Defining Telecommuting

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Both as a business response to internal business problems, and as a transportation demand management strategy, telecommuting is gaining acceptance in the United States and elsewhere. Yet there is no consensus on what actually does and does not constitute telecommuting. This paper first indicates why approaching such a consensus is important. It then discusses the definition of telecommuting in two different contexts. In the first context, telecommuting is considered in general, in the context of a variety of other remote work options. Each of the remote work options is classified according to its transportation impacts and its managerial implications. In the second context, the efforts of one group to define non-home-based telecommuting in the specific context of an air quality regulation designed to reduce travel are documented.

Telecommuting is often defined as the use of telecommunications technology to partially or completely replace the commute to and from work (*1*). Both as a business response to internal business problems, and as a transportation demand management (TDM) strategy, telecommuting is gaining acceptance in the United States and abroad. In the United States alone, the federal government (*2*) and the states of California (*3,4*), Hawaii (*5,6*), Washington (*7,8*), Arizona, Virginia (*9,10*), Florida (State Employee Telecommuting Act), Minnesota, and Connecticut (Public Act 90-219) are in various stages of institutionalizing, implementing, or planning telecommuting programs. Numerous other programs are developing that involve local governments or the private sector.

Particularly in California, telecommuting has become an important element of transportation and air quality planning. Telecommuting as a transportation strategy has found its way into several major public policy documents, including the 1989 Air Quality Management Plan for the South Coast (California) Air Basin (*11*), Regulation XV of the South Coast Air Quality Management District (AQMD) (*12*), and the Statement of National Transportation Policy (*13*).

However, despite its increasing popularity, there are about as many definitions of telecommuting as there are settings in which it is being practiced or considered. Not surprisingly, not all definitions are consistent. Consider the following examples:

1. The term "telecommuting" is often used interchangeably with "working from home." Yet there are several varieties of working from home, including home-based businesses and overtime work, that are not commonly considered telecommuting. Telecommuting need not be home based; in fact, some experts feel that the satellite or local work center variations of telecommuting will eventually become the most popular forms (*14*).

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2. Telecommuting is sometimes equated with teleworking—the use of telecommunications-related technology to conduct work (*15*). Not all teleworking is like teleconferencing, which replaces a commute trip. In fact, teleworking may or may not replace travel at all (*16,17*).

3. Initially, telecommuting was thought of as being full time. Many commonly cited drawbacks of telecommuting (e.g., worker isolation) apply most forcefully to the full-time work-at-home version, and little or not at all to other forms of telecommuting. These drawbacks are still being raised as serious obstacles, even though it is widely conceded that full-time work-at-home will ultimately be the least-adopted form of telecommuting.

In some settings, telecommuting is still being defined in terms of how often it takes place. One program specifies telecommuting to be "working a day or two a week from a home or satellite office . . ." (*7*). On the other hand, proposed California legislation (State Assembly Bill 374) would provide tax credit to employers implementing telecommuting programs, provided participants telecommute 3 days or more per week. (The legislation in question has been tabled until the next session, but meanwhile, amendments are being discussed that could provide reduced credit when employees telecommute 2 days a week).

4. Early discussions typically assumed that computers were essential to telecommuting, and that telecommuters were of necessity at least "information workers," if not actually computer programmers and the like. It is now more generally accepted that non-computer-based work (requiring skills of e.g., reading, writing, thinking, talking on the phone) can also qualify as telecommuting. Although the information worker stereotype may persist, in reality many employees who would not be classified as information workers still deal with information (reading, paperwork) to such an extent that they can telecommute at least part time.

In some cases, the variations in definitions are caused by a deliberate choice to emphasize particular aspects of telecommuting or to relate telecommuting to other forms of working. More fundamentally, however, there is not a complete consensus on what does and does not constitute telecommuting. The multiplicity of definitions has several undesirable consequences: (a) The term "telecommuting" means different things to different people, resulting in confusion and misunderstanding. Some people reject telecommuting on the basis of their erroneous or limited view of it (e.g., full-time work at home), without evaluating each different form of telecommuting on its own merits; (b) estimates of the amount of existing and projected telecommuting vary widely, often because they are based on different definitions of the term (*18, 19*), (c) the transportation impacts of other, related, work

alternatives may be underestimated at best or ignored at worst, because of the attention focused on telecommuting per se; (d) the transferability to telecommuting of characteristics of other work alternatives may be overlooked; i.e., some knowledge and skills that are already commonplace for related work options may be applicable to telecommuting; (e) finally, those responsible for developing public policy designed to promote telecommuting are struggling to identify practical, monitorable criteria for deciding what constitutes telecommuting.

This paper is divided into two sections dealing with clarifying the definition of telecommuting. In the first section, a classification system for remote work forms is developed. Telecommuting is placed within this classification system and related to other form of remote work. The second section reports an attempt by a Southern California group to define non-home-based telecommuting within the context of air quality regulation. A final section makes some concluding observations.

CLASSIFICATION OF REMOTE WORK TYPES

Telecommuting Criteria

Telecommuting can be considered one type of remote work, but there are a number of others. Before discussing some of those other types, it may be necessary to define the term "remote work" in this context. A definition that is both broad enough and restrictive enough to be useful is difficult to craft. However, one reasonable definition of remote work might be "work done by an individual while at a different location than the persons directly supervising or paying for it."

What are some reasonable criteria for determining whether a particular remote work situation is telecommuting or not? The structure of the word itself suggests two main criteria: tele (a Greek word meaning far or distant)—is the worker physically distant from the primary worksite, i.e., the location of the supervisor? and commuting (traveling back and forth to work)—is commute travel reduced or eliminated? By these criteria, a remote work type would be considered telecommuting if it involved remote management and reduced commute travel.

It is of interest to test a variety of remote work types and related work types against these two criteria: remote management and commute reduction. The position of each type is graphically shown in Figure 1. The following discussion is based on the figure, starting in the top right area and generally moving clockwise. The classification and discussion of each work type vis-à-vis remote management focuses on its relevance to telecommuting. The discussion vis-à-vis commute reduction has points in common with an earlier discussion by Salomon (*18*).

Classification of Remote Work Types by Transportation Impacts and Managerial Proximity

At-home overtime generally does not reduce commute travel. (An exception is a case in which the employee would have to drive back to the office after dinner if it were not possible to

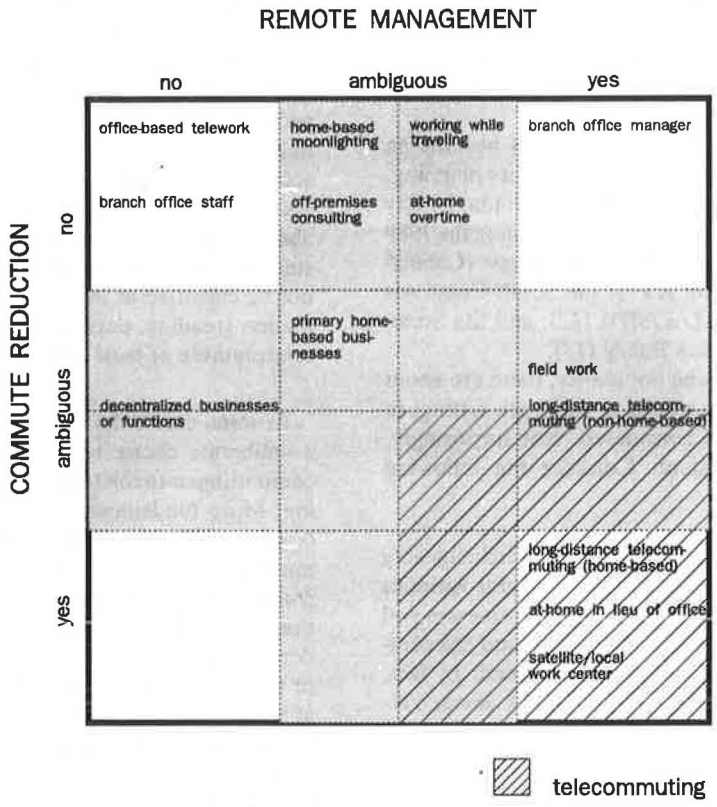

FIGURE 1 Classification of remote (and related) work types.

work from home, but this would not affect peak-period travel.) Technically, the work is being done remote from supervision, but this situation has potentially little relevance to telecommuting. Overtime work is often a short-term "crunch," with a well-defined product and deadline by which performance will be judged. With ample opportunity for on-site observation, managers are usually not reluctant to allow employees (at least, exempt employees) to work at home after they've already put in the normal time at the office.

However, there is at least one way in which at-home overtime might lead into telecommuting. Some employers have established financial incentives for their staff to buy home computers, in the expressed or implied hope that the employees will (a) learn or improve their computer skills on their own rather than the company's time and (b) be likely to put in more overtime when they can do it from home. Regardless of the ethics of that stategy, it does provide a technological base and a foot in the door as far as management policy is concerned, for eventual migration to working from home in lieu of ongoing to the office.

Like at-home overtime, working while traveling does not directly reduce commute travel. Again, it may, strictly speaking, be conducted away from a manager, but experience with it will probably not itself lead an employer to implement a telecommuting program. For one thing, those with the sophisticated tools for working while traveling (carphones, laptop computers, etc.) often are the managers rather than the rank-and-file (field and sales workers are a common exception, however; they are discussed separately later). For another thing, travel time may not be expected to be used productively. Any ability to do so may be viewed as a bonus rather than the norm, and therefore not subject to the usual management scrutiny. Such expectations may grow, however, as the tools for using that time productively become more ubiquitous.

The branch office manager does make a conventional commute trip. It might be argued that the commute is reduced if the branch office is closer to home than the headquarters office, but (a) that is by no means certain to be the case, and (b) it would be valid only if the branch manager actually has the option of working at either place and simply chooses the one with the shorter commute—an unlikely situation.

Supervision of the branch office manager takes place remotely. This type of remote work has some management parallels to telecommuting. Presumably, the office manager and the supervisor set objectives, criteria, deliverables, and deadlines for the work to be accomplished by the branch office, and the office manager's performance is evaluated on how well those objectives are met. Presumably, too, frequent communication takes place between the branch and the headquarters, with performance feedback requested and supplied as needed. These activities are characteristic of well-run telecommuting programs as well.

Field and sales work may or may not involve a reduced commute, depending on whether the trip to and from home is directly from and to a field site or the central office. In many if not most situations, the field worker is still required to report to a central site—to be dispatched, to complete paperwork, to make phone calls, or simply for one's presence to be recorded—before and after the workday. However, some employers are realizing the absurdity of requiring a field worker to drive into the office for a "telephone hour." Los Angeles County's telecommuting program, for example, involves a variety of field workers, including audit staff, welfare fraud investigators, health services inspectors, probation officers, and social service workers (*20*). These types of occupations are not generally classified as information work.

Field work certainly does involve remote management. Performance criteria for many field work jobs are easily quantifiable (number of service calls made, dollar value of sales generated, number of data records gathered), and therefore managing field work is not comparable to managing an information worker whose performance is more subjectively measured. Without disputing that, some parallels to telecommuting can be observed. The element of trust is involved in both cases. The manager often has no guarantee, for example, that the field worker isn't finishing the quota in 6 hr instead of 8 hr, and idling away the other 2 hr, instead of increasing productivity. Trust may be required in other areas, too, such as the legitimacy of all the contacts reported, or of expense account claims. Ultimately, then, the field work manager must make some subjective assessments of merit just as the manager of a telecommuter does.

Long-distance telecommuting, when it is home based, eliminates the commute trip. For long-distance telecommuting based in a local office, it is debatable whether the commute is reduced or not. It could depend on whether the office is a nearby telecommuting center or a highrise in the central business district. It could also depend on the likelihood that a different work arrangement would result in a longer commute. In terms of management, long-distance telecommuting is much like regular local telecommuting. Importantly, though, long-distance telecommuting is likely to be full time, whereas local telecommuting arrangements often involve spending 1 day or more per week in the primary office. In this respect, the long-distance telecommuter more closely resembles the branch office manager than the local telecommuter.

The salaried employee working at home instead of in the office usually meets the telecommuting criteria. However, there are two types of marginal areas: one relating to commute reduction and the other to remote management. The first potential exception occurs when the alternative to working at home is not working at all, rather than working in a conventional office. This exception may be the case for mobility-limited segments of the population such as the disabled, the single parent, and the prison inmate. In these situations, commute travel is not reduced.

Second, some classes of salaried workers do not have supervisors in the usual sense of the word: university professors, top executives of firms or public agencies, the President of the United States, and so on. Whether or not one refers to work at home by these kinds of people as telecommuting, their ability to work at home is unlikely to influence employers to allow it for their less-privileged types of employees. In each of these special cases, however, as with regular telecommuters, the worker is ultimately judged on results, rather than on appearances, time spent in the office, or other superficial measures.

The salaried employee working at a satellite or local center nearer to home than the primary office also fulfills the two telecommuting criteria, assuming the kinds of conditions described in the following section are met. These two

categories—salaried employees working at home or at a center near home—are considered as traditional forms of telecommuting.

Because they do not involve management from afar, several work types are not classified as remote but are related to other remote work forms. Branch office staff, as mentioned earlier, are supervised on site. Commute reduction cannot be said to occur, except in the relatively rare cases in which employees are given a choice of working at the branch office closest to their homes.

A related situation is that of decentralization of an entire business or of a functional unit (e.g., personnel or data processing) to an outlying area of a region. The effect on commuting is again ambiguous. If the new sites are chosen specifically to minimize the average commute of existing employees, then it could be viewed as reducing the commute in most cases. On the other hand, if the site is chosen for primary reasons other than minimizing commute travel, then it is likely to increase travel, at least for existing employees who have already centralized their residential locations around the previous site (*21*).

Office-based telework does not reduce commute travel, but may reduce other kinds of travel. For example, an on-site videoconferencing facility may eliminate the need for some business trips. The ability to interact with remote data bases may permit the decentralization of government services, reducing the need for members of the public to travel to a downtown civic center to access those services (*6*).

Where do home-based businesses fit in this classification system? Moonlighting typically does not reduce commute travel, because it is only a secondary job. For a primary home-based business, as for the home-based salaried worker, whether commute travel is reduced depends on whether the alternative is (a) no job, or (b) a conventional job involving a commute. In either type of home-based business, the worker is the owner-manager, so management is, technically, anything but remote. However, the home-based business owner is working remotely from the customer (the person paying for—and therefore, broadly speaking, supervising—the work). In that sense, there are some valuable parallels to telecommuting. The customer and the business owner agree on the amount and type of work to be done for the price, and on a schedule for completing the work. Then, the customer judges the final products against the agreement, rather than by ascertaining that the business owner was in the office every day from 8:00 a.m. to 5:00 p.m. Similarly, telecommuters and their managers agree on performance standards, and the work is judged on those standards rather than on physical presence at a desk.

Finally, a similar argument can be made for virtually any consulting business that is not on the client's premises. Although commute travel is typically not saved, the same aspects of remote management apply as for a home-based business.

Implications of the Classfication System

This classification system has some implications for the managerial acceptance of telecommuting, and for its usefulness as a transportation reduction measure. First, the characteristic of remote supervision is not unique to telecommuting. Similar remote management skills are required in familiar types of jobs: managers of branch office managers, supervisors of field workers, and clients of consulting firms. To the extent that this commonality is recognized, telecommuting should not appear to be a radical departure from ordinary ways of doing business. Exploiting that commonality should lead to improved remote management techniques.

Second, the characteristic of commute reduction is also not necessarily unique to telecommuting. It was suggested that several other forms of remote work could reduce commute travel, depending on the alternative. For example, to the extent that a home-based worker would otherwise be making a conventional commute, the transportation impacts of a primary home business are identical to those of full-time telecommuting. Thus, transportation planners should be interested in tracking remote work types other than telecommuting. It will not usually be practical to ascertain whether, for each individual, the alternative to the current work arrangement would in fact reduce commute travel. However, it is possible to monitor and analyze broad trends in work arrangements—such as home-based businesses, geographical or functional decentralization of businesses, and telework—for their transportation implications.

Finally, even when focusing exclusively on telecommuting, predictions of its transportation impacts will be faulty if too restrictive a definition is used. For example, it has been seen that the universe of potential telecommuters is not limited to information workers, as has been assumed in the past. Also, more commute trips may be eliminated by the large number of people who are willing to work at home 1 day per week than by the small number willing to do it full time. The transportation, energy, and air quality implications are different for non-home-based telecommuting than for the home-based form.

DEFINING NON-HOME-BASED TELECOMMUTING

Background

As mentioned earlier, it is expected that the satellite or local work center will ultimately be the most widely accepted form of telecommuting. Work centers are, initially, more difficult and perhaps more expensive to set up than home-based telecommuting programs, but they have potentially a much broader appeal. For the employer, prospective advantages of a telecommuting center over the home as a workplace include (a) a more professional image, (b) an improved ability to deal with security and confidentiality concerns, (c) an increased confidence in the telecommuter's productivity, and (d) a more conventional worker and property liability context. For the employee, prospective advantages include (a) adequate space to work, which may not be available at home; (b) minimization of family or domestic distractions, which may not be practical at home; (c) the ability to share equipment, facilities, and services too expensive to maintain in an individual home; and (d) professional and social interaction. Many personalities and jobs not well suited to working from home may quite effectively work from a center close to home. Thus, for policies intended to encourage telecommuting, the treatment of non-home-based telecommuting becomes important.

Regulation XV of the South Coast (California) AQMD is one such policy. The Introduction indicated that Regulation XV includes telecommuting among the ways an employer can reduce peak-period vehicle travel to achieve a specified average vehicle ridership (AVR) target. South Coast Air Basin firms with 100 or more employees at a single site are subject to Regulation XV—more than 8,000 employers in all. (The South Coast Air Basin includes Los Angeles, Orange, and the urbanized portions of Riverside and San Bernardino Counties).

Giving an employer AVR credit for home-based telecommuting is straightforward. However, the situation for non-home-based telecommuting is not so simple. In the first place, travel to a telecommuting center would likely involve a vehicle trip, thereby creating significant emissions [a typical 5-mi trip generates 61 percent of the hydrocarbon emissions of a typical 20-mi trip, because a high proportion of the emissions occur during the cold start, the first few minutes that the engine is running (*22*)]. In the second place, no clear guidelines have been set as to what constitutes non-home-based telecommuting. The AQMD does not want a firm to obtain commute-reduction credit by calling a conventional branch office or a decentralized function a telecommuting center, nor does it want conventional field workers classified as telecommuters.

In spring 1990, the AQMD indicated that it was considering granting only partial credit for vehicle trips to a telecommuting center. As part of its request for public comment on this proposal, the AQMD invited the Los Angeles–based Telecommuting Advisory Council (TAC) to develop recommendations on both issues: how to grant credit for non-home-based telecommuting involving a vehicle trip, and guidelines for determining what non-home-based telecommuting is.

The TAC recommendations to the AQMD fell into three main categories: changes to the AQMD definitions of telecommuting; policy statements on granting credit for vehicle trips to a telecommuting center; and guidelines or criteria for determining what a telecommuting center is (S. Yanner and E. Shirazi, letter to S. Siwek). These sets of recommendations are described in the following subsection.

Recommended Definitions

The AQMD had been defining telecommuting as "working at home or at satellite work stations using electronic or other means to communicate with the usual place of work" (*12*). The TAC proposed two changes to that definition. First, it recommended replacing the phrase "satellite work stations" with "an alternate location." Doing so would be more consistent with the nearly standard terminology that reserves the term "satellite" for the special case of a telecommuting facility occupied by a single employer. Second, it added the phrase, "instead of physically traveling to a more distant work site," to emphasize that reducing travel was essential from an air quality standpoint. Thus, the proposed definition reads: "Telecommuting is working at home or at an alternate location and communicating with the usual place of work using electronic or other means, instead of physically traveling to a more distant work site."

The AQMD had no definition specifically for non-home-based telecommuting. The TAC proposed referring to these alternate locations generically as "telecommuting centers," and provided the following definitions: "A telecommuting center is a site, other than the home, from which the employee works instead of traveling to a more distant central work location. There are several kinds of telecommuting centers: satellite work centers are facilities used for telecommuting by the employees of a single organization. The center can be office space obtained expressively for the purpose of telecommuting, or a portion of space devoted to telecommuting within a conventional branch or local office. Local or neighborhood work centers are telecommuting facilities shared by two or more employers. The center may or may not be part of space within an existing office."

Recommended Policy toward Vehicle Trips to a Telecommuting Center

In the AVR calculation for a given primary site, the TAC recommended giving full trip reduction credit for trips to a telecommuting center. The six reasons provided for this recommendation are self-explanatory:

1. When a commuter drives a short distance to rendezvous with a vanpool, carpool, or express bus, the entire trip receives full credit under Regulation XV. The trip to a telecommuting center typically is not longer than the access trip to such a rendezvous point, and the "line-haul" portion of the trip is eliminated entirely. Trips to telecommuting centers result in a greater benefit to air quality than these two-leg transit and rideshare trips.
2. Telecommuting centers substantially shorten the commute trip, resulting in a direct reduction in emissions.
3. Trips to telecommuting centers often avoid the congested urbanized corridors of the region. This procedure improves traffic flows and average travel speed, thereby indirectly reducing emissions.
4. Telecommuting centers improve the jobs and housing balance of the region, a policy that the AQMD supports.
5. The establishment of telecommuting centers is called for in the South Coast Air Quality Management Plan (*11*).
6. The AQMD is searching for every reasonable incentive for employers to reduce the peak-period commute travel of their employees. Failure to allow credit for telecommuting centers is, in fact, a disincentive to the establishment of such centers.

Recommended Guidelines for Acceptance

The TAC proposed seven guidelines for determining whether a specific situation was a telecommuting center. These guidelines were designed to assist a company wanting to claim credit for a telecommuting center, as well as AQMD staff who would evaluate the adequacy of a company's transportation demand management program. The proposed guidelines are as follows:

1. Transportation Demand Management (TDM) Programs. The operation of a firm's telecommuting center should be an integral part of a central office work site TDM program, and monitored accordingly.

2. Distance. An employee's commute to a telecommuting center should result in a reduction of the distance traveled from home to central work site.

3. Linkage to the Office. The telecommuter's job responsibilities should be a direct extension of the work normally performed at the central work site within the AQMD's jurisdiction. Results of the work at the telecommuting center should be transmitted or communicated to the central work site and integrated into the central site's work.

4. Job Mix. A telecommuting center may include selected employees from one or more business units of a company. A telecommuting center may include employees from one or multiple companies, government agencies, or business entities.

5. Employee Characteristics: Employees that work out of a telecommuting center can be full-time telecommuters who, for example, use the facilities more than half of the work week or timeframe, or part-time telecommuters who use the facilities 1 to 2 days per week, on an occasional or drop-in basis.

6. Supervisors. The full- or part-time presence of a supervisor at a telecommuting center is not a required criterion for defining a telecommuting center. A supervisor may or may not visit the employees at the telecommuting center, or may work from a telecommuting center provided that results in a reduction of the supervisor's commute.

7. Telecommuting Employee Population. As long as all other telecommuting criteria are met by a group of employees of a firm at any telecommuting center, such employees should be considered telecommuters reporting to a central worksite. A telecommuting center, regardless of the number of telecommuters, will not have a separate employee count or AVR requirement. Nontelecommuting employees that work at the same site will be subject to Regulation XV.

Discussion of the Recommended Guidelines

Telecommuting Employee Population Guideline

The seventh guideline is a policy statement reinforcing the principle that a telecommuting center should be treated differently than a conventional company facility, even if it happens to be colocated with that conventional facility. For a conventional facility, the employees are viewed as reporting to that site, and any site with more than 100 employees reporting to it is subject to Regulation XV. The AQMD had suggested that if a telecommuting center had more than 100 employees, it too should be subject to Regulation XV as a separate worksite, and should meet the AVR target at that site.

TAC members argued that, by definition, telecommuters report to a different location, and are contributing to improving the AVR at that primary site. Requiring them to do even more would be a double standard that other strategies for trip reduction do not have to meet. The issue becomes especially important when the AQMD lowers the applicability threshold to 50 or even 25 employees at a single site (as is called for by the AQMP within the next few years).

Supervisors Guideline

The sixth guideline, supervisors, requires an explanation, in view of the previous emphasis on remote management. It is intended primarily to deal with the exceptional case in which an employee and supervisor are both telecommuters, and happen to live close enough to each other to be using the same telecommuting center. Assuming the supervisor had other staff at the primary office and at other telecommuting centers, the principle of remote management would still hold.

However, some TAC subcommittee members wished to explicitly include another type of special case. They considered a situation in which a company establishes a small telemarketing unit in an outlying part of the region. They supposed that the unit is an expansion of a larger, existing telemarketing section at the primary office. Existing employees are assigned to the new unit only if they live nearby, and any new employees are drawn from the local (not regional) labor market. The company wants to have a supervisor manage the new unit, and transfers or hires someone who also lives nearby. Under the guidelines given, this unit could qualify as a telecommuting center.

However, such a situation should be classified as a form of functional decentralization rather than telecommuting. It may still be beneficial from an air quality standpoint and desirable to encourage this kind of location activity (as current air quality regulations do not)—but without the element of remote supervision, it is not telecommuting.

TDM Programs Guideline

The first criterion, TDM Programs, deliberately excludes informal or ad hoc non-home-based telecommuting from qualifying for Regulation XV credit. Consistent with AQMD's intent for other TDM stategies (including home-based telecommuting), the intent is to force an employer to (a) proactively plan to achieve transportation improvements, and (b) be public and accountable about transportation-related company policies. Thus, a side benefit of Regulation XV for telecommuting advocates is that firms are beginning to document and formalize the ad hoc telecommuting that has been there all along. However, the TDM criterion is a somewhat artificial constraint on telecommuting. Ad hoc arrangements have been, and will probably continue to be, a nonnegligible proportion of total telecommuting.

Employee Characteristics Guideline

The fifth guideline, Employee Characteristics, states that employees can telecommute from a center full or part time. There was some deliberation among the TAC subcommittee members as to whether a telecommuter should be expected to physically report to the primary office with some regularity (e.g., at least once every 2 weeks). Such a requirement would help distinguish telecommuters from branch office workers. On the other hand, mandating a physical trip to the primary office every 2 weeks would mean that at most 90 percent of the work trips could be reduced, rather than 100 percent. It

seemed inappropriate for an air quality agency to impose a restriction that decreased the trip reduction that could be achieved. Thus, it was ultimately decided to leave such policies up to the individual firms involved.

Other Guidelines

The weakest of the guidelines are the third, Linkage to the Office, and fourth, Job Mix. They fail adequately to distinguish a telecommuting center from a branch office, field site, or decentralized function. In all four cases, a job could be construed to be a "direct extension of the work normally performed at the central work site," with results "transmitted or communicated to the central work site . . ." If the supervisor is off-site, it may be assumed that the facility is not a branch office or decentralized function, but it could certainly be a field location, for which the supervisor would almost always be off-site. Having an on-site supervisor may mean the location is probably not a field location, but the facility is not automatically excluded from being a telecommuting center. How, then, can telecommuting centers, branch offices, field locations, and decentralized functions be distinguished? Two additional guidelines are proposed. The first guideline helps to distinguish between telecommuting and field work and the second to differentiate a telecommuting center from a branch office or decentralized function.

1. Location Independence. Work done at a telecommuting center should be capable of being performed anywhere there are, at most, the same facilities available as in the primary office. It should not have to be performed at a specific location because of properties intrinsic to that location.

That is, telecommuting is location independent, whereas field work is by definition location dependent, that is, it must be performed at a specific location because of properties intrinsic to that location (e.g., because that's where the customer, equipment to be serviced, unit to be audited, or activity on which data are being collected is).

2. Organizational Structure. A telecommuting center is characterized by the absence of a self-contained pyramidal organizational structure. Telecommuting staff should report to off-site managers (except for the case in which both manager and staff reduce their commutes by working at the same telecommuting center), and telecommuting managers should have at least one off-site staff person reporting to them.

Thus, both branch offices and decentralized functions generally have a pyramidal structure, with a well-defined hierarchy of reporting. The structure is normally self-contained, meaning that everyone under the top person in the pyramid is on site. Employees work at that site because of their place in the organization, regardless of residential location. A telecommuting center, on the other hand, has no intrinsic organizational structure. Functional units are fragmented, and telecommuting center employees are often working for a variety of company departments (or a variety of companies), unrelated to each other. Employees work at a particular site because of residential location, regardless of their place in the organization. Figure 2 shows the distinction between conventional and telecommuting organizational structures; below,

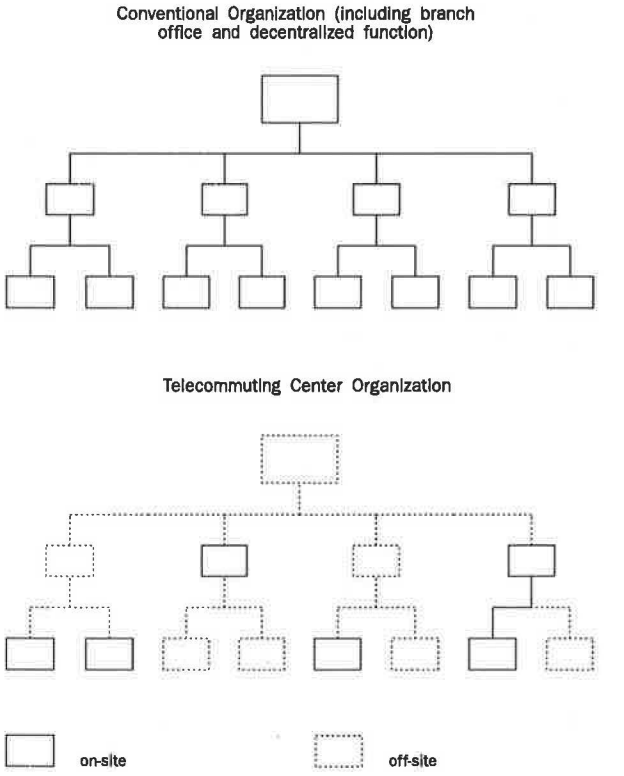

FIGURE 2 Comparison of conventional and telecommuting center organizations.

the site refers to the telecommuting center, not the primary work site.

The Job Mix guideline was intended to acknowledge that difference in organizational structure as typical, but it falls short of identifying it as a distinguishing feature between telecommuting centers and other types of facilities. The specific wording was adopted as a compromise between those who wanted the case in which an on-site manager supervises a locally hired unit to qualify as telecommuting and those who did not.

Finally, it is useful to document the debate that took place surrounding the second of the seven guidelines, Distance. Early discussions centered on requiring a certain proportion of the commute trip distance to be eliminated to receive full credit for a trip to a telecommuting center. As a precedent, there has been an unwritten rule of thumb that at least 70 percent of the commute trip length must be in a bus, vanpool, or carpool to receive full credit as a ridesharing or transit trip under Regulation XV.

However, some members of the group felt that it should not be an all or nothing proposition. For long commutes, the absolute number of miles saved should be considered, even if the 70 percent (or some other arbitrary) threshold were not met. For example, suppose a worker lived at Lake Arrowhead in the San Bernardino Mountains and commuted to Fullerton in Orange County, about 80 mi away (by no means unheard of for Southern California). If a telecommuting center were established in Riverside, about halfway between Lake Arrowhead and Fullerton, the employee should get credit for

eliminating the 40 mi of the commute that were most congested, even though it was only 50 percent of the total distance.

This position turned out to be controversial. Some members of the group felt that such long-distance commutes should not be encouraged at all, because they contribute to urban sprawl and to degradation of the quality of life in small resort communities. Eventually, it was decided to opt for simplicity, which led to the unelaborated concept of distance reduction quoted earlier. As a fallback option (that is, if the AQMD were unwilling to grant full credit for proportionately small distance reductions), an alternate guideline was prepared (but not presented to AQMD), that would grant partial credit for commute reductions of less than 70 percent.

Outcome of the Telecommuting Advisory Council Proposal

The AQMD has not yet issued a formal response to the TAC's proposed definitions, policy, and guidelines. There was no need for urgency, as few or no companies had claimed credit for telecommuting centers in their TDM plans. However, that is perhaps a self-perpetuating phenomenon. Companies will be reluctant to establish telecommuting centers when it is not clear how they will be treated under Regulation XV. Thus, the AQMD could have an important catalytic effect by adopting some set of guidelines and publicly supporting telecommuting centers as an appropriate element of a TDM plan.

In the meantime, the definitions and policy proposed by TAC have been formally endorsed by the Southern California Association of Governments (Executive Committee Meeting, May 3, 1990) and the Riverside County Transportation Commission (meeting, June 13, 1990).

SUMMARY

The definitions of telecommuting and its various subforms have been clarified. Telecommuting is only part of the universe of remote work types, and is often confused with other members of that universe. On the basis of the etymology of the word "telecommuting," two simple criteria were proposed for determining whether or not a form of remote work is telecommuting: (a) Is there remote supervision? and (b) Is the length of the commute trip reduced? The case is made for learning from related forms of remote work. Work forms that involve remote supervision can provide insight into the management of telecommuters (and vice versa), and work forms that involve commute reduction should not be overlooked by transportation planners.

Further, progress has been made toward a definition of non-home-based telecommuting, or telecommuting centers. The TAC proposal to the South Coast Air Quality Management District is presented as an important first step toward the acceptance of telecommuting centers as a useful strategy for reducing peak-period travel and improving air quality. Perhaps the most valuable contribution of the TAC proposal is its set of guidelines for determining what constitutes non-home-based telecommuting. The seven original guidelines (numbered 1 through 7) proposed by TAC are augmented by two other guidelines designed to help distinguish telecommunicating centers from field work sites, branch offices, and decentralized functions.

Although the process of defining telecommuting centers has started, it may not yet be complete. Definitions, policies, and guidelines may continue to be refined as additional empirical experience with telecommuting centers is gained. It is hoped that documenting the process undergone in one part of the United States will benefit other areas seeking to encourage the adoption of telecommuting as a transportation and air quality strategy.

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The analysis, inferences, and conclusions expressed here are those of the author, and not necessarily those of TAC or its members.

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