and an activity recognition program. The Partnership provides these comprehensive guidebooks free to each Southern California community and conducts workshops and

presentations to encourage participants to use ATTs. It also develops and distributes ATT newsletters and promotional materials to heighten awareness and garner unified understanding and support for the technologies from both the public and private sectors. Most of this information is also presented on The Partnership's Web Site which is continuously updated with deployment achievements throughout the region. Measures to be carried out by the Partnership are non-regulatory and thus do not have specific "adoption" dates but will be implemented through the AQMP planning period. Legislation may assist in implementing these measures, but it is too early to establish specific adoption dates.

Private sector actions center around technology development, identifying appropriate marketing conditions for technology product introduction and sales, and serving as active participants in the process of infrastructure deployment. In the 1994 Regional Mobility Element, a mix of both private and public actions and funding were assumed. In addition, target ranges of market penetration or estimated effectiveness were identified. At the lower end of the ranges, minimal public seed funding was assumed; at the higher end, more significant public resources were assumed to enhance the acceleration of introduction and implementation of these technologies.

The public sector's efforts are also intended to foster market conditions conducive to advanced technology deployment. Encouraging development of local support actions and participation in a voluntary Clean Cities Program are key focus areas. This program includes efforts to encourage local governments to: provide technologies/supporting facilities at local government facilities and employment sites; committing to an annual percentage of purchases and/or operating budget to deploy the technologies; provide incentives for businesses within a jurisdiction to use and/or implement the technologies; and adopt appropriate building code and permit requirements.

The five advanced transportation technologies are summarized below. While more specific descriptions of the measures are included in Section 3, refinement to the ATT component of the transportation strategy of the AQMP will occur through the 1997 and subsequent Regional Transportation Plans. Deployment plans which integrate efforts occurring and planned for implementation within the region are also in the process of being developed.

ATT-01 Telecommunications

This measure focuses on increasing the use of telecommunications products and services in the conduct of daily business, educational and personal activities to reduce trips for congestion relief and emission reductions. By the year 2010, enhanced use of telecommunications technologies can be expected to reduce home-to-work trips (or the non-work trip equivalents) by 6.8 percent from 1990 base year levels.

ATT-02 Smart Shuttle Transit

Smart shuttle transit is intended to introduce into the consumer market technology-enhanced "smart" vehicles oriented to shifting consumers from their automobiles to multi-passenger "smart shuttles" for purposes of commuting, shopping, recreation, and other trips. In combination with traditional transit, smart shuttle transit has a mode split goal of 10 percent of vehicle trips by the year 2015.

ATT-03 Zero Emission Vehicles

Zero emission vehicles are a critical component in reducing emission from on-road vehicles. Significant market penetration - 30 percent of new vehicle sales by the year 2010 - beyond the state law implemented by the Air Resources Board is targeted. No emission reductions are taken, however, in the AQMP beyond those committed to by the California Air Resources Board. Aggressive deployment of supporting infrastructure, incentives for vehicle manufacturers to accelerate introduction of such vehicles into the marketplace, and inducements for consumers to use these alternatives are the core action areas for this measure.

ATT-04 Alternative Fueled Vehicles

Enhanced market penetration - 34 percent of new vehicle sales by the year 2010 - is the goal for this measure. No emission reductions are taken, however, in the AQMP beyond those committed to by the California Air Resources Board. Actively facilitating the introduction of alternative fuel vehicles and the necessary refueling infrastructure is the key focus area.

ATT-05 Intelligent Transportation Systems

Advanced Traffic Management and Advanced Traveler Information Systems are designed to decrease congestion, reduce fuel use and emissions, improve travel time and safety, and support transit-user information and patronage. By the year 2010, the goal of this measure is to have 9 percent of vehicles in the South Coast Air Basin equipped with these technologies.

Enforceable Commitments

Public expenditures to help establish advanced technology market penetration are commitments identical to those which occur transportation improvements included in TCM-01. Private expenditures, as noted earlier, also provide commitments to further market expansion. In addition, development and implementation of deployment plans to develop, market and sell advanced technology products are strong commitments by both

private and public partners to bring a technology to market. Clusters (a grouping of partners with a similar interest in developing a product and creating a market for it) help foster and reinforce these commitments. Finally, public approvals and commitments such as Public Utilities Commission permits, Memoranda of Understanding and other agreements are designed to ensure that agreed upon actions occur.

FSS-02 Market-Based Transportation Pricing

Market-based transportation pricing has been advanced as a key area which has significant potential to improve both mobility and air quality. The Reduce Emissions And Congestion on Highways (REACH) Task Force was established to address implementation issues and develop an action plan to implement the most feasible and cost-effective market incentive programs to reduce both congestion and mobile source emissions. Jointly chaired by SCAG and SCAQMD representatives, the task force includes representatives of the California Air Resources Board, Southern California Economic Partnership and other organizations to constitute a broad cross section of the community and pertinent expertise.

This committee continues its work. The full text of the measure is contained in Appendix IV-A.

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SECTION 2
SUBSTITUTION AND DELEGATION[1]

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[1] Excerpted from the 1994 Air Quality Management Plan.

SUBSTITUTION

Substitution is defined as the implementation of actions by local governments and subregional organizations with legally binding commitments from agencies legally capable of undertaking actions to achieve specified emission reduction equivalents. Subregions/local governments would be able to use other methods and regulate sources other than those identified in the set of control measures for which substitution is offered, provided that the measure is not already included in the AQMP as a regional measure. Substitution offers a great deal of flexibility in that subregions/local governments would be allowed to design a program uniquely suited to their area.

DELEGATION

Delegation is defined as the implementation agency with legal authority to regulate the source category identified in a regional rule. The delegated agency would have two options: 1) administer the rule locally, "as is"; or 2) use other methods which reduce equivalent emissions for the specified source category.

Under this definition, delegation offers greater flexibility than had been allowed previously. Subregional organizations, local governments and other implementing agencies would have greater incentive to seek delegation under this definition because this option would allow individual plans to be developed that look very different from the control measure. The only restrictions would be that the plan must achieve the same level of emission reductions from the source specified in the control measure. Delegation is an important local option for those local jurisdictions and subregions that are not able or choose not to prepare an integrated subregional implementation program, but would like to have the option to seek delegation by preparing local implementation plans for specific sources.

In the 1994 Air Quality Management Plan, the substitution/delegation process focused on providing locally developed alternatives to regional indirect source rules. There is only one remaining regional indirect source rule, Rule 2202.

SECTION 3

ADVANCED TRANSPORTATION TECHNOLOGY MEASURES

ATT-1. TELECOMMUNICATIONS

SUMMARY

Telecommunications technologies represent one of the five advanced technologies to reduce congestion and mobile source emissions. Congestion and emission reductions occur through the elimination and/or redistribution of home-to-work and other vehicle trips.

DESCRIPTION

Telecommunications technology encompasses a number of sub technologies including: telecommuting, teleconferencing, teleservices, tele-education, telemedicine, teleshopping, telebanking, and other applications. All use electronics to move information and/or pictures that allow work or transactions to be done from home, from a neighborhood work center or other work location, reducing the number of vehicle trips to accomplish the same purpose.

Currently, basic telecommunication technologies or devices are commercially available. The barriers to market penetration are infrastructures permitting faster transmission (broadband/wireless/digital), concept acceptance (for telecommuting and other teleservices), and the cost of home office equipment. If

ENFORCEABLE COMMITMENT

SCAQMD, SCAG, and other public and private organizations have committed to help accelerate telecommunications market penetration throughout the region through public/private cooperation. The creation of the Southern California Economic Partnership is one of the venues through which this commitment is demonstrated. Actions have included the definition of industry standards, the development of prototype local policies, resolutions, codes, and permitting processes to facilitate infrastructure deployment, and an incentive program for local communities to become "Telecommunications Ready".

IMPLEMENTING AGENCIES

ROLE	AGENCY
SCAQMD	Financially support the Southern California Economic Partnership and develop legislative initiatives
SCAG	Financially support the Southern California Economic Partnership

	and develop legislative initiatives
EPA	Non-achievement determination of TCM RFP
THE PARTNERSHIP	Develop strategies to increase market penetration rates/implement programs to install support infrastructure
Local Governments	Develop local support actions via The Partnership (Clean Cities Program)* and other locally initiated programs

*   Potential actions for the Telecommunications Industry Cluster

CLEAN CITIES TELECOMMUTE/TELESERVICE (TC/S) ACTION MENU
Provide Telecommute/Teleservice facilities in Government Buildings and for City employees
Commit to an annual percentage of TC/S purchases for the City Operations
Commit to an annual percentage of Capital Budget TC/S Infrastructure
Utilize AB2766and other sources for TC/S and infrastructure purchases
Develop incentives for TC/S use, e.g. funding to Business owners who provide TC/s   facilities
Adopt the new TC/S infrastructure building code and permit requirements
Provide extra benefits for TC/S use in trip reduction programs

IMPLEMENTATION PROGRAMS

SCAG and The Southern California Economic Partnership (The Partnership) have been successful in the creation of a Telecommunications Cluster/Stakeholder Group to assist in the creation of a "Telecommunications Model City" program for cities and counties throughout the South Coast basin. Participants in this constantly evolving, primarily private sector, Cluster Group include:

- AT&T

- GTE

- Intel

- Earthlink Network

- Southern California Cable Association

- Pacific Telesis

- SpectaNet

- Nextel Communications

- Access Media

- Southern California Telecommuting Partnership

This Telecommunications Cluster, which meets on a bi-monthly basis has been vital in providing valuable insight and input into the outreach efforts of The Partnership regarding the accelerated deployment of telecommunications technology.

SCAG and The Partnership, working with the Cluster and supported by a grant from Caltrans, developed a Telecommunications Strategy which was approved by the SCAG Regional Council. SCAG, The Partnership, public and private organizations, and others will be carrying out this Strategy.

Meanwhile, many exciting telecommunications applications are taking shape throughout the region:

CityTel, the nation's first citywide telecom network, links 21 departments at 200 locations with 4,500 employees in the City of Long Beach. It offers both voice and data communications.

 MTA's Blue Line Televillage at the Compton Transit Center is a community center where computers and telecommunications provide South Central LA residents with telework support, medical information and services, education and training, and access to government information and transaction processing.

Los Angeles, San Bernardino and Riverside counties have used interactive video signal links since the 1980's in the arraignment of charged criminal defendants. The signal links the jail and the courthouse eliminating the need to transport prisoners.

California Community Colleges have been offering courses over public TV and local cable channels since the 1970's.

- **Cyber High** in Oxnard, CA is a private school that offers a four-year high school curriculum over the Internet.

- **Cal State Northridge has a distance learning program** offered via video telecommunication at its satellite campus in Ventura and at the Antelope Valley Telecenter.

- 50.2% of Californians have home computers, as do 53.2% of Orange County residents. This compares with a national average of 33%

- 83% of Orange County companies plan to use the Internet by the end of 1996, and 63% say they already had access in 1995. (UC Irvine Executive Survey)

TELECOMMUNICATIONS MARKET GROWTH INDICATORS

The use of telecommunications to conduct business, banking, education and purchases is beginning to become more common place and is expected to grow exponentially by the end of the decade, indicating great promise in meeting trip reduction goals. Here are some key statistics supporting the trend:

Distance Working - Home Office

- Over 40% of U.S. PC shipments were to the home in 1995. This increases to 60% in 2000 and 80% in 2010. (International Data Corporation)

- **46 million individuals operated home offices in 1995.** Nearly 13 million Americans operated full-time businesses from their homes, 14 million more had part-time home businesses, and 8 million telecommuted from home offices. As the demand for remote access rises, Dataquest expects increased demand for full-feature telephones and home computers equipped with a modem, and ISDN terminal adapter and fax capability.

- **There was a 46.5% growth in the modem market in 1995** (Dataquest)

- **Two million consumers will use cable modems by 1998.** Data-over-cable technology will break into mass markets beginning in 1996, carrying information at speeds hundreds of times faster than a 14.4 modem, and priced significantly more affordable than ISDN. 7% of Internet subscribers will go on-line via cable by the year 2000. (Forrester Research Group)

- **The current $400 million market for Intranet services, software and hardware will reach $8 billion by 1998,** according to industry analysts. Intranets are private computer networks within organizations and are used to connect employees and business partners to corporate information.

- **83% of companies are embracing alternative-officing strategies,** from "cave and commons" and "hoteling" to telecommuting and open-plan office designs. (Int'l Facility Management Assoc. 1995 Survey)

- 1.86 million California customers have second phones lines in their homes, up 11 percent from a year ago. 66,000 ISDN lines are hooked up in California, up 144% from a year ago, according to Pac Bell. Residential lines are up 3.1% to 10 million and business lines are up 5.4% to 5.8 million.

Distance Working - Videoconferencing

- 20,000 room-size video-conference systems and 90,000 personal video conferencing systems were sold in 1995.

- $168 million in desktop videoconferencing equipment sales is predicted in 1996, and nearly $15 billion by the year 2000. (Multimedia Research Group)

- In 1995 the telecom industry agreed on a standard that allows different maker's video conferencing systems to talk to each other, ending a standoff between market leader Picture Tel Corp. and semi-conductor giant Intel Corp., which had been pushing for its own standard.

Distance Banking

- Users of Microsoft's Money personal finance software can make direct connections over the Internet with their financial institutions. Visa Interactive and Intuit Inc. offer similar home banking via Internet services.

- Wells Fargo offers online banking to customers, who can view account balances and transaction detail anytime, day or night, by dialing up the Internet site http://www.wellsfargo.com.

- **New services, E*TRADE and e.Schwab, make possible online investing and trading.** Both provide direct access to the markets through a PC or phone and allow you to get quotes and place stock or options orders 24 hours a day, for a fraction of the cost of traditional brokers.

Distance Learning

- **3500 systems for distance education have been distributed** to corporate and educational facilities around the world by PictureTel Corp., the world leader in videoconferencing.

- **15% of U.S. companies use CD-ROMs as part of their training program,** eliminating the trip to a training seminar and reducing cost by 64%. (American Society for Training and Development Survey)

- **The FCC has proposed a rule to set aside a chunk of airwaves to provide schools, libraries and clinics with free Internet hookups.**

Distance Medicine

- 29% of the nation's rural hospitals currently use telemedicine services or plan to by the end of 1996.

- The Oklahoma Telemedine Network links 45 hospitals together and allows rural physicians to collaborate with experts across the state on patient diagnosis and treatment plans. An additional 20 hospitals are in the process of being connected to the network.

- The healthcare industry spent over $25 billion on computing and information technology in 1994, a figure expected to more than double by the year 2000.

- **Multimedia Medical Systems has developed a family of workstations to deliver "virtual" consultation rooms** for remote diagnosis and treatment, interactive distance learning for medical personnel, and physician/patient access to medical information databases. They have aligned with MCI.

   Distance Shopping

- 75% of Fortune 1000 companies are expecting to deliver online transactions via the Internet by 1997. (Forrester Research)

- **Visa/Microsoft and Mastercard/Netscape have agreed to cooperate on a common electronic-payment standard.** E-payment start-ups are already taking advantage of this standard. CyberCash and DigiCash are among the e-payment offerings. First Virtual Holdings is focusing on protecting credit card transactions in cyberspace and RSA Data Security is developing the encryption software that will make secure digital commerce possible.

- **Wells Fargo offers shopping at their "virtual mall",** where Net surfers can purchase a wide variety of products, from CDs to wine to golf equipment, using Cybercash. All the stores in the 'mall' utilize the latest encryption technology to ensure that purchases are secure.

MONITORING

Overall monitoring to track the implementation and effectiveness of this and the other ATT measures will occur at an aggregate level

INDICATOR	MONITORING TOOL
The Partnership	SCAG, SCAQMD, The Partnership Board action minutes
TELECOM Cluster	Cluster action minutes
Technology Indicators	Reports on technology announcements and demonstrations
Application	Reports and surveys on programs and demonstrations

Indicators	
Local Government	Policy adoption and property access
Private Sector	Private Operations and Infrastructure Deployment
Vehicle Trips	Employee reports and surveys of trips reductions
Product Sales	Reports and surveys and telecommunication product sales in the Basin

REFERENCES

1   South Coast Air Quality Management District, March 1994.

2   Project California Findings Market Assessment, 1992, California Council on Science and Technology. The job estimates include manufacturing, construction/installation, and servicing.

3   Telecommute estimates from SCAG staff while conducting analysis for the ATT Task Force via Technical Memo of March 1994. Emission reductions calculated by Battelle using inputs from SCAG and SCAQMD staffs as follows.

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ATT-2. SMART SHUTTLE TRANSIT

SUMMARY

Smart Shuttle Transit represents one of the five advanced technologies identified to achieve congestion and mobile source emission reductions. Emission reductions occur through the use of advanced technologies (e.g. computer-aided dispatching) to provide personalized transit service as a substitute for the single occupant automobile.

DESCRIPTION

Smart Shuttle Transit uses advanced transportation technologies to provide demand responsive service more tailored to the needs of individual riders for both work and non-work trips. Smart Shuttles will be the most effective and efficient when applied in either corridor or center-focused service. In corridors, Smart Shuttles provide service similar to jitneys, operating without fixed stops or a fixed route. Center-focused services provide enhanced access to employment centers, transit stations, shopping centers, schools, medical facilities, recreation locations, and other large traffic generators. (Airport shuttles are an example of center-focused service connecting multiple origins and a single destination.)

Implementation of Smart Shuttle services would enable local jurisdictions, sub-regional areas or special purpose/function centers the flexibility to design services that are goal specific and which are not subject to limitations of more traditional transit. The technologies that will allow this to be a functional and profitable business for operators include: telephones, computer aided dispatch and routing using GPS, computer assisted reservations, and use of debit cards, smart cards and other prepayment media. Data collected by the automated systems will allow detailed monitoring of shuttle use, including trips provided, ridership statistics by area and by time of day, average trip length, and types of fares paid.

ENFORCEABLE COMMITMENT

SCAQMD, SCAG and other public and private organizations have committed to help accelerate smart shuttle market penetration through public/private partnerships. The creation of the Southern California Economic Partnership is one of the venues through which this commitment is demonstrated . Actions have included the development of a memoranda of understanding among local jurisdictions, sub-regions and county transportation commissions to address legal, institutional, and legislative issues and actions necessary to develop and implement Smart Shuttle operations, the development

of prototype documentation for municipalities or other entities to give credit to developers, land owners or others who sponsor Smart Shuttle services, and an incentive program for local communities to become "Smart Shuttle Ready".

Long-term enforceable mechanisms may include: the adoption of financial incentives to improve the competitiveness of Smart Shuttle Transit; California Public Utility provisions; local government legal provisions

IMPLEMENTING AGENCIES

ROLE	AGENCY
SCAQMD	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
SCAG	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
EPA	Non-achievement determination of TCM RFP
CTCs	Program implementation, removal of regulatory barriers, coordination among operators
Public and Private Transit Operators	Program implementation, operation of service
THE PARTNERSHIP	Develop programs to identify and remove barriers and strategies to increase market penetration rates/implement programs to install support infrastructure
Local Governments	Develop local support actions via The Partnership (Clean Cities Program)* and other locally initiated programs

CLEAN CITIES SMART SHUTTLE (SST) ACTION MENU
Clean Cities Smart Shuttle Transit (SST) Action Menu
Provide SST deployment strategies
Provide SST services through Private Firm Contracts
Allow Business/Shopping/Special Event/Airport/transit Centers to utilize SST Services
Utilize AB2766, and other sources for SST Services
Develop incentives for SST use, e.g. Clean Transport Smart Debit Card, Consumer Rebates, funding to Business owners who provide SST
Adopt Cities with the new SST infrastructure building code and permit requirements
Provide extra benefits for SST use in carpool programs

IMPLEMENTATION PROGRAMS

During FY 95-96 SCAG, in cooperation with a host agency and consultants, has undertaken a number of studies and actions which are intended to provide and (where necessary) develop an information base for the regional application of smart shuttle programs. Smart shuttle implementation has been focused in six areas:

Feasibility Studies in follow up to the Urban Innovation Group Study (SCAG 1993), SCAG has funded several studies to asses the feasibility for the implementation of smart shuttles in various and regionally diverse activity centers. These studies specifically addressed operational and technological questions and issues and have identified, defined, and developed the analysis criteria to evaluate the potential locations and impacts for smart shuttle service in a given center.

Demonstration Projects

Based on SCAG's feasibility studies, the LACMTA is funding demonstration projects in four areas. Additionally, a demonstration is being developed in North Orange County.

These demonstrations test the entrepreneurial scenario which assumes private operation of the projects on a turn-key basis. This will determine whether smart shuttles can operate on a fully private for profit basis, provide employment opportunities, and/or reduce the amount of public subsidy required for existing public transportation services.

Marketing and the Marketplace

In support of the LA and Orange County demonstration, SCAG has funded a study to identify target markets and define marketing strategies to successfully support smart shuttle programs.

Developing a reliable and usable method for quantification

SCAG has funded a "supply-side" methodology study to calculate and project the number of vehicles, levels of service, and the estimated cost to provide smart shuttle services in a given activity or special use center in comparison to existing modes of public transit.

The regulatory environment

The implementation of smart shuttle services does not fit in the existing regulatory environment at the local and/or state level. Public vs. private operation, taxi vs. vanpool, fare vs. expense reimbursement, employee vs. volunteer, are all issues that need to be addressed to assure successful implementation.

Technology application

SCAG is preparing a Transit ITS demonstration project application to the FTA to integrate the newly available "next level" technologies (e.g. computer-aided dispatch, real time customer information and trip itinerary, etc.) into a fully bundled and functional system of technological support for transit operators.

The Southern California Economic Partnership (The Partnership) has been successful in the creation of a Smart Shuttle Cluster/Stakeholder Group to assist in the creation of a "Smart Shuttle Transit Model City" program for cities and counties throughout the South Coast basin. Participants in this constantly evolving, primarily private sector, Cluster Group include:

- Super Shuttle

- Prime Time Shuttle

- TRW

- L.D. King

- Smart Transportation, Inc.

- DKS Associates

- Foothill Transit

- Certified Transportation Services

- Dave Transportation Services

This Smart Shuttle Cluster, which meets on a bi-monthly basis, has been vital in providing valuable insight and input into the outreach efforts of The Partnership regarding the accelerated deployment of the Smart Shuttle concept and its supportive technologies.

SMART SHUTTLE DEPLOYMENT PLANS

Smart Shuttle demonstration programs funded by SCAG and other local government sources are currently taking place throughout the basin.

- Smart Shuttle demonstration projects are planned for three separate and distinct areas of Los Angeles.

  - ♦ **Area 1**, the Northeast Valley, includes the communities of Sylmar, San Fernando, Pacoima, Arleta, and Sun Valley. The estimated Smart Shuttle ridership here is 2,816 daily boardings compared to a potential single occupancy vehicle (SOV) trip market of 9,3455.

  - ♦ **Area 2**, South Central Los Angeles, covers the communities of Florence, Watts, Athens, and Willowbrook. Estimated ridership is 3,384 daily boardings compared to a potential SOV trip market of 4,705.

  - ♦ **Area 3**, the West Valley, includes he communities of Chatsworth, Northridge, Woodland Hills and Canoga Park. Estimated ridershhip in this area is 6,556 daily boardings out of a potential SOV trip market of 7,767.

On an annual basis, these Smart Shuttle projects are expected to provide service to approximately 4.2 million passengers. (.9MM, 1.1MM, and 2.2MM respectively per Area.)

- The City of Ontario's high-tech personalized public transit system, the ATHENA Project, is expected to begin operation early in 1997. Using GPS technologies and a complex database, ATHENA coordinates the routing and scheduling of all kinds of vehicles available to riders, from personal automobiles to existing vans and shuttles to regular big buses. Anyone wanting a ride accesses ATHENA via telephone, computer or kiosk. The system then does a search of all logged-in vehicles and matches up riders and drivers based on their destinations. Since drivers would be making the trip anyway, they can carry an additional person for a very low cost and the fare is considerably lower than a taxi. The primary objective of this project is to use technology to fill empty seats in private vehicles, thereby creating an efficient personalized public transit system.

- The North Orange County Smart Shuttle is a new shuttle service program in the Cities of Brea, Placentia and Yorba Linda providing door-t-door service and more route stops to major activity centers in the tri-city region. It is intended to complement toe Orange County Transportation Authority bus routes, providing more frequent stops. In addition, riders can request door-to-door transport service along the fixed route if reservations are made anywhere from two to 24

hours in advance. The service is 'smart" because it is a demand-responsive operation, so requests for service determine the routing and schedule.

MONITORING

INDICATOR	MONITORING TOOL
The Partnership	SCAG, SCAQMD, The Partnership Board action minutes
Smart Shuttle Cluster	Cluster action minutes
Technology Indicators	Reports on technology announcements and demonstrations
Local Government	1. Adoptions of design, safety and permitting requirement for support infrastructure 2. Smart Shuttle Operations
Passenger Trips	Data from operators and surveys

REFERENCES

1 Home-to-work vehicle trips estimates from SCAG consultant, Urban Innovations Group, conducting analysis for the ATT Task Force via Technical Memo, March 1994.

2 Vehicle trips, VMT, and emission reductions calculated by using inputs from SCAG regional transportation model and EMFAC 7F.

3 South Coast Air Quality Management District, March 1994.

ATT-3. ZERO-EMISSION VEHICLES

SUMMARY

The wide spread replacement of traditional fuel vehicles with zero-emission electric vehicles presents perhaps the greatest potential to reduce mobile source emissions within the Basin. The objective is both to facilitate the State mandate and accelerate their introduction beyond the mandate.

DESCRIPTION

Regional actions are aimed at facilitating the introduction of electric vehicles (EVs) and an electric charging infrastructure throughout the Basin. Cities and counties need policies, codes and permitting processes in place to support this new technology. Inspection standards need to be established. Proper safety and emergency response training courses need to be conducted. Municipal fleet managers need to be encouraged to make EV purchase commitments. The Southern California Economic Partnership has been given the mission to accelerate this entire process.

ENFORCEABLE COMMITMENT

To support the CARB mandate, SCAQMD, SCAG and other public and private interests have committed to help accelerate market penetration throughout the region through public/private cooperation. The creation of the Southern California Economic Partnership is one of the venues through which this commitment is demonstrated Actions have included the definition of industry standards, the development of prototype local policies, resolutions, codes, and permitting processes to facilitate infrastructure deployment, and an incentive program for local communities to become "EV Ready".

IMPLEMENTING AGENCIES

ROLE	AGENCY
SCAQMD	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
SCAG	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
EPA	Non-achievement determination of TCM RFP
CARB	Develop Regulations/Program implementation
CEC	Fuel program implementation/recharging power needs
THE PARTNERSHIP	Develop strategies to increase market penetration rates/implement programs to install support infrastructure
Local Governments	Develop local support actions via The Partnership (Clean Cities Program)* and other locally initiated programs

   * Potential actions for the Clean Cities Program could include:

CLEAN CITIES ZERO-EMISSIONS VEHICLE ACTION MENU
Provide the new ZEV charging facilities building code permit requirements
Require All New & Redevelopment be Wired for 220 Volt
Enable all service stations to provide ZEV Quick-Charge facilities
Utilize AB2766, and other sources for ZEV Services
Support state legislation to authorize cities to establish preferential ZEV on-street parking
Provide ZEV charging facilities and preferential parking for city employees
Commit to an annual percentage of ZEV purchases for the City Fleet
Install ZEV Fuel charging and metering units

IMPLEMENTATION PROGRAMS

The Mobile Source Review Committee's (MSRC) innovative two-part 'Quick Charge" Zero Emission Vehicle Program puts Southern California on the leading edge relative to the support and successful market introduction of electric vehicles in the United States. It's $6 million "EV Buydown" purchase incentive program will reduce the price of the first 1200 EVs sold in the region by $5,000. The $1,725,000 "Corridor Communities" funding program, matched by local funds, will make an important first step in the development of what will eventually be a seamless charging infrastructure.

The Southern California Economic Partnership (The Partnership) has been successful in the creation of an Electric Vehicle Cluster/Stakeholder Group to assist in the creation of an "EV Model City" program for cities and counties throughout the South Coast basin. Participants in this constantly evolving, primarily private sector, Cluster Group include:

- LADWP

- Southern California Edison

- Edison EV

- Ford Motor Company

- General Motors

- Honda

- Calstart

- Hughes

- Norvik Technology

- Aerovironment

- Fuel Solutions

- Battelle

- City of Newport Beach

- CARB

- California Energy Commission

This Electric Vehicle Cluster, which meets on a monthly basis, has been vital in providing valuable insight and input into the outreach efforts of The Partnership regarding the accelerated deployment of electric vehicle technology.

SCEcorp created Edison EV in 1996 as a non-regulated subsidiary to support and install public charging and meet the recharging needs of consumers and fleet buyers of EVs. It will be the premier provider of charging equipment, circuit installation, service and repair in California for EV charging systems.

The California Building Standards Commission made changes to the California Building Code allowing the installation of EV charging equipment on residential and commercial properties. The revised code gives building officials guidelines to oversee a safe installation of EV charging systems. The new code will go into effect in July, 1996.

Additionally, several exciting EV programs and projects have been undertaken within the region and are gaining positive notoriety:

City of Los Angeles Department of Water and Power

The City of Los Angeles DWP, in partnership with the city's Department of Transportation and the L.A. County Metropolitan Transportation Authority, has implemented an EV station car project using MSRC discretionary funds. The purpose of the project was to demonstrate that EVs could easily become an integral part of the daily commute mix and to establish the EV station car concept in the Los Angeles area.

Two Metrolink stations in the San Fernando Valley, the Chatsworth and Sylmar stations, were used for the project. EVs were made available to selected commuters willing to use the Metrolink rail system in their daily commutes to the downtown Los Angeles area. The commuters would drive the EVs to and from the Metrolink station each day and charge the vehicle as needed.

The project results quantified the reliability of EVs and identified commuter satisfaction with the vehicle. It also established two EV charging locations in the San Fernando Valley, which can be utilized and expanded in the years ahead. Many believe the station car concept will be an excellent use for EVs in the Los Angeles area.

City of Lancaster

The city of Lancaster has developed a multi-phased program, called the Electric Vehicle Model Community Project, which includes the implementation of EV infrastructure, EV training, development of model EV codes and ordinances and an EV public awareness communications campaign.

The infrastructure component consists of six EV charging station sites located throughout the city. Locations include the Lancaster Metrolink Station, Lancaster City Hall, Lancaster City Yard, Antelope Valley Schools Transportation Agency, The Factory Outlet Center and Valley Central Shopping Center. Four of the six sites are available to the public.

The City also established a Designated Training Center in City Hall. Southern California Edison will host training coursed and special technical classes will be held for Emergency Service Personnel addressing police, fire and emergency response issues. Classes for EV users will be held on a regular basis and open to the public on a space available basis.

City of Azusa

The City of Azusa Light and Water Department has installed a solar powered electric vehicle recharging station into the Department's administrative facility using a

combination of MSRC discretionary funds and city funds. The chargeport represents the first application on a new construction project of photovoltaic arrays specifically designed for an EV charging station in California. The chargeport was constructed at approximately $10 per watt, substantially lower than previous $13-$19 per watt installation costs for the state.

City of Palm Desert

An electric bus service has been inaugurated by the City of Palm Desert, and the SunLine Transit Agency. The "Shopper Hopper" connects various Palm Desert shopping districts, and is powered by lead-acid batteries.

Graham & James Law Firm

The Los Angeles office of Graham & James, an international law firm, has initiated a pilot program to test the practical viability of electric vehicles for commuting to downtown Los Angeles. The firm entered into a venture with its landlord and the City of Los Angeles Department of Water & Power to purchase two EVs, which were then test driven by partners and employees for their daily commute. Six EV charging stations were installed in the parking garage of the building to enable workers to conveniently recharge the vehicles during the day. More than 30 persons have participated in the program to date and the feedback is excellent. This unique program is an excellent example of what can be accomplished when the public and private sectors work together.

ELECTRIC VEHICLE MARKET GROWTH INDICATORS

Within the last two years there have been exciting advancements in electric vehicle technology and real world deployment. Future advancements in battery technology will pave the way for significant market penetration of electric vehicles by all major auto manufacturers.

Electric Vehicles

- **GM will become the first major automaker to market EVs to the public when its new EV1 goes on sale in late summer 1996** at Saturn dealers in Los Angeles, San Diego, Phoenix and Tucson. The two-seat EV1 has a driving range of 70-90 miles per charge, a top speed of 80 mph and an estimated MSRP of $33,000.

- **GM will also market an electric Chevy S-Series pick-up truck nationwide in 1997** for use in commercial fleets. Powered by a lead-acid battery pack, the truck will have an effective range of 40-60 miles with a top speed of 70 mph.

- **Toyota announced plans to market approximately 320 electric-powered RAV4 sports utility vehicles to fleet buyers beginning in 1998**. Using an advanced nickel-metal hydride battery pack, the RAV4-EV will post speeds up to 79 MPH and has a range of 120 miles per charge.

- **Honda aims to introduce an EV at California dealerships in the Spring of 1997**. The two-seat EV is powered by nickel-metal hydride batteries and has a range of 125 miles, accelerates from 0 to 60 in 18.7 seconds and a top speed of more than 80 mph.

- **Chrysler will market the EPIC, an electric-powered version of the current Dodge Caravan and Plymouth Voyager minivans, beginning in 1998**. Chrysler expects the enhanced lead-acid battery pack to be good for a 60-mile range with a top speed of 80 mph. From 1993-1995, Chrysler sold 56 electric-powered TEVans.

- **Ford plans to begin selling an electric-powered Ranger pickup this summer**. With an advanced lead-acid battery pack, the electric Rangers will be priced in the mid-$20,000 range. Additionally, electric utilities around the world are continuing to rest a fleet of 103 Ecostars, electric-powered versions of Ford's European Escort.

- **Nissan committed to putting 20 EVs equipped with lithium-ion batteries in a demonstration fleet in 1998**. Much of current development is focused on the FEV-II concept car and lithium-ion battery being developed with Sony Corp.

- **BAT offers an electric sedan and electric Ford Ranger truck**. The sedan boasts a 55-90 mile range per charge, a top speed of 85 mph and a sticker price of $19,900. The truck also has a 55-90 mile range, a top speed of 80 mph, and a MSRP of $25,900.

- **U.S. Electricar is selling an Electricar Pickup 2-seater** with a range of 50-70 miles between charges and an acceleration of 0-50 in 17 seconds.

- Massachusetts-based **Solectria is pursuing a dual game plan: EV conversions now and a ground-up car in 1998**. Currently, the company offers converted GM pickups and sedans, and is developing the new "Sunrise" that will have greater range and cost far less than the conversions offered now. **Solectria has more than 180 converted EVs in service**, making them the U.S. leader in EVs.

- **The Solectria Sunrise holds the EV range record, cruising 238 miles** in a distance race and 175 miles in urban driving last summer. The Sunrise, a full-size 4-door sedan using newly-developed nickel-metal hydride batteries, will be available in 1998. Target price for the Sunrise is $20,000.

- **Sharper Image has begun offering the Zap electric bicycle**. The Zap ElectriCruiser can do 15mph, and regenerative charging allows battery replenishment during downhill cruising or with the bike mounted on a stand for stationary exercise.

- **2,369 electric vehicles are registered in the U.S. today**, according to the Electric Vehicle Association of the Americas.

- **817 electric vehicles are on the road in California today**, according to the California Energy Commission.

- **There were 200 patents for EV components awarded in 1995 alone**, whereas, before 1990, only one had been awarded.

  ## Infrastructure Deployment

- **Automakers have announced plans to standardize the way in which EVs are recharged**. Chrysler, Ford, Toyota, Honda, Mazda and Nissan have all agreed to adopt common conductive AC recharging capabilities, so that as the public recharging infrastructure develops, all vehicles from the six automakers will be compatible with the recharging stations. GM is developing its own inductive recharging technology.

- **Saft has set up the "world's 1st plant to produce EV batteries in volume" in Bordeaux, France**. The big customers for the company's nickel cadmium batteries are French automakers PSA and Renault for the Citroen AX, and Peugeot 106, and Renault's Clio and Express EVs. The $20 million plant will be able to produce batteries for 5,000 vehicles/year.

- **By 2000, EV batteries will provide more than 250 miles between charging**, according to the best technical estimates.

- **EVs will cost the same to buy and operate as gasoline vehicles by 2003**, even without federal tax credits, predicts the Department of Energy's Office of Transportation Technology. Past that, lifecycle costs are lower for EVs.

- Southern California Edison and the Los Angeles Department of Water and Power have announced **new off-peak rates for charging electric vehicles**, meaning that, mile for mile, EV charging will cost less than ¼ the cost of filling up at the gas station – the equivalent of 33 cents per gallon.

- **There are 900 EV recharging stations in U.S.**, with 642 of them located in California.

- The Mobile Source Review Committee's (MSRC) two-part "Quick Charge" Zero Emission Vehicle Program has devoted $7.7 million to create the beginnings of a seamless charging infrastrcuture.

- **EV Purchase/Battery Technology Incentives**

- **The DOE will allocate $2 million to purchase and demonstrate approximately 100 EVs in the federal fleet during fiscal year 1996**. DOE, along with the Department of Defense, has made a commitment to assist the EV Market Launch Program by placing as many as 2,500 EVs in the federal fleet.

- Though CARB modified the mandate that auto manufacturers start selling EVs in 1998, **10% of vehicles offered for sale in California in 2003 are still mandated to be zero-emission vehicles**. And the new MOU agreements call for a rollout of as many as 5,000 EVs in 1996-97, and 14,000 per year for 1998, 1999,2000, 2001 and 2002.

- **$6 million has been set aside by the MSRC for the advancement of EVs with the Quick Charge Program**. The program offers consumers a $5,000 "buy-down" on the price of EVs.

- **The state of Virginia is requiring LEVs in some fleets**. In areas classified as having a "serious" smog problem, the Air Pollution Control Board has mandated that in the model year 1998, 30% of vehicles bought by owners of 10 vehicles or more must be low- or non-polluting cars and trucks. In model year 1999, half the purchases must be clean-fuel vehicles, and in 2000 and beyond, 70% of purchases must be clean-fueled.

- The United States Advanced Battery Consortium awarded $27.4 million to 3M and partners to develop a lithium polymer battery for a 300-mile EV. They intend to show that lithium polymer batteries will someday make electric vehicles go as far on a charge as gasoline cars go on a fill-up.

MONITORING

INDICATOR	MONITORING TOOL
The Partnership	SCAG, SCAQMD and The Partnership Board action minutes
Telecom Cluster	Cluster Meeting action minutes
Technology Indicators	Reports on technology announcements and demonstrations
Local Government	1. Adoptions of policies, resolutions, ordinances, building codes, safety and streamlined permitting requirements for support infrastructure 2. Participation in Building Code and Emergency Response Training Programs 3. Public Charging Infrastructure Installations 4. Fleet conversion to EVs
Infrastructure Deployment	Reports on Infrastructure home, convenience and fast charge installations in the Basin
Vehicle Sales	Reports and surveys and ZEV product sales in the Basin

Quarterly/annual vehicle sales figures from auto dealers and manufacturers (OEMs)

REFERENCES

1 SCAG Advanced Transportation Technology Task Force Zero-Emissions Vehicle Technical Memo, March 1994. Prepared by Battelle for the Task Force using Project California analysis.

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ATT-4. ALTERNATIVE FUEL VEHICLES

SUMMARY

The wide spread replacement of gasoline and diesel fuel vehicles with low-emission vehicles (LEVs) and ultra-low-emission vehicles (ULEVs) presents a great opportunity to reduce mobile source emissions within the Basin. Although all alternative fuels are supported, a significant component underlying this advanced transportation technology is natural gas due to its wide-spread availability within the region and the support of manufacturers. The District and SCAG have a fuel neutral policy and is pursuing all forms of alternative fuels.

DESCRIPTION

Using alternative transportation fuels makes sense for a multitude of reasons, particularly as applied to light, medium and heavy duty vehicles.

Regional actions are aimed at facilitating the introduction of alternative fuel vehicles and a refueling infrastructure throughout the Basin. Cities need policies, codes and permitting processes in place to support this new technology. Siting, design and inspection standards need to be established. Proper safety and emergency response training courses need to be conducted. Municipal fleet managers need to be encouraged to make alternative fuel vehicle purchase commitments. The Southern California Economic Partnership has been given the mission to accelerate this entire process.

ENFORCEABLE COMMITMENT

SCAQMD and SCAG have committed to help accelerate market penetration throughout the region through public/private cooperation. The creation of the Southern California Economic Partnership is one of the venues through which this commitment is demonstrated. Actions have included the definition of industry standards, the development of prototype local policies, resolutions, codes, and permitting processes to facilitate infrastructure deployment, and an incentive program for local communities to become "Alternative Fuel Vehicle Ready".

IMPLEMENTING AGENCIES

ROLE	AGENCY
SCAQMD	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
SCAG	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
EPA	Non-achievement determination of TCM RFP
CARB	Refine Regulations/Program implementation
CEC	Fuel program implementation and non-achievement action items
THE PARTNERSHIP	Develop strategies to increase market penetration rates/implement programs to install support infrastructure
Local Governments	Develop local support actions via The Partnership (Clean Cities Program)* and other locally initiated programs

*   Potential actions for the Clean Cities Program could include:

CLEAN CITIES AFV ACTION MENU
Provide AFV facilities and preferential parking for city employees
Commit to an annual percentage of AFV purchases for the City Fleet
Assist in the installation of AFV Fuel Stations at local Service Stations
Utilize AB2766and other sources for AFV Services
Develop incentives for AFV use, e.g. rebates, funding to Service Station owners who provide AFV refueling facilities
Adopt the new AFV refueling facilities building code permit requirements
Provide extra benefits for AFV use in carpools
Require all service stations to provide AFV facilities

IMPLEMENTATION PROGRAMS

The Southern California Economic Partnership (The Partnership) has been successful in the creation of a Alternative Fuel Cluster/Stakeholder Group to assist in the creation of an "Alternative Fuel Vehicle Model City" program for cities and counties throughout the South Coast basin. Participants in this constantly evolving, primarily private sector, Cluster Group include:

- Southern California Gas Company

- Ford Motor Company

- General Motors

- Honda

- Sunline Transit

- ARCO

- Shell Oil

- City of Long Beach

- Batelle

- Valley Detroit Diesel

This Alternative Fuel Vehicle Cluster, which meets on a monthly basis, has been vital in providing valuable insight and input into the outreach efforts of The Partnership regarding the accelerated deployment of natural gas vehicle technology.

The Partnership has worked closely with the Southern California Gas Company to initiate many NGV and other alternative fuel projects throughout the region. Here are a few of the larger programs:

City of Newport Beach

The City of Newport Beach is initiating a new alternative fuels program that will serve as a model for jurisdictions in the South Coast Air Basin as a catalyst for fleet conversion in the Southern California region.

The project features the creation of a state-of-the-art multi-clean-fuel station (compressed natural gas, methanol, EV charging) which will become the "Service Station of the Future". The station will be located at the junction of three major regional transportation routes and within one of the primary employment and tourism centers within Orange County.

The City will also convert a portion of the city fleet to run on compresses natural gas (CNG), with a commitment to convert additional vehicles to alternative furl in the near-term. Together with Sunset Property Services, the City plans to add 15 medium-duty AFVs through engine repowering or replacement and the purchase of new OEM equipment. In addition, a number of fleet owners have committed to use the proposed station, including Waste Management, Inc. and Super Shuttle.

City of Fountain Valley and the County Sanitation Districts of Orange County (CSDOC)

The City of Fountain Valley and the CDSOC have created a significant public private partnership to promote the development, demonstration and commercialization of innovative clean fuel technologies for use in heavy-duty trucking applications. The City

and CSDOC will make this demonstration possible through the installation of a CNG fueling station at its Fountain Valley facility.

Ten trucks hauling bio-solids from CSDOC to destination in Kern County, Imperial County and Yuma, Arizona each day will be up-fitted with dual-fuel engines and participate in the program. The potential exists for other trucks under contract with the CSDOC to be converted to CNG over time. The availability of this public access station in Fountain Valley will provide a fueling location for public and private fleets in the area that are considering alternative fuel vehicle programs. EV charging is now under consideration.

City of Santa Monica

The City of Santa Monica has been aggressively pursuing an alternative fuels program since 1993. The City Council directed the city to develop a policy whereby nearly 100% of the city's fleet vehicles would be categorized as low emission by the end of the decade.

The City has committed to convert all its medium and heavy duty vehicles and the majority of its light duty vehicles to run on CNG. Some 25 light duty vehicles, belonging to various departments including Police and Fire, were fueled by CNG at the end of 1995. Plans are currently being developed to convert the 130 buses of the Santa Monica Bus Line to CNG. In addition, the city fleet maintains 11 LPG and 5 electric vehicles. The alternative fueling infrastructure includes a CNG public access fueling facility owned by the Southern California Gas Company.

Sunline Transit Agency

The SunLine Transit Agency, serving the Coachella Valley region, implemented a model alternative fuels program by replacing their deteriorating diesel fleet of transit buses with 40 new buses fueled by CNG. Assisting SunLine by installing a state-of-the-art, 24-hour-public-access SNG fueling station was the Southern California Gas Company. SunLine was the first transit company in the United States to replace its entire fleet at one time with 100 percent alternative fuel vehicles.

Additionally, SunLine earns 25% credit for each therm (1.18 therm = 1 gasoline gallon equivalent) of CNG sold. Their goal is to reduce fuel costs to zero, so the more fuel they sell, the closer they come to meeting their goal. Local city fleets, which have converted and/or acquired NGVs, utilize the SunLine facility, along with private fleets.

The Southern California Gas Company has reported that monthly CNG throughput doubled between 1994 and 1995 and is expected to double again in 1996. There will be over 100 CNG fueling stations in operation within the region by the end of 1996.

ALTERNATIVE FUEL VEHICLE MARKET GROWTH INDICATORS

Alternative Fuel Vehicles

- **Five U.S. manufacturers are expected to offer dedicated natural gas-powered medium- and heavy-duty trucks for model year 1996**. They include Volvo, GM, Freightliner, the affiliates Kenworth and Peterbilt, and possibly Navistar.

- **Ford began selling a CNG version of its Contour sedan in March of 1996**, offering a smaller, more economical alternative to its dedicated-CNG Crown Victoria. Ford also offers a bi-fueled F-Series pickup truck and E-Series Econoline vans and flex-fuel Taurus sedans. The company's overall goal is to turn out 10,000 alternative fuel vehicles (AFVs) in 1996.

- **Honda will offer a dedicated CNG Civic Sedan** 4-door by late 1997.

- There are about **1 million NGVs worldwide**, with 488,000 in Europe (mostly in Italy and Russia), 346,000 in South America, and just over 50,000 in the Pacific Rim and Asia.

- **Ford has vowed to operate 10% of its own domestic motor pool (some 4000 vehicles) on alternative fuels in 1996**, increasing to 30% in 1998.

- **Brooklyn Union, the New York City utility, plans to convert its entire fleet of 1,000 vehicles to natural gas by 1997**. Brooklyn Union already operates 700 NGVs and a dozen CNG fueling stations.

- **There is heavy NGV activity in the Washington D.C. metropolitan area**, where more than 1400 NGVs are being operated as part of more than 80 public and private fleets. Also, the District of Columbia's government is converting 200 D.C.-owned vehicles to operate on natural gas or replacing them with new NGVs. And Supershuttle, the nation's largest provider of airport ground transportation, will soon begin operating more than 40 Chrysler natural gas vans to serve Washington National and Dulles International airports.

- **The New Jersey Natural Gas Co. will provide CNG refueling access for 50 NGVs operated by the U.S. Postal Service**, which has been pursuing the use of alternative fuels in accordance with the Clean Air Act Amendments of 1990. New Jersey Natural Gas also plans to convert its entire fleet of 400 vehicles to natural gas by the year 2000.

- **Infrastructure Deployment**

- There are currently **100+ natural gas fueling stations in Southern California**, 40+ of which have 24-hour public access.

- **600,000 gallons of natural gas was sold in Southern California in February 1996**, up from 200,000 gallons in February of 1995, a 200% increase! 1 million gallons per month are expected to be sold by the end of 1996.

- **There are more than 1,100 NGV fueling stations in America**, with 3 to 5 new ones opening every week.

  ### Legislative Support

- **A new federal rule requires alternative fuel providers, including state and municipal fleets, to convert their vehicles to alternative fuels beginning in September of 1996**. Fuel providers must start by converting 30% of their fleets to alternative fuels, while state and municipal fleets must convert 10% of their vehicles. By 2000, 90% of fuel providers fleets must run on alternative fuels, and 75% of state/municipal fleets must be AFVs by 2001.

- **Georgia has adopted a Clean Fuel Fleet Initiative** which requires fleets of 10 or more vehicles to buy clean fuel vehicles beginning in model year 1998. For vehicles 8,500 pounds and under, 30% must be CFVs in 1998, and for heavier vehicles, 50% must be clean-fueled in 1998.

  ### Market Incentives

- **Ford is offering rebate incentives for 1996**, $1,000 on NGV pickups and flex-fuel Taurus sedans, and $2,500 on dedicated CNG Crown Victorias. Ford is also expanding its network of dealers handling NGVs from Texas and California to Colorado, Florida, Georgia, Indiana, Michigan, Pennsylvania and Wisconsin.

- **A $1000 rebate is being offered by New Jersey's Public Service Electric & Gas** for every NGV placed in service. The Port Authority of New York and New Jersey was the first to take advantage of the rebate on 4 NGVs. The PSE&G rebate is available through August 1997.

- The **Texas Alternative Fuels Council announced that it has $50 million to lend at low interest rates for alternative fuel vehicle purchases**, conversions and fueling infrastructure projects.

MONITORING

INDICATOR	MONITORING TOOL
The Partnership	SCAG, SCAQMD and The Partnership Board action minutes
AFV Cluster	Cluster Meeting action minutes
Technology Indicators	Reports on technology announcements and demonstrations
Local Government	1. Adoptions of design, safety and permitting requirement for support infrastructure 2. AFV Fleet conversions
Infrastructure Deployment	Reports on Infrastructure installations in the Basin
Vehicle Sales	Quarterly/annual vehicle sales reports in the Basin

REFERENCES

1   South Coast Air Quality Management District, March 1994.

2   SCAG Advanced Transportation Technology Task Force Zero-Emissions Vehicle Technical Memo, March 1994. Prepared by Battelle for the Task Force using Project California analysis.

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ATT-5. INTELLIGENT TRANSPORTATION SYSTEMS

SUMMARY

California has long recognized the potential of applying advanced electronic, computer and communications technologies to transportation systems to address the significant mobility, environmental and economic challenges in the state and the rest of the nation.

By putting intelligence in vehicles and building it into the transportation infrastructure, these efforts will not only make resident and visitor travel and commercial transportation faster and more efficient but also reduce emissions.

DESCRIPTION

Information is power. Information is the "intelligence" in Intelligent Transportation Systems. Its collection, assembly, interpretation and rapid dissemination is what empowers users to make intelligent, time-saving, cost-saving, as well as life-saving decisions regarding transportation and travel. If the user of the information is a public authority, it is used to implement tactical transportation management techniques to assist travelers in ways which are often transparent. This **active** ITS application is known as a **Transportation Management System.** If the information is provided to travelers (in one of a multitude of ways), it can be interpreted by users to make their own "real time" travel decisions. These **passive** ITS applications are known as **Traveler Information Services.**

Transportation Management Systems

In order to "manage" traffic congestion it must be "seen" and that information must be transmitted to a traffic operation center for input in making management decisions to correct it. Various traffic surveillance/traffic detection technologies are either in place or in development to accomplish this data collection task:

- Pavement - Based Traffic Detectors

- "Inductive Loops" embedded in highways. These are considered "intrusive" due to the fact that their installation and maintenance require lane closures which can cause congestion.

  #### Non-Intrusive Traffic Detectors

- Mounted acoustic, infrared, or microwave devises which sense movement

- Mounted optical devises which can provide video images

- Airborne services - helicopters

- Mobile spotters - individuals on cellular phones

Once this data is collected and interpreted, traffic control centers can have various high tech systems at their disposal to actively eliminate or reduce the congestion:

- **Traffic Signal Control Systems** - real-time ability to change timings as needed and coordinate them across road systems to enable motorists to drive through high-volume traffic areas with minimal slowing and stopping

- **Freeway Management Systems -** real-time ability to control ramp metering and to present traffic advisories and/or routing direction with computerized message boards

- **Incident Management Systems** - ability to dispatch police, emergency medical services and tow trucks to the scene within moments

- **Transit Management Systems -** ability to re-route public vehicles/fleet vehicles equipped with vehicle location technologies to improve travel time, service reliability and cost effectiveness. Ability to provide true routing information and advise travelers of actual arrival and departure times

Pro-active data-collection/management systems designed to reduce congestion include:

- **Electronic Fare Payment Systems** - ability to speed up fare payment through the use of stored-value magnetic stripe fare cards

- **Electronic Toll Collection Systems** - ability to greatly improve toll lane throughput via sale and detection of electronic toll tags

The state of the art in transportation management will be the **Integrated Transportation Management Center.** These centers will not only operate freeways, highways, arterial streets, and traffic signal systems but also integrate staff and facilities to assist police, fire, rescue and transit services. The ITS technology that can produce these results is available today off the shelf.

Traveler Information Services

Traveler Information Services will give travelers access to traffic, transit and other services via an incredible assortment of communications vehicles including:

- Hand-held computers with two-way communications capabilities

- In-vehicle navigation route guidance devices

- Network TV/Cable TV

- Radio stations

- Kiosks in visitor centers, bus/rail/airport locations and other public areas

- Interactive TV

- Computer Internet

With the information available, a traveler will be able to:

- arrange pre-trip travel with "real-time" transit/traffic information

- modify plans on route due to travel advisories

- get specific directions to any location via a map guidance system

- receive parking information, including park & ride transit and car pool

- access electronic yellow pages for lodging and dining information

- access information on local events and activities

Public demand for real-time information is expected to grow rapidly over the next decade as it proves its ability to improve transportation effectiveness and safety.

Intelligent Transportation will be optimized when information from "all modes and all roads" are integrated into a "system of systems" which crosses all city, county, regional, state and national boundaries and provides seamless travel information to consumers. To accomplish this there must be standard data collection and data dissemination interfaces in place to ensure compatibility. The US Department of Transportation in cooperation with ITS America has recently developed an ITS standards development process addressing everything from communications message sets and protocols to standards for in-vehicle and traveler information systems. This will allow for future expansion and extensive private sector product and service opportunities. In the meantime, many test programs are in progress across the country.

In Southern California, the ITS Strategic Deployment Plan for the Corridor, including the Showcase Project, are developing concepts and standards/protocols for intercommunication between two or more public and private organizations and maintain quality control.

Regional actions are aimed at facilitating the introduction of Intelligent Transportation Systems (ITS) throughout the Basin. Cities need policies, codes and permitting processes in place to support this new technology. The Southern California Economic Partnership has been given the mission to accelerate this entire process.

ENFORCEABLE COMMITMENT

SCAQMD and SCAG have committed to help accelerate market penetration throughout the region through public/private cooperation. The creation of the Southern California Economic Partnership is one of the venues through which this commitment is demonstrated Actions have included the definition of industry standards, the development of prototype local policies, resolutions, codes, and permitting processes to facilitate infrastructure deployment, and an incentive program for local communities to become "ITS Ready".

IMPLEMENTING AGENCIES

ROLE	AGENCY
SCAQMD	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
SCAG	Support the Southern California Economic Partnership and other public and private efforts. Develop legislative initiatives
EPA	Non-achievement determination of TCM RFP
CALTRANS	Program Implementation
CTCs	Program Implementation
THE PARTNERSHIP	Develop strategies to increase market penetration rates/implement programs to install support infrastructure
Local Governments	Develop local support actions via The Partnership (Clean Cities Program)* and other locally initiated programs

* Potential actions for the Clean Cities Program could include:

CLEAN CITIES ITS ACTION MENU
Deploy ITS products at earliest possible date
Commit to an annual percentage of Capital Budget ITS infrastructure
Commit to an annual percentage of ITS Product purchases for the City Fleet
Assist in the Distribution and Installation of ITS In-Vehicle Products
Utilize AB2766and other sources for ITS Vehicle Products and Infrastructure purchases
Clean Cities ITS Action Menu (cont.)
Develop incentives for ITS use, e.g. rebates, funding to Auto Dealers who install

ITS Products
Provide extra benefits for ITS use in carpools
Require all Transportation equipment to utilize devices that recognize Credit/Debit/Smart Cards

IMPLEMENTATION PROGRAMS

The Southern California Economic Partnership (The Partnership) has been successful in the creation of an ITS/Smart Travel Cluster/Stakeholder Group to assist in the creation of an "ITS Model City" program for cities and counties throughout the South Coast basin. Participants in this constantly evolving, primarily private sector, Cluster Group include:

- Rockwell

- Hughes

- Automobile Club of Southern California

- Batelle

- JHK & Associates

- TRW SIG

- Lockheed Martin

- Allied Signal

- Metro Dynamics

- Bechtel Corporation

- ETAK,Inc.

- L.D. King

- Project California

- Seiko Communications

- TRW Transportaion Services

- Jet Propulsion Laboratory

- Delco Electronics

- Maxwell Labs

- Toyota Motor Corp.

This ITS/Smart Travel Cluster, which meets on a bi-monthly basis, has been vital in providing valuable insight and input into the outreach efforts of The Partnership regarding the accelerated deployment of ITS technology.

ITS DEPLOYMENT IN SOUTHERN CALIFORNIA

Through an aggressive California Advanced Transportation System (ATS) program, Intelligent Transportation Systems (ITS) are being researched, planned, built and tested for deployment to address today's transportation needs and those of the 21st Century.

Traffic Management Systems

- **Southern California Showcase/ITS Priority Corridor.** This corridor is one of four identified under the Intermodal Surface Transportation Efficiency Act (ISTEA) that will move beyond ITS limited tests and activities into a more comprehensive planning, showcasing and deployment of ITS. The corridor spans from Ventura County through Los Angeles, Orange, Riverside and San Bernardino Counties ending in San Diego County at the US/Mexican international border. The project is overseen by a Steering Committee representing a diverse variety of governmental organizations.

- The vision of the project is to demonstrate the feasibility and desirability of integrating all "modes and roads into a "system of systems" . The Rockwell/NET team is currently working on the scoping and design phase which will result in a national architecture-compatible, fully open system design that will define the path for full system integration of freeway, arterial, bus, rail, emergency, sea/air, port and commercial vehicle operations within the corridor. Structured system interfaces will be fully defined to allow for future expansion and extensive private sector product and service opportunities.

- **Showcase Kernel.** A system kernel is being prototyped over the next year to begin implementing the open systems profile while providing the core elements for initial deployments. This kernel will be expanded into four key regions of the Corridor to accelerate both the regional system integration and the dissemination of Showcase information out to the general user. As each regional set of systems integrate into the kernel using the open systems profile,

a fully distributed architecture will be implemented that will maintain each system's desired independence while allowing interoperability between users of the Showcase "system of systems".

- **IMAJINE.** The Intermodal and Jurisdictional Integrated Network Environment project will integrate freeway and arterial street operations in the South East Los Angeles County along with the Los Angeles County Metropolitan Transit Authority transit operations. This project will include the synchronization of local and state signals, the adjustment of signal coordination to allow transit vehicles through with minimal delay, and the synchronization of paratransit arrivals with the arrival/departure of the fixed transit vehicle.

- **Integrated Modal Shift Management System.** A traveler information system that will provide Los Angeles and Ventura counties real-time, accurate, and consistent access to transportation related information. This information will include various mode options such as public and private bus schedules, rail, paratransit, highway and arterial congestion, incidents, and closures.

- **Spread Spectrum Radio Traffic Interconnect - Los Angeles.** This project is testing the use of spread spectrum radio as a traffic signal communications device and has a targeted end date of June 1996.

- **Electronic Toll Express Lanes on 91 Freeway - Orange/Riverside Counties.** This pioneering, $126 million, privately-financed, four-lane tollway running down the former median of the Riverside 91 Freeway between Anaheim and Corona opened in December, 1995. The developer and operator, California Private Transportation Company (CPTC) is currently testing a five-tier value pricing strategy (tolls range from $.25 - $2.50) aimed at keeping traffic moving smoothly even in rush-hour conditions. Rates applicable at any given time are calculated and adjusted at the operations center and displayed on one of a pair of electronic variable message signs (VMS) located ahead of each automatic tollzone. Relevant sums are deducted from commuter's pre-paid accounts.

- **California Advanced Testbed - Orange County.** The testbed is a cooperative research, implementation and evaluation project for development and operation of an integrated multi-jurisdictional, multi-modal transportation management system. It is based on real-time computer-assisted traffic, communications and control technologies. Opened in February 1996.

- **Mobile Surveillance - Orange County.** Project testing portable detection and surveillance of highway construction, special events and incident locations. Targeted end date is December 1996.

- **Integrated Ramp Metering/Advance Signal Control - Irvine.** This project is managing traffic flow between I-5 and I-405 and parallel arterial streets. The targeted end date is June 1996.

- **"Scoot" Adaptive Traffic Control System - Anaheim.** This project is evaluating the effectiveness of SCOOT as an adaptive signal timing control package. The targeted end date is June 1996.

- **Transit Probe.** An early deployment vehicle location project using Global Positioning System technology to support both advanced transit operations and traffic management systems within Orange County, Calif. The system will be integrated into fixed-route buses along routes in the cities of Anaheim and Santa Ana and will process probe information into traffic measures of effectiveness to be integrated into the Advanced Transportation Management Centers operated by Caltrans, and the cities of Santa Ana and Anaheim.

- Exhaust fumes have been reduced by 26%, fuel consumption by 13% and traffic-light stops by 8 million with systems that automate and monitor traffic flow at intersections on some roads in Los Angeles.

- **"Athena" - Personalized Public Transit System - Ontario This** program will provide door-to-door service to the public-at-large in the Ontario Airport region. The system will include advanced communications, automatic vehicle location, in-vehicle displays, smart cards and readers, and automated, demand-responsive dispatching to match up rider and driver destinations offering the benefits of a taxi/carpool. Total budget is $2.3 million.

- **Advanced Traffic Management System/Advanced Traveler Information System (ATMS/ATIS) Architecture Prototype Center.** Rockwell Transportation Systems has developed an ATMS/ATIS traffic operations center architecture prototype center at its Anaheim, Calif., facility. The center includes an integrated control center database, graphical user interface, and an interface structure that will allow data transfer between Advanced Traveler Information Systems, Advanced Public Transit System, Commercial Vehicle Operations, and Advanced Traveler Management Systems.

Traveler Information Systems

- **Southern California Smart Traveler.** Smart Traveler is a project consisting of out-of-vehicle information services to provide transit route, fare, schedule information, freeway traffic conditions and carpool matches on ridesharing. Currently it is limited to a 1-800-COMMUTE number telephone system (traveler advisory) deployed throughout Southern California in cooperation with

local and regional agencies. The project is ongoing and the budget is about $2 million per year.

- **Smart Corridor - Santa Monica Freeway - Los Angeles.** The objective of this project is to provide congestion relief, reduce accidents and reduce fuel consumption on the I-10 between downtown LA and the 405 Freeway. Highway Advisory Radio, Changeable Message Signs and Kiosks will all be used to deliver information to motorists. This project should be fully operational by June 1997. Total budget is about $47 million.

- **Travel TIP - Orange County.** A county-wide traveler information system in Orange County that collects congestion and incident information from four advanced transportation management centers and over 20 signal systems and bundles it with real-time transit data, special event, weather, yellow pages, and road closure/construction information. Travelers and agencies will be able to access this information through a variety of sources including kiosks, telephone and radio advisories, cable TV and dial-in computer interfaces.

- **City of Santa Ana Integrated Traveler Information Sharing System (ITIS) Design.** The design includes a public information data base management system that will be able to interface with the Santa Ana Advanced Transportation Management System (ATMS), and the Caltrans Traffic Management Center (TMC). The system will collect information, such as highway and arterial congestion status from the ATMS and TMC and special advisory information regarding road closures, weather conditions and accidents. The information will be disseminated throughout Santa Ana via several communications vehicles, including an interactive kiosk located at the new Ronald Reagan Courthouse, a telephone advisory system, the public access cable television channel, and an advisory radio system. This system ultimately will interface with the Orange County-wide traveler information system, TravelTIP, also being designed by Rockwell. The interaction between the two systems will enable Santa Ana residents to receive congestion information, transit information, and special event data throughout the county.

- **Up-to-the-minute traffic information is available on the Caltrans Web site**, with links to real-time maps of the Los Angeles and San Diego freeway systems and to lists of construction closures. Users can find out at the click of a mouse where traffic is moving along and where progress is stalled. Similar sites have also been developed by the Seattle and Houston Departments of Transportation.

ITS NATIONAL DEPLOYMENT EXAMPLES

Traffic Management Systems

- **Intermodal Transportation Management and Information System.**
  Expands the San Diego Management Center from its current single mode
  architecture to a standardized intermodal architecture. This center will include
  the first deployment of the Showcase kernel and provide the initial integration
  of the early start projects into a "system of systems".

- **Transit Management and Information System.** Will develop a transit
  management center at San Diego's Metropolitan Transit Development Board
  that will provide real-time information to transit planners and dispatchers
  enabling them to improve transit efficiency, ridership, and passenger safety. In
  addition, the real-time transit information will be integrated with the regional
  intermodal transportation management center, which includes both Caltrans and
  California Highway Patrol operations.

- **Computer Aided Dispatch Integration.** CAD will implement a
  communication link between three San Diego County law enforcement
  agencies' CAD systems, which will improve communication capability of these
  CAD systems by allowing the free exchange of information to improve
  emergency response time and management.

- **Jack Murphy Stadium ATIS/ATMS.** A system that will be deployed around
  Jack Murphy Stadium, a major event generator, to assist both the stadium
  operations as well as coordinate traffic operations with the City of San Diego.
  This project will develop a Stadium-based management center that will control
  several key field elements including changeable message signs, signal
  controllers, and highway advisory radios.

- **A$140 million traffic-control system based on fiber optics in Atlanta** will
  employ cameras, electronic signs and synchronized traffic lights to guide
  commuters through the metropolitan area.

- **Maryland, in August of 1995, became the 1st state to cover its entire
  network of major roadways with a full-time traffic-management system**.
  The Chesapeake Highway Advisories Route Traffic (CHART) includes video
  displays of traffic taken by closed circuit cameras, traffic detectors mounted on
  signs and bridges that transmit the average speed of vehicles, and sensors
  embedded along highways to convey weather and road conditions. Information
  is transmitted to the traffic management center, where officials issue real-time
  warnings over traveler-advisory radio.

- San Antonio, Texas' **TransGuide system monitors traffic conditions, controls traffic signals and allows rapid response to accidents and emergencies**. The Texas DOT "smart highway" project uses a sensor system installed in 26 miles of highway to feed data to a high speed computer network for analysis.

- **Houston transportation center Transtar** tracks city buses, controls stop lights, changes message boards, opens carpool lanes, and dispatches wreckers to clear disabled vehicles.

Traveler Information Systems

- **The Traveler Information Showcase will begin providing traffic news on hand-held computers, in-vehicle navigation units**, cable television, the Internet, interactive kiosks, and on interactive hotel TV sets. The 4-month federal project will begin in Atlanta in June of 1996.

- **Personal Travel Guide, a hand-held travel information solution, will be tested as part of the Atlanta Traveler Information Showcase**. Travelers will be able to ask for and receive life traffic reports, send and receive 2-way messages, find addresses and turn-by-turn directions to any location, as well as information on alternate means of transportation and flight timetables.

- The Seattle Wide-area Information for Travelers (SWIFT) provides real-time transit and highway information to the public via wrist watch, car radio, or small computer.

- **Boston's SmarTraveler is a popular traffic advisory for motorists with cell phones**. Usage soared after commuters were given a one-digit code to make free calls to SmarTraveler.

- **75% of The Genesis Project participants in Minneapolis based their trip routes on Genesis advisories**. The project provides traffic updates via pagers and personal digital assistants.

- **Transcal program will provide motorists traveling along a corridor from San Francisco to Lake Tahoe with weather, traffic and construction updates**. The program will be launched in 1996**.**

- **There were 65,000 hits on Sacramento Smart Traveler WWW site in the first two months online**. The program provides consumers with information on an array of transportation modes in the region.

ITS TECHNOLOGY ADVANCEMENTS

Traffic Management Systems

- **FHWA expects delivery this year on VideoTrac, an advanced traffic-surveillance system designed to control traffic signals** by monitoring vehicles nearing an intersection and deciding either to extend the existing green light or change it in favor of a longer line of waiting vehicles. It will also alert drivers to traffic conditions and redirect traffic around incidents. Deploying the system is expected to increase traffic capacity on existing roads and decrease the need for new highway construction.

- The **nation's 1st commercially available weigh-station bypass service, PrePass, will expand to Arizona**, building on an existing network in California and New Mexico. PrePass uses automatic-vehicle-identification technologies, weigh-in-motion sensors and vehicle-to-roadside communication transponders to electronically weigh and verify the identity of trucks as they approach weigh stations. This means carriers soon will be able to travel throughout the southwestern U.S. on I-10 and I-40 without the time consuming delays of traditional weigh station stops.

Traveler Information Systems

- **The first in-dash vehicle navigation system in U.S.** was introduced by Acura in May of 1996. The system comprises a 6-inch touch screen, GPS receiver and electrogyro and delivers voice instructions. Software contains maps of streets, highways, and freeways in metropolitan areas, as well as information about and directions to destinations including hospitals, restaurants, and ATMs.

- **A car featuring the latest safety, security, and communications technologies has been introduced** by Delco Electronics. The SSC concept vehicle includes the Forewarn collision warning system, occupant sensing, intrusion sensors, mayday emergency communication, navigation systems and vehicle-to-roadside communication that displays information about approaching road conditions and traffic signs, among other features.

- **63% of adult travelers are willing to pay for travel information**, and 55-72% of long-distance recreational travelers are willing to pay $1-$5, according to a survey by Urban Engineers, Inc.

- **71-86% of local automobile travelers rank pre-trip and en-route weather, construction, traffic, and alternate route information as somewhat or very important** in the same survey by Urban Engineers, Inc.

- **30% of all new vehicles will be equipped with turn-by-turn navigation systems** by the year 2000, predicts auto industry experts. Most are expected to use Global Positioning Systems (GPS) which will bring the vehicle within a few yards of its destination.

- **Geotek Communications and SmartRoute Systems are developing enhanced traveler information services** that will provide Geotek's mobile users with route-specific traffic conditions, turn-by-turn street directions, actual airline arrival and departure times, and dynamic route guidance, among other services, beginning this month. Geotek estimates the current market for its services will be more than 2 million small and medium sized businesses operating 27 million vehicles nationwide.

- **MobileWeb will turn a car into rolling Web site**, providing potential applications from checking local traffic conditions on the drive home to tracking a fleet of delivery trucks. MobileWeb is a controller/server that connects with existing electronics in the car. Software allows the device to connect with a vehicle's liquid crystal dashboard display, which will display Internet information.

- **Forewarn system uses microwave sensors to detect objects close behind or to the side of a vehicle**, eradicating the driver's blind spot. Developed by Delco Electronics, the system was introduced in November of 1995 for use on heavy-duty trucks.

- **Cadillac offers a satellite and cellular phone system that can call for help** immediately after a car crash – and can be used by drivers to order flowers, get directions or find the nearest ATM or seafood restaurant. The OnStar system will be available on 1997 Sevilles, Eldorados and Devilles.

- **New RESCU navigation system boasts a 13.4% installation rate**. 900 of the 6,032 Lincoln Continentals built in the two months since the option's introduction have been equipped with RESCU. The system combines a cellular phone and GPS satellite unit to allow the driver to summon emergency or roadside assistance by pressing a button on the overhead console. The vehicle's precise location is transmitted to a response center in Texas where an operator can talk to the driver via phone or can contact the nearest police agency or service center to aid the driver.

- **Sony Corp.'s "personal digital assistant"** is a hand-held computer that uses a radio data link with a central computer to display street maps.

- **Mercedes offers Intelligent Cruise Control**, which automatically slows the vehicle down if it comes too close to other cars, as an option.

- **U.S. motorists will buy 250,000 electronic navigators per year by 2001**, according to projections floated at the Houston ITS conference.

- **25 million navigators will be on the road by 2005**, a prediction based on focus groups conducted by New Jersey's Navigation Technologies.

MONITORING

INDICATOR	MONITORING TOOL
The Partnership	SCAG, SCAQMD, The Partnership Board action minutes
ITS Cluster	Cluster action minutes
Technology Indicators	Reports on technology announcements and demonstrations • Transportation Management Systems • Transportation Information Systems
CTC/CALTRANS	RTIP Expenditures
Local Government	Regional Transportation Plans Infrastructure Deployment Expenditures
Private Sector	Private Operations

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2 South Coast Air Quality Management District, March 1994.
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