number of hypotheses that should be tested:

1. Residential parking restrictions alone will encourage few drivers of single-occupant automobiles to use transit or carpools,
2. Significant numbers of automobiles will be moved to off-street facilities,
3. Significant numbers of automobile drivers will continue to park in the area and move their cars from one space to another to conform to the time limits, and
4. Residents of the area will increase their use of automobiles.

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# Land Use Zoning as Transportation Regulation

**DON H. PICKRELL AND DONALD C. SHOUP**

**Land use zoning, which is frequently relied on to improve resource allocation in the land market itself, is also used to indirectly regulate the urban transportation market. The effects of one of the means by which it does so, the requirement for a minimum amount of off-street parking space in conjunction with new commercial development, are discussed. Evidence is demonstrated that this minimum amount of parking is well above what the land market would supply in the absence of such requirements. The result is to depress the market price of parking to a level below the cost of its supply. This indirect regulation of the price of parking has several consequences, principally an increase in the number of trips made by automobile. Aside from their effects on the urban transportation market, parking requirements may also cause distortions in the urban land market. In effect, they can impose a "tax" on new development, which not only slows the redevelopment of older areas but may also alter the spatial pattern of new development in undesirable ways. Unwisely used, land market controls can thus aggravate some of the transportation, and other, problems they are intended to solve. This illustrates the potential hazard of attempts to remedy urban transportation problems indirectly—for example, by intervention in the land market rather than direct intervention in the transportation market itself.**

Land use zoning, which is frequently relied on to improve resource allocation in the land market itself, is also resorted to in attempts to improve the allocative outcomes of other markets. The catalog of goals for zoning listed in the Standard State Zoning Enabling Act suggests the variety of effects sought: to promote health, safety, morals, or the general welfare; to lessen congestion on the streets; and to facilitate the adequate provision of transportation, water, sewerage, schools, parks, and other public requirements (1). Clearly, this list includes many outcomes that are determined well outside the market for urban land, the traditional province of zoning. Despite an often tenuous causal link between the explicit form of intervention in the real estate market and its intended consequences in the market where a problem is perceived, attempts to regulate non-land-market outcomes through zoning do seem to be common.

A clear illustration is the surprising variety of ways zoning is used to regulate urban transportation activity. In new residential and commercial developments, detailed specifications typically govern the width and layout of street systems as well as the design of intersections and access ways. In the downtown areas of many cities, density controls, which take the form of floor-area ratios, minimum lot sizes, and limits on the number of dwelling units per parcel, are used in an attempt to reduce traffic congestion. Requirements for a minimum number of parking spaces in new buildings are intended to improve traffic circulation by getting cars off the street once they have arrived at their destination. All of these forms of regulation have the intent of increasing the quantity of land and other resources allocated to the provision of urban transportation services.

## RATIONALE FOR RELIANCE ON ZONING

While land use zoning has as its legal basis the furtherance of the public welfare, it also has a long-recognized foundation in economic theory. Its potentially valuable role in mitigating the effect of negative externalities by regulating the location of offending land uses was first explicitly recognized by Bailey (2) and Davis (3).

More recently, zoning has increasingly been used to regulate the quantity of land used for various activities as well as simply to control the location of specific land uses. Like location controls, this rationing aspect of zoning has as its justification the improvement of resource allocation in a land market characterized by the presence of external diseconomies that arise from certain land uses. In fact, growing recognition of the pervasiveness of such diseconomies may have encouraged continued attempts to impose more detailed control on land use. The ease of implementing such controls has also caused them to be extended to a variety of urban problems that, while not specifically originating in the land market, often appear superficially to result from the manner in which urban land is used. Problems as diverse as slum housing, traffic congestion on city streets, and air pollution have all been the targets of local land use controls. Although confidence that zoning is a promising approach to such problems is certainly one rationale for local government's reliance on it, there are other understandable reasons why planners urge direct controls over land use to remedy what are not fundamentally land-market problems:

1. Political consensus in support of direct intervention in the various markets where problems originate is rare. For example, economists have long

Table 1. Parking spaces required in various California cities for a 10 000 $ft^2$ office building of three floors.

| City | Parking Requirement | Total No. of Spaces Required |
|---|---|---|
| Placentia | 8 spaces/1000 $ft^2$ | 80 |
| Duarte, Glendora, Los Alamitos, Upland | 1 space/150 $ft^2$ | 67 |
| Buena Park | 6 spaces/1000 $ft^2$ | 60 |
| San Jacinto | 1 space/300 $ft^2$ plus 1 space/each 2 employees | 53 |
| Walnut | Minimum of 6 plus 1 space/each 175 $ft^2$ above 1000 $ft^2$ | 51 |
| Hawaiian Gardens, Paramount, Pico Rivera, Signal Hill | 1 space/200 $ft^2$ | 50 |
| Costa Mesa | 6 spaces/first 1000 $ft^2$, 4 spaces/1000 $ft^2$ from 1000 to 11 000 $ft^2$, and 3 spaces/1000 $ft^2$ above 11 000 $ft^2$ | 42 |
| Chino, Corona, Cudahy, Santa Paula, Simi Valley, Thousand Oaks | 1 space/250 $ft^2$ | 40 |
| Garden Grove | 4 spaces plus 1/300 $ft^2$ | 37 |
| Rolling Hills | 3.5 spaces/1000 $ft^2$ | 35 |
| Fountain Valley | 1 $ft^2$ of parking/1 $ft^2$ of building | 31 |
| Westminster | 1 space/200 $ft^2$ of first floor plus 1 space/500 $ft^2$ of each additional floor | 31 |
| Riverside, Rialto | 1 space/250 $ft^2$ of first floor plus 1 space/500 $ft^2$ of each additional floor | 26 |
| Burbank, Downey, Industry, Los Angeles (except CBD), Santa Monica | 1 space/500 $ft^2$ | 20 |
| Los Angeles CBD, Long Beach, Vernon | 1 space/1000 $ft^2$ | 10 |

argued that road pricing is the most effective solution to the problem of traffic congestion in urban areas. Although limits on the density of development are certainly a less promising remedy, in the absence of a realistic prospect of implementing road pricing, the relative ease of their imposition makes density controls understandably attractive. In addition, they may provide at least partial relief from traffic problems in some neighborhoods.

2. A zoning solution entails no direct outlay of public money. This is at once an advantage and a delusion: It gives the appearance of progress in resolving the problem without public expenditure and yet disguises the true resource cost of the intervention because the costs of compliance do not appear in any public budget.

3. There is a failure to anticipate the less direct consequences even well-intentioned intervention can produce. Again, zoning measures intended to mitigate transportation-related externalities are unfortunate examples of this in their tacit assumption that the demand for travel by automobile to a site is unaffected by the street capacity that serves the location or the supply of parking there and thus by the time and cost entailed in driving to the site.

Despite the host of benevolent purposes for their use, zoning controls can go seriously awry when the real problem lies outside the land market.

This paper focuses on a particular aspect of land development controls used to regulate the urban transportation market: the requirements for minimum off-street parking contained in most local zoning ordinances. Unfortunately, the results illustrate how a form of transportation regulation as circuitous as land use controls may actually aggravate the problem it is intended to remedy.

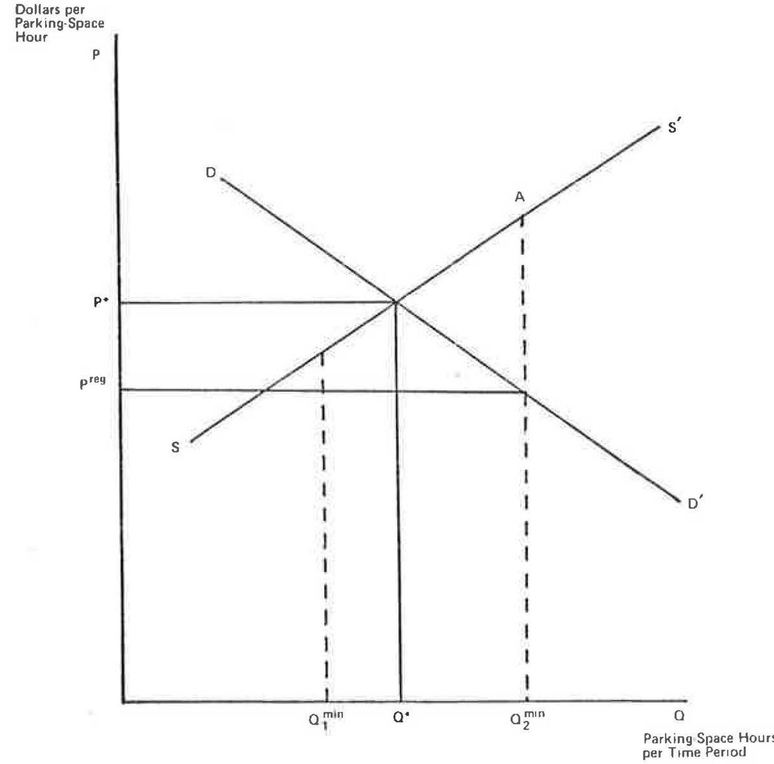
## PARKING REQUIREMENTS IN ZONING ORDINANCES

Zoning ordinances that require the provision of off-street parking for new buildings have existed since the 1920s. Their usual intent is to alleviate traffic congestion in densely developed areas by accommodating in off-street facilities the peak number of automobiles that are drawn to a site. To accomplish this, the parking component of zoning ordinances usually states the number of required spaces per seat in a theater, per dwelling unit, or per square foot of office space. Some cities also have sliding scales for commercial development that provide one requirement for the first several thousand square feet of space and a lesser one for subsequent increments of space or one requirement for the ground floor and a lesser one for the upper floors. The minimum dimensions of the required parking spaces are also usually specified. There is a consistent rule-of-thumb quality about these requirements as well as an apparent lack of consideration of the cost of providing the spaces or the price that will be charged for their use. Apparently, the implicit assumption is that the trip generation rates on which they are based reflect a "need" to travel by automobile and that the resulting demand for parking spaces is not a function of price.

The number of parking spaces required by municipal codes varies greatly among cities. The wide variation within southern California alone is suggested in Table 1, which is taken from a special survey made in 1975 by Rex B. Link and Associates. This table gives the number of parking spaces that would be required for a hypothetical 10 000-$ft^2$ general office building of three floors in various cities in California. Because the average space required per parked car ranges from approximately 330 $ft^2$ for surface lots to 500 $ft^2$ for multilevel structures, the data in Table 1 show that almost all cities require at least 1 $ft^2$ of parking space for every square foot of building area and some require up to four times that amount. Furthermore, it is not uncommon for planning departments, as part of their negotiations with developers, to require more than the number of parking spaces required by the zoning codes as a condition for building-permit approval.

This detailed regulation of the supply of parking for new buildings implies not only that an undesirably low quantity of parking would be supplied in the absence of intervention but also that planners are capable of tailoring the parking supply to accommodate differing local circumstances. In fact, some planners recommend zoning regulations to force the supply of parking above the quantity that would be provided by the private market, whereas others recommend an upper limit on the number of parking spaces in order to force the supply below what would be provided by the private market, both with the goal of reducing traffic congestion. There is some logic to both policies, of course: Abundant off-street parking can certainly help get cars off the streets once they are at their destination, yet in the long run it may actually increase the number of vehicles traveling to activity centers. More important, insofar as the provision of more parking encourages automobile travel, it can aggravate the problems of congestion, pollution, and energy consumption that it, together with a host of other policies (many of them

**Figure 1. Effect of minimum parking requirements on parking supply and market price.**




promulgated by the same governmental bodies that are acting to increase the supply of parking), is intended to alleviate.

CONSEQUENCES OF MINIMUM PARKING REQUIREMENTS

By specifying the parking required per unit of floor space, as Table 1 illustrates, zoning mandates a minimum quantity of parking capacity for any particular density of development. Although the specification of minimum parking requirements suggests the intent of increasing the quantity of parking so that it exceeds what the market would have supplied, it is certainly possible that such requirements are based on an underestimate of what the unregulated supply would be.

Figure 1 shows this situation. The horizontal axis represents the quantity of parking-space hours (a measure of the capacity for accommodating parked vehicles), and the vertical axis represents the average price per space for 1 h. The long-run-supply curve for parking-space capacity (S to S') is determined by the prices of land, capital, and operating inputs at the location in question, together with the production function whereby they are combined to produce parking space. The demand-schedule curve for parking space at the site (D to D') is derived from the demand for automobile travel to the site, itself a function of certain characteristics of land use there and of traveler incomes and the cost of traveling there by automobile as well as by other modes. Lower parking prices increase the quantity of parking space demanded as travel is diverted from other modes and destinations or new automobile trips are induced.

In Figure 1, the dashed lines represent two possible minimum parking requirements. If local zoning requires a minimum parking capacity $Q_1^{min}$ in conjunction with the density to which the site is developed, the market-determined equilibrium supply and price (Q* and P*) will be unaffected. However, a minimum space requirement such as $Q_2^{min}$ would alter the supply function for parking capacity to the kinked configuration $Q_2^{min}$ AS'. The result would, of course, be a binding minimum requirement that the quantity of parking-space hours $Q_2^{min}$ be supplied, which would in turn depress the average price they command to $P^{reg}$. Clearly, the divergence between this (indirectly) regulated price and the market price depends partly on how extensive an oversupply of parking is mandated by zoning codes.

Probably the strongest evidence that such requirements actually do increase the supply of parking space above its market-determined level is the fact that the marginal cost of providing additional parking in certain areas exceeds the price it commands. As Figure 1 indicates, one effect of a minimum parking requirement set above (e.g., at $Q_2^{min}$) the quantity that would be supplied in its absence (Q*) would be to depress the market price below the marginal cost of the zoning-mandated increase in supply.

There is clear evidence of both of these effects in the city of Los Angeles, which has the lowest parking requirement in southern California. Table 2 compares the cost of supplying additional parking in several areas of the central business district (CBD) and two outlying commercial districts with its price. It illustrates exactly how far below the cost of additional supply prices are in each of these areas: In one area of the CBD, for example, the daily price is less than half the cost of supplying additional parking space.

One effect of a zoning-mandated increase in the supply of parking may indeed be to reduce traffic congestion in the immediate area, perhaps in the entire CBD. But another consequence seems likely to be an increase in the number of automobile trips destined for the site, whether through their diversion from other destinations, a switch to automobile travel among those who formerly got to

**Table 2. Parking cost and price in Los Angeles.**

| Location | Land Cost[a] ($/ft²) | Capital Cost[b] ($/space) | Daily Cost Equivalent[c] ($) | Market Price[d] ($) |
|---|---|---|---|---|
| CBD | | | | |
| Arco Towers area | 100 | 12 400 | 4.96 | 2.39 |
| Spring Street | 50 | 6 775 | 2.71 | 1.97 |
| Broadway Street | 40 | 6 150 | 2.46 | 1.57 |
| Civic Center | 30 | 5 525 | 2.21 | 1.34 |
| CBD average | 40 | 6 150 | 2.46 | 1.48 |
| Westwood | 40 | 7 200 | 2.88 | ≈1.50 |
| Century City | 35 | 5 840 | 2.34 | ≈1.50 |

[a]From Office of the Mayor of Los Angeles (4, p. 71).
[b]From Peat, Marwick, Mitchell, and Company (5).
[c]Assuming indefinite structure life, 10 percent capitalization rate, and 250 days/year.
[d]From Wilbur Smith and Associates (6, Table 6) and Office of the Mayor of Los Angeles (4, p. 73).

**Table 3. Estimates of price elasticity of automobile choice probability from models of work-trip mode choice.**

| Study | City | Elasticity of Automobile Choice Probability with Respect to Parking Cost | Elasticity of Automobile Choice Probability with Respect to Automobile Travel Cost |
|---|---|---|---|
| Brown (7) | Vancouver | -0.36 | |
| Gillen (8) | Toronto | -0.31 | |
| McGillivray (9) | San Francisco | | -0.37 |
| Train (10) | San Francisco | | -0.32 |
| Charles River Associates (11) | Pittsburgh | | -0.27 |
| Warner (12) | Chicago | | -0.26 |
| Lave (13) | Chicago | | -0.19 |

the site by other modes, or an increase in the total number of automobile trips. Thus, traffic congestion and air pollution throughout the metropolitan area may actually be aggravated. There is also the possibility that, if a sufficient number of additional cars are drawn to the site, these problems may grow worse rather than better even in the local area where parking requirements are imposed.

Abundant evidence exists that lower prices for parking do indeed increase the demand for automobile travel. Table 3 gives various estimates of the elasticity of demand for travel to work by automobile with respect to both parking cost and the total cost of driving (driving cost includes operating expenses and tolls as well as parking charges). Although the estimates vary somewhat, they consistently suggest that lower parking prices do divert existing travel to automobiles from other modes.

This suggestion is reinforced by survey evidence that compares the travel modes chosen by commuters facing different parking prices. Using a sample of 275 government employees working in the Civic Center area of downtown Los Angeles, Francis and Groninga (14) investigated the effect of parking subsidies on mode choice for the trip to work. Of the sample, 135 were employees of Los Angeles County who received free parking if they chose to drive. The remaining 140 were federal employees, among whom those who drove paid an average of about $0.70/day to park. The percentage of employees in each of these two groups who used the various modes of travel to work are given below (14):

| Mode | Employees (%) County (free parking) | Employees (%) Federal (unsubsidized parking) | Difference |
|---|---|---|---|
| Drive alone | 72 | 40 | -44 |
| Carpool | 16 | 27 | +69 |
| Transit | 12 | 33 | +175 |

Significantly higher fractions of the unsubsidized federal employees traveled to work in carpools or by bus, and a higher proportion of the subsidized county employees drove to work. However, the dramatic difference between the two groups' mode shares probably overstates the effect of differences in parking prices. Because the average salary of those who had access to subsidized parking was somewhat higher than that of those who were required to pay for parking, a higher percentage of the former group would have been expected to drive even in the absence of parking-price differences. Yet, in each of three income groups, the fraction of automobile commuters was significantly higher among those who were able to park free, which suggests that lower parking prices can induce commuters of widely varying incomes to change from transit to automobile for the trip to work. They imply a parking-price elasticity of aggregate demand for work trips by automobile of -0.29, which is consistent with the range reported in Table 3.

A similar elasticity of demand for automobile work trips with respect to parking price is also implied by the evidence of travelers' responses to changing parking prices. In 1975, the Canadian government began charging 70 percent of the average commercial rate for parking it had formerly provided free to its employees who work in the central district of the Ottawa-Hull metropolitan area (15). The following table gives aggregate travel-mode percentages before and after the discontinuance of free parking for almost 4000 commuters who responded to a survey administered shortly after the parking policy was changed:

| Mode | Commuters (%) Before Parking Charges | Commuters (%) After Parking Charges | Change |
|---|---|---|---|
| Drive alone | 34.9 | 27.5 | -21 |
| Carpool | 10.5 | 10.4 | -1 |
| Transit | 42.3 | 49.0 | +16 |
| Other | 12.3 | 13.1 | +7 |

Although by U.S. standards the proportion of employees commuting by automobile was quite low, even when parking was free, more than 20 percent of those who initially commuted by car changed to transit or other modes in response to the imposition of nominal parking fees [about $1 Canadian ($1.0172 U.S.) per day]. These data are consistent with a parking-price elasticity of the number of work trips by automobile of -0.24 (16), which is again in reasonable agreement with the estimates given in Table 3.

Although there is a convincing argument that reduced parking prices do divert existing travel from other modes to automobiles, the evidence that automobile trips can be either diverted from other destinations or newly generated by reduced parking prices is more sketchy. Two reactions to a parking-price decrease would be expected: The total number of trips that use parking in the zoned area would be expected to increase, and the average duration of parking time associated with trips should lengthen as the price falls. Both of these reactions represent increases in the quantity of parking services consumed, measured by parking-space hours consumed during some specific time period (Figure 1). Whether zoning achieves one of its intended objectives--alleviating traffic congestion in and en route to downtown--depends in part on how the required additional parking supply is used.

Although measurements of the composition of an increase in the quantity of parking services consumed as the price falls are not readily available, some idea about this response can be inferred from related information. Let

- Q = number of parking-space hours sold per time period,
- q = number of parking-space occupancies (i.e., the number of trips that require parking of any duration),
- t = average duration of parking occupancies,
- R = gross revenue from parking operations, and
- P = average parking price per hour.

Then the total number of parking-space hours sold is Q = qt, which yields revenue given by R = PQ = Pqt.

What is of interest is the response to a change in the hourly price of parking. Differentiating revenue with respect to price yields

$$dR/dP = Pq(dt/dP) + Pt(dq/dP) + qt \quad (1)$$

Hence,

$$(dR/dP)(P/R) = (dt/dp)(P/t) + (dq/dP)(P/q) + 1 \quad (2)$$

or

$$\eta_R = \eta_t + \eta_q + 1 \quad (3)$$

where $\eta_i$ is the elasticity of variable i with respect to P.

From a review of responses by travelers and parking operators to a 25 percent municipal parking tax that was imposed and later reduced by the city of San Francisco, Kulash (17) infers values of two of these parameters. Estimates of $\eta_q$, the price elasticity of the number of trips downtown, fall in the range of -0.2 to -0.4, which corresponds closely with the range of values given in Table 3. Yet operating revenue seems to be more elastic with respect to observed price changes: Kulash's computations imply values of $\eta_R$ ranging from -0.4 to -0.6. In conjunction with Equation 3 above, the indicated range of elasticities of t, the average parking stay, is -1.0 to -1.4.

Thus, the apparent greater sensitivity of revenues to a parking-price change than of the number of trips can apparently be reconciled by a change in the average duration of parking occupancy associated with trips. Although the total number of trips shows an inelastic response to price changes, the duration of trips may change more than proportionately when price varies. This can occur not only because the parking stay per trip changes, the obvious response, but also because of substitution between trips that require short- and long-term parking. Such substitution would occur, for example, if the number of work trips increased in response to a parking-price reduction more than the number of trips that require short-term parking (for shopping, recreation, or various other purposes). The experience with the San Francisco municipal parking tax suggests that travel for all purposes varies markedly in response to parking-price changes, although automobile travel for work trips may be more sensitive to parking price than automobile travel for other purposes.

The collective implication of this evidence is that lower parking prices increase the demand for automobile trips, primarily by inducing people who travel by other modes to begin driving instead. Reduced parking prices seem particularly likely to increase the fraction of work trips made by automobile, most of which are made during morning and evening peak hours. Because automobile travel demand is already heavy at those times, the effect of even marginal increases in the number of vehicles using urban streets and highway networks can be a pronounced slowing of travel speed and an increase in aggregate travel time. Another consequence of this increased congestion can be higher pollution levels, since peak-hour travel contributes disproportionately to air pollution in some cities (18).

Aside from their effects on the urban transportation market, parking requirements may also cause serious distortions in the urban land market. Where a zoning ordinance requires provision of more parking spaces than are justified by the price they command, the excess spaces result in a financial loss in proportion to the scale of the building, just as would a tax per unit of floor space. This effective parking "tax"--the difference between the marginal cost of providing additional parking and the revenue that it will yield--is a clear disincentive to the redevelopment of older areas, because the zoning requirements apply only to new construction and changes in parking requirements are not applied retroactively to existing buildings. Since the marginal cost of providing more parking spaces at a site increases dramatically for underground or multistory structures, the tax per square foot of additional building space increases more than proportionally with building size, an obvious disincentive to high-density development.

Another land-market effect of parking requirements may be a change in the spatial pattern of new development in the downtown area. This indirect tax levied on new development by parking requirements is particularly burdensome in areas where land values and building densities (and thus the cost of providing parking) are high in relation to parking price--for example, in areas that are already well served by mass transit. Thus, the parking tax would tend to shift new development away from areas that are best served by mass transit toward areas where the demand for automobile travel and parking is highest. Such a tendency may counteract other local policies that are designed to encourage development in areas easily accessible by transit.

## CONCLUSIONS

Although the reasons for resorting to land use zoning in an attempt to improve resource allocation in the urban transportation market are understandable, the unintended effects of such a course of action can actually aggravate certain aspects of the problem it is intended to remedy. Minimum parking requirements for commercial development are a good example: If a zoning-mandated increase in the supply of parking reduces the parking price, a substantial increase in the number of trips that use long-term parking may result. The number of trips that require short-term parking would also be expected to increase if parking rates are lowered.

Consequently, an attempt to solve downtown congestion problems via minimum parking requirements may backfire and not only aggravate problems of surface street circulation in the downtown area but also add to congestion on regional transportation routes that serve the downtown. In addition, the problems of air pollution and energy consumption, themselves often the targets of other policies adopted by local governments, may be exacerbated by the resulting increase in automobile travel.

This analysis suggests that the inclusion of requirements for a minimum amount of parking space in zoning regulations should be reconsidered. In the meantime, local planning departments should adopt the policy already used experimentally by some--i.e., allow adjacent establishments whose peak travel demands occur at different times to credit the same parking facilities toward their required supply.

As usual, such policies are easier to prescribe than to implement, partly because of the recurrent argument that additional parking is necessary to encourage trade and employment in downtown areas. This view apparently stems from the realization that, if new construction is not required to provide parking for all additional traffic attracted to a site, the price of parking for those in adjacent buildings may be driven up by the increase in the demand for parking space. Still, the widespread view that construction of additional commercial floor space without accompanying parking will lead to more congestion, higher parking prices for everyone, and a resulting decline in the number of people coming downtown ignores the fact that, if the demand for travel by automobile to a site increases, the private market will act to allocate additional resources to the supply of parking there. The chief effect of minimum parking requirements would seem to be merely to guarantee that parking spaces remain priced below the cost of providing them. If the price of parking is at or above the cost of providing it, there is no obvious reason why developers would not provide it on their own, even in the absence of the requirement.

An additional weakness of the argument that parking requirements are necessary to encourage people to travel (i.e., drive) downtown is that most parking requirements apply citywide, with the result that more cars are driven and parked--parked throughout the city, incidentally, and not just downtown. In fact, many cities have a "downtown exception," so that fewer parking spaces are required per square foot of building space in the CBD area than in other parts of the city. For instance, the data given in Table 1 show that the requirement in the Los Angeles CBD is 1 parking space/1000 $ft^2$ of building area whereas it is 1 space/500 $ft^2$ elsewhere. The effect of the different parking requirement may be to make CBD locations relatively less rather than more accessible by automobile compared with other parts of the city. One should not, however, extend this reasoning to conclude that downtown parking requirements should be increased. In any case, it is a mistake to identify the health of a downtown area with the number of vehicles that can be driven or parked there. If one considers the effect of an increased number of parking spaces on the demand for all modes of transportation to downtown areas, including public transit and carpooling, the net result is unlikely to be beneficial.

Although certain of the consequences alleged here are speculative, this review certainly provides reason to suspect that parking requirements may have some unintended and undesirable effects in both the transportation and land markets. The evidence reviewed here illustrates the potentially counterproductive results of intervening in the land market to solve problems that originate outside it. Unwisely used, zoning may actually aggravate many problems, including some that it is intended to solve.

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