The Impact of the Car on American Urban Form

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American City Ideals

It seems curious to me that when architects, and their students talk about cities they assume either European cities like London, Paris, or Rome or major American cities like New York, Chicago, Boston, or San Francisco. All of these examples are dense, highly urban cities which were laid out and developed prior to the turn of the 20th Century. When suburbs or modern cities, cities which have matured since the turn of the century, are mentioned they develop strange facial expressions and pretend they did not hear. If they do address the comment it's a condemnation of them for their sprawl and conformity.

If we look more open-mindedly at the newer American cities we live in, or note the popularity of the suburban house, or accept the fact that we seem to have chosen, and not been coerced, into living in the suburban environment, we might realize that the more open American cities or suburban additions are our environment of choice. Based on the shear number of examples of nonurban living situations or less dense building environments it would seem that we, as architects and urban designers, would be wise to take a more serious look at the modern American urban landscape and its evolution.

I would argue that the form of our city centers and their suburban edges are a direct result of our search for an ideal city form and that the evolution of modern transportation systems has supported that search and has been a major con-tributor to transforming the old city into its newer more idealized form. I would also suggest that the modern American urban landscape is a better match with the mass idea of how we should live than are the European cities which we as Architects hold in high esteem.

It is safe to say that America was founded by men who were seeking an urban environment which was an improvement over the European cities they were leaving. Those men felt the density of European cities created an environment which was unhealthy, intrusive, and at times, dangerous. The fundamental ideals brought by planners as they laid out cities on this continent, and carried by settlers as they developed them, were first, an appreciation for nature as "good, clean, and pure" and a means for accessing a more wholesome life, and second, a strong desire for independence and personal identity and expression. These two ideals underlie what I see as the fundamental differences between the old and new cities.[1]

The old cities, represented most clearly by European examples, are essentially continuous mats of buildings from which streets and squares have been carved (Fig. 1). Public buildings exist within this fabric as set pieces or monuments, but most buildings appear to be as concerned with maintaining the continuity of the street edge and public order of the city as they are in providing an expression of the individual building and its private owner.

Fig.1 Florence, Italy - A continuous mat of buildings from which streets have been carved.

Modern cities, represented most clearly by American cities which have matured since the turn of the century, are essentially an open plain onto which free-standing buildings have been placed (Fig. 2). Although there are examples of a willingness to conform in the modern city, it is more common to see even dense urban areas as closely packed individual buildings rather than uniform collections of similar ones.

Public Space Types in the Modern City

While the old city, a city-of-walls, has been examined and its public space types identified[2], the modern city, a city-of-objects, has been generally ignored. In an effort to understand the spatial order of the modern city I began an analysis of the archetypal American city-of-objects, the small town. That analysis identified 5 space types which could be used to describe most American cities. Those space types are: Court House Square, Main Street, Church Street, Elm Street, and the Strip.

Court House Square is like a European square except it is planted and has a civic building or monument prominently located within its boundaries or spatially linked to it. The second type, Main Street, has many of the same characteristics as the European city streets, it is a linear space with its edges clearly defined by continuous walls of buildings. Church Street, the third type, makes the street space by the orientation and alignment of the basic building forms and by minor additions to those forms which strengthen the relationship between the buildings and clarify the public
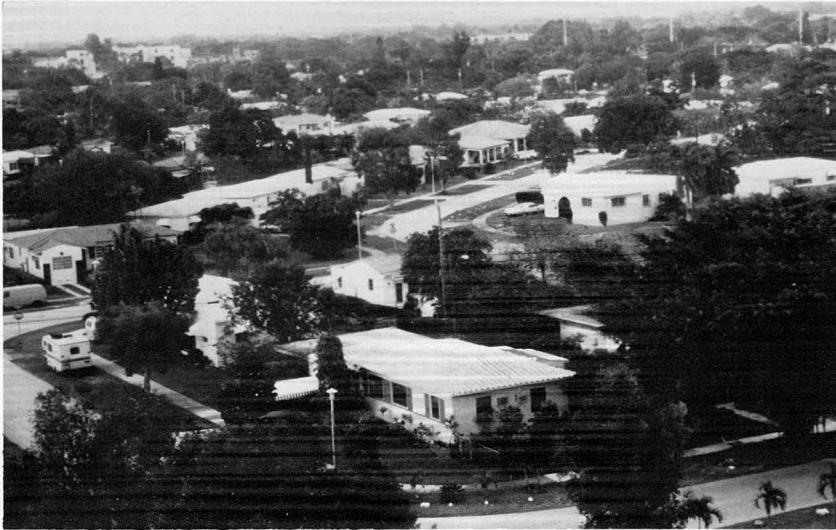
Fig. 2 Coral Gables, Florida - Free-standing buildings on an open plain.

space. The Elm Street space type makes the street space coherent through the use of a set of entourage elements, such as trees, which are not attached to the buildings at all. The spatial clarity of this entourage is great enough to define the street, independent of the free-standing buildings beyond. In the last of the space types, the Strip, the individual buildings are more concerned with their individuality than the collective public or urban space of the street. In this type, minor building additions and entourage elements are used to separate the buildings rather than create a collective identity.

With these five space types in mind we can describe most American cities. One of the surprises of such an analysis showed that even the most dense of the American cities, New York City, is a city of Church Streets rather than Main Streets. That is the urban space of the streets in New York are formed, not with a set of uniform buildings but with a set of free-standing tower buildings which were changed slightly at their bases. These modifications to the bases allowed the street space to be formed at the same time the individuality in the tower was retained. With this in mind, New York and most modern cities would be categorized as a city of Church Streets while Rome and the older city centers of Europe would be categorized as city of Main Streets.

The last three of the space types are particularly well adapted to creating cities which are consistent with the desire to create environments which celebrate the individual at the same time that they maintain a general public order. It is not surprising that the modern American city is made up primarily of these types. It is disappointing, and may help to explain the general lack of coherence of the modern city, that the most frequently used space type is the Strip.

While designing free-standing buildings is one way to create independence and freedom of expression, another is to surround the building with nature. The natural surroundings also address the other of the American ideals, our desire to be close to nature. That desire can be traced back to our English roots. The English sought an environment which could provide "a half acre and a cow" for all its population and that idea seems to have been translated to the surburban developers of today. It is fortunate that the green which is added to the free-standing houses in most surburban developments also helps to transform what could be large areas of strip streets into spaces which have some of the characteristics of the Elm Street type. The collection of landscape elements which surround each house also fill in the space between houses so that a spatial continuity is created.

Our more dense urban areas also introduce natural elements into their fabric. Although these areas are often too densely developed to allow large areas of nature throughout, even the most dense have created opportunities for at least symbolic natural landscapes. Historically these were relatively large symbolic landscapes beginning with the commons. Later they became cemeteries, and then central parks and gardens. Today they are often atriums in the large buildings or planting areas in the lobbies or entries of the smaller ones. All these areas are intended as natural relief from the pressures and hostilities of the city.

Central City

With the above as a foundation for understanding the basic vocabulary of the city we can now go on to examine its general form and order to try to understand the basic forces which influenced it in an effort to establish a theory which explains its current condition. Although it is dangerous to base a theory of urban growth on research on a single city, I believe there is enough consistency between the specific findings of my current research into the growth of Gainesville, Florida and my observations, work, and readings about other cities to allow me to take the risk. If nothing else, this article can provide a forum for more discussion which may shed new light on the subject and help to develop the next generation of theory.

Gainesville was founded in the middle of the last century, but remained very small until relatively recently. At the turn of the century its population remained at about 5,000. With the introduction of the University of Florida in 1905 and the general growth of the state in recent years it has grown to about 120,000 people including 30,000 students. The University remains a major force in the town with the majority of the population directly associated with its students, staff, or faculty or derives income from members of one of those populations.

Gainesville was selected for research focusing on the growth and change in the form of the modern city in part because it was convenient, but more importantly because most of its growth has occurred since the advent of the automobile. I believed, as I began my research, that transportation and even more so the automobile would have a major impact on the city's form and that changes which resulted from that impact would provide insights into the current form of the American urban landscape.

In many respects the mall brings us full circle to the old downtown. In the mall a series of stores and other activities are located along a "public" way similar to that of the old downtown. In Gainesville the overall dimensions of the mall are about the same as that of the old downtown. That is, the distance between anchor stores is about the same as the distance from one end to the other of the old active downtown. Although it came as a surprise when I first saw that, it should not have since pedestrians are still pedestrians and their rate of travel and the extent of area they are willing to cover is about the same whether they arrive by car or horseback.

The nature of detail and space definition in the old Main Street and inside the new mall are very similar in many ways. In both, stores are narrow and deep, signs are relatively small and advertising is likely to be in handbills or other small signs easily read by pedestrians. The pedestrian activities are enhanced by seating areas and plantings and in some of the newer circulation creating an opportunity for a promenade similar to the old downtown.

The mall was located at the most important intersection at the perimeter of town (if it was not already the most important it became the most important with the arrival of the mall). Other activities followed the mall and began to consolidate at major intersections. Consolidating facilities at major intersections allowed a set of buildings offering 13
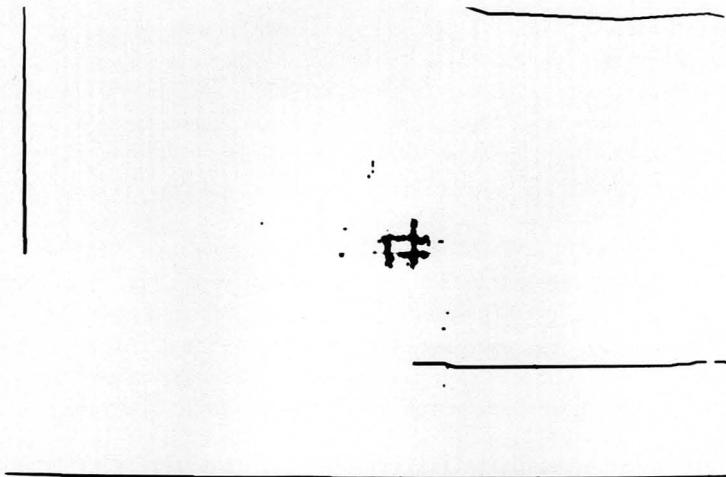
Fig. 3   Gainesville, Florida, 1908 - Central city form

Fig. 4   Gainesville, Florida, 1938 - Plaid city form

similar services to utilize common parking and other infrastructure and to minimize the conflict between traffic and adjoining residential areas.

My earlier work in older cities in the Northeast and Midwest verified that transportation provided the basic location and direction for a city's form. Our oldest cities were initially dependent on waterbased transportation as an interface between the local environment and the world at large. As a result, cities were often founded along major bodies of water or rivers which connected to them. The form of these cities centered on the wharf and grew in concentric rings about it.

In the 1830's the natural water bodies were supplemented by canals. The canals were in turn replaced in the 1850's and 60's by the railroad. Cities which preceeded the existence of the railroad tried to draw the train as close to its center as they could so that the activities, services and people which were focused on that center could continue to be served. New cities simply replaced the wharf with the depot and followed the same concentric growth using it as the center.

Local modes of transportation were horse-driven or pedestrian with the majority, by far, pedestrian. With the local transportation being pedestrian and the desire for businesses to be located close to the inter city transportation system which could provide them with contact to the larger world, the form of the city retained its clearly central form. My mapping of activities in Gainesville at the turn of the century shows that almost any service imaginable could be found within 2 blocks of the court house square and that that square was at the physical center of the city (Fig. 3). That is, the city center was in fact that, a center to which everyone gravitated to buy and sell goods, or render and receive services.

The railroad was used primarily to connect city centers to each other but it was not long before they began to be used by people, with time and money, as a commuter line. Commuting on the train allowed people to live in the pastoral grandeur of the country and still maintain jobs or businesses in the city center. When the trolley was introduced it allowed more of the population to exit the crowded central city, creating markets for real estate development at the edge of the old city. However, because the trolley was initially used to connect new real estate at the edge of the city with old jobs and services located at the center and the commuter trains all arrived at the depot which was located near the center, both continued to support the basic central city form of the predominantly pedestrian city.
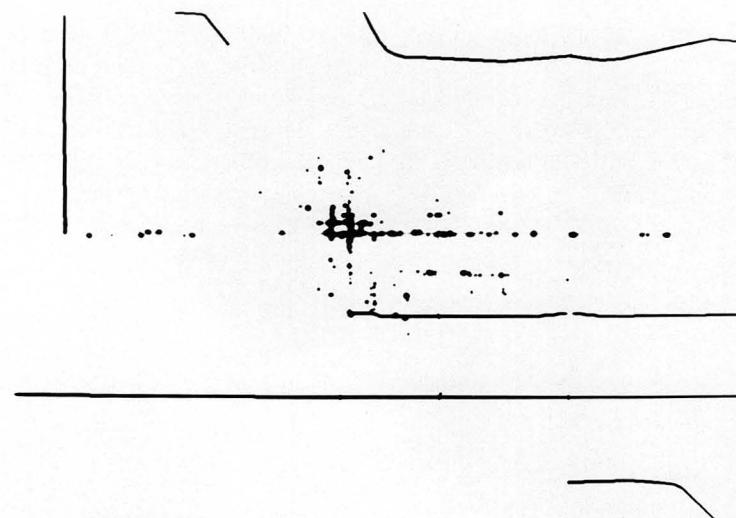
The introduction of the automobile began to change things. While the trolleys and trains concentrated activity in the center of the city, the automobile made it as easy to leave or skirt the center as to enter it. In addition, because the car was inexpensive and personal, that is it did not require major expenditures for tracks or canals, it was available to a large portion of the population. While the car was initially a novelty available to, and used by, the rich who were the only people who had the money and time for it; as the car's speed and reliability increased, and its price dropped, more people acquired them. The more people acquired cars the more people left the city center and the more impact it had on the city's form.[3]

New Functions: New Spaces

The initial impact the car had on the city's form was the result of the need for more control over traffic. Signal lights, white lines, and one-way streets were introduced to control traffic and maintain order on the streets. While the first cars may have been about the same size as a wagon, as their number increased, so did their size and demand for parking space. At first the car could simply replace the wagon in front of the store, but it was not long before that proved inadequate. Double parking and reoriented parking so that it was perpendicular to the road's edge improved the condition. But even perpendicular parking was not enough and alternative locations off the street needed to be found.

Early off-street parking was created on empty lots or was inserted where old unoccupied buildings were removed. As each building was removed for parking the clarity of the street space changed. As the dominance of the wall of buildings diminished the Main Street space began to be destroyed and the clarity of the city weakened.

The clarity of the downtown also changed as other new functions were introduced to service the car. Gasoline, initially dispensed from a pump in front of the general store, produced a new building type which provided repairs, services and gas. This new service station was a small building surrounded by parking and created still another interruption in the city's fabric. In addition, because the car needed easy access and good exposure, the service stations occurred at the most disruptive spot in the city fabric, the corner, and the city order was further diluted.

Plaid City

The wall of Main Street buildings was further eroded by the emigration of some of the functions which were traditionally located in downtown. The first emigrants

were functions which needed easy access by customers for short periods of time. These activities found that being located in a downtown congested with cars and lacking convenient parking became more of a liability than an asset. In Gainesville, the first businesses to move were grocery stores.

The grocery stores were followed by other retail outlets which moved to new locations along the major arteries which lead from the city center. These new locations were one store deep with their long dimension parallel to the street rather than perpendicular to it as was true in the old downtown. The additional width of the store provided more window area to display goods to passing cars and provided additional area for parking.

The new retail stores stretched out along the busiest streets and changed the city from the old centralized form to a plaid of retail functions woven over the residential fabric of the old city (Fig. 4). The plaid followed the routes of the state roads which ran through the center of town and along the city roads which carried the majority of local traffic.

The increase in parking allowed by the expanded width of stores along the street did not satisfy the growing need for parking. The strip shopping center became the second generation of the plaid city. In this form, the stores were moved back off the road to allow several rows of parking to occur between the street and the stores. A collection of strip shopping centers became the Miracle Mile of shopping and can be found in many cities across the country. The essential ingredients of a Miracle Mile are a strip of buildings paralleled by rows of parking and a large sign located along the street which identifies the entire strip. The Miracle Mile changed the clear definition of the public realm as presented in the old Main Street to a space defined by a series of signs which were too widely spaced and surrounded by a sea of parked cars.

Other building types in this period followed the same pattern. Motels, fast food restaurants, even professional offices and industrial buildings were set back from the highway so that parking could be located in front. A sign was erected in front of each of these buildings which visually shouted to the driver passing at 50 mph that this facility was the best, largest, or most convenient for x miles. These signs were a collection of shapes and images intended to appear "futuristic" by symbolizing speed and defying gravity. The signs were large in scale, but low enough to be seen through the windshield of a car in relatively close proximity.

Speed and the Scale of the City

Although the signs along the state highway still addressed both the high speed through traffic and the slower local traffic, they were still substantially larger than those which were the mainstay of advertising in the downtown area. The evolution of the sign from small paper advertisements on the store window or a handbill which could be nailed to a post to the billboards and elaborate signs of the state highway and Miracle Mile are indicative of the change in scale of the plaid city fabric (Fig. 5).

When the city was centralized around the courthouse and its adjacent square, the city was sized at all levels to be seen and understood by pedestrians. Signs were small and public spaces were defined and detailed by buildings and entourage elements intended to be viewed by passing pedestrians. The fact that the passing pedestrians were probably the same ones who were born down the street and had lived most of their lives walking up and down it, meant that the information and understanding of the city was very complete. The occasional visitor could be easily identified by the townfolk and any information which that stranger might need could be provided by almost anyone of them.

Fig. 5a Main Street sign

Fig. 5b State Road sign

Fig. 5c Interstate highway signs (photo by Marc Parsons)

Intercity travel by railroad was on a system which was parallel to, rather than concurrent with, local traffic. Train passengers existed in a kind of spatial limbo as they traveled between cities. When they finally arrived in town they passed through an entrance device which mediated between the speed of the train and the speed of the town and provided them information which helped them adapt to the local condition. When in Peoria the traveler was immersed in Peoria and although he was not as well informed as one of the locals, he had the same access to the information as the did locals.

Since cars initially traveled about the same speed as pedestrians and co-existed on the local street system they continued to be part of the local system and information was presented to the driver in the same way as it was presented to the pedestrian. Because the car's speed increased slowly its impact on the size and scale of local urban fabric was also slow. The plaid city evolved into a stretched out

version of the old central city with signs a little bigger and buildings a little wider.

As state highways began to bypass the city center and draw strip developments out along the edges of town, the way information was presented changed also. Signs changed from small handbills, to sequences of signs, to large signs with abbreviated versions of information, as the rate of travel increased from pedestrian to the 50 mph allowed on the state highway. The large signs increased the driver's viewing distance while the simplified information made it possible for him to comprehend and react to it without causing an accident. The increased speed was also responsible for the building actually becoming the sign during the 1950's. The most obvious was McDonald's Golden Arches, but it was also true for other fast food chains and many motels and stores. A trip down the state highway past the now probably defunct fast food stores, gas stations, and motels will illustrate this idea very clearly.

If we take time to look at downtown and the old by-pass road we can see the changes that have occurred as the car replaced pedestrians, increased speed, and the city was transformed from a central to a plaid form. Unless downtown underwent major "revitalization" in the 1960's it still has some of the public spaces defined by the buildings themselves even though there are occasional gaps for parking lots, gas stations or new drive-in banks. The signs on Main Street are still small and attached to the building so they can be read by both pedestrians and cars traveling at 35 mph or less.

The Strip makes the plaid form, but has buildings set behind rows of parking with large signs located along the road way. The signs are the system of information and become the primary space definers. The buildings are apparent as part of the spatial system, but they are so small relative to the width of the road or the space between them that they provide little material to define public space or create local identity.

It was not long before the owners of strip developments realized that the drivers they were attracting with their signs and building-boards were pedestrians when they parked their cars. As pedestrians they could not travel the Miracle Mile from one end to the other. The answer to this problem was to simply fold the strip over on itself and create the interior Mall.

Matrix City

The Mall and the consolidation of activities around it generated the next city form, the matrix. The matrix city is a series of incomplete centers located at important intersection of the grid of city streets (Fig. 6). Each of the intersections serve a specialized need and the independence and speed allowed by the car puts these specialized intersections close enough together so that they exist collectively as a city. It means that although there is no single location which can be called the city center, that is a location

which is the heart of the city and all its necessary activities are located, the collection of intersections provides all of the necessary goods and services of a city.

The strength of the matrix is also the weakness of the downtown, for it changed downtown from the obvious center of the city to just another of intersection in the matrix. The old center, because of its small scale and detail, became an obvious location for entertainment activities. Restaurants and bars located in the old stores and because of the scale of the area, are close enough together so that municipal parking lots can serve them all and patrons can wander from place to place in search of new or different crowds or activities.

The few nonentertainment activities which remain in downtown are related to the government functions which tend to stay because of their investment in buildings and because of their vested interest in the old city center. The few buildings which survived the earlier emigrations and refunctionalizations, house offices for law firms or other professionals who find the county or city courts and records important or who wish to be close to the action created by those firms.

The professional offices have a symbiotic relationship with the restaurants and entertainment facilities in the area because of their need for places for lunch and occasional important client meetings. Although most business information can be relayed by phone or FAX, it is still critical to be able to look a client or colleague in the eye while making a deal or discussing ideas, so meeting over lunch or a drink is still an important part of business. This need for direct contact justifies, supports and maintains the continuing development of the downtown as a small scale pedestrian environment. At the same time it illustrates how downtown has become just one of the specialized intersections which have developed making the modern city a matrix rather than central form.
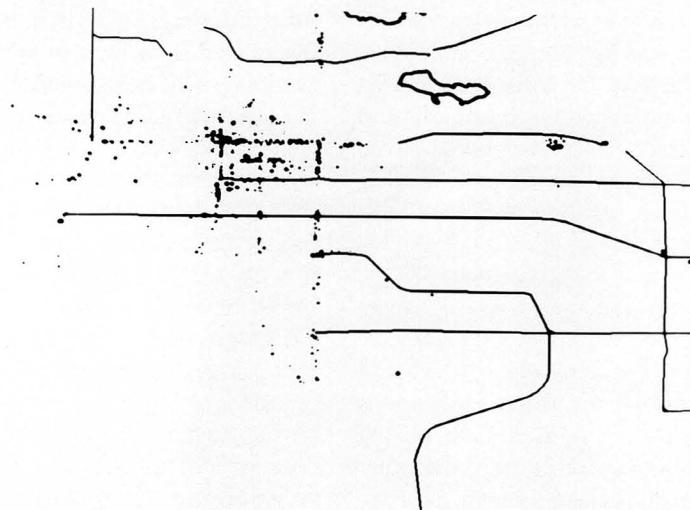

Fig. 6   Gainesville, Florida, 1968 - Matrix city form

Regional Center

In Gainesville, the city has gone a generation beyond the matrix city. The overall matrix remains local in character and serves the population of the town and near-by suburbs. One of the most important intersections in the city, at the intersection of the interstate highway and the local strip development, has taken on regional rather than just local significance and has begun to identify a new regional city.

The regional shopping mall, plus its entourage of fast food outlets, convenient marts, professional offices, and health services has begun to create a location which functionally re-establishes the idea of a downtown. But this new center is serving a regional rather than local scale. This new regional center is attracting a population from a 40-mile radius rather than the 4-mile radius which used to support downtown.

The character and scale of events in the regional city form are radically different in scale and order from those which exist at any of the other locations in town. As discussed above, the downtown was created by pedestrians for pedestrians. The scale of buildings and the size and content of signs were intended to be seen and understood by pedestrians or slow-moving traffic. The regional city center is

organized around drivers on the interstate and as a result is scaled and ordered to be seen and understood by them.

The interstate highway, like the railroad, exists in a space which is parallel to, rather than integral with, the local condition of the regional center. Like the train passengers, the drivers have the opportunity to observe the environment as they pass through and have only limited access to it. There is, however, a fundamental difference between the drivers on the interstate and the passengers on the train. While the train passengers have no control over where they are going and have predetermined when they are getting off, the drivers are responsible for both. While the train passengers change systems when they arrive at a destination and become pedestrians and members of the local community, the drivers retain their vehicles and remain isolated from the local condition while they make their decisions about where to stop.

The drivers, as a result, need to be informed as to what is available at each stop and how to arrive at particular destinations while they are still part of the parallel system. The local community must present itself in a wholly different manner to the interstate than it does to the passing train. This is accomplished by edging the interstate with giant signs posted on towers which enable the drivers

to see them for miles (even though it is still only seconds) up the road. The content of the signs are often limited to symbols or logos which requires drivers to have previous knowledge about a place from some earlier stop up the road. This reliance on past experience is needed to allow drivers to reduce anxiety about choices which they make while simultaniously monitor traffic, pilot their vehicle and make decisions about when to pull off the road for food, gas or a night's rest. With that in mind it is not surprising, and is probably best, that the regional center is populated by national brands and logos.

The disadvantage of the regional city and its national brands is that it is indifferent, and almost hostile to, the local community. Road signs which address the passing car are not appropriate for local traffic. The information and clarity of an environment intended to be observed at 65 mph does not translate to slower local traffic speeds. Signs, which are appropriate for the interstate, dominate buildings at the local level. Road widths needed to accommodate the quantity and speed of traffic on the strip are so great that a sense of space, public realm, or local identity, is impossible. In fact the environment becomes more chaotic as the intensity of oversized signs and abbreviated information spaced too far apart becomes even more exaggerated as traffic slows to local speeds. The information systems which work at interstate speeds simply fail to create a collective image for the additional exposure of slower traffic or the repeat visits of local patrons to the regional center (Fig. 7).

Although the large signs and isolated buildings best serve the population of strangers who stop at the regional city from the interstate because they allow a driver to focus on specific information and destinations they still produce chaotic and offensive environments for anyone with any spatial sensibility. The examination of space types explored earlier would suggest that either the Elm Street or Church Street types might be ap-

plied to the regional center to allow both the ordered environment desired at the local level and the discrete information needed by drivers from the interstate. If nothing else, a transition space might be created which recognizes the transformation of the drivers' needs as they change from interstate to local highway to pedestrian speeds as they enter the regional center and arrive at their destination.

Developing the mechanism needed to deal with the interface between the different scales in the regional center is a task which we as designers must take on. Although this article would suggest that the regional city and its collection of freestanding buildings and green appointments are a natural outcome of the American urban landscape and the modern city it does not deny our responsibility as designers to improve the condition.

Conclusions

The car began as a local transportation device. Its speed, however, evolved from one which was compatible with the pedestrians to one which is now hostile to them. The changes which have occurred to the city as it evolved in response to the automobile occurred not only in the rate of travel and the direct physical danger of the car. Changes also include modifications to the scale of the city which make it more comfortable for drivers and the resulting damage it has wrought to the local pedestrian world.

The environment of downtown was, and still remains, pedestrian, but an examination of the evolution of the city shows the order and spatial definition of the whole city has changed. The old central city became a plaid city as activities followed the cars along state roads. It then reformed into a series of major intersections creating a matrix city. It now seems to be transforming again as one of the intersections is beginning to take on the identity of regional center. This new regional center at the intersection of the strip and

Fig. 7   The visual chaos of the regional city. (photo by Marc Parsons)

the interstate has evolved in response to the specific needs of the high speed traveler and in doing so has lost its relationship with the local and slow speed traveler.

The new matrix city and regional center both consist of object buildings, large signs, and occasional green spaces, and are the logical outcome of the evolution of the modern city and is probably more compatible with our current needs than the romanticized versions of European cities which we as architects, planners, and designers carry around. While the physical vocabulary of the old city is not appropriate for the needs of the new modern city the American small town does provide examples of a physical environment which has local identity, free-standing buildings and a clear spatial order. The space types identified in the small town might provide the vocabulary for future work in the regional center.

It is now time to take a more careful look at what the modern American city is and what it really wants to, or can be. The new form needs to accept the car, the freestanding building, and the desire for contact with nature which are our fundamental desires and are at the modern city's root. But what currently exists is not acceptable, and what might be, is being avoided by the architects, planners, and designers who are best qualified to

generate it. Beginning the search for what might be is the basis from which this article started and it is to that end which I am now focused.

END NOTES

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