

Incentives for Healthy Communities



THE INDIRECT SOURCE RULE
FOR THE SAN JOAQUIN VALLEY
AND ITS PROMISE OF CLEANER AIR

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ENVIRONMENTAL DEFENSE

finding the ways that work

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Executive summary

The San Joaquin Valley is currently enjoying a population and economic boom. But these developments could be compromised by the congestion and pollution that an increase in people and traffic brings. Recent history provides a hint of what is to come. In just 20 years, from 1980 to 2000, the region's population increased by 60% and daily vehicle miles traveled (VMT) in the region grew by 150%.¹ By 2040, the region's population is expected to double to about 7 million.² This would amount to dropping ten new Fresnos into the Valley. The lack of any clear policy for addressing this growth threatens to turn the San Joaquin Valley into another San Fernando Valley disorganized, congested sprawl where any gains in air quality are threatened by new growth and traffic.

But this need not be the Valley's future. Proper planning using sensible market incentives can manage growth in ways that create more travel choices, save money, build healthier communities and boost the economy. But this can happen only if civic and business leaders unite

behind such goals. Fortunately, a new air pollution control strategy, known as an *indirect source rule* (ISR), can help. ISRs work by limiting the indirect emissions from new developments. Indirect emissions include air pollution from automobile traffic attracted to the new development; energy demand from new homes and businesses; and pollution from construction equipment.

Such a rule first estimates how much indirect emissions will increase over time. This estimate is typically expressed in terms of tons of new pollution. The rule encourages reducing this new pollution at the development itself by promoting measures, such as double-paned windows or a solar water heater, that will cut energy demand. To offset the remaining emissions that the developer either cannot or does not want to address on site, the rule applies well-calibrated impact fees that will pay for offsite pollution reductions.

Several air districts in California are exploring ISRs to cut air pollution while still meeting housing and job needs. The San Joaquin Valley Air Pollution Con-



trol District is among these. It released a legislatively mandated ISR proposal in June called DESIGN (Decreasing Emissions' Significant Impact from Growth and New development). Unfortunately, the proposed rule falls short. It seeks to reduce NO_x pollution by just 4.1 tons per day, even though vehicle NO_x emissions are expected to increase by 25 tons per day by 2010.

If the San Joaquin Valley air district's ISR is to be effective, its goal should be *full* mitigation of the air pollution associated with new development. This is an achievable objective for which there is legal authority.

The air district's proposed rule can be improved. If well designed, such a rule will provide means for low-cost compliance and generate substantial long-term health benefits, travel time reductions, and energy cost savings for consumers, home buyers and residents, while boosting the economic vitality of the San Joaquin Valley. To achieve the greatest benefit, we recommend that the district's proposed rule be redrafted to do the following:

- 1.** Fully mitigate the most health-threatening indirect source pollutants. This means including oxides of nitrogen, particulate matter (PM₁₀ and PM_{2.5}), and reactive organic gases (ROG), in the rule.
- 2.** Extend the mitigation to 30 years to more faithfully reflect the life of the development project. Recognize that

developments have variations in emissions over their lives, include that variation in emissions modeling, and review actual emissions periodically.

- 3.** Ensure that mitigation measures, especially off-site mitigation measures, provide permanent reductions in pollution. In some cases, it may be necessary to sequence shorter-term measures with other shorter- or longer-term measures to ensure permanent mitigation.

- 4.** Develop longer-term measures, including those improving transportation choices, with mitigation funds. In considering the best uses of the mitigation funds, the district should engage the public, local government and other agencies. Ensure proper oversight and transparency. The ISR will only work if the public has confidence that it is being administered effectively. Building that confidence requires that there be timely public access to the information used to calculate emissions or mitigation or fees. Additionally, decisions about how fees are used must include the public, and accounting of those fees must be easily available.

- 5.** Reveal the benefits of the program by revealing the health and other costs air pollution creates in the San Joaquin Valley. Socioeconomic analyses must include the economic impacts poor air has on the Valley's businesses and residents.

Introduction

One of the greatest barriers to healthy air quality in the San Joaquin Valley is rapid growth and the vehicle pollution that growth creates. Recent history provides a hint of what is to come. In just 20 years, from 1980 to 2000, the region's population increased by 60% and daily vehicle miles traveled (VMT) in the region grew by 150%.³ The increase in miles driven offsets the pollution reductions gained from the shift to cleaner motor vehicles and fuels. In 2003, for example, although the average new car sold in California was 75% less polluting than 1994 models, mobile sources still accounted for 69% of nitrogen oxide (NO_x) emissions in the San Joaquin Air District.⁴ And miles driven continue to soar, increasing 9% between 1999 and 2002, with an additional 27% increase expected by 2010.⁵

By 2040, the region's population is expected to double to about 7 million.⁶ This would amount to dropping ten new Fresno's into the Valley. If current planning trends continue—with no clear policy addressing growth-induced pollution and traffic increases—then the San Joaquin Valley will become another San Fernando Valley: disorganized, congested sprawl where any gains in air quality are threatened by new growth and traffic. In addition, this could drive the cost of living in the Valley up while driving the quality of life down. As in other parts of California, as housing starts increase, the amount of broadly affordable housing could decrease, adding to an already strong disparity between the haves and have-nots in a region long suffering from double-digit unemployment.

But this need not be the Valley's future. With the adoption of sensible market incentives, planning and accountability,

robust growth could be managed in ways that would give people more and better choices, save money, create healthier communities and boost the economy. However, this can happen only if civic and business leaders unite behind such goals and support measures that will help ensure that future growth reinforces, rather than undermines, those goals.

Residents of the San Joaquin Valley are clearly aware of these challenges. In a 2004 Central Valley survey, the Public Policy Institute of California determined that:

Since 1999, concern over traffic congestion has nearly doubled from 23% to 44%. Air pollution—viewed as the Valley's most important issue—is now considered a big problem by 45% of the population, up from 28% in 1999. Furthermore, residents express increasing dissatisfaction with the lack of affordable housing: Positive ratings have fallen from 37% to 19% since 1999.

From among traditional planning agencies and government organizations no clear leadership has emerged to respond effectively to the public's concerns. However, a new air pollution control strategy shows the promise of delivering the kind of leadership and creative thinking needed to ensure a more responsible growth pattern. This strategy, if properly developed and enthusiastically embraced, would:

- preserve farmland and open space;
- encourage revitalization of existing communities;
- reduce vehicle miles traveled and traffic congestion;
- improve opportunities for affordable housing;

- create more transportation and housing choice; and ultimately
- produce permanent solutions to air pollution.

The strategy is an *indirect source rule* (ISR) that mitigates indirect emissions from new developments. Indirect emissions typically include air pollution created by truck and car traffic attracted to a new development; the energy demanded by new homes and businesses for electricity, heating and cooling; and construction equipment used to build the new development. Ideally, an ISR completes three different tasks for each new development.

First, the rule considers the likely change in indirect emissions over time for a land parcel proposed for development. That is, the rule uses reasonable and generally accepted methods, including computer modeling, to estimate how much new car and truck traffic, new energy demand, and new construction a development will generate and how much pollution all of these indirect sources will create. This estimate is typically expressed in terms of new tons of pollution.

Next, the rule encourages maximum onsite mitigation of the new pollution from the indirect sources. Normally, that means a developer is encouraged to do things on the development site that will reduce the amount of pollution from the homes or businesses themselves (the direct sources) and from the indirect sources attracted to those homes or businesses. For instance, to reduce the amount of pollution a new home generates, a developer might install double-paned windows or a solar-powered water heater to cut the home's energy demand. Or, in another example, to reduce the number of pollution-generating car trips that residents make between a new housing development

and a nearby shopping mall, a housing developer might fund an electric shuttle service between the development and the mall.

Finally, for the new development, the ISR applies well-calibrated impact fees to offset the remaining emissions that the developer either cannot or does not want to mitigate on site. A well-functioning ISR ensures that the fees are reasonable, and will pay for a portfolio of offsite pollution cleanup measures that will last at least as long as the development generating the indirect source pollution.

Several air districts in California are exploring ways to use an ISR approach to cut air pollution while still meeting housing and job needs. The San Joaquin Valley Air Pollution Control District is among these.

Under legislative mandate to create such a rule, on June 15, 2005, the San Joaquin Valley Air Pollution Control District released a draft proposal for an ISR which it calls the DESIGN (Decreasing Emissions' Significant Impact from Growth and New development) Program. As the Air District's *Extreme Ozone Attainment Plan* for the San Joaquin Valley noted in October 2004:

Although tailpipe emissions per vehicle are declining, growth in travel related to new development is projected to cause an additional 25 tons/day of NO_x emissions that would not be emitted if the growth did not occur. This means that the mobile source program is inadequate to do the job by the mandated 2010 attainment date and that additional reductions are needed. The indirect source program can provide some of the emissions reductions to offset growth.⁷

The draft ISR proposed by the Air District in June 2005 falls far short of fully offsetting the 25 tons per day of



MICHAEL REPOGLE

Bicycle parking and pedestrian-friendly sidewalks help reduce air pollution.

NO_x emissions—seeking to reduce these by only 4.1 tons per day, or by less than 20%. Nevertheless, the draft establishes a valuable framework that can be enhanced as the ISR moves towards adoption.

To achieve the greatest benefit, we recommend that the district's proposed rule be redrafted to do the following:

1. Fully mitigate the most health-threatening indirect source pollutants. This means including oxides of nitrogen, particulate matter (PM₁₀ and PM_{2.5}), and reactive organic gases (ROG), in the rule.
2. Extend the mitigation to 30 years to more faithfully reflect the life of the development project. Recognize that developments have variations in emissions over their lives, include that variation in emissions modeling, and review actual emissions periodically.
3. Ensure that mitigation measures, especially off-site mitigation measures, provide permanent reductions in pollu-

tion. In some cases, it may be necessary to sequence shorter-term measures with other shorter- or longer-term measures to ensure permanent mitigation.

4. Develop longer-term measures, including those improving transportation choices, with mitigation funds. In considering the best uses of the mitigation funds, the district should engage the public, local government and other agencies. Ensure proper oversight and transparency. The ISR will only work if the public has confidence that it is being administered effectively. Building that confidence requires that there be timely public access to the information used to calculate emissions or mitigation or fees. Additionally, decisions about how fees are used must include the public, and accounting of those fees must be easily available.

5. Reveal the benefits of the program by revealing the health and other costs air pollution creates in the San Joaquin Valley. Socioeconomic analyses must include the economic impacts that poor air has on the Valley's businesses and residents.

If the San Joaquin Valley air district's ISR is to be fully effective, its main goal should be *full* mitigation of the air pollution associated with new development. This is an achievable objective for which there is legal authority. If well designed, such a rule will provide means for low-cost compliance for the development industry and generate substantial long-term health benefits, travel time reductions, and energy cost savings for consumers, home buyers and residents, while boosting the economic vitality of the San Joaquin Valley.

A brief history of indirect source rules

Experience with indirect source rules goes back to the early 1970s, when initial efforts were made at the federal, state and local level to link air quality, transportation and land development decisions. In the early 1970s, the United States Environmental Protection Agency (EPA) sought to include ISRs as a common required element in federally mandated air quality control plans, but resistance from the building industry led Congress in 1975 to rescind EPA authority to require such rules in Clean Air Act implementation plans, as the industry saw them as a federal intrusion on local land use powers.

Nonetheless, some states and local jurisdictions voluntarily adopted ISRs as a tool to manage air pollution and traffic congestion and help fund local air pollution reduction programs, including Oregon, Vermont, New York State and Wisconsin. These first-generation ISRs varied in scope, often focusing only on large developments within areas that were in non-attainment of various air pollution standards and on simple impact fee structures not well tied to actual pollution emissions.

The California Clean Air Act of 1988 set stricter air quality standards than the federal act and required non-attainment areas to adopt all reasonably available transportation control measures to reach its goals. From the 1990s on, this led various California air districts to focus on identifying and mitigating indirect air pollution associated with larger-scale land development. Air districts also have authority under the

California Environmental Quality Act (CEQA) to establish conditions for approval of developments that will have significant effects on the environment. Under CEQA, public agencies shall not approve a project unless feasible alternatives are considered and mitigation measures incorporated that would substantially lessen any significant effects on the environment. First-generation ISRs in several air districts arose from intersection of this CEQA mandate and the California Clean Air Act.

These first-generation ISRs, mostly in rural areas, focused on mid-size and larger developments and sought to generate impact fee revenue but not to mitigate fully emissions impacts. For example, the Feather River Air Quality Management District rule, issued in 1998, exempts projects producing less than 25 pounds per day of NO_x or reactive organic gases (ROG) emissions. This is approximately two tons per year of each pollutant, equivalent to the NO_x and ROG emissions of about 100 to 120 homes, respectively.

The challenges of achieving and sustaining healthful air quality in the San Joaquin Valley demand a more effective and comprehensive approach than these first-generation approaches. A second-generation indirect source rule—that creates strong market incentives that enable developers to avoid or fully mitigate the indirect air pollution from new developments—is both achievable and necessary to support sustainable long-term economic growth and community development that protects public health in the Valley.

The impetus for a San Joaquin Valley Indirect Source Rule

As Figures 1 and 2 show, development has a major impact on emissions of particulate matter (PM₁₀, or particles between 2.5 and 10 micrometers) and NO_x in the eight-county San Joaquin Valley Air Pollution Control District. Between 2006 and 2010, PM₁₀ emissions are forecast to grow 51.7 tons/day due to new development, while NO_x

emissions are forecast to grow by 17.3 tons/day, according to the San Joaquin Air District.⁸

NO_x is a key ingredient of ground-level ozone. Ozone is known to reduce lung function and cause or exacerbate a range of heart and lung ailments, including asthma. Particulate matter is also known to cause or exacerbate heart and lung

FIGURE 1
PM₁₀ emissions from growth and development in San Joaquin Air District⁹

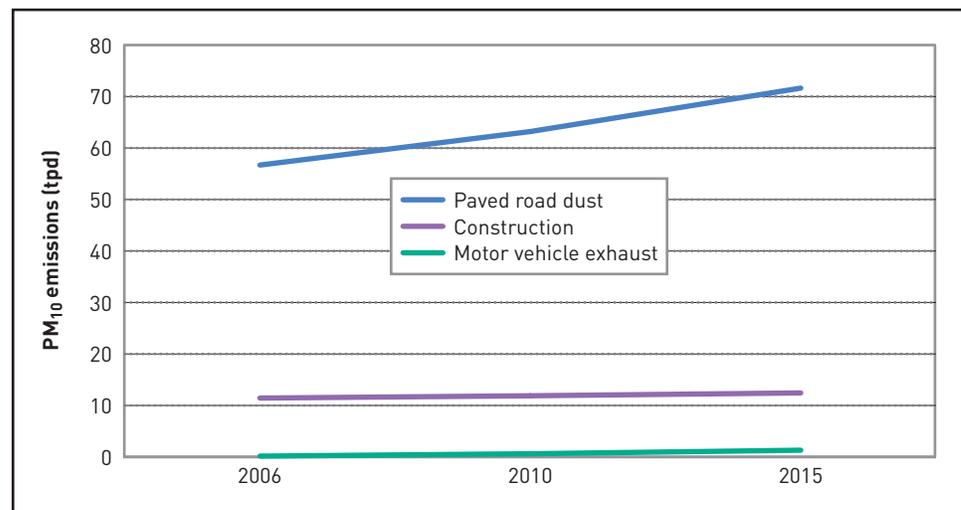
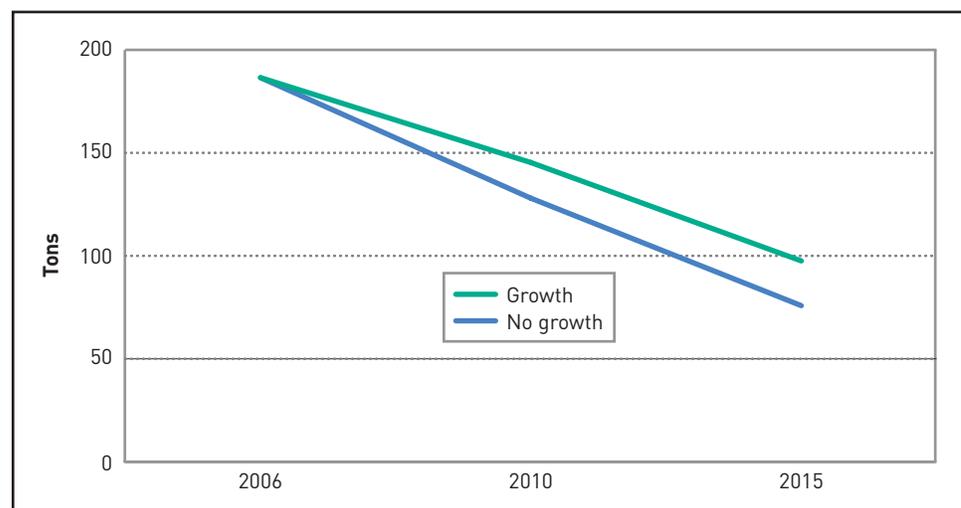


FIGURE 2
Difference in NO_x emissions from all vehicles, San Joaquin Air District





A strong ISR allows new construction and mitigates new pollution.

ailments and is estimated to be responsible for thousands of premature deaths in California each year.¹⁰ The San Joaquin Valley is currently noted for having the worst air quality in the country and is in extreme non-attainment of federal ambient air quality standards for ozone, and serious non-attainment for PM₁₀.

Public health concerns alone would suggest that the San Joaquin Valley Air Pollution Control District would be anxious to use an innovative tool like an ISR to reduce air pollution. But there are other compelling reasons. One is that the Air District has a legal mandate to adopt a strong second-generation ISR to meet state and federal air quality requirements.

In its 2003 PM₁₀ air pollution control plan, the San Joaquin Valley Air Pollution Control District (APCD) committed to adopt an ISR by 2004 to reduce 1.3 tons/day PM₁₀ in 2005, 4.0 tons/day in 2008, and 6.2 tons/day in 2010 in order to meet federal air quality standards.¹¹ The Air District's Extreme Ozone Attainment Demonstration Plan

also contained commitments to reduce indirect source NO_x pollution by 4.0 tons/day.¹² By 2007 the District must prepare a plan to attain the new more stringent federal eight-hour ozone standard and this will require additional deep pollution reductions. More reductions will be needed to plan for attainment of the standard for PM_{2.5} (particles below 2.5 micrometers). Under the California Clean Air Act's severe non-attainment classification for the state ozone standard, the District is required to include "reasonably available transportation control measures sufficient to substantially reduce the rate of increase in passenger vehicle trips and miles traveled per trip..." in its state air quality plans.¹³ Section 40910 of the California Health and Safety Code (CH&SC) requires air pollution control districts in the state to achieve and maintain state ambient air quality standards for ozone, carbon monoxide, sulfur dioxide and nitrogen dioxide at the earliest practicable date.¹⁴

Another legal mandate for this ISR comes from the California Legislature through its adoption of Senate Bill 709, authored by Senator Dean Florez, on September 22, 2003. This bill includes a requirement that the San Joaquin Valley Air Quality Control District adopt "a schedule of fees to be assessed on area-wide or indirect sources of emissions that are regulated, but for which permits are not issued, by the district to recover the costs of district programs related to those sources." The law also says that the fee schedule shall be designed to yield a sum not exceeding the estimated cost of the administering the programs and the cost of "mitigation of emissions."

Progress towards a San Joaquin Indirect Source Rule

The Air District issued a preliminary draft staff report for an indirect source rule in October 2003 in the face of significant opposition, including Building Industry Association threats of legal challenges in court should a rule be adopted. The District proceeded to update technical tools and conduct other analyses, which slowed the rule development. On June 15, 2005, the District posted a new draft staff report and proposed ISR. It held a public workshop on the draft on June 30, and after more revisions, will hold another workshop in September.

Sierra Club challenges to various major developments in Kern County

under CEQA in recent years resulted in settlements that included substantial emissions impact mitigation fees. After being approached by two major developers who were anxious to avoid a similar challenge and project delay, the San Joaquin Valley Air District in April 2005 adopted controversial emissions reduction contract agreements with the two developers. The agreements involve payment to the District of emissions impact fees. These contracts were adopted with little opportunity for public review and comment and without release of the technical assumptions underlying the calculation of the emissions or related impact fees.

An extraordinary opportunity

The indirect source rule process provides an extraordinary opportunity to help the San Joaquin Valley change course. With involvement and encouragement by the general public and other stakeholders, the rule could help shape development patterns and decisions in ways that clean the air and, at the same time, provide other benefits—from better housing to less time in traffic. If the Valley takes advantage of this opportunity, it could lead the way for other air districts across the state to follow and adopt the Air District’s model rule.

The San Joaquin rule could include short- and mid-term emissions strategies such as: replacing dirty diesel engines with cleaner ones, cleanup of dirty construction equipment, improved transit in the city core and rural vanpool services. It could include investment in emissions reduction strategies that produce sustained long-term benefits, such as incentives to expand affordable infill housing developments close to job centers and

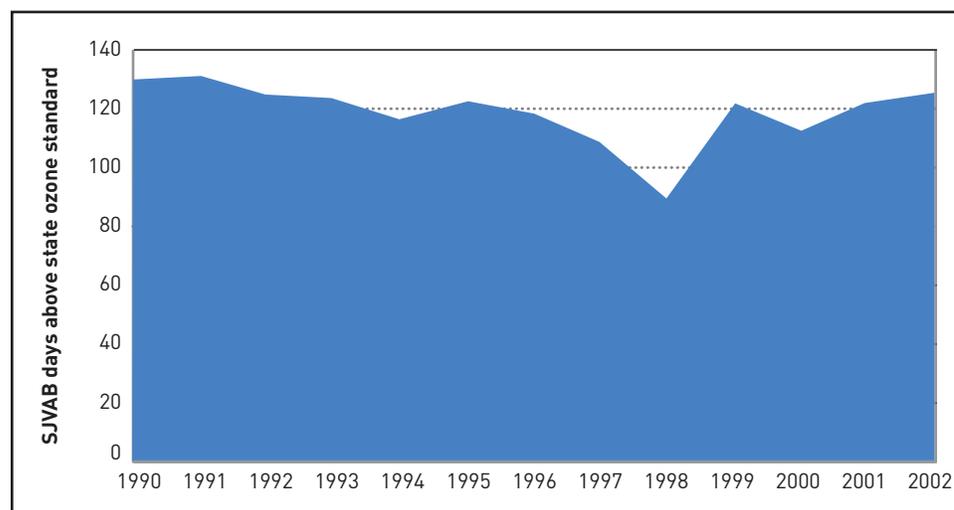
bus rapid transit lines to boost transit use and focus new development.

It could work with the eight separate metropolitan planning organizations and dozens of local jurisdictions to help fund a region-wide transportation planning coordinator to help identify cost-effective economic development and investment opportunities to support job and housing growth with less traffic. Public-private partnerships focused on transportation and emissions management could enable small and large developers alike to cooperate in identifying and marketing least-cost emissions reduction strategies.

The San Joaquin Valley has repeatedly failed to meet federal deadlines and locally adopted goals for attaining healthful air quality for area residents. As Figure 3 shows, smog pollution remains as big a challenge today for public health in the Valley as it did in 1990. If the District adopts a weak ISR that falls short of full emissions mitigation for new development, such

FIGURE 3

San Joaquin Air District’s smog pollution remains as big a problem today as in 1990



failure is likely to be repeated to the detriment of public health, especially for vulnerable populations such as children and the elderly. A weak rule will set back efforts to attract high-paying jobs that will support sustainable and attractive community development.

A well-crafted, strong ISR that fully offsets new emissions would cut the very substantial health and business costs imposed on the Valley by air pollution while expanding travel choices, cutting traffic congestion, and enhancing

the affordability of housing close to jobs. It could also serve as the first step in a region-wide public planning process, similar to those that have succeeded elsewhere in the country, including Salt Lake City, Utah and Sacramento County. The San Joaquin Valley is clearly ripe for such an effort, especially in Fresno County, where community leaders grapple with designing a local transportation funding measure that can win broad public support to pay for new transportation investments.

Winning the greatest benefits

For the San Joaquin Valley ISR to provide more and better choices, save money, create healthier children, families and communities and boost the economy, it is important that the rule be based on several key principles:

1. Full emissions mitigation. The rule should require full mitigation of emissions from new development to support the timely meeting of air quality standards and public health protection. The District should not undermine already adopted federal and state emissions reduction rules, such as more stringent motor vehicle emissions and fuel standards, by allowing the real estate development industry to cancel out these already planned and credited emissions reductions. This would be the effect of indirect source emissions accounting that implicitly gives developers credit for such reductions.

2. Use of best analysis tools and assumptions. Emissions calculations should be based on best available analysis tools and assumptions, such as the URBEMIS model developed by the Air Resources Board and other air districts, complemented with analysis assumptions drawn from and consistent with regional travel models and recent local studies.

3. Use of time-sensitive development lifecycle emissions analysis. Emissions accounting should take note that emissions from developments will vary considerably over time. Although cars and trucks are getting cleaner each year as older vehicles are replaced with newer, cleaner ones, first-year indirect source emissions will still often increase significantly a few years later. This is

because as more residents move in and grow their families, and as commercial and industrial developments attract and expand their markets and activities, traffic increases and emissions grow.

Similarly, the effectiveness of most emissions mitigation strategies cannot be treated as a constant. Effectiveness varies over time. Some strategies, such as replacing a dirty diesel agricultural pump with a new clean pump, produce a big initial benefit that will disappear at some point in the future. Other strategies, such as developing a new bus rapid transit line to attract new transit riders and spur less car-dependent community development, produce only modest emissions reduction benefits in their early years but can accrue ever-growing emissions reduction benefits over a long period of time.

4. Timely public oversight of analysis. Emissions accounting should be transparent and available for timely independent oversight and public comment to ensure the integrity of the ISR and confidence of the public and development community in the administration of emissions accounting and mitigation funding. Documentation of how emissions have been estimated for any development should be sufficiently clear that any competent outside independent auditor could understand the assumptions and methods well enough to replicate the analysis.

5. Encouragement for regional and community-based traffic and emissions management public-private partnerships. Many opportunities for the most cost-effective long-term emissions avoidance can be found only through better regional business and government

cooperation to explore smart growth and transportation management strategies, as is being done through the Sacramento Regional Blueprint process. The emissions analysis techniques of the ISR could be applied to evaluate the general plans of cities and counties and to identify benefits in emissions avoidance that could result from better balancing job and housing growth at different income and affordability levels and fostering increased travel choices. Such regional travel model sensitivity analysis should be used to produce small area-specific adjustment factors to the URBEMIS model where opportunities for extra emissions reduction crediting may be appropriate, such as for urban infill housing in areas with too little housing near a major job center.

Other opportunities lie at the community level in mechanisms like transportation management associations that help employers expand commuting options for their employees, manage parking supply and prices, improve conditions for pedestrians and cyclists, sponsor improved transit and vanpool services, and foster market-incentive and marketing based approaches to reducing traffic growth.¹⁵ The ISR should help support widespread availability of these approaches and provide a framework to enable small developers to gain technical assistance and participate in these initiatives to mitigate small project development emissions with minimum administrative cost and hassle.

6. Support emissions mitigation from small developments with simplified community-based compliance programs.

A simplified and flexible approach should apply to all projects smaller than the exemption thresholds for the full

ISR. Smaller projects should be exempt from more detailed analysis required for larger developments, but should still be required to incorporate all feasible on-site mitigation strategies identified in checklists tailored to the type of development and its location, and to make a contribution to offsite mitigation, with credits available for exemplary onsite mitigation and participation in transportation management district agreements, where available.¹⁶ Urban infill projects below the full ISR thresholds that contribute to meeting affordable housing needs close to job-rich areas or that contribute to employment creation in low-income, high-unemployment neighborhoods might be exempted from further ISR emissions mitigation requirements.

7. Fully account for costs and benefits in developing and administering the rule.

Dirty air and few or no transportation choices carry large hidden costs to public health, the environment, natural resources and communities. A sound ISR will take these costs into account and help make them explicit. It will not consider only the development industry's direct costs of compliance with the rule but also the fiscal, economic and societal benefits of changes brought about by the rule. These changes could include more compact mixed-use development; an improved local job-housing balance that increases the availability of affordable housing near job centers; reduced transportation costs for residents with more travel choices and less need to travel long distances daily; and reduced travel time, which means higher productivity and more time with family and friends.

Improving the San Joaquin Valley proposal

The draft ISR released for comment by the San Joaquin Air District in late June 2005 lays an important framework for future action. The proposal is a good foundation for crafting a stronger rule that better incorporates the principles discussed above.

Create full emissions mitigation

The June 2005 draft rule takes a sound approach to mitigation of PM₁₀ construction-related emissions—that should be applied more broadly: 100% mitigation. But in several other key respects, the proposed rule would fall far short of full emissions mitigation. The proposed rule seeks to exempt from mitigation requirements two-thirds of total project indirect source NO_x emissions, half of PM₁₀ emissions, and all indirect source emissions after the tenth year of a development project.

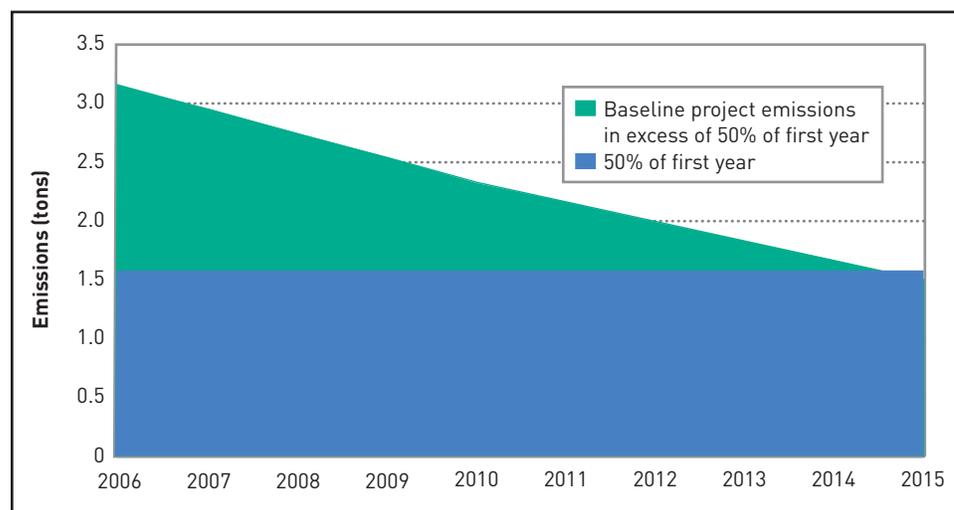
The proposal exempts from mitigation requirements two-thirds of total project NO_x emissions during the first ten years, as illustrated in Figure 4.

The developer would be required to do onsite or offsite mitigation or purchase mitigation credits only sufficient to offset pollution represented by the light area, representing one-third of the first ten years of total indirect source emissions.

The indirect source emissions represented by the dark colored area constitute two-thirds of the unmitigated project indirect source emissions that would be produced over the first ten years and that would not be subject to emissions reduction or mitigation requirements. The project's indirect source emissions after the tenth year would not be subject to any accounting or mitigation whatsoever. The exemption of these emissions from the rule appears to be arbitrary and capricious. The discussion of this discounting in the June 2005 draft ISR fails to justify properly the exemption of these emissions. All that the staff draft says is:

Since the majority of the NO_x emissions associated with a project are due to motor

FIGURE 4
NO_x project emissions and reductions compared to 50% of first-year emissions



vehicles, there is a decline in NO_x emissions over time due to ARB's tailpipe controls. The primary concept for the NO_x mitigation fee is that annual NO_x emissions from motor vehicles declines 50% over ten years. Thus the rule requires mitigation of the cumulative NO_x emissions in excess of 50% of the projects first-year baseline emissions until the project's baseline emissions reaches half of the project's first-year baseline emissions, which is approximately 10 years.¹⁷

This justification implicitly gives credit to developers in advance for the cleaner fuel and vehicle programs mandated under already-adopted state and federal rules as these take effect and older, dirtier motor vehicles wear out and are replaced by newer, cleaner vehicles. It argues that, because newer cars are cleaner, after ten years their emissions should not matter. However, after ten years the project's indirect source emissions will continue at half the level of ten years earlier, contributing to the challenge of attainment and maintenance of national and state air quality standards, which today by far remain unmet. Moreover, motor vehicle fleet turnover assumptions may not be realized if consumers and businesses hold onto older, dirtier vehicles longer than anticipated in the emissions modeling—a problem that has contributed to past failures of air quality control plans.

The proposed San Joaquin Valley ISR also requires mitigation of only half of the first-year operational PM₁₀ emissions from a project for the first ten years of the project, plus full mitigation of construction-related PM₁₀ emissions. It thus exempts developers from any mitigation requirement for half the first year of operational PM₁₀ emissions and any increment of PM₁₀ emissions in years two through ten that are higher than the first-year emissions, as well as all emissions of PM₁₀ after year ten. The draft rule's requirement

for full mitigation of construction emissions is the right approach and should be applied to all indirect source emissions for the lifetime of a project.

To assume that a new development generates just half the trips it actually does would result in new air pollution that could be avoided. That would result in allowing air pollution that adds to the local pollution health risk. If there is going to be discounting—say, to take account of double counting for trips that might be attracted to a new neighborhood shopping center developed in the same timeframe as the new residential subdivision—it should be based on the particulars of the area and not presumed without justification.

The proposed ISR also ignores one of the key criteria pollutants emitted by indirect sources: reactive organic gases (ROG). This pollutant should be included among those that must be mitigated at new developments.

A well-crafted strong ISR would seek avoidance or mitigation of all indirect emissions from new developments. It would do so for the life of a project. That life is far beyond a ten-year planning horizon, and should run for 30 years or more, roughly the time until the deadline for attainment plus the duration of two ten-year maintenance plans beyond that, as required by the federal Clean Air Act.

Low-cost near-term emissions reduction strategies are available to support full mitigation in the early years. These can be found through more effective application of incentives for onsite mitigation, accelerated investment in diesel retrofits throughout the Valley, employer based commuting incentive programs and other initiatives. Low-cost emissions reduction and avoidance strategies to fully offset emissions in 2015 and beyond are also available. They can be obtained through both regional and

community-based transportation, land use and emissions management and planning; incentives for smart growth and infill affordable housing close to jobs; and incentive-based transportation operations, such as time-of-day tolls, toll truck lanes and parking management.

Use of best available analysis tools and assumptions

URBEMIS is an “Urban Emissions Model” developed by the Air Resources Board to help local agencies estimate the air quality impacts of land use projects for CEQA analysis. It has been complemented by further upgrades funded by the San Joaquin Valley Air Pollution Control District and has undergone extensive review by various experts and stakeholders. It appears to be the best available analysis tool to support the San Joaquin ISR.

How the tool is applied, however, remains critical. Many assumptions must be made in developing inputs for the model that appropriately characterize a given project. When possible, it is important to ensure the use of appropriate local trip rates or other factors for a project to capture the difference in trip length distributions between, for example, an urban infill project, an inner or outer suburban area project or an isolated rural development. Some of these are readily available from metropolitan-level or county-level travel models maintained by several of the eight metropolitan planning organizations in the San Joaquin Valley. A printout checklist of changes from URBEMIS default values should be routinely made available as part of the standard documentation of any application of URBEMIS to support ISR evaluations.

There are several areas where the URBEMIS model can benefit from further refinement, such as including

emissions related to raw material delivery to construction sites or quarrying activities. URBEMIS now pulls emissions factors from the statewide EMFAC emissions model but could be refined by drawing on air district-specific and site-specific mix of factors, where appropriate.

Tracking emissions variations over time

With new developments come periods of construction-related emissions. This often involves highly polluting diesel equipment used for delivery of material, hauling of debris and various onsite activities. Once a new residential development is populated, there is typically significant variability in the amount and character of local motor vehicle traffic over time. As has been noted in travel behavior research in Montgomery County, Maryland, and elsewhere, a “more elderly population in the more urban areas of the county results in different trip generation than do young families starting out in the newer suburbs. As areas age, their trip-making characteristics can be expected to change.”¹⁸

The variation in trip generation rates by age of head of household for residents of single and multi-family housing units in Montgomery County was used to develop a trip generation model that better matched observed data. In the typical lifecycle of new residential neighborhoods, peak trip generation rates and population often occur 5–15 years after the completion of the neighborhood, as more households are filled with driving-age teenagers and young adults. Trip generation rates and population often fall off in later years as aging empty-nesters continue to occupy the same structures that once provided a home for more people during child-rearing years. Trip rates fall after people reach their 50s,



Emissions produced by indirect sources change as neighborhoods age.

and more sharply in even later years. Eventually, a new generation of young families will come to occupy neighborhoods that were built up 25 to 40 years before, starting the cycle over, usually with a less pronounced lumpiness in age distributions.

A well-crafted strong ISR would seek to mitigate both short- and long-term emissions from new development and take into account this lifecycle by adjusting the long-term URBEMIS forecasts for emissions mitigation planning. However, the June 2005 proposed ISR from the Air District fails to look at anything other than construction emissions and first-year project NO_x emissions. It ignores the evidence that, for many projects, first-year emissions will be lower than the emissions in the third, fifth, or later years, especially PM_{10} emissions, which increase proportionately with growth in vehicle miles traveled. This shortcoming of the District's proposed rule creates a framework that biases the rule towards overinvestment in short-term emissions reduction strategies, such as diesel agricultural pump replacement. It neglects the need to invest in longer-term emissions avoidance strategies that match the significant long-term indirect source emissions

profile derived from the study of the lifecycle of new developments.

A sound analysis will require estimation of emissions in the first, fifth, tenth, twentieth, and thirtieth years of the project and seek to mitigate these as much as possible onsite, then look to offsite mitigation and mitigation fees to offset the remaining emissions for each of these points in time.

Emissions avoidance and mitigation strategies: evaluating variation over time

Similarly, emissions mitigation strategy accounting should account for the lifecycle of equipment replacement, retrofit programs and other initiatives. The Carl Moyer Program has been a very cost-effective and worthwhile emissions reduction program. But a dirty diesel agricultural irrigation pump dating from 1980 or 1985 that is subject to accelerated replacement in 2005 may have worn out and been replaced with a new pump in 2015, one that would be even cleaner than today's Tier II diesel-fueled agricultural pump, in the absence of a Carl Moyer Program grant today. The Moyer program provides grants for retrofitting, replacing or repowering high-polluting diesel engines to reduce emissions. In this case, the emissions benefits of a Moyer grant today would be quite positive between 2005 and 2015, but somewhat negative for years after 2015, when the Tier II pump would continue in use for many more years instead of being replaced in 2015 by a cleaner "Tier III" or "Tier IV" pump likely to become available by 2015.

The San Joaquin Air District considers such Moyer Program investments to be permanent emissions reductions. However, as the above example illustrates, such a Moyer Program investment should not be viewed as a "permanent"

emissions reduction benefit. Rather, it is a time-dependent emissions reduction, good perhaps for seven years.

Longer-term emissions reduction strategies

While some longer-term reduction strategies may sometimes appear to be costly at first, they can have the largest cumulative emissions avoidance benefits, making them very cost effective in the long run. For example, investment in a bus rapid transit line in Fresno—bus priority lanes, dedicated bus stations, stops facilitating rapid boarding and alighting, high service frequencies throughout the day—could create the momentum for substantial infill transit-oriented development along the route, reducing traffic growth and car dependence in this corridor. Investment in incentive programs to encourage urban redevelopment in the core of communities like Fresno and Modesto, close to jobs and public transportation, in walkable neighborhoods, could cut regional vehicle miles of travel and related air pollution.¹⁹ Just as cities like Portland, Oregon; Denver; Salt Lake City; Sacramento; Charlotte; and Chattanooga have reduced long-term traffic growth through rapid transit investment.

In Charlotte in the mid-1990s, in response to excessive air pollution emissions from traffic under a 20-year transportation plan, planners and officials adopted a revised plan emphasizing better transit and smarter growth. This enabled them to trim forecast traffic growth and pollution by almost a quarter. They won voter approval for the plan for a sales tax to pay for a regional bus rapid transit, light rail and commuter rail system, and began revising local land use plans to support this new vision.

Denver was faced with terrible winter particulate pollution in the 1980s. Agen-

cies took action against wood burning, but particulate pollution remained well in excess of federal standards. In the 1990s transportation and air quality officials replaced street sanding with chemical deicers and widespread road sweeping, causing particulate levels to drop by half. Conformity spurred officials to build into regional plans enough maintenance plan measures to meet long-term health standards through 2015 and provided an incentive for developing light rail as a long-term pollution control measure, as well as a commitment by metro area governments to limit growth to a 730-square mile area, with transportation alternatives to support this goal. Travel demand management strategies in the Denver long-range plan promote ridesharing and telework and are used as a safety margin in meeting the 2025 emissions budget. By 2001, Denver was one of only a few large metro areas that had attained every national air quality standard.

But investments in expanding travel options need not be urban or metropolitan in focus to be effective in cutting emissions while supporting job and economic development. The San Joaquin Valley's Kings County Rural Transit Agency in the past four years has built a 150-van vanpool fleet operating in five counties and largely serving 800 farm and prison workers. This takes traffic off the highway and boosts access to jobs for low-income workers while cutting pollution.

Unfortunately, the air district's plans for investing the mitigation funds that are generated appear to be limited to replacing or retrofitting engines and reducing dust from dirt roads in the region. While each of these mitigation measures provides quick fixes to NO_x and dust problems, they don't provide the kind of long-term solutions needed.

Given this, it would be appropriate for the air district to put greater consideration into the best uses of the mitigation funds. This consideration should include opportunities for open discussions with the public and local governments and agencies.

Identifying cost-effective and available regional emissions avoidance strategies

The Sacramento region, through its council of governments, has done much to develop effective frameworks to evaluate transportation and land use scenarios that can produce longer-term permanent travel reductions embedded in land use, infrastructure and reform-of-pricing structures. Similar opportunities can be created in the San Joaquin Valley, through the ISR process, to help identify cost-effective long-term emissions avoidance strategies. This is especially true if the ISR recognizes the need to address not just first-year emissions, but thirty-year emissions from new developments in order to protect public health and to trim the hidden long-term costs of economic development.

Timely regional travel model sensitivity analysis should be undertaken to identify locations where job or housing growth in potential transit-oriented centers might reduce rather than increase regional vehicle miles of travel. This could provide critical evidence for adjustment to URBEMIS analyses by developers in relation to proposed developments at these locations. This might help identify areas that would be subject to much easier emissions mitigation requirements, and opportunities for emissions fees to be invested as additional development incentives for long-term pollution avoidance through smart growth.

The upcoming debate in the Fresno area over Measure C transportation funding provides an opportunity to

consider a new vision of how transportation investment could support more effective growth patterns with less traffic growth and related air pollution. Some groundwork has already been undertaken with the Getting Smart Growth Response Model and other initiatives. But business, civic, and political leadership will be needed to establish goals and a framework for action, avoiding more paper planning studies.

A portfolio-based indirect source rule

Just as sound investment portfolio planning seeks to include a mix of short- and longer-term investment strategies that are hedged against risk by including a diverse array of investment types, so too a sound emissions mitigation portfolio will include a mix of strategies that address different aspects of the pollution challenges confronting the Valley over time. An ISR should focus on ensuring a match between short and longer-term forecast indirect source emissions and related mitigation strategies.

The rule proposed by the Air District in June 2005 fails to look beyond year one and fails to consider longer-term indirect source emissions problems associated with new development, focusing only on generating fees for short-term emissions reduction programs and the costs to the Air District for administering these. A model rule can and should be crafted to address these missing elements in the proposal.

Ensuring transparency and independent oversight for accounting

The proposed June 2005 ISR fails to require that the information used to

calculate emissions or mitigation or fees be made public in a timely manner for independent oversight of the accounting. Greater transparency is crucial and should be required as part of the ISR.

The public has already witnessed serious shortcomings in the process for releasing information to the public about air pollution mitigation contracts with Tejon Ranch and Castle and Cooke projects, which came before the Air District for approval in April 2005. In those contracts, the Air District made what appear to be questionable assumptions about emissions reductions and responsibility for indirect source emissions. But even after an open records request, the Air District has failed to provide sufficient information to the public to show how it arrived at its estimates of impact fees. This situation must be remedied and not repeated

if the ISR is to have credibility with the public.

Ensuring accounting for benefits and avoided costs

The proposed June 2005 ISR does not yet include a socioeconomic impact analysis, but this should take into full account the long-term hidden costs to the region's residents and businesses of rising levels of car dependence, unequal and often poor access on the part of low income residents to jobs and public facilities, and the health and other impacts of unhealthful levels of air pollution. According to the Federal Highway Administration, adverse health effects of motor vehicle pollution cost Americans over \$40 billion/year.²⁰ And this figure does not even include the adverse impacts of mobile source air toxics, which recent research suggests are considerable.²¹

Conclusion

The San Joaquin ISR process is an extraordinary opportunity, but the proposed rule needs to be strengthened to ensure that it fosters sensible market incentives, planning and accountability. A well-crafted strong rule will support robust growth in the San Joaquin Valley in ways that give people more and better housing and

transportation choices, save money, create healthier children, families and communities, and boost the economy. But this will happen only if civic and business leaders unite behind these healthy community goals and support adoption of an ISR to ensure that future growth reinforces, rather than undermines, these goals.

Traffic reduction success stories²²

TravelSmart program: Kamloops, British Columbia²³

The TravelSmart program in Kamloops, British Columbia, promotes changes in travel behavior and encourages sustainable community development in order to minimize demands on the municipal transportation system. Kamloops' population, which is expected to increase from 85,000 to 120,000 by 2020, is placing increased demands on the city's transportation system and causing growing concern about quality of life among residents. Launched in January 1997, TravelSmart includes these on-going initiatives:

- **Land use integration:** Recognizing the strong links between transportation and land use, the city's official plan was revised to minimize the demand for car travel by influencing growth patterns. The plan now favors a compact form of development, situating accommodation close to employment and community services, and increasing density of the central area.
- **Less expensive road structure alternatives:** To avoid expensive improvements to road networks, the city has slowed or halted development in some areas and identified underutilized arterial corridors for access to the downtown core. Rather than building bypasses over the busy highway that runs through town, the city encourages residents to use alternatives to the highway.
- **Improved public transit:** A comprehensive travel plan was developed to improve the level of service and provide alternatives to the single occupant vehicle. Some improvements include increased frequency of service to outlying

communities and the use of smaller buses that feed into the main system.

- **Promoting bicycle use:** The Kamloops Bicycle Plan identifies \$6 million worth of additional cycle routes and initiatives for businesses to provide "end-of-trip" facilities to cyclists, such as showers and bike racks.
- **Promotional programs:** Transportation alternatives, such as carpooling, biking and walking, are promoted through workshops and seminars in workplaces; the "Safe Routes to School" program in schools; "Go Green" billboards on commuter streets; and door-to-door neighborhood education by city staff. The plan recognizes the need for an ongoing awareness campaign and community involvement to sustain TravelSmart.

Total project planning costs \$300,000, of which \$245,000 was funded by the city and \$55,000 by the province. The full program is funded through city's general revenue, development cost charges, the B.C. Transportation Financing Authority, specific developers and BC Transit. TravelSmart will be updated every five years as one component of "Kamplan," the city's growth management strategy.

After three years of operation, the program has improved air quality and reduced planned road expenditures by 75%. Economic and environmental benefits:

- Reducing anticipated road expenditures from \$120 million to \$14 million.
- Reducing annual per capita energy consumption from 128 to 125 gigajoules.
- Reducing annual per capita carbon dioxide emissions from 7,200 to 7,000 kg.

TABLE 1
Commute Partnership Products, King Co. Metro

Product	Description
Alternative Work Schedules	Compressed or flexible work schedules allowing employees to work longer hours in fewer days.
Biking and Walking	Alternative commute mode that can be subsidized.
Business Use of Vans	A program making Metro commuter vans available for use by employees (at that worksite) during the business day.
Carsharing	A convenient and economical alternative to owning a personal vehicle.
Commuter Bonus	A non-taxable voucher program that encourages employees to take the bus, a vanpool or a ferry.
Commuter Bonus Plus	A voucher program to encourage employees to commute by carpool, or walking and biking.
Carpools	Alternative commute mode that can be subsidized.
Custom Bus	A special service for areas with limited bus service.
Datamatch	A computerized ridematching service to encourage employees to “share the ride.”
Flex Pass	A comprehensive discount pass program that can be customized to include commute incentives.
Home Free Guarantee	A program that ensures an emergency ride home for employees using alternative commute modes.
Parking Cash-out	A program for offering employees a choice between a subsidized parking space, and cash.
Pass Subsidy	A variety of options for businesses interested in purchasing employee transit passes.
Preferential Parking	Program that reserves worksite parking spaces for those employees commuting by carpool and vanpool.
Ridematch	A computerized ridematching database and mapping service.
Rideshare Plus	A customized service approach for carpool and vanpool formation that employers can contract for.
Tax Laws	Some helpful guidelines about commute-related tax issues that provide advantages for both employer and employee.
Vanpools	A program that supplies vans to groups of employees to share. How to get a Metro Vanpool on the Road

King County METRO Commute Partnership Program²⁴

The King County (Seattle area) METRO Transit Agency has developed a comprehensive commute trip reduction program. The table below lists program components. A detailed description of

each component can be downloaded from their web site. METRO also provides general support and resources to employers to develop commute trip reduction programs and integrate these efforts with parking, land use and transit management activities.

TABLE 2
Alameda County Commute Incentive Program

	Alameda	Albany	Oakland	Pleasanton
Incentive offered	\$1.50/day	\$2.50/day	\$40/mo transit pass	\$2.00/day
Average combined fuel savings and financial benefit	\$268/year	\$381/year	\$407/year	\$282/year
Eligible employees	573	130	400	380
Participants before	12 (3%)	7 (5%)	11 (3%)	147 (40%)
Participants after	108 (19%)	30 (23%)	93 (23%)	130 (34%)

Alameda County Congestion Management Program²⁵

The Alameda County (East San Francisco Bay area, including suburban and rural areas) Congestion Management Program enlisted four employers to provide financial incentives to encourage reduced driving. The table below summarizes the results at the four worksites. The program managers conclude that financial incentives alone typically reduce automobile commute trips by 16–20%, and significantly more if combined with other TDM strategies.

Ernst & Young²⁶

Since 2001, the accounting and management firm Ernst & Young has offered pre-tax commuter transportation and parking benefits to its employees in partnership with WageWorks. This is projected to save employees 40% of their commuting and work-related parking costs and reduce the firm’s payroll expenses.

“Adding commuter benefits to our innovative benefits offerings is just one more reflection of Ernst & Young’s commitment to make the firm a great place to work,” says vice chairman of human resources, James L. Freer. “When we surveyed a group of employees regarding what benefits they value,

a pre-tax commuter program was the most frequent enhancement by far, with 62% of the respondents asking for it. We are pleased to offer such a program that will make our people’s commute to work a bit easier.”

CH2M Hill

Upon moving into new offices in the Seattle suburb of Bellevue, Washington, the 430 employees of the engineering firm of CH2M Hill were offered \$40 per month if they walked, bicycled, carpooled or took transit to work, or free parking if they drove alone. The firm’s drive-alone rate declined from 89% to 54%, and stayed there, while the percentage biking or walking increased from 1% to 17% (see Table 3). With parking demand down by 39%, the firm’s problem of “too many parkers for too few spaces” disappeared. This approach reduced costs for the company and reduced traffic and pollution while increasing tax revenue.

TABLE 3
Parking cash-out program results

	Before	After
Drive alone	89%	54%
Carpool	9%	12%
Bus	1%	17%
Bike, walk	1%	17%

Exel: how the logistics campus can reduce unnecessary trips and enable the efficient flow of goods to market²⁷

Exel Worldwide is an international provider of logistics services, which has pioneered the “campus” concept—a collection of multiple manufacturers focused on consumer products with similar distribution channels. The collection of companies in a single location achieves critical mass in several key areas. It allows for the sharing of resources, freight consolidation and flexibility. A campus begins with establishing individual accounts within a narrow geographic area and grows organically through new business acquisitions. There are clear practical benefits and economic efficiencies to the campus: having facilities and resources close to customers; being able to share labor resources among clients and operations; improved transit time and reduced order cycle time; and reduced inventory velocity and lower freight costs through volume leverage. In addition, there are also important environmental efficiencies made possible through the campus model.

For instance, in the past, if Loblaw's requested an order of two truckloads of soup and one truckload of cereal, three trucks would go out. Now, only two trucks go out because the cereal can sit on top of the soup. Trips are reduced, and \$600 can be saved by providing one less truck. The trend towards supply chain integration allows the linking of inbound goods with outbound goods and materials. The result, made possible by more sophisticated software and breakthroughs in tracking media, allows logistics specialists to mix inbound materials with outbound products, so that trucks have a higher load factor. In the area of Canadian food sales, which amounted to \$66.2 billion in 1998, totaling 662,000 truckloads (two thirds of which were in the

GTA), there is potential through consolidation to reduce truck movements by up to 30%. It is important to note that there is additional room to improve capacity efficiency because an average “full truck load” is 40,000 lbs and 2,300 cube, while the actual capacity is 62,500 lbs and 3,400 cube.

Campus Transport Management²⁸

Stanford University in Palo Alto, California plans to expand capacity by 25%—adding more than 2.3 million square feet of research and teaching buildings, public facilities and housing—without increasing peak period vehicle traffic. By 2000, 1.7 million square feet of new buildings had been developed while automobile commute trips were reduced by 500 per day. To accomplish this, the campus transportation management plan includes:

- a 1.5 mile transit mall;
- free transit system with timed transfers to regional rail;
- a bicycle network;
- staff parking “cash-out”;
- a ridesharing program;
- other transportation demand management elements.

By using this approach the campus was able to add \$500 million in new projects with minimal planning or environmental review required for individual projects. The campus also avoided significant parking and roadway costs. Planners calculate that the University saves nearly \$2,000 annually for every commuter shifted out of a car and into another mode. This also reduced regional agency traffic planning costs.

Public benefits included decreased congestion and improved safety on

surrounding roadways and the regional traffic system, reduced air, noise and water pollution, and improved local transit options. All of Stanford's transportation services are available to students, employees and the general public.

Inside track: How to think people out of their vehicles²⁹

When 8,000 Perth households were helped to analyze their journeys, car use fell by 14% with a shift to public transport and cycling. It sounds like a transport dream: a cheap and effective scheme that could cut traffic by 10% or more within months. But in Australia it is reality. And the idea is now on trial in 15 European countries.

The concept, called "individualized marketing," is simple. Households are contacted and offered advice about the journeys they make. If they are interested, they can get information and personalized timetables by mail, telephone hotline, or a home visit from a consultant who analyses the trips they make and suggests alternatives to the car.

Socialdata, a German-based consultancy, claims to have developed the idea and spent ten years looking for a test case before the government of Western Australia agreed to try it in Perth. An initial trial in 1997 of more than 800 households in South Perth showed a 10% drop in car journeys and vehicle miles, with a significant shift to public transport and cycling. Surveys a year later, and again 18 months after that, showed those gains were sustained.

Last year, Western Australia's Department for Planning and Infrastructure extended the project to 8,000 households in South Perth, with even better results. Car journeys and mileage fell 14% and walking, cycling and use of public transport rose again. Use of local shops and services increased, air pollu-

tion fell and bus companies collected enough extra fares to recoup the cost within three years.

The south Perth trial cost AUS\$1.3 million—including new bus stops in the suburbs, printed material and surveys—and took three months. That compares with the UK government's ten-year transport plan, published last summer, which promised that in return for 180 billion pounds of private and public money, traffic would rise by 17%. (Admittedly, that is 5% less than what has been forecast without the plan.) At a seminar at the Institute for Public Policy Research in London, Werner Brog, Socialdata's founder and managing director, explained the theory behind the individualized marketing project.

Socialdata found that only 20% of journeys in Perth were by "green modes"—public transport, walking and cycling. However, in potentially 60% of journeys, people either did not need cars or had an adequate alternative.

Socialdata asked why people did not leave their cars behind more often and found a big gap between perceptions and the reality of public transport, walking and cycling. Typically, people thought their journey would take twice as long as it did and would cost a third more than the actual fare. Half of motorists with a viable alternative did not know about the individualized marketing service.

"There's an alternative there," said Mr. Brog, pointing outside to buses, cycle lanes and subway stations, "but not there" he said, jabbing at his head. "Transport planners want to fix that" he continued, pointing out of the window again "but we'd say it's much easier to fix the head."

The success of the Perth project persuaded the International Public Transport Union-UITP—to hold a series of trials in Europe, although only on public transport. 45 results have come in and only one, a project



Smart uses of mitigation fees can help reduce traffic congestion.

in Oporto in northern Portugal, failed to cut traffic. Some are planning bigger schemes—including one in Germany covering cycling and walking as well as public transport.

It sounds almost too good to be true, which raises the question of why more towns, cities and regions are not pursuing the idea. As it stands, Western Australia plans to extend the scheme to all 600,000 residents of Perth, while elsewhere in the country, Brisbane is running a trial. Transport operators in Europe are talking to Socialdata about city-wide initiatives, says Mr. Brog. Socialdata is also exploring how individualized marketing can be used for energy, water, waste disposal and other applications.

However, before the transport scheme can spread, deep-rooted cultural and practical barriers will need to be overcome in many countries. Perhaps the biggest perceived threat, especially among politicians being asked to fund such projects, is a backlash from motorists who may see the scheme as “anti-car.”

But in Australia, the Department for Planning and Infrastructure collected seven files of positive feedback and not one letter of complaint, insists Bruce James, the department’s executive director metropolitan. One reason is that the

approach is “not Stalinist,” says Mr. Brog. People are not stopped from making journeys; they are never told to stop using their cars, and the project stresses how even tiny changes—say, one journey a week—can make a big difference.

“As soon as people hear what I do at a party they start saying ‘Do you know how far I have to travel to work? Do you know I have to make interchange four times?’ and so on,” says Mr. Brog. “I say, if that’s the case, use your car. But let’s look at where else you can use public transport.”

More subtly, another barrier is the long-standing assumption by transport engineers and planners that putting on more services and building new infrastructure is the solution to all problems—an approach that has often been reinforced by the political attraction of opening new railways and roads.

Individualized marketing can be complementary to investing in infrastructure, says Mr. Brog, and, he believes, it is more cost effective. “We can better them hands down every time,” he insists. Linked to this is the reverse problem that in some places—large cities such as London, for example—the capacity and quality of public transport are inadequate to cope with a major increase in use. There is a correlation between the quality of transport and the size of the modal shift but most areas do have the capacity—and the extra fares can help to fund improvements.

Then there is the natural distrust of experimental results. In Perth they have tried to overcome this by repeating the surveys to show that improvements are sustained. Further successful projects would strengthen the case for individualized marketing. Doubters should know that Perth—designed for cars and a massive 100 km by 80 km in size—was a highly testing trial area, says Mr. Brog. “The saying is if it works in Perth it works everywhere in the world,” he says.

The Chattanooga story³⁰

Over the last 20 years, Chattanooga, Tennessee has turned its once-depressed downtown into a major commercial and tourist center attracting millions of visitors a year. This evolved from three decades of community planning that emphasize citizen involvement, local environmental quality and strategic investments.

Concerned about the impacts that pollution was causing on local economy, the Chattanooga Chamber of Commerce created an Air Pollution Control Board in 1967. The board included a diverse group of business leaders and citizens. In 1972, it established a deadline requiring all existing major sources of pollution to be in compliance with emissions standards, which was met at a cost of \$40 million. National and international attention was focused on a city that in three years had changed from the most polluted cities in the United States into one of the cleanest. This inspired a new community challenge, revitalizing a dying city core.

In the early 80s, city officials set the goal for Chattanooga of becoming a leader in developing solutions to urban problems. In 1982, City and county governments appointed a task force to study and determine the best way to develop the 22-mile Tennessee River corridor around Chattanooga. Thousands of citizens attended hundreds of meetings focused on the riverfront. The Task Force drafted the Tennessee Riverfront Master Plan, which covered 20 years and involved \$750 million in commercial, residential and recreational development.

This led to creation of the RiverCity Corporation, a private nonprofit organization with a mandate to implement the Riverfront Master Plan and 40 community development goals. Among other achievements, it developed the Tennessee Aquarium, the world's largest freshwater aquarium, which

opened in 1992 and which has since become a trademark for a city that, in ten years, transformed itself, becoming a prime example of sustainable growth and development.

A second development that has come to define Chattanooga was also introduced in 1992, when the Chattanooga Area Regional Transportation Authority initiated the Electric Shuttle. With free five minute service between the Tennessee Aquarium and the Chattanooga Choo Choo hotel, the Electric Shuttle provides the transportation link that had been identified as one of the top goals. As a result of such efforts, Chattanooga is now deemed one of America's most livable cities.

Portland's positive experiences in curbing sprawl³¹

The Portland metropolitan area is thriving with 1.3 million people in a compact region, about 35 miles across at its widest point. The region has grown by more than 24% over the last 20 years but only by 13% in land area. Employment in downtown Portland has nearly doubled from 63,000 (1970) to 108,000 (1995). In addition, the average lot size for residential development has been reduced by 50% over the last 20 years. This is due to diversification of the housing market with land use initiatives to encourage a compact community. The region has adopted a 2040 Growth Concept that promotes minimal expansion of the existing Urban Growth Boundary (UGB), increased densities in centers and along transit corridors, multi-modal accessibility, and protection of neighborhoods, parks and green spaces.

There are five historical events that help frame the discussion about the Portland region's experience in curbing sprawl:

- 25 years ago, the State of Oregon enacted legislation requiring universal land use planning and UGBs, as well as state goals such as public involvement, creating compact communities using UGBs, and preserving farmland, forest land and water resources.
 - 25 years ago, the City of Portland first adopted its Downtown Plan. This provided for pedestrian and transit amenities, open spaces, public art, housing and active streets. The plan was instrumental in ensuring that downtown remained vibrant and continued to redevelop and intensify with both jobs and housing.
 - Metro adopted the first regional UGB 20 years ago. Since then, there has been continued community leadership in promoting the downtown and multi-modal access to the downtown (including parking caps, a bus mall and light rail).
 - The state also adopted a Transportation Planning Rule to increase accessibility, require pedestrian and bike facilities, and require reductions in vehicle miles traveled and parking spaces per capita.
 - In 1992 the Metro region approved a Metro charter with a primary priority being the coordination of transportation and land use planning for the region. A key responsibility for Metro is the administration of the UGB.
- Portland works because of its collaborative planning approach, supportive state laws and engaged people who care about the environment and the community.

Four key benefits of an ISR

An ISR's main purpose is to clean up the air by mitigating the pollution generated by cars, trucks and other indirect sources attached to new developments. Because this rule makes developers and consumers think a little harder about how to reduce the air pollution associated with growth, it also encourages creative action and innovation. Ultimately, the rule carries a range of benefits. Many of these benefits can be summarized in four main categories.

1. Gives people more and better choices

The rule can encourage a broader choice of housing by rewarding developers who look for ways to put good and affordable housing closer to work sites and reduce the need for new infrastructure development such as new roads and sewers on undeveloped land.

The rule has the potential to spur new ways of thinking about public transportation and new funds for transportation planning and development. This can give people more options for getting to work and school, for shopping, and to see friends and family.

2. Saves money

A rule that offers more transportation opportunities allows people to choose less expensive and more efficient ways to travel. A rule that encourages building closer to jobs and existing infrastructure saves public dollars that otherwise go into maintaining roads. All of this adds up to less pollution from new developments, which means that citizens and public agencies can spend less money figuring out ways to

clean up more dirty air. In addition, cleaner air means less money spent on health care.

3. Creates healthier children, families and communities

An ISR helps create an overall better quality of life for people by reducing air pollution and, by extension, the number of school days and work days children and adults miss because of lung and heart ailments related to air pollution. A good ISR can help people avoid traffic congestion by offering alternative transportation and encouraging housing closer to jobs. This means more leisure time and family time, less time stalled in traffic, and generally safer and less stressful travel. And by providing an incentive for building businesses closer to where people live, and houses closer to where they work, an ISR helps relieve pressure for building on agricultural lands and green fields.

4. Boosts the economy

When people are able to get to work without a stressful commute, they are more productive. When they and their family members are not burdened by the health impacts of dirty air, they don't have to take as much time off to attend to medical appointments and to care for sick family members. And when a community has more housing choices, more transportation choices and clean air—or at least evidence that it is on the path to cleaner air—it becomes more attractive to new businesses and new tourism, all of which helps create more and better jobs and a stronger local economy.

Notes

- ¹ Bedsworth, Louise Wells. *Clearing the Air in the San Joaquin Valley: Developing an Action Plan for Regulators, Legislators, and the Public*. Union of Concerned Scientists, Cambridge, MA. 2004. Available online at: www.ucsusa.org or at www.kirschfoundation.org.
- ² Ibid. And State of California, Department of Finance. *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties 2000-2050*. Sacramento, CA. May 2004.
- ³ Bedsworth, Louise Wells. *Clearing the Air in the San Joaquin Valley: Developing an Action Plan for Regulators, Legislators, and the Public*. Union of Concerned Scientists, Cambridge, MA. 2004. Available online at: www.ucsusa.org or at www.kirschfoundation.org.
- ⁴ San Joaquin Valley Unified Air Pollution Control District, *Draft Staff Report: Rules 3180 and 9510*, June 30, 2005, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ⁵ San Joaquin Valley Unified Air Pollution Control District, 2003 PM10 Plan, Appendix B, June 30, 2005, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ⁶ Ibid. And State of California, Department of Finance. *Population Projections by Race/Ethnicity, Gender and Age for California and Its Counties 2000-2050*. Sacramento, CA. May 2004.
- ⁷ San Joaquin Valley Unified Air Pollution Control District, *Extreme Ozone Attainment Plan*, 2004, Appendix H, page 15, http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_Final.htm (accessed June 18, 2005).
- ⁸ San Joaquin Valley Unified Air Pollution Control District, *Draft Staff Report: Rules 3180 and 9510*, June 30, 2005, Appendix B, page 6, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ⁹ San Joaquin valley Unified Air Pollution Control District, *Draft Staff Report: Rules 3180 and 9510*, June 30, 2005, page 5, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ¹⁰ Anair, Don and Patricia Monahan. *Sick of Soot: Reducing the Health Impacts of Diesel Pollution in California*. Union of Concerned Scientists. Cambridge, MA. 2004.
- ¹¹ San Joaquin Valley Unified Air Pollution Control District, 2003 PM10 Plan, Chapter 4, page 52, June 30, 2005, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ¹² San Joaquin Valley Unified Air Pollution Control District, *Extreme Ozone Attainment Plan*, 2004, Chapter 4, page 12, http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_Final.htm (accessed June 18, 2005).
- ¹³ San Joaquin Valley Unified Air Pollution Control District, *Extreme Ozone Attainment Plan*, 2004, Appendix G, page 1, http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_Final.htm (accessed June 18, 2005).
- ¹⁴ San Joaquin Valley Unified Air Pollution Control District, *Extreme Ozone Attainment Plan*, 2004, page 8-18, http://www.valleyair.org/Air_Quality_Plans/AQ_plans_Ozone_Final.htm (accessed June 18, 2005).
- ¹⁵ See Appendix A for some examples of successful programs that help cut traffic through such initiatives.
- ¹⁶ There are many successful examples of such trip reduction agreements under various growth management programs. For example, traffic mitigation requirements imposed under Montgomery County, Maryland's Adequate Public Facilities Ordinance in the 1980s and 1990s led many developers and employers to create and support Transportation Management Associations, public-private partnerships that facilitate employee commuter trip reduction and invest in local shuttle services, manage parking supply and price, and undertake other initiatives to reduce traffic problems.
- ¹⁷ San Joaquin valley Unified Air Pollution Control District, *Draft Staff Report: Rules 3180 and 9510*, June 30, 2005, page 9, http://www.valleyair.org/Workshops/public_workshops_idx.htm (accessed June 17, 2005).
- ¹⁸ Ajay Kumar and David Levinson, "Specifying, Estimating, and Validating a New Trip Generation Model: Case Study in Montgomery County, Maryland," *Transportation Research Record 1413*, (1993) page 111.

- ¹⁹ An example of this kind of initiative is the Atlantic Steel Transportation Control Measure in Atlanta, which was approved by EPA in 2000, as the region was facing a formidable clean air conformity challenge. A transportation management district was formed to ensure that emissions and traffic reduction goals would be met by this 135 acre mixed use urban brownfield redevelopment project near downtown Atlanta, which was shown likely to *reduce* regional vehicle miles of travel despite its accommodation of thousands of new dwelling units and jobs.
- ²⁰ U.S. Department of Transportation Federal Highway Administration. Addendum to the 1997 Federal Highway Cost Allocation Study Final Report. <http://www.fhwa.dot.gov/policy/hcas/addendum.htm> (accessed 3/14/05).
- ²¹ Michael Replogle and John Balbus, M.D., M.P.H., "Considering Cancer Risk in Transportation Decision-Making," *Environmental Manager*, June 2005, Vol. 55, pages 10-13.
- ²² These examples are taken from the TDM Encyclopedia, <http://www.vtpi.org/tdm/tdm71.htm>.
- ²³ www.city.kamloops.bc.ca/transportation/plans/travelsmart.html.
- ²⁴ <http://transit.metrokc.gov>.
- ²⁵ www.accma.ca.gov.
- ²⁶ www.wageworks.com.
- ²⁷ Moving the Economy (www.city.toronto.on.ca/mte). A more detailed version of this case study is featured in *Moving Goods in the New Economy: A Primer For Urban Decision Makers*, a joint publication of Moving the Economy and the Canadian Urban Institute, made possible by support from Transport Canada and HRDC.
- ²⁸ Stanford University (www.stanford.edu).
- ²⁹ www.travelsmart.transport.wa.gov.au; www.socialdata.de, Juliette Jowit, *Financial Times*; Sep 11, 2001 (<http://globalarchive.ft.com/globalarchive/article.html?id=010911001424&query=Transport#docAnchor010911001424>).
- ³⁰ www.chattanooga.gov.
- ³¹ Elaine Wilkerson, Director, Portland Metro Growth Management Services Department, www.trans.ci.portland.or.us



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