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# Public Transportation and Urban Decentralization: Conflict or Accord?

ARNOLD J. BLOCH AND LOUIS J. PIGNATARO

**The implications for public transportation of population and employment decentralization within the nation's urban areas are examined. Five case studies are viewed in terms of growth patterns, land use policies toward growth and decentralization, and the types of public transportation projects planned and implemented. It is found that most projects were planned with an incomplete or inaccurate understanding of decentralization patterns, that most projects were not usually in concert with land use objectives (which themselves were rarely enacted), and that projects often reflected unrealistic expectations of what public transportation services can perform. Recommendations center around a future reformulation of the relation between land use policy and public transportation.**

A most likely scenario for the near (year 2000) future indicates that low-density population dispersion will continue to occur in the United States despite significant changes in demographic patterns (lower birth rate and increased elderly population), energy prices (a consistent rise in oil prices), economic conditions (worsening stagflation), and technological advances (in the areas of telecommunications and vehicle innovations) (1,2). This implies two things for transportation analysts to consider: (a) a greater reliance on personalized transportation (i.e., the automobile) for urban America and (b) a lesser proportion of the population capable of being served by conventional transit.

This is a general overview, however, and there are a number of specific events and issues that need to be examined within the context of this overall urban decentralization. Among these are the following:

1. It is important to examine the similarities and differences in population decentralization within separate categories of urban areas. To what extent have prior development patterns (pre-20th century and pre-World War II) affected decentralization characteristics? Is the shape of decentralization different in declining urban settlements than in growing areas? Does population and employment decentralization occur simultaneously in different urban types? The answers to these questions have obvious and relevant implications for public transportation policy formation.

2. In all urban areas, there is an understandable reluctance to let decentralizing patterns dilute the power and prominence of central-city areas. In some urban areas, this has meant an attempt to reverse decentralizing trends because of accompanying decline. In others, however, it has manifested itself in a desire to merely adapt trends to the benefit of the urban area. But in all cases urban areas are contemplating transportation and land use actions that are not entirely compatible with the scenario presented earlier.

3. Among the most prominent objectives of the Urban Mass Transportation Administration (UMTA) are to provide for basic urban mobility needs and to increase the modal share of public transportation. But given the urban decentralization scenario, these objectives are no longer harmonious with one another: In order to satisfy mobility needs of future urban areas, which are continually decentralizing, the emphasis on increasing conventional transit's modal share must be lessened. But objectives are only the visible outgrowths of implicit, evolving goals that UMTA adheres to. These goals include (a) reducing automobile use in urban areas to conserve energy and reduce air pollution; (b) redistributing income, especially to disadvantaged central-city dwellers; (c) redeveloping the nation's urban cores; and (d) reinforcing or stimulating dense urban development to conserve energy and other resources and provide accessible employment opportunities to the general population (3,4). Clearly, any alteration in objectives would first necessitate a shift in basic goals. The extent to which UMTA can be expected to shift basic goals must be examined, given on the one hand an understanding of future decentralization trends and on the other the current interests, intentions, and actions of urban areas, the prime recipients of UMTA aid.

These issues are explored in this paper in an effort to identify the opportunities and difficulties that will arise over the next 20-year transition period between the still prevalent notion of urban areas as densely packed hubs and the coming

awareness of urban areas as deconcentrated centers. Specifically, this work attempts to show the following:

1. How well do urban areas recognize the decentralizing forces occurring within them?
2. Are they basically supporting or opposing such forces, and how serious are the efforts made to do so?
3. To what extent are major public transportation actions and proposals used as tools to support or alter decentralizing trends in urban areas? Based on direct and related experience, how successful are these measures?

Furthermore, this information is connected to a key issue, the future role of UMTA, by examining these questions:

1. What specific actions (i.e., projects in a given setting, to achieve certain purposes) should UMTA be divesting itself of in order to prepare for a future of further urban decentralization?
2. What types of actions should UMTA be supporting that will aid the near-term transition?
3. How can UMTA deal with the demands of urban areas, whose concerns lie neither with the near and long term nor with national trends and forces but with the inherent interests of self-preservation and growth?

## URBAN DECENTRALIZATION: FIVE REPRESENTATIVE AREAS

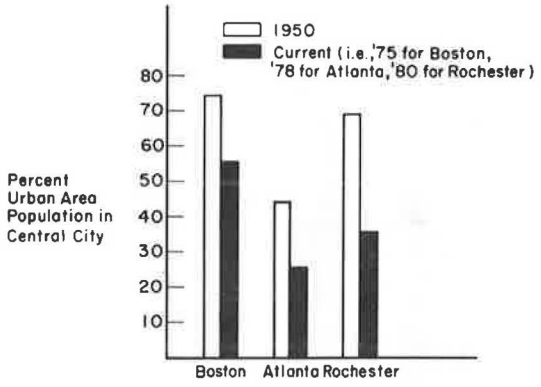
The research was carried out by examining case-study examples of the nation's urban areas. Rigorous classification methods (5,6) were used in choosing the following areas:

| Type | Urban Area |
|---|---|
| Relatively declining urban areas | |
| Heavy transit use | Boston, MA |
| Light transit use | Rochester, NY |
| Maturing sunbelt growth | Atlanta, GA |
| Booming urban areas | |
| Core oriented | Tampa, FL |
| Dispersed | San Jose, CA |

The current shapes of these five urban areas gained their initial characteristics from development that essentially began in the 18th (Boston), 19th (Rochester and Atlanta), and 20th centuries (San Jose and Tampa). Following World War II, when longstanding desires for low-density life-styles that had been pent up for 15 years or more were released and satisfied by the availability of cheap housing, automobiles, and improving highways, these urban areas commenced stages of development that are likely to remain at least through the remainder of this century. The Boston and Rochester urban areas began to stabilize in both population and employment growth and more recently have shown indications of declining population. Whereas other larger and smaller urban areas (e.g., Cleveland, Ohio, and Utica, New York) have suffered heavier population and employment losses, it is fair to characterize both Boston and Rochester as relatively declining urban areas, even though each has attractive features (e.g., historical attractions, educational facilities, and strength in particular employment sectors) that allow considerable activity to be maintained and even enhanced.

In the 1950s and early 1960s, Atlanta represented the model of northern urbanization transplanted to a southern setting. That this urbanization was so rapid only makes it more understandable that the continued population and employment growth should be somewhat eroded by attraction of other less-developed sunbelt urban areas. Atlanta represents the new maturing urban area in this nation--one that develops far more rapidly than those of the past but that also reaches its zenith of growth at a quicker rate. Still, the area's development into the initial capital of the post-World War II sunbelt (perhaps now supplanted by Houston) allows it to retain its attraction for continued population and employment growth, although at a considerably slower pace.

Figure 1. Decline of central-city population in Boston, Atlanta, and Rochester.

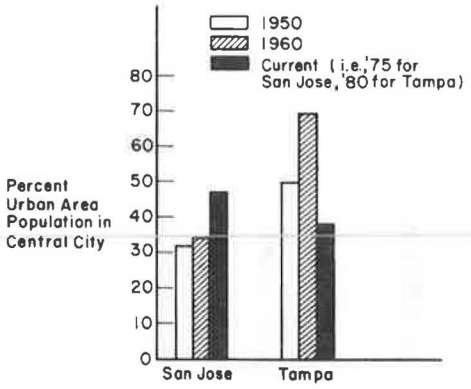



San Jose and Tampa represent two versions of rapidly developing urban areas. San Jose's growth continues to be spurred by its "discovery" in the early 1960s by the electronics and related industries as a good workplace setting. In this it resembles somewhat the boom-town developments related to mineral discoveries earlier in the nation's history. Tampa's discovery was made largely by persons relocating for life-style purposes (e.g., climate, low density, land expense), a movement that has characterized many other smaller Florida cities over the past 15 years. With strong manufacturing, mining, and port functions as a base for initial growth, the area intends to support further growth by expanding its service sector, especially within a modern and expanding central business district (CBD).

In all of these urban areas, which are representative of declining, maturing, and booming stages of urban development, decentralization of population and/or employment away from the urban core is occurring. Figure 1 shows the relative decline of the central-city share of urban-area population in Boston, Rochester, and Atlanta over the 25- to 30-year period following 1950. In each of these areas, employment opportunities have also largely shifted outward: to the MA-128 Beltway in Boston, to the satellite towns and office-industrial parks in Atlanta, and to the suburbs of Monroe County in Rochester.

Figure 2 indicates a less-generalized pattern of decentralization within the two rapidly developing urban areas of San Jose and Tampa. Clearly, the City of San Jose has grown substantially as the population center of that urban area. At the same time, however, most employment and employment growth occur in the northern suburban portion of the urban area. That area is constrained in its ability to expand housing by geographic limitations--namely, low-lying baylands, mountain ranges, and earthquake faults. Thus, San Jose has become a bedroom community, largely consisting of single-unit home developments, for these employment centers. In Tampa, growth in the 1950s was confined largely to the central city. But since then the more accelerated growth that the area has experienced has resulted in

Figure 2. Central-city population share in San Jose and Tampa.




a declining central-city share of population. Unlike Boston, Rochester, and Atlanta, however, this increasing population shift to low-density settings has not been accompanied by a similar shift in employment. The City of Tampa maintains and is expanding its role as the center of employment opportunities in the urban area. (By the year 2000, it may contain 75 percent of urban-area employment but only 29 percent of the population.)

Each of these urban areas has experienced growth in office building construction in the CBD during the past 10 years (as have most of the nation's urban areas), as the table below indicates (data courtesy of Black of the Urban Land Institute and Ketter of the Genesee Transportation Council):

| Urban Area | Office Space Growth (%) |
|---|---|
| Boston | 33 |
| Rochester | 35 |
| Atlanta | 60 |
| San Jose | 30 |
| Tampa | 90 |

In some cases, retail activities have also expanded (e.g., in Boston and Tampa) as well as hotel-convention facilities (as in Atlanta). However, only in Tampa has the growth in CBD activity had any substantial effect on decentralization patterns. Tampa's surge in CBD office building construction during the 1970s (and more planned for the coming decades) has helped concentrate expanding service-sector employment in a central-city setting, although it has not had a similar effect on population location. In other areas, employment in the CBD is expected to continue to decline (in Atlanta and Rochester) or to grow at a slower pace than in the rest of the urban area (in San Jose and Boston). Furthermore, employment centers outside the CBD and the central city (along beltways or other expressways, in industrial-office parks, and in satellite or nearby communities) are expected to grow irrespective of CBD experience.

## LAND USE POLICY RESPONSE TO URBAN DECENTRALIZATION

All urban areas, including those studied here, recognize negative aspects of the decentralization of residential and workplace activities. These aspects are mainly economic, including a loss of central-city tax base and an increase in infrastructure costs for low-density areas. Thus, all have proposed, and some have implemented, policies and actions intended in some manner to stem decentralization and produce denser, more-concentrated land use patterns. This response centers around either or both of these objectives:

1. Strengthen the central-city position at the expense of suburban areas and
2. Curtail further decentralization by concentrating suburban settlements.

The policies derived from these basic objectives are summarized below.

### Supporting CBD Office Development

All five case-study urban areas have successfully implemented the strategy of supporting CBD office development, taking advantage of nationwide service-sector employment growth and using such techniques as tax incentives, bonus zoning, actual public investment, and coordinating public development agencies. The success rate has been strong not only in the case-study areas but also in many CBDs across the country. As indicated previously, however, among the five urban areas studied these development activities have not significantly strengthened the role of the CBD in conparison with other major activity centers in the urban area (except in Tampa). Office mall developments continue to flourish, and office space is continually added in non-central-city communities. Some CBDs continue to lose employment.

### Discouraging Suburban Office Growth

Although discouraging suburban office growth is a professed goal of planning documents in all five urban areas, its translation into an operative policy has so far been unsuccessful. Achieving the necessary coordination between various communities within an urban area, especially because it necessitates foregoing some further development for the sake of an overall objective, has been a nearly impossible task. Furthermore, the fact that this policy is opposed to decentralization trends in most areas makes its capability of gaining support and working effectively rather weak.

### Encouraging Suburban Infilling

Encouraging suburban infilling implies restraining further outward decentralization by encouraging a higher concentration within existing suburban areas. The policy implies interaction and coordination among suburban communities without necessarily the direct participation of the central city. Thus, agreement on infilling concepts may be more likely than agreement on discouraging suburban office growth because issues of prime concern can be discussed (especially the effect on infrastructure costs) versus the issue of loss of central-city tax base, which is only of secondary or tertiary interest to suburban communities.

Still, as of now infilling is a concept proposed by government entities that have little implementation power (in these cases, the county), having garnered little support among individual municipalities. Its possibilities of successful implementation are greatest when overall growth and decentralization trends are to be altered (at least in the short term) to only a small degree (i.e., Rochester versus San Jose).

### Encouraging Suburban Nodal Development

Encouragement of suburban nodal development is a variation of infilling, which purports to gather concentrated suburban growth around existing (Tampa)

or potential (Atlanta) nodes of employment development (often competitive with the CBD). Considerations similar to those for infilling apply here--e.g., the need for suburban community interaction and the need to accept decentralization trends. Nodal development, however, shares the same potential pitfalls as the strong CBD/weak suburb policy: Concentrations of activity are assumed to have a special importance that necessitates their continuance and, especially, encouragement of their growth, even in the face of population and employment shifts and growth elsewhere, in areas unrelated to the nodes.

## PUBLIC TRANSPORTATION PLANNING IN CONTEXT OF DECENTRALIZATION AND LAND USE POLICIES

Major public transportation actions, some implemented and some only planned, conceived by the five urban areas within a relatively recent time period are given in Table 1. A question may be raised as to the reason for including in this paper projects that have only been proposed and that in some cases stand little chance of being implemented for one reason or another. Their importance lies not necessarily in the potential for successful implementation but in the fact that significant time and effort have been expended on the local level toward generating (and often providing preliminary analysis for) these projects. They represent the direction of public transportation planning in these urban areas in the present period, and it is therefore appropriate to examine such proposed projects within the same decentralization context as actually implemented projects.

### Rail Transit Planning

The rail transit projects in Table 1 have added or will soon add slightly more than 25 miles of new heavy rail line (Atlanta and Boston) and upgrade an additional 10 miles (Boston). If fully implemented, all projects could add an additional 47 miles of heavy rail line (Atlanta and Boston), 70 miles of upgraded commuter rail (San Jose), and 30 miles of new light rail systems (Rochester and San Jose). The cost of implemented projects exceeds $2.5 billion, and additional proposed projects would cost at least another $2 billion. However, under most feasible scenarios, it is highly doubtful that the Rochester light rail line will ever be built. It is also somewhat doubtful that the full Atlanta system will be completed in this century or that the proposed Boston extensions will be fully implemented.

### Bus Transit Planning

The bus transit projects in Table 1 were divided in their area of impact into two groups: those that affect the entire urban area (San Jose and Tampa fleet expansion) and those that affect the CBD only [Rochester's free-fare program and Boston's transit mall and automobile-restricted zone (ARZ)]. Those that affect the urban area as a whole, however, have a definite central-city and CBD emphasis, especially in Tampa. San Jose and Tampa plan to add 730 new buses by the year 2000. They expect this to cost $84 million, which does not include increased operating costs. In Tampa, the expanded fleet would take advantage of 25 new miles of highway preferential treatment. However, if the highway improvements are implemented, automobiles could also take advantage of a 600 percent increase in freeway lane miles under a joint construction program.

Rochester's free-fare project costs the system $70 000 annually while increasing CBD ridership by approximately 1000 percent. Boston's Downtown Crossing transit mall-ARZ, a project that affects pedestrians, automobile users, and transit users, has reduced automobile use and increased bus use, as intended.

### Paratransit Planning

The paratransit services cited in Table 1 were intended to meet the full spectrum of low-density area travel demand: work trips (Boston's MASSPOOL program, especially) and shopping, social, recreational, and other (Rochester and San Jose). The results of those projects indicate that

1. There is considerable demand for paratransit-type services,
2. The failure of the two general community services projects was not a factor of inadequate demand per se but of the inability to focus limited resources so that high-quality transportation could be provided to major demand areas, and
3. The success of the work-trip service was in large part due to the recognition that, without some type of mandated requirement of participation, employers in low-density settings (i.e., where there is little congestion and generally cheap land to provide parking) have little incentive to encourage employer ridesharing.

### Projects and Decentralization

All of the rail projects are being planned or implemented in settings that are not highly conducive to providing a strong and growing market for rail transit. That is, population and/or employment decentralization is occurring at a rate whereby (a) original estimates of ridership levels are highly unlikely to be attained (Atlanta, Boston, and Rochester) and (b) other extensive transportation or

**Table 1. Recent and notable rail, bus, and paratransit projects from case-study urban areas.**

| Mode | Urban Area | Project Type | Status |
|---|---|---|---|
| Rail | Atlanta | Implement new heavy rail system | Initial stage near completion |
| | Boston | Expand and/or upgrade existing heavy rail system | Some completed, other under construction or only proposed |
| | San Jose | Expand and/or upgrade existing heavy rail system | Proposed |
| | | Implement new light rail system | Proposed |
| | Rochester | Implement new light rail system | Proposed |
| Bus | San Jose | Bus fleet expansion | Ongoing |
| | Tampa | Bus fleet expansion combined with added express bus service and high-occupancy-vehicle lanes | Some ongoing, most only planned |
| | Rochester | Free fare in CBD | Ongoing |
| | Boston | Transit mall/automobile-restricted zone | Ongoing |
| Paratransit | Rochester | General community services | Discontinued |
| | San Jose | General community services | Discontinued |
| | Boston | Work services | Ongoing |

land use control and development aids are necessary to generate any significant ridership levels (Boston, Rochester, and both San Jose rail projects).

It is perhaps not a coincidence that the two demand-related bus projects (CBD free fare and transit mall-ARZ) were implemented in the two declining urban areas (Rochester and Boston). In scope, these projects recognize that, although the urban area is losing population and the CBD is continuing to lose relative prominence, considerable activity and some growth are occurring that public transportation services can both take advantage of and support.

The San Jose fleet expansion, which for the most part is central city oriented, does not mesh with the work-trip patterns that have developed over the past 15 years--i.e., central city to ring. Unless other factors cause a shift in those patterns, a fairly low level of travel demand will be served.

Although the Tampa expansion, which emphasizes express bus and highway preferential treatment, is intended to serve the developing CBD workplace, it may actually play only a small role in that development. Although the goal of the project is to achieve a 30 percent modal share for transit for CBD-bound trips, the tremendous expansion of highway capacity that accompanies this project is likely to (a) increase the attractiveness of the automobile and (b) spur dispersed residential growth, putting bus operations at a further disadvantage.

The implication of the paratransit experiences is that, despite considerable demand in low-density areas, paratransit projects cannot be expected to operate successfully in these settings without carefully planned and developed implementation procedures. The reason for this is clear: the widespread proliferation of the automobile and its ability to provide high-quality transportation to most residents of low-density areas.

### Projects and Land Use Responses

Close examination of the land use consequences of rail actions indicates that translating planning objectives into implemented reality is a difficult and rare accomplishment. Specifically,

1. Rail projects can influence locational decisions of development projects already planned or expected to occur in CBD areas. But there is no indication that rail projects by themselves encourage new CBD development.
2. The infilling and nodal development potential of rail stations can be and often is reduced by individual antigrowth actions of affected communities and by the availability and prominence of other, non-rail-related nodes of development (highway interchanges).
3. In at least one prominent case (San Jose light rail), the infilling objectives of the project require coordination with land use controls that involve such powerful consequences that the objectives could be met by the land use controls themselves without the light rail system.

All four bus projects are linked with CBD office development policies. In addition, the San Jose fleet expansion would complement a set of infilling policies, if such policies could ever be implemented. In Tampa, however, what appears to be an enforcement of nodal development (via express bus terminals and park-and-ride lots located at key nodes) may actually spur further dispersed growth, since the high-occupancy-vehicle-lane segment is allied with a highway expansion program.

It is interesting to note that the potential compatibility of paratransit actions with suburban infilling policies is not clearly recognized during planning and implementation of general community services. Even if it were, there is strong reason to believe that the implication--to coordinate services with land use controls in proposed infilling areas--would be ignored since local funding mechanisms make it politically necessary to meet equity objectives (i.e., serving the entire area) before developmental objectives (i.e., serving areas of highest demand).

## CONCLUSIONS

The following are the major findings and implications of this paper:

1. Decentralization is occurring in all urban areas regardless of whether the areas are characterized as declining, maturing, or rapidly growing. The market for conventional transit modes in urban areas is thus also steadily decreasing. Even in rapidly growing areas currently characterized as having either growing central-city population (San Jose) or growing central-city employment (Tampa), the fact that one occurs without the other limits the potential role of conventional transit services.
2. The relative resurgence of CBD areas during the 1970s should not be viewed as a trend toward recentralization or as a prime justification for building, upgrading, or expanding public transportation services and/or facilities, since in most cases the future extent of such growth is limited by growth elsewhere in the urban area.
3. Urban areas have had relatively good success in supporting CBD office growth and virtually no success in halting suburban growth of this nature. Improved conventional transit service is only one means, and certainly not among the most effective at the local government's disposal, of encouraging, enhancing, or otherwise managing CBD office development. Other means are generally more direct (e.g., joint public-private development and zoning) than public transportation improvements and less expensive. Public transportation projects that purport to slow the decentralization of office-type employment into suburban areas should be viewed with great hesitancy and circumspection, since urban areas have generally shown an unwillingness to apply other means or controls at their disposal to achieve this objective.
4. Transportation planners recognize the need for land use controls as a support for many (especially rail) transit projects. What is less clearly recognized is that, if meaningful (but politically difficult) land use controls could actually be effectively implemented, growth management objectives could be met without implementing public transportation actions. Thus, public transportation projects, especially those that involve bus and paratransit services, should be viewed as potentially complementing land use policy actions and not the other way around.
5. An evaluation of rail projects should include an "up-front" understanding that such projects on their own will not create recentralization of central cities or generate new demand for these services as a result of reversed urban development patterns.
6. Expanded bus operations are better suited than rail projects to support suburban growth management objectives. However, such projects do not often use this potential and sometimes conflict with infilling or nodal development objectives.
7. Demand for paratransit services exists in low-density settings in urban areas but may go unserved if projects are implemented in an unsuitable manner.

RECOMMENDATIONS TO UMTA

The following are pertinent recommendations for UMTA to consider in light of the findings presented in this paper:

1. Support the proper local application of land use controls for decentralization management along with public transportation planning. That is, promote among urban areas an understanding of the role of public transportation as a tool of land use policies and not the reverse. Although this may be anathema to those who support continuing and growing capital grant programs as well as to those who abhor direct government interference in land use development, it is the only cost-effective choice in light of decentralization trends and local desires to control the growth patterns emanating from those trends.
2. In light of this, grant approval to funding requests that have guaranteed support mechanisms, such as controls, requirements, and restraints that ensure proper implementation and fulfillment of objectives.
3. Support reshaping of metropolitan planning organizations in such a way that one of their roles should be as a broker between the needs and desires of central cities and suburban communities. The key opportunity here is for central cities and developed suburban areas to achieve infilling, nodal development, and curtailed suburban growth objectives (i.e., management of decentralization) by affecting a basic trade-off: gaining land use control concessions from low-density areas (which in effect is a self-control on growth) in return for central-city subsidization of public transportation services (i.e., paratransit and bus services) in these low-density settings.
4. Revise basic UMTA goals to (a) support positive aspects of urban decentralization, (b) support efficient movement of the urban population, and (c) develop the concept of public transportation as a support versus a lead planning tool.

ACKNOWLEDGMENT

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## Discussion

Richard M. Stanger and John W. Bates

The subject of the paper by Bloch and Pignataro, the role of transit in a decentralizing urban area, is an important one for transit planners and policy formulators. The authors are correct in saying that conventional transit (one supposes rail and fixed-route bus under prevailing operating strategies) is less efficient in non-nodal, decentralized suburbs than in nodal, high-density areas. Providing conventional service in geographically large suburban areas with low-population density has increased transit operating costs significantly without commensurate gains in ridership. This has contributed greatly to the financial plight now facing most transit operators. Clearly, something needs to be done.

However, the authors imply that the most effective solution is to throw up one's hands and withdraw transit as an alternative for positively influencing urban development. We suggest that (a) the situation is not as bleak as the authors describe it and (b) there is great potential for improvement in transit operating strategies so that a "good" centralization-decentralization mix might occur.

The paper begins with the words, "A most likely scenario for the near (year 2000) future indicates that low-density population dispersion will continue...." Several paragraphs later, the "decentralization scenario" becomes "decentralizing forces" and soon "a future of further urban decentralization" becomes fact. The remainder of the discussion advances from the assumed inevitability of decentralization as it has occurred in the post-war era. In the conclusions, the reader is advised, "The relative resurgence of CBD areas during the 1970s should not be viewed as a trend toward recentralization...." Why not? This could be a hopeful sign that perhaps the tentative and recent federal policies to encourage recentralization are in fact working. The authors have based their premise on an uncertain scenario and then concluded that federal transit policies are fruitless and ineffective. They discount the fact that transit as a federal activity is very young and lightly funded compared with the long-term, much heavier funding of highways, which foster dispersion effects. Given the energy, fiscal, and economic constraints we feel are more likely, long-term decentralization as we have seen it over the past 30 years is not so inevitable.

Implicitly, the paper defines centralization as a single urban core or CBD that contains most, if not all, nonresidential activity. Decentralization, on the other hand, seems to imply an "urban sheet" of homogeneous low density with a few small pockets of slightly higher-density nonresidential activity centers. The potential for multiple, high-density nodal activity centers is explicitly rejected with the comment that such activity centers are not substantially different from the "strong CBD/weak suburb policy". We feel they are. Any number of studies have established the economic, social, and energy inefficiency costs of sprawl. Given these costs, would it not be wiser for federal policy to counter decentralization than to accept or even

foster a pattern that is less desirable? After all, it was in some measure federal policies on the financing of suburban housing and private transportation established after World War II that led to sprawl. It seems logical that other policies could similarly lead to recentralization. Economic and demographic developments in the past decade are certainly different from those three decades ago. Perhaps federal policy should focus on and converge with these new developments--not, as the authors suggest, ignore them.

Rail transit does promote centralization, as the history of any older city will show. Recent experience indicates that it may also promote recentralization (as defined by the authors) or at least the high-density nodal development dismissed by the authors. The Metropolitan Atlanta Rapid Transit Authority (MARTA) East Rail Line has increased corridor transit trips from 40 000 to 60 000 trips/day, one-third of which are new transit trips. Automobile traffic in the corridor has decreased 10 percent in spite of increasing sector and downtown populations. Since construction began on the MARTA rail system, the CBD share of office space growth has exceeded the regional average. In addition, major developments are being planned for the areas around current and future transit stations, which were intended to be the focus for such development. There is no reason to believe that the experience in Atlanta, where recentralization policies have been implemented in large part through a federal commitment to rail transit, is unique.

Finally, the issue of transit operating strategies, which is ignored by the authors, must be considered. The traditional long-haul fixed bus route carrying passengers from the suburbs to the CBD on a single vehicle is costly. The costs are so great that reasonable levels of service cannot be provided, which results in low use. During much of the day this is not the trip pattern followed by suburban residents. Short-haul collection and distribution bus routes, timed to connect at nodal development centers to internodal trunk-line services, will be much more efficient and effective. By reducing route length, operating costs can be reduced for the same level of service, or, more significantly, much higher levels of service can be provided with little increase in costs. More ridership and more revenue will result.

In summary, we feel that the authors have accepted as inevitable and perhaps beneficial the continuation of a trend that began in very different times than we face today. They fault the tentative efforts that have been made to halt that trend and federal policies that foster stronger CBDs and nodal development. We suggest instead that federal policy, as well as state and local efforts, toward recentralization be intensified. To this end, UMTA should encourage the development of modifications to prevailing transit operating strategies to further enhance high-density, non-CBD activity centers as well as continue to support the development of rail and other trunk-line services connecting them.

## Authors' Closure

In their discussion, Stanger and Bates bring out a number of points that warrant our response. First, they point out that the decentralization scenario that our paper briefly introduces is an uncertain one. Surely any scenario of future conditions is inherently uncertain; all that we claim, and the discussants do point this out, is that from our viewpoint it is a most likely scenario. The basis for making this assertion is not detailed in this paper simply because it was explicitly explained and justified in a prior paper (1). The scenario is not ours alone, however; for example, it has been stated in similar terms by former President Carter's Commission for a National Agenda for the Eighties and has been verified by various census reports. Although we accept the fact that less likely factors can alter the scenario to a small or large degree, we cannot adequately respond to the discussants' view that long-term decentralization "is not so inevitable", since they do not identify the energy, fiscal, and economic constraints that they feel are more likely.

Second, our finding that the relative resurgence of CBDs is not a recentralization signal is simply that--a finding that is discussed in the paper. Although we acknowledge the office building boom in CBD areas, we point out that employment growth has not kept pace (and indeed has declined in some settings) and that building activity and employment growth elsewhere in the less-dense sections of urban areas continue unabated.

Third, our statement about nodal development is not intended to reject it outright as a worthwhile land use policy but to point out that, since it operates under the same basic premise as policies to strengthen the CBD and curtail suburban growth, it may face the same difficulties in garnering support and effectively slowing further decentralization.

Fourth, it is true that in the past rail transit has promoted centralization, but this was at a time when public transportation was the only means of intraurban travel. Today's growing (e.g., San Jose and Tampa) and maturing (e.g., Atlanta) urban areas have been shaped in large part by automobile accessibility. As long as such travel means remain available, there is no reason to state, as the discussants do, that federal policies could logically lead to recentralization. A major purpose of our paper is in fact to show that local land use policies, and not federally financed public transportation programs, are the key to managing decentralizing growth.

Finally, the discussants state that our paper has ignored transit operating strategies. On the contrary, we have pointed out that

1. Bus operations can be geared toward serving low-density travel patterns better (as the discussants reiterate), but in practice this is rarely done, and
2. Paratransit operations must be implemented in a careful and thoughtful manner in order to operate effectively in an automobile-dominated setting.

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