

Guidelines for Developing Local Demand Management or Trip Reduction Policies

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Local governments are increasingly turning to demand management or trip reduction strategies, policies, and programs to combat traffic congestion. Using various policy instruments, localities are encouraging employers and developers to implement transportation systems management (TSM) and parking management strategies. These strategies include encouraging use of transit, carpooling, bicycling, walking, and flextime. However, still other measures include reduced employer subsidies for employee parking, tightening of maximum parking requirements of zoning codes, reduced parking requirements in return for implementation of TSM strategies, and other measures to reduce solo driving. Recommendations are made to local government decision makers and planners on the adoption and implementation of demand management or trip reduction policy instruments, including: (a) recommendations about when demand management and trip reduction strategies and policies are appropriate to consider; (b) considerations in selecting trip reduction or demand management policy instruments, including ordinances, developer agreements, special permits, and parking code requirements; (c) suggestions on the design of particular policies, including application of requirements, specificity of requirements, uniformity and stringency of goals, and use of exemptions; and (d) guidance on program monitoring, enforcement, management, costs, and timelines for program development.

Demand management or trip reduction strategies are playing increasing roles in the attack on traffic congestion. The strategies generally fall into two important categories, transportation system management (TSM) and parking management (PM).

Generally, demand management approaches aim to reduce peak period automobile trips by encouraging the use of high-occupancy modes. TSM strategies include preferential parking for carpoolers; promotions for transit, carpooling, bicycling, walking, and flextime; designation of transportation coordinators at employment sites; and shuttle service to and from park-and-ride lots.

PM actions include raising existing rates or imposing new surcharges or differential rates at public facilities, imposing parking taxes at commercial facilities, reducing employer subsidies for employee parking, revising the supply of long-term parking through new maximum requirements in zoning codes, allowing reduced supplies of parking in return for in-lieu fees or implementation of TSM strategies, revising fines and enforcement, and other measures aimed at the provision and

management of parking spaces for purposes of reducing solo driving.

Both the public and private sector play roles in the implementation of TSM and parking management strategies. Localities set regulations requiring private developers and employers to carry out strategies, and meet trip reduction objectives. Often, requirements also provide for an annual employee survey or other forms of monitoring. Sometimes, transportation management associations (TMAs) play a role in implementing the programs.

Numerous localities have fashioned and adopted policy instruments to encourage implementation of TSM and PM, including

- Ordinances,
- Developer agreements,
- Special permits, and
- Parking code provisions.

WHEN TO CONSIDER TSM AND PM POLICIES

Every community plagued with traffic congestion should not necessarily try to develop and adopt TSM and PM policies. Some important considerations include the degree of through traffic, size and nature of employers, management capability and program resources, importance of parking pricing, and the role of exogenous variables.

Degree of Through Traffic

If a large proportion of congested traffic is bound for developments and employers outside the locality, TSM and PM policies may have limited effect. TSM and PM policies aim at reducing automobile use to and from developments and employment sites within a community. Thus, if much local traffic is not generated by these sites, local ordinances, developer agreements, and other policies may not help. However, if several localities join together and form common policies to attack both local and regional traffic, then through traffic may be influenced by these policies. Localities should be aware that few local governments have successfully joined with other localities to adopt uniform local ordinances, joint-power arrangements, or regional programs. Several are trying, but

the process of coming to agreement on common requirements as well as funding and program operations is long and laborious. For example, localities within the counties of Marin and San Mateo in California have debated for months the possible adoption of coordinated ordinances, without success. Maricopa and Pima counties in Arizona have adopted area-wide ordinances applicable to employers across several cities, but only after the passage of special state legislation and much pressure from the U.S. Environmental Protection Agency to adopt trip reduction measures or face delays in federal highway funding.

Size and Nature of Employers

All else being equal, results of TSM and PM programs at multiemployer centers tend to be less successful than at single employers. One review of programs at multiemployer sites found the maximum drop in solo driving to be only 3 or 4 percent (1). Sites included in the study were El Segundo, California; Greenway Plaza in Houston, Texas; and Tysons Corner, Virginia. Another recent review of suburban TSM and PM programs suggests little success in ridematching at the Denver Technical Center in Colorado because of the preponderance of small firms in the center (2). The size and type of employer may also be important because TSM and PM programs tend to be more successful at larger companies with lesser proportions of professional staffs, though the evidence is not clear cut. Some studies suggest TSM and PM success stories tend to be with large employers and large pools of clerical and data processing personnel, as opposed to small employers with professional workers. Yet other literature contradicts these findings. For example, among nine leading companies in the Santa Clara County Manufacturing Group (SCCMG) in California, the proportion of employees in alternative modes averages only 21.5 percent with employment under 5,000 persons. Only four firms have sustained rates of 25 percent or higher and they tend to be larger firms (3). Nationally, the picture is similar with TSM and PM programs at larger companies showing the greatest success. For example, one survey shows alternative mode shares between 30 and 40 percent for companies with over 1,000 employees, but with companies under 1,000 the share is generally around 20 percent. Nevertheless, there are exceptions, such as Cenex in St. Paul, Minnesota, with only 730 employees and 47 percent in alternative modes and Minnesota Mutual Life Insurance also in St. Paul with just 1,000 employees and 39 percent using alternative modes (4). Furthermore, early studies of company vanpool programs found "no relationship between company size and . . . (success of) . . . ridesharing programs" (5). The overall lesson is that localities with a preponderance of small companies or largely professional workers should adopt TSM and PM policies with caution because the policies probably will not be as effective as those in communities with larger employers and more clerical or data processing workers.

Management Capability, Vigilance, and Program Resources

Localities considering adoption of TSM and PM policies must be prepared to support policy implementation. In the long

run, management and resources may be more important than the type or stringency of the policy instruments adopted. One recent study of 40 suburban TSM and PM programs concludes: "More important than the policy instrument or its terms and provisions may be the resources devoted to the programs, vigilance of monitoring and general level of visibility and commitment to the TSM and PM effort" (6). Another review of TSM and PM programs in the San Francisco bay area supported by ordinances concludes, "The effectiveness of . . . programs hinges on the management commitment that is made at start-up, and its (sic) sustainability depends on the durability of that commitment" (7).

Importance of Parking Pricing

Limited or expensive parking combined with strong rideshare and transit incentives can reduce solo driving considerably. In Bellevue, Washington, a suburb of Seattle, Pacific Northwest Bell (PNB) has reduced solo driving to only 19 percent of the work force through a combination of scarce, expensive parking (\$3.00 per day at the time of the study), reduced parking rates for carpoolers, and intensive ridesharing assistance (8). Likewise, Commuter Computer outside the Los Angeles, California, central business district (CBD) decreased the share of solo driving from 42 to 8 percent by eliminating free parking (9). Parking pricing also is creating effective demand management programs at several other employers including Twentieth Century Corporation in Los Angeles; the Nuclear Regulatory Commission in Maryland; and Bellevue City Hall in Bellevue according to a recent national survey (6).

Role of Exogenous Variables

Exogenous variables are important to program success. These variables include proximity of companies to transit service and preferential treatments for ridesharing and transit on streets and highways near employment sites. Parking availability and price surrounding the site also are important. For example, in Walnut Creek, California, one study shows the proportion of transit users varies in relation to proximity to transit, with twice as many Bay Area Rapid Transit (BART) users at offices close to the rail station compared to more distant offices (10). Preferential treatments also help. High-occupancy-vehicle (HOV) bypasses to ramp metering on Los Angeles (including some areas outside the CBD) freeways boosted weekly ramp usage by carpools from 125 to over 275. Transit use in the Minneapolis, Minnesota, I-35W corridor increased 6 percent after meter bypass systems were introduced (11). Finally, as the example of the PNB building in Bellevue, Washington, demonstrates, the supply and regulation of parking around work sites also are important. Limited parking and high prices are encouraging considerable ride-sharing at PNB, but some PNB employees are spilling over into uncontrolled parking on minor arterials near the building. Bellevue is expanding on-street controls in areas of major developments to guard against just such spillover (8).

Summary of Limits of TSM and PM Program Variables

Overall, the prospects of TSM and PM programs and the rationale for supporting policies depend on several variables.

In the best case, these variables align to favor reductions in solo driving and increases in ridesharing and transit use. In this case, localities should consider application of TSM and PM policy instruments. In the worst case, just the opposite pertains. The best and worst cases for TSM and PM programs are as follows:

Variable	Best Case	Worst Case
Traffic	Large proportion generated within or bound for the locality	Large proportion of through traffic
Employers	Large companies, numerous clerical or data processing staff	Small companies, high proportion of professional staff
Program	Strong management, high visibility, good commitment of resources, strong monitoring and vigilance	Little or diffuse management, low visibility, few resources, lack of monitoring and vigilance
Parking	Tight supply, moderate-to-high prices, low level of parking cost subsidy, little on- or off-street parking nearby	Ample supply, low or no prices, parking subsidies from employer, available nearby parking
Exogenous	Nearby transit service, HOV facilities, metered bypasses, little on- or off-street parking nearby	Little nearby transit service, HOV or bypass facilities, available on- or off-street parking

POLICY INSTRUMENT EXAMPLES

TSM Ordinances with Broad Applicability

Many localities have developed ordinances requiring employers and developers to implement TSM and PM programs. In many cases, such ordinances apply to new and existing employment centers and in a few cases include residential development. Some jurisdictions also are attempting to form coordinated programs across jurisdictions, including the following examples:

- Concord, California, requires TSM and PM programs of all new and existing nonresidential development within the city, provided development generates at least 100 peak-hour employee trips. Residential complexes with over 100 dwelling units also are covered.
- In San Mateo County, California, five cities are collaborating through a joint powers agreement to develop and adopt uniform ordinances and an intercity transportation management authority. The draft ordinance would require employers to implement TSM and PM programs resulting in 25 percent of employees using alternatives to solo driving.
- Pleasanton, California, applies its ordinance to the entire city and gears it to employers of 10 or more employees with escalating requirements for larger employers. Multitenant buildings and business complexes are specifically included.

Developer Agreements

Some communities use instruments appropriate to requiring TSM and PM programs as a condition of development. Devel-

oper agreements backed by covenants written into property deeds bind owners and successors in interest.

- In the case of Montgomery County, Maryland, the sample development agreement (Costain Agreement) is for 10 years, and on expiration the TSM and PM program is to be incorporated into a county ridesharing program. Materials, software, and supplies all transfer to the locality.
- In the case of Bellevue, Washington, the Bellevue Place agreement requires a broad set of TSM and PM actions, including limits on the parking supply, automatic vehicle counters for traffic monitoring and reporting, target maximum p.m. peak-hour vehicle trips, required membership in the local TMA, set-aside carpool spaces, required parking charges for employees, increasing levels of required actions depending on project performance, and an assurance bond guaranteeing the program terms are in force beginning with occupancy and continuing until no longer required by the city.

Special Permits

Various public entities require special use permits for projects, including binding commitments from project sponsors for TSM and PM actions, and other actions aimed at mitigating traffic and air quality problems:

- The Minnesota Pollution Control Agency requires an indirect source permit for parking facilities; retail, commercial and industrial facilities; office buildings; large housing developments; airports; racetracks; and other developments. TSM and PM requirements have included transportation coordinators, transit promotions, carpool incentives, and other actions. Some of the projects regulated are within “fast developing suburbs” (12).
- Alexandria, Virginia, requires a special use permit for new developments over a certain size including a transportation management plan for ridesharing, transit incentives, bicycle measures, flextime aimed at up to 30 percent use of alternatives to solo driving, or certain percent reductions in peak-hour travel by solo drivers.

Parking Code Requirements

Some localities have implemented parking code requirements aimed at encouraging TSM and PM. One approach is to establish a maximum rather than minimum parking requirement for certain developments. Another approach is to offer relaxations in minimum parking requirements in return for TSM and PM actions. Under relaxations, localities appear to reduce requirements by no more than 20 or 30 percent. Some require land set asides to be converted to parking if supply doesn’t meet demand.

- Bellevue, Washington, sets both a maximum and a minimum parking space requirement for office use in the downtown area. Specific requirements are negotiated by site and set in developer agreements. The Bellevue Place agreement provides one specific example. An early precedent agreement for ENI Co. also limits parking supply, and requires priced parking.

- Fairfax County, Virginia, allows reduced parking in proximity to a mass transit station on the basis of projected reductions of automobile trips caused by proximity to transit.
- Sacramento County, California, allows reductions for TSM and PM measures, with showers and bike lockers rendering a 2 percent reduction, and one space reduction for every marked carpool space (Ordinance 83–59).
- Montgomery County, Maryland, requires land set aside be sufficient to provide “parking spaces equal in number to the reduction granted” (Ordinance 10–32).
- Palo Alto, California, has a similar contingency provision.

POLICY INSTRUMENT DESIGN ISSUES

Applicability of the Policy

A key issue is defining applicability. To what entities will the policy apply? Will all new and existing developments be included? What areas will be included, what uses, what size thresholds? For developer agreements, policies apply to new and usually large office projects. Parking codes usually apply to core areas. Applicability requires considerable attention in the design of ordinances. Several ordinances reviewed apply to employers, and scale requirements by size.

- Pleasanton, California, stages requirements on employers by size as well as whether or not they are located in complexes. Employee requires careful definition, as well as what constitutes a complex. The city’s intention is to include complexes or employment centers with several small employers, as opposed to isolated small employers.
- Pleasant Hill, Contra Costa County, and Concord, California, include residential uses in their ordinances, in contrast to many other localities excluding these uses.

Specificity of Requirements

How much should the locality specify in the way of strategies and programs, and how much should be left to the regulated entity to plan and carry out? Localities must decide how certain they are specific TSM and PM strategies will work in the developments and areas subject to regulation. Are designated carpools worth requiring in a particular developer agreement or area-wide ordinance? What programmatic requirements should be set, such as designated coordinators or resources devoted to the program? Experience to date suggests the most common requirements in policy instruments is for distribution of information on car and vanpooling, transit, bicycling, and other alternatives to solo driving. Designation of an on-site coordinator responsible for carrying out the program is another commonly prescribed strategy. A few localities do require more aggressive strategies, including priced parking, designated carpool stalls, rideshare matching services, sale of discount transit passes, even implementation of shuttles.

In Bellevue, Washington, requirements in some developer agreements specify the number of car and vanpool spaces, membership in a local transportation association, on-site transportation coordinator, as well as added actions (sale of transit passes and discount parking for carpools) if certain mode share or traffic level targets are not achieved.

Fewer and more flexible requirements generally are specified in ordinances. For example, Contra Costa County, California, allows owners and employers to choose any combination of strategies and they are free to design their own information program. However, the ordinance does require an annual employee survey, designated coordinator, reference to program requirements in lease agreements, and specific annual report to the county.

Recognizing the importance of charge parking to the outcomes of TSM and PM programs, some localities impose requirements for pay parking through developer agreements. Developers will be concerned with the marketability of projects where rates are imposed versus others where they are not. Nevertheless, Fairfax County, Virginia, has required applicants to institute a parking policy with incentives for ridesharing. In the agreement with Bellevue Place, Bellevue, Washington, specified that parking charges be no less than certain transit fares in the area. Bellevue also required fee parking in its agreement with ENI Co.

Types, Uniformity, and Stringency of Goals

Localities must decide what goals, if any, to set in their requirements. Localities can select from goals in terms of mode share or occupancy (e.g., percent of employees traveling alone or by alternative transportation); traffic performance (vehicle trips at certain times and places, levels of service at intersections); proportion of commuting in peak periods; or combinations of these and other approaches. Goals must be set that are reasonable to attain given experience with TSM and PM. Goals also might vary by areas or proximity to transit. Perhaps more important, localities must decide whether the goals are good faith targets that employers and developers are expected to try to meet or are binding performance standards that, if not achieved, trigger certain consequences. Before opting for performance standards, localities must consider the possibility that an employer may make every effort to implement the TSM and PM program but still not achieve the standard. In some cases, the standard may be unreasonable, or gasoline prices may fall, or the economy may boom, or imported car prices may fall. These and other variables outside the TSM and PM program may encourage automobile use. Generally, it seems localities apply the most stringent goals to development agreements and the less stringent goals to broad-area ordinances. Examples of goals and stringency follow.

- Pleasanton, California, defines the goal in its ordinance as a 45 percent reduction of vehicle trips during a 1-hr peak period compared to the case where all employees commute by single-occupancy vehicle. If the goals (staged over time) are not met, the city may then require the employer to carry out a specific program.
- Contra Costa County, California, uses a binding primary and secondary goal. The primary goal is no more than 65 to 75 percent of employees commuting in single-occupant vehicles, depending on the area. But if the project sponsors can demonstrate the goal is unfeasible, the secondary goal applies, which is 55 to 65 percent solo drivers in the a.m. and p.m. peaks. If the goal is not reached, the county is entitled to mandate implementation of a revised program.

- Larkspur, California, has set a demanding goal in its Ordinance 737. Approved projects receiving a circulation permit—with or without TSM and PM actions—must not increase average daily traffic on any roadway segment or intersection of the city's principal circulation system by more than 1 percent or more than 100 vehicles, whichever is less.

- Walnut Creek, California, varies its goals not only by uses (retail, nonretail) but by area, with sites closest to a BART rapid rail station slated for the highest goal, i.e., “no more than 60 percent of all employee commute trips in single-occupant vehicles.” Elsewhere the goal varies up to no more than 75 percent who drive alone.

- In Montgomery County, Maryland, the Costain agreement's goal is a reduction of 180 vehicle trips during the peak period, in the peak direction. If the goal is not reached, the county can draw on a letter of credit posted by the project sponsor, or transfer the program to the county ridesharing agency.

Nature and Timing of Plan Requirements

Often TSM and PM requirements specify development of a plan that spells out what TSM and PM strategies the developer and employer will carry out and how. The plan may have a one-time requirement, often before development of certain projects, or it may have a continuous (usually annual) requirement for reporting on the TSM and PM program and making modifications. The advantage of plan requirements is that they allow employers and developers to develop and propose strategies and programs tailored to particular sites, employee populations, and parking or traffic conditions. Of course, plans require time and expertise to review and negotiate. Small localities may not have the resources or experience to conduct reviews. In addition, the questions of which applicants should face the requirements and what plan contents will be required need to be answered. Another issue is how the first plan can be prepared for a proposed development without knowing exactly the tenant mix until occupancy begins. For example,

- Sacramento County, California, requires applicants of major developments to prepare a trip reduction plan on rezones, use permits, special permits, development agreements, or variances. The ordinance also specifies the contents of the plan (Ordinance 83–59, Section 330–147).

- Contra Costa County, California, requires a conceptual plan at the time of application and a final plan recorded as a covenant on the project in all cases in which reductions in parking requirements are allowed for the promise of TSM and PM actions.

- Concord, California, requires a final plan after occupancy to ensure the plan reflects actual employees and tenants locating in the building. A preliminary plan is submitted at the time of application. The contents of the plan are spelled out in the ordinance.

- South Coast Air Quality Management District (SCAQMD) in Los Angeles, California, requires a plan to achieve certain average vehicle ridership targets and also requires annual updates to verify TSM and PM strategies in place and to propose changes in strategies.

When and How to Enforce

All recently developed TSM and PM policy instruments contain provisions for monitoring and enforcement. Most commonly, localities require reporting from developers and employers and reserve the right to impose fines or other sanctions for failure to carry out such required actions as submittal of annual reports, implementation of the TSM and PM program, or designation of a transportation coordinator. Toward the end of ensuring against lagging programs, some localities require performance contracts and bonds. A disadvantage of this approach is that it binds only signatories. Purchasers of the property are not contractually bound. However, covenants running with the land may accompany performance contracts, thereby ensuring enforcement against new title holders. Few jurisdictions impose fines or noncompliance sanctions on ineffective programs, provided all required strategies and program operations are carried out. Nevertheless, some localities reserve the right to take some action in the case of ineffective programs. Actions include the locality assuming program operations or specifying how the program should operate or delaying further stages of building development until a program is effective. Examples include

- Bellevue, Washington, and Montgomery County, Maryland, sometimes use a performance bond in support of enforcement. Montgomery County requires posting of initial and subsequent replacement letters of credit. The county may draw on the letter if the developer is not operating the program or achieving goals.

- In Pleasanton, California, annual reports from employers are required. Failure to reach goals triggers a task force review, which can impose additional strategies. Failure to implement the program can result in a fee of \$250 per day until compliance is complete.

- In Concord, California, the city again requires annual reports on program actions and proportions of employees using transit, carpools, and solo driving. The city reserves the right to require a traffic impact report and added strategies or capital improvements to roads and signals in cases in which the goals are not met.

- Fairfax County, Virginia, in its applicant agreement reserves the right not to issue building permits for development over a certain square footage if total peak-hour trips exceed specific levels. The county provides for appeals to the board of supervisors, independent traffic engineering analysis, and arbitration on the question of the traffic generation and impacts of the subject property (unspecified agreement, May 20, 1982).

Types of Exceptions, if Any

Localities must consider if and how to exempt employers or developers from requirements. Exemptions can make allowances for unusual situations and cases. For example, an ordinance may go into effect in an area where employers already operate effective TSM and PM programs and are subject to agreements or ordinances. Here, exemptions may be warranted. Exemptions also help make a policy acceptable where otherwise it would not be. On the other hand, exemptions may invite abuse or create continuous demands for more

exemptions. Localities also must craft exemption language to include only the desired cases, but exclude others.

- Contra Costa County, California, exempts employers from TSM and PM requirements, provided the employer already meets the ordinance objectives in terms of the proportion of employees commuting alone and by alternative means of transportation (Ordinance 87–95).

- SCAQMD exempts employers already subject to local ordinances, provided the local ordinances are at least as stringent and effective as the district's Regulation XV.

- Maricopa County, Arizona, exempts employers opening for business, relocating, or otherwise adding employees, but employers do become subject to the ordinance within 60 days before the annual due date of the employee survey and plan. The county also exempts from ordinance requirements employers who can demonstrate effective programs already in place at least for 12 months before the date when the employer is subject to the ordinance.

Types and Purposes of Fees and Financing

Localities sometimes build into their policy provisions for fee collection in support of administering the policies or in support of TSM and PM program operations. Localities must decide if and how to set fees or financing provisions in policy instruments. Many localities have not built fees or financing mechanisms into policy instruments. Although not including finance and fee issues in policy instruments may ease passage or negotiation of the instrument, there remains the question of how plan review, monitoring, and implementation in which fees are not specified will be supported. Generally, it appears localities are more likely to impose fees in developer agreements and special permits than in broad-coverage ordinances, probably because it is politically more palatable to do so. For example,

- In Bellevue, Washington, the developer agreement for Bellevue Place specifies dues on the basis of employee vehicle trips generated by the project. Revenues go toward supporting the local TMA, a public-private organization responsible for many mitigation efforts downtown.

- In Montgomery County, Maryland, fees are specified in support of the county ridesharing agency, Share-A-Ride. The basis of fees is per \$100 of real property value (Bill 19–84). Additionally, the county reserves the right to draw on a letter of credit posted as security in developer agreements and to use proceeds to support the county's rideshare program (Share-A-Ride). For Silver Spring, Maryland, the county may transfer revenue from parking fees in order to support the TSM and PM program (Bill 24–87).

IMPLEMENTATION EXPERIENCE

TSM and PM policies do not operate in a vacuum. Implementation of these policies brings management and organizational implications. National experience suggests important issues and lessons for jurisdictions.

Management and Organization

In the management and organization of TSM and PM programs, locality staffs, building managers and employers, and possibly a local committee are involved.

In most localities, planning departments are responsible for reviewing and approving any TSM and PM plans and parking relaxations. In many jurisdictions, a transportation coordinator designated within the planning department reviews plans submitted with applications, as well as required annual plans and employee surveys. In addition, the coordinator would

- Collect and analyze the annual employee surveys;
- Prepare the annual report to city or county council;
- Develop the central transit pass sales outlet;
- Organize promotional events across developments;
- Prepare, collect, and develop promotional materials;
- Develop and carry out promotional seminars and meetings;
- Conduct overall monitoring;
- Lobby for transit, bicycle, or other applicable services;
- Contract and direct TSM and PM consultant services; and
- Conduct training of on-site employer coordinators.

In many localities, the coordinator acts as the staff to a special committee responsible for overall review of TSM and PM programs and policies and reporting to decision makers. For example, the roles of the Pleasanton, California, Task Force are delineated in the ordinance as establishing program and plan guidelines, monitoring, deciding if mandatory provisions are necessary, and hearing disputes and appeals. A TSM or PM committee would

- Adopt TSM and PM policy and intent statement;
- Review the annual plan, suggesting directions and policies;
- Represent developers and employers before locality or transit agencies;
- Evaluate proposals for new TSM and parking strategies;
- Help suggest and design all promotional materials;
- Facilitate monitoring of program effectiveness;
- Assist in special events and company seminars;
- Review literature and visit model programs;
- Act as an information exchange on all strategies;
- Help provide access to employers for survey and promotions;
- Consider supportive tenant lease language;
- Review and respond to transit service proposals; and
- Arrange space for seminars, promotions, and training sessions.

City councils or county supervisors, in most communities, function as the point of last appeal on issues of noncompliance or nonperformance.

Developers and employers are responsible for setting up programs at the site. Often, ordinances or developer agreements specify that an on-site coordinator will be designated to carry out the program. Developer responsibilities typically include

- Attending committee meetings and supporting committee decisions;

- Installing bicycle lockers, if warranted;
- Implementing carpool stalls and easy exits, if warranted;
- Authorizing and helping to set up lobby displays;
- Informing tenant companies of program;
- Adding supportive lease terms; and
- Setting up transit and van pool stops.

For employers, the coordinator would

- Urge management support for employee participation,
- Distribute and collect employee and manager surveys,
- Post and update bulletin boards,
- Insert company newsletter articles,
- Distribute transit passes and carpool matching information, and
- Ensure new employee orientation.

Another important and emerging organizational entity in TSM and PM policies is the TMA. It is a private, nonprofit corporation composed of developers, employers, and representatives of public jurisdictions working to alleviate transportation problems. In some localities, the TMA has responsibilities in the management of TSM and PM programs. For example, in Bellevue, Washington, the city has required a developer to support the local TMA through dues on the basis of vehicle trips generated by the Bellevue Place project.

Monitoring

TSM and PM policy instruments often specify surveys, regular reports, and sometimes a form of traffic monitoring. A common requirement is some form of annual report from employers subject to requirements. Usually, the report is based on employee surveys. Surveys are aimed at determining the proportion of employees solo driving, using transit, bicycling, walking, and ridesharing. The Pleasanton, California, city council receives an annual report and employee survey results. Fairfax County, Virginia, requires a traffic analysis at different phases of the subject development. In case of dispute over results of the traffic analysis, the county provides an arbitration board to resolve disputes. Bellevue, Washington, requires traffic counters embedded in exits of the project and specifies the exact month and weekdays of counts. At the same time, the project occupancy is assessed to determine compliance with required limits on outbound employee vehicle trips in the p.m. peak.

Program Costs

Costs of TSM and PM programs vary widely by the nature and size of the program. For employer-based programs, costs are borne primarily by developers and companies responsible for implementation. Of course, localities also bear costs, especially if they designate their own coordinators to participate in and enforce programs. Some examples from employer-based programs in the San Francisco, California, area demonstrate cost ranges. At the high end of the cost range, a few programs provide examples.

- At Varian in Palo Alto, with about 5,000 employees, the program costs \$72,000 per year, or \$14.40 per employee (R. Loomis, unpublished).

- At Lockheed in Sunnyvale, about 25 percent of the 25,000 employees use alternative modes. Their program costs \$25 per employee per year.

- Probably one of the most extensive programs is the Bishop Ranch office complex in San Ramon serving 4,000 employees. This program includes a full-time coordinator, transportation store, computer matching, and two luxury coach shuttles for an annual cost of about \$200,000 or about \$50 per employee.

- Chevron in San Ramon serves 2,000 employees and spends \$110,000 on a full-time coordinator, BART shuttle, flextime, demonstration vanpools, and marketing materials. The annual cost of the program per employee is \$55.

Other programs serving fewer employees, or not so comprehensive in scope, cost less and include the following:

- AT&T in Pleasanton serves 2,000 employees and spends \$27,000 with a nearly full-time coordinator, monthly cash awards, carpool meetings, flextime promotion, transportation hotline, and information center. Unit cost is \$13.50 per employee.

- Rolm Corporation in Santa Clara serves 4,000 employees and expends \$40,000 for a cost of \$10 per employee. The program entails a full-time coordinator, transit pass sales, bicycle lockers, semiannual drawings and transportation fair, and in-house matching.

- A 1985 study of employer programs in Santa Clara County reveals an average annual budget per employee of \$6.15 (13).

Overall, it appears basic costs of moderate-sized TSM and PM programs range from \$30,000 to \$50,000 per year, excluding such costs as office space, computers and software, furniture, training, insurance, and survey analysis. At larger employment centers with as many as 5,000 employees, costs may reach \$100,000 to \$150,000. A shuttle operation might bring costs closer to \$225,000 or even more. For small employers (e.g., less than 500 employees), costs for a modest program might range from \$10,000 up to \$20,000 and for extensive programs, between \$30,000 and \$60,000. For large employers (e.g., greater than 1,000 employees) a modest program could cost between \$30,000 and \$60,000, whereas for an extensive program the costs range from \$100,000 to \$250,000.

Program Financing

Both public and private financing arrangements are used to support employer-based programs. In some cases, programs are supported by private financing without enforceable commitments. These voluntary private commitments might include in-kind contributions of personnel, office space, computer facilities, and the like. Or, some employer dues and fees might be contributed, again without a legally binding commitment. In other cases, programs are financed by legally binding public mechanisms put in place by local government. These mechanisms include impact fees, business license taxes, benefit

assessment districts, and others. Examples of public mechanisms in some jurisdictions include the following:

- In the Los Angeles area, the Coastal Corridor and Westwood ordinances require trip fees. The fee per p.m. peak-hour trip in the Coastal Corridor is \$2,010, whereas in Westwood it is \$5,600 per trip.

- Concord, California, has established a fund consisting of interest on the in-lieu parking fund, net income derived from any city-operated parking facilities, and other dedicated sources. The fund supports the activities of the city coordinator.

- Berkeley, California, imposes a one-time fee of \$2.00 per ft² or an annual fee of \$.20 per ft² for 30 yr. Fees that enter the transportation services fund are used to support ridesharing, transit, and bicycling.

Where TMAs are formed, they might use private commitments to support the program. For example,

- The TMA in El Segundo, California, levies an assessment of \$1.25 per employee.

- The North Bay TMA in Marin and Sonoma counties in California charges an annual fee of \$25 per employee up to a maximum of \$250 per employer.

Enforcement and Legality

Thus far, enforcement and legality have not been large issues in the implementation of TSM and PM programs. Many localities check compliance with mitigation regulations by requiring annual reports from employers on employee travel modes and program activities. Others require traffic reports. Few TSM and PM programs have operated long enough to provide examples of localities invoking sanctions for noncompliance. However, localities and employers have negotiated issues of compliance without resort to sanctions or court tests. For example,

- In 1986 and 1987, the coordinator in Pleasanton, California, found it necessary to pressure several employers to submit annual reports and surveys. Finally, the reports and surveys came in without resort to notification from the city attorney or the need for other procedures (G. Gilpin, unpublished).

- Likewise, Montgomery County, Maryland, has never called in letters of credit in cases in which employers were not achieving mode-share or trip-reduction standards. The county has reviewed such cases carefully and is satisfied best and good faith efforts are occurring (J. Clark, unpublished).

- Novato, California, in an agreement with Fireman's Fund Insurance Co. required the implementation of a flextime program to ease traffic burdens on nearby streets. After a few years of successful operation, the company abandoned the policy, causing traffic to worsen in the area. The city pressured the company to again restart the program. The company complied without the city invoking sanctions (J. Bourgart, unpublished).

In sum, whether and exactly how localities will invoke sanctions specified in various policy instruments remain to be seen.

The main lesson at this point is that various sanctions are specified in ordinances and agreements allowing for enforcement to proceed.

Concerning legality, courts have not yet tested the legality or reasonableness of ordinances, developer agreements, or other instruments. Still, there is little question localities may impose reasonable traffic mitigation requirements through agreements and ordinances. Generally, courts have ruled that reasonable traffic mitigation requirements and regulations are a proper exercise of police power. State constitutions expressly confer on cities the power to make and enforce within their limits all local, police, sanitary, and other ordinances and regulations not in conflict with general law. Most judicial authorities also appear to conclude that developing property is a privilege and that the dedication of land or payment of fees is voluntary in nature and developers must meet any reasonable condition imposed by local jurisdictions before issuance of building permits. Consequently, even strict traffic performance standards specified in developer agreements may be found reasonable and binding should they be challenged and tested. However, the same provisions imposed on existing employers and developers after the fact of development may not be so interpreted.

Parking Management Implementation

Parking management strategy implementation presents several issues. How can parking policies support program efforts? What is feasible and unfeasible to do?

Supportive Public Parking Rates and Policies

Some localities attend to pricing policies in publicly owned and operated facilities as a way to buttress programs and requirements. Important considerations include ensuring prices for long-term parking are not under market rates, or far below transit fares; providing location or price preference to ride-share patrons; and avoiding employee parking subsidies wherever possible. Montgomery County, Maryland, maintains market rates for long-term parking and offers discounts to carpoolers in facilities under its control. The county also recently halted block sales of parking permits to employers to discourage employer subsidies of employee parking.

Developer Agreements

As previously discussed, some localities use developer agreements to encourage pay parking for tenants and employees as in the agreement in Bellevue, Washington. However, a policy of pay parking will not necessarily lead to employees paying for parking. In buildings with multiple tenants, an owner may agree to institute pay parking at the garage or surface lot. Employees may pay the charge, but be reimbursed for all or a portion of charges by employers. Employer-subsidized parking is not uncommon in cities with pay parking. Also, such an approach will quickly generate spillover parking onto streets, commercial facilities, retail parking areas, vacant properties, and other areas not priced or regulated. The TMA in Bellevue, Washington, guards against such a possibility by

contracting with employers to monitor and enforce short-term parking regulations in retail lots.

Enforcement

Enforcement is the key implementation issue with preferential parking for rideshare patrons. Many local ordinances, permit requirements, and developer agreements encourage preferential parking for car and vanpoolers. The key implementation issue is how to enforce use. One approach appropriate to garages with attendants is simply not to allow any vehicle to park in designated stalls without two or three persons in the vehicle at the time of parking. In short, no drop-offs are allowed. Alta Bates Hospital in Berkeley, California, uses this approach.

Flexible Parking Requirements

Where localities are using flexible parking requirements in codes to encourage developer-sponsored TSM and PM programs, experience suggests flexible requirements may not attract developers or lenders. It seems localities have a difficult time setting parking requirements in support of policy objectives. Several urban localities have provided for optional relaxations in parking requirements for various purposes (support of peripheral parking, ridesharing and other transit encouragements, and in-lieu funds) only to find developers not taking advantage of relaxations. Los Angeles, Hartford (Connecticut), and Seattle all provide examples (14). Difficulties in setting maximums, minimums, or relaxations to serve public purposes are understandable, whether in urban or suburban areas, because knowing what developers and lenders prefer to provide in the way of parking supply and setting requirement policy is not a simple task. Even if planners are able to determine the market demand and supply levels at any one time and place, the demand-supply equation is constantly varying because of everything from the state of the economy to the price of gasoline to the level of transit service. Thus, flexible parking requirements must be approached with caution.

CONCLUSION

Policy Instruments

Policy instruments are increasingly important in initiating TSM and PM programs. These instruments set the stage for monitoring and enforcement and, if necessary, for program modifications. Consequently, the design of policy instruments is important and experience suggests some lessons.

- For broad applicability of TSM and PM requirements across new and existing employers, TSM ordinances or special permits are preferred instruments. For focused requirements on new developments, developer agreement requirements are appropriate to consider. To date, there is little experience with cooperative or joint-power ordinances regulating more than one jurisdiction.

- Localities have had a difficult time establishing parking requirements and relaxations to attract developers and lenders. Apparently, it is difficult to anticipate what developers and lenders prefer in terms of parking supply and their interest in reduced supplies in return for TSM and PM.

- Parking price strategies can be encouraged by ensuring any publicly controlled parking is not priced under market rates and through developer agreements specifying pricing strategies. A danger in fashioning such policies is the possibility of encouraging spillover parking in uncontrolled areas.

- Given the wide variation in TSM and PM program results and the difficulty of knowing which strategies are most effective, localities must be cautious in establishing uniform or stringent goals in policy instruments, or prescribing implementation of specific strategies.

- Requiring program plans from developers and employers requires locality staff time and resources, which may prove to be a burden for small localities. However, requiring and negotiating plans has the advantage of tailoring TSM and PM programs to each site, a strong plus given the many program and site variables influencing program outcomes.

- Though courts have yet to test TSM ordinances and regulations, state law generally should enable localities to set TSM and PM requirements and enforcement provisions. Fines and civil penalties for failure to act in accordance with requirements also are possible under ordinances, provided usual appeal procedures are added. Performance contracts, bonds, and letters of credit are possible assurance mechanisms in developer agreements, though these must be added to covenants running with the land to provide maximum assurance. One area of caution is in stringent and binding traffic performance standards or goals. Although these may be upheld in developer agreements, presuming acceptable contractual practices were followed, ambitious and binding goals in ordinances applying to existing employers may be successfully challenged on the grounds of reasonableness.

- Exemptions to policy requirements are not very common in policy instruments, but are useful in cases with preexisting TSM and PM regulations or in cases where annual plan and survey deadlines may unreasonably burden new, expanding, or relocating employers.

- Fees and financing mechanisms in support of TSM and PM programs are not built into many local policy instruments. This practice may speed passage of policy instruments, but may hinder later monitoring, plan review, and enforcement.

Implementation

Comprehensive TSM and PM programs in localities require participation by numerous parties (public and private) and monitoring and financing mechanisms. In particular,

- Localities with comprehensive programs involve planning departments, task forces, or review committees with monitoring responsibilities and possibly private TMA organizations. Local decision makers also serve as points of appeal in the enforcement of policy instruments.

- Monitoring of mode shares, traffic levels, and parking volumes are important for determining program effectiveness.

In light of the many variables affecting travel behavior to and from employment centers, comparisons of program results with control sites without TSM and PM programs would be useful.

- Annual program costs at employment sites range from a few thousand dollars at small employers with modest programs to \$250,000 at large employers with extensive programs. Both voluntary and legally binding mechanisms are in place, as well as TMA fee structures in support of private financing.

RECOMMENDATIONS

Policies

Localities do not need to institute stringent policies to ensure program success. More important than the exact policy terms and provisions is how implementation proceeds. Nevertheless, policy instruments are important for initiating TSM and PM efforts, setting commitments and resources, and establishing the evaluation framework.

Before considering local TSM and PM policies, localities should check with county, regional, and state air quality or other agencies with responsibility for transportation control or traffic mitigation. Increasingly, these agencies are developing their own trip reduction regulations, which may supersede local regulations. Los Angeles Regulation XV provides an example. Where such regulations are not developing, localities may wish to cooperate with one another to institute consistent instruments across jurisdictions. However, localities should proceed with caution because aside from Maricopa County, Arizona, there are no region-wide policy instruments serving as models.

Before selecting the type of policy instruments to develop, localities must consider their traffic problem and objectives (reduced solo driving, shift in peak travel, focus on internal versus through traffic); the source of the problem (all employers or just new employers); the best types of TSM and PM strategies to encourage; and the difficulty of getting approval for proposed instruments and implementing them. Generally, larger communities with area-wide traffic problems caused by new and existing employment should consider ordinances applicable to all medium-to-large employers. Of course, new ordinances will require public hearings, legal council review, and passage through decision-making bodies. Smaller communities with spot congestion problems attributable to new development should consider special permits and developer agreements secured by covenants. These instruments may involve less time-consuming review and consensus building with decision makers to gain passage. In addition, these instruments may require only staff review and negotiations to carry out. Developer agreements also are more appropriate for securing specific physical facilities such as bicycle racks, transit turn outs, or parking areas devoted to carpoolers.

Generally, localities should not require implementation of many specific strategies in policy instruments. Instruments may require a designated coordinator, regular reporting, annual survey, and distribution of basic rideshare and transit information. However, instruments should avoid requiring specific proportions of parking devoted to carpool stalls or the pro-

vision of discounted transit passes or imposition of specific parking prices. The preferred approach is to require and negotiate plans spelling out strategies and then to evaluate and approve these on the basis of their suitability to the site and employee population. This approach is especially recommended for special permits and ordinances applying to large areas. Localities should develop plan requirement guidelines to ease compliance and speed review. Concord, California, provides one model for such guidelines. Developer agreements for particular sites may require some specific strategies in which there is little doubt about effectiveness. For example, bicycle lockers or transit pass promotions may be required as complements to other locality programs such as bicycle paths or transit centers near the subject development. But as a general rule, localities must be cautious about specifying TSM and PM strategies because it is difficult estimating their probable effectiveness.

Localities must monitor and enforce policy instruments, but must be careful not to develop or try to enforce binding traffic or mode share standards that are too stringent, especially in area-wide ordinances and permits. Ambitious goals may invite successful legal challenge because attainment of such goals may not be possible. Localities must appreciate that some of the variables influencing traffic volumes and commuting patterns to and from employment sites are not within the control of employers or developers. Localities probably can be more secure in applying stringent and binding performance requirements to developer agreements. Experience suggests such provisions may be enforced without legal challenge. Novato, California, provides one example in the case of Fireman's Fund. Exemptions should be developed in policy instruments only to allow for cases of duplicating regulations or unusual hardship in complying with survey and reporting deadlines. Policy instruments should include provisions for financing monitoring, plan review, and enforcement. Too often, instruments ignore the need for fees and financing.

Implementation

Localities must provide local resources in support of TSM and PM programs; monitoring both of regulated and of unregulated sites as well as spillover parking should accompany PM strategies. In addition, the private sector needs to be involved in program development and appraised of the costs involved in implementing the programs.

Consideration should be given by localities for establishing a transportation coordinator position in support of TSM and PM programs, especially programs required by ordinances or permits over broad areas. The coordinator should serve to explain requirements, review plans, and survey results, provide technical assistance, and possibly centralized rideshare matching services if not available through other agencies. A coordinator may not be required where only a few developer agreements are in place or planned, though staff still needs to be designated for monitoring and review.

Localities should organize a review and support task force to help monitor the program, recommend enforcement and policy changes, and assist with special events. The private sector should participate in the task force or committee, whether through representation from the local TMA or from local

employers. Private employers should be appraised of policy instrument provisions and provided information on typical TSM and PM programs, levels of effectiveness, and costs.

Monitoring of mode shares should not only occur at employers subject to TSM and PM requirements, but also at sites not subject to requirements. Additionally, localities should pay special attention to monitoring of PM strategies such as pricing or restricted supplies negotiated through developer agreements or required by parking codes. These strategies may be accompanied by spillover into residential or retail areas. If so, localities should be prepared to enforce against spillover parking. The enforcement procedures of the TMA in Bellevue, Washington, provide one model.

All program participants should be prepared to develop, monitor, and modify the local program and policy instruments over a period of several years because programs typically take considerable time to evolve and can experience declining effectiveness over the long haul.

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