California Clean Air Act
Transportation Requirements Guidance

Air Resources Board
Office of Strategic Planning
Transportation Strategies Group

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Acknowledgments

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## APPENDICES

A. California Clean Air Act Sections Related to Transportation  
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PREFACE

In June 1989, ARB staff invited representatives from state and regional transportation agencies and air pollution control districts to an intensive, two-day meeting to discuss the problems associated with addressing the transportation requirements of the California Clean Air Act and to gain recommendations for guidance organization and content.

The ARB took these recommendations and developed a first draft of the guidance. This document was discussed at a public workshop held in December 1989 at which time staff recorded public comments on the draft. There were roughly 50 attendees to this meeting representing various state and local transportation agencies, councils of governments, air pollution control districts, and private organizations.

The draft document was mailed to air pollution control districts, regional transportation planning agencies, transit providers, and interested individuals and organizations. ARB staff made presentations of this document upon request to several groups. In particular, staff spoke with the California Air Pollution Control Officers Association's Planning Managers Group and with the Transportation and Air Quality Review Group (TARG). ARB staff has maintained close coordination with staff of the California Department of Transportation.

ARB has received extensive written comments on the draft guidance which have been helpful in strengthening and clarifying the guidance. ARB has attempted to address and incorporate the concerns in the final guidance. We believe that the final document presented here is a fair interpretation of the Act, calling for aggressive actions, yet, providing local areas with flexibility to design their own unique programs. We believe that this guidance sets a solid foundation for the 1991 planning effort.
EXECUTIVE SUMMARY

The California Clean Air Act (the Act) requires that air quality plans be prepared for areas of the state that have not met state air quality standards for ozone, carbon monoxide, nitrogen dioxide, and sulfur dioxide. The plans are due in July 1991. Areas which can meet standards by 1994 are classified as moderate, those that attain between 1994 and 1997 are classified serious, and those that cannot attain until after 1997 are classified severe areas. The plans must include a wide range of control measures which, for most areas, include transportation control measures. In addition, performance standards are established by the Act for transportation measures. These standards are more stringent for areas that require more time to reach clean air.

In order to implement the transportation-related provisions of the Act, air pollution control districts have been granted explicit authority to adopt and implement transportation controls. This guidance offers the Air Resources Board's interpretations and expectations regarding how the Act's requirements can be met in the 1991 plans. It is provided to assist in the preparation of plans that meet the requirements of the Act, and to inform involved agencies and the public of the Act's requirements. Each chapter of the guidance focuses on specific requirements. The following summarizes these sections:

Chapter 2. Reasonably Available Transportation Control Measures

Reasonably available transportation control measures are required to be included in the 1991 plans to the extent necessary to attain or maintain standards. The guidance suggests criteria for determining if the plan contains all reasonably available measures. This guidance identifies an initial list of measures that appear to be reasonably available for urbanized nonattainment areas:

Regulatory Measures

1) Employer based trip reduction rules
2) Trip reduction rules for other sources that attract vehicle trips
3) Management of parking supply and pricing

Transportation System Improvements

1) High occupancy vehicle system plans and implementation programs
2) Comprehensive transit improvement programs for bus and rail
3) Land development policies for motor vehicle trip reduction
4) Development policies to strengthen on-site transit access for new and existing land developments
Regulatory measures can be implemented by air pollution control districts, as well as cities and counties through rules or ordinances. Transportation system improvements are implemented by transportation planning agencies and transportation providers. A role is suggested for cities and counties to incorporate air quality criteria into their land use and circulation policies and implementing actions.

Chapter 3. Indirect Source Control Programs

Indirect sources of air pollution include employment sites, shopping centers, schools, housing developments, etc., which generate pollution by attracting motor vehicle trips. The Act requires that air quality plans include provisions to develop programs for controlling emissions from these sources. The districts can work with cities and counties to implement this provision.

Chapter 4. Performance Standards and Emission Reduction Targets

Plans for serious areas must significantly reduce the rate of growth of vehicle trips. Plans for severe areas must achieve 1.5 vehicle occupancy during peak commute hours and achieve no increase in vehicle emissions beyond 1999. Air districts are allowed to set emission reduction targets and delegate responsibility for transportation measure development to other regional agencies. Setting emission reduction targets and achieving the performance standards will require the cooperation and commitment of air quality and transportation agencies.

Chapter 5. Control Measure Definition and Analysis

This section sets forth the information that is needed to prepare an analysis of control measures.

Chapter 6. Monitoring and Reporting Mechanisms

Ongoing monitoring is critical to determining the effectiveness of the plan as a whole, as well as measures, individually. Guidance on establishing baselines of vehicle activity and means to measure progress is provided.

Chapter 7. Integration of Transportation and Air Quality Plans

Integration of air quality and transportation planning will be necessary to achieve the performance standards and clean air goals set forth in the Act. Chapter 7 suggests ways for districts and transportation planning agencies to integrate air and transportation planning.
Chapter 8. Public Education and Public Involvement

Public support is essential and education efforts are required by the Act. Public education programs can be designed to inform the public the air quality consequences of their actions and the results that changes in travel behavior can bring.

Appendices

Attached to this guidance document are four appendices. The first provides the specific sections of the California Clean Air Act related to transportation control measures. The second is a review of roles and responsibilities of participating agencies. The third is an issue paper which suggests a modified approach to developing a strategy to control transportation-related emissions. A short bibliography is also provided.
1. INTRODUCTION

Although state controls on vehicles and the use of clean alternative fuels will provide cleaner cars and trucks, California cannot solve its air pollution problems if the growth in vehicle use and congestion experienced in the '70s and '80s continue into the 21st century. Vehicles continue to produce more than half of California's urban air pollution. Air pollution and traffic congestion are of concern to a majority of people who live and work in California's urban areas. These combined issues are in the news on a regular basis. In recognition of those facts, the legislature included substantial requirements related to transportation in the California Clean Air Act (Act), which became effective in 1989.

The purpose of this guidance is to inform affected parties about the requirements of the Act and, to the extent possible, provide the Air Resources Board's (ARB) interpretation and guidance on how to implement the Act's requirements with regard to transportation. This guidance sets forth recommendations, suggestions and expectations of how to address these requirements and achieve the goals of the Act -- clean air for all Californians. The guidance addresses the transportation and indirect source control measures that must be part of air quality plans the Act requires by mid-1991.

The guidance is advisory in nature. It is not a regulation. Agencies preparing plans that wish to deviate significantly from the suggestions or interpretations should discuss these alternative approaches with ARB staff to ensure that they meet the requirements of the Act. For a more general discussion of the Act, the reader is referred to the Air Resources Board's Clean Air Act Guidance #1, "Answers to Commonly Asked Questions About the California Clean Air Act's Attainment Planning," August 1989.

Implementing the transportation provisions of the California Clean Air Act will require the active involvement of air districts, Caltrans and other agencies involved in providing transportation services, and local cities and counties. Transportation and air quality planning will have to be fully coordinated to achieve the challenging requirements of the California Clean Air Act.

Overview of Transportation Provisions

Air quality plans are to be based upon:

"...a cost-effective strategy to achieve attainment of the state (air quality) standards by the earliest practicable date." (Health & Safety Code (H&SC) Section 40913 (b)).

The transportation provisions in the act are required to the extent needed to meet this directive. The following is an overview of the transportation provisions that are addressed in this guidance.
Plans for MODERATE areas must show attainment by no later than December 31, 1994 and include (H&SC 40918(a)(3)):

- Reasonably available transportation control measures
- Provision to develop an indirect source control program
- Public education programs to promote actions to reduce emissions from transportation and areawide sources
- Schedule for implementing transportation control measures
- Identification and agreements from implementing agencies
- Monitoring and compliance procedures

Plans for SERIOUS areas must show attainment by no later than December 31, 1997 and include:

- All of the above plus transportation control measures to substantially reduce passenger vehicle trips and miles traveled per trip

Plans for SEVERE areas are not expected to show attainment until after 1997 despite aggressive programs and must include:

- All of the above plus transportation control measures to achieve an average, during weekday commute hours, of 1.5 or more persons per passenger vehicle by 1999
- No net increase in vehicle emissions after 1997

Air pollution control districts have been provided with clear authority to adopt, implement, and enforce transportation control measures (H&SC Sections 40716-17). The air pollution control districts may establish emission reductions targets for transportation sources and delegate the preparation of transportation control plans to councils of governments or other regional agencies (H&SC Section 40717(b)-(f)).

HEAVY-DUTY TRUCK TRAFFIC GUIDELINES - The Air Resources Board with Caltrans and the California Highway Patrol is to establish a task force to develop guidelines for traffic measures affecting heavy-duty trucks prior to district adoption of truck controls (H&SC Section 40717.5 South Coast AQMD exempt).

The chapters in this guidance document address these requirements in detail.
2. REASONABLY AVAILABLE TRANSPORTATION CONTROL MEASURES

Introduction

At the heart of the California Clean Air Act's transportation provisions is the requirement that nonattainment areas adopt and implement reasonably available transportation control measures. These requirements appear in several sections of the Act, all in the Health and Safety Code. Section 40717(a) states:

"A district shall adopt, implement, and enforce transportation control measures for the attainment of state or federal ambient air quality standards..."

and Section 40918(a) requires that districts that cannot attain state standards by 1994:

"...shall, to the extent necessary to meet the requirements of... Section 40913 include the following in measures in its attainment plan:...

...(3) Reasonably available transportation control measures."

Finally, the Act clarified the authority of districts related to transportation control measures. Section 40716 states:

"...a district may adopt and implement regulations to...

...(2) Encourage or require the use of ridesharing, vanpooling, flexible work hours, or other measures which reduce the number or length of vehicle trips."

As can be seen from the language of the Act, districts have been provided with clear legislative direction to include reasonably available transportation controls in nonattainment plans and authority to adopt and implement these measures.

However, the Act does not provide specific guidance on what particular measures are "reasonably available," how complete the measures included in the 1991 plans must be, how small urban areas and rural areas should be treated, and many other issues of practical concern to those who must prepare air quality plans by June 1991. This chapter addresses these issues.
What are transportation control measures?

The Act, in Section 40717(g) defines transportation control measures to mean:

"...any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions."

Clearly, this definition includes a great many measures to influence travel habits. In order to organize how transportation control measures (TCMs) are addressed in the 1991 plans, it is recommended that districts, and other agencies involved in the transportation aspects of the plans, separate measures into two broad categories: regulatory measures and transportation system measures.

**Regulatory Measures**

This category includes measures that can be implemented through district regulations or local government ordinances, which are used to regulate traffic volumes or flow or to affect individual travel choices. Examples of these types of measures include:

- Employer based trip reduction rules
- Parking management ordinances
- Restrictions on vehicle operations (for example no drive days or restrictions on trucks during peak hours)

These types of measures clearly fall within the authority of air districts, as well as the existing authority of cities and counties. Implementation responsibility falls directly on businesses and individuals. The public sector's cost of implementing these measures is relatively low, although enforcement and monitoring could involve substantial effort.

**Transportation System Measures**

The second category of transportation control measures (TCMs) are measures that would be implemented by transportation providers (local government, transit districts, Department of Transportation (Caltrans), bridge authorities, etc.) to influence travel behavior to reduce vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion. The TCMs in this category should be designed to support the measures in the first category by providing greater incentives for alternative travel mode options. This second category can be divided into short term and long term transportation system measures. Examples of short term measures include:

- Institution of HOV individual bypass ramps or lanes
- Improved transit services
- Tolls on bridges
These measures cannot easily be mandated by regulation and are probably outside of the direct jurisdiction of air districts. When these are implemented as part of longer term systemwide improvements, they can have substantial beneficial air quality impacts.

The long term transportation system improvements are regional in orientation and include measures or changes in the transportation system 5, 10 and 20 years into the future. While portions of these measures, i.e., links in the HOV system may be built in a current year, the completion of the total system may take 10 or more years. Examples include:

- Construction of a regional HOV system
- Fixed rail transit systems
- Increased bus fleet
- Long range land development policies that support reductions in vehicle trips

These measures must be accomplished in the context of a regionwide transportation plan and local general plans. They have relatively long lead times and may require substantial funding commitments by local voters, state agencies, the legislature and/or federal agencies. Obtaining full commitments to these measures are normally beyond the authority of air districts, and often can not be accomplished alone by any single unit of local or regional government.

What TCMs are reasonably available?

The Act does not define what measures are reasonably available or how decisions on "reasonableness" are to be made. The districts, in partnership with local government, county transportation commissions, regional transportation agencies and state agencies such as Caltrans and the California Transportation Commission, have the primary responsibility to determine what measures are reasonable and to ensure that those so deemed are included in the district's air plan. The ARB also must play an important role in the determination of what is reasonable. As part of its oversight responsibility under the Act, the ARB must:

"...review the rules and regulations and programs submitted by the districts...to determine whether they are sufficiently effective to achieve and maintain state air quality standards." (Health and Safety Code (H&SC) Section 41500 (b)).

Thus, prior to approving district plans, the ARB must concur with the districts' decisions regarding which TCMs are reasonably available and necessary for attainment, or must find the plan deficient and seek changes through a conflict resolution process.

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How will the ARB determine if all reasonably available TCMs have been included in an attainment plan?

ARB's determination of whether a district's plan contains sufficient TCMs will be based on answers to several questions:

- Does the plan contain all measures determined to be reasonable in the plans of other areas with similar air quality problems and comparable transportation situations?

- Has the process used by the district to determine the measures to be included in the plan made sound and defensible decisions?

- Are the transportation measures in the plan, when combined with other controls, sufficient to achieve the required triennial emission reduction (5% yearly reduction) and to attain standards by the earliest practicable date?

- Are the transportation measures in the plan sufficient to meet other requirements of the Act, including:
  - For serious and severe areas - Do the TCMs substantially reduce the rate of increase in passenger vehicle trips and trip length?
  - For severe areas - Do the TCMs achieve an average vehicle occupancy of 1.5 by 1999 during commute hours and achieve (when combined with other measures to reduce vehicle emissions) no net increase in vehicle emissions after 1997?
  - In any area that does not project attainment of the state standards, or which cannot achieve the 5% annual rate of reduction - do the TCMs in the plan include all feasible measures?

If the answers to all of the questions specified above are satisfactory, the plan would be judged to meet the requirements of the Act. Where the plan fails to answer a question affirmatively, ARB must be able to determine the reason and find that the question is not suitable or applicable to the area. This assessment allows for unique, locally developed parameters for "reasonableness" within the context of meeting the specific requirements in the Act.

For example, one or more reasonably available TCMs could be excluded from a plan if the adoption of the measure would not result in earlier attainment and the measure is not necessary to achieve the required triennial emission reduction (i.e., the 5% requirement). It may be possible for a locality to adopt a transportation strategy different from other areas with similar conditions provided air quality standards are expected to be achieved expeditiously and that performance standards are met along the way.
What measures are sufficiently defined today so that they can be judged to be reasonably available?

A great number of TCMs have been used in California, at least to manage traffic. However, few of these measures have been employed primarily as air pollution control regulations. In addition, for most measures, additional definition of the specific form the measure should take is needed.

Despite these limitations, current information and common sense suggest that a number of measures can be quickly developed and implemented in most urban areas and that several are critical to achieving a mode shift from single passenger autos to alternative modes of travel. Reasonably available transportation control measures fall into the same two categories mentioned earlier in the text: regulatory measures and transportation system improvements. With this in mind, the following reasonably available transportation control measures are suggested.

**Regulatory Measures**

1. **Employer based trip reduction rules.**

   These rules, which incorporate a variety of TCMs, specifically target reductions in the home-work commute trip. Reasonable components of such a rule include (but are not limited to):

   - Ridesharing and vanpool programs
   - Employer-subsidized transit tickets/passes
   - Flexible daily work schedules (to accommodate ridesharing and transit use)
   - Flexible work week scheduling (e.g. 4/10/40 or 9/9/80 schedules) to reduce number of trips
   - Telecommuting and teleconferencing programs
   - Employer based parking management to promote ridesharing and discourage single occupant vehicle use.

2. **Trip reduction rules for other sources that attract vehicle trips.**

   This measure includes trip management of the student populations of educational facilities, patrons to shopping facilities, airports, arenas, or other sites. The employees of such facilities would also be included.

3. **Management of parking supply and pricing.**

   This TCM is embedded in 1 and 2 above but could also be pursued individually. Research has shown parking management and pricing is critical to the ongoing success of trip reduction rules. Decisions related to parking supply are often made by agencies not related to employment sites. Because of this and because the supply and cost of parking is such a strong determinant in commute travel decisions, it is included as a separate TCM category.
Transportation System Measures

1. Regional high occupancy vehicle system plans and implementation programs.

The effectiveness of high occupancy vehicle (HOV) lanes is greatly increased when they are included in a total system. Research has shown that HOV lanes provide powerful incentives for ridesharing to take advantage of the times savings. Greater time savings occur with longer systems. Thus, the effectiveness of a ten mile link will be many times more effective than a one mile link. Similarly, a regionwide HOV system will provide significantly greater opportunities for the traveler to take advantage of HOV lanes.

The system approach goes beyond link-by-link determinations. The region would produce a long range system plan designed to meet both mobility and air quality needs. This plan would designate HOV corridors for short range and long range implementation priorities on both freeways and arterials. Several regions are in the process now of developing HOV system plans as an element of their regional transportation plan.

2. Comprehensive transit improvements program for bus and rail (as appropriate for the area).

Similar to HOV system planning, this looks to both short range and long range planning to meet future mobility and air quality needs.

Transit providers can become involved in the air quality planning process and develop plan alternatives that would meet the mode shift goals of the air quality and transportation plans. An example of this is the Southern California Rapid Transit District's plan to meet the air quality plan's goal of achieving 19% of commute travel by transit.

At the present time, buses emit high concentrations of particulates and nitrogen oxides and concerns have been raised that transit strategies may not have great emissions benefits. Newer buses will have to meet more stringent emissions standards and bus retrofit programs to accommodate clean fuels appear possible. Alternative fuels and electrified buses are ways that emissions can be reduced. Transit plans should also include aggressive schedules for providing cleaner buses to reduce particulate and nitrogen oxide emissions so that the mode shift accomplishes air pollution reductions.

3. Land development policies that support reductions in vehicle trips.

Cities and counties can review their land use development policies and make changes in them to minimize air pollution and motor vehicle trips. Such policies include:
Location and design of commercial and industrial uses to maximize transit, bicycle, and pedestrian usage.

Mixed use development.

Preferential access for non-polluting transportation.

Changes in parking requirements to encourage alternative transportation.

Incentives for new development to locate along proposed and existing transit lines.

Jobs/housing balance and housing/services balance which reduce trip length and also support alternative modes of travel.

4. Development policies to strengthen on-site transit access for new and existing land developments.

These are development policies and development standards that encourage pedestrian and transit access and use at specific development sites. Transit districts are encouraged to be a part of the development review process.

Synergistic packaging of TCMs brings about trip reductions of a scale far beyond what can be achieved by any single measure. For example, employer trip reduction rules go hand in hand with HOV system plans and parking management. Transit expansion supported by high density corridor development and transit access standards leads to higher transit ridership. Districts and councils of governments (COGs) should consider packaging TCMs to meet their area's needs.

Another aspect of "reasonably available" is that of cost. The Act intends for cost to be a consideration in implementing control measures. Localities are encouraged to be sensitive to economic impacts and, at the same time, to be creative in gaining funding that can enable programs to work. (Guidance on cost effectiveness evaluation is forthcoming under separate cover.)

How should transportation measures in air quality plans be linked to similar efforts in the transportation planning effort?

The integration of air quality and transportation planning is essential. Transportation control measures, especially at the system level, must be designed to meet mobility and air quality objectives, simultaneously. This calls for cooperation and coordination. ARB will be looking for agreements between air districts and implementing agencies to be included in plans. These agreements will necessarily be more clearly defined for short term measures (within five years). Long term measures will need schedules to develop such agreements.
Because air quality plans serve as the focal point for the integration of air quality and transportation planning, air districts will play an important role in bringing together the necessary players and representing air quality control needs associated with transportation planning. Greater examination of integration and agency relationship in developing and implementing reasonably available transportation control measures is contained in Chapter 7, "Integration of Transportation and Air Quality Plans," and Appendix B, "Review of Roles and Responsibilities."

What transportation measures are reasonable for rural areas?

Districts in rural areas with transportation problems which are closely tied to adjacent urban or suburban areas should include TCMs in their plans that are consistent and compatible with the measures instituted in the adjacent areas.

Districts in rural areas which are not closely linked to urban or urbanizing areas are not automatically required to include transportation control measures in their plans. Such rural districts (for example, nonattainment areas with populations under 50,000) should examine the nature of emissions within their area. If motor vehicle emissions are a substantial part of their emissions and TCMs are feasible, they should consider the development and implementation of transportation control measures.

What are the requirements for uniform implementation of TCMs?

The Act states that the state board (ARB) shall:

"...require control measures for the same emission sources to be uniform throughout the air basin to the maximum extent feasible..." (H&SC Section 41503(b)).

The uniform implementation of control measures throughout an air basin has different implications for TCMs than for stationary source controls.

The largest urban areas in the state (greater Los Angeles, the San Francisco Bay Area and San Diego) are governed by districts that have jurisdiction over the entire urban area. These areas also have regionwide transportation planning efforts. The uniformity requirement is therefore an issue only where districts delegate responsibility for TCM implementation to local government. Where this is done, local governments should implement measures that are consistent throughout the region.

The situation is more complex in several other basins which are not governed by a single district, and which have a diverse set of large and small urban areas, as well as rural areas. In such areas, uniformity of control measures for transportation sources does not make sense. For example, measures that are appropriate for the Sacramento Metropolitan Area may have little applicability in Glenn and Colusa Counties. In these cases, the Act's uniformity requirements are not applicable, except within sub-basin areas that are urbanized (or urbanizing), such as greater Sacramento,
greater Fresno or Ventura County. In these sub-basin areas, county
districts (or local government where delegation has occurred) should
implement measures that are consistent.

What will be done to assist in identifying reasonably available TCMs?

The ARB's Transportation Strategies Development Group will work with air
districts, Caltrans, and regional transportation agencies to examine
transportation control measures that appear to be promising. It is expected
that one or two model transportation control measures will be developed each
year with the cooperation and technical assistance of state and local
professionals. A report of findings on the measure will include measure
design and implementation, emission reduction effectiveness, and monitoring
approaches.

As part of the process, the ARB will consult with existing technical and
policy working groups such as the Transportation/Air Quality Review Group
(TARG) and the California Air Pollution Control Officers Association
(CAPCOA), as well as Caltrans, the California State Energy Commission, and
the California Transportation Commission (CTC). The ARB is working closely
with Caltrans to develop mutually supportive policies and working
arrangements.

What about low-emission "clean" fuels for motor vehicles?

The Act requires severe areas to include:

"measures to achieve the use of a significant number of low-
emission motor vehicles by operators of motor vehicle fleets."
(Section 40920(a)(3)).

While this document does not provide guidance on the use of clean fuels, it
is recognized that clean fuel programs have an important role in cleaning
the air. In this document, transit expansion has been emphasized. It goes
without saying that transit services must be provided by "clean" vehicles or
face possible degradation in air quality rather than improvement.

The ARB has an ongoing effort to reduce air pollution through cleaner fuels.
ARB has proposed a short term program for cleaner conventional gasoline
usage and a long term program for phasing in low-emission vehicles and clean
fuels. For more information on alternative fuels, see ARB staff report,
"Low-Emission Vehicles/Clean Fuels and New Gasoline Specifications--Progress
Report," dated December 1989. Regulatory language for this program will go
before the Air Resources Board in the fall of this year.
How does the Act affect trucking operations?

The Act requires the ARB, the Business, Transportation and Housing Agency, and the California Highway Patrol to jointly establish a technical advisory group which includes representatives of the trucking industry, organized labor, shippers, retailers, and districts to develop:

"...model guidelines and procedures for traffic control measures affecting heavy duty trucks for use by districts." (H&SC Section 40717.5(a)).

An advisory committee chaired by the Business, Transportation, and Housing Agency has been formed and is scheduled to complete its guidelines by mid-1990. Upon completion, local air districts, with the exception of the South Coast Air Quality Management District, must review and consider the guidelines prior to adopting or revising any regulation imposing traffic control measures for heavy duty trucks.

The South Coast Air Quality Management District has specific authority to adopt regulations affecting heavy duty trucks in Health and Safety Code Section 40447.5. The South Coast is actively pursuing a program to reduce the number of trucks traveling during peak traffic hours, primarily by shifting shipping operations to off peak hours.
3. INDIRECT SOURCE CONTROL PROGRAMS

Introduction

In California, stationary sources are required to meet strict standards for emission control before they are issued permits. In addition, most air pollution control districts in California require significant new stationary sources to offset those emissions by reducing an equivalent amount of emissions of an existing source.

The California Clean Air Act has established the principle that the emissions from indirect sources should also be examined and, to the extent necessary and feasible, mitigated. The Act requires districts to include in their attainment plans:

"...provisions to develop area source and indirect source control programs." (H&SC Section 40918(a)(4)).

The Act further states that in meeting its responsibilities with respect to attainment of state ambient air quality standards that:

"...a district may adopt and implement regulations to ...reduce or mitigate emissions from indirect and areawide sources of air pollution." (H&SC Section 40716(a)(1)).

What is an indirect source?

The California Clean Air Act does not contain a specific definition of indirect source. A definition is included in the federal Clean Air Act:

"... a facility, building, structure, installation, real property, road, or highway which attracts, or may attract mobile sources of pollution." (U.S. Clean Air Act Section 110(a)(2)(K)(5)(C)).

Examples include employment sites, shopping centers, schools, sports facilities, housing developments, etc.

What is an indirect source control measure?

An indirect source control measure is a rule or ordinance established to reduce the mobile source emissions associated with specific activity centers such as noted above. Indirect source control measures can be divided into two categories -- measures to reduce emissions from existing sources and measures to reduce or mitigate emissions from new or modified sources.
What are some practical examples of measures to control existing indirect sources?

Measures to control existing indirect sources have been enacted to reduce emissions related to commute trips to and from large employment sites. The South Coast Air Quality Management District’s Regulation 15 is one such measure. The Ventura County Air Quality Management District recently adopted Rule 210 with similar provisions. These two rules require employers to develop and implement plans to achieve a specific occupancy in vehicles coming to the site during the commute period. The plans generally include a variety of incentives aimed at changing employee travel behavior to result in the desired vehicle occupancy. If the vehicle occupancy is not achieved, the employers are to revise and strengthen their plans. The district may disapprove plans which do not include feasible measures that the district judges to be needed to achieve the vehicle occupancy criteria.

The plans prepared by a trained transportation coordinator can include, but are not limited to, the following measures to reduce commute trips:

- Partial or full subsidization of parking for ridesharing employees;
- Full or partial subsidization of carpools, vanpools, buspools, shuttles, or use of public transit;
- Provision of an allowance for employees to utilize company-owned fleet vehicles for ridesharing purposes;
- Preferential parking for vehicles used for ridesharing;
- Facility improvements which provide preferential access and/or egress for ridesharing employees;
- Facility improvements to encourage use of bicycles (showers, bike racks, etc.);
- Active use of a computerized rideshare matching service or an effective in-house rideshare matching service;
- Compressed work weeks such as a 4/40 or 9/80 work schedule where employees work 40 hours in fewer than five days in one week or 80 hours in fewer than ten days in two weeks;
- Flexible work hours that facilitate employee ridesharing;
- Telecommuting or work at home.

Indirect source measures could also be developed to address the specific nature of vehicle trips to other types of sources. For example, shopping centers over a certain size could also be required to develop plans to achieve a certain daily vehicle trip/square foot ratio. In order to develop such plans, the shopping center would need to analyze the nature of trips coming to its facility— the distance, time of day, and time between arrival and departure. The measure could include such requirements as
bicycle lockers at activity centers, bus stops at shopping malls, improved delivery services, telecommunication including purchase and delivery by phone, and other actions to encourage the use of non-polluting or lesser polluting transportation modes.

How might new indirect sources be regulated?

Programs to control emissions from new or modified indirect sources are somewhat analogous to the control of new stationary sources as part of a "new source review program." The key elements of a new indirect source control program include:

1. The requirement that the source be reviewed and approved prior to commencement of construction.

2. An analysis of the nature of trips including: the location, distance, hour of day, vehicle occupancy, and mode split of trips.

3. A quantitative assessment of trips and vehicle miles traveled (VMT) associated with the project and the resultant air pollution emissions (ROG, NOx, CO, PM10).

4. A program to reduce the trips generated with the application of specific measures to mitigate the air pollution impact of the projected increase in vehicle trips. This would include the best available design to reduce trips and lower VMT, as well as the application of appropriate TCMs.

5. An assessment of the projected emissions with the application of the transportation mitigation measures.

6. Assurance of consistency with the applicable air quality plan.

7. A timetable for implementation and a mechanism for monitoring results over time.

8. Establishment of a permit that clarifies how the source will be constructed and operated, and that serves as the basis for determining ongoing compliance.

Some areas have proposed provisions for offsets and mitigation fees. Offsets refer to a program to obtain additional emission reductions not directly associated with the project to partially or completely "offset" the emission increases that cannot be eliminated through mitigation measures. Mitigation fees pay for TCMs to reduce trips and emissions in other locations within the district.
What level of effort is needed to meet the Act's requirements relative to indirect sources?

The Act requires that districts with moderate, serious or severe air pollution make provisions to develop indirect source control programs, to the extent necessary, to meet air quality standards. For most urban areas, it is likely that an indirect source control program can contribute emission reductions needed to meet the emission reduction or long term maintenance requirements of the Act.

However, the development of effective indirect source control programs will require breaking new ground. Given this, it is unlikely that many areas will have the program adopted and underway prior to adoption of the plans in 1991. Accordingly, the requirements of the Act could be met when the following is included as part of the district's attainment plan:

1. The adoption of indirect source control regulations or a schedule for development, consideration, and adoption of an indirect source control program.

2. Adoption or commitment to a time line, staffing allocation, and monitoring program to implement and assess the results of the indirect source review program.

The ARB is currently preparing an indirect source review guidance document with a planned completion date of July 1990. The guidance document will be developed in consultation with districts, councils of governments, as well as cities and counties and the operators of affected sources. It will examine existing information, identify questions and additional information that may be needed, and suggest approaches that could be used to develop an indirect source review permitting program.

Can districts delegate indirect source control responsibility?

Development of the design of the programs can be delegated or contracted with other agencies if the district chooses. However, districts have the ultimate responsibility to ensure the successful development and implementation of an indirect source control program. Once districts have established programs as part of their air quality plan, then specific details of a program, such as individual measures, can be delegated. The district continues to be responsible to exercise an oversight role to assure that the measures are implemented and monitored to maintain effectiveness over time. District delegations on indirect source review should conform with the same criteria established in the Act for TCMs. Specifically, the Act states that:

"A district may delegate any function with respect to implementation of transportation control measures to any local agency, if all of the following conditions are met:
(1) The local agency submits to the district an implementation plan which provides adequate resources to adopt and enforce the measures, and the district approves the plan.

(2) The local agency adopts and implements measures at least as stringent as those in the district plan.

(3) The district adopts procedures to review the performance of the local agency in implementing the measures to ensure compliance with the district plan." (H&SC Section 40717(e)).

How do indirect source control measures relate to transportation control measures?

Indirect source control measures are a form of transportation measures in that they are a strategy to reduce vehicle trips. They fit the definition of TCMs in the Act:

"...any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions." (H&SC Section 40717(g)).

How do indirect source control measures relate to "areawide" or "area" source control measures?

Indirect sources may contain "areawide sources" or "area sources" of emissions. For example, a housing development is an indirect source of transportation emissions; yet, the subdivision also contains area sources of emissions, such as fireplaces, water heaters, and gas furnaces.

Controls of area sources can be developed concurrently with the development of an indirect source so that a comprehensive control program is achieved.

Emission control strategies for area and indirect sources can then also be implemented by districts (or the delegated agency) concurrently. For example, in new housing developments, indirect source measures (such as providing adequate mass transit access) may be coupled with area source requirements (such as requiring low emission woodstoves) in one set of permitting requirements.
4. PERFORMANCE STANDARDS AND EMISSION REDUCTION TARGETS

Introduction

The California Clean Air Act sets several challenging performance standards for the transportation portion of the air quality plans.

For serious and severe areas, the Act requires the implementation of TCMs to:

"...substantially reduce the rate of increase in passenger vehicle trips and miles traveled per trip." (H&SC Sections 40919(a)(3) and 40920(a)).

For severe areas, the act requires TCMs to:

"...achieve an average during weekday commute hours of 1.5 or more persons per passenger vehicle by 1999, and no net increase in vehicle emissions after 1997." (H&SC Section 40920(a)(2)).

The Act specifies that for those districts which delegate the development of the transportation portion of the air quality plan to councils of governments (COGs) or transportation planning agencies, the districts must:

"...establish the quantity of emission reductions from transportation sources necessary to attain state and federal ambient air standards." (H&SC Section 40717(b)(1)).

Finally, the plans as a whole must meet an annual emission reduction target of 5% (H&SC Section 40914(a)).

This chapter offers guidance on how to address these performance standards.

Who is required to set emission reduction targets?

The development of emission reduction targets from transportation sources is required for districts which delegate development of the transportation control plan to their COG or other regional agency. Districts without such agreements and districts exempt from this requirement may also establish targets as part of their planning process.

Although responsibility for completing this task lies with the district, practical considerations dictate that it will take the combined efforts of the districts, COGs, local and regional transportation planning agencies, transit districts, cities, and counties to define meaningful emission reduction targets for the nonattainment area. The integration of transportation planning and air quality planning is critical to the success of attaining clean air standards. There needs to be not only cooperation in setting targets, but also "buy in" or commitment to the targets by each of the participating agencies.
What targets are required and how are they to be used?

The Act requires air pollution control districts to set emission reduction targets for transportation sources necessary to attain state air quality standards. This does not mean that the burden of attainment should be placed on transportation controls, but rather, that there will be interplay in estimating reductions from stationary source controls, vehicle emission controls, and transportation controls. These programs, in total, must achieve the 5% annual emissions reduction required in the Act.

Requirements that targets be met are not specifically stated in the Act, and ARB will not judge the adequacy of local plans on whether or not transportation targets have been achieved. Targets are meant to guide the control measure development process in a positive way and not to hinder local planning.

Targets should be phased, providing interim estimates for future year emission reductions. Serious and severe areas will need to address specific transportation requirements for 1.5 person per vehicle, substantially reducing growth in trips and VMT, and no net increase in emissions after 1997. (See Appendix C for examples of targets.)

Practically speaking, emission reduction targets will have little meaning to the transportation sector or to the general public unless they are translated into reductions of VMT, vehicle trips, or other vehicle activity indicators. Thus, it is recommended that districts provide a combination of emission reduction targets and transportation activity goals appropriate to the area's severity of air pollution and the transportation sector's contribution to the air pollution.

How will compliance with the requirement to achieve a vehicle occupancy of 1.5 or more persons per passenger vehicle during weekday commute hours by 1999 be determined?

The Act states that areas that cannot attain standards by 1997 must adopt sufficient TCMs to meet this requirement. To demonstrate compliance, ARB anticipates air quality plans will include commitments to develop sufficient TCMs to increase the ratio of total person trips over total passenger vehicle trips to 1.5 during commute hours. This ratio should be for all trips during commute hours, not just work trips.

In the 1991 plans, a baseline determination of average vehicle occupancy during the commute and non-commute hours is needed, as are projections for several future years, including 1999.

The definition of commute hours will vary from region to region, but should be related to the hours of greatest congestion. The Act is specific to passenger vehicles. Trucks used for goods delivery or as service vehicles are excluded from the determination.
What constitutes a substantial reduction in the rate of increase in passenger vehicle trips and miles traveled per trip?

The Act calls for areas that cannot attain the standards by 1994 to institute TCMs that "substantially reduce the rate of increase in passenger vehicle trips and miles travelled per trip." Over the last decade, most urban areas in California have experienced dramatic growth in travel, often at rates more than double that of population growth. By explicitly calling for a reduction in the rate of growth, the Act appears to recognize that as the state's population grows, increases in overall trips and travel is likely. Although each area will have flexibility in defining what constitutes a substantial decrease in travel growth, the Act's air quality goals are unlikely to be met unless substantial changes from current trends are accomplished in more polluted areas. To this end, it is suggested that the TCMs included (or committed to) in the air quality plans be designed to hold the increase in vehicle trips to no more than the regional rate of population growth.

Does the requirement that TCMs result in no net increase in vehicle emissions after 1997 require that VMT and trips be "frozen" at 1997 levels?

No. This provision is intended to ensure that the gains made through 1997 in reducing auto emissions are at least preserved beyond 1997 in areas that have not attained standards by that date. To accomplish this, the combination of the TCMs applied in the region, programs to reduce vehicle emissions through the use of clean fuels, and the ARB's ongoing efforts to reduce per vehicle emission through technological controls must be adequate to at least hold emissions at or below the levels achieved by 1997.

Regions with high levels of population and economic growth may have to institute additional TCMs to comply with these provisions. Other areas without such growth pressures may be able to rely on the ARB program to ensure that vehicle emissions do not increase.

How should districts consider the emission benefits from ARB's Motor Vehicle Control Program and Smog Check Program?

The ARB's Motor Vehicle Control Program (MVCP) is a separate control strategy from TCMs and should not be substituted for the TCM portion of the plan. However, the effects of ARB's program and the Smog Check Program should be reflected in the assessment of the emissions benefits of TCMs. The ARB updated its Motor Vehicle Plan in 1989 as part of the South Coast Air Quality Management Plan. It is included as Appendix IV-F to that plan and is available from the ARB. The ARB will be updating its Motor Vehicle Plan again in 1990. Questions on how to incorporate the program's impact can be directed to the ARB's liaison staff.
5. CONTROL MEASURE DEFINITION AND ANALYSIS

Introduction

A critical step in plan preparation is the definition and analysis of proposed control measures. The first step is to assess the measure's ability to change transportation behavior. This analysis needs to define what trips will be affected, in what way will they be affected, and what changes are expected in either trips, VMT, travel time, or all of these. It is important that the source of estimates be clear so that as new information is obtained, assumptions and, thus, calculations can also change.

The Act requires that the analysis of control measures include an assessment of cost effectiveness and requires that other factors also be considered in the evaluation and selection of control measures. These include but are not limited to: technological feasibility, public acceptability, and enforceability.

What information should be given for each proposed transportation control measure, or package of measures, in the plan?

At a minimum, the following information is necessary:

1. A description of the measure and of the nature of the trips to be affected by the measure. This should include identification and analysis of potential trip making shifts that could occur with the measure. For example, a 4/10 work schedule could reduce work trips but increase non-work trips.

2. Projected travel behavior changes, with all assumptions and all uncertainty clearly labeled and discussed, including:
   
   Baseline and projected VMT
   Baseline and projected trips
   Other (vehicle occupancy, trip time, etc.)

3. A detailed emission reduction analysis, with all assumptions and uncertainty clearly labeled and discussed, including:
   
   Baseline emissions
   Emissions subject to control
   Projected emissions reduction

4. A detailed workplan, including as a minimum:
   
   A description of the implementing agencies and any intra/interagency implementation agreements
A plan for monitoring measure effectiveness

An enforcement plan

5. A timetable for implementation, monitoring, and evaluation

6. An estimate of the resources required to implement, monitor, enforce and evaluate the plan

For some measures, only preliminary estimates of system impacts and resulting emissions will be available. Work schedules may need to include allocation of resources to develop better information. Timetables need to take into consideration the simultaneous development of many measures and resource allocation over time.

How can emission reductions from transportation control measures be estimated?

Emission reductions can be estimated from the expected changes in the transportation system in terms of measurable system performance indicators such as reductions in trips, trip length, or vehicle occupancy. Expected changes in these indicators are translated into emission reductions using accepted emission factors and methodology, and, where appropriate, air quality models.

Baseline transportation data and emission estimates are used as the comparative norm for determining how transportation control measures may affect system parameters. The baseline transportation data will be the formal data base by which the success or failure of a particular TCM is determined. Performance indicators that suit the particular TCM under evaluation, format the baseline data for that measure (e.g., person-trips per household, vehicle miles traveled (VMT), vehicle trips, or vehicle hours traveled (VHT)).

It will be necessary to make assumptions about the number of trip reductions anticipated. It is critical to ensure that all assumptions made in the preparation of emission reduction figures are thoroughly documented. These assumptions can later be re-evaluated to determine how reasonable they were and future assumptions can be improved.

Assumptions regarding the nature of the data acquisition should be documented along with assumptions made during emission quantification. Emission estimates can be separated into four categories:

1. Baseline emissions

   For example, for an employment site commute trip reduction, the baseline emissions would be all emissions associated with the home-to-work trip.
2. Emissions subject to control

Continuing the example, the emissions subject to control would be the home-to-work trip of employees who come to work in the peak period and work for employers above a certain size.

3. Potential reduction of emissions

This step would assess the potential reduction of emissions which would result from the provision of incentives. In this step, experiences from other areas as to the trip change potential of various incentives can be used as the assumptions.

4. Anticipated reduction of emissions, based upon projected effectiveness

After the assumptions have been defined, the actual emission reductions that would result can be calculated using emission factors for current and projected vehicle fleets.

Estimation of all pollutants are suggested. For those areas exceeding ozone standards, both reactive hydrocarbons and nitrogen oxides should be estimated. For areas which also have PM10 exceedances, PM10 should be estimated. For areas with carbon monoxide, carbon monoxide emissions should be estimated.

Is cost effectiveness analysis required for transportation measures?

The Act requires that cost effectiveness be a consideration in the districts' plans. In addition, the Act requires that air quality plans include cost effectiveness assessments of all control measures (and therefore of transportation control measures). The Act also requires that these analyses be used to rank the control measures from the least cost-effective to the most cost-effective (Section 40922(a)).

Should TCMs be compared or ranked with stationary and mobile source control measures?

Each of these measure categories deserve separate cost effectiveness comparisons. TCMs are likely to be done for mobility and transportation needs, as well as air quality. It is therefore inappropriate to compare the cost effectiveness of TCMs with other measures done solely to improve air quality.
What other factors should be considered in a control measure analysis?

In addition to cost-effectiveness, the Act also requires districts to consider other factors including:

"technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforceability" (Section 40922(b)).

In addition, the Act expressly states that "priority shall be placed on the goal of healthful air" (Section 40910). This suggests that the primary emphasis of consideration of the listed factors is to make choices between measures, not to eliminate measures needed to attain standards or achieve the required emission reductions.

Below is a list of other criteria for consideration in addition to cost-effectiveness in the decision making process. This list is not all-inclusive and should not be considered as such. The first five are required. The remaining are suggested.

- **Technological feasibility**: Technology that is highly cost-effective may be currently unavailable or difficult to implement.

- **Total emission reduction potential**: When working with limited resources, implementing several highly cost-effective measures that have a low total reduction potential could preclude development of less cost-effective measures that have a high reduction potential.

- **Rate of reduction**: The time it takes for a measure to become 100% effective is important in designing a measure and in its relationship to the plan as a whole.

- **Public acceptability**: As in any democratic process, public acceptability is critical. Without adequate public awareness, however, it is unlikely that public acceptability will be achieved.

- **Enforceability**: How and by whom a measure will be enforced is crucial in determining the measure's feasibility. Enforcement costs should be considered in the cost-effectiveness analysis; however, where this is questionable or infeasible, or where the costs fall on another agency (for example, the Highway Patrol), enforceability must be considered externally.

- **Packaging**: Some TCMs complement each other to produce greater combined results than if the individual results of each were merely added up. Thus, three TCMs, each only moderately cost-effective, may be highly cost-effective when implemented together.

- **Economic impact**: Most measures will have indirect economic cost well beyond the scope of the implementation costs used in the cost-effectiveness analysis. Capital improvements can be more cost effective than regulatory strategies, due to the economic costs that regulations may impose on society.
- Energy conservation and fuels: The energy conservation effect of proposed measures can show the combined societal benefit of a transportation control measure.

- Global warming: The effect of measures on reducing global warming gases can be estimated by applying carbon dioxide emission factors to proposed measures.
6. MONITORING AND REPORTING MECHANISMS

Introduction

The Act requires that each transportation plan includes at a minimum, a schedule for implementing transportation control measures and procedures for monitoring the effectiveness of and compliance with the measures in the plan (Section 40717(b)(2)).

The monitoring of TCM implementation and effectiveness is a complex process requiring procedures as individual and specialized as the TCMs themselves. With this in mind, the ARB will address the question of monitoring on two fronts. The following chapter addresses the general monitoring requirements of the Act but avoids an in-depth "how-to" discussion of monitoring.

Why is monitoring necessary?

Implementation monitoring is necessary to ensure that transportation control measures are developed and implemented per the commitments in the plan. Compliance and effectiveness monitoring is needed to evaluate the effectiveness of the individual transportation control measures in providing emission reductions. This information is used to determine whether the emission reduction goal of the overall plan is being achieved by aggregate control measures.

Who does the monitoring?

Districts have primary responsibility for implementing and monitoring the effectiveness of TCMs, even when interagency agreements have been entered into for plan development. The Act does provide for districts to delegate the authority for implementation of control measures to an outside agency or agencies; however, the district is also required to monitor the agency's or agencies' performance and to ensure that implementation of the measures is in compliance with the plan.

How is implementation monitored?

The monitoring of implementation is initiated by preparing a calendar of the events needed to bring the design, approval and funding of the plan and its measures to fruition. The list of such events includes deadlines for the development, review and approval of the overall plan and individual measures, deadlines for the determination and acquisition of funding, and target dates for actual implementation of the measures. Periodic reports on progress must be prepared at least annually to assess progress (Section 40924(a)).
How is effectiveness generally monitored?

Transportation plans are designed to accomplish two goals: 1) to meet the specific requirements of the Act and 2) to provide the emission reduction goal deemed necessary in the air quality management plan (AQMP). Monitoring should be designed to determine whether specific Act requirements are met and that emission reduction goals have been achieved. During the planning process, individual control measures are calculated for projected emission reductions. The assessment process must determine if these goals were met. The implementation of all control measures should yield the emission reduction established in the AQMP, as well as the other goals.

For example, the Act stipulates that a number of specific requirements be met through the use of TCMs. Areas designated as "serious" must implement TCMs to "substantially reduce" the growth rate of the number of passenger vehicle trips and miles traveled per trip. Similarly, severe areas must also achieve the same substantial reductions as serious areas, plus they must ensure an average vehicle occupancy of 1.5 during commute hours after 1999 and that there will be no net increase in vehicle emissions after 1997. Thus, monitoring efforts should result in data that will demonstrate progress toward achieving these requirements.

We have already mentioned in Chapter 5 the importance of establishing baseline data. Each area, with the cooperation of state, regional and local air and transportation agencies, cities and counties, will need to design monitoring networks to establish baseline information as a point of comparison for future or ongoing monitoring. A high level of coordination in this effort is needed in order to: 1) perform the task as economically as possible and 2) produce the kind of monitoring network that can best relate to the performance standards set forth in the Act.

What are the monitoring requirements for specific TCMs?

Individual control measures should be well enough defined so that they can be monitored to determine if they were successfully implemented. For example, if a parking control strategy is implemented in a downtown zone, with a design goal of reducing traffic flow into the center by 20%, the effectiveness of the individual measure should be determined by monitoring traffic flow into the zone.

Will the plan be found deficient if the performance of individual TCMs is less than targeted in the plan?

The plan is composed of many individual measures. What is critical is that the combination of all measures achieves the total emission reduction required by the Act. The effectiveness of the overall plan is dependent upon the effectiveness of its individual measures; thus, the planning process must track the effectiveness of individual measures, as well as their combined effectiveness.
If a specific measure does not achieve the emission reduction that was assumed in the plan, an emission reduction shortfall is said to have occurred for the measure. It is appropriate to re-evaluate any measure that does not achieve its projected emission reduction and implement changes that will make the measure more effective, thereby mitigating the emission reduction shortfall. If it is not possible to improve the effectiveness of the measure, the emission reduction shortfall needs to be mitigated by another means. To mitigate the emission reduction shortfall of a deficient measure, districts may:

- Substitute "excess" emission reductions that were achieved by another measure
- Strengthen the deficient or other measures to achieve additional emission reductions
- Design new measures that will achieve additional emission reductions

When this mitigation strategy is applied to all emission reduction shortfalls and accurately tracked by planning groups, the overall effectiveness of the plan is assured.

What mechanisms are useful for testing plan effectiveness?

The data gathered to monitor the overall effectiveness of the plans must relate to the Act requirements. The following lists are suggestions of possible methods to use in testing how effectively Act requirements have been met:

**Reduction in rate of increase in passenger vehicle trips:**
- Traffic counts, employer/employee record keeping, travel surveys.

**Reduction in rate of increase in miles traveled per trip:**
- Track gasoline/alternative fuel sales, annual/biannual odometer checks (may be coordinated with smog inspections), individual trip monitoring technology.

**Average vehicle occupancy:**
- Highway vehicle/passenger counts, public transit data, employer/employee record keeping.

**No net increase in vehicle emissions after 1997:**
- Transportation and air quality modeling (extrapolation from trip reduction data), motor vehicle emission inventory.
How often should effectiveness monitoring be repeated?

The Act specifies that every three years after plan approval, the districts must prepare an assessment of the overall effectiveness of the plan. The emission reductions achieved in the preceding three-year period must be quantified, and the rates of growth of both the district's population and emissions related to industrial and vehicular sources must be determined. These assessments must be measured against the assumptions and goals contained in the district's plan, and the findings must be reported to the ARB.

Although the Act requires that districts report their assessments once every three years, it is recommended that TCM effectiveness be measured and evaluated annually. An annual evaluation of the effectiveness of TCMs allows progress to be monitored and provides the opportunity to adjust TCM design.
7. INTEGRATION OF TRANSPORTATION AND AIR QUALITY PLANS

Introduction

The integration of transportation and air quality planning is critical to meeting the objectives of the California Clean Air Act. New performance targets for transportation sources were set by both the California Clean Air Act and the 1989 transportation legislation (AB 471, et al). While the Act focuses on emission reductions, the transportation statutes emphasize congestion relief. It is important that efforts to meet two objectives be in concert rather than at cross purposes -- again, integration is critical. This chapter suggests ways to accomplish this integration of planning and implementation efforts.

What is the structure of the transportation planning process?

Transportation facilities are provided by a myriad of agencies. However, a regional and state transportation planning and development process governs the timing and allocation of resources. It is important for air quality planners to become familiar with and participate in this process in their regions. Also, air quality objectives need to be included in the design and operational plans for specific transportation projects.

Virtually all significant transportation projects are based on the adopted regional transportation plan and are implemented through the state and regional transportation improvement programs. This ongoing planning process is discussed below:

Regional Transportation Plan

Regional transportation plans (RTPs) are updated every two years by the regional transportation planning agencies (RTPAs) pursuant to guidance that is developed by Caltrans and adopted by the California Transportation Commission. Generally, the regional transportation planning agency is the council of governments (COG). However, it may be a separate commission, as is the case with the Metropolitan Transportation Commission in the Bay Area.

The RTP is a twenty-year plan containing maps, policies, and long term projects for each mode of transportation. It is based on an analysis of the existing transportation systems and additional travel demand expected from growth in jobs and population. New RTP requirements, such as elements for high occupancy vehicle (HOV) systems and congestion management plans, were recently proposed. A financial element which discusses revenue sources and what shortfalls exist in funding individual modes is required.

The RTP defines the long range transportation system based on the desires of local and regional agencies. Some future scenarios, such as the Southern California Association of Governments' Regional Mobility Plan, define systems that the region desires, but may not fall within the projected future funding.
In view of the fact that the RTPs and the air plans are on different schedules, air pollution control districts and regional transportation agencies will need to work together on integrating these two planning processes in order to meet the requirements in the Act. This may mean that districts and COGs will need to prepare interim drafts of their own plans containing mutually agreed upon goals and commitments. The next RTPs are due in 1992; the air plans are due in 1991. To achieve plan integration, the regional transportation planning agencies can prepare an early plan alternative that addresses California Clean Air Act objectives and can be utilized in the 1991 air quality plans.

Regional transportation plan goals are implemented through both the regional transportation improvement program and the state transportation improvement program, as discussed below:

**Regional Transportation Improvement Program**

The regional transportation improvement programs (RTIPs) are lists of projects in the regions proposed for funding and implementation. Under AB 471, the RTIPs will become seven-year listings which are to be updated every other year as projects are completed. The first round of RTIPs on the new schedule is due to Caltrans and the CTC by April 1, 1990, and by December 1 of each odd-numbered year thereafter. The RTIPs reflect the local and regional priorities for projects within the seven-year funding horizon.

**State Transportation Improvement Program**

The State Transportation Improvement Program (STIP) focuses on projects that will affect operation of state transportation facilities, such as highways, transit guideways, rail, and airports. Caltrans prepares a preliminary list for each planning cycle based on state and regional priorities. This is called the Proposed State Transportation Improvement Program or the PSTIP. Each RTPA reviews it and may suggest revisions during hearings held by the CTC before a final STIP is adopted. Caltrans will prepare the next preliminary list for review in February 1990 and to the CTC by April 1st. The CTC will adopt a final list of projects from the PSTIP and RTIPs by August 1, 1990. In future years, the time lines will be December 1 of odd-numbered years for submittal of both the RTIP and the PSTIP lists.

Additions or changes to the STIP are made in monthly CTC meetings as needed. Interested parties, such as the ARB and districts, may offer testimony to be considered.

**Sub-Regional and Corridor Transportation Planning**

In addition to the comprehensive regional transportation plans, special studies are undertaken which may cross city or county boundaries to encompass areas with a common interest, such as countywide transit, transportation corridors, or county sales tax administration. New ideas are discussed in these studies, and this can be fertile ground for implementing transportation-source control measures. In addition, preliminary agreement on facility priorities is sometimes made that is then incorporated into the regional transportation plan and improvement program.
What are the critical elements in an integrated planning process?

Coordination between transportation planning agencies and air quality management districts is the beginning step toward an integrated planning effort. The following is a suggested list of actions the two (or more) agencies can undertake:

- Development of a joint work program and time schedule
- Interagency agreement on goals
- Development of systemwide strategies
- Development of specific measures
- Ongoing consultation with affected agencies, organizations, and individuals
- Dedicated resources to maintaining, implementing, monitoring, and updating the plan over time

The South Coast Air Quality Management Plan, jointly developed by the South Coast Air Quality Management District and the Southern California Association of Governments over a two-year period, is the first example of an integrated planning process in which transportation planning was done simultaneously with air quality planning. Planners used the same growth forecasts to develop related air quality, mobility, and growth management plans.

How should the requirements of the Act be reflected in the next update of the RTP?

To achieve integration with air quality plans, it is important that the regional transportation plans address the applicable transportation performance standards of the California Clean Air Act. These include:

- Substantially reduce the rate of increase in passenger vehicle trips and vehicle miles traveled (for Serious and Severe areas)
- Achieve 1.5 vehicle occupancy during peak travel periods by 1999 (for Severe areas)
- Provide for no net increase in vehicle emissions beyond the year 1997 (for Severe areas)
- Adopt all reasonably available transportation control measures (for all areas which have not achieved the state air quality standards)
The next update of the RTPs should be designed to meet each of these performance requirements and to be consistent with the 1991 air quality plan for the area. Long term efforts will be necessary to develop balanced systems of facilities to encourage travel by transit, rail, high occupancy vehicles, or nonvehicle modes.

What new programs were added by the 1989 transportation funding statutes?

The 1989 transportation funding legislation (AB 471, et al) made major changes to transportation programs. New funding and new requirements were established for ongoing programs. In addition, significant new programs and requirements were added. While funding is contingent on passage of SCA 1 in June 1990, most programs will go into effect with existing funds. The exception to this is the Congestion Management Program.

The following is a summary of the new programs:

- **Flexible Congestion Relief** - This program would add $3 billion in new revenues for "flexible congestion relief projects" — capital projects which reduce or avoid congestion on existing routes by increasing the capacity of the transportation system. Projects on city streets, county highways, state highways, and commuter rail and urban rail corridors may qualify. Priority will be given to projects which are included in county congestion management programs.

- **Congestion Management Program** - This program, which would go into effect with the passage of SCA 1, would require urbanized counties to develop congestion management programs. Consultation with the air quality management district is required. The program must contain:
  - Traffic level-of-service standards
  - Transit service standards for frequency, routing, and coordination
  - A trip reduction and travel demand element promoting alternative transportation methods
  - A program to analyze impacts of local land use decisions on regional transportation systems
  - A seven-year capital improvement program to maintain or improve level of service and transit performance

- **Commuter and Urban Rail Transit** - This program (along with the Intercity Passenger Rail Program) would add $3 billion in new revenues with the passage of three bond measures in 1990, 1992, and 1994. The commuter and rail projects eligible are those included in the rail corridors specified in the transportation legislation (Streets and Highways Code Sections 164.51 and 164.52). The projects to obtain funding must be able to be completed no later than June 30, 2001.
Intercity Passenger Rail Program - A portion of the $3 billion of new funds is for intercity rail, commuter rail, and urban rail transit. Again, this would be funded by rail bonds voted on in 1990, 1992, and 1994. The projects would be on five intercity corridors:

- Los Angeles/San Diego
- Santa Barbara/Los Angeles
- Los Angeles/Fresno
- San Francisco Bay Area/Sacramento/Auburn
- San Francisco/Santa Rosa/Eureka

Interregional Road System Plan - This program would add $1.25 billion of new revenues for interregional roads. The legislation identifies the specific state highway routes eligible for inclusion in the plan.

Highway Systems Operation and Protection Plan - This program would add $1 billion in funding for maintenance and rehabilitation of state highways. This is for projects not currently in the STIP.

Traffic Systems Management Plan - This program would add $1 billion in new funds. Traffic System Management projects are projects which increase the number of person-trips on the highway system in a peak period without significantly increasing the design capacity of the system. Projects include restriping, ramp meters and meter bypass lanes, computerized signals, changeable message signs, television surveillance, and integrated single-system state and local traffic operations centers. These projects are mainly short term enhancements to the existing system to increase person capacity but not vehicle capacity.

In addition to these programs, the $18.25 billion would be used to meet the current $3.5 billion STIP shortfall. Another $3 billion would be directly subvened to counties and cities, $2 billion would go into the state-local partnership program, and $500 million would be allocated to transit. A pie chart illustration of how these programs are funded is provided in Figure 7.1.

Guidelines for these programs are being prepared by Caltrans. In addition, Caltrans is preparing new guidelines for the STIP and RTIP. The proposed guidelines are submitted to the CTC for their review and adoption. The ARB is working with Caltrans and the CTC to integrate clean air objectives into the guidelines where appropriate.

Are requirements for "conformity" included in the California Clean Air Act?

The term "conformity" refers to the federal Clean Air Act requirement that federally funded or approved transportation plans and projects be consistent with or in conformance with the federally approved "State Implementation Plan for Achievement and Maintenance of National Ambient Air Quality Standards" (the SIP).
Transportation Funding Programs Enacted by AB 471 and Estimated Funding Contingent on Passage of SCA1
Determination of conformity by the regional transportation planning agencies is a requirement to receive federal highway funding. If a project is not in conformity, funding is threatened. The state process defined in the California Clean Air Act does not contain such "conformity" requirements.

However, it is clear that integration of air quality objectives into transportation plans and implementation programs is critical to the success of air quality plans. What is recommended is a proactive process which will lead to plans and implementation programs that are mutually responsive to both mobility and air quality goals.

While the Act does not include conformity requirements, plans that are developed to meet the provisions of this Act, as well as the federal Clean Air Act, will by necessity be judged by requirements of both laws. And, until the federal Clean Air Act is changed, federal conformity provisions will continue. However, as transportation and air quality plans are better integrated, it is anticipated that the problems associated with conformity findings will lessen.

What transportation and development decisions are made by local government?

Cities, counties, and special districts participate in transportation planning at the local level. Circulation elements in long range general plans are implemented by local capital improvement programs that allot funds to street and roadway projects. Special transportation authorities may be set up to administer other funds, such as sales tax override revenues.

Transportation planning at the county level will also include the development, adoption, monitoring, and reporting of results of countywide congestion management plans if ballot measure SCA 1 is approved in June 1990.

Day-to-day land use decisions create the future demand for transportation facilities. Development policies which minimize the growth in motor vehicle trips while at the same time increasing mobility through alternative transportation modes are the most supportive of air quality goals. Locating new developments with good transit access is critical. Other ways to improve alternative mode access can be incorporated as part of the project's conditions of development. After vested property development rights are granted through project approval, this opportunity is lost.

Air quality elements to local general plans have received increasing attention in recent years as a way of linking air quality plans and local policies regarding future community growth and development. Such elements support the enforceability for TCM action programs because general plans are required to have internal consistency among their elements.
Local ordinances that establish the zoning and conditions of development for different land uses must also be consistent with the adopted general plan. So, the adoption of a trip reduction or a parking management ordinance that implements a general plan policy is a more effective and less costly way of securing TCM mitigation of traffic and emissions impacts than negotiating for the same conditions on a case-by-case basis.
8. PUBLIC EDUCATION AND PUBLIC INVOLVEMENT

Does the Act require public education programs?

The California Clean Air Act recognized the importance of public education in gaining public support for travel behavior change to reduce air pollution emissions. Areas classified as moderate, serious, or severe are required to include within their air quality management plans provisions for public education programs to promote actions to reduce emissions from transportation and areawide sources (Section 40918(a)(6)).

Must public education programs be implemented before the 1991 plan is complete?

Public education is a crucial part of the plan's implementation. Because implementation follows plan development, it is desirable, but not essential, to have public education programs on line at the time of plan adoption.

What about public involvement?

A good planning process will include mechanisms to take advantage of technical advise and expertise from both the public and private sectors and for building consensus for plan approval. Careful thought should be given to achieve the kind of positive, constructive involvement that will lead to a better product, as well as citizen support.

Implementation and consensus building processes will involve:

- State, regional and local air and transportation agencies (including transit districts and county transportation commissions)
- Cities and counties
- Private industry
- General citizenry

What are the essential elements of a public education program?

A public education plan should seek to provide information that helps people see the need for and benefits of supporting the air quality plan -- with changes in their behavior related to air pollution. To be effective, this information should be focused where it will do the most good. It is suggested that the following questions be answered in the design of a public education plan:

- WHO: Which people or groups of people are most critical to reaching clean air goals in both the short and long term?
WHAT: What information (message) is needed by the public to move it toward decisions and actions that support the goal?

HOW: What communication channels (media) will best carry the message to the identified people? What agencies have related public education programs that can be coordinated in order to maximize public resources?

COST: What resources are necessary to implement the public information plan?

WHEN: What is the timetable for implementing the public education program to coincide with the plan's implementation?

Commitment to take action to implement a public education program is necessary. The plan should address and answer each of the questions proposed above and make the necessary resource and policy commitments to implement the program in an expeditious fashion.

These suggestions are included as an initial outline of a public education plan. The ARB will assist districts and other agencies in coordinating the development of cooperative public education programs as this effort goes forward.
Appendix A

California Clean Air Act Sections Related to Transportation and Indirect Source Control

Legislative intent is expressed in Section I(5) of the California Clean Air Act:

(5) That in order to ensure the future health and welfare of the people of the State of California, and the state's environment and economy, are protected despite lack of action or direction from the federal government, it is necessary for the State of California to develop and implement its own program to attain air quality standards through the application of best available control technology and operating methods, improved motor vehicle maintenance and inspection, control of indirect and areawide sources of emissions, the required use of cleaner burning fuels, the implementation of stricter new vehicle emission standards and warranty requirements, the design and implementation of transportation control and vehicle fleet management measures, and the incorporation of air quality considerations into local land use planning decisions.

Legislative intent is also expressed in Health and Safety Code Section 40910:

40910. It is the intent of the Legislature in enacting this chapter that districts shall endeavor to achieve and maintain state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide, and nitrogen dioxide by the earliest practicable date. In developing attainment plans and regulations to achieve this objective, districts shall consider the full spectrum of emission sources and focus particular attention on reducing the emissions from transportation and areawide emission sources. Districts shall also consider the cost effectiveness of their air quality programs, rules, regulations, and enforcement practices in addition to other relevant factors, and shall strive to achieve the most efficient methods of air pollution control. However, priority shall be placed upon expeditious progress toward the goal of healthful air.
District and Council of Governments (COG) responsibilities are spelled out in Health and Safety Code Section 40717:

40717. (a) A district shall adopt, implement, and enforce transportation control measures for the attainment of state or federal ambient air quality standards to the extent necessary to comply with Section 40918, 40919, or 40920.

(b) A district which has entered into an agreement with a council of governments or a regional agency to jointly develop a plan for transportation control measures shall develop the plan in accordance with all of the following:

1) The district shall establish the quantity of emission reductions from transportation sources necessary to attain state and federal ambient air standards.

2) The council of governments or regional agency, in cooperation with the district and any other person or entity authorized by the council of governments or regional agency, shall develop and adopt a plan to control emissions from transportation sources which will achieve the emission reductions established under paragraph (1). The plan shall include, at a minimum, a schedule for implementing transportation control measures, identification of potential implementing agencies and any agreements entered into by agencies to implement portions of the plan, and procedures for monitoring the effectiveness of and compliance with the measures in the plan. The council of governments or regional agency shall submit the plan to the district for its adoption according to a reasonable schedule developed by the district in consultation with the council of governments or regional agency.

3) Upon receipt of the plan submitted by the council
of governments or regional agency, the district shall review and approve or disapprove the plan in the following manner:

(A) The district shall review, adopt, and enforce the plan if it meets the criteria established by the district pursuant to paragraph (1) and has been submitted pursuant to the schedule established under paragraph (2).

(B) If the district determines that the plan does not meet the criteria established pursuant to paragraph (1), the district shall return the plan to the council of governments or regional agency with comments which identify the reasons the plan does not meet the criteria established pursuant to paragraph (1). Within 45 days, the council of governments or regional agency shall review the district's comments, revise the plan to meet the criteria established under paragraph (1), and resubmit the plan to the district. The district shall review and approve the revised plan if it meets the criteria established by the district pursuant to paragraph (1) and has been resubmitted to the district within 45 days.

(C) If the plan is not submitted pursuant to the schedule established under paragraph (2), or if a plan revised by a council of governments or regional agency and resubmitted to a district pursuant to this subparagraph does not meet the criteria established under paragraph (1), the district shall develop, adopt, and enforce an alternative plan for transportation control measures.

(4) Whenever the district revises its establishment of the quantity of emission reductions from transportation sources necessary to attain state and federal ambient air standards, the plan shall be revised, adopted, and enforced in accordance with paragraphs (1), (2), and (3).

(c) Subdivision (b) shall not apply to the Sacramento County Air Pollution Control District if Assembly Bill 4355 of the 1987–88 Regular Session is enacted, in which case Assembly Bill 4355 shall govern preparation and enforcement of that plan for transportation control measures. However, if Assembly Bill 4355 is not enacted, subdivision (b) shall govern preparation and
enforcement of that plan.

(d) Notwithstanding subdivision (b), a district located in a county of the third class shall develop a plan for transportation control measures as follows:

(1) The district, in consultation with the council of governments, shall develop, approve, and adopt criteria under which the plan shall be developed.

(2) The council of governments shall develop and adopt a plan for transportation control measures which meets the criteria established by the district, and shall submit the plan to the district for its review and adoption according to a reasonable schedule developed by the district in consultation with the council of governments.

(3) Upon receipt of the plan submitted by the council of governments, the district shall review and approve the plan if it meets the criteria established by the district pursuant to paragraph (1) and has been submitted pursuant to the schedule established under paragraph (2). If the district determines that the plan does not meet the criteria established pursuant to paragraph (1) or if the plan is not submitted pursuant to the schedule established under paragraph (2), the district shall develop and adopt an alternative plan for transportation control measures.

(e) A district may delegate any function with respect to implementation of transportation control measures to any local agency, if all of the following conditions are met:

(1) The local agency submits to the district an implementation plan which provides adequate resources to adopt and enforce the measures, and the district approves the plan.

(2) The local agency adopts and implements measures at least as stringent as those in the district plan.

(3) The district adopts procedures to review the performance of the local agency in implementing the measures to ensure compliance with the district plan.

(f) A district may revoke an authority granted under this section if it determines that the performance of the local agency is in violation of this section or otherwise inadequate to implement the district plan.

(g) For purposes of this section, "transportation control measures" means any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions.

Definition
Overall plan requirements for moderate areas:

40918. (a) Each district with moderate air pollution shall, to the extent necessary to meet the requirements of the plan developed pursuant to Section 40913, include the following measures in its attainment plan:

(1) A permitting program designed to achieve no net increase in emissions of nonattainment pollutants or their precursors from new or modified stationary sources which emit or have the potential to emit 25 tons per year or more of nonattainment pollutants or their precursors.

(2) Reasonably available control technology for all existing sources.

(3) Reasonably available transportation control measures.

(4) Provisions to develop area source and indirect source control programs.

(5) Provisions to develop and maintain an emissions inventory system to enable analysis and progress reporting and a commitment to develop other analytical techniques to carry out its responsibilities pursuant to subdivision (b) of Section 40924.

(6) Provisions for public education programs to promote actions to reduce emissions from transportation and areawide sources.

(b) A district’s air pollution is moderate if the state board finds and determines that the district can attain and maintain the applicable state standard by not later than December 31, 1994.

Plan requirements for serious areas:

40919. (a) Each district with serious air pollution shall, to the extent necessary to meet the requirements of the plan adopted pursuant to Section 40913, include the following measures in its attainment plan:

(1) All measures required for moderate nonattainment areas, as specified in Section 40918.

(2) A permitting program designed to achieve no net increase in emissions of nonattainment pollutants or their precursors from all permitted new or modified stationary sources.

(3) Transportation control measures to substantially reduce the rate of increase in passenger vehicle trips and miles traveled per trip.

(4) A requirement for the application of the best available retrofit control technology, as defined in Section 40406, to existing stationary sources.

(b) A district’s air pollution is serious if the state board finds and determines that the district cannot attain and maintain the applicable state standard until after December 31, 1994, but can attain and maintain the standard by not later than December 31, 1997.
Plan requirements for severe areas:

40920. (a) Each district with severe air pollution shall, to the extent necessary to meet the requirements of Section 40913, include the following measures in its attainment plan:

(1) All measures required for moderate and serious nonattainment areas, as specified in Sections 49018 and 40919.

(2) Transportation control measures to achieve an average during weekday commute hours of 1.5 or more persons per passenger vehicle by 1999, and no net increase in vehicle emissions after 1997.

(3) Measures to achieve the use of a significant number of low-emission motor vehicles by operators of motor vehicle fleets.

(4) Measures sufficient to reduce overall population exposure to ambient pollutant levels in excess of the standard by at least 25 percent by December 31, 1994, 40 percent by December 31, 1997, and 50 percent by December 31, 2000, based on average per capita exposure and the severity of the exceedences, so as to minimize health impacts, using the average level of exposure experienced during 1986 through 1988 as the baseline.

(b) A district’s air pollution is severe if the state board finds and determines that the district cannot attain and maintain the applicable state standard until after December 31, 1997, or is unable to identify an attainment date.
(g) A district may adopt, by regulation, a schedule of fees to be assessed on areawide or indirect sources of emissions which are regulated, but for which permits are not issued, by the district to recover the costs of district programs related to these sources.
Trucking Guidelines:

40717.5. (a) The state board, the Business, Transportation and Housing Agency, and the Department of the California Highway Patrol, using existing resources, shall jointly establish a technical advisory group which shall include, but not be limited to, representatives of the trucking industry, organized labor, shippers, retailers, and districts for the purpose of developing model guidelines and procedures for traffic control measures affecting heavy-duty trucks for use by districts. The technical advisory group shall consult with any interested person or entity in developing the model guidelines and procedures.

(b) The model guidelines and procedures shall, among other things, take into account any requirements of federal or state law which affect safety of operation of heavy-duty trucks, which require heavy-duty trucks and drivers to operate at certain times of day for the protection of public health and safety, and which are established under Section 25633 of the Business and Professions Code.

(c) Upon completion of the model guidelines by the technical advisory group established under subdivision (a), every district shall review and consider the model guidelines and procedures prior to adopting or revising any regulation imposing traffic control measures for heavy-duty trucks.

(d) This section does not apply to the south coast district, and nothing in this section limits or abridges the authority of the south coast district to adopt regulations affecting heavy-duty trucks pursuant to Section 40447.5.
Related requirements which apply to control programs in including transportation:

- cost effectiveness

40922. (a) Each plan prepared pursuant to this chapter shall include an assessment of the cost effectiveness of available and proposed control measures and shall contain a list which ranks the control measures from the least cost-effective to the most cost-effective.

(b) In developing an adoption and implementation schedule for a specific control measure, the district shall consider the relative cost effectiveness of the measure, as determined under subdivision (a), as well as other factors including, but not limited to, technological feasibility, total emission reduction potential, the rate of reduction, public acceptability, and enforceability.

- uniformity

41503. (a) Within 12 months of receiving each district's attainment plan developed pursuant to Section 40911, the state board shall determine whether the attainment date specified in the plan represents the earliest practicable date and whether the measures contained in the plan are sufficient to achieve and maintain state ambient air quality standards.

(b) Where regional air pollution is involved, the state board shall conduct its review to include the plans of every district in the air basin, and shall determine whether the combination of measures in all the plans is sufficient to achieve and maintain state ambient air quality standards throughout the air basin. The state board shall hold at least one public hearing in each affected air basin prior to reaching a final determination of the sufficiency of the plans. The state board shall require control measures for the same emission sources to be uniform throughout the air basin to the maximum extent feasible, unless a district demonstrates to the satisfaction of the state board that adoption of the measure within its jurisdiction is not necessary to achieve or maintain the state ambient air quality standard.
APPENDIX B

A REVIEW OF ROLES AND RESPONSIBILITIES
by Donna Lott

Air Quality Management/Air Pollution Control Districts

Districts were given added responsibility for transportation control measure (TCM) programs in the Act. They must set a goal for emission reduction from the transportation system operations, develop and adopt a TCM action plan to achieve the reduction, and report annually to the Air Resources Board on what has been done.

The existing authority of districts to adopt indirect and area source controls was reinforced by addressing them in the Act as measures to be included, to the extent necessary to achieve state standards, in future California Clean Air Act plans for all nonattainment areas.

In general, districts have not been extensively involved in the transportation planning process. However, the new goals for emission reductions based on changing existing travel behavior will require new strategies. Districts will need to work closely with the many state, local, and regional agencies that provide transportation planning, funding, and services to meet the performance standards.

Successful implementation of transportation and indirect source control programs will depend heavily on the cooperation of cities and counties. Coordination of regionwide efforts to help local governments adopt effective TCM action plans, might be delegated to councils of governments (COGs) and supported in their overall work plan with district revenues.

Councils of Governments

The relationships between districts and COGs in developing and implementing the TCM goals for emission reductions were defined with slight variations in the Act. Generally, where districts and COGs have worked together on previous TCM planning, this planning process is continued. However, districts must find that the TCM plan meets the agreed criteria and that it is submitted as scheduled before approving it. If problems exist with the initial plan and an adequate plan is not re-submitted within 45 days after notification, the district must develop, adopt, and enforce an alternative plan for transportation control measures.

Under federal and state transportation law, many important roles and responsibilities are delegated to COGs in their role as regional transportation planning agencies (RTPAs). When acting as a RTPA, COGs distribute state and federal transportation funds to cities and counties,
and they prepare and update several required transportation documents, including regional transportation plans and regional transportation improvement programs.

Important for air quality is the RTPA responsibility for making findings of conformity with the state implementation plan for projects, including plans and implementation programs which require federal approvals or financial assistance. All new sewer and transportation facilities must meet this criteria.

**City and County Government**

While the Act is silent on the expected role of cities and counties in meeting regional emission reduction goals, it is clear that their support is critical to the success of these plans. Local governments have the responsibility for making decisions regarding local land uses, conditions of development, and permits for construction and ongoing operations. The Act supports this long-established principle, while requiring review of possible emission reductions from district control of indirect and area sources where they may be needed to achieve the Act's goals.

The decisions made by cities and counties impact the Act's planning. Counties receive a share of state and federal transportation funds for streets, roadways, and transit services. In addition, in some counties, transportation authorities have been created to administer funds from county sales tax overrides. New congestion management plans may also be established in 1990.

**Transit Districts**

The Act does not define a role for transit providers, but their active participation will be an important factor. It is suggested that transit agencies adopt long term plans that are consistent with applicable air quality plans. As an example, Southern California Regional Transit adopted the same performance goal for increases in work and non-work transit use that were previously included in regional air quality, mobility, and growth management plans.

Transit agencies and districts can both gain by developing a close working relationship in the review of major projects. Joint benefits can occur when both agencies request the same type of mitigation measures to reduce negative impacts of the proposal.

**California Air Resources Board**

The Act assigns the general oversight role and a number of specific responsibilities to the California Air Resources Board (ARB). Transportation-related duties include the review and approval of the planning and implementation steps described in these TCM guidelines.
Identification of "reasonably available transportation control measures," in cooperation with districts, COGs, and other interested parties, will be an ongoing task. Serving as a state clearinghouse for new ideas, the ARB will provide leadership in developing model rules and procedures to implement TCM plans.

Coordination between the ARB and other state agencies in policy and technical areas has been increased to seek solutions to joint growth-related problems, including increased vehicle emissions, traffic congestion, and fuel use related to growing travel demand.

The ARB also works with federal agencies that have responsibilities for air quality and transportation in the State of California. Regional offices of the Environmental Protection Agency (EPA; Region IX) review major transportation and sewer projects for conformance with California's State Implementation Plan. Regional offices of the Federal Highway Administration (FHWA) oversee federal transportation fund use.

California Department of Transportation (Caltrans) and California Transportation Commission (CTC)

The Act requires the Business, Transportation and Housing Agency, together with the ARB and the California Highway Patrol, to establish a broadly-based technical advisory committee for the purpose of developing model guidelines and procedures for traffic control measures affecting heavy-duty trucks for use by districts.

The Act does not address the role of Caltrans in developing, approving, and implementing the transportation control measures, although other state statutes do so. Therefore, communication between the ARB, Caltrans, and the CTC will need to be an ongoing process in attaining the Act's emission reduction objectives.

The roles and responsibilities of all transportation planning agencies are based on a variety of state and federal laws. The package of state transportation funding legislation approved in 1989 made changes to the structure and programs as well.

California Energy Commission

No role or responsibility for the California Energy Commission is defined in the Act. However, many actions taken to conserve fuel also result in reduced vehicle emissions. Ongoing contacts among energy, air quality, and transportation agencies, such as the interagency activities of the Transportation-Air Quality Review Group (TARG), build on this existing community of interest.
APPENDIX C

ISSUE PAPER - A MODIFIED APPROACH FOR TRANSPORTATION STRATEGY DEVELOPMENT
by Pam Burmich

To meet the performance standards set forth in the Act (1.5 average vehicle occupancy by 1999 and no net increase in vehicle emissions after 1997), an expanded transportation and air quality planning effort is needed. This planning will need to include both the integration of transportation and air quality planning concerns and a process that focuses on results in reducing air pollution emissions as an inherent part of the transportation planning process. A targeted approach is needed. This issue paper provides suggestions as to how to accomplish this.

What changes are needed in transportation control strategy development?

In past transportation and air quality planning efforts, energy has been diluted by the "shopping list" approach to transportation control measure (TCM) implementation. Choosing TCMs from a virtually unlimited list of possibilities has proven to be unfocused and unsuccessful in affecting the behavior changes necessary to reduce vehicle usage.

Transportation control measures that are most likely to be effective as air quality controls, generally focus on people movement rather than vehicle movement. In addition, strategies which combine measures, in many cases, increase the overall effectiveness of the individual measures through their synergistic packaging. One such example is the provision of high occupancy vehicle (HOV) lanes and increased transit along a specific corridor in combination with parking pricing at attractor sites. The continuing challenge is to design a TCM strategy that is truly targeted to reduce vehicle emissions, while at the same time increase or maintain mobility and be politically viable.

How can TCM development be targeted to maximize emission reductions?

One suggestion for prioritizing TCM development to maximize emission reductions is to first, identify a particular trip purpose with a relatively high potential for emission reductions, and second, package TCMs to effect a change in the travel behavior relating to that trip purpose. The following steps are suggested:

1. Determine the percent of travel/trips for each trip purpose and estimate current mode of travel.

2. Give priority to the trip purposes with highest percentage of associated trips.
3. Consider feasibility of influencing mode choice for each trip purpose.

4. Choose trip purpose with the highest potential for trip reductions.

5. Identify packages of TCMs designed specifically to influence mode shift for chosen trip purpose.

An example of this approach is discussed here. This example uses trip purpose numbers generated in The 1976-1980 Statewide Travel Survey for the Southern California region prepared by Caltrans. (Regional transportation planning agencies may have more recent statistics on the nature of local travel that better reflect current travel behavior.)

Percent Trips by Trip Purpose
Two Directional (Out of 100%)

<table>
<thead>
<tr>
<th>Trips</th>
<th>% Trips</th>
</tr>
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<tbody>
<tr>
<td>Home to work/work-related</td>
<td>26</td>
</tr>
<tr>
<td>Home to other</td>
<td>17</td>
</tr>
<tr>
<td>Home to shop</td>
<td>11</td>
</tr>
<tr>
<td>Work to work-related</td>
<td>7</td>
</tr>
<tr>
<td>Home to social/entertainment</td>
<td>6</td>
</tr>
<tr>
<td>Home to education</td>
<td>5</td>
</tr>
<tr>
<td>Work/work-related to other</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>76</td>
</tr>
</tbody>
</table>

Out of 49 possible trip types (see Table C.1), the top 7 are shown above. The category with the highest percentage of trips is the home to work/work-related. Second is home to other and so on. (The "other" category includes family business, such as banking, medical and dental appointments, and lunches.)

Employee trips between home and either work or work-related sites are a preferred emission reduction "pot." Commute trips represent approximately one-fourth of all daily trips in California.

The South Coast Air Quality Management District's Regulation 15 is designed to target this pot of emissions. This regulation requires employers to design programs to reduce vehicle emissions from employee commute trips. The combination of incentives and services provided by employers in meeting the requirements of this regulation, accompanied with HOV system planning, strategic parking management, and provision of public transit, constitutes a focused effort to change travel behavior for the home to work trip.

It may be worthwhile to expand the focus of employer based trip reduction measures to consider ways to influence both the work to work-related (7%) and the work to other (4%) trips. Provision of services on-site or within walking distance can help to reduce travel from these trip types.
Table C.1  

**WEEKDAY DRIVER TRIP PURPOSE INTERCHANGES**  

**SCAG REGION**

<table>
<thead>
<tr>
<th>Trip Purpose From (Percent)</th>
<th>TRIP PURPOSE TO (PERCENT)</th>
<th>Home</th>
<th>Work Place</th>
<th>Work Related Business</th>
<th>Social/Entertainment</th>
<th>Recreation</th>
<th>Shopping</th>
<th>Education</th>
<th>Other</th>
<th>Total From</th>
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</thead>
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<tr>
<td>Home</td>
<td></td>
<td>0.4</td>
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<td>2.3</td>
<td>2.7</td>
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<td>0.6</td>
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<td>0.0</td>
<td>0.3</td>
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<td>Shopping</td>
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<td>0.1</td>
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<td>1.1</td>
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<tr>
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<td>0.1</td>
<td>0.2</td>
<td>0.0</td>
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<td>0.2</td>
<td>0.5</td>
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</tr>
<tr>
<td>Other</td>
<td></td>
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<td>1.2</td>
<td>0.4</td>
<td>0.9</td>
<td>0.3</td>
<td>2.2</td>
<td>0.4</td>
<td>3.8</td>
<td>17.3</td>
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<td>Total To</td>
<td></td>
<td>34.4</td>
<td>16.1</td>
<td>8.2</td>
<td>6.5</td>
<td>2.4</td>
<td>11.1</td>
<td>3.9</td>
<td>17.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

*Data for "Change Travel Mode" and "Serve Passenger" trip purposes was not collected during the 1976 SCAG Survey.*

The home to other trip purpose is second in volume, 17%. Mixed land use and the pedestrian pocket concept are examples of possible TCMs for impacting this interchange.

Home to shop trips are 11% and third in volume according to the chart. These trips are difficult to influence. Shoppers often have carry-ons that are difficult to manage on alternative modes of travel. Thoughtful siting of major shopping centers to reduce trip length and strengthening transit access are ways to reduce emissions in this category.

Another trip type worth examining is the home to education trip. There is a need to examine the policies of school districts and other large educational institutions and how they affect trip-making patterns. Provision of school buses, shuttles, and organized ridesharing to alleviate single occupant student trips, as well as parent chauffeur trips are ways to reduce emissions in this category.

How should targets be defined?

We suggest that targets be defined in terms of both emission reductions and transportation activity indicators. They should be phased short term and long term. They should be designed to guide control development and also to meet specific requirements in the Act, such as the 1.5 persons per vehicle requirement.

**Short and Long Term**

Targets should be defined for both long and short term reductions in emissions and vehicle activity. Targets can also be set for specific portions of the transportation system, as well as for individual users of the system. Setting average driver targets can help bring an understanding of transportation control efforts to the public.

Long term goals will relate the attainment date set forth in the plan and for maintenance beyond. If attainment is not projected before 1997, interim milestone targets should also be set.

Short term targets should be set in one to three year periods, whichever suits local planning efforts the best. The short term targets are a gauge for monitoring interim progress.

**Vehicle Trips and Vehicle Miles Traveled (VMT)**

The Act's requirement for severe areas to substantially reduce the rate of vehicle travel (trips and VMT) is one of the requirements for both serious and severe areas.

For the past 20 years, population growth in California has increased at roughly 2-1/2% per year, while VMT has increased at roughly 5% per year. Thus, if VMT were held to an equal rate of increase with population, the current rate of growth for VMT would be cut in half. Holding VMT to a 2-1/2% increase per year is a "substantial" reduction in that rate and would
effectively meet the requirements of the Act. Districts that plan for
greater than 2-1/2% increase in VMT may not be meeting the "challenge"
criteria that is intended by the Act.

Emission reduction targets should be tempered with achievable expectations
that reflect reasonable, yet aggressive, progress towards attainment and are
in conjunction with meeting an overall 5% emission reduction per year from
all sources (H&SC Section 40914(a)).

Vehicle Emissions

No net increase in vehicle emissions is a target that is the combined result
of the achievement of the above vehicle activity reductions and emission
reductions resulting from the ARB's motor vehicle control program.

Examples of Targets

Targets should be simple to understand and also relate to personal travel.
Where possible, it is preferable to choose numbers that can be easily
remembered such as 10%, rather than 11.4%, for example. A big part of the
TCM effort will be to transfer awareness and recognition to decision makers
and the general public.

The following are examples of emission and vehicle activity reduction
targets which address the various performance standards:

Reduce 1987 vehicle emissions 50% by 1995
Reduce 1987 vehicle emissions 65% by 1999

Hold annual VMT increase to 2-1/2% (rate of population increase)
Reduce projected VMT for 1995 by 20%
Reduce projected VMT for 1999 by 30%

Hold annual increase in trips to 2-1/2%
Reduce projected trips for 1995 by 15%
Reduce projected trips for 1999 by 25%

Achieve 1.4 persons per vehicle (commute hour) by 1995
Achieve 1.5 persons per vehicle (commute hour) by 1999

Reduce trips per driver (SOV) 10% over 3 years
Reduce trips per driver (SOV) 20% over 10 years

These more general targets can be distributed over trip types to guide the
control measures development process. For example:

Achieve 20% reduction in VMT by:

Reducing work trips (SOV) 40%
Reducing school trips 40%
Reducing shop trips 10%
Reducing family business trips 20%
... etc.
Recent transportation legislation contains new objectives for transportation planning. Some of these relate to congestion management programs and include "level of service" standards for roadways, performance standards for public transit, etc. Air pollution control districts will need to coordinate with these efforts to insure that the transit ridership, transit access, and trip reduction objectives in these programs are consistent with and supportive of the air quality strategy.

What are suggested steps to take in setting targets?

Step 1: Districts, COGs, and transportation agencies work together to determine the nature of existing and projected travel for their locality.

Step 2: Based on best available information and staff opinion, districts, in coordination with COGs and transportation agencies, set short and long range targets for emissions from transportation sources with translations into VMT and trip reduction numbers.

Step 3: Districts, COGs, and transportation agencies test the targets by considering the following:

Are targets reasonable?

Are targets challenging?

Are targets simple to understand and transfer to the public?

How do the targets relate to achieving the standards?

How do the targets relate to other transportation goals and policies for the area?

How do the targets relate to growth?

Step 4: Adjust targets.

Step 5: Gain the support of decision makers and the public.

Step 6: Adjust targets as new data is made available and measures are tested and monitored.

Why are targets needed?

Emission reduction targets for transportation sources of pollution are important to regional air quality planning for two major reasons: first, to establish expectation and second, to gain public support and awareness.

The persistence of air pollution in major urban areas demands that a systematic, focused effort be made to reduce emissions from the transportation sector. Targets establish expectations and set the tone for
action. Targets paint a picture of a future that breaks free from past
trends. Targets establish the opportunity to monitor progress and redirect
future efforts to increase effectiveness in cleaning the air and providing
mobility.

Emission and activity targets for transportation sources provide an
important mechanism for educating the public on the severity of air
pollution and mobility needs in their locality and are essential to gain
public support for implementing critical transportation measures. All
areas of the state subject to the transportation requirements of the Act are
required to provide public education programs (H&SC Section 40918(6)).

It is also important to remember that targets to reduce air pollution
emissions are, by their nature, consistent with and supportive to mobility
and energy conservation targets.
APPENDIX D

BIBLIOGRAPHY


