tities in project development, such as Gallery Place in Philadelphia. I said earlier that urban development is a matter of self-fulfilling prophesies. Nowhere is this more true than in projects closely related to transit development. Deliberate initiatives have to be taken by the responsible public agencies to make such development a reality. The Gallery Place project resulted from a public agency, in this case the redevelopment agency, pursuing the goal of joint development with great skill and considerable risk taking. The rewards have been commensurate. The Philadelphia agency realized that center city development can no longer be done under the old rules of urban renewal. It is necessary to be much more creative in the use of public funds. Joint public and private partnerships call for the use of a wide array of organizational relationships and financial arrangements. In all of them, the public agency must be capable of acting as a business partner, sometimes even an equity partner.

Unfortunately there are not many public agencies capable of negotiating complicated development deals. Often, transit operating agencies either lack the authority to act as full partners in joint development deals or they lack the staff capacity to participate. Either this situation will have to be changed or the transit agencies will have to align themselves with agencies that can perform a development function. In many cities this means creating a new public development agency and, in turn, obtaining the necessary state enabling legislation. I do not deny that it will take some time before all our cities are equipped to deal with the new realities of center city development. The least that can be done is to increase the staff competence of existing transit and local community development agencies to deal with public and private projects. A joint effort on the part of UMTA and the U.S. Department of Housing and Urban Development in connection with the implementation of the new urban development action grant program could go a long way toward increasing this capacity.

Financing is always a major challenge when it comes to development in central cities. As part of the general adjustment in institutional arrangements, provision should be made for a variety of financing options and incentives. In a transportation task force report, for example, the Urban Land Institute recommended that local authorities be authorized to insure private debentures required to carry out joint development projects. There are many other techniques such as subordinated leasing and tax abatement that should be considered for use by public agencies. They are tools that every central city is going to need to carry out development generally. People in the transit field should join with those in the housing, commercial, and industrial development fields to obtain the necessary authority and resources.

I would be remiss if I did not say something about UMTA. I am encouraged to see UMTA beginning to express a more serious interest in joint development. With the advent of the Young amendment and with its evolving interest in economic development, UMTA has a chance to make a positive contribution to the land use side of the transit equation. I hope UMTA does not approach the issue too timidly. It must quickly get up to speed on how development proceeds these days and must not impose requirements that will frustrate joint development. For example, I understand that Young amendment funds can only be received by an agency with transit operational responsibilities. If this is true, there are going to be problems in areas where the operating agency has neither the power nor capacity to act in the fashion I suggest is necessary. UMTA should make sure that the local public agency responsible for joint development is fully competent to do the job, but, once that competency is established, the agency should be given wide discretion in the uses to which funds may be applied.

SUMMARY

I believe that public transportation, particularly fixed guideway systems, has a very bright future and a very important role to play in the evolving revitalization of our central cities. However, the secret to the success of transit and of central cities will be the careful coordination of transit services with the dynamics of the urban development process. We must build on economic strength. Deliberate steps must be taken to revise the transportation planning and implementation processes to ensure that transit can perform an economic development mission. Public transit investments must be used to provide leverage for private investments. This can be accomplished best by involving the private sector in the planning process from the beginning. Together and in concert with many other interests we shall be able to bring vitality to cities and provide a better living and working environment for all.

Land Use and Transportation in an Energy Efficient Society

Milton Pikarsky, Regional Transportation Authority, Chicago

Most people are aware of the close relationship between land use and transportation. However, little is known of how to apply this conceptual knowledge in achieving the goal of a mobile and energy efficient region and nation. Despite the research studies and publicity to the contrary, transit can be an energy saver; energy savings can be an argument for transit. The comparison should not be made simply between a bus and a van pool or between a streetcar and a heavy-rail vehicle but between transit-oriented environments and automobile-oriented environments.

I would like to examine some of the achievements of the Regional Transportation Authority (RTA) of Northeastern Illinois and some of the new and important research that has been undertaken giving us vital new insights about public transportation's role in conserving this nation's precious and dwindling energy resources.

In the 3 years that the RTA has been in existence, a great deal has been accomplished. Five of the region's commuter railroads are now operating under purchase-of-service agreements with the RTA. Secretary of

Transportation Brock Adams has called these agreements "models for future negotiations throughout the nation." Rail fares have been standardized. Hundreds of millions of dollars have been spent for improvement of track and purchase of new rolling stock for commuter rail lines throughout the region, and millions more have been earmarked for continued upgrading of our commuter rail network. Recently, RTA has taken delivery of the first of 28 new locomotives that will be serving our area on the Chicago, Rock Island, and Pacific Railroad Company; the Chicago, Milwaukee, St. Paul, and Pacific Railroad Company; and the Chicago and North Western Transportation Company. RTA also acquired 50 new commuter coaches this fiscal year to replace antiquated equipment.

Surface bus systems have been markedly improved since RTA began operations. RTA subsidizes 24 bus companies, including the Chicago Transit Authority (CTA), for 100 percent of their operating losses. A universal transfer and a regional fare structure have been established for all bus companies. These innovations allow a passenger to travel throughout the region, transferring on or off any RTA bus, for a maximum trip cost of 60 cents. Half-fare and priority seating programs for senior citizens and handicapped persons are in effect on all RTA-funded carriers. More than 100 000 RTA Special User Travel Cards have been issued to date.

In the suburbs lacking service, RTA has established more than 40 new bus routes; 39 others have been modified and improved. By the end of this fiscal year more than 470 new buses will have been added to our system, including 20 buses specially equipped for handicapped passengers.

These are but a few of the highlights of the work we have been doing during the past 36 months. But how do these achievements truly relate to the pressing problems that face northeastern Illinois and other regions across the nation? The vitality of public transportation may have a much greater bearing on our economic and energy future than previously calculated. According to the most recent studies, public transportation may in fact be one of the keys to the continuing economic prosperity and well-being of the entire nation. The interrelationship of public transportation, land use, and energy consumption is undeniable. What are only now being analyzed and understood are the scope and importance of the relationship of these variables.

Everyone at this conference is aware of the close relationship between land use and transportation. It is, after all, the theme of this meeting. However, we are less aware of how to take and apply this conceptual knowledge in achieving our goal of a mobile and energy efficient region and nation. Energy conservation is one of our most important aims and an issue I would like to address relative to transportation and land use policies. I especially want to emphasize some conclusions being drawn from new information on local transportation energy use and what this means in terms of what we ought to do within the time limits placed on our region and nation by the energy crisis.

Transportation and land use planners agree that a skyscraper such as the Sears Tower, employing 18 000 people, is feasible only in a region with some form of rapid transit available. The kind of access needed for such a building cannot effectively be provided by the automobile alone. Conversely, rapid transit is only feasible if some type of strong central focus such as a large central business district exists. Chicago's Loop has about 465 hm^2 (50 million ft^2) of office space.

Of course, if rapid transit becomes available in a city center, the land itself becomes more valuable and has greater loan potential. Bankers know this; property along a rapid rail route, providing almost unlimited access, has more value than similar properties along a highway where automobile access is limited even when very large parking lots are provided. The BART system in San Francisco was built to revitalize downtown San Francisco. BART added 191 hm^2 (20.6 million ft^2) to the central business district of that city. Similarly, a new rapid transit system is under construction in Atlanta. When construction began 2 years ago, only $50 million in new offices and industrial building was under way; it soon boomed to over $300 million as a result of the anticipated transit system that will begin operation in December 1978. We believe that a similar building spurt will materialize in the Chicago area when portions of the old elevated come down and the new subway and O'Hare Extension begin. The O'Hare Rapid Transit Extension, which is expected to be completed within 30 to 36 months, will cover a distance of only 13 km (8 miles) from the airport to the CTA Jefferson Park Terminal but will serve as the connecting link between the airport, Chicago City Center, and the entire CTA rapid transit and surface systems. By merely extending one fixed-rail system by a few kilometers, the mobility of an entire area is improved. The O'Hare Extension will serve not only air travelers but also thousands of airport workers and employees in the hotel, commercial, and industrial areas near the airport. It is estimated that more than 36 500 riders/d will use the O'Hare Rapid Transit Extension. The strong interdependence between a vital central business district of a metropolis and public transportation has been known for a long time. Perhaps some of you do not know the numbers involved, but you most likely know and grasp the concept.

Similarly, most people are aware that low-density suburbs cannot be served by conventional transit. The suburban sprawl across the nation today was caused and is flourishing because of the automobile. Attention is focused on the suburbs because of the high energy use in these regions. The automobile in our society uses about half the oil we consume, and the long trips required by suburban life account for a large fraction of this. If we could cut out automobile use, we could completely eliminate all oil imports, since we import about half the oil we need. But the suburbs today could not function without the automobile.

The suburbs use additional energy in other ways. Single-family dwellings have high heat loss when compared to multiple-family dwellings or attached housing. These housing forms offer energy savings especially in their efficiency in space and water heating. Savings on the order of 50 percent are common when comparing the two kinds of housing. Fewer exterior walls and the efficiency of central heating units can be very important. Equally important is the greater efficiency of transit that such higher density housing makes feasible.

We are just now beginning to find out how energy efficient higher density regions are. We have always known that dispersed housing and job sites were not very efficient, but we are just now learning in a very specific way what a tremendous difference it can make if housing is better organized and properly integrated with transit.

Most people—land use planners, transportation planners, college professors, public officials, or the average citizen—can see that coordinated transit and housing development can be highly energy efficient. Most people would agree, however, that operating policies to stimulate this kind of transit-land use interaction do not exist. What we have had since World War II is a system where developers chose their development sites based primarily on optimizing profits. Very often these sites, which are often on the least expensive land, turn out to be areas having no transit or public utilities. As a result, many developers looked to the central urban area to make up for whatever deficiencies existed in a new community.

Cities provided schools, utilities, improved highway access, sewers, reliable water supplies, governmental services, public transportation facilities, and many other elements that go into making a community a decent place to live. This was done even though the cost was, and is, an ever-increasing burden that ultimately falls on the taxpayer. It is also very energy inefficient.

To achieve a workable and effective joint land use and transportation policy, however, requires an irrevocable commitment to high-quality public transit facilities. That must really come first, and RTA has taken the initial major steps in developing plans for a comprehensive public transportation network. The second step must be the decision to support the transit development by coordinated land use policies.

The BART system is a good example of where this interrelationship broke down. BART is one of the most beautiful systems in the world and was constructed to serve suburban areas. Nonetheless, in most cases the commitment to build higher density housing forms near the terminals was not carried out. In some cases, the communities involved actively opposed higher density and more efficient construction. The new Metro system in Washington, D.C., is facing some of the same problems in certain suburban regions. There has to be some relation between the issuing of building construction permits and the transit investment. In a new system in the final planning stages in Detroit, the federal government has insisted on an agreement with the city that new building permits must be for land along chosen transit corridors. That kind of coordinated policy must be developed everywhere if we are to make any headway on the low-density energy use problem.

So, when we talk about coordinated housing and transportation policies, we are really talking about a major change in the selection of investment priorities. The entire urban energy future rests clearly on altered public investment policies.

But policy change really only occurs during times of crisis. Though some planners and public officials saw the need for an areawide public transportation system in northeastern Illinois, most saw the formation of RTA as a means of preserving existing public transportation services that were about to go bankrupt. If that happened, serious economic hardship would befall the entire region. Now it appears that an altered public investment policy coordinating transit and land use needs will come into being, not because such a change in policy is needed, but because crisis conditions have developed.

The so-called energy crisis is one such example. It is not really a crisis in the sense of being a single, unique, catastrophic event, but rather a series of ominous events and persistent, intractable problems that do not go away.

Experts have long been saying that our oil reserves could not last forever. President Jimmy Carter is not the first leader to voice concern about our waning energy reserves. In 1907, President Theodore Roosevelt said in his annual message to Congress:

> We are prone to speak of the resources of this country as inexhaustible; this is not so. The mineral wealth of the country—the coal, iron, oil, gas, and the like—does not reproduce itself and therefore is certain to be exhausted ultimately; and wastefulness in dealing with it today means that our descendents will feel the exhaustion a generation or two before they otherwise would.

I do not think that any of us would argue with this statement even though it was made 70 years ago.

In earlier days wood was the source of energy and it was renewable. We could always grow more trees. But oil cannot be regrown, and so we find ourselves close to running out of oil just about 100 years after it was discovered.

As our domestic supplies have dropped, imports have risen drastically due primarily to the great increase in gasoline use. Our problem is not that oil supplies in the Mideast have been depleted—there is enough there to last 50 years—but rather that the export of our investment dollars in 1977 will exceed $40 billion. It is called the most massive transfer of wealth in the western world. The growing U.S. trade deficit is causing the value of the dollar to shrink in relation to other key currencies; this in turn is causing severe pressures on our international relations and is directly related to the unemployment and inflation cycles we are experiencing today.

As a nation, we have not yet had time to adjust to what it means to have lost the power to set the price of oil. Until 1973, the United States controlled the price of oil. No matter what the crisis, the United States could outproduce anyone so that no one could ever sell higher than we did. Other countries could only sell their oil at a lower price if they wanted to market it. Thus, when Egypt took control of the Suez Canal from England in 1957, oil to Europe was cut off; the United States simply overproduced and met 90 percent of European needs without any interruption. In 1967, during the Six-Day War between Egypt and Israel, oil to Europe and other places was again cut off. Once again the United States overproduced and met the needs with no price increase. But by 1973, during the Yom Kippur War, U.S. oil production was reduced. The United States was unable to meet its own needs, much less anyone else's, and the Mideast price of oil skyrocketed. We have not been able to do anything about it but pay the tremendous oil bills to the detriment of other domestic needs. When the depth of this crisis is fully understood by both our people and legislative leaders, then change in land use and transportation policy will occur.

These concerns are particularly important as we are now entering a period of sustained urban growth due to the coming of age of persons born during the baby boom after World War II. These people have moved through our society like a platoon and, by 1981, will have reached their 20s and 30s. Planners call these years the age of household formation. Over the next 15 years this age group will place unprecedented demands on housing and municipal services, and there will be a dramatic increase in public investment required to create and service these new households.

This immediate growth period then is an opportunity to introduce new urban design to better meet the needs of the next 15 to 25 years. If we are going to do anything about building a more energy efficient society, it must be within this time period.

If regions and cities across the nation do not begin comprehensive programs of public transportation development as RTA is doing in this area, we will not have maximum influence on city form and energy use. These programs must begin at once. If not, we will lose the opportunity to change the pattern and consequences of our unavoidable urban growth. We will find ourselves in a self-fulfilling prophecy of high energy consumption and a declining economy.

Consequently, it is of critical importance that we gear up at once for a determined effort. One of the factors that has delayed progress is the misunderstanding about some of the relationships between housing and transit in terms of energy conservation. Until very recently, there has not been any disaggregate data to understand the relationships involved. But from what is available now, we can begin to see what most people instinctively know: Transit, especially electric rail service, is highly efficient and plays an important

role in community energy use.

In the past, planners had to make do with knowing about the fuel efficiency of a bus or train compared with that of an automobile. By making some guess on passenger loading, they computed a theoretical efficiency that they hoped had some relation to the actual energy use of the community as a whole. What does this theoretical efficiency have to do with the real efficiency? As we are finding out now, not very much. This kind of theoretical calculation fails because it does not take into account the most important happening, namely, the feedback effect of transit in reducing automobile use. The overall amount of gasoline saved by communities that have transit compared with those that do not have adequate transit is striking, and it comes from measurement of actual gasoline sales in those cities, not from theoretical computations.

Measurements of real efficiencies show the value of existing transit systems in conserving energy to be much greater than originally supposed. This confirms what most of us working in transit already knew.

Some of you may have heard on national television and read in the newspapers about the new report from the Congressional Budget Office claiming that, when the energy involved in getting to the transit station was included, it would have been better to put people in a car pool or other transit mode. Theoretical studies such as this use many assumptions and small changes can make a big difference in the results. It is not surprising then that the results do not reflect what actually happens in a community.

A community with transit behaves differently from communities without transit. Housing is more dense, employment and shopping sites are better organized, and the automobile is not used in the same way as when rapid transit is not available. The result is that the total gasoline sales in such regions are far less than if transit were not available. No theoretical calculation could hope to account for all these variables. It is understandable then that the theoretical computation is in error. This situation is best illustrated by considering a typical theoretical comparison between an automobile and a bus. At rush hour, the standard 50-passenger bus, operating under express conditions, is highly energy efficient. Every day, buses on Chicago's Lake Shore Drive carry 70 passengers each. At 2.4 km/L (6 miles/gal) that is 168 passenger km/L (420 passenger miles/gal). An automobile carrying only a driver, which is the case about 75 percent of the time, will get at most 8 km/L (20 miles/gal). Of course, the bus has to make the return trip, so the average for the bus may drop to as low as 80 passenger km/L (200 passenger miles/gal). Further, on crowded streets the bus fuel consumption will increase, giving a lower efficiency of 1.6 km/L (4 miles/gal). Efficiency depends heavily on the number of bus passengers. According to theoretical comparisons, the average city bus must have at least five passengers to be as efficient as a driver-alone compact automobile. If the bus has fewer than five people or an express bus fewer than three people, then the compact automobile would be more efficient.

The obvious conclusion of this type of analysis is that, if bus ridership drops below these values, bus service should be curtailed then in the interest of conserving energy. However, that would be wrong. All theoretical computations of this type assume that the distance traveled is the same for the bus passenger and the automobile owner. Actually, passenger kilometers per liter is not the correct variable. What should be compared is the total gasoline per week used by the individual.

Discretionary driving for automobile owners is about one-half of total driving. This is true whether the family has one or two automobiles. If the individual has the opportunity for discretionary travel, it will amount to about 10 560 km/year (6600 miles/year), or about 34 L/week (8.5 gal/week). In contrast, the individual who uses bus service will travel for nonwork purposes only once or twice a week, or at most 20.8 km/week (13 miles/week). Even if this person is the only person on the bus, travel will still only account for about 12 L of gas/week (3 gal/week), or about one-third of the gasoline used by the individual who has an automobile available for discretionary use and who makes more trips.

The car pool or van pool rider provides a different kind of example. Such a person may be reluctant to rely completely on the ride pool unless some type of transit is in operation to be used as an alternative, if for some reason the rider misses the pool on a given occasion. Thus, nonrush-hour train service with satellite feeder buses encourages car pool and van pool usage. In some cases, nonrush-hour transit service makes it feasible for a family to eliminate the second automobile.

What, then, is the true efficiency of after-hours transit service? Clearly, it is higher than that calculated on the basis of ridership figures alone. This energy saving should then show up in total energy use within the community. Such thinking is so new, however, that data on actual energy use in the region are difficult to obtain. For example, gasoline consumption and sales figures are traditionally reported by states and are not broken down on a city or regional level. Many cities do not know how many registered drivers they have, as this information is kept primarily on a state level. Today, the analyst wishing to show that cities with transit use less gas than cities without has difficulty in locating and collecting the relevant data.

With diligence, some of these much needed sales data were obtained. Manhattan, for example, uses about 17.6 L/driver/week (4.4 gal/driver/week). It is important to note that the figures are per driver, not per person. Clearly, many people in cities do not have automobiles because they use transit. In New York or Chicago, places where large percentages of people do not have automobiles, gasoline consumption per person is much lower than the national average.

It is more realistic and objective to look at gasoline consumption per driver. For example, Chicago drivers use only about 28 L of gas/week (7 gal/week). For the entire city of New York, the average is around 39.2 L/week (9.8 gal/week)—much lower than the 58.8 L/week (14.7 gal/week) national average. Washington, D.C., which had only a good bus system when these data were taken, has a low consumption rate also. It will be interesting to see what effect the new Metro system has on these values. Washington drivers use only 32.8 L/week (8.2 gal/week). Other cities, such as Seattle, Los Angeles, Tucson, and Houston, are almost completely dependent on the automobile and so are closer to the national average. Many suburban areas such as Bridgeport, Connecticut, are well above the average.

The weekly gas consumption figures in the Chicago area vary almost directly with transit availability. Consumption for Cook, DuPage, Kane, Will, Lake, and McHenry counties increases as the distance from the city center grows. McHenry county, the farthest from the city, has the largest value of 60.2 L/week (15.05 gal/week), which is above the national average. The data also show that cities with transit have markedly lower consumption rates than their surrounding counties. This does not occur in cities where no transit or limited service exists.

There are many reasons why a central city will have lower gas consumption. Many older cities were built around streetcar routes. While they were never as dense as foreign cities that were initially pedestrian cities,

these streetcar cities were expanded by transit. Therefore, they are reasonably efficient and dense. Cities tend to have shorter trip lengths and lower gas use. It is very common in the suburbs to drive 3.2 km (2 miles) for a loaf of bread, but not in Chicago. On the other hand, work trips in Chicago tend to be very long. The national average is 16.3 km/trip (10.2 miles/trip). Chicago's average work trip is believed to be 12.8 to 16 km (8 to 10 miles). San Francisco, Los Angeles, and New York City work-trip distances tend to be much higher than other cities. Based on these considerations, it is not quite clear how much these other characteristics of cities affect the meaning of the numbers. There are not enough detailed data as yet to compare, for example, gas sales in areas of similar density and structure where one region has transit and the other does not. There is no indication either as to what the threshold of transit is, that is, how many buses should be on the street to inhibit traffic and reduce automobile trips. There are many missing pieces to the puzzle, and the rough data offer only clues.

Consequently, it is well to look to other sources of disaggregate data such as the census. For example, the 1970 census does contain specific journey-to-work data that at least permit work trips to be analyzed in detail.

Siim Soot has been studying much of this census material at the University of Illinois under a federal grant. In analyzing the energy spent in the journey-to-work trip, he found detailed support for the conclusions drawn from the gasoline sales data. Patterns of journey-to-work energy use were mapped and interpreted. Mapping showed that increasing amounts of energy are used for work trips in the Chicago area as the distance from the city increases. A distinct and unusual fingerlike pattern emerged when energy consumption was mapped. These finger patterns turned out to be the RTA commuter rail network.

A map of those taking transit to work had a pattern almost identical to that of the energy map: the same fingerlike patterns corresponded to the commuter rail lines.

In determining how socioeconomic factors influenced these energy patterns, it was found that multiple-automobile households correlated more closely than any of the 25 variables studied. Such households exist primarily where transit is absent. Conversely, households having no automobiles correlated second highest in low energy use. Such households exist where there is high-level transit service and, especially, rapid transit.

Aside from whether households have automobiles or not, the next five most significant factors were all density related. These included such things as the age of housing. Tenants of housing built prior to 1950, for example, show strong transit use and low energy use. This is true whether the housing is rented or owned. Renters tend to use transit and have considerably lower energy use patterns. Households with one or two members used far less energy in going to work than those with larger families. It is the medium-sized family, typically found in small suburban homes located away from rail lines, that does not use transit.

Variables associated with personal characteristics such as age, occupation, income, and educational level had weaker correlations than did the automobile or density variables. Construction workers use more energy than other groups studied. This is true probably because they drive to work as their employment sites shift. Executives and managers also had nearly as high a rate. The lowest energy users among the occupations we studied were clerical workers, who tend to live near transit and closer to their work. Heads of households aged 25 to 34 had a pattern of high energy use. These young families tend to live in areas between transit corridors on generally less expensive land parcels. These correlations were very weak, however; personal characteristics do not impact on energy use. Density and automobile use are the significant characteristics.

If we examine again households without automobiles, which had the second highest correlation with energy use, it is interesting to note that this variable has a direct relationship with that for people who take transit to work. This happens in almost all major cities, leading to the observation that cities with rapid transit automatically have higher energy efficiencies. Low-density regions do not always correlate quite as directly as might be expected, in part because certain low-density areas on commuter lines have better transit service than might normally be expected. This is true of a number of suburbs in the six-county region served by the RTA transportation network. The pull of comprehensive public transportation and a large central business district accounts for this efficiency. Thus, a centralized and strong central business district is a vital factor in energy efficiency.

Generally, very low-density areas, such as those having new housing for moderate-sized families with fewer than 7.5 dwellings/hm^2 (3 dwellings/acre), cannot support traditional transit service. However, special transit services such as van pools can be effective if there are centralized job sites. When the number of dwellings rises to 17.5/hm^2 (7/acre)—the typical single family residence on 18- by 30-m (60- by 100-ft) lots—then traditional transit service such as half-hourly bus service appears feasible. Special rush-hour buses or paratransit modes also can be effective at this density.

When density reaches levels found with single-family houses on 9- by 30-m (30- by 100-ft) lots, such as those found in communities like Wilmette, Illinois, then these areas qualify for more frequent bus service and possibly light rail. This is particularly true when a community like Wilmette is part of a corridor leading to a central business district. When housing is attached, with about 62/hm^2 (25/acre), then a wide array of transit is feasible. Apartment units together with lower density housing also qualify for frequent service. However, even high-rise apartment houses, which are isolated from other housing and are not on a rail corridor, cannot support conventional transit. High-density areas such as the inner-city Chicago region with 33 000 people/km^2 (100 000/mile^2) can support almost any type of transit service. Very high densities always discourage automobile use and encourage transit, thus conserving energy.

It must be emphasized that we do not anticipate the permanent separation of the average American from the automobile—at least not in this century. The automobile in our culture does much more than provide mere transportation. If the advertisements are to be believed, the automobile is not so much for getting us around as it is for satisfying certain cultural and emotional needs. For some, the automobile is an outlet for hostility and tension, for others it represents a fantasy love life. Advertisements speak of the power of putting a tiger in your tank, of luxury and prestige, of happy romantic couples. Humorists have observed these absurdities in our culture for a long time. For the transportation and land use planner, the automobile is a kind of X-factor. It is an unseen part of the charts, maps, and diagrams that we have just been discussing. Time and continued work will help to clarify the role of the automobile in land use and energy consumption, but its impact is undeniable.

These are just some of the things RTA is learning and documenting about how we live and what trade-offs we have to be willing to make. Much of the information that I have discussed reflects what is already known within

the transit community—what kinds of people use transit, where they live, where they are going. These data have guided the RTA since its inception. But we need to know much more about such things to enable RTA and other transportation agencies to serve the people who do not yet use transit. It is especially important if we hope to change future urban growth patterns.

Perhaps the most significant thing we are learning is how important transit is in saving energy, even when much of the community may not use it. Good public transit decreases automobile use and changes mobility patterns. At RTA we are seeing that transit can and does make a difference—a far greater difference than was thought previously.

All of us at this conference have a special, vested interest and responsibility in working together to communicate more effectively to the public that support for strong public transportation throughout the nation is synonymous with building a brighter and more prosperous future.

Transportation Programs and Investments to Deal With Critical Needs

Philip Hammer, Hammer, Siler, George Associates, Washington, D.C.

Revitalization of the inner city—or perhaps of the older city—is the most critical economic need that faces us today. We are not going to solve that problem by dreaming up some program and imposing it from the top. Rather, we need programs that will respond to and will encourage local initiative; the stimulus for improving the economy must come from the bottom. What is needed is flexible joint development. While the money may come from the top, work with local government and with private investors in realizing whatever potentials may exist at local levels is also necessary.

We are at another of those turning points in national policy making where issues are discussed in concrete terms. Many at this conference have been in the field of land use and transportation for many years. Some time ago, we were talking about regional land use and transportation planning and joint development opportunities at expressway interchanges. The new life was on the way; we were going to build a new America in the suburbs.

In those discussions and in the planning and implementation that followed, all of us omitted a very important factor. It was the existence of the arbitrary boundary line that set off the central city from the rest of the metropolitan region. We discussed regional planning as if the central city did not exist. The city limits lines were deleted from the maps. We never showed where the city ended and the suburbs began. For highway and expressway planning, it did not seem to make much difference.

The fact is that the existence of the arbitrary boundary line that separates the central city from the rest of the region is the most important single fact in our domestic polity today. I think it has been proved in the last 20 years that our inability and incapacity within the central city area to maintain both private and public institutions for dealing with the central economy within that boundary line has been at the heart and source of most of what is called the urban problem. Most of the nation's unemployed are within that boundary line; most of the nation's new job creation and new investment are taking place outside that boundary line.

INSTITUTIONAL CRISIS

We have, in effect, an institutional crisis. I think we are now aware—probably for the first time and with a willingness to recognize it—that we are going to have to deal with the urban problem more specifically as the city problem within the framework of the municipal corporation. We are going to have to think in terms of the pressure that the municipal corporation can exert on the economy within the city limits, if indeed we are to get any answers to our urban problem.

This is not to say, of course, that there is not a regional framework or that we should not continue to pursue regional approaches and get regional cooperation and coordination. But until and unless we can develop the muscle in city hall that is capable of using private investments as leverage within that boundary line, we are going to continue to throw public money down the drain. We will continue to have large "backwater" economies within our central cities. We will continue to have underutilized and unused resources in our cities—people, land, and buildings. We will not be able to make any fundamental gains in dealing with the urban problem. I am not minimizing the fact that we also have problems in the suburbs nor am I minimizing the importance of a regional context for our overall planning. I am simply saying that the most important need is to strengthen the economy of the city, and this can be done only by strengthening the capacities of the municipal government in the area of economic development.

The present administration is now beginning to put together an urban program that promises to deal more realistically with the problems and that highlights the decisive importance of the city as an institution. The leadership is talking about economic development within the city, of using public money as a leverage against private reinvestment within the city, and of the capabilities of municipal corporations. For the first time, Washington is talking realistically about how to deal with gut issues at the local level.

We see this in the new definitions and regulations related to urban development action grants (UDAGs), to the deployment of community development block grant funds for economic development, and to the new urban thrust of the Economic Development Administration (EDA). We see it in the new guidelines that the Urban Mass Transportation Administration (UMTA) is talking about regarding the use of Young amendment money in transit development. All of these are related to economic development with a primary emphasis on the city and its economy.