Changing Parking Requirements in Downtown Districts: Possible Strategies for Hato Rey, San Juan, Puerto Rico

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When developing new transportation systems such as the Tren Urbano light rail system in San Juan, Puerto Rico, planners should explore transportation policies to complement the transit system by increasing ridership and creating transit oriented environments in station areas. The most common complementary strategies address only the automobile trip by introducing tolls on parallel automobile facilities, manipulating gasoline taxes, transportation demand management plans, and reconfiguring the existing transit network to feed into the new system. Unfortunately, the possibility of changing parking policy is often overlooked. As any automobile trip must include storage of the vehicle at the destination, parking cost and availability must be considered a component of the daily automobile round trip. Any changes in the cost and supply of parking can affect mode choice. Effective parking policies can use market forces to affect both the short-term mode choice decision by transferring the real cost of parking directly to the consumer, and the long-term mode choice decision by allowing developers to consider true opportunity costs of land and materials devoted to parking lots and garages. Such long-term cost considerations may direct the allocation of land resources toward higher density development and lead to a lower parking supply in transit station areas. Low parking supply should, in turn, induce greater demand for the new transit system. Central to any discussion of parking supply are locally mandated parking requirements for developments. One of the major causes of distortion in the parking market are arbitrarily set parking minimum requirements. In San Juan, municipalities require developers to supply between 3.5 and 6.0 parking spaces per 1,000 square feet of development. This regulation forces parking supplies to be up to two to three times greater than many mainland United States cities with new rail systems. The construction of the Tren Urbano project presents a good opportunity to reassess the prospect of revising these high minimum requirements.

This paper presents an introductory exploration of zoning requirements for parking provision for new developments in downtown office districts. Case studies of the experiences of other cities in changing parking requirements as a response to new rail systems will provide interesting insights for the San Juan case, and especically for the San Juan financial district, Hato Rey. Another minor focus of the case studies is the manner in which the changes were instituted. Often, planners and zoning administrators are perceived as regulators who impede the development process and decrease profits through arbitrary requirements. The case studies will present different negotiation schemes and examine the varying levels of involvement of the development community in the parking requirements determination process. By exploring the level of involvement of the development community in the determination of policy, we might determine what concessions can be received from the developers in exchange for more involvement in the regulation process.

Impacts of Parking Policy on the Transportation Market

One of the strongest impediments to rational market-driven mode choice decisions is the provision of free parking by employers at the trip destination. According to data from the American Automobile Association, parking costs can comprise much more than half the total automobile commute cost. For an average trip of 9.9 miles, the costs associated with ownership of a typical automobile (including depreciation, finance charges, licensing and registration) and the cost of fuel total $4.65 per day. Given that parking costs for central city employment centers are much greater than this amount, generally from $10 to $15, the provision of free parking to employees provides a much more powerful incentive than free fuel and a free automobile. (Pickrell, p. 1) National census data shows that 93 percent of all commuters park free at work. (Shoup, 1980, p. 2) One common reason that parking is provided free to employees is the lack of alternative transportation choices. Free parking is thus seen as a "quasi public good". (Econometrica, Inc., December, 1992) One would expect, therefore that metropolitan areas with high levels of transit service, that the extent of employer subsidized parking would be rare. This is, in fact, not the case. For example, according to the Port Authority of New York and New Jersy, 64 percent of auto drivers crossing the Hudson River to the Manhattan Central Business District park in spaces that are completely or partly paid for by their employers. (Pickrell, Don, March 14, 1990, p. 1) The hesitance to pass the cost of parking to the consumer is especially

prevalent where regional competition for employees and tenants is high. Employers often absorb these costs and supply free parking to employees as a fringe benefit. Developers often absorb the cost of parking provision in order to attract tenants and to achieve low vacancy for their office buildings. Parking minimum requirements also force developers to absorb the cost of parking. Zoning codes that mandate minimum levels of parking lead to expectations that such costs are an intrinsic part of the development. Since the costs of providing parking are seen as a sunk cost, these costs are not transferred to the tenants and thus to the employees within the development. Even where the cost of parking is passed on to the consumer, the costs that the consumer sees is often not the full cost associated with assembling the land and with building the parking space due to minimum parking requirements. These minimum parking requirements often create a higher supply of parking than market equilibrium leading to a prevailing price less than market equilibrium price. Shoup concludes that, given the choice, 20% of drive-alone commuters who do receive free parking would switch to the ride share mode if forced to pay the full market price of a parking space. (Shoup, p. 37 quoted in Willson, Parking as a Transportation Problem) Certainly, there is potential for transit, especially a new transit system like the Tren Urbano light rail system, to capture some of the mode share. Despite such conclusions, planners often do not address the parking question.

Land Use Impacts of Parking Policy

The impacts of subsidized parking are not limited to the transportation market. There are significant impacts upon land use, as well. The hesitation to transfer the full cost of the parking to commuters warps the perception of the impacts of the costs of parking facilities on land development. Providing parking below the market price, increases the quantity of spaces demanded to artificially high levels. Zoning administrators may reset parking minimum ratios for developments at levels higher than the market would determine. High minimum parking requirements and the lack of maximum parking limits lead to an oversupply of parking spaces and foces the price of parking below the true market cost of the parking space. This leads to an even higher demand for parking and the subsequent impulse to mandate the provision of that parking through even higher parking minimum ratios. This recurrent cycle underscores the impact of development requirements upon the transportation market. It is thus important to develop such zoning requirements in conjunction with improvements in transportation level of service in order to achieve the strongest complementary effects. Higher parking requirements also force development costs higher by forcing developers to build less leasable commercial or office space. Such artificially high requirements thus discourage high transit usage (by reducing automobile travel cost) and high-density environments desired for higher rates of transit ridership generation and attraction (by increasing development cost). Even, the National Parking Association and the Urban Land Institute, organizations that have traditionally asserted the benefit of ample parking supplies, admit that "money spent on excessive parking can usually be bettwer spane on amenities for the project." Furthermore, they assert that "excessive paved parking" is "undesirable to the community from both the aesthetic and environmental perspectives." (Urban Land Institute, p. 48) Failing to address parking requirements when introducing a high capacity transit system can thus undercut the intent of the transit system to provide a viable alternative to automobile travel and to create pedestrian-friendly transit-oriented environments.

The Parking Problem in San Juan

The perception that parking is a "public good" is especially prevalent in the San Juan Metropolitan area. This may potentially limit the amount of change that planners can introduce to policies regarding parking requirements. Automobile users in Puerto Rico, "expect [that] they would be provided with parking for their needs" and that parking policies and management were "independent from the Island's transportation system" (Barton-Aschman Associates, Inc., Part 1, p. 13). This expectation places an acute burden upon the entire transportation system in metropolitan San Juan because rampant illegal parking in traffic lanes, bus

lanes, and sidewalks and double and triple parking impede the free movement of automobiles, trucks, and buses. The illegal parking problem, however, is largely due to a lack of enforcement of existing ordinances. Reinforment of the Cuerpo de Ordenamiento who are entrusted to enforce parking regulations must thus coincide with any change to parking policy.

The expectation of high parking supply and the resulting parking spillover problem is compounded by the fact that the Department of Consumer Affairs places price controls on private parking facilities. Parking suppliers are also averse to raising the price of parking spaces from $11 a day to $14 a day because this would place the price of parking out of the range of most San Juan commuters. It is reasoned that the since the average income for Puerto Rico is less than a third of the average income of the rest of the United States, Puerto Ricans are less willing and able to pay for a parking space at the same price. (Econometrica, p. 4) Hence, rather than allow private parking firms to raise the price of parking and possibly raise the supply due to higher profitability, the Department of Consumer Affairs mandates artifically low prices that lead to parking demand surplus. Yet, parking shortages are not attributed to artificially low parking prices but to a lack of public efforts to provide additional parking and to compensate for the parking deficit. The lack of public parking leads to regulations on private developments that are much higher than similar standards in the rest of the United States. Requirements for commercial developments in Puerto Rico range from 3.70 to 6.00 parking spaces per 1,000 square feet of leasable space while requirements in the United States range from 1.20 to 3.65 parking spaces per 1,000 square feet of leasable space (Econometrica, p. 2).

Parking Policy Opportunities for Hato Rey (the San Juan, Puerto Rico Financial District)

The financial district of Hato Rey in San Juan presents many opportunities to manipulate parking policy to promote transit orientation by the commencement of Tren Urbano in 2001. Excluding the road network, public space, and parking, 81% of all land within 300 meters of the Hato Rey Central Station and 55% of land within 300 meters of the Nuevo Centro Station is comprised of commercial or institutional development (RJA Group Inc., Estacion Hato Rey Centro, October 1994, pp. 4-22 to 4-23 and Estacion Nuevo Centro, October 1994, pp. 3-23 to 3-24).
Due to the relatively homogeneous nature of the uses in Hato Rey, the traffic generation and parking requirements are likely to be uniform over most developments. This allows for uniform application of policy throughout the area and lessens the complications associated with implementing such policy.

Although there are two additional relatively homogeneous districts, in terms of land use, along the original alignment of the Tren Urbano light rail system, Rio Piedras (institutional) and Centro Medico (medical), this study will focus on the Hato Rey district for five additional reasons. First, the district is relatively compact with a few relatively large landowners. This facilitates coordination and negotiation with the developers in developing a change in parking requirements. In addition, developments near transit lines and stations have been demonstrated to generate and attract a higher proportion of transit trips than in comparable developments further from transit. The effect of proximity to transit is limited to a distance of a few blocks. In the case of San Diego, transit ridership drops dramatically for developments more than 3 or 4 blocks from transit stations (Higgins, p. 51). Because commercial and office development in Hato Rey is confined to a relatively narrow corridor centered on Avenida Luis Munoz Rivera and Avenida Ponce De Leon, all office developments within the district should experience a similar degree of higher transit usage with the completion of the Tren Urbano system. This allows for the application of uniform parking requirements upon the entire district. Second, many of the landowners in the district are financial institutions, many of whom are helping to finance the Tren Urbano light rail system. These banks and financial institutions may be more willing to cooperate with planners by establishing transit-oriented policies to insure the success of their investments in Tren Urbano. Third, case studies of office and commercial districts, especially in downtown areas are more thoroughly documented than those of other land uses and other types of districts. There is thus a broader variety of case studies of changes in parking policy with the introduction of new rail systems with which to compare the San Juan case. Fourth, the two Hato Ray stations, Hato Rey

Central and Nuevo Centro, are centrally located within the expanded plan of the Tren Urbano light rail system. Insuring effective transit-oriented parking policies in this central area may facilitate similar policy changes around stations along future extensions of the system to Carolina, Old San Juan, and to the Airport. Finally, parking requirements for universities and hospitals are already lower than the norm for similar developments in the United States. For exapmle, Puerto Rico requires 0.20 parking spaces per student while universities in the United States must supply 0.44 parking spaces per student. (Econometrica, p. 2).

The Role of Developers in the Policy Process

Planners must be aware of the hesitation of developers to accept change. This is especially pertinent in Metropolitan San Juan because developments in Hato Rey face direct competition from outlying districts such as those further west along Franklin Delano Roosevelt Avenue, as well as other areas like Plaza Las Americas, Bayamon, and Carolina. In order for the change in policy to be effective, planners must assure developers that the proposed changes are meant to increase the competitiveness of the district with respect to the others, by lowering development costs and creating a more attractive transit-oriented district, rather than to detract from the marketability of the developments. To insure this, the planners should involve the developers in the process to maintain constant communication as the new parking requirements.

In exchange for the open process and more active involvement, the developers might be able to make certain concessions to the government and possibly accept more regulation. Otherwise, if regulations are applied without consultation and involvement of all parties involved, the development community will view the regulations as intrusive rules. Finally, planners should initiate change in parking requirements throughout the region so that unfair regional competition through non-uniform zoning laws will not be used as an excuse for noncompliance. It is hoped that the lessons learned by adjusting parking policies for developments in Hato Rey will help develop a proper negotiation strategy changing parking requirements around other transit stations

Parking Requirement Theory

Parking Minimum Requirements

Research on proper parking requirement levels for office and commercial developments is sparse. Moreover, what research does exist is either inconclusive or inconsistent. Early approaches to parking requirements for developments focused upon a traffic engineering approach to parking minimum requirements. It was common practice for parking requirements to be determined from a certain "design day", for example, the day with the tenth highest peak parking space demand (Shoup, 1994). One major flaw of this technique was the assumption that all parking provided was free. As stated previously, this lead to a distortin in automobile costs and a distortion of the mode choice decision. In addition, this assumption places the cost of parking provision (in land purchases and garage construction costs) entirely upon the developer. Automobile tripmakers never see any costs associated with providing the "necessary" parking spaces. Furthermore, a different surveys of parking facilities demonstrate that the dictated parking requirement ratios were artificially high even given peak levels of use. A survey of Southern California cities reveal that 91 percent of the surveyed cities required more parking than the demand at a zero price. (Shoup, 1994, p. 6) A survey of the 57 largest suburban employment centers in the country reveald an average of 3.85 spaces per 1,000 square feet of floor space. This figure yields slightly more than one parking space per worker. (Cervero, America's Suburban Centers: A Study of the Land Use-Transportation Link, 1988). Current research indicates that uniform parking requirements for similar types of developments among different localities is an unrealistic goal. This is due to the fact that parking requirements depends on other factors besides land use. Other factors to consider are employee density, proximity to transit, the combination of

uses in the district, and level of automobile use in the metropolitan area (Higgins p. 50).

If the motivation for modifying parking policy in downtown districts near transit stations is to increase transit use, there is still no consensus as to what levels of parking provision are appropriate for transit-oriented districts. After examining developments in downtown San Diego, Higgins recommends that mimimum ratio for office developments should be 2.0 parking spaces per 1,000 square feet of leasable space. The ranges ratios from which the 2.0 ratio is derived is so large that choice of a single value seems somewhat arbitrary. Higgins ultimately recommends the use of local parking surveys to determine appropriate values for the parking ratios. However, such surveys can be costly and time-consuming. In addition, despite all the effort needed to conduct such local parking surveys, they still cannot provide lasting predictions of parking demand. Moreover, setting minimum parking requirements still does not allow the parking space market to determine the correct quantity of parking supplied and the correct price for each parking space. In fact, many minimum parking requirements are set with the implicit assumption that the spaces will be available free or below the cost of construction of the parking spaces. Setting minimum parking requiremments replaces the normal supply curve of parking to the right of the demand curve preventing the intersection of the two curves. There is thus no market price for parking. (Willson, Suburban Parking Requirements, p. 34)

The conservativism with respect to setting minimum parking requirements is due to the fundamental concern that insufficient off-street parking for each development will lead to a deficit and spillover parking into adjacent districts and, in the case of San Juan, gridlock due to widespread illegal parking in travel lanes. Spillover parking is a special concern when the abutting districts are residential. There are a number of strategies proposed to deal with the problem of spillover parking. Neighborhood resident peferential parking programs can limit parking to residents of a certain district and thus prevent the use of curbs as employee parking. Short term parking zones and parking meters also prevent the use of on-street parking space by commuters and allow customers to park for short periods of time and patronize area businesses. Most recently, Shoup has proposed the creation of parking benefit districts. These districts might still have the option of residential permits but would allow all other automobile users to pay for the right to park in the district. Revenue from the parking charges would be directed to finance additional neighborhood public services. These strategies are outside of the scope of this paper but are an important consideration whenever parking requirements are at issue. Since several residential communities lie adjacent to Hato Rey, they should be involved in the community participation process to determine the most appropriate strategy to alleviate the problem of spillover parking.

Parking Maximum Ratios

In addition to lowering parking minimum ratios, planners may also introduce maximum parking ratios. The justification for parking maximum ratios is that given unrestricted market conditions, developers will build a higher supply of parking than the market would determine in order to insure marketability and thus profitability for their developments and to anticipate potential higher parking demand for the future. Without maximum ratios, the aggregate supply of parking within certain districts would be much higher than equilibrium supply, thus driving the price of each parking space for consumers lower than equilibrium price. Parking maximum ratios are thus designed to prevent such oversupply. New reports indicate that applying parking maximum ratios to downtown districts without similar maximum ratios in suburban districts can actually weaken the marketability of developments (confer with study) downtown districts with respect to the suburban districts. This effect can, in fact, be counterproductive to the goals of a rail system to strengthen and to promote transit orientation and higher density in station areas. The experience of the City of Portland with its downtown parking cap district confirms this to some extent. The city has made moves to lift the parking cap given that the original air quality goals of the cap have been met and that the cap was channeling development outside of the downtown district. A more detailed account of the Portland case will be presented

later.

Parking Requirements in Practice

Generally, parking requirement ratios in zoning codes, are higher than the recommendations of the most recent studies. Shoup's survey of cities throughout Southern California reveals that 74 out of the 164 cities surveyed require at least 4 parking spaces per 1,000 square feet of office space. This demonstrates poor correlation of the practice of parking policy to current theory. Perhaps, the lack of correlation is also due to the inconsistencies in the research. The survey of parking requirements also reveals that cities often adopt requirements, not necessarily to match the specific parking needs of their own communities but to stay "close to the average" parking requirment. As the average parking requirement for these 117 cities rose between 1975 and 1993 from 3.6 to 3.8 spaces per 1,000 square feet of office space, the standard deviation decreased from 1.27 spaces to 0.64 spaces (Shoup, September 1994, Appendix) .

Where policies tend to deviate from the norm are in high density office and commercial districts. Generally, these districts have such high levels of transit service that planners can justify lower parking requirements due to higher transit mode share. Cities also tend to be more inclined to reconsider parking policy concurrent with major public investments in new transit systems. The following case studies of five cities with relatively new rail transit systems -- Sacramento, Miami, Portland, Denver, and San Jose -- illustrate the responses of different city planning departments and redevelopment agencies to change parking requirements with respect to new rail systems.

Sacramento, California

The case of Sacramento presents on the of the more successful reductions of parking requirements. The Sacramento light rail system serves downtown Sacramento with extensions to suburbs in the northeast and the east. In 1980, after continued pressure from environmental groups, the Sacramento City Council lowered the parking requirements to 1 parking spoace per 400 square feet of floor area (2.5 spaces per 1,000 square fee) throughout the city. For a six by sixteen block area of downtown, the city council allowed developments to supply as low as 1 parking space per 600 square feet of floor area (about 1.7 spaces per 1,000 square feet). If one takes the survey of California cities to be typical of metropolitan areas throughout the United States, the low minimum parking standards of Sacramento represent an ambitious attempt to orient development to the new transit system through parking policy.

In 1987, the city instituted a Transnportation Management Requirement for developments throughout the city. According the the requirement, all large planned unit developments must develop transportation demand management plans subject to city approval. This broadened the focus of planning through transportation policy throughout the region. Despite this expanded area of application, the policy of lowering parking requirements has not spread to suburban sites. The city has not yet considered lowering parking requirements for areas surrounding outlying transit stations. Since the Transportation Management Requirement applied subjective standards to planned unit developments, developments outside of the downtown area thus did not have the simplicity of objective planning goals. It may be worth noting that developers generally prefer clear objective standards over subjective review of projects. They would rather prefer and early politicization of the planning process in order to avoid a politicization of the development process (Ricard, 1990).

As plans for Sacramento ligh rail extensions to the south, north, and west progress, the city council had indicated its support for further reductions of parking for the city center. Already, the city council has lowered parking minimum requirements to 1 space per 1,000 square feet of floor area for the downtown area. As new developments have begun appearing outside of the original six by sixteen block downtown area, the city has applied the lower parking requirements to an expanded 30 by 30 block area. Most notable among the new areas now covered by the lower parking requirement are the Richards Boulevard area which is being

converted from industrial use to mixed use development and the Southern Pacific area, which is behing redeveloped from Southern Pacific rail yards to commercial development. The city is pursuing orientation toward transit even before the light rail extensions through these districts is built.

Lowering parking requirements has since gained the suppport of the Sacramento development community due to the fact that the lower parking requirements allow for lower development costs for given amounts of leasable space. Developers have indicated their preference for providing as much parking a financially feasible to insure the profitability of their particular projects. They have not, however, indicated their desire to raise the minimum standards back to previous levels. This may be due to the fact that outside of the individual development review process, there is not upper constraint on the amount of parking a developer can provide.

Opposition to the low minimum parking requiremetns has developed among two groups -- residentes within downtown and in abutting neighborhoods (because of parking spillover onto adjacent streets) and downtown employees, because of parking shortages and higher parking prices. The city has addreddes the concerns of abutting residents through the establishment of Residential Preferential Parking Districts. These districts allow on-street parking for residents, enforced through the use of permits. Non-residents may parking within these districts for a maximum of two hours. As development spreads and the parking spillover problem spreads, the city creates new Residential Permit Parking Districts.

The city has not addressed the concerns raised by downtown employees. Employee opposition to low minimum parking requirements due to limited parking capacity has not been significant enough to concern Sacrament planners for several possible reasons. First, since employees are dispersed among multiple worksites and among multiple employers, there is not single source of the parking "shortage". Second, since employees are removed from the development process, they may not attribute the lack of low-priced parking directly to low parking minimum requirements. The determination of the number of spaces was made in the design process of each building. Tenants, and secondarily the employees of those tenants, thus cannot affect the number of spaces each development provides. Third, employwees may not feel the issue of low parking supply as urgent enough to warrant the effort to change development requirements. Fourth, one of the larger tenants within the Cityof Sacramento is the State of California. The State provides supplementary off-site parking lots on state-owned land in fringe areas of downtown Sacramento. This decreases the severity of the lack of low-priced parking.

That the State of California is the major tenant in downtown Sacramento also contributes to the success of the low linimum parking requirements. Generally, the State is not concerned with lower parking capacity at the office sited that it leases. The State may not feel the need to compete in the labor market by supplying fringe benefits such as free or reduced price parking to its employees. In addition, the tendency of the State to consolidate most of its operations within the downtown area reinforces the strangth of downtown in the regional office market. As the experiences of other cities assert, the relative strenth of a central business district, in terms of attracting developers, tenants, and retail activity may affect the willingness of the planners within that city to implement what may be viewed as aggressive planning and parking policy strategies.

Miami

The experiences of the City of Miami present an equally insightful case of successful changes to parking requirements. The Miami rapid rail system is two-tiered. Metrorail, a heavy rail system, extends from downtwon Miami to western and southwestern suburbs. The Metromover aerial guideway transit system that connects with Metrorail and functions as an internal circulator. In anticipation of the completion of the Metrorail project, Dade County, the county of which Miami is the seat and the agency providing primary funding for Metrorail, pressured the City of Miami to develop planning policies that would complement the county Metrorail investment. The Miami Planning Department subsequently developed

Station Area Design and Development (SADD) guidelines for areas around Metrorail station sites. The SADD guidlines presented a holistic approach to address development toward Metrorail. Each SADD document defined existing land uses and zoning ordinances affecting development through the com¡munity, land development trends, and opportunities for development around each station. Proposals were then made as to the appropriate strategies to be taken to orient development patterns to the new transit system. Off-street parking policy was one minor component of the SADD guidelines. The parking policies in the guidelines presented only general principles rather than station-specific plans to address parking requirements.

In addition to the SADD guidelines, Miami revised parking policies for the downtown area. As with the case of the City of Sacramento, the revision of downtown parking policies was not limited to those developments immediately adjacent to or within only a few blocks of the transit stations. This blanket approach to the entire downtown district assumed that the prevalence of transit service downtown leads to universally easy access to the transit regardless from the position of each development to the transit system. Because of the high density of Metromover sta¡tions in downtown Miami, it may be the case that access to tran¡sit service is level through the district. One must, however, be careful in applying this assumption to other cities. As stated earlier, propensity to use transit, and the requisite propensity to forgo the automobile mode and parking use, does depend on distance to the transit service.

Prior to 1987, Miami had minimum parking ratios for office developments of 4 spaces per 1,000 square feet of gross floor area. At the time, there was no maximum parking ratio. City planning agencies held a series of workshops with focus groups to elicit the participation of such groups interested in parking policy as hotel owners, retail tenants, and developers. The city then lowered the minimum parking ratio to 1 space per 600 square feet (1.67 spaces per 1,000 square feet) and introduced a maximum parking space ratio of 1 space per 300 square feet (2.5 spaces per 1,00 square feet) for downtown Miami. Although planners in Miami would have liked to institute a more market driven solution (with no parking minimum standards), the new standards represent the compromise reached with the development and financial com¡munities. The developers and banks felt the minimum standards provided objective assurance to the profitability of each development. According to the planning department, the new parking ratio range, although slightly higher than desired, has been instrumental in bringing the quantity of parking supplied closer to market equilibrium and in achieving the department's planning objectives.

Concurrent with the parking policy change in 1987, the Miami Planning Department commissioned a consultant, K.T. Analytics Inc., to study the relationship between parking and transit ridership. The initial assumption of the study was that excess supplies of parking would have a detrimental effect on transit ridership. The correlations between transit mode share and parking supply that the study presented disputed the initial assumptions and shoed that the relationship between the two was generally weak. Only in the extreme condition of very low supp¡ly and high price, was there a significant effect on transit ridership. Very ample supples of parking are associated with low transit use, but very low supplies did not necessarily lead to high transit shares. The study concluded that the major determinants of transit use in cities in the United States are urban densities, office floor space and the quality of transit service, not the quantity of parking supplied. While the study recommended an absence of a parking minimum ratio to allow the market to determine the minimum level, it endorsed parking maximum requirements of 2.0 to 3.0 spaces per 1,000 square feet of space or discretionary review of projects in order to guard against excessive parking supplies (K.T. Analytics, Inc.,1987, p. 77).

The City of Miami is also pursuing other strategies to orient development to transit through parking policy. Developers can achieve exemptions to the minimum requirements by means such as providing 2 transit passes for each parking space below the standard. In addition, there is an attempt to allow for cashing out of parking subsidies. Developers who pursue this option must report to the City of Miami on the relative success of their programs.

Miami also attempts to reduce the density of parking in the downtown area by allowing developers to supply part or all each project's required parking off the site of the project. Developers may instead place their parking supplies adjacent to outlying Metromover stations, thereby inducing employees within the

development to use transit for the last part of their commute and reduce congestion in the busiest parts of downtown. There are no significant indications that developers have done this. In fact, where developers have placed parking off the site, the parking structure is generally adjacent to or across the street from the site, rather than at an outlying transit station. Also, the planning department allows multiple developers to supply required parking in shared parking facilities in order to take advantage of economies of scale for constructing a parking structure. Again, there are no indications that developers are taking advantage of this opportunity.

The new parking policies have accomplished many of the objectives of the City of Miami Planning Department. With few exceptions, developments have remained marketable despite lower parking supplies. Prevailing parking ratios for recent projects, however, tend to fall close to the maximum parking ratio despite the ability to supply fewer spaces and reduce cost. The larger problem for planners in Miami is channeling the development that does occur to areas within a certain distance from transit stations. Due to certain political compromises, certain high density developments have been allowed to be built in areas not well served by Metrorail. This detracts from the goal of the planning department to match high density development to high levels of transit service. Unusually, there is no strong anti¬density sentiment in metropolitan Miami. Certain communities have hoped to divert the economic development associated with downtown high density projects to outlying neighborhoods.

Three trends characteristic to the City of Miami may have also insured the success of the changes in parking policy. First, one of the possible reasons for the ready acceptance of low parking standards is that downtown Miami has a strong role in the metropolitan area. As a testament to the strenth of downtown, one half of the property taxes generated in the entire city of Miami is generated in the downtown district. Second, during the 1980's, downtown Miami underwent a real estate boom. Under such periods of strong economic activity, developers see regulations as less of a burden and may be more willing to accept government intervention in planning issues. Third, transportation access is a stronger constraint upon development than Üother planning constraints. While the maximum floor area ratio possible in the city is 30 to 1, the most dense block in Downtown Miami has only a 17 to 1 floor area ratio. Height limits are also a relatively weak constraint upon office buildings since developers are often granted exemptions to the 300 foot height limit. Yet, because of constraints on transportation access, the Miami Downtown Development Authority, has declared that Downtown Miami is close to the saturation point with respect to the number of develop ments it can ac commodate. This urgency may have facilitated the cooperation of the developers with the county mandated city planning objectives.

Portland

The case of the City of Portland is interesting because of the two tiered approach to parking policy. The city placed a parking limit upon the entire downtown area in addition to its parking requirements on individual developments . In 1972, due to concerns about air quality, especially due to the high number of violations of the carbon monoxide standards of the Environmental Protection Agency, the State of Oregon applied pressure upon the City of Portland to address the many air quality violations within the city. The State threatened to withhold federal transportation funding if no action were to be taken. One strategy that the State proposed and that the City agreed to was the placement of a parking lid upon the downtown area. Portland declared that the number of new parking spaces not aleady exempt from existing parking ratios in the downtown area could not exceed a threshold of 43,000 spaces. Due to federally mandated reductions in automobile tailpipe e missions, to an automobile pollution inspection and maintenance program, and to more progressive transportation policies adopted for downtown, including the new Metropolitan Area Express (MAX) light rail service, the number of violations of the federal carbon monoxide standard has decreased over the past 15 years to the point where no violations were recorded downtown since 1984.

By the 1990's, the downtown parking supply was approaching the maximum parking threshold. At

the same time the development community expressed a growing interest in additional office and commercial development in the portion of the central city outside of the defined boundaries of downtown. The city subsequently initiated studies for the Central City Transportation Management Plan (CCTMP). The primary purpose of the CCTMP was to present different growth scenarios for the region and to investigate the effects of these different growth scenarios upon regional mobility and regional air quality. The two long term regional growth scenarios studied were a Concentrated Growth Scenario which concentrated a higher proportion of projected employment and housing growth in the downtown area and the RTP Scenario which predicted a more dispersed development pattern according to previous versions of the Regional Transportation Plan. Under the Concentrated Growth Scenario, downtown would absorb 30 percent of the new housing growth and 40 percent of the employment growth.

The CCTMP growth models for the year 2010 showed that the Concentrated Growth Scenario would produce fewer person trips, fewer vehicle miles travelled, and a higher share of alternative transportation modes. Under the RTP transit trips would increase 70.3 percent, while under the Concentrated Growth Scenario transit trips would increase 95.8 percent. The mode shift "could be attributed to the higher density levels and accessibility to transit" (Loudon, et al., January 1995).

Given that the Concentrated Growth Scenario might yield a lower number of trips and miles traveled by automobile and more active downtown districts, Portland planners feared that the existing parking limit of 43,000 spaces might stifle the office and commercial development market downtown and actually lead to the higher levels of air pollution predicted by the RTP scenario. Separately generated models on regional parking restrictions confirm the paradoxical reduction in transit share as a result of stringent parking policy. A study by Hamerslag and Fricker reveals that if parking restrictions are limited only to transit corridors, long term destination choices would shift. This shift would lead to decentralized development patterns, the dispersion of transit demand, and a lower transit mode share. Stringent parking restrictions must thus involve regional coordination in order to achieve regionally consistent parking availability without weakening development patterns on transit corridors (Hamerslag and Fricker, July 1994).

After concluding that current parking ratios would result in construction of sufficient new spaces to meet the increased demand given existing mode shares, planners in Portland initiated the process to have the State and the federal Environmental Protection Agency to lift the parking lid. Removal of the parking lid would leave only the restrictions on the individual developments to control the aggregate supply of parking. Portland has placed a series of parking maximum requirements upon developments depending on distance from the MAX light rail system. In the heart of the downtown area, developments immediately adjacent to the light rail transit mall have a maximum ratio of 0.7 spaces per 1,000 square feet of floor area. The maxiimum parking spaces allowed per 1,000 square feet of floor area is 1 for developments up to 6 blocks away from the transit mall, 1.2 for developments between 6 and 8 blocks away, and 2 for developments immediately outside the downtown area.

Developers have accepted the parking maxima as essential for the the City of Portland to have an effective balance of transportation services. Realtors of office and commercial space, feel that the market is doing well and that downtown has a sufficient parking supply for its needs. Residents in adjacent districts have also accepted the maximum requirements because the potential problem of parking spillover have been alleviated by the establishment of Residential Permit Programs. Although developers do not complain about the parking requirements, they generally do build to the upper limit of allowed parking. Again, the acceptance of such limitations upon downtown development may have been facilitated due to the strength downtown as a center of the metropolitan area. Although there are many suburban office parks that take advantage of cheap land in outlying areas, Downtown Portland is regionally competitive in the office and commercial space market and is the unrivaled center for culture and retail activity in the region. The parking requirements have been so successful that the City is lowering the maximum requirement for parking in areas immediately adjacent to downtown to 1.2 spaces per 1,000 square feet.

Denver

The approach of the City of Denver may present the best approximation to a free market solution to the provision of parking in office developments. The City of Denver has no minimum parking requirement for the downtown area. No development from 1976 through 1986 has tested this limit. Among developments that have exclusively office and commerical uses (15 projects), the ratio of parking supplied, ranges from 0.20 spaces per 1,000 square feet of gross floor area to 2.37 spaces per 1,000 square feet. The average ratio of parking supplied for office and commerical buildings was 0.936 spaces per 1,000 square feet of floor area. This is significantly less than the 2.0 spaces per 1,000 square feet that Higgins recommends from his analysis of San Diego.

Without a parking requirement as a lower constraint, developers identify the financial community as major constraint on how little parking each developer must supply. The banks who provide financial backing for each project need reassurance that the development will be profitable and attract enough tenants, and secondarily enough employees and retail customers, to each development. Banks thus require a certain number of parking spaces for these employees and customers as a prerequisite for providing development loans. Despite the extent to which the financial community can determine parking supply, planners have generally not dealt directly with the banks. In the future, planners might be able to capitalize on the influence of the banks to achieve their development goals.

San Jose

The City of San Jose has not been as agressive in changing parking policy as other cities with new rail transit systems. San Jose has a citywide parking minimum requirement of 4 spaces per 1,000 square feet of floor area. In the downtown area, zoning ordinances require only 1.5 spaces per 1,000 square feet. Although this value is comparable to other cities surveyed, the San Jose Redevelopment Agency actually encourages developments to supply up to 3 spaces per 1,000 square feet. Since the Development Agency must approve all downtown developments, most projects built within the past 6 to 8 years conform to a parking ratio of about 3 spaces per 1,000 square feet, fully twice the minimum required ratio.

The City of San Jose allows only three exceptions to the standard parking policies. First, all buildings in existence before 1982 are deemed legally noncompliant to the parking minimum requirements. If there are significant renovations and additions to these older buildings, the supply of parking for the building must be brought into compliance. Second, the city allows developments to supply less parking if the developer pays the city an fee in lieu of the parking. This fee provides a disincentive for developments to provide fewer parking spaces and no developer has heretofore taken advantage of this exception. Third, the Redevelopment Agency does allow for projects, especially those with uses that have peak parking demands at different times of day, to share parking facilities to take advantage of economies of scale. Only one major development, a combination retail pavillion, hotel, and office building, has taken advantage of this provision.

Planners within the City of San Jose view parking as an essential amenity for the success of development. This explains the hesitancy that many within the city have to abandon former parking rules of thumb and base a regional transportation policy upon the new light rail system. The new light rail system has also not garnered high shares of the trips made within San Jose or Santa Clara County. Office users immediately adjacent to the new line have accepted the new line. However, commuting patterns for office sites more than one and a half blocks away from the light rail line are largely unchanged from those before the line was built. The Redevelopment Agency also uses some of its revenues to build supplemental public parking facilities. Planners are not yet confident in the ability of Downtown San Jose to compete in the regional office market and concede that suburban Santa Clara County (the Silicon Valley) has traditionally attracted larger and more prominent developments and office tenants.

Conclusions

The previous case studies as well as the latest literature on parking policy point to five major conclusions concerning parking requirements.

First, the relative strength of an office district within the regional real estate market may indicate the extent to which planners are willing to experiment with parking requirements that specify provision of parking below the norm. If Hato Rey is the solid financial center for Puerto Rico as is claimed, planners should feel no reservations about lowering parking minima and leaving parking supply up to market forces to decide. The relationship of the strength of downtown to the willingness to experiment with parking requirements is especially relevant when instituting limits or maxima on the supply of parking for new developments. Unusually stringent requirements on the supply of parking may change travel patterns and regional patterns to the extent that transit demand along the new rail corridor may claim a smaller share of the regional transit demand. The dispersed transit demand may weaken the ability of new transit systems like the Tren Urbano to provide better access for the region's residents to the major activity centers of the San Juan metropolitan area. Coordinated regional parking policy changes must immediately follow any changes in Hato Rey in order to prevent regional competitive disadvantage of transit station areas in the real estate market.

Second, constraints imposed by banks (lenders) upon a developer are as strong as those imposed by planners. Often, even though developers have the opportunity to decrease their costs by providing less parking, they will follow the advice of their financial backers and supply more than the minimum requirement. In many cases, they will supply even more than market equilibrium supply due to an aversion to defying the norm of parking practice and in order to assure the marketability of the development in the long term. That the banks do impose such a limit may support arguments to lower parking minimum requirements. If banks can determine the maximum profitability of a development, then they, rather than arbitrarily set minimum requirements, are most capable of setting parking supplies. The identification of the importances of banks in the development process presents an opportunity for planners to involve the financial community in the community planning process. This may present a new model of the development process. In the previous model, developers determined their parking supplies based upon constraints imposed by two separate sources, city planning agencies and banks. In the new model, developers would deal interactively with these two institutions and a line of open communication would exist between banks and planners. Effectively, the three parties would cooperate to insure the marketability of the development and of the transit station area.

Third, correction of parking poicy in San Juan requires much more than simply changing minimum requirements. Enforcement of illegal parking and alleviation of parking overflow remains a primary obstacle to gaining public support for lowering any off-street parking requirement. The Puerto Rico Department of Transportation and Public Works (DTOP) must strengthen its Cuerpo de Ordenamiento (Parking Enforcement Corps) and work in conjuction with the State Police to enforce existing and future laws to curb illegal parking and achieve order in the parking market. The Department of Consumer Affairs should investigate the termination of parking price regulation as price regulation imposes artificially low prices upon an already strained parking supply. Finally, education efforts should be aimed at the affected sectors of the public to inform them of the benefits of changing parking policy as the Tren Urbano nears completion and to counter the expectation that a free parking space will be available at every destination.

Fourth, impacts on adjacent residential areas should be assessed and addressed before any radical

change in the parking requirements is instituted. Since overflow parking remains a central justification for keeping parking minima high, planners must act carefully when such minimum requirements are removed. It is essential to retain the support of adjacent communities in order that the Tren Urbano and any changes in parking policy may gain their support.

Fifth, consistent policies are important to gain the support of the development community. Developers feel most confident about certain locations and certain office districts if there is a consistent and stable set of policies (dealing with parking or otherwise) in place. Where development approval seems arbitrary is where developers are most wary about building large projects. Consistent policy can indicate a strong planning commitment to the area and the support of the local government for developments that satisfy objective planning goals. The desire for consistent policy does not mean that developers are entirely averse to changing parking requirements when they have outlived their use. Simply, changes in policy must not be the result of arbitrary decisions but should be the result of long deliberation preferably with the involvement of the development community.

Bibliography

Barton Aschman Associates, Inc, Parking Policy Report, prepared for Department of Transportation and Public Works, August 1991.

Cervero, America's Suburban Centers: A Study of the Land Use-Transportation Link, 1988

Econometrica, Inc., Some Economic Issues Related to Parking Plicy in Puerto Rico, December 1992.

Rudi Hamerslag and Jon D. Fricker, Parking Restriction in Employment Centers: Implications for Public Transport and Land Use, July 1994.

Higgins, Parking Requirements for Transit Oriented Developments, Transportation Research Record 1404.

K.T. Analytics, Dade County Parking / Transit Ridership Study, January 1987.

William R. Loudon, et al., Changing Transportation Policy in the City of Portland, January 1995.

Don H. Pickrell, The Tax Exemption of Employer Provided Parking, Testimony presented to the Committee on Ways and Means, U.S. House of Representatives, March 14, 1990.

Diane Ricard, The Potential of Congestion Reduction Strategies in Urban Centers, May 1990.

RJA Group, Inc., Tren Urbano: Estacion Hato Rey, Estudio de las Estaciones y Sus Vecindarios, October 1994.

RJA Group, Inc., Tren Urbano: Estacion Nuevo Centro, Estudio de las Estacioines y Sus Vecindarios, October 1994.

Donald C. Shoup, An Opportunity to Reduce Minimum Parking Requirements, September 10, 1994.

Donald C. Shoup and Richard W. Willson, Employer Paid Parking: The Influence of Parking Prices on Travel Demand, prepared for Commuter Parking Symposium, Association for Commuter Transportation, Seattle, Washington, December 1990.

Urban Land Institute and National Parking Association, The Dimensions of Parking, Third Edition, 1990.

Richard Willson, Parking Subsidies and the Drive Alone Commuter: New Evidence and Implications, presented to the 67th Annual Meeting of the Transprotation Research Board, January 1988.

Richard Willson, Suburban Parking Requirements: A Tacit Policy for Automobile Use and Sprawl, Journal of the American Planning Association, Vol. 61 No. 1, Chicago, IL Winter 1995.