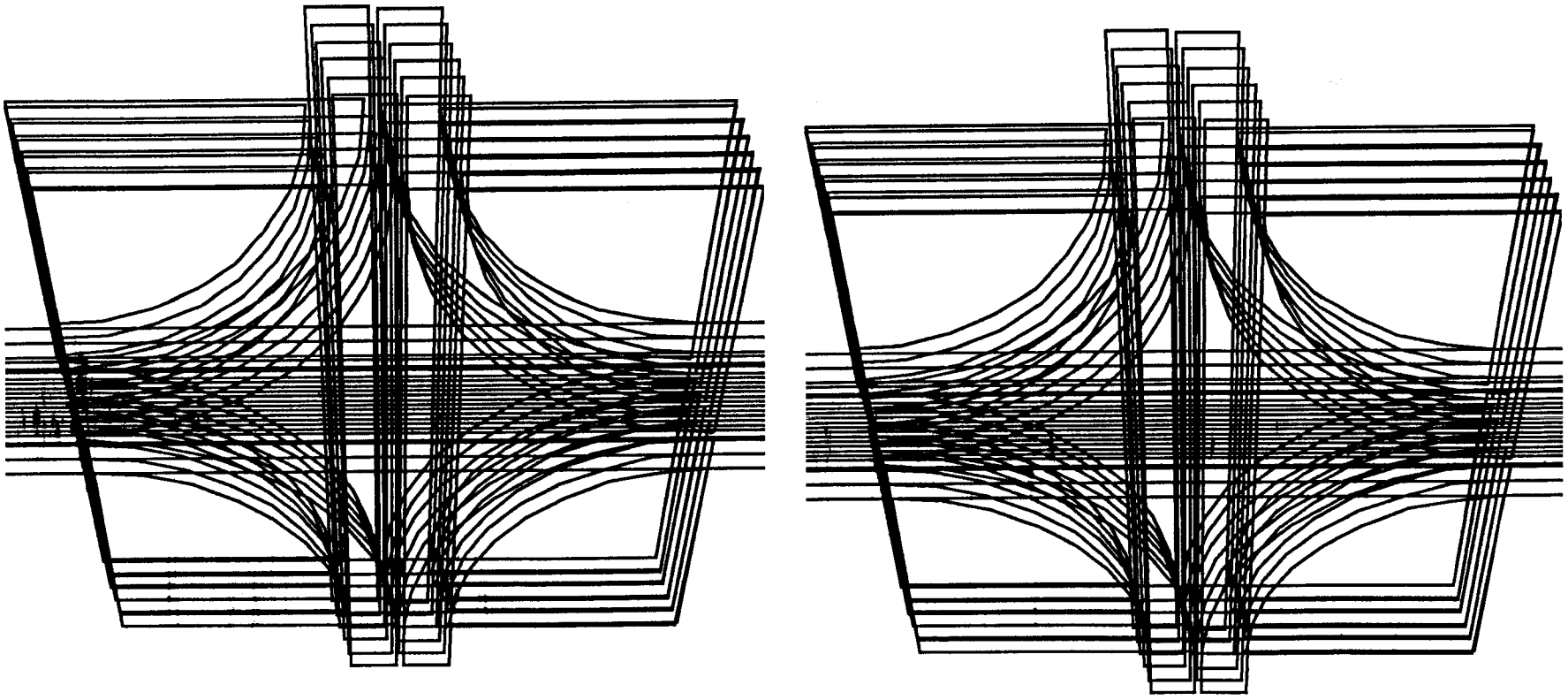

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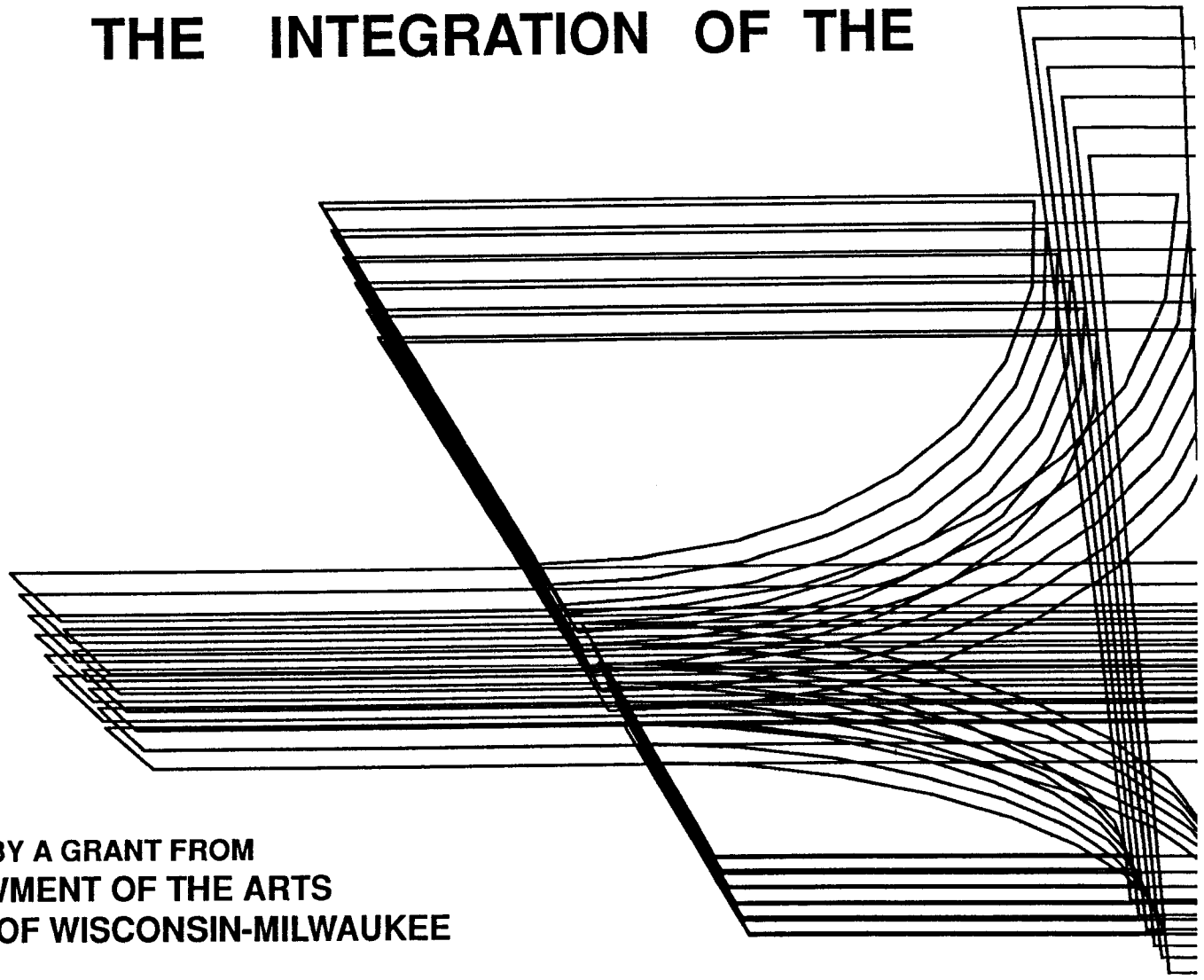

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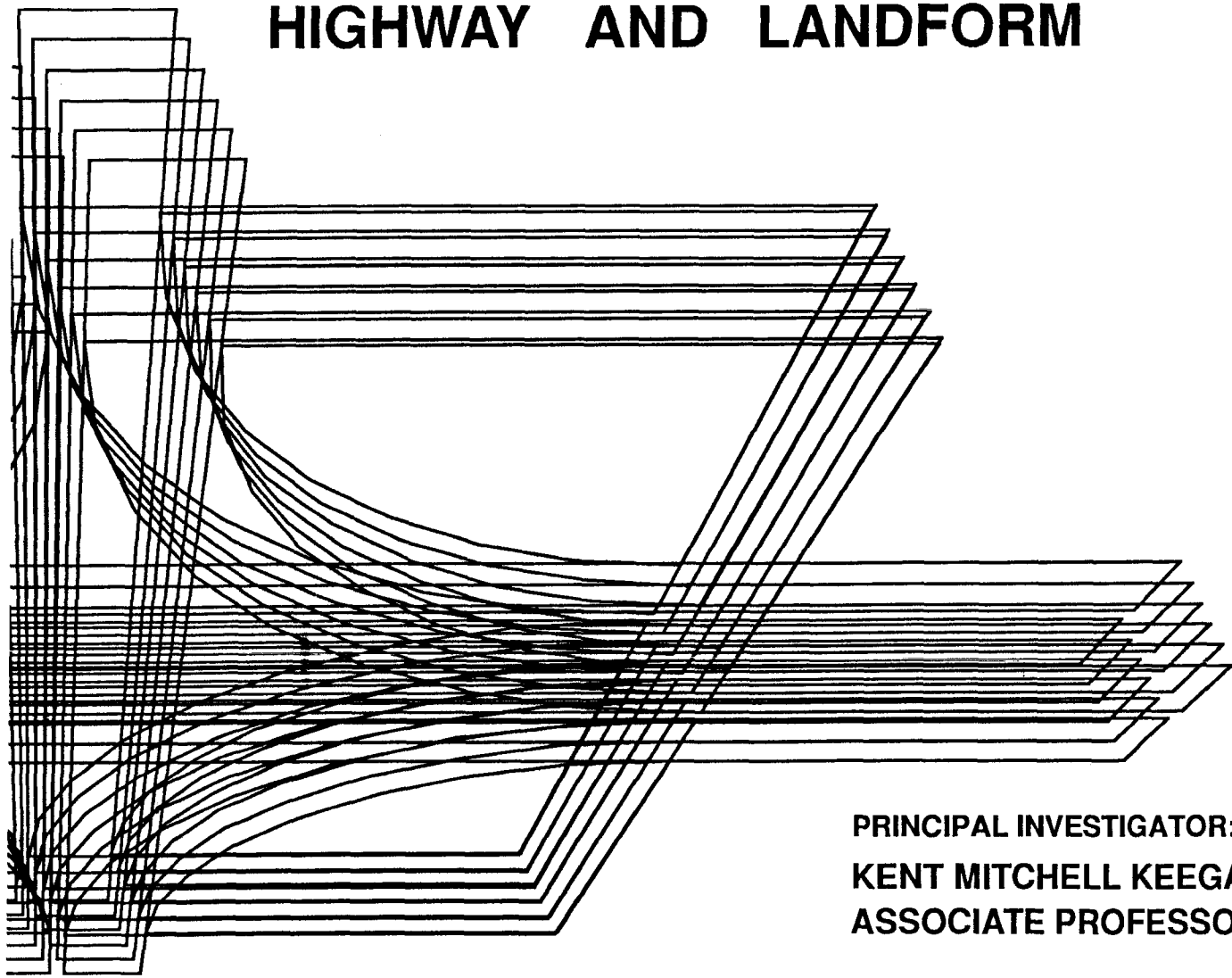
HIGHWAY AND LANDFORM



PRINCIPAL INVESTIGATOR:

KENT MITCHELL KEEGAN

ASSOCIATE PROFESSOR OF ARCHITECTURE

ABSTRACT

The national interstate highway system has been regarded as a technological masterpiece, the emphasis has stressed speed and efficiency of movement over the aesthetic elements inherent within the landscape and the roadway. The prevalent attitude of negating the landform is countered by this project which stresses the artistic potential of the roadway through the introduction of, artistically derived, formal design elements. Using landscape, median, gate, spanning, roadway and enclosure elements within the highway planning and design process, the design professional can introduce a new vocabulary to the process of highway construction. The formal design guide presents a range of design potentialities, that when combined with the technological requirement of an efficient and safe highway system, a unique and identifiable "design aesthetic" will prevail.

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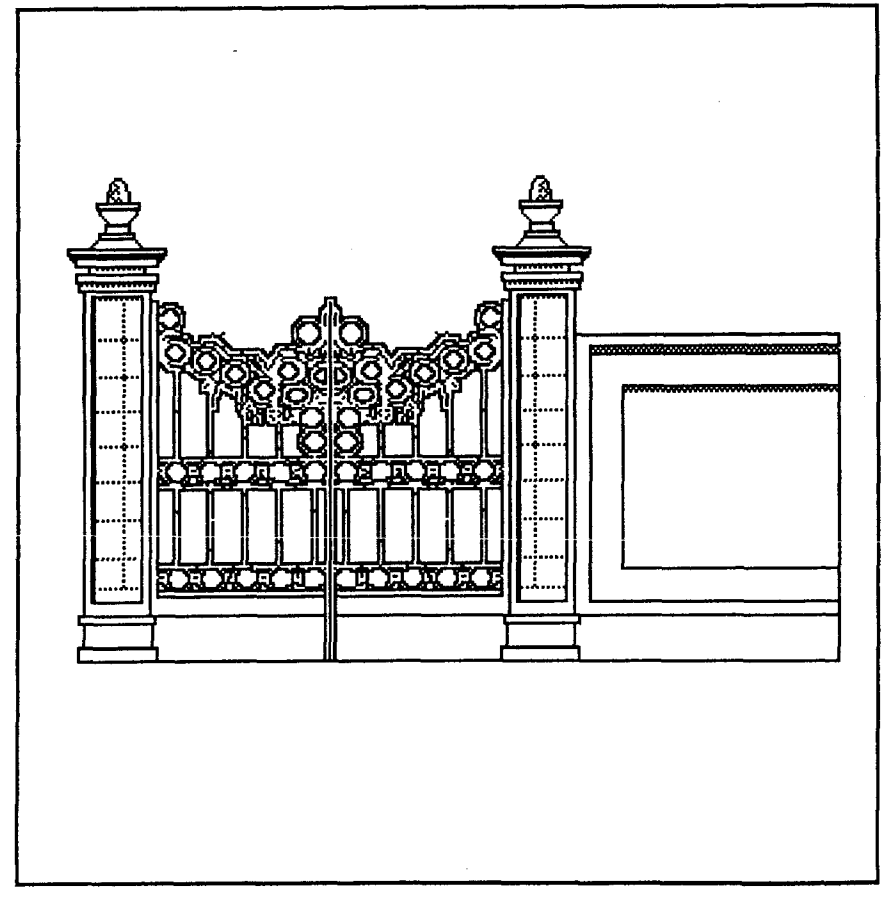
Gate elements in a variety of scales and shapes can be used to suggest visual entry or procession.



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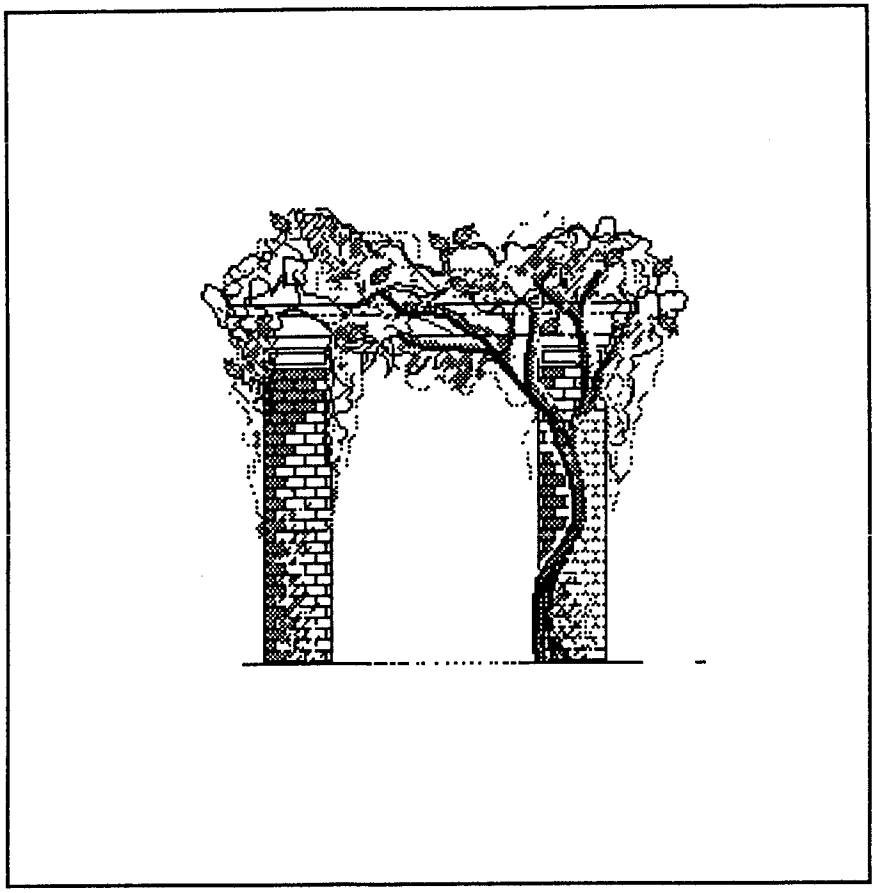
While this project had its moments of acceleration and deceleration, the professional assistance and moral support provided by my very able Research Assistant, **James Brus**, was indispensible to the successful completion of this project.

In addition, I would like to thank the following people for their support: Professor **David Reed** for his early assistance, Ms. **Cythia Zantow** for all of her editing insights, Ms.**Lynn Higgins** for her willingness to talk about the ideas contained within, Ms. **Mary Bates** who managed the impossible, and to the Center for Architectural and Urban Planning Research, specifically, Professor **Gary Moore** and **Tim Lovett** for their support.

A gazebo, placed in the median strip, can allude to regional history.



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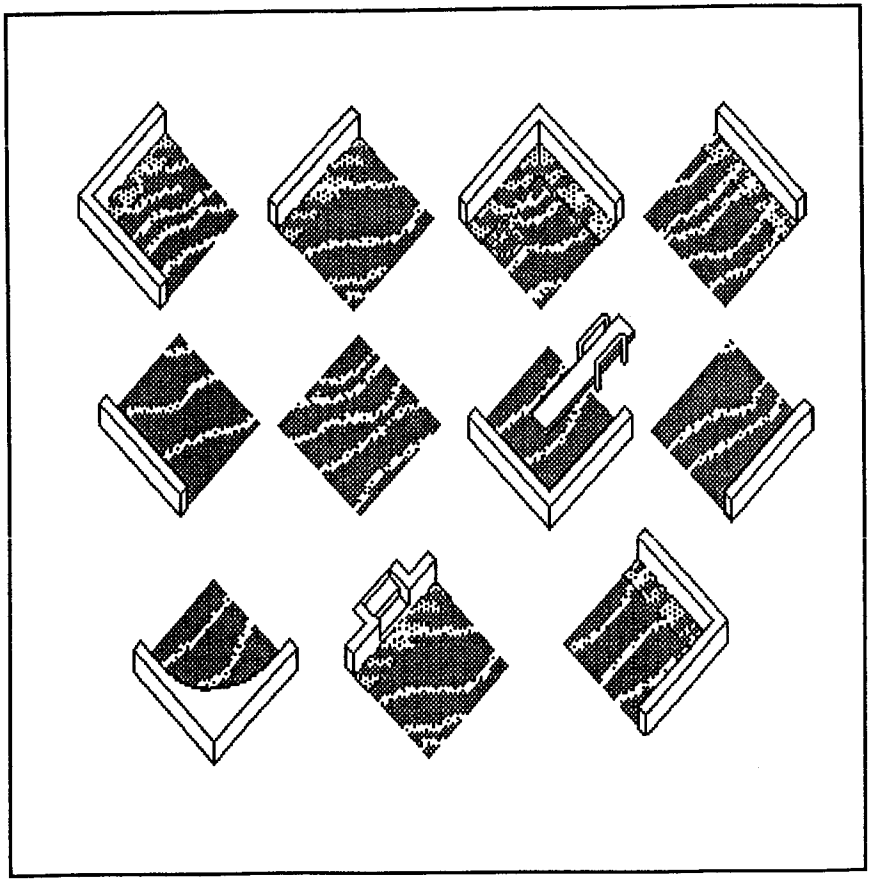
Sculptural blocks of water placed in rest areas can provide recreational interest.



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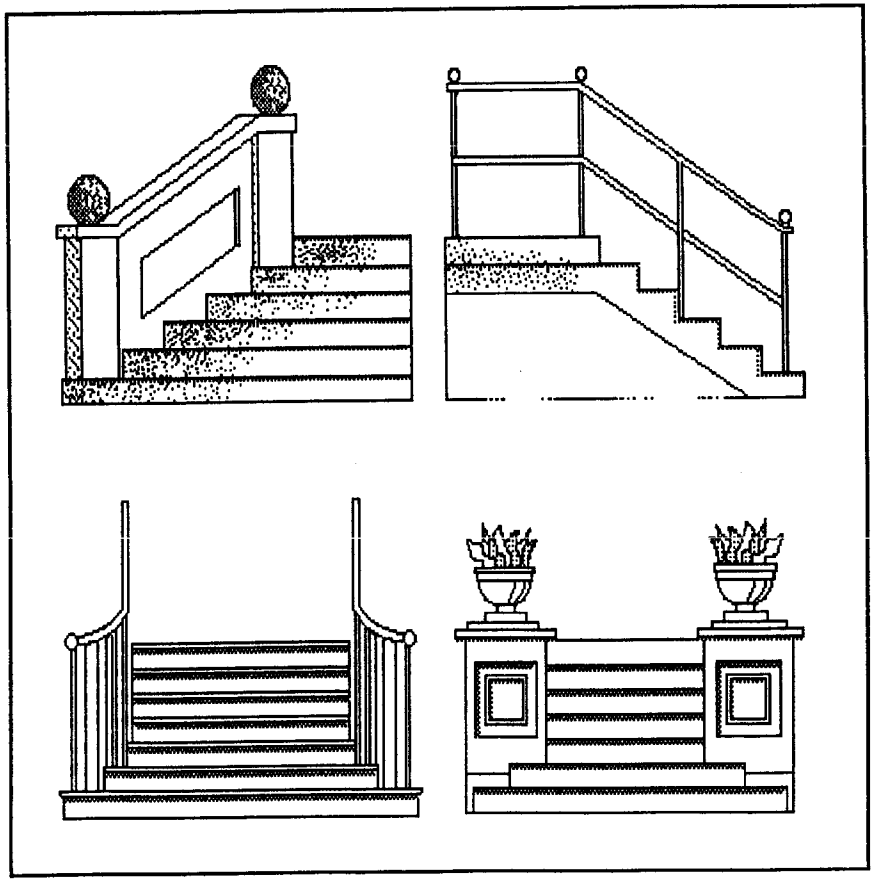
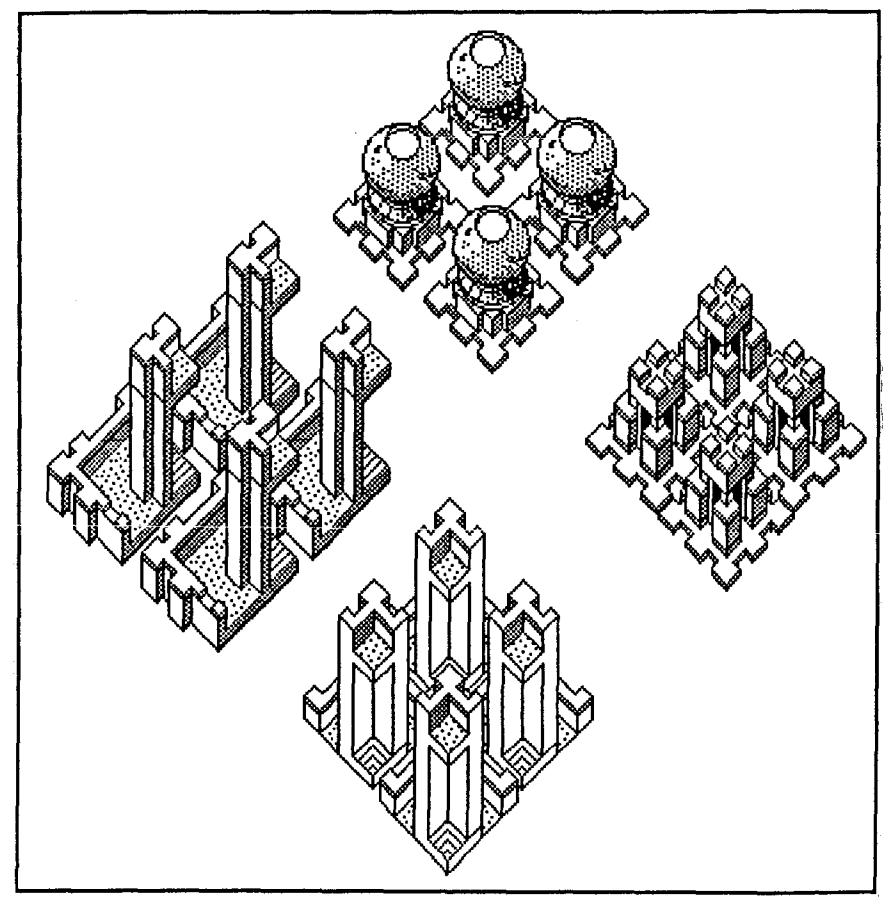
Stair elements placed into embankments or rest areas stimulate visual focus.



PREAMBLE

Roadway and reststop lighting can be highly distinctive as well as modular.



This research was undertaken under a grant from the National Endowment of the Arts to investigate the role of the natural and man-made landscape under the influence of the interstate highway system. The three major objectives of the study are as follows:

1. To determine the degree to which the American landscape, under the influence of the national highway system, has been altered, destroyed, re-shaped or modified at the urban, suburban and rural scales of interaction and to determine what historical, cultural and environmental factors are associated with that changing landform.

2. To determine the range of existing and proposed formal design concepts, theoretical bases and objectives that underlie the interstate highway planning process.

3. To develop a formal design guide that codifies visual and non-visual formal elements in the three scales of interaction and illustrate how design related criteria can be incorporated into the highway planning process.

Investigations into the objectives outlined above involve the

accumulation of technical and artistic data, current studies and literature in the fields of environmental design, highway planning, motion and safety as well as ecology, aesthetics, human perception and the future of transportation systems.

The research, investigation, design guidelines and documentation are included in this report in the following order:

Part I establishes the basis of the investigation by defining the parameters of the problem through attitudinal, socio-economic and political factors as well as the current "state of the art" in the United States and Europe and its infrastructure.

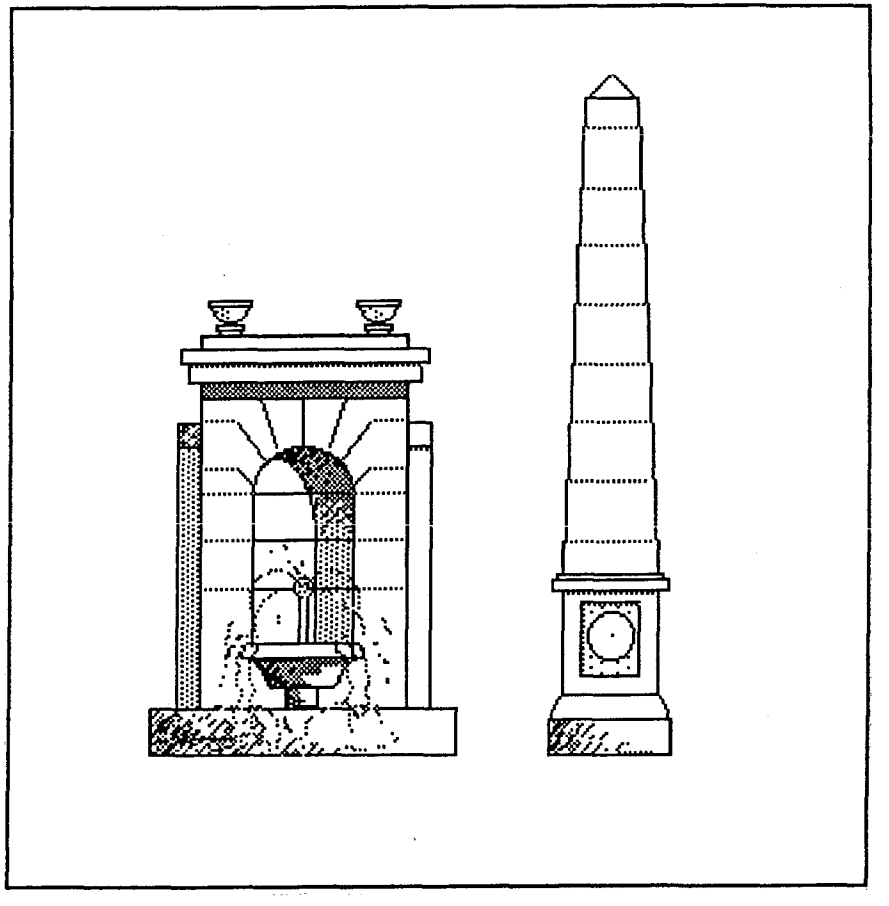
Part II presents the highway from a historical perspective and the evolution of the conflict between technological and cultural goals in the developmental process of the highway.

Part III examines and inventories the physical elements associated with the highway planning process as well as the literature resources currently available to the highway planner.

Part IV presents a conceptual design guide organized around three basic modes of interaction between the car, the passenger, the highway strip and the landscape.

Part V presents a summary of design ideas and establishes a method for implementation.

Fountains and ornamental columns can become highway signage.



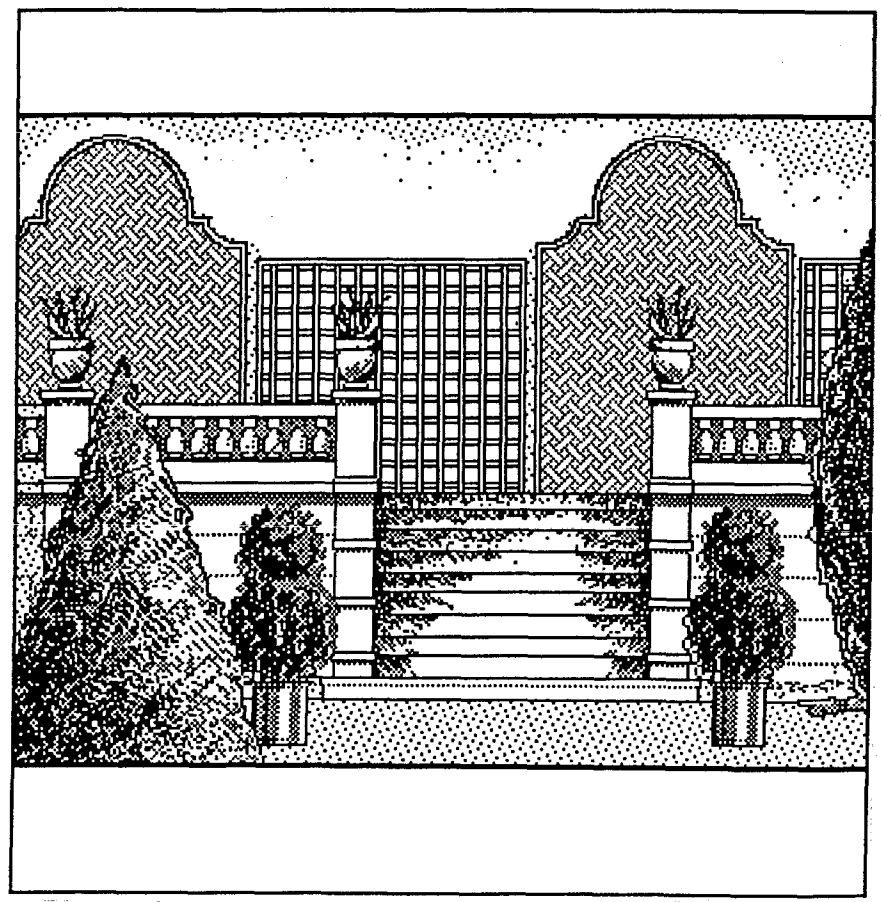
Part VI presents a current bibliography and the sources through which information and site related data was acquired.

The report establishes a philosophical position regarding the use of architectural, sculptural and environmental elements as an integral part of the highway planning process. Each part establishes just cause for the examination of goals, policy and implementation necessary to reverse the current "state of the art." In addition, the ground-rules for future interstate highway projects are clearly delineated in terms of the nature of the relationship between the project and the landscape. Through the dissemination of ideas, design attitudes and theoretical hypotheses, the professionals associated with the highway planning process can insure a greater harmony and balance through the integration of the highway and the landform.

The design guide may be utilized to develop projects that parallel the current rehabilitation effort in rebuilding the infrastructure as well as the planning of new highway projects. By introducing visual and cognitive elements into the highway "strip", the highway can become an effective tool for the dissemination of cultural and historical values. The highway planning professional, by accepting, interpreting or modifying the design attitudes and tools contained within this report, will be able to increase highway user awareness and appreciation for the land and its value to the quality of life.

The intention of this project is therefore the dissemination of

A terrace formed as part of a rest stop can provide a respite from the roadway.



design ideas, resources and formal applications to stimulate and challenge the professionals associated with the highway planning process. This report is available to all local, state and federal agencies involved with the national highway system through:

The Center for Architectural and Urban Planning
Research
School of Architecture and Urban Planning
University of Wisconsin-Milwaukee
P.O. Box 413,
Milwaukee, WI 53201
(414-229-4014)

THE AMERICAN HIGHWAY SYSTEM

Introduction

With the national Interstate Highway and Defense System nearing completion the need for re-evaluation and re-codification of the social, cultural and economic value of the system is imperative. The highway system is being used to a higher degree than ever before in the history of the roadway and, as a result, the deterioration of the roadway infrastructure that underlies the system requires immediate as well as long range attention. The economic requirements necessary to revitalize a highway system that has been in operation for 20 years is staggering.

The landscape is constantly being modified, reflecting complex changes in the role of transportation and the networks necessary to support those changes. As the expansion mentality of the 1960's slowly dissipates, all that remains from the millions of dollars invested are endless stretches of highway that connect urban centers in the most direct route permitted by the landscape and the state of highway technology. The current state of the national interstate highway system (based on the latest data released by the NHTA) suggests that over 40% of the highway infrastructure is in need of repair, replacement or retrofitting to meet the expanded useage. The economic implications of this scale of work are staggering compared

New Jersey's I-280 aligned for minimal impact on neighborhoods and existing traffic patterns.

to the initial investment. The cost per mile of roadway has trebled compared to that of 15 years ago. If the future roadways that connect the geographical ends of the United States of America are not perceived from a point of view that stresses the aesthetic component, a tremendous opportunity will be lost and our future culture will again be denied the true worth of the landform.

Dan Ryan Expressway and Robert Taylor Homes, Chicago.

National Awareness of the Problem

The American interstate highway system has isolated large segments of the population, throwing a noose of ring roads around urban centers, and separating them from the land. The highway system has been employed in a variety of ways to reshape the landform at the Urban, Suburban and Rural levels to such an extent that while the technological aspects of roadway design are seen as wondrous, the natural landform as a resource and an aesthetic has largely been ignored.

While the highway beautification process, begun under the Johnson administration, did much to clean up the adjacent roadbeds and the visual blight, it did little to attack the underlying problem - that the highway "strip" had already been damaged and that surficial repair made very little difference considering the extent of the highway system. Little, if any, effort was invested toward the preservation of the highway "strip" as a cultural and historical asset. The absence of billboards and automobile junkyards indicates

that the "beautification" process has worked to a surficial level but has not focussed on the central problems:

a. the value of the land has been treated only from an economic perspective negating any aesthetic value that the "strip" might have.

b. an attitude that places the land in a position of having little or no representation in the planning process.

c. that the "new" technology can accomodate the vast network of roadways and their specific techno-material requirements.

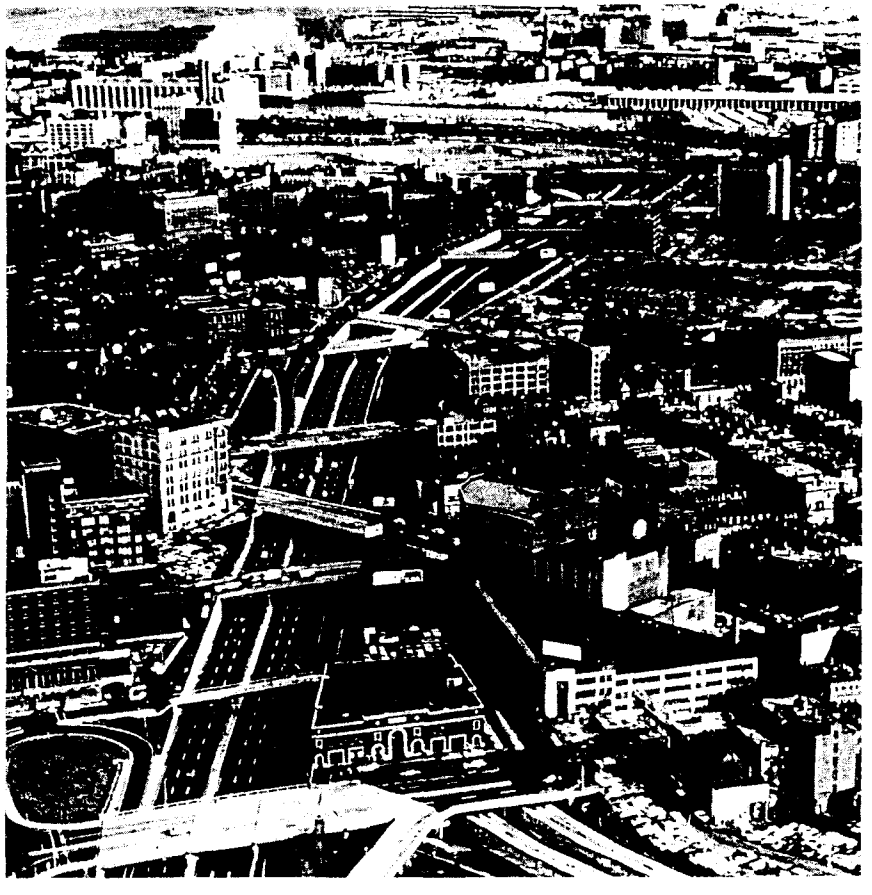
d. an attitude that stresses speed and efficiency of movement as the prime design and planning imperatives.

e. that the structure and material constraints necessary to construct the roadway have become the major planning issues and not that of form.

f. the highway and its immediate environment is rarely "seen" at the assigned highway velocities and therefore becomes invisible to the traveler.

g. with an accelerating technology, society is not willing to slow the process in order to prioritize its values, ie., *the technological imperative is determining* societal values and their respective priorities.

Aerial view of the Massachusetts Turnpike, Boston.



h. distance to a society used to speed is not measured in distance but rather in units of time.

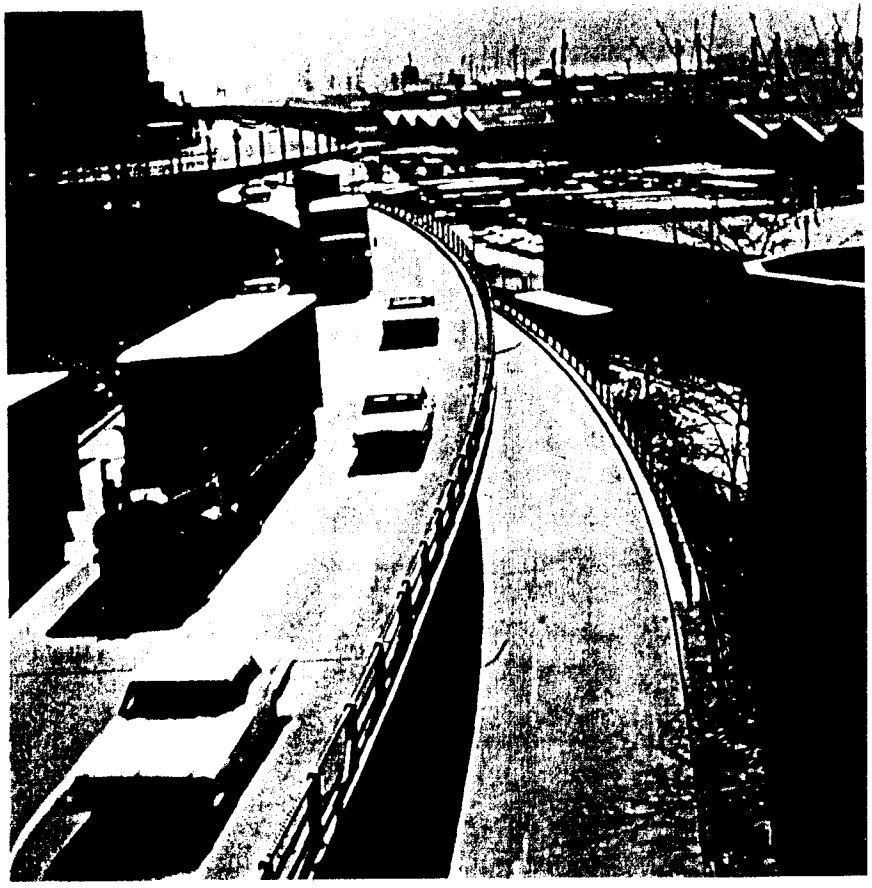
i. the vast number of professionals involved in the planning process creates a chaotic and uncorrelated environment through which the highway design emerges.

In a society in need of almost instantaneous communication, the Interstate Highway System has performed admirably with direct connections between most geographic locations. The concentration of highways has centered around those areas of greatest population reflecting a society dependent on a transportation network facilitating the flow of goods. While the nation's railroads are struggling for economic survival, road transportation continues to dominate the list of our national priortities.

Definition of the Interstate Highway System

The Interstate Highway System was originally based on the need for a national highway system that facilitated the movement and accessibility of the nation for defense related purposes. The movement of troops, materials and weaponry in as direct and economical a manner as possible was a primary concern after the Korean War. The concept of civil defense and the move toward a more dominant international posture encouraged the development of a new national priority -national defense.

I-278, Brooklyn Heights, N.Y. Clarke and Rapuono, design consultants.



The national defense system (as developed as it was at that period in time) relied on a number of disparate but related parts. The development of weapons systems necessitated a decentralization of manufacturing, research and testing facilities. The need for material acquisition, manufacture and distribution to the weapons facilities coupled with a view that the entire defense system would utilize all geographic locations within the continental United States prepared the platform for the development and implementation of the National Interstate Highway System.

A second level of priority was the national tendency to rely on the roadway system to give impetus to intensive commercial and industrial development. In doing so, the period between 1960 and 1970 showed a tremendous growth of highway development that rivaled that accomplished by the Roman Empire under The Emperor Hadrian (400 AD).

The lattice-like network of roadways linked most major urban centers with the rural expanses increasing the economic and social inter-dependency of the city and its immediate surroundings. The movement toward the country to find relief from the crowded urban condition created new uses for the interstate system. Between 1975 and 1980 the national interstate system began to complete its mission - that of closure. All that remains are isolated sections and outer ring-roads around a number of urban centers.

Projected Routes for the I-system, 1947.

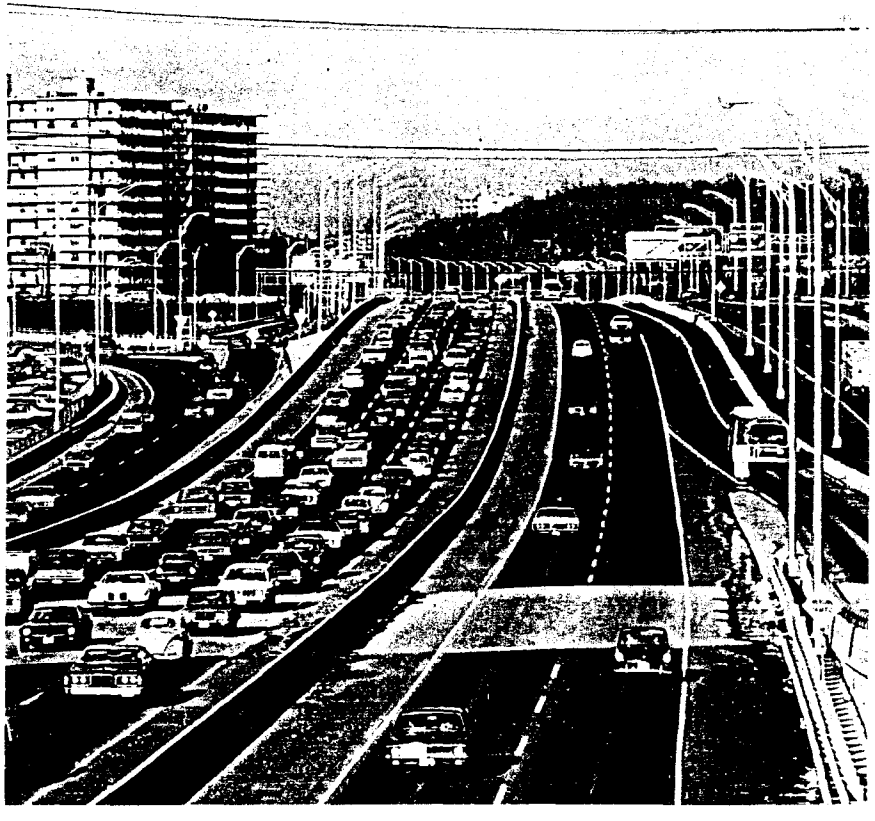
Planning the Interstate Highway System

At the base of planning the interstate system is a confusion about what the highway actually does: when a point "A" is joined with a point "B" is the primary purpose to construct a highway between them to connect the joints or to provide man the opportunity to pass from one to the other?

With the expansionist attitudes manifest as national policy during the period after World War II, a 20 year period of growth precipitated the need for a transportation network that could facilitate the coming of the "new machine age." The political structure, recognizing the need for research and development in the transportation sector invested heavily in a two-pronged attack on the problem: mass transportation and roadway infrastructure. While much has been written about the failures of mass transportation, the national system of roadways has received favorable reviews.

Throughout the development of the roadway system, the American landscape was rarely integrated into the planning process due to a nationalistic perception that the land belonged to the people and therefore should be used to serve that constituency. The land became a platform for the political processes to insure the future of a roadway system that in a few rare cases (Merritt Parkway,etc.,) invoked the land as a part of the larger process. While the American interstate highway system has been regarded as a

Shirley Highway (I-95) near Washington, D.C.



technological masterpiece, it has tended to obfuscate the aesthetic elements which produce extraordinary scenic beauty.

The reliance on the technological solution has produced short-term results that are the envy of the international community, but it is the long-term implications that are of the greatest concern. The translation of socio-political programs into physical form has relied on a long list of professionals who have been schooled in the emergence of the technological solution to problem solving. Most professional curriculums dedicated to the highway and bridge design have relied on the **structural** components of roadbed design: soil mechanics, soil structures, material design, analysis and testing as well as pavement and abutment design. Major emphasis has also been placed on those issues of **function:** stream of traffic, safety regulations, maintenance, rehabilitation and location have been well documented.

There is little evidence that the **formal** issues of "form" and the "aesthetic" of the landscape were incorporated into the curriculum during the 20 to 25 year period after World War II. This leads to the supposition that highway design has been seen as a technical/material problem and has had little to do with the cultural, historic or scenic aspects of the landform and its design. The disciplines most capable of introducing the "aesthetic" component into the highway planning process such as: architecture, industrial design, landscape architecture and regional planners, did not see

Waldo Grade, Marin County, California.

the problem with the roadway as a "design" problem. While ecologists, naturalists and conservation related groups decried the desecration of the landscape by the ever expanding highway system, it had little effect on the larger planning processes of roadway design. The current design attitude (often found in the appendeces of the engineering handbooks) to enhance or "beautify" the landscape to make it "scenic" suggests effort in the wrong direction. The absence of effective form design guides and the integration of those principles of form within a professional curriculum is at the heart of the problem.

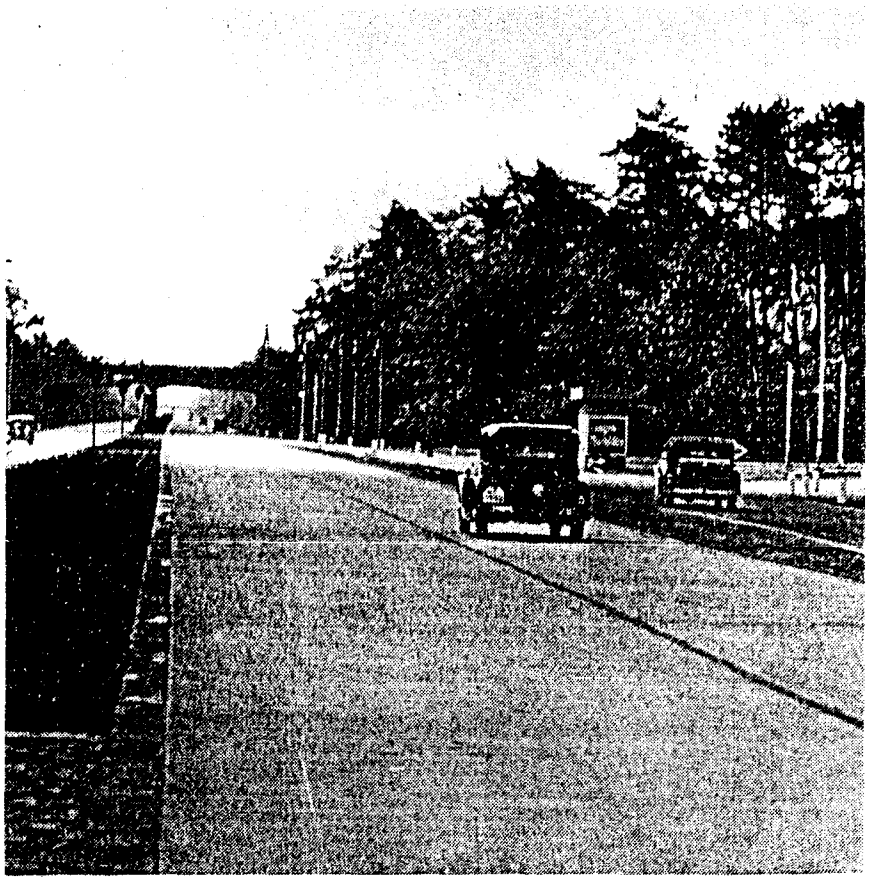
The perception was that the national interest was best served by a highway system that reflected the immediacy of the solution ignoring the fact that an inadequate land and highway planning process would have future environmental, socio-economic and political ramifications.

The European Highway System

In Europe, the current state of highway development suggests that the roadway had been developed on a theoretical level since pre-World War I days. Proposals for superposed highways and cloverleaf intersections existed as early as 1906. By 1913, a private group established an experimental highway which opened to traffic by 1919. The design aesthetic was that of a four-lane, limited access, six mile highway that ran straight as an arrow through the Grünewald forest. By 1935 the *Autobahnen* , the first real freeway, was introduced between Frankfurt and Darmstadt. What characterized the *Autobahnen* was an exceptionally high regard for native landscape values which translated into a freeway conceived of as a work of art and positively integrated into the surrounding landscape.

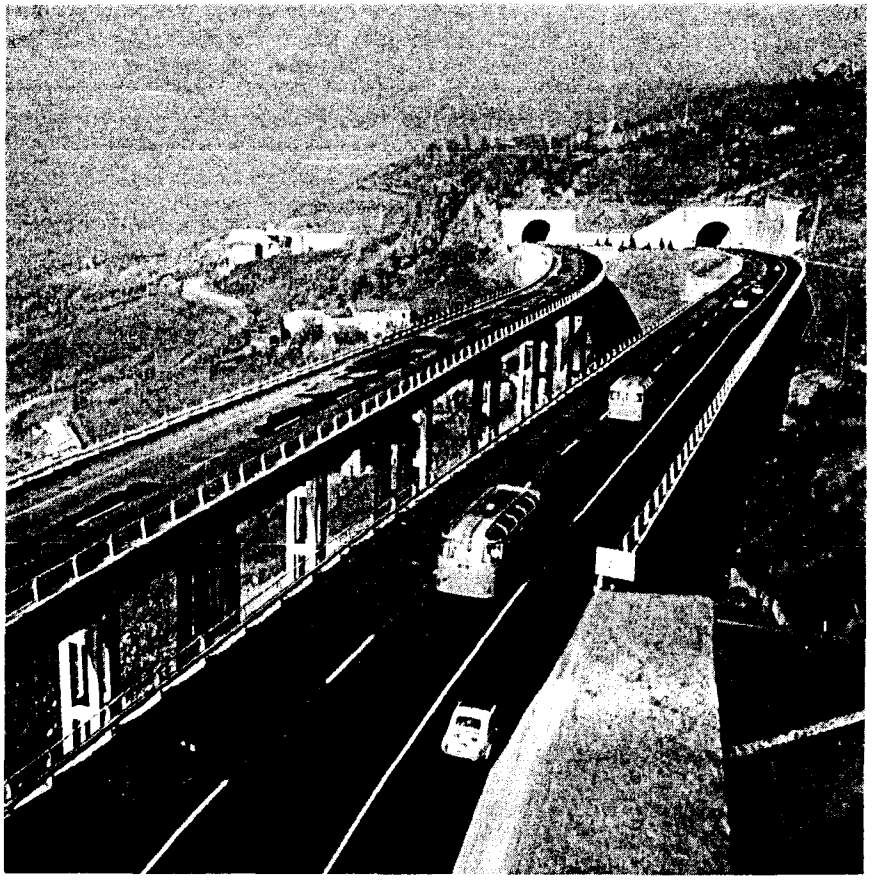
This particular attitude permeated the rest of the European transportation network. Shortly after World War II, France, Italy, Belgium and the Netherlands instituted freeway projects that followed in a similar artform aesthetic. All of the projects generally followed the German model for roadway technology. The German engineers designed according to strict visual guidelines which gave rise to a concern about the relationship of the highway to the landscape and the visual alignment of the roadway itself. The sculptural qualities of the landscape were

The German Autobahn of the 1930's.



seen as important to the roadway design as it moved from point to point. Bridges, abutments, rest-stops, lookouts and signage were developed to provide an articulation of the micro-landscape of the roadway.

The Autostrada del Sole between Bologna and Florence, Italy.



Italy

In Italy, the modern Autostrade connecting Milan and Rome is a work of art. Tunnels, bridges and overlooks contribute to a hightened visual aesthetic. Unusual overpass designs combined with cantilevered roadways add to the visual and sculptural natural landform. Routes are not chosen based on the expediency of connection but on the expressive content of the roadway experience. In Genoa, large single-masted suspension bridges designed by the engineer Morandi create a landmark in the urban landscape by announcing the "entrance portal" to the city center.

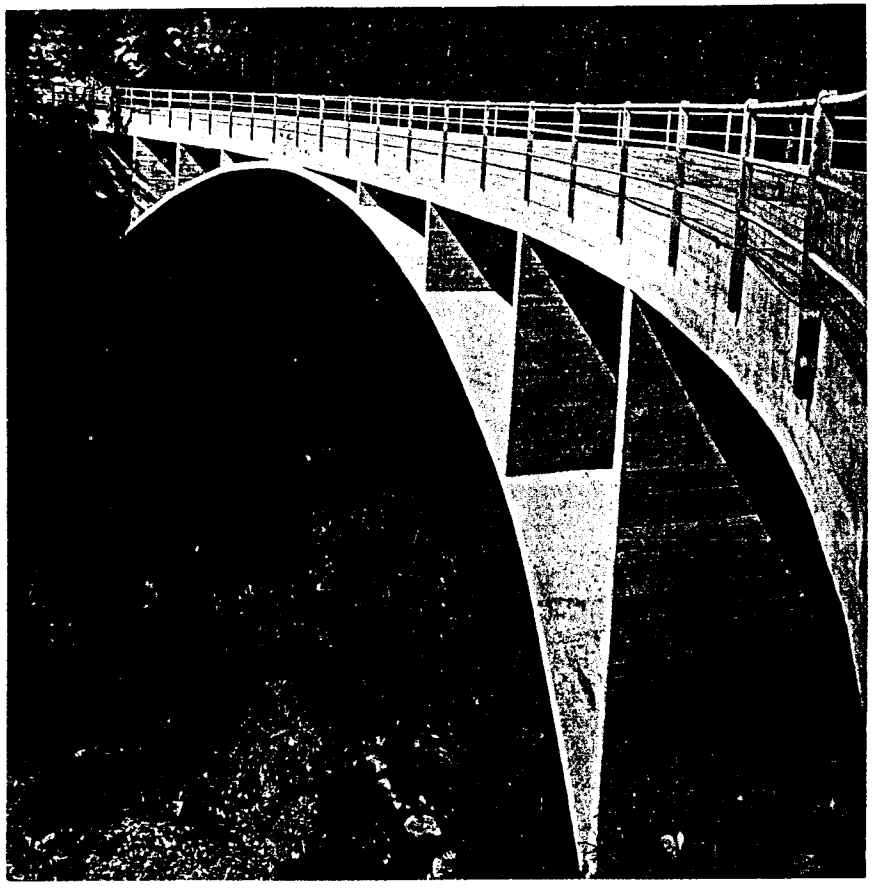
France

Along the Autroroute A4 connecting Paris to Saarbruchen, the French national transporation agency has commissioned a number of artists to provide sculptural relief to an otherwise flat and unarticulated landscape. The pattern variation of form, color and frequency of platonic elements creates interest and anticipation of another sequence of platonic elements. Studies have shown that the number of accidents were significantly reduced after the sculptural elements were installed.

Switzerland

In Switzerland, the concrete bridges of Maillart far exceed the functional requirements for span. They bring to the micro-landscape unusual and very successful designs in reinforced concrete that visually accentuate the landscape rather than compete against it. The technical articulation of a Maillart bridge is surpassed by its sculptural form. In this sense, the bridge extends the horizontal and lateral qualities of the landscape with a minimum sense of interruption with no sacrifice of the landscape.

Schwandbach-Brucke, Canton Bern, Switzerland. 1933. Robert Maillert.



The main characteristic of the European roadway is the apparent concern for the visual and formal aspects of the environment. While cities like Paris, Rome, Berlin and London share similar problems of traffic congestion, pollution and deterioration of the infrastructure as their American counterparts, the freeway that encircles or connects the urban centers respect to a far greater degree the land and urban patterns that shape the landform.

The richness of the European highway system emerges from an expression of the ecological value of the landscape as it pertains to vehicular motion. In evaluating the cultural, philosophical, psychological and aesthetic phenomena of the European highway, the dimension of time, as it relates to travel on the motorways, has not been the prime-mover. Instead, a different perceptive basis in respect to the external world that

stresses the dynamics of time over that of movement is in evidence. In very few cases have external sculptural experiences been added to enhance the driving experience. It would appear that the highway driving experience is based on a uniformly changing quality that reflects the natural landscape, its applied components and an overall concern for the kinesthetic sense of body movement. The net result is a kinship with the natural landform.

ATTITUDES AND APPROACHES

Oppositions

Golden State Freeway under construction
1956. Photo courtesy of CALTRANS.

The steady drift of the American population to urban regions, coupled with trends toward larger families and an extended life span, are clearly changes of great importance for professionals involved with the highway planning, design and construction process. The physical impact on the landscape has been far from compassionate and promises continued deterioration of what was once a natural landscape.

This section of the project establishes the dichotomy between an increased demand for transportation networks throughout the country, and the need to preserve, conserve and restore a lanform that has suffered tremendously from urban and regional growth. It is interesting to note that, contrary to popular belief, that the landscape cannot be "replenished" or "refurbished" within a brief period of time. We are just beginning to experience the full impact of a national highway construction program that not only has leveled earthforms but has given little in return. Great emphasis has been placed on the techniques of highway construction and placement but little, if any, on the aesthetic expression or 'expressive content' of a highway and the landform. The techniques employed are a curious patchwork of approaches, many an outgrowth of special-purpose efforts to meet particular or localized problems and

needs of their time. Many of the design approaches bear the mark of fragmented governmental situations that have prevailed during the time when those specific techniques evolved. Until quite recently, techniques were developed and administered on a regional basis with visual conflict most manifest in the nature of the roadway at the state line.

The concern for the aesthetic component of highway design has been minimal. Isolated examples show what can be done rather than how it is done. The so-called cost of a "designed" solution to the highway corridor has placed a major percentage of the interstate system on the side of a technological response. The evolution of techniques, combined with attitudes that have put immediacy of solution at the forefront have all contributed to a patchwork of interlaced highway networks with little or no concern for the future. A designed approach, that integrates an aesthetic component, can look beyond the present to apply a more dynamic methodology in evaluating and applying design methodologies for the highway corridor. Attention must be shifted to human and cultural issues as they relate to the development and preservation of the American landscape.

The sections presents a view based on the following oppositions: structure versus form; technology versus art, and looking versus seeing.

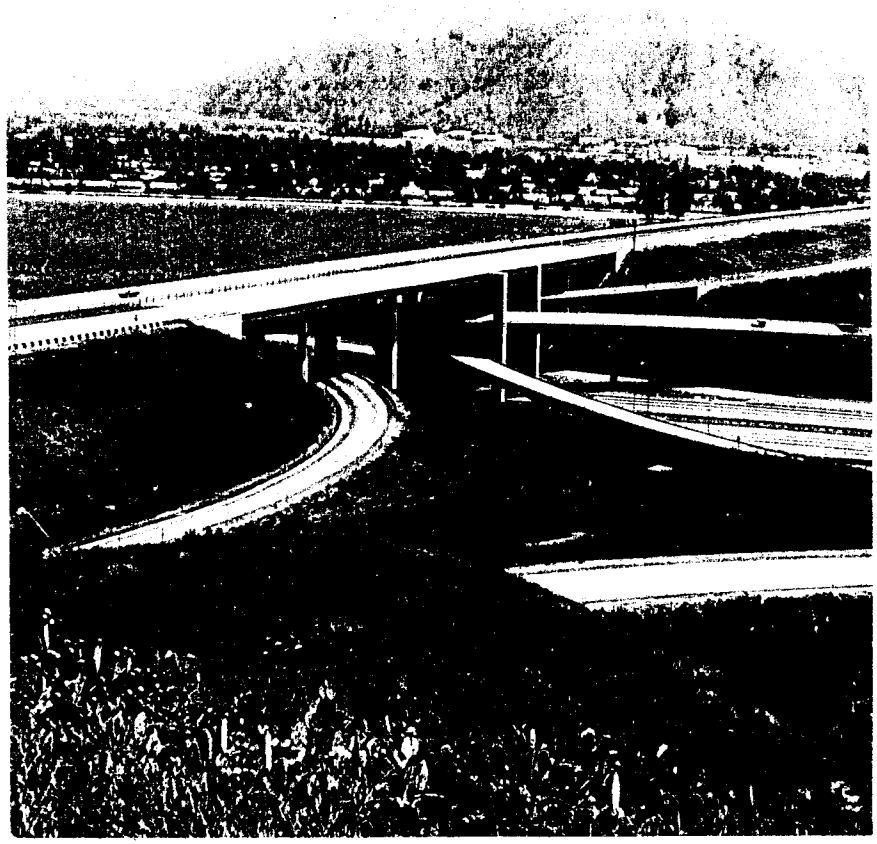
Structure versus Form

Despite the technological accomplishments of the United States, a mature approach to problems of physical planning and outdoor esthetics as they relate to large and small land areas has not been assumed. The number of different professions and interests involved in the highway planning process often appear to be working at cross purposes and the breakdown in communication is reflected by the breakdown between the highway strip and the landform on which it is placed. It is this breakdown that has tended to place an emphasis on the *structure* of the highway and not on the development of the highway *form.*

Structure

While many regard the highway as only one of many elements in the landscape, it has tended to be seen as the singular element of functional expression. Though its primary function may be to provide efficient circulation between land units, it also interrupts connectivity between immediate land units with limited-access routes. The character of the route is determined by standards controlling alignment, grade, sight distance, median widths and other geometric design factors which must be observed to make the highway safe for travel. The emphasis

The Kellogg Hill Interchange of the San Bernadino and Orange Freeways. Photo courtesy of CALTRANS.

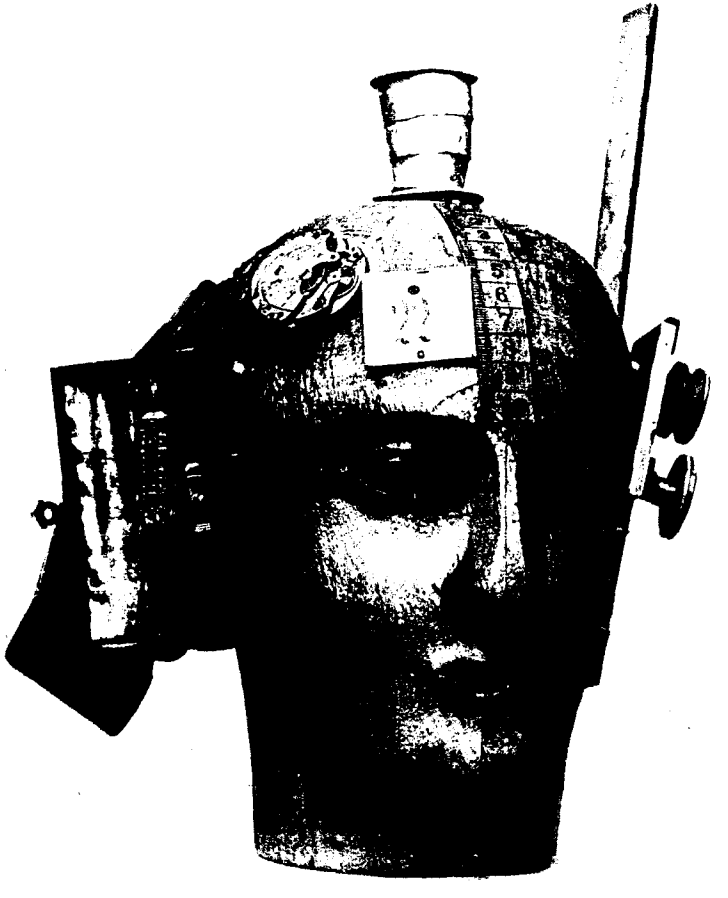


placed on velocity of travel has shifted the focus away from the landform and the aesthetic of place to that of the physical *structure* of the highway strip.

In this sense, the *structure* of the highway strip has become a tool, a tool to shape the landform, a tool to modify patterns of land use and standards of living. The tool by which vast expanses of land are modified to accommodate a single element with a singular purpose - transportation. The role of man as a user of tools has been well documented historically but to understand how the highway strip has become another tool requires an understanding of the relationship between the tool and the object that it produces.

Commensurate with the expansion of the national highway system has been a movement in American schools toward thing, tool and object-mindedness, so distrustful of symbol that the fundamental instruments of thought have almost disappeared from the curriculum. There has been a movement toward the concrete, the real and all experience should be based on the "real" situation. The need for understanding of the real has led to greater and greater need for the answer or solution to the problem and less need to understand the whole experience. The emergence of a technologically dependent society centered around the role of scientific "truth" is a natural extension of this technological acceleration. The dependency on the machine for its consistency and constancy has produced a nation of technicians.

"Mechanical Head", Raoul Hausman, 1918
Collection of Mrs Hannah Hoch, Berlin.



While the role of the technician, or the specialist, has been glorified, the generalist has lost considerable ground to the new ideology. The development of specialities within any one discipline has produced an abundance of specialists so limited by their respective interests that a major breakdown in communication has occurred. The last 50 years has shown a quadrupling of specialty degrees within the educational arena. It may be argued that in a society that values technological processes and the mastery of the physical conditions of living, the need for greater understanding of that physical world has produced a society of "specialists". There has been serious erosion of man's adaptability in almost every climate and environmental condition due to the technological dependency.

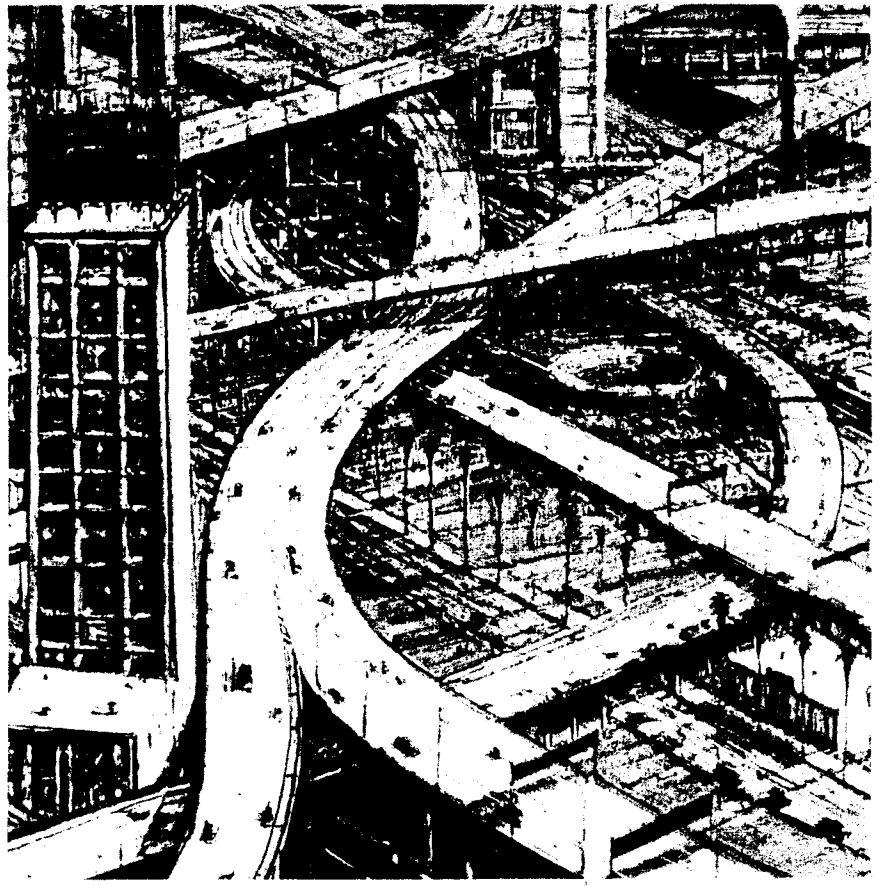
The lack of integration between the highway strip and the landform is one of many examples of the breakdown that has occurred. All the technological achievements have produced a highway strip that is regarded as one of the most advanced movement systems in the world. The *tool,* in the hands of the specialist, has shaped an *object* (landform) to such a degree that little of its aesthetic value remains. Historically, the original contribution of technology was not dedicated to man's physical life, but gave him a certain respect for the nature of materials and processes with which he worked. As the machine interceded, the shift away from the natural processes emerged. The aesthetic component of the highway corridor was replaced by a machine aesthetic in which the *form* of the object was dictated solely by the tool.

Red-Blue Chair, Gerrit Rietveld, about 1918. Photo Hulskamp.

Form

The habit of a society dominated by mechanization, a society submissive to routine and drill suggests that man has thrown his "whole subjective and qualitative life overboard" states Lewis Mumford in Art and Technics. The need for personalization, for an identity beyond that of the number is at the heart of the problem. The shaping of the environment, its inherent *form*, was originally in balance with the development of the machine. However, as man has become mechanized, they have transformed themselves into mechanical, replaceable and uniform parts. They teach themselves to perform standardized and repeatable acts. By breaking down the once unified process of work into "specialized" parts, the integrity of the *form* has been jeopardized. The disintegration of form, from a physical and intellectual perspective has had a reciprocal association with a specialized society.

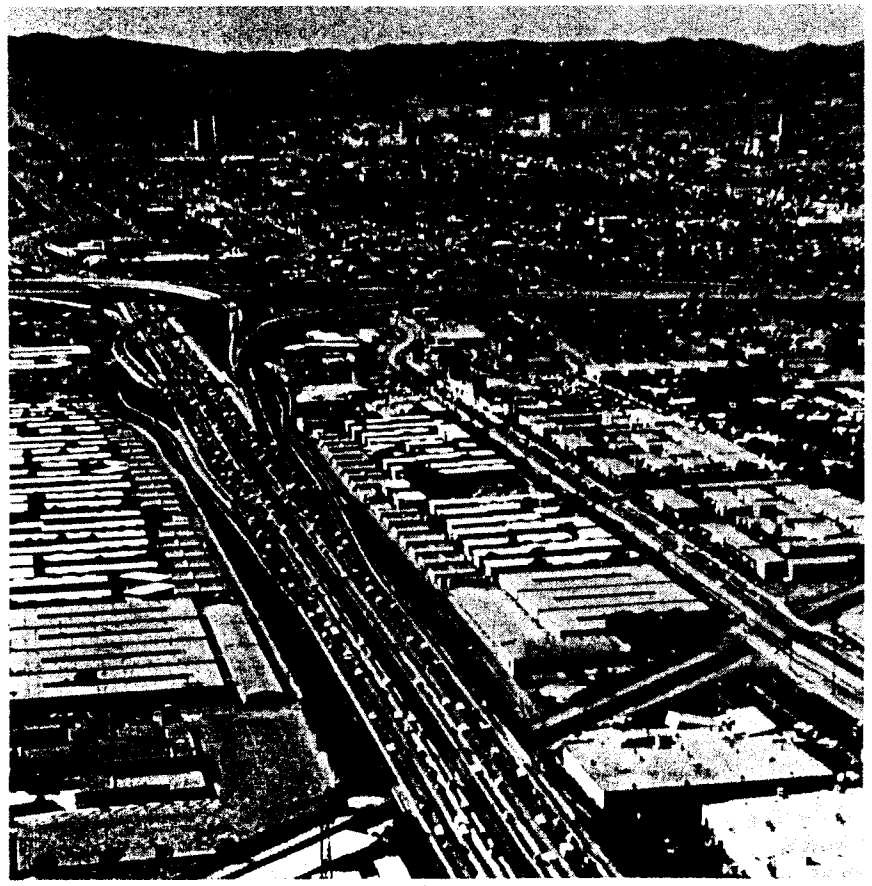
"Urban Freeways"
Wayne Thiebaude.



The earlier "high way" that etched its way across the tops of hills and valleys reflected its form and shape with the very land on which it was dependent. The natural aesthetic was irrevocably intertwined with the system of movement. The physical landmarks along the route were a formal part of the image of that specific path. Whatever natural processes occurred help shape the personality of the route. The balance between the aesthetic and the function was well established. There is a definite correlation between the perception of form and culture. Amos Rappoport in House, Form and Culture, stresses the regional

shaping of form and its perception through the bias of culture. The aesthetic of a particular form as perceived by a culture is dependent on many expressed elements other than function. Language, material, social and political forces as well as archeological values have tended to shape the idea of *form.* It is no wonder that the drastic change in American society between the 1900's to the present has resulted in a formless and regionless environment. It is often impossible to distinguish the degree of uniqueness or particularity from one highway route to another. The sameness - an attitude that appears to pervade our society- has reflected the lack of cultural differentiation. It has produced a highways system, technologically advanced, and yet devoid, in most geographic locations, of any sense of natural form or aesthetic. The machine aesthetic of the roadway that spans the country has a sameness and a formlessness that reflects the very same qualities and mores of the society that built it.

San Diego Freeway



Form and Structure

The *structure* of the highway emphasizes the techno-material aspects of the roadway while the *form* emphasizes the natural processes and aesthetics of the landscape. Does this separation represent an inability on the part of the design professional to reconcile the apparent differences? It is true that the technological viewpoint is trained in the "solution to the problem" while the formal viewpoint stresses the "problem with the solution", the need for an integrative design vocabulary is mandatory if

change is to occur. An indictment of the physical environment is far too easy and avoids dealing with the reality of the problem and the potential of apparent solutions. The integration of the roadway and the landform from a structure and form perspective requires that man understand nature and is able to intervene to enhance its creative processes. The despoilation of the natural world by the scything of the landscape for the roadway must end. As the roadway infrastructure undergoes a metamorphosis into a third generation *structure*, the landform and its intrinsic values, offering both opportunities and constraints to human use must be recognized- as we recognize nature as a process in which man exists.

Technology versus Art

With the formation of national interstate highway system a new era was ushered in that espoused: efficiency of movement at the expense of the landscape; safety considerations at the expense of visual form and the sense of motion at the expense of the highway experience. In the haste to ring the cities and connect disparate regions of America, the interstate highway system has negated the potential of the "strip" in terms of its artistic, educational and cultural image for one that stresses the *technology* of the times. It is rare to find the highway "strip" used as an image as the role of *art* is negated over the expediency of connection.

The highway experience has proven to be a physically numbing, often dangerous and time consuming event. The perception of distance is no longer measured in miles but hours or days of incarceration within the automobile environment. The broad perspective of the highway is filled with the blare of the radio, daydreams, endless conversations or the silence of road noise reverberation. The experience has become one of necessity, trapped in interminable traffic jams, suffocating on exhaust fumes or poorly ventilated tunnels or protecting ourselves from irrational and often inexperienced drivers, dodging the potholes of deteriorating highway or refuse that has been deposited

Los Angeles River, Southern Pacific Railroad, Riverside Drive and Golden State Freeway. Los Angeles, California.

along it. We are a nation of highway dependent users trapped by the need to maintain our independence and unwilling to participate to any large degree in mass transportation. The *art* of the *technology* has proven hazard-ous to the human condition.

San Bernadino Busway and Freeway, looking west.

Technology

The role of technology in the post-industrial age has been well documented and has been shown to reflect the current state of the society. In this society, the increasing precision of human understanding of motion in the physical world has led to its recognition as a pervasive aspect of nature. The dynamics of the outside (the automobile) world are in continuous movement, but in spite of this fact, the essential characteristics of the world as we perceive it are constancy and stability. These two attitudes have rendered the overall experience of the national highway system to be one of stasis. The landmarks along the route are given "object" status but the miles in between lie fallow, devoid of any aesthetic identity. The highway "strip" has become a series of inanimate objects strung together by miles of endless landscape bound by the restrictive freeway corridor with the alternating rhythm of the tires ticking the expansion joints the only disturbance. It is hard to believe that such an incredible piece of construction, composed of limitless miles, has been so underutilized as a place for the development of *art*, both perceived and real.

Perceptual studies have revealed a paradox that shapes creative vision in that the patterns of visual images that reach our brain are always in motion. While the endless repetition of highway elements dulls the senses, the lack of stimulation other than the occasional rest stop or "scenic" overlook produces sensory deprivation. The *technology* that generated the ribbon form has separated the user from nature due to the functional necessity of interconnection. Nature is something that is seen only at a distance, the distance created by the state of the technology. Rest stops are a very good example of the isolation. The rest stop area is surrounded by fencing, is dedicated to the mechanical relief of the automobile and secondarily the driver. Little if any natural area is provided for human relief and it would appear that the household pet has greater claim to what remains. The building structure performs a double role of feeding the car as well as the driver. Often designed to reinforce the concept of movement, the rest stop building lacks all but the minimal image necessary to its function. Endless diagonal or perpendicular parking spaces surround it with overflowing garbage cans to complete the picture. The role of *technology* in this arena is clearly dominant. Except for a few isolated places, the state of the "art" is clearly dedicated to the machine and not the occupant.

In the example of the rest stop, the image of place has been stripped of any potential artistic image. The place simply addresses the service and functional requirements. How many times have all the rest stops merged into one generic type

The Cadillac Ranch, along Route 66 near Amarillo, Texas. The Antfarm art collective, 1974.

without any differentiation of time, place or space. It has been referred to as a wasteland - a technological wasteland stripped of human meaning and scale.

Art

The technological achievement manifest in the highway has not has its corresponding equal in the form of the artistic image. With the pressure toward increasing highway safety for even greater speeds, the movement has been to express road alignments, field of view and the elements of attention while minimizing many of the natural and man-made features of the landscape, the cities and the environment. The research has shown that the beautification of the national highway system has been quite surficial and has concentrated on the "eye sore" approach and has not dealt with the basic problem.

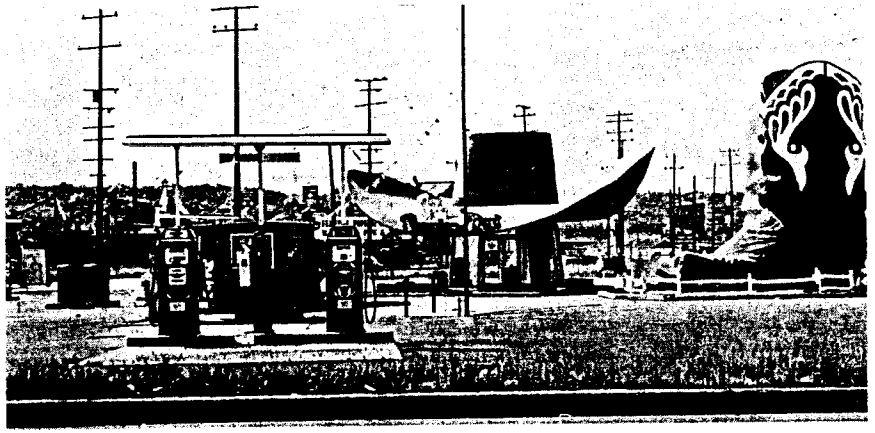
Highway beautification eliminated many of the visual blights that paralleled the roadway. It is ironic that one of the nation's institutions - the automobile junkyard - was the first to be highlighted as visually damaging to the viewer and to the landscape. To correct the problem, large scale sightline fencing and/or plantings were placed around the yard to isolate the view. The problem was never eliminated because the fencing simply created another type of "blight". In addition, the road side junkyard, surrounded by the applied cosmetic, became the new symbol of how technology has a high rate of obsolescence built-in. The automobile in motion reflecting its ultimate demise.

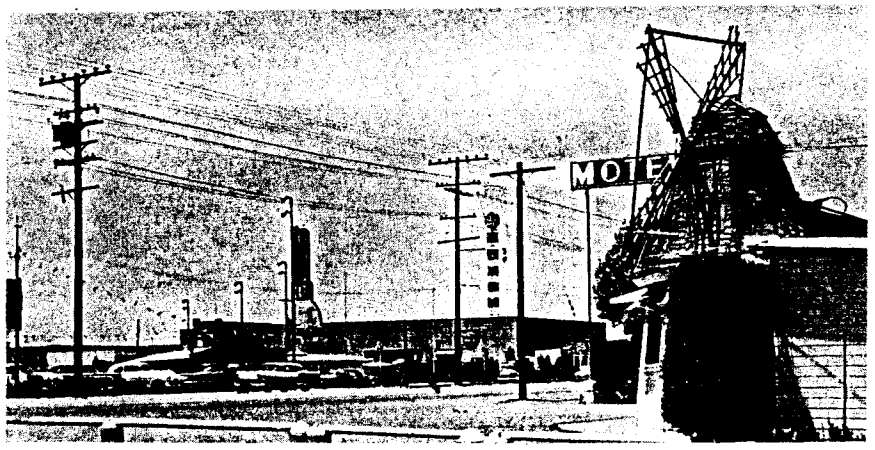
East Los Angeles Interchange. Santa Anna, Pomona and Golden State freeways.

Very little thought was ever given toward the integration of the "eye sore" as a form of art that expresses the societal relationship with the automobile. While the junkyard may in and of itself have few redeeming qualities, instead of covering up or eliminating the problem, often a change in design attitude would have brought the junkyard into the vernacular aesthetic of the roadway strip.

Art has largely been viewed as elitist in nature. The museum, the art gallery, the sculpture garden, and the art film attract a clientele that finds meaning at many intellectual and symbolic levels. The American billboard was seen as having little artistic or social value and became another abuser of the highway experience. Gone were the Burma Shave signs, the local signage was eliminated or placed so far off the roadway as to be unreadable at almost any speed. Billboard art became another target for the highway beauticians. It is true that many of the signs reflected little if any concern for the quality of the subject but emphasized the message. As a nation, we were taught through a media blitz that our national pride would be enhanced if we eliminated or covered up those public eye sores. Highway beautification became a moral issue for the population. To replace much of the man-made blight, nature was called upon in the form of ground cover, coniferous and deciduous trees and earth berms that turned the right of way into a high speed corridor.

On Route 99 in the Pacific Northwest.



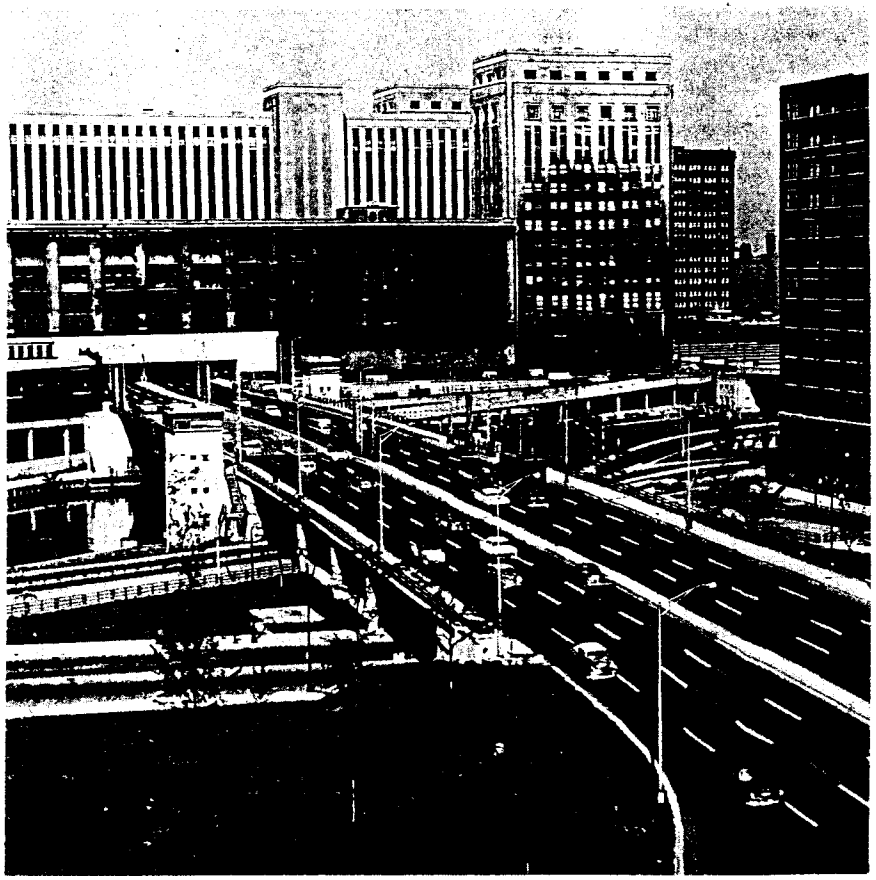


As the nation undergoes an annual stylistic change in its vehicles, it sees little of the seasonal change in its highway landscape. The *art* or component has been reduced to superficial treatment in isolated places. The conservation of cultural property has had little impact on the highway strip. The sense of place, from region to region, has been nullified by the sameness of the technological response. The *art* component has been eliminated by the repetitive nature of spatial elements that define the highway edge.

Art and Technology

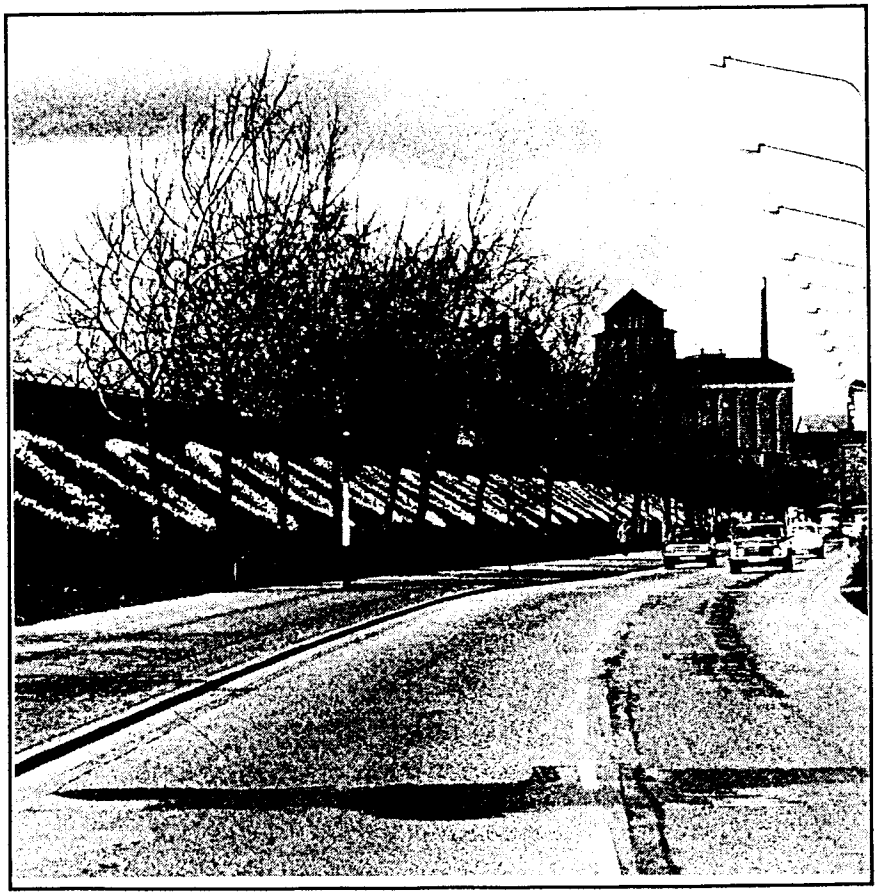
Perhaps the greatest resource toward the combining of art and technology on the highway is Man's entrepreneurial capacity, which is his disposition to look far ahead toward the provision of future services. For the economic gain he neatly assembles goods and services in a thoughtful and careful manner. He pays great attention to the proper combining of these pieces and displays a fastidiousness in what is relevant to the project. But he does not seem to care about what is not immediately relevant to the project and therefore behaves in a reckless fashion with respect to that. The joining of highways sections, the on and off ramps, bridges, overpasses and tunnels, each in themselves is well worked out and then joined in a workmanlike manner with little thought given to the compatibility of the components or the aesthetic of the topography and natural form of the route.

The Chicago loop with the highway tunneling through the Post Office

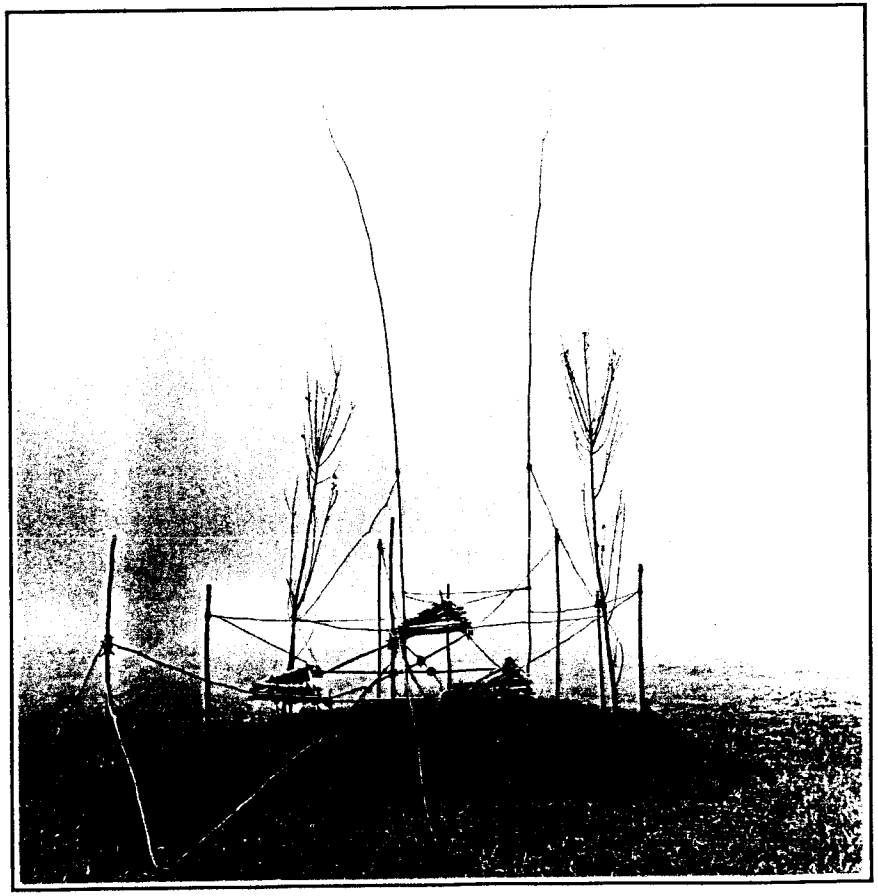


The interaction between the *art* form and the technological form occurs most often by happenstance. The damage done to the environment by the roadway suggests that as professionals serving a useful social function, creating the highway, we conduct operations in a manner that is rational relative to that singular purpose, but thoughtless and damaging with regard to the scene in general. Art has long been considered a means by which society can examine itself, its values and its aspirations. The amount of time that a citizen spends on the national highway is staggering. The miles of roadway with such great human exposure could be used to introduce the art component necessary to create an aesthetically pleasing environment. This approach is based on a market measure of the value placed upon the character of the landscape. Indeed, the commuter has chosen to commute for the aesthetic quality of the living environment, setting, view or the character of the place. The motivations to merge highway and landform are identical; it is the search for an aesthetically pleasing roadway environment where the highway amenities reflect the qualities and aspirations of the society at a local and regional level.

Serpentine floral plantings
reinforce the treed embankment.



Natur-Skulptur by Nils-Udo(b.1937)
Hommage a Gustave Mahler, 1979.



Looking versus Seeing

To clearly describe the subject matter of a work of art, the term "expressive content" is used. Expressive content is the unique fusion of "subject matter" and specific "visual form" which characterizes that particular work. The landscape on which the roadway sits has its own expressive content separate from that of the roadway. These two can also be integrated to form a new "expressive content" which can be seen as a work of art. The objects and incidents along the highway can be viewed as subject matter. The landscape itself can be both subject matter and visual form. We tend to *look* at these elements in a subjective manner. The expressive content which we can *see* is the combined effect of both the subject matter and the visual form; in this case the landform. The ability to *see* the landscape in a moving vehicle is largely dependent on the aesthetic integration of the roadway with the natural landform.

The spatial experience of the highway "strip" is related to man's viewpoint: incarceration in an automobile. When incarcerated the driver is limited to a two-dimensional field of vision framed by the aperture of the windshield. The *looking* is as basic to the highway environment as is locomotion. The *seeing* component requires a more active involvement between the viewer and the landform itself. The complex relationship between the looking

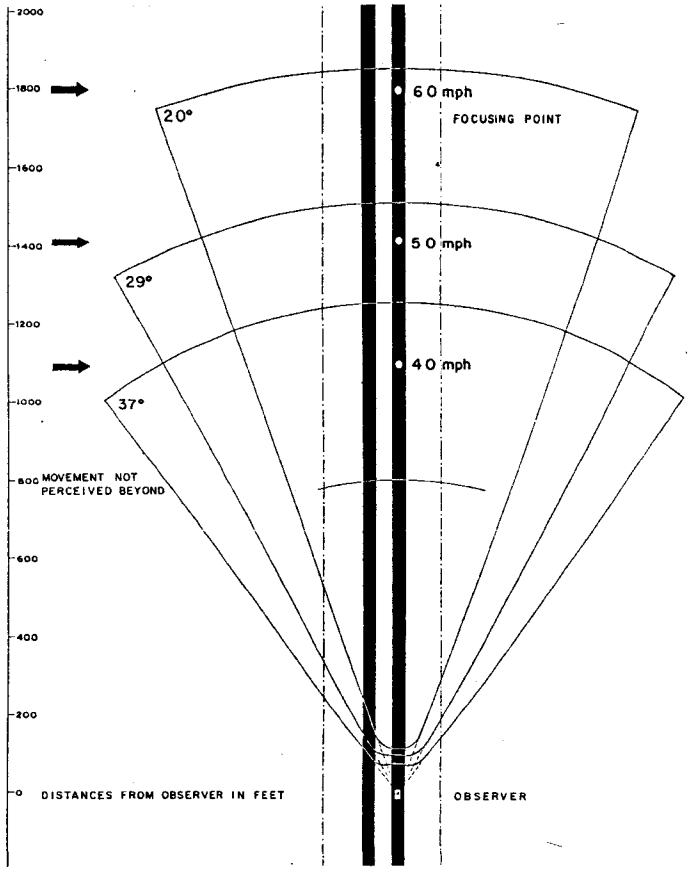
Palisades Interstate Parkway approaching Bear Mountain Ridge, New York.

and the seeing components forms the basis of an effective highway design.

When combined with velocity, the human eye has great difficulty distinguishing the form of the art object over a long distance and tends to compress all similar colors, contrasts, forms and textures into a narrow two-dimensional field of vision. Within this restrictive field, large forms tend to attract immediate attention while gradual changes in spatial or object form seem to progressively blend from one visual step to another. The blending of form reduces the driver's visual awareness of form. In this way our eye moves from point to point following a pattern which may vary with regard to point of origin or concentration but not in expressive content. The nature of this pattern when applied to the highway environment should be considered with care since much feeling can be conveyed using the experience of movement.

The formal relationships that are observed within the frame of the automobile in motion are largely dependent on a perception of line, or direction. How the landform is seen depends on a number of factors: scale, proportion, perspective, color, contrast, massing and edge. While there are many theories about how man sees and perceives space, the visual apparatus: the eye, brain and processes appears to be central to the perception of the highway environment. The three-dimensional aspects of man's nature do not appear to be of equal importance to that imposed by the linearity of the highway.

Focusing distance, angle of vision and distance of foreground detail at 40 mph., 50 mph. and 60 mph.

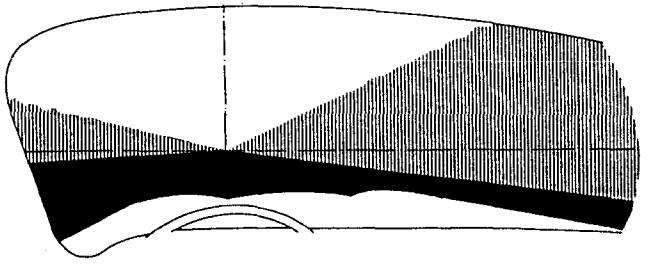


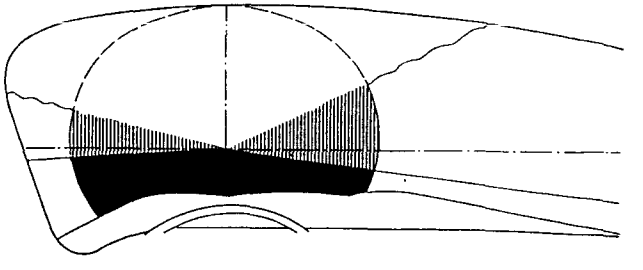
Looking

Motion is capable of favoring and intensifying the empathetic element which exists in both the passive and active states. The effect and efficacy of motion - motion which is rapid in respect to the "norm" established as basic to our physiological nature is passivity. We have a passive attitude toward the dynamics of events which surround us, not a dynamizing effect which would intensify our perceptive and cogitative activity, but an effect which is compelling, spell-binding, blunting our normal perceptive and conscious faculties. Trapped within the highway "corridor", those spatial and perceptual faculties lie dormant until resuscitated at the end of the trip or acted upon by unforeseen events.

The perceptual transformations resulting from speed on the "normal" panorama of the roadway has conditioned the driver's ability to respond to localized changes along the roadway. The consequence of "tunnel vision", created by motion effects, is a driver with a restricted field of vision and a reaction time that is significantly lower than that of a non-highway driver. The new possibilities of visualization and of representation induced by the mode of transportation are unlimited when applied to the current highway environment. The effects of motion places demands on the design of highway related objects that substantially modify their static imagery. Forms that would normally appear in the driver's field of vision as static "serial" elements must be seen as more three-dimensional in order to forewarn of upcoming events. It is important that the designer integrate

Proportion of visual field to windshield at 25 mph. and 60 mph.





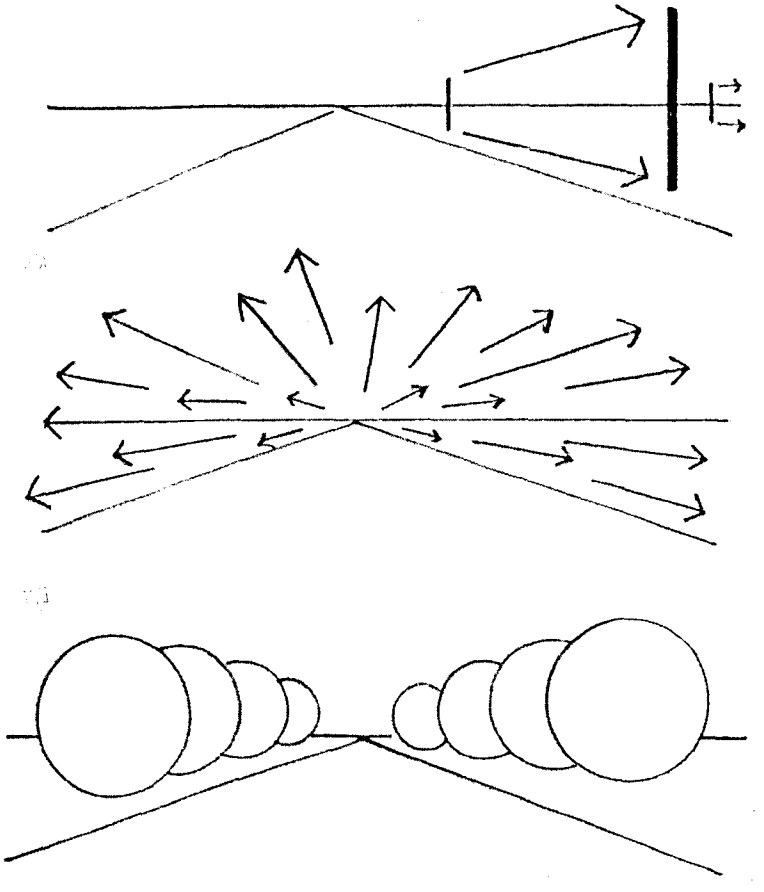
the communicative and aesthetic forms which have sprung up as a result of technological mechanisms. The potential lessons to be derived from cinematography, television and serial animation techniques, when applied to the highway strip, are enormous.

While man's visual ability to *look* versus *see* has been severely conditioned by his world, it is within recent time that he has found himself in contact with a technological condition that profoundly interferes with his ability to remain responsive to visual stimuli. The seeing component is reduced to a primal state when subjected to the rhythmic nature of the roadway. The lowered state of consciousness has been shown to be extensive and creates conditions for the driver and passengers that are quite dangerous. When objects and landscape in the foreground are passing with great speed, and are therefore difficult to register, "tunnel vision" concentrates the driver's attention on the background which often appears to be immobile and therefore becomes a visual constant for the driver to "lock" onto. "Fixation" on static elements in the roadway suggests that visual attention centers on elements that do not exceed a certain quotient of rapidity. The *looking* component is expressed within the fixity of the visual image that exists in the background. The visual "blinders" that are attached to each driver, and frequently the passenger, when in motion creates a narrow field of vision that appears to be only stimulated by "legible" elements scattered along and about the highway landscape.

Confining forms alter drivers' perceptions of speed and safety.

The reading of the elements, which are kinetically perceived, is made possible by the fact that a particular symbolic "element language" is established. The meaning associated with each element is progressively introduced to the driver over a prolonged period of time. For example: a farm complex, located in the driver's visual background, will emerge as a visual element until sufficient information is established necessary for recognition. By the time the element has moved into the foreground, its meaning has been established and discarded for another distant element. In this sense, the driver saw the object through an element language.

Visual clues that help drivers sense motion.



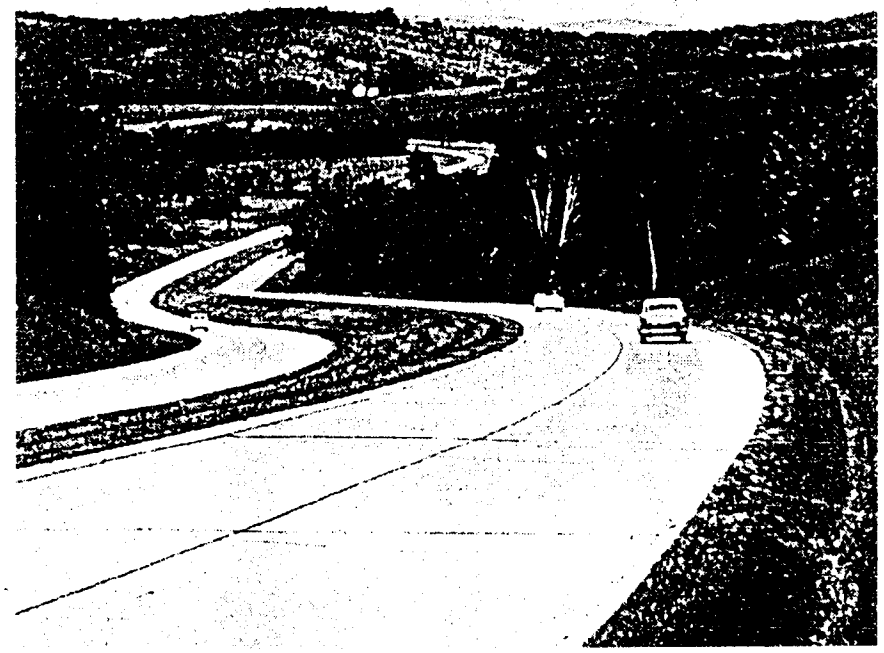
Seeing

Whenever an observer moves from place to place, the pattern of his field of vision undergoes a perspective transformation. The "perspective" is generated from a static point within the landscape. A stationary point has been fixed along the highway strip as a point of observation or an "overlook." This type of stationary persepective is defined as "pure vision" as the observer's visual image is understood from a static position. The majority of the highway experience is limited to this type of condition. While the roadway overlook captures a significant aspect of natural phenomena, the observer must remain stationary. The requirements of perspective force the viewers to position themselves on a predetermined station point in order to obtain the "scenic" aspect of the landscape relative to the highway strip. The natural panorama with its visual content is restricted to a limited number of places along the highway

ribbon. Based on the placement of the overlooks, rest areas and other points of extra-vehicular activity, the frequency appears to be determined by two attitudes: concern for safety and the technical requirements of motion. Little has been given to understanding the internal harmony of the highway from the perspective of the expressive content. The *seeing* component is often completely missing or relegated to a secondary role thus the expressive content of the landscape is seldom realized. The sculptural fusion of the roadway, landform and the objects forms the basis of the landscape which can be seen from the inside-out and the outside-in.

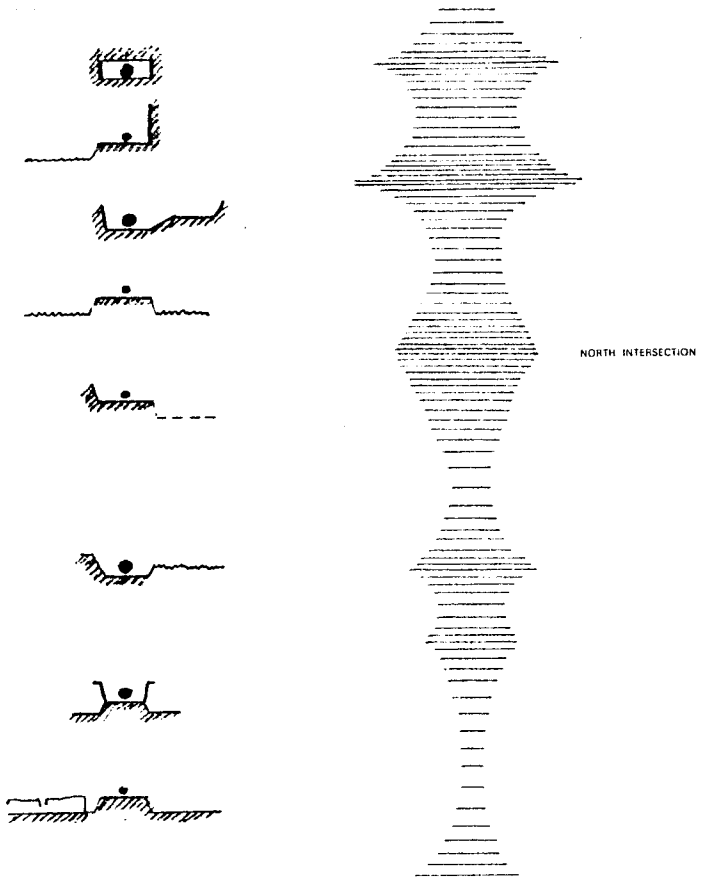
Aside from the sculptural analogy, continuity is an inherent part of the highway environment. The landscape represents a dynamic force, undulating and wavy, that counters the necessity of roadbed alignments and radius of curvature. The effect is one of mismatch between what is understood from the roadway and what is seen from the outside looking in. When the observer moves, the world around him is set in motion. The environmental field of mass, space, light, surface, detail and place appear to be seen as a continuous rotation throughout the highway corridor. The roadway has traditionally been designed from the driver's perspective. As a result, the view has been essentially two-dimensional. The three-dimensionality of the landscape has been pushed to the background in order to express the technological and functional criteria inherent in the design of the highway.

Visual harmony on the Taconic State Parkway.



The visual enjoyment of the highway is sometimes an experience that defies analysis. The expressive content appears to be coincidental as many views are marred by guardrails, concrete parapets or bridge abutments. The movement along the freeway corrdor should provide the driver and the passengers with a sequential and unfolding view of attractive images. The world in motion to the driver should not be abrupt or fragment but continuous and comprehensible. In the urban setting there is a specific need for framed visual settings. The effect of motion requires that the faster the vehicle speed, the narrower the angle of vision. This restrictive view requires the visual field to be designed to such an extent that objects, landmarks or natural events in the distance are featured in order to establish a sense of place and not just a featureless entity to escape through.

Tempo of attention. View From the Road, Appleyard, Lynch, Myer.



Looking and Seeing

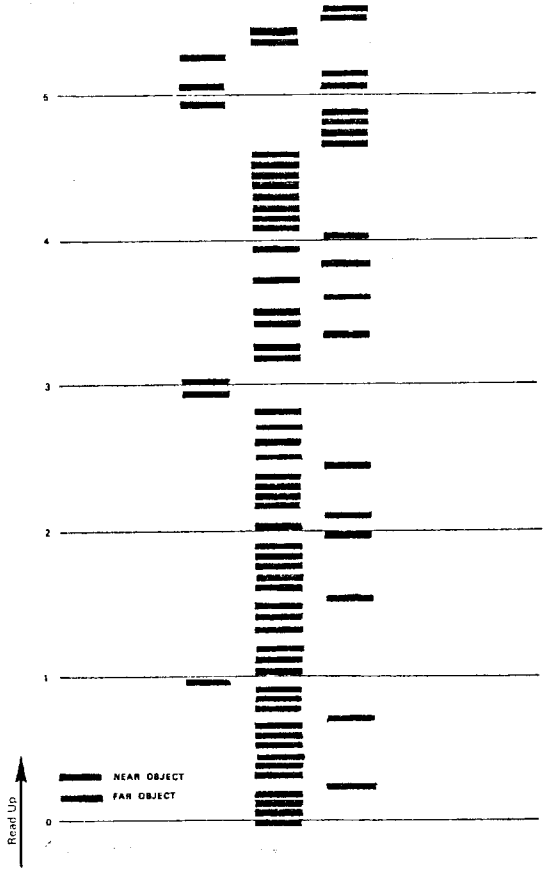
The importance of both looking and seeing in the design of the highway is clear and is in part based on understanding the specific requirements and abilities of the human eye. The thresholds of human vision at rest differ significantly from those in motion. The range of psycho-physiological data collected suggests that the ability to look and see is directly controlled by a number of principles: seeing is dependent on light energy; seeing takes time and is limited in space. There has been sufficient documentation to support the notion that as vehicular speed increases, space perception becomes quite impaired. Space and motion are perceived indirectly, with the help of

memory, by relative changes in size and position of "objects". As the speed increases, the observer gradually underestimates the vehicular speed and therefore is less able to evaluate the relationship between space and motion. The deterioration of the seeing component is inevitable in this setting. While the observer may "look" at the surrounding landscape or urban form, the driver is bound to a very narrow lateral enclosure that, without some variation, can result in a loss of reality thus further reducing the seeing component.

The spatial detachment from the roadway due to the effects of motion is central to this investigation. The loss of human life attributed to a loss of reality occurs on a daily basis and clearly warrants a re-evaluation of current standards and methods employed in the design and planning of the interstate highway system. The relationship between what can be seen and that to be viewed must be integrated within the highway environment. Horizontal and vertical roadway elements carefully conceived can produce a highway experience that broadens the aesthetic value of the trip while at the same time increasing driver safety. The seeing component, through which the expressive content of the roadway is revealed, must be consciously designed with formal goals in mind not simply technological ones.

There are six determinants that must be accomodated in the design of the interstate highway system. Each determinant having very specific expressive content requirements necessary to maintain safety standards and visual quality.

Rhythm and locus of attention. **View From the Road.** Appleyard, Lynch, Myer.

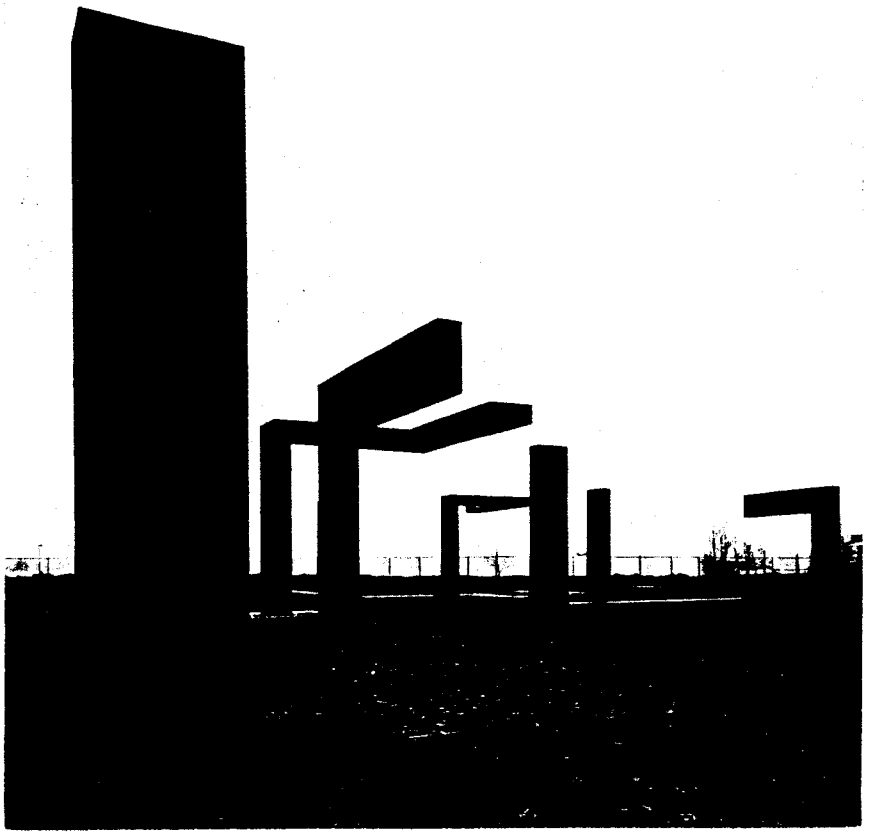


The first determinant of visual form is the **highway environment** which means its relationship to the landscape and adjacent structures. The current emphasis on visual "settings" and "objects" is particularly weak in this respect and ignores even the basic relationship of the highway to the sky. The potential afforded the designer or planner to expand upon basic spatial and object inter-relationships would "particularize" stretches of highway thus attenuating the driving experience.

The second determinant of visual form is the **functional** requirements of the highway corridor. Great emphasis has been placed on the technological solution, little has been done to conceive of the roadway as a means of expressive the sculptural content of the technology employed. The sameness of the technological solution from one end of the highway to the other reduces the impact of the visual image. By stressing differences in technology and problem solving, the designer has another tool to utilize.

The third determinant of form is that of **cultural** and **regional** conditions. Issues of climate, land massing, earth color and light conditions or elevation are seldom accounted for in the design process. An interstate section in the West shows little difference in its aesthetic placement from a similar stretch in New England or the South. There are numerous reasons for the homogenous nature of the roadway such as industrialization, economics, labor and the state of highway technology. A greater emphasis on regional or cultural differences that stress unique ecological or environmental factors should be consid-

Water Works, 1977. Kralingen, Holland. Andre Volten.



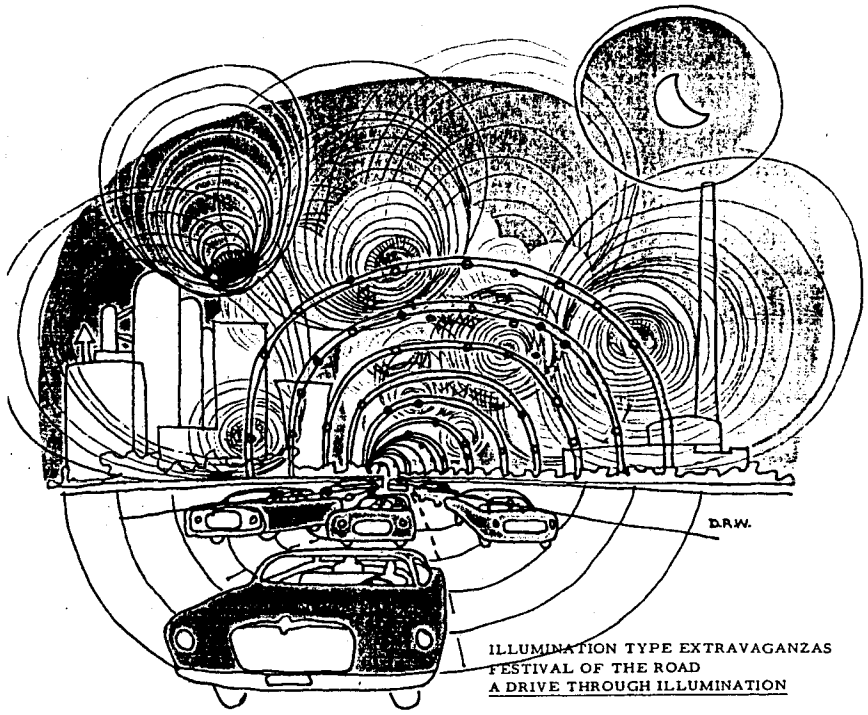
ered. The potential for introducing educational features of the landscape or the regional culture are enormous.

The fourth determinant is that of **material**. While macadam, concrete and steel form the major building materials of the construction palette, the range of material application is quite limited. Little aesthetic variation is encouraged in the placement, forming or surfacing of these primary materials. Since slight surface variation in the texture of the material can produce great visual changes, the potential does exist to increase the application of texture, color and forming of the material.

The fifth determinant of visual form is that of the **experiential** and **physiological** aspects of the highway corridor. Much of the highway system appears to address the more functional aspects of design at the expense of addressing human issues. While the idea of the American Dream is dependent on freedom of movement, the quality of the experience has not been dealt with. The highway represents a "place" to many travelers, and yet few "places" exist along the route to enhance the experience of movement or of rest. The potential exists to create special places along the highway corridor that are dedicated to the quality of the human experience rather than the expiditing of the vehicle.

The last determinant of visual form is concerned with the **intangible** or **"spirit"** of the times. While the roadway represents and type of continuity in time and space, it should also

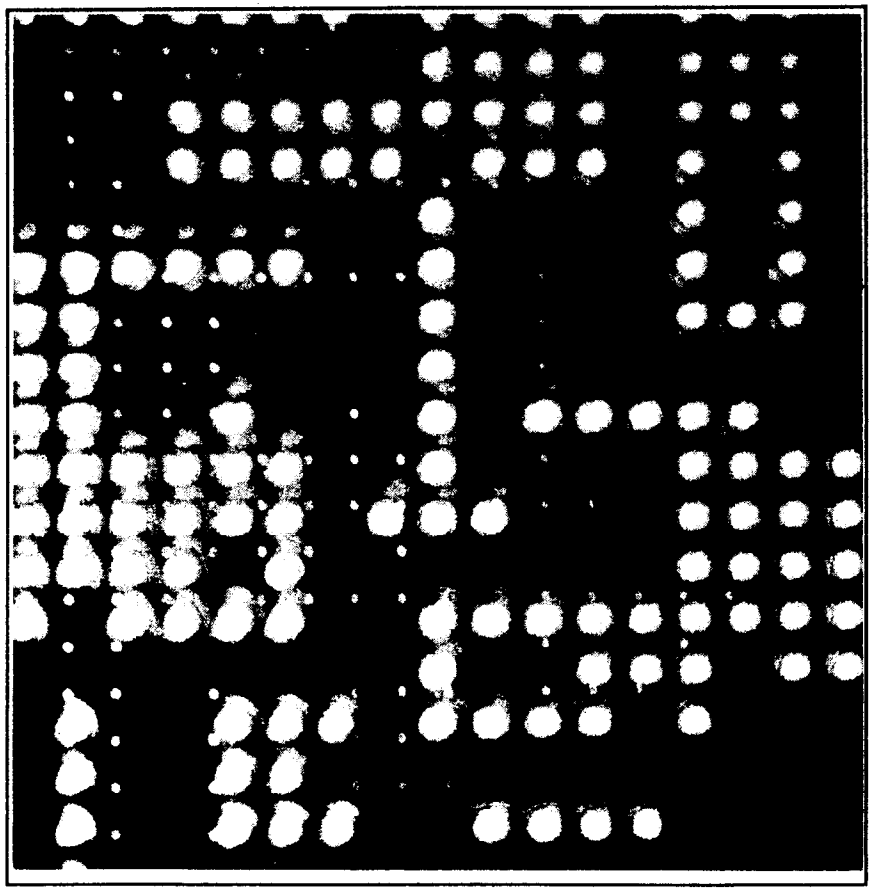
Illumination extravaganza. **Milwaukee Stadium Freeway.** University of Wisconsin, Department of Landscape Architecture.



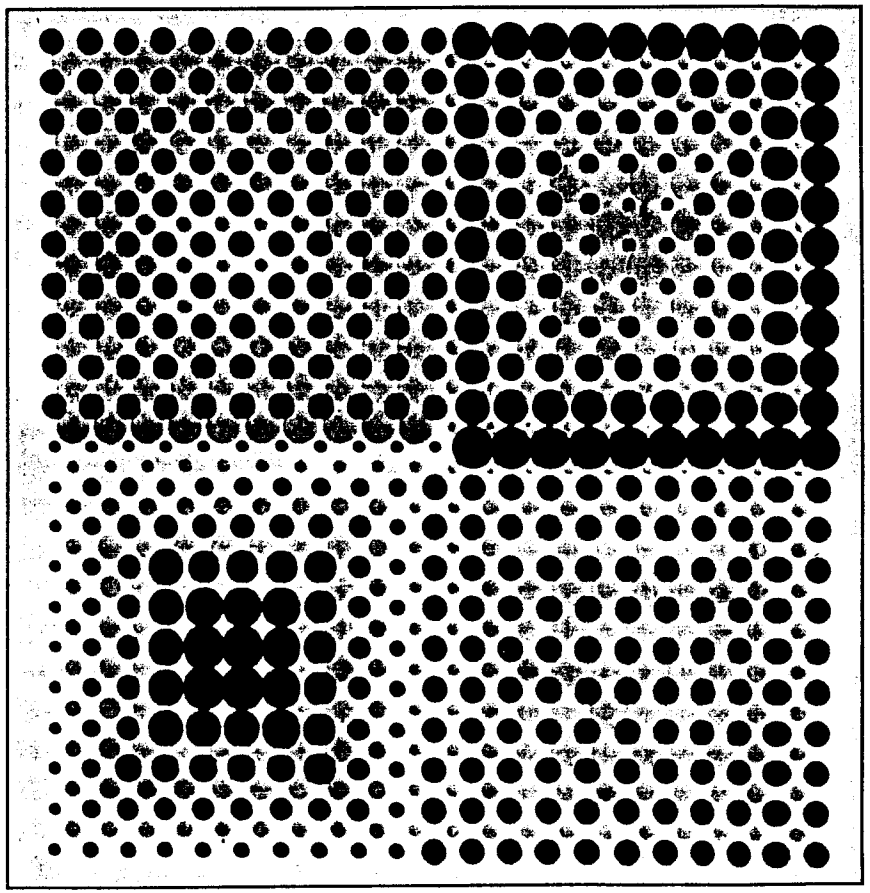
express its respective time. Each decade is expressed by its vitality, its tensions, curiosities and desires for creature comforts. The highway has the far greater potential to express those unique characteristcs of its time and place than simply fulfilling the functional liason between disparate parts of the nation.

The landscape is one continuous experience in time and space, it is a composite expression of everything felt, seen and sensed, t.he unique bonding agent being that of motion. As a visual experience the national landscape is a resource to be experienced, nurtured and maintained. The connection to the landscape in our society is achieved primarily through the mobility afforded by the automobile, and as such, the highway represents the gateway to the natural environment. In a society where change is the only constant, land, roads, utilities, buildings and elements of the landscape must be revitalized on a regular cycle, and the opportunity to re-evaluate and invest in the visual aesthetic exists.

Transformation of surface texture through illumination.
Student Project under Gyorgy Kepes



Transformation of surface texture through patterning.
Student Project under T. Maldonado



HISTORY OF THE ROADWAY

Introduction

The history of roads is the history of the needs of men. Roads express the desires, direction and purpose of the societies they serve. The common term "way" illustrates this clearly.

The English term "road" is derived from the act of riding a horse. The term "way", however, implies the means, the path, the opportunity to reach a goal.

"Ways" came about for different purposes and express this in their form. For nomadic man the hoof led the way and established paths of least resistance between sources of food, water and shelter. Once agriculture was established the paths were those made by domesticated animals on their way to the fields. With the invention of the wheel by the Sumerians came speed and the need for smooth, level, hard paths. With the wheel too came more freight. Commerce. Trade. Defense.

The Sacred Ways in ancient Greece were ceremonial paths leading to oracles through which one could communicate with the gods. At the end of the road a temple stood, each dedicated to a god, whereas, the Royal Way in Egypt was a sacred procession leading to the temples along the Nile and from there to everlasting life after death.

An ancient Roman road.

Civilizations powerful enough to would reach out along paths. The better the roads the farther the reach. Twenty-nine military roads, the *viae militares*, radiated from Rome. These "Ways" stretched 53,000 miles, connecting the capitol with the frontiers. They were laid out on a grid and garrisons were placed at intersections. These military roads, which are such engineering marvels, made no attempt to integrate with the land as they proceeded as straight lines from point to point regardless of natural or man-made obstacles.

In Europe the Roman empire was followed by the Middle Ages and there would be no great projects for a thousand years. With decentralization came the diverse connecting road patterns needed for fiefdoms. No longer did all roads lead to Rome. Trade between Europe and the Far East ceased.

In the same period in South America, the Incas established roads through the Andes with spectacular suspension bridges and masonry. The Incas were only one small tribe that was able to dominate many others. Its main weapon was the passage of information along a dependable highway system. The roads are still used today.

Early American Roadways

The American colonies relied on water routes principally. The land was so heavily timbered and distances were so great that roads were unfeasible. Gradually post roads were established

Approaching the Mont Cenis Pass in the Alps by coach.

for mail traffic.

The first dependable roads were the turnpikes - toll roads commissioned by the state with the profits going to the owner/ operator. This early turnpike era had much in common with one later in the 1940's. In both periods the turnpikes were the finest quality roads available. And they prospered during times when the demand far exceeded the government's capability to supply funds for roads.

The first roads to head west through the Appalachians, such as the Cumberland, were meant to stop the French from holding the interior, or, like the Natchez Trace, to provide insurance in case of trouble with Spain over New Orleans. The waves of pioneers that settled the Midwest traveled over roads blazed by the military. The Cumberland, for instance, was extended to become the National road and reached as far as the capitol of Illinois. Trails across the far west, such as the Santa Fe Trail and the Mullan Road, were laid out by the army and were the only ways available to settlers.

Most of these roads have their origin in the routes established by wildlife. The hoof, the foot, the wheel. Man followed the herds, now he follows the market.

In the years between 1850 and 1900, 1.5 million miles of rural roads were built, mainly on section lines. These were the paths between farms. The important lines of transportation were the

Two miles outside Cleveland, Ohio, 1891.

railroads. Wherever possible, the railways paralled the roadway but this was the age of steam and the roads could not compare, let alone compete, with the rails.

Dawn of the Motor Age

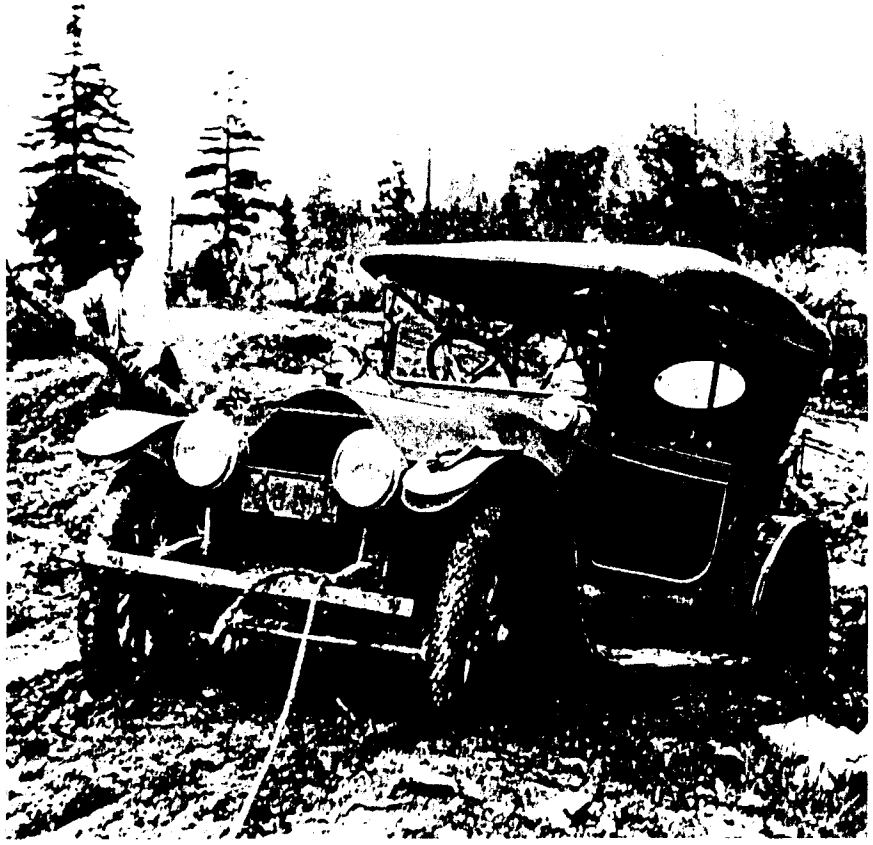
Enter the automobile. From the 1890's on, there would be pressure by owners and manufacturers of cars to improve highways. As late as 1907 there were only 152,662 miles of surfaced road in America. Groups such as the American Automobile Association and the American Highway Association worked for the sake of smooth travel by car.

Trucks were produced in large numbers for the first time during WWI. They were needed for transport and were indispensable for mobilization. The trucking industry took freight away from trains and the large truck is still the principal freight handler in America. The increased burden on highways demanded new attitudes and dimensions in highway construction.

So did the post-war industrial surge and the production of autos. The period between 1921 and 1929 saw the development of the commuter routes The Mount Vernon Memorial Parkway and The Bronx River Parkway. Both were masterworks that could have been paradigms of all highway construction afterwards.

In 1939 the U.S. began rearming for war.The War Department reviewed its strategic highway map, prepared by the Army in

Stuck in the mud in Sacramento Canyon,California.



1922. What was obvious was that thousands of miles of road and 2400 bridges failed to meet the standards necessary to move military equipment. 1941 brought the Defense Highway Act and its strong-arm merger of federal and state money. The next year the Interstate Commerce Commission was given the power to set uniform truck weights and sizes. Then in 1944 the Federal Highway Act brought even more money to the fore. Still missing, however, was a true commitment and coordinated effort between the states and the federal government.

After VJ Day the American economy changed and the peace-time demand for automobiles was as never before. Production jumped from 69,532 in 1945 to 2.1 million in 1946, 3.5 in 1947 and 3.9 million in 1948.

The nation's highways were too narrow, too structurally weak, too poorly paved. Overloaded trucks had seen widespread use during the war. The suburbs, growing fast because of private transportation, demanded more and more ribbon. Construction costs were inflated and engineers were in short supply.

The Modern Toll Road Era

Increased traffic meant increased revenue for the toll roads. Pennsylvania, Maine, New Hampshire and New Jersey had turnpikes that were fine roads that paid handsomely. The public was willing to pay for the privilege of good roads. Other states followed up with tollroads of their own.

A widened rural road still too narrow for 1953 traffic.

All toll roads were access controlled. This significant change in form guaranteed little congestion from strip development. Later the Interstate would adopt this same form. Improvements included especially wide rights-of-way, independently planned lanes and smooth curves. All were to provide for speed, safety and amenities; but mainly speed. Access control as a policy for the Interstate was difficult until the toll roads set the standard.

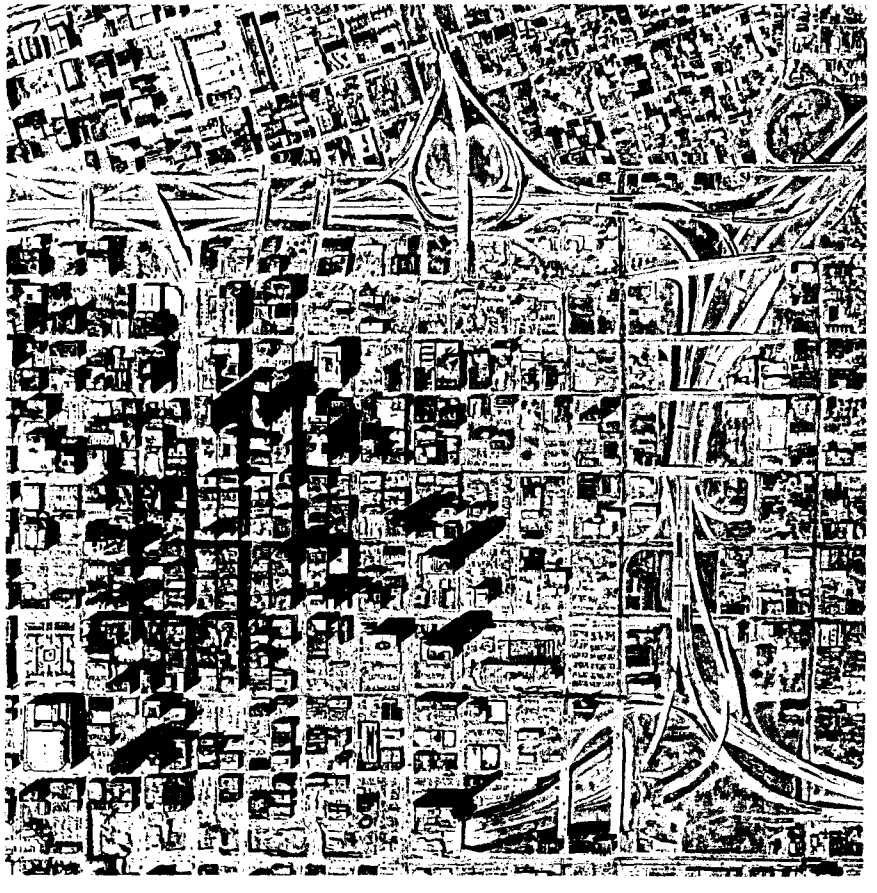
The turnpikes, however, did not fit the bill entirely as a model for the Interstate. Different roads had different standards. Access was insufficient for local or short haul traffic.Perhaps most important was that the turnpikes were not free. This was not appropriate for the Interstate system. Today some stretches of Interstate are turnpikes, but generally that method of financing was rejected in favor of free access to tax-supported public road.

The Freeway

Freeways were and are an expression in America of a person's right to travel. There is the inalienable right to freely move about and the freeway represents that to Americans. Leisure driving is America's number one outdoor activity. Nothing comes close to the hours spent cruising in the car, touring scenic sites or just going out to be seen.

The freeway form allows the traveler to move quickly with little resistance. The citizen is free to roll on with no obstructions.

The inner loop around the Kansas City downtown area.



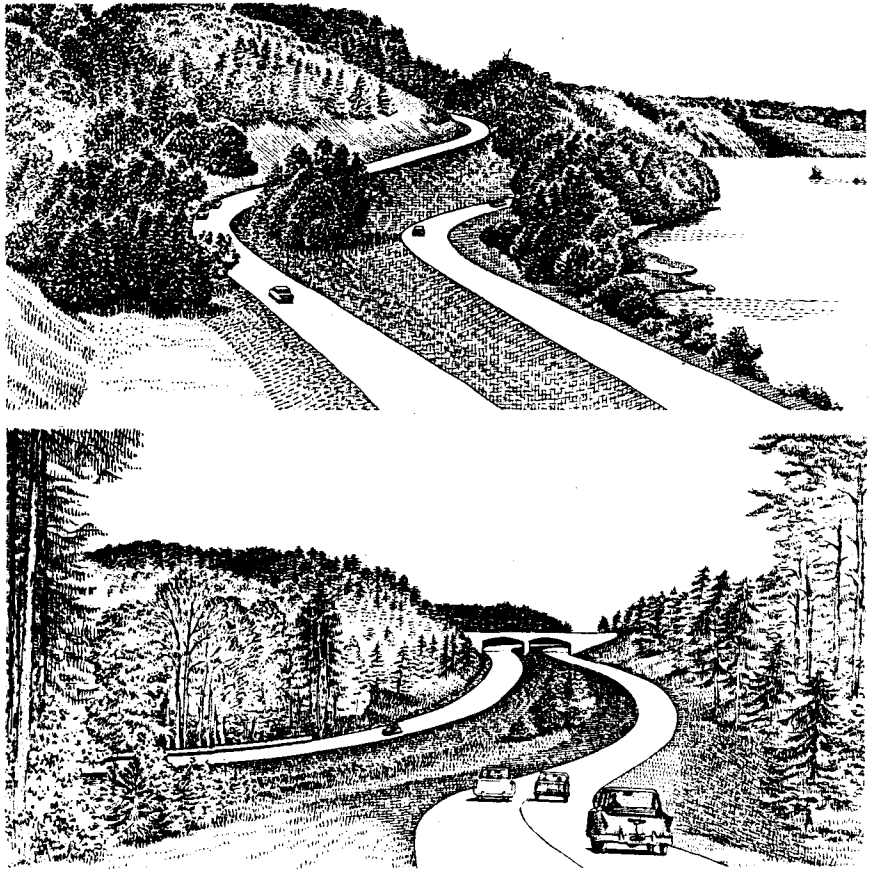
The free man is presented with the means, the tools to zoom around anonymously, snugly belted into the cockpit. This was sensed by the public and spurred interest in a modern Interstate. The Korean conflict, resulted in increased freight and an increase in vehicle registrations which pushed the highway systems to the limit.

Up to this time, roads were simply topped, widened and improved to accept the automobile and the increased traffic. They were, most often, roads that had long existed for foot traffic, later carriage, cart and horse traffic. They were upgraded after they had become obsolete.

The interstate was different. Here were miles of road, conceived, planned and built according to "modern" needs and safety requirements. Rights-of-way took commanded new routes and assumed forms resulting from the impact of modern travel. Where the freeway interfaced with urban patterns, the associated problems necessitated a major restructuring and redefinition of neighborhoods.

The Interstate reflects an important step reached by lawmakers in the forties - that it would be thought of as one large project - not many. That there would be a stand-ardization and a uniformity throughout the states and that the federal government would be setting policy in terms of construction. That the form would be consistent and recognizable anywhere in the nation.

The George Washington and Baltimore-Washington Parkways. Sketch by Philip Lin.



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The federal government would pay the majority of the cost, would set standards and see that they were enforced, would decide routes in general The states would decide exactly where and how routes would be situated and would establish relative "need" for funding. The states needed a fundamental, though limited, control over the impact of the roads. Meanwhile, they agreed to take over much more responsibility in the planning and construction of secondary roads.

Perhaps the time was just right or perhaps the road movement needed a personality to coalesce its power and argue need. In 1950 Dwight D. Eisenhower became president. Eisenhower had unique insight into roads. After WWI, while still in the service, he was assigned to an expedition moving tanks and trucks across the country on the incomplete Lincoln Highway. That expedition took two difficult months. He had also witnessed as General and Commander of the Allied Forces during WWII the potential of Germany's Autobahn and Italy's Autostrade. He was able to carry out the inception of the largest peacetime construction program ever undertaken. He signed into law the Federal-Aid Highway and Highway Reserve Acts of

Painting by Christopher Magadini.

1956. They authorized 25 billion dollars for the Interstate system through 1969. Both the time frame and the amount proved to be miscalculations.

The I-system took many more years to build and is still not quite finished. There are, scattered around the country, access ramps to nowhere and overpasses that don't connect to anything. However, the national landscape is saturated with the freeway form.

The system follows basic transportation channels that have long existed, but because of scale and form has found opponents critical of the resulting environmental impact. The features which make the freeway safe for high-speed travel require and lay claim to, large areas of rights-of-way and cause great and long-term damage to the ecology of the surrounding landscape.

Some of the sensitivity to ecology, which was so evident in the 60's and 70's, grew out of movements begun to block certain highway projects. Where the highwayman talks access to natural beauty for the public, the environ-mentalists describe large-scale destruction of ecosystems and areas, and human congestion and overuse damaging areas previously pristine. The urban scene has the same sort of confrontations. The highwayman talks about access to the central city and the people in the neighborhoods talk of communities split, urban blight, air pollution, noise and traffic congestion.

I-90 along the Mississippi River in Minnesota.

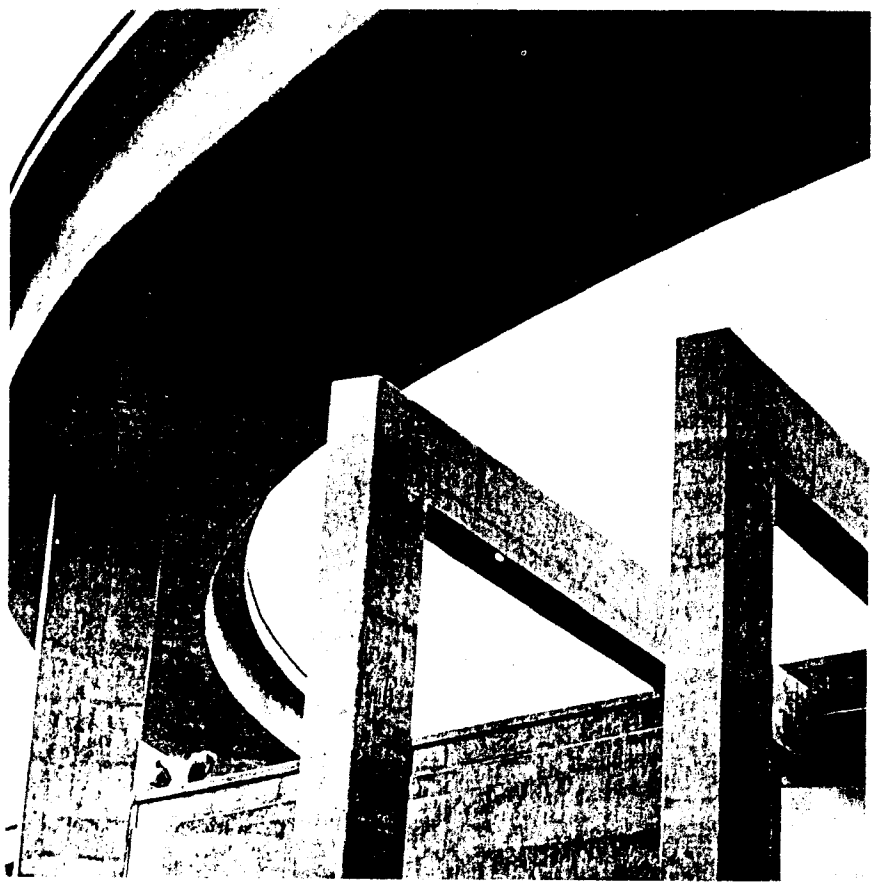
A basic dichotomy exits between providing access and the congestion and demands that follow. The interface between the high-speed freeway and the lower speed streets is a friction zone. At the suburban level the strip architecture is devastating to the development of neighborhoods. Buildings and advertising of just about any kind are allowed on land along freeway frontage zoned as light industrial. Expressways have been enlarged by lane additions again and again, the result being enlarged flow and greater demands down the road.

Much has been written during these building years about the experience of traveling on and living next to the freeway. The driver's high-speed visual experience is explained and described in a number of texts. This kinetic, dynamic experience can be stimulating or hypnotic. Relative position and speed combine to produce patterns and rhythms that affect driver's perceptions.

Freeway architecture can be aesthetically appealing - some projects are the distilled essence of the forces of high-speed auto travel. Spiraling, slithering, sinuous ribbons down which the experience is one of constantly changing position in space. There sometimes is real choreography against a veritable stage set.

And sometimes the freeway is an experience of disorientation, anxiety or boredom. Sometimes the poor siting, or the commercial and industrial strip or the relative perception of speed will

Sweeping viaduct in California. Photo by Lawrence Halprin.



ruin a trip. Too often it is a dirty no-man's land - smelly, noisy, dangerous, bleak, dreary - something to be screened out through the air-conditioning and the stereo.

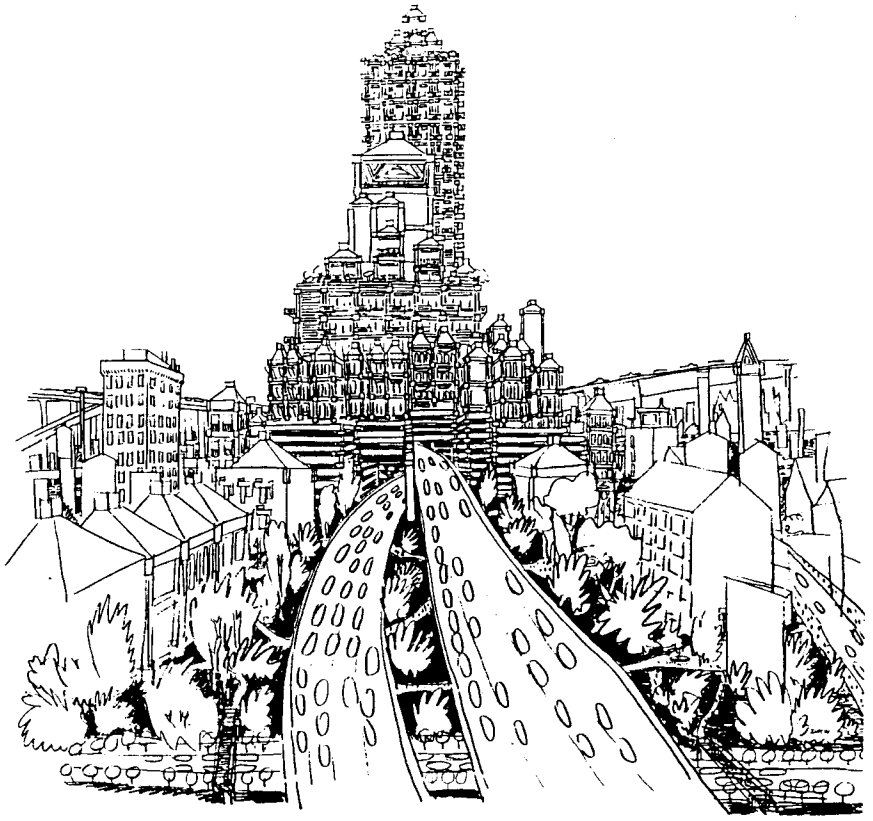
All in all, the I-system today is an impressive project. There will always be grief for those special places lost forever because of the bulldozer. But it is difficult not to be a little awed by the length, breadth and meaning of this road.

It is one of man's most recent grand, socially oriented, progressive projects. It has the scale to stand up to some of the great works of the antiquities that we revere. At its best it enriches our lives. We have access to opportunity, recreation, education, wealth, and welfare over the roads. These physical connections manifest their purpose in the personal connections which result. They are a span across the space between people and are corridors for growth. At the same time they are the ties that bind us to our government, to centralized power. It certainly helps to strengthen the political clout of the federal government. Like the "ways" of the Roman Empire, the U.S. Interstate is a net of influence and control.

The Future of the Roadway

Futurists envision groups of people living in megastructures great planned communities with such things as transportation integrated with the structure. Automatic systems-controlling high-speed travel would be integrated with slower inter-urban

The city gate - an encounter between motion and static mass. Sketch by Lawrence Halprin.



systems. Such large-scale planning, while providing convenience, security and order, would threaten the personal freedoms of the individual. A growing dependence on computers to control technology leads to an acceptance of it as a controller of men's lives. The use of the freeway corridors in the future may lose much of its romanticism when the individual ties himself to an electronic guidance system and gives up issues such as personal choice and skill.

INVENTORY OF RESOURCES

Introduction

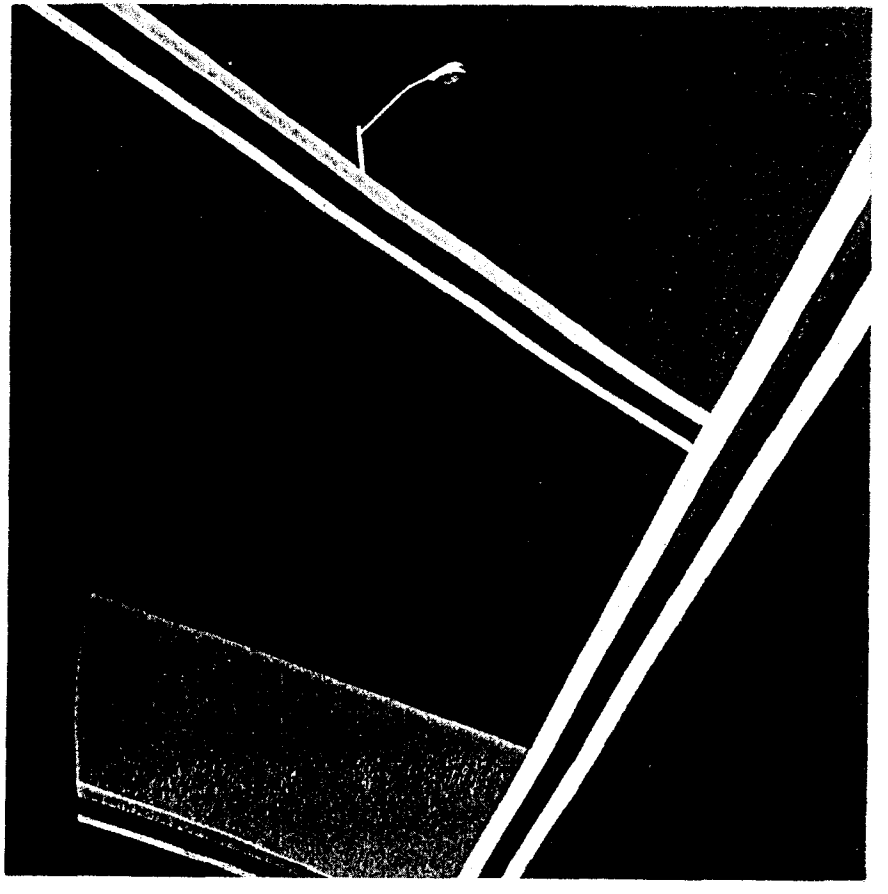
In discussing resources connected with the freeway it seems most appropriate to begin in a general way with the freeway and the landform themselves and then move on to more specific elements occurring on and about these larger forms - elements that support and are applied to the right-of-way.

The Interstate Highway has its own form, different from other roads, that is largely an expression of the speed of travel in the modern world. Its character, impact and import is obviously that of a system made necessary by a technilogical invention - the automobile. The mild grades and gradual curves, its integration or lack of it with the city fabric, its demand for great land areas and its flying over or diving under obstructions are all manifestations of speed.

The freeway is a linear form, parallel to the movement on it. Take away static objects from the view of the motorist and the road itself and the experience of movement down it would become static. That is, the static objects along the way move relative to the motorist while the road seems static and immobile.

The topography of the land has characteristics which are either

The L.A. Freeway.



in conflict or agreement with the highway's linear form. Rivers, lakes, ridges, oceans and mountain ranges have edges which are linear or define linear paths. To integrate the freeway is relatively easy because it is also linear and can follow natural pathways. Plains, wide valleys, plateaus, etc., are planar and will accept the linear roadform readily. Hills, gullies, mountains, canyons, rock outcroppings, etc., are volumetric and will resist efforts to integrate them with the linear road. Of course man insists on connecting two points with the straightest path possible, leading to clashes of dissimilar forms, i.e., the two dimensional road with the three dimensional volumetric landforms.

The land is discontinuous in its form. Unlike the freeway ribbon, the land is always changing for the motorist and is experienced kinetically. It is the relatively static objects and forms along the way that move by and rotate within the field of vision.

Roadform

The highway can, in general, be positioned four different ways: elevated, at-grade, recessed and as a tunnel. As general types they have a lot to do with the existing environment they pass through.

Elevated roads can go just about anywhere and are successful, albeit expensive, solutions to situations where the grade could not ordinarily support a freeway. This is just as true in many

The language of rock formations. Photo by John Reed.

urban settings as well as sensitive natural sites. A certain drawback is its visual impact and its overbearance on its surroundings, especially in the city.

At-grade is the least expensive position for a freeway. It is easiest and fastest to build. However it is visible and requires many attendant structures to respond to cross traffic. It is characterized by large earthmoving to produce the roadbed. It is most easily integrated with planar or linear landforms. In the city it is too visible and noisy and disrupts the textures and patterns of neighborhoods.

Depressed freeways are common in the city because they are generally out of view, noise is controlled and it is easy to bridge across local traffic. However, because of access requirements, it requires a wider right -of-way than the at-grade type, often cutting a swathe up to 400 feet across. The area given in large cities such as Chicago to the recessed freeway is staggering. Especially so considering the value of vertical space in such settings.

Tunnels are great solutions to many kinds of problems relating to integration of highway and landform. The land form remains, the highway moves directly where it wishes. Gateways, exploding panoramas, anticipation, processions, tension and release - in short, the ability to control drivers' experience is built in to the tunnel type. The integration comes from virtual avoidance and acceptance of the topography. Tunnels are expensive and only

Freeways were often routed through inexpensive property. Harbor Freeway, Los Angeles, as it cuts through Watts.

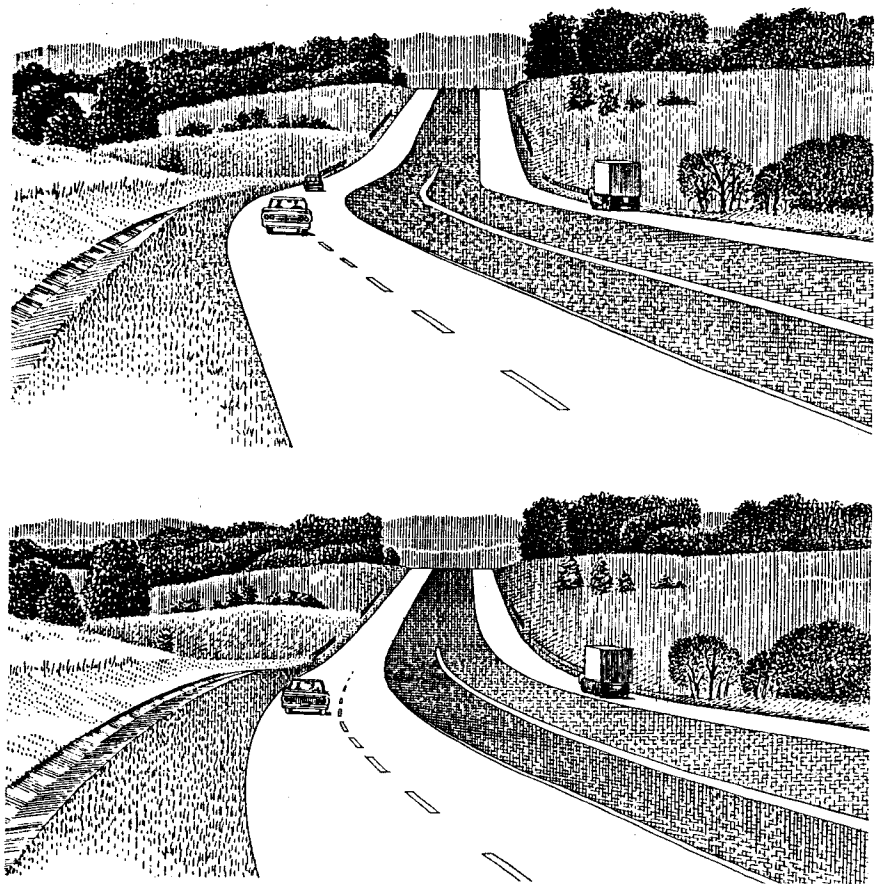
realistic where there is no real need for frequent access. But they are excellent answers for the designer and the users where the landform or cityscape clearly resist the linear, high speed freeway.

Sections of Roman, Macadam, and modern Interstate road construction reveals a reliance on steel reinforcement today. The use of this tensile material makes possible daring forms, thinness of construction, considerable short-term savings on material, time and cost. But in the long run the modern technology cannot compare to the massive beds of antiquity still usable today. Much of the substructure of the modern freeway is in need of replacement because of the effects of road salts on concrete, steel reinforcement and steel structures.

A great deal has been done in the way of developing the shape of the roadbed in terms of curvature and grading. The radii of curves and the transitions leading into and out of them are well documented. Every effort has been made to make the road "read" properly and "drive" safely. These concerns are, again, a response to the higher speeds of freeway travel and the needs inherent to that. The form the ribbon of pavement and the landform strip takes is the natural result of its function.

As limited access roads, freeways depend on large, specialized exits, entrances and interchanges. These large forms are necessary elements which often determine location of the freeway, positioning of the freeway relative to grade, amount of

Curve without and with a spiral transition. Sketch by Philip Lin.

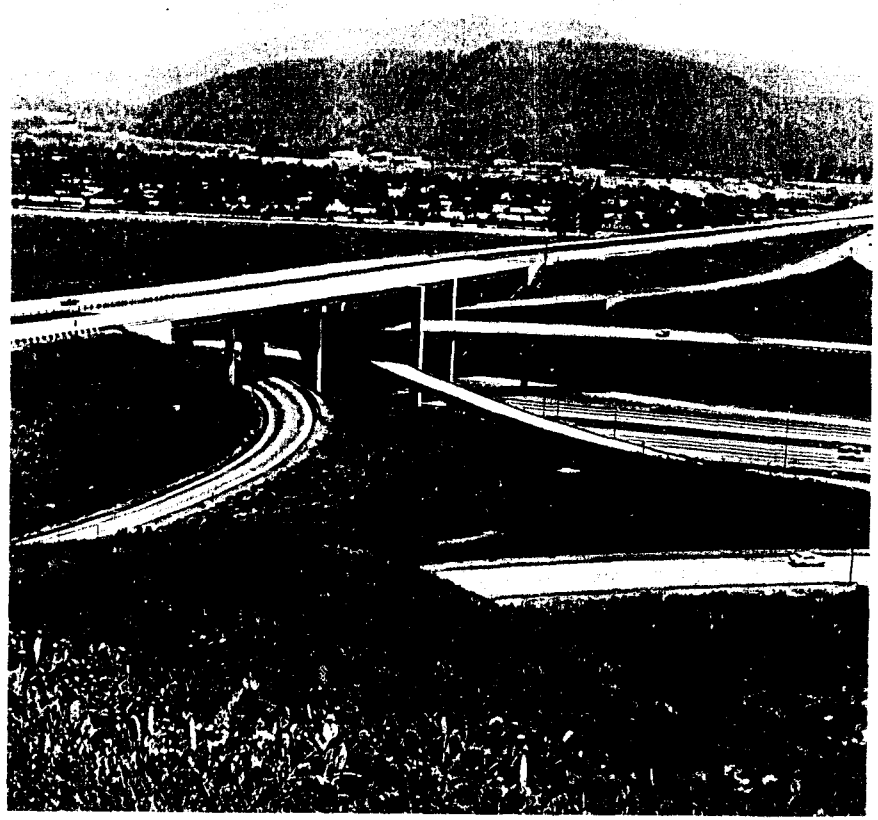


right-of-way acquisition, landscaping, overall costs, driver's views, etc. A few basic types can be shown to influence specific choices, but all relate through their form, the importance of providing smooth transitions during speed and direction changes. Interchanges especially often require very large areas and extensive structure.

Large structures such as bridges, viaducts and tunnels have real impact on the motoring experience. Whether driving over, under or through such linear forms, the motorist is affected by their magnitude and potential for altering the environment. Many receive a lot of attention in design and contribute significantly to the enjoyment of a drive - many are merely generic types that go unnoticed. These roadway structures certainly represent opportunities to act upon drivers' perceptions in a kinetic way as they are used as elements that often counteract the normality of view They leave behind the banal at or below-grade perspective and route the motorist into a sense of corridor or restrictive view that in turn hightens the driver's awareness of his normal reference point. They are a visual, sculptural result of man's favorite mode of transportation.

Surrounding and interlacing the hard surfaced built forms is the median and right-of-way. This "soft" surface is often designed but is clearly of secondary or "left-over" importance. In rural settings the better roads seem to move through landscape that seems relatively untouched or natural. Too frequently however, especially noticeable in urban settings, the median and

Kellog Hill Interchange of the San Bernadino and Orange Freeways.

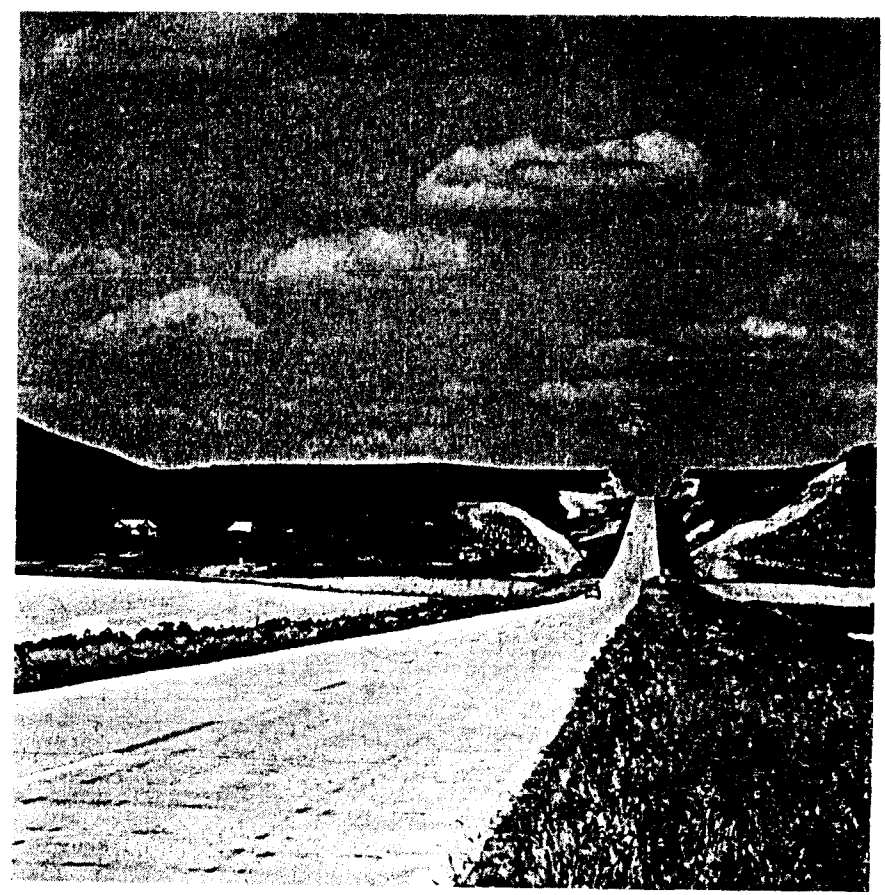


right-of-way are obviously shaped and scaped as a subservient space to the road and show obvious signs of large-scale earth moving.

Some places remind one of the after effects of strip mining or quarrying and seem to have been the result of expedient solutions to such problems as grade, drainage and noise abatement. Today's technology in earth-moving is overwhelming. There is nothing on the surface of the earth that can stop leveling efforts when machines and explosives are brought to bear. Too frequently scars are left on the land that testify to an impatient, insensitive and aggressive human desire to conquer nature for economic reasons.

The Interstate Freeway construction from 1956 to about 1970 was almost frantic in its effort to complete the system as planned. This attitude was certainly somewhat responsible for an environmental conscience which arose in the 60's and 70's. Many lives and properties were touched by freeway construction. Comments of environmental activists during this time period, were published quite extensively by the national media, eventually reached the ears of federal legislators and can be given much of the credit for some of the more sensitive, careful projects undertaken more recently. Today most states have designers and architects on staff in their Highway Departments or Departments of Transportation who are members of divisions expressly concerned with protecting, restoring and enhancing the environment touched by the freeway. The intro-

Lack of integration with the landscape. A state highway in Kansas.



duction of an expanded design aesthetic has been reflected in some recent highway construction.

Landform

Underlying the obvious and visible exterior layer of top soil and vegetation is the geology that characterizes the true shape of the land. Occasionally it projects through and displays itself - usually in dramatic fashion. Where erosion is severe exciting sculptural shapes can result and dominate panoramas. Whenever man tampers with these natural enduring formations the result is obvious and disturbing.

Surface water is one of the great shapers of the land. Rivers, lakes and oceans delineate natural pathways for travel and commerce. They offer level paths of little resistance across the surface of the globe. Very often their shores are natural routes for wheeled vehicles. People are attracted to the dynamic qualities of water - the ever changing textures, colors and moods, and its recreational possibilities. Man has done much to shape and control waterways in the name of progress. Often one defect in their plans has been the loss of a certain natural quality, that dynamic interplay between opposing forces in nature. The freeway system has produced many small lakes by excavating fill for roadbeds or enbankments, sometimes creating recreational spots or areas of potential scenic beauty, often absurdly irregular shaped ponds or wetlands with no ecological niche.

Aerial view of a river estuary.

In an undisturbed area of land there exists an interrelated pattern of separate systems such as soil, flora, fauna, etc. which depend on each other for existence. It is often described as a textile with many threads. Any thread broken or removed tends to weaken the strength of the fabric and jeopardizes the integrity of the whole. Each ecological niche has natural boundaries yet depends on surrounding systems for life support. Something as large in scale, linear in form and unnatural as a superhighway obviously destroys many parts of the ecology and becomes an unnatural barrier between interdependent parts. The man-made ecology of the city is also weakened by the freeway unless it is carefully planned not to break apart neighborhoods and to route goods and services into areas where they are needed.

Intimately tied to the landform is the weather with its many patterns and affects. The landform plays a critical part in the making of weather systems. Thermal patterns, humidity, wind velocities and solar orientation are crucial to weather conditions. Geographical areas with special characteristics invariably have unique weather patterns as a result. The weather in turn is constantly altering the surface of the land. Thaw and freeze cycles and water and wind erosion are strong forces acting upon and creating landforms.

Mentioned earlier was the notion of cities as man-made ecology. A number of fine books have illustrated this idea. The term "cityscape" has been coined to describe that kind of environ-

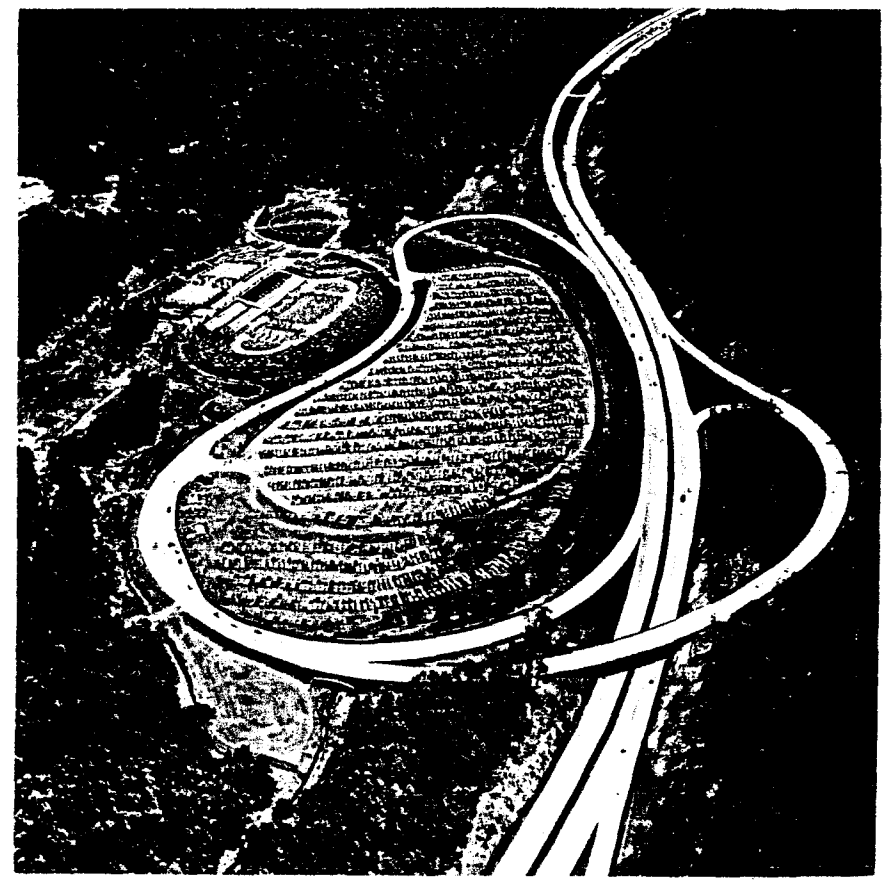
The texture and patterns of central Los Angeles.

ment which man creates and experiences in urban settings. The city"s ecology is much more than surficial shapes and massing. The ecology includes such things as traffic patterns, trade and shipping patterns, Government and social outreach patterns, recreational areas, ethnic and economic patterns, age demographics, industrial areas, etc. The city has a real textile-like patterning to it, a crazy quilt kind of a design that is indicative of the history of that place. The cloth has varied textures, densities and colors. Very obvious from an airplane or a tall building are the great stitched seams that are the freeways. It can be seen that the scale and form of the freeways is not easily integrated with the scale at which man lives in his built forms within the city.

Supporting Forms

Along the freeway are built structures that can be easily identified as supporting forms to the travel process. Human and machine needs require such things as rest stops, gas stations, motels, restaurants (as fast as possible) and certain types of stores. Rest stops are legislated, officially required adjuncts to the road. When done best, they seem to be part of the road and yet put people in touch with the characteristics of that region - things that are not noticed from within a car traveling 55 m.p.h.. They are real opportunities to integrate for the traveler his experience of passing through a region with its history, geography, culture, etc.

Anthony Wayne Recreation Area, Palisades Interstate Parkway.



Gas stations, motels and restaurants have shown a response to automobile travel in their architecture. The automobile has shaped, in an erosion-like way, the forms attending it. Discussed earlier was the way the road is shaped by its use. Similarly, whether consciously or not, designs within the strip along the road have an identifiable quality related to their servant role to the car. Generally, in the U.S., not enough attention has been paid to consciously designing structures which respond to and express the linear, speed-oriented modern freeway.

A service area intergrated with a turnpike in Oklahoma.

Applied Forms

There are a number of elements applied to the overall form that is the highway. These elements are technical necessities required by safety and driver orientation. They include signs, reflectors, line patterns, barriers and lights. They also include larger scale elements such as abutments, walls, ceilings (in tunnels) and any building that might be integrated directly with the road.

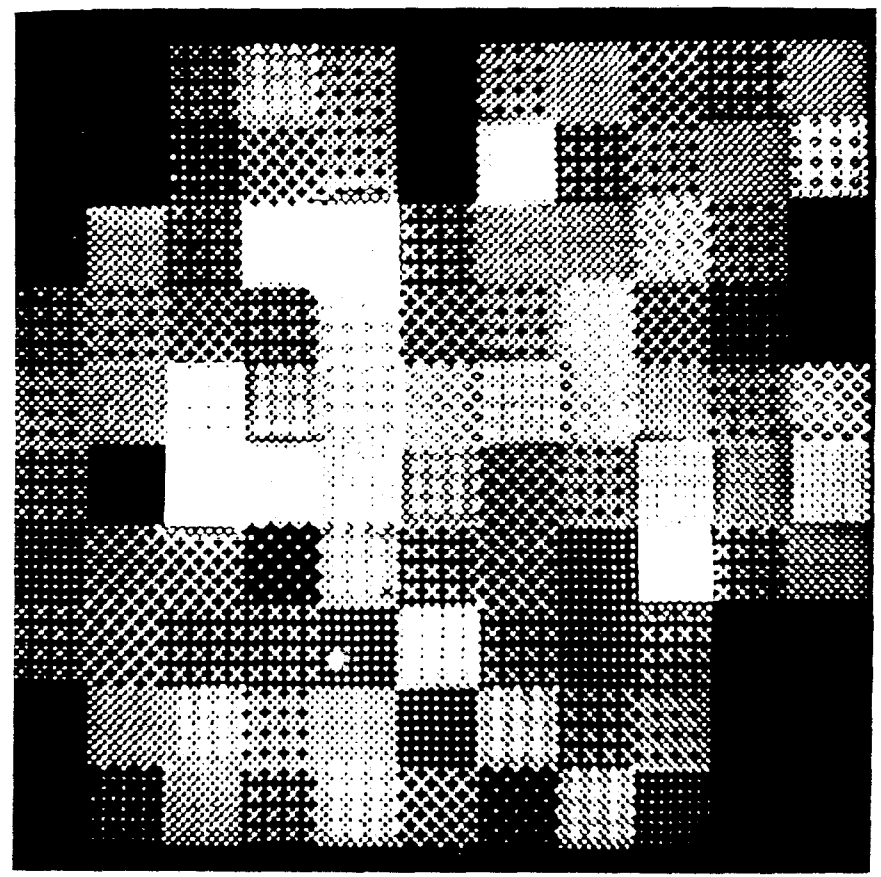
Signs are important as a topic because they compete for the attention of the driver. They are placed where the driver will look and they are designed to be easily read and understood. Some signs are official, relatively small, close to the road, concise, standardized and placed unobtrusively. Other signs are commercial, gigantic, off to the side on private land, gaudy and placed as obtrusively as possible. The Highway Beautification

Act during the Johnson administration did little to keep aggressive commercial interests from despoiling the horizon along the freeway. Any areas zoned as light-industrial, a common zoning along the freeway, can support huge, overbearing billboards. Despite the obvious intention of the Act to remove obnoxious billboards from view, the courts and local governments have failed to carry out the spirit of the law. It can be demonstrated that fewer and smaller signs provide adequate information. Travel on the freeways today includes a chaotic, dissonant, abrasive string of commercial advertising. Official signage does not have to be boring. There is a great potential for exciting graphics that accentuate important information. Graphics that work kinetically as the viewer moves by are especially promising and present information over a greater viewing time period.

Reflectors, an obvious safety feature, create a kinetic experience when they are placed regularly down the road. Interesting rhythms and progressions that could influence drivers' perceptions can be composed. Color, size and shape could also be used to develop motifs. This process, like the lively arts, is experienced through time.

Lights can do the same thing. There is the added potential of their ability to light areas and take forms. Everyone recognizes the esthetic affect of graceful light poles marching down the road, enhancing perspective, They are surrounded by fields, cones of light. Lights can also be shaped - i.e. globes, tubes etc.

A sequence of computer-generated rainfall patterns at ten- second intervals. Bell Telephone Laboratories.



Linear displays, flashing choreography, color, shape and size used in creative ways suggest that special events along the way at special places could have dynamic effects.

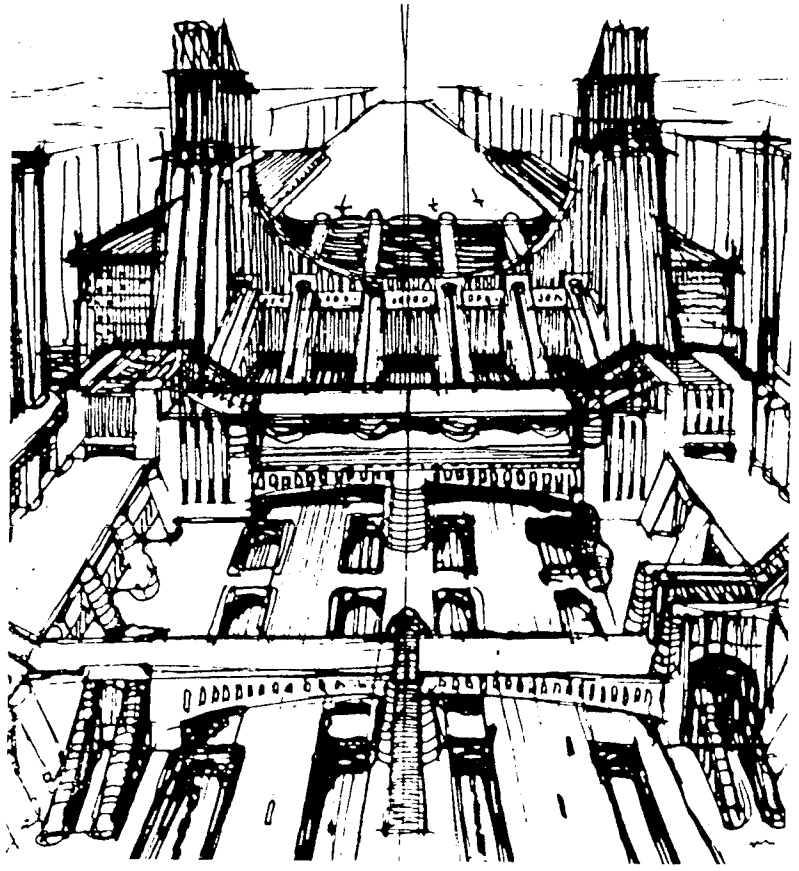
Barriers are important and have functional characteristics. There are crash, sight and sound barriers. The form of crash barriers has been determined experimentally. They generally are very unobtrusive. They are standardized and become almost invisible through familiarity. Sight barriers can take many forms and be constructed of many diverse materials. Often trees and shrubs are the best solutions.

Sound barriers, however, need to be solid enough to reflect or absorb noise without transmitting any. Vegetation is very inefficient. Berming soil works well. Sight and sound barriers are generally large elements which line the road, blocking views and altering perceptions of space and speed. Because of their size and impact both on the road and off, they should be used carefully. Citizens should be included in the planning stages.

Like sound and crash barriers, abutments and retaining walls are large elements that can intrude on and dominate the driver's perception of space. These elements ask for some kind of architectural treatment to enhance and unify the road. The forms should respond to human scale and human responses to the kinetic experience.

There have been attempts to integrate buildings directly with

"Stazione per treni ad aerei." Proposal by Antonio Sant' Elia. Integration of tunnel and architecture with the roadbed.



the freeway. It is surprising that more of the air space over freeways is not used. In a place like Chicago, where property downtown is sold by the square inch, that vertical space is very valuable. The french architect Le Corbusier drew an idea for a very long linear building on top of which were freeways. The freeway was intended to connect the interior of the city with the ground on the outside of the city proper. Frank Lloyd Wright proposed a new configuration for the freeway within the city grid. Louis Kahn proposed a complete renewal of the highway and traffic movement systems in Philadelphia.

Actual projects have proven to be very successful, which leads one to wonder again why there is so little of it. The freeway in the city should run through, under and over buildings. The driver experiences the building approaching, the building engulfing him, and the release when he catapults out the other side. This would be the most powerful and purposeful integration between the highway and the cityscape.

Man-made landscape surrounding man-made pathways. In the country the strip next to the freeway is being built up to the extent that there are linear communities forming. It makes sense for those communities to engulf, enframe and straddle the road. This relationship, along the strip roadway, often results in visual blight. The potential interaction between the highway and public transportation is enormous but untapped.

Recessed roads in large cities are perfect candidates for

New York City.
Aerial View of Manhattan

bridging by buildings. It would be imperative that this integration takes into account and designs for the road user. Extensive bridging of the road creates a tunnel-like effect which, as mentioned earlier, has the potential to be the most dynamic and intense of all driving experiences.

ABSTRACTS

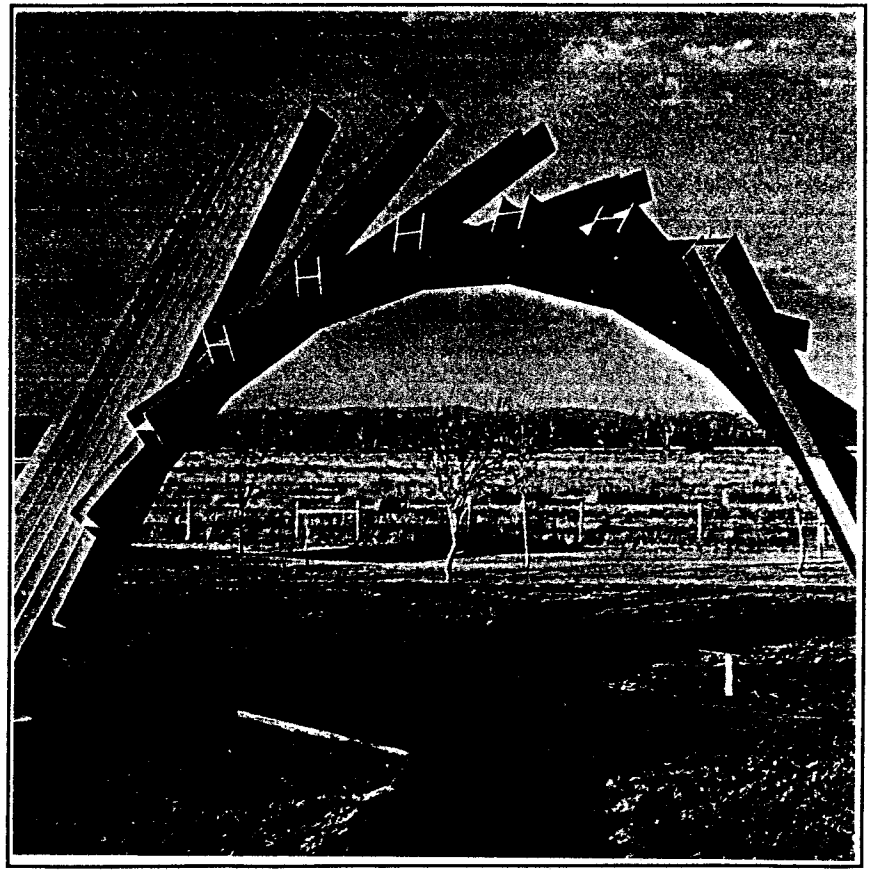
Introduction

The objective of this part of the abstract research was to determine the degree to which the American landscape, under the influence of the interstate highway system had been destroyed, re-shaped or modified through applicable literature. Another objective was to determine the range of existing formal design concepts, theoretical bases and intentions that underlie highway planning processes. This information includes the determination of the "state of the art" form response.

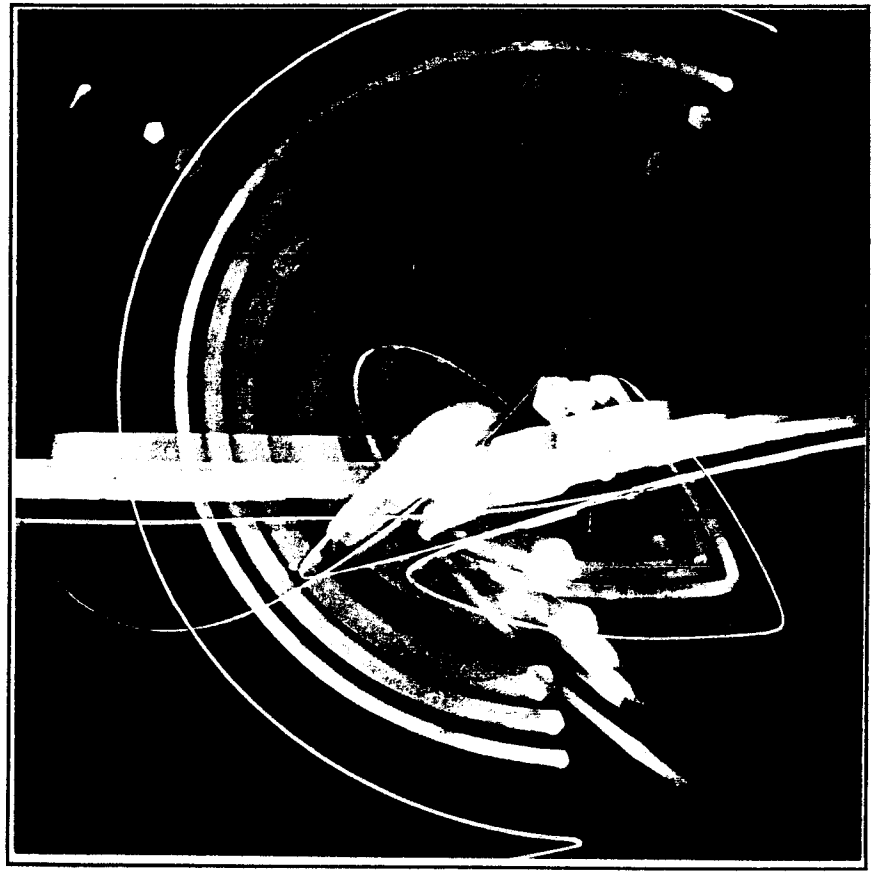
The acquired data and information fell into three distinct categories: functional and safety, techno-material and formal. Of the available material, asignificant majority fell into the first two categories. Since the primary emphasis of this project was to further the formal design issues, the abstracted books and journals, within this section, reflect a desire to introduce material that meets four specific conditions: cultural, natural, historical and environmental factors.

The cultural selection presents ideas that deals with aesthetics, art, sculpture, painting and architectural issues. The natural of motion and its effect on human vision is covered in a number of abstracts. The literature covering the natural landscape stresses the ecological, geological and topological aspects of

Nebraska Interstate 80.
Bicentennial Sculpture Project, 1976
Linda Howard. " Up/Over"



Motion Study
Photo by M. Flint & F. Williams, M.I.T.



the land. In addition, issues of land preservation, conservation and development are addressed. The historical literature focuses on the value of the land within the historical framework of America. The archaeological value of the landform is also discussed at the rural and urban scales. Lastly, the environmental literature stress the role of planning as a major component in the design of the highway corridor. Further, the relational aspects of the highway and its context are explored.

The abstracts are intended to present formal design viewpoints that, in and of themselves, represent an ideology that stresses the value of the landscape and the potential for a much higher level of "expressive content". Ideas, directions, attitudes and philosophies are presented to suggest the untapped design potential that is available. The abstracts synthesize each piece of literature to highlight the issues that are most applicable to the project.

AMERICA'S HIGHWAYS; 1776-1976

U.S. Department of Transportation, Federal Highway Administration, Washington, D.C., 1978

This book deals with the nation's highways on two fronts: - the general history of the system's development parallel with the country's, and matters relating to technical aspects of highway transportation. The country's development as a great power is attributed to the success of the highway system.

The historic section begins with the primitive state of overland transportation in the colonial period. Wheeled vehicles had no place on the early roads - the norm was travel by foot or horseback. Soon after came a period marked by turnpike works undertaken by private interests authorized by the states. These soon turned westward.

The federal government was slow to get involved despite a comprehensive study and set of recommendations by Secretary of the Treasury Albert Gallatin in 1808. States were largely responsible for road construction. A number of military roads in the territories were developed by the federal government for defense. These were often the only paths available to settlers.

In the years between 1850 and 1900 1.5 million miles of rural roads were built, mainly on section lines. However, these roads were little competition for the railroads and their ability to handle freight.

It was not until the 1890's that the states, and later the federal government, felt the need for improved surfaces and mapping as part of the "Good Roads" movement. The Office of Road Inquiry (begun in 1983) within the Department of Agriculture had the influential and dynamic General Roy Stone at its head. He inaugurated a policy of "object lesson roads" which were successful. In 1907 a National Road Inventory was completed. With 2,151,510 miles of rural public roads only 152,662 had any kind of special surfacing.

The Motor Age changed the nation's perception of travel and led to formation of such groups as the American Automobile Association, the American Highway Association, and eventually the American Association of State Highway Officials. These groups were instrumental in lobbying the federal government for funds. The Shackleford Bill, passe in 1916, was the beginning of the federal subsidy to the states for road construction.

With World War I and the war effort came the beginnings of the trucking industry and the demonstrated need for interstate travel, even in severe weather. In the following years the railroads lost millions of tons of freight to trucking.

Production of automobiles increased dramatically between 1921 and 1929. Accompanying that was an overwhelming

West Virginia's Route 2 along the Ohio River.
An excavation of over 5 million cubic yards of earth.

increase in traffic congestion and accidents. This period saw a decided improvement in road construction technology and design for safety - parkways and divided highways being the best examples. This period saw the construction of the Mount Vernon Memorial Parkway and the Bronx River Parkway.

The next significant period was that of the mobilization effort for World War II. While 1941 saw the peak of the construction boom begun in 1921, by 1943 the only work done was strictly for defense purposes. Production of cars stopped. Shortages of steel, rubber and oil stalled civilian development and caused a marked drop in tax revenues to the states.

The postwar period was one of a massive shift to peacetime economy. States expanded their highway funding, finding increasing revenue in gasoline taxes. A significant toll road era began, resulting in a high standard of engineering and amenities unmatched by state highways. There arose, however, a fear that free access roads would disappear and that free transportation would be stifled. The issue of national defense was raised again and again.

President Eisenhower inspired the states' governors and Congress to legislate a new grand plan for federally funded interstate roads. This led to the Federal-Aid Highway and Highway Revenue Acts of 1956 and the guarantee of a standardized regulated interstate system.

ARCHIGRAPHIA

Walter Herdig, Editor
Hastings House, New York,. 1978

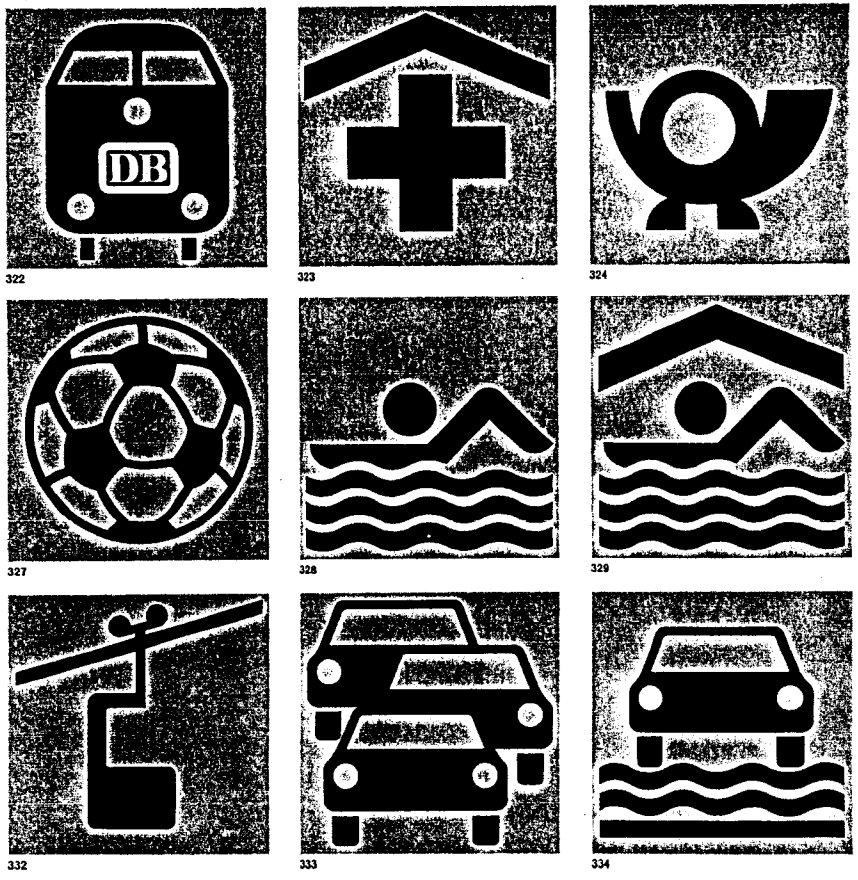
Archigraphia reviews some of the most recent and effective attempts at graphics that put order into the optical chaos of contemporary society. The first principle of the environmental designer should be the integration of art and architecture and the unity of function and aesthetics. The city dweller should be provided with easily comprehensible orientation and signage both aesthetically attractive and effective.

There are six sections in the book:

1. Pictograms and Symbol Signs
2. Traffic and Highway signage
3. Visual Guidance Systems
4. Graphics and Lettering on Buildings
5. Super-graphics and Animated Walls
6. Transportation and Vehicle Graphics

It becomes obvious that there is a connection between the need for such graphics and the speed and separation of the viewer relative to the highway environment. Most of this work is for the person traveling at relatively high speed in an automobile. Symbols, animated walls, Super-graphics, Visual Guidance, etc. - these are for individuals who have

Pictograms by Dieter Willich for Frankfurt Airport.



"Participatory Mural Environment" Relief wall sign in a Brooklyn School. Robert Propper and Dorothea Elman.

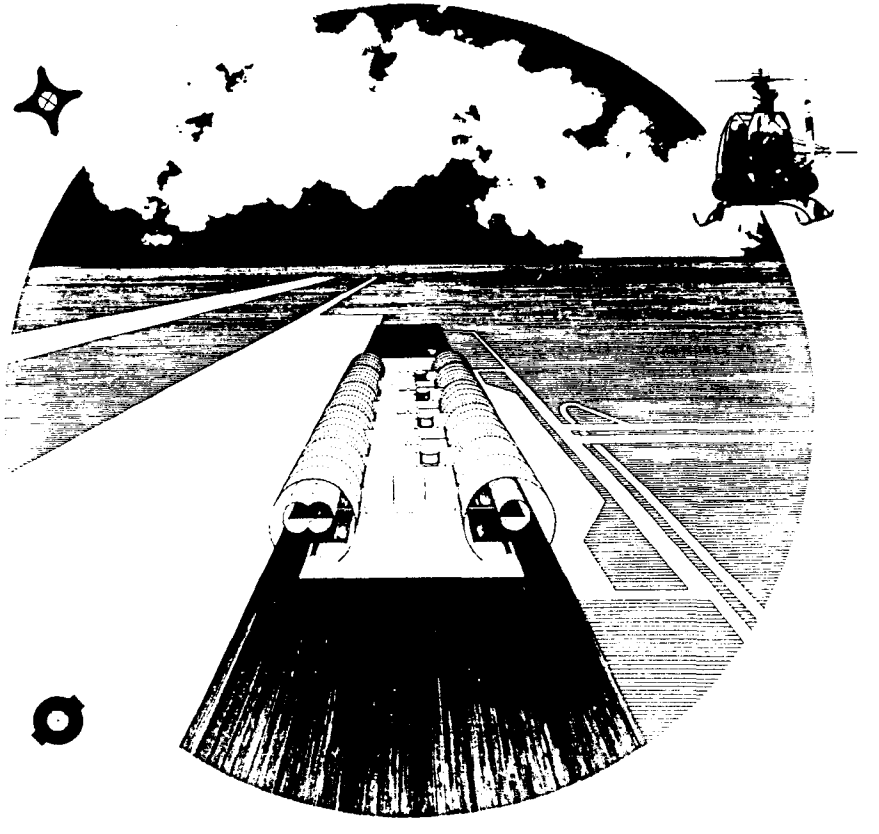
no time and no opportunity to move closer to the sign or synthesize a wordy message. Images with instant recognition are necessary.

Included are two case studies - American Institute of Graphic Art's signs for the U.S. Department of Transportation and Vignelli's standards manual for the New York Transit Authority.

ARCHITECTURE 2000: PREDICTIONS AND METHODS

Charles Jencks
Praeger Publishers, New York, N.Y., 1971

Transportation Interchange, 1965. Friedrich St. Florian.

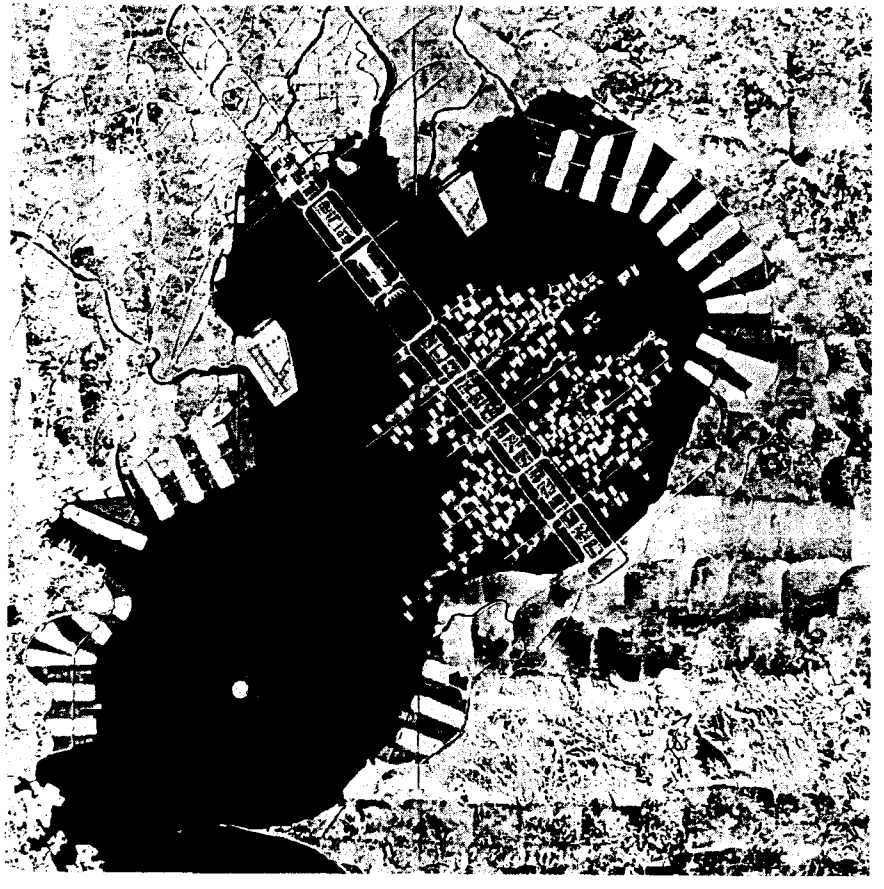


The future is unavoidable and so are the methods of predicting future events. The interplay between expectation and confirmation forms the basic model of the hypothesis for future events.

The influence of the "Oedipus effect" on population suggests that, firstly, there is an irreducible element of uncertainty in all social predictions caused by an interaction between observer and observed, and, secondly, the effect of ideas and predictions on the actual course of events is the essential key. Future trends appear on the surface to be inevitable, but they can be altered. If trends did not exist, argues Jencks, we would have to invent them, because to a large extent they constitute the common framework of continuities on which we speculate and act.

By using six major traditions that remain essentially autonomous, a structural analysis is established by Jencks to develop future models. The six classifications comprise the major tendencies which have occurred since 1920, as well as demonstrate how civilizations tend to pulsate between opposing terminologies. Thus when a cluster of concepts is explored, exhausted, and used up by the society, either a new stage appears or a reaction to the

Tokyo Bay Plan, 1960. Kenzo Tange and Metabolists.



previous cluster emerges.

With modern techniques, the indoors and outdoors are merging, as are the qualities of night and day, summer and winter, and north and south. The thesis is advanced that in the near future large populations will inhabit a city/country which is air-conditioned, lit for the 24 hour cycle, fully serviced, and continually alive with activities. The visual blurring of the differences between nature and the culture of the environment is paralleled by the reconceptualization of nature and culture as people's knowledge and development increases. The state of complex ordering is transferred through a work of art, ultimately transforming the viewer so that he too can attain a balance within the framework of nature and culture.

Jencks maintains that future discoveries which will appear on all fronts will lead to new forms of belief that will have strong similarities to those of the past. In this sense, those cultural 'object models' that shape the environment will evolve into each other creating a transient perception of change. The duality created by future change between people and their environment will require 'critical rationalism' to underline the fact that if humans are to survive we will need both rational thought and constructive criticism to work in a synergistic manner.

ART AND TECHNICS

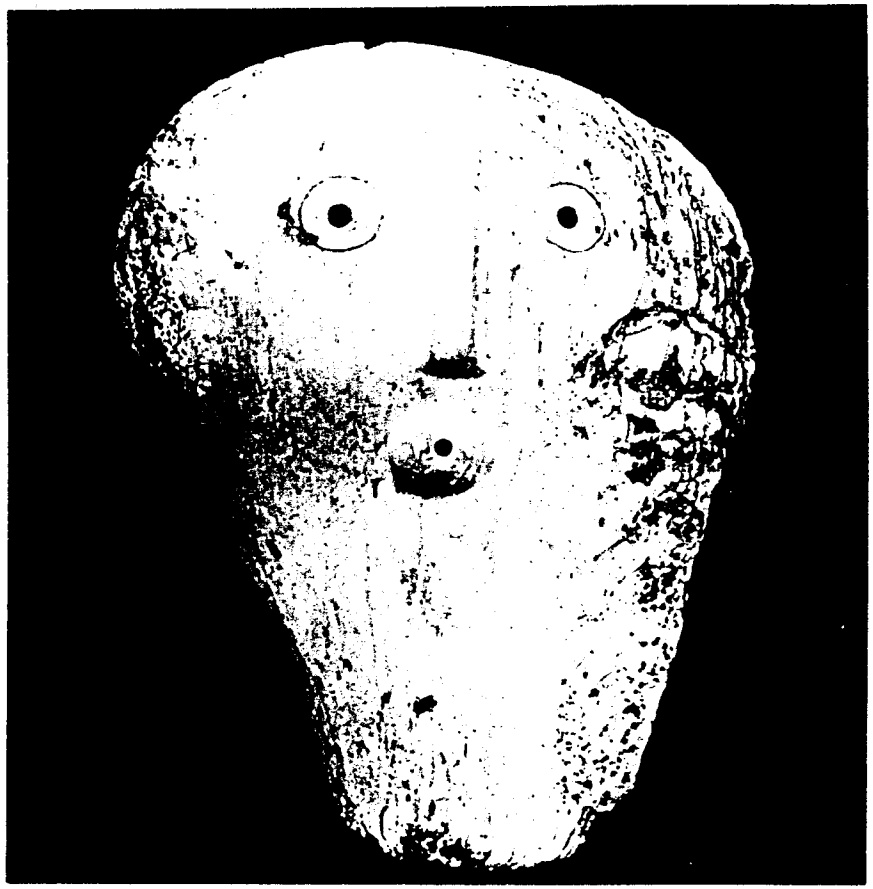
Lewis Mumford
Columbia University Press, New York, N.Y. 1952

Art and Technics is a series of six lectures delivered at Columbia University in 1951. Each lecture is devoted to a specific aspect of the artistic, or subjective, and the technical, or objective, impulses in the human being. In Art and the Symbol, the role of scientific learning and mechanical invention is investigated at the expense of the spiritual and philosophical aspects of the human being. With the advent of tendencies towards mechanical organization and robotic environments, the machine is displacing man from the center of the equation and reducing him "to the mere shadow" of the machine he created.

Through the advance of technics an environment and an orderly life style have evolved that stress uniformity, regularity, mechanical accuracy and reliability to a high degree of perfection. Art and technics both represent formative aspects of the human organism. Art stands for the inner symbolic person that is being denied by the technocracy of societal "objectivity".

In the Tool and the Object, Mumford explores the change in society that has resulted in a tool-minded, thing-minded and object-minded being totally distrustful of symbols such as language, thought, numbers and logic. Ours is a tool based

Shellmask from Lick Creek Mound, Tennessee.



Racing driver's shock-insulated helmet.

society producing objects no more coherent and as devoid of art as the toolmaker himself. The capacity for order appears to be the source of a particularly human value. The repetitive and iterative nature of the human machine has turned him towards technics and the object and away from art and the symbol.

In From Handicraft to Machine Art, Mumford explores the historical perspective of modern man's infatuation and ultimate separation from the environment through the influence of the machine. When society becomes mechanized, men are themselves transformed into mechanical, uniform, replaceable parts, or they teach themselves how to perform standardized and repeatable acts with accuracy. The drawing hand becomes the articulated machine, which is the final subjugation of man to the machines he invents. In the essay, Standardization, Reproduction and Choice, the democratization of the image produced a repetitive standard that was so successful as to influence countries like Japan, where all the dominant patterns of society remained feudal.

Mumford concludes his argument in the essay, Art,Technics-and Cultural Integration by asking the question: Why has our inner life become so impoverished and empty when our outer life has become so exorbitant? The renewal of the inner being, so necessary to a vital life experience, can be discovered when "art elevated, imagination affirmed and peace governs the nations."

ART INTO LANDSCAPE

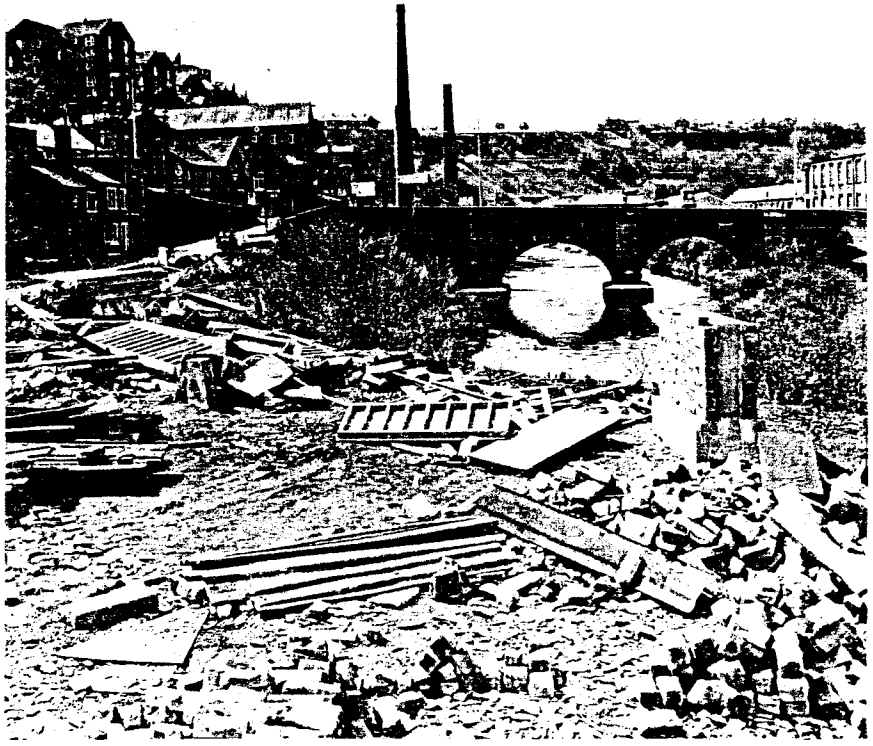
Arts Council of Great Britain, London, 1974

A competition in 1977, held in Great Britain, offered the public the chance to design for one of twelve sites chosen by a panel. The same panel chose 150 designs to catalogue out of over 1000 entered. Ten of the designs were to subsequently be developed. The competition was sponsored by the Royal Institute of British Architects, the Landscape Institute, the Sunday Times of London and fifteen corporations.

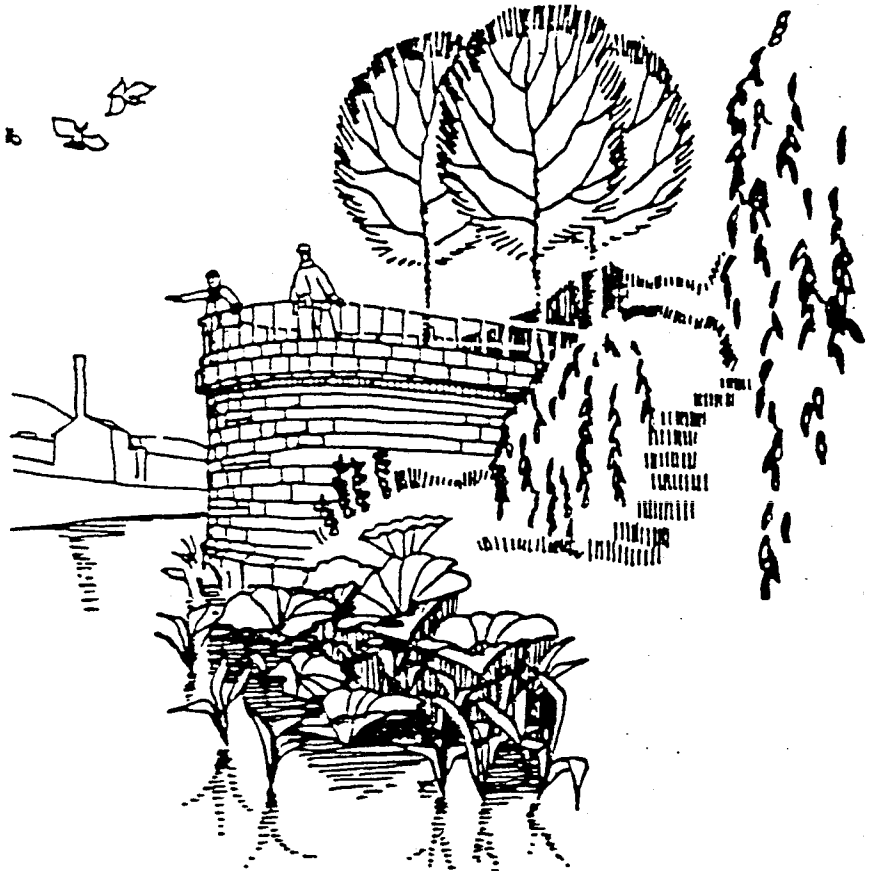
Sites were places chosen for their neglected state and need for development - slagheaps, demolished city plots, an old roundabout, a park center, etc.

Some solutions provide for objects constructed on site, others for shaping the land. All show a relationship to the site contextually or historically. Designs were submitted by the general public, not just design specialists. Participation by children, amateurs, artists, professionals, etc., was encouraged, providing ideas with a kind of character and freshness more diverse than usual.

Elland Bridge. Site for riverside revival to restore panorama.



Sketch for Elland Bridge site development. Mike Baldwin.



ARTS OF THE ENVIRONMENT

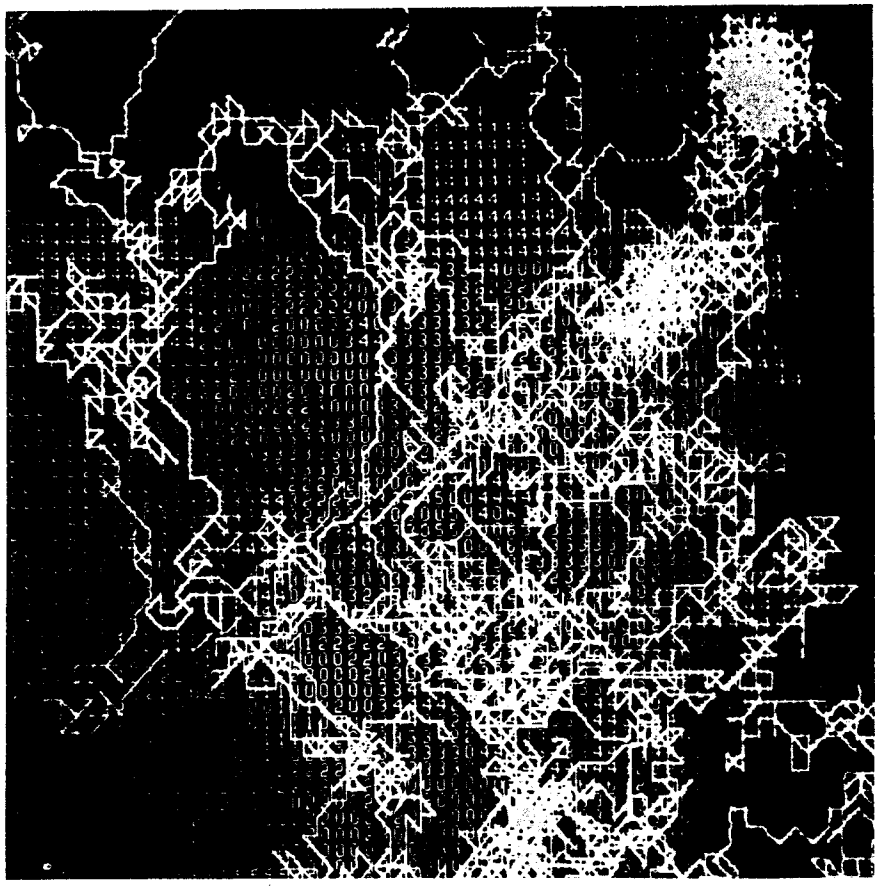
VISION + VALUES SERIES
Gyorgy Kepes, Editor
George Braziller, New York, N.Y. 1972

In Arts of the Environment, Kepes organizes a series of articles that relate art, space, vision and the human experience. In an article by Edward T. Hall, Art, Space, and the Human Experience, the relationship between the built environment, primarily spatial, and human subjects suggests that there is a problem of sensory deprivation. Western culture has tended to seal off the real from the symbolic resulting in a spatial experience that is totally based within the visual convention.

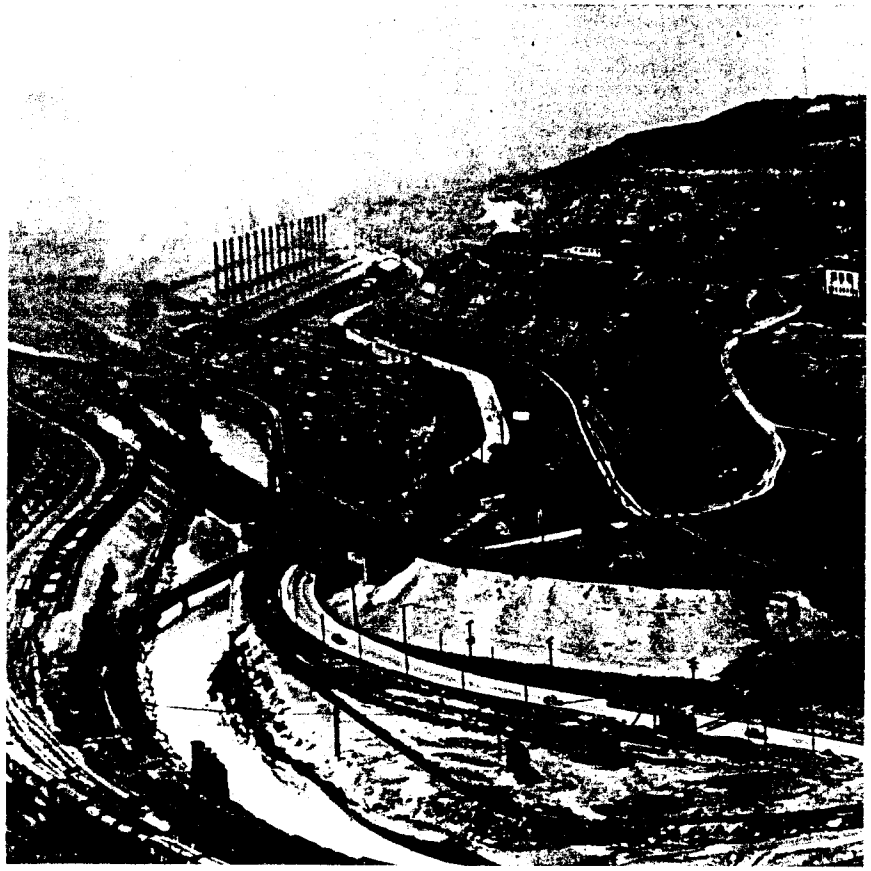
Transactionalists have attempted to develop a theory that would explain how man sees and how he perceives space. In this sense the whole subject of visual space is so complex that the understanding of visual space is formed by the interaction of: (1) The visual apparatus: the eye, brain and processes, (2) The external context: synthesized reactions and (3) The internal context: perceptual patterns and the human memory drum. Hall maintains, that Western man as a three-dimensional sensate is not a factor in spatial perception since only the visual sense is employed.

The spatial experience is intimately related to what man does and for the full utilization of the spatial envelope a greater integration of all the components available to the

Boston land-use computer mapping. Nicholas Negroponte.



Looking toward Pittsburgh from hill near Westington House Bridge.



human being must be engaged. The artist and the scientist provide the leadership towards greater visual and experiential awareness on the part of society.

Through a series of photographs, environmental potentials of the real and the visionary are explored as they relate to the built world. In the article, "The City as Artwork", by Patrick Clancy of the group Pulsa, the history of the man-made object is explored as an extension of the "artifact system" composed of the current technology and communication system. Only the highways system expresses the nature of energy flow within an urban gestalt. Through the use of emblematic energy configurations, the individual nature of each city can be developed to invigorate the fractured city parts. While the power of the urban form has been shaped by societal pressures, it is apparent that the natural resources are withheld from the residents.

Through the full integration of art within the urban arena, the surroundings can be made pleasing for people to live in and enjoy. Through the technological dissemination of the myth and symbol of the artistic world, the aesthetic resources of the community can be made available. It is only by introducing the subjective component (art) into a technically objective society that a true visual perception can be achieved. By raising the visual and aesthetic consciousness of the constituency, the quality of life within the urban realm would insure the continued growth of a vital community life.

THE CONCISE TOWNSCAPE

Gordon Cullen
Architectural Press, London, England, 1971

According to Cullen, the nature of Townscape is the art of giving visual, artistic and organizational coherence to the jumble of buildings, streets and spaces that make up the urban environment. A better understanding of why the majority of urban settings appear dull, uninteresting and soulless may be found in the history of the city and its founding principles.

Through a series of composite photographs, annotated drawings and diagrams, Cullen points out the need to rid ourselves of the notion that excitement and drama can be born automatically out of the scientific research and analysis offered by a technocratic society. It is the 'art of relationship' that must be developed between people and their environment. By utilizing principles of vision Cullen shows how the public environment can be comprehended and analyzed through the faculty of sight, particularly as this relates to the impact of objects on the emotions, and through the principles of serial vision. By using these principles the elements of existing view and emerging view produce the optical setting for the city as coherent drama.

The second contribution by Cullen concerns the reactions to the position of our body in its environment. Place achieves impor-

PUNCTUATION: demarcation of function and pattern change by a physical signal.

KINETIC UNITY: roadway boring through urban space.

tance because the body has an instinctive and continuous habit of relating itself to a spatial datum. The notion of 'here and there' affects the perception of the urban environment by stressing the entering or leaving of a place. This open-ended relationship stresses the importance of imagery, fulfillment and anticipation of 'there'.

The final section of the book turns to the examination of the fabric of cities; its color, texture, scale, style, character, personality and uniqueness. Through this concern for quality in the built environment, Cullen suggests that the inherent signature of a place can be enhanced through an elemental framework that stresses lucidity and not anarchy -through careful control of the content of the visual environment, the environment resolves itself into an interplay of elements.

With the acceleration of culture and the notion of change, the role of the environmental organizer is changing communication between the planner and the planned environment has broken down. The connection can be rebuilt by revitalizing the visual connection between people and their environment. Through the application of the principles of serial vision, place and content the city can be appreciated.

EARTHSCAPE: A MANUAL OF ENVIRONMENTAL PLANNING

John Ormsbee Simonds
McGraw-Hill Book Co., New York, N.Y., 1978

This large manual is meant to be a book of practical principles, a primer, on the broad field of environmental planning. It deals with the means by which our living spaces can be made more useful and pleasant. Its scope, attempting to be as complete as possible, ranges through pollution, noise, erosion, traffic, wilderness, politics, etc.

Simonds is caught up in the ecological interest of the 1970's, and has edited together a very persuasive body of work. He extensively quotes experts in areas related to his discussion, his book benefitting greatly by their brilliance and style. He uses diagrams and graphics throughout to explain concepts and includes case studies from actual projects to demonstrate practical application of the principles described.

Simonds begins with an overview of ecology and the crisis proportions of the problems facing modern man. Clear threats to the living Earth exist; man can now alter his environment on a global scale. He talks of safeguarding our life-support system, the biosphere, the earth, the water and the air as well as the ecosystem. We are headed within decades or centuries, to the point where the earth will be unfit for human habitation.

Urban activity centers are lost when split apart by trafficways.

Interstate 278 in Brooklyn, N.Y. Terraced roadway integrated with the topography.

After a general discussion of topics at the large scale, Simonds moves on to human scale with chapters on the visible landscape, noise, and movement. His chapter on "Paths of Movement" is especially critical because of the overwhelming, far-reaching effects of the automobile. He proposes ways to integrate the road with the landscape or cityscape, to step lightly and preserve the best features along the way, to create gateways to the city, to frame major vistas. He would protect "Scenic Byways" and plan systems of recreational parkways. He considers new highways as restructuring elements in the city and believes in the need for comprehensive planning that incorporates citizens' information and an interdisciplinary team approach.

He moves on to the Urban and Regional planning scale, using a case study of a new city, a planned community. His topics include ecological surveys, form and content, structuring, land-use allocation, patterns for growth, etc. The last chapter contains a formula for preserving and protecting the living Earthscape.

EARTHWORKS AND BEYOND: CONTEMPORARY ART IN THE LANDSCAPE

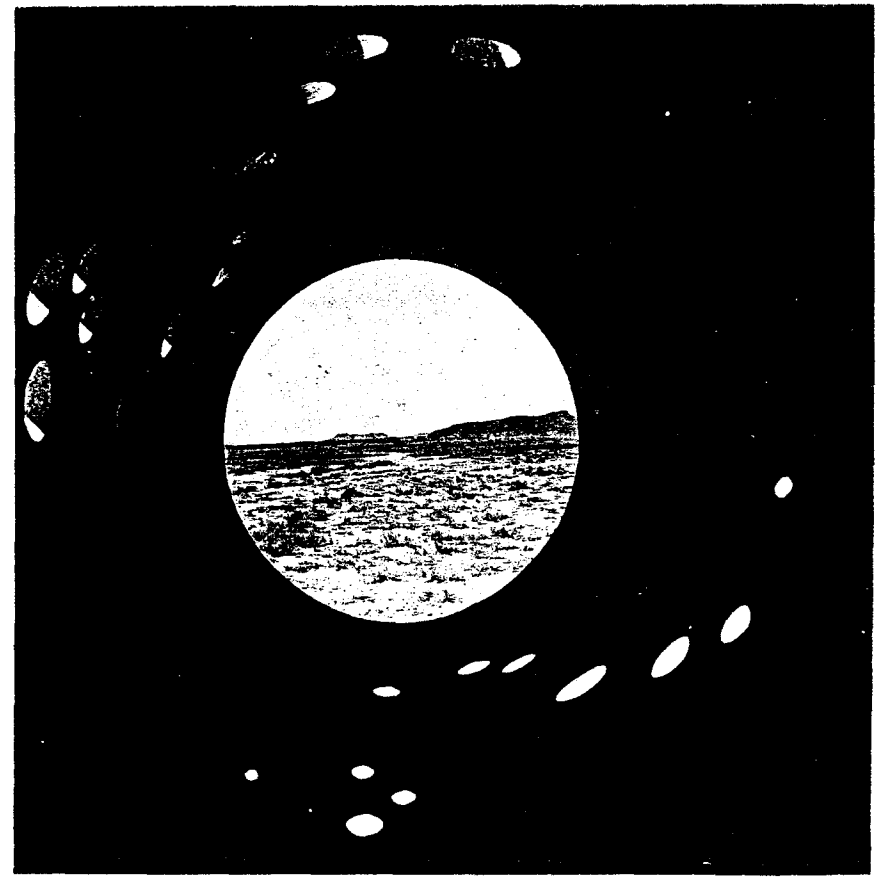
John Beardsley, editor
Abbeville Press, New York, N.Y., 1984

In the artistic revisions that followed the cultural turbulence of the late 1960's, landscape reappeared as an inspiration for a number of artists. They chose not to merely depict but to engage the landscape, using its materials and working with its features. Works by Michael Heizer, Robert Smithson, Walter Demaria and Robert Morris are bound to their settings and relate to the special characteristics of their surroundings.

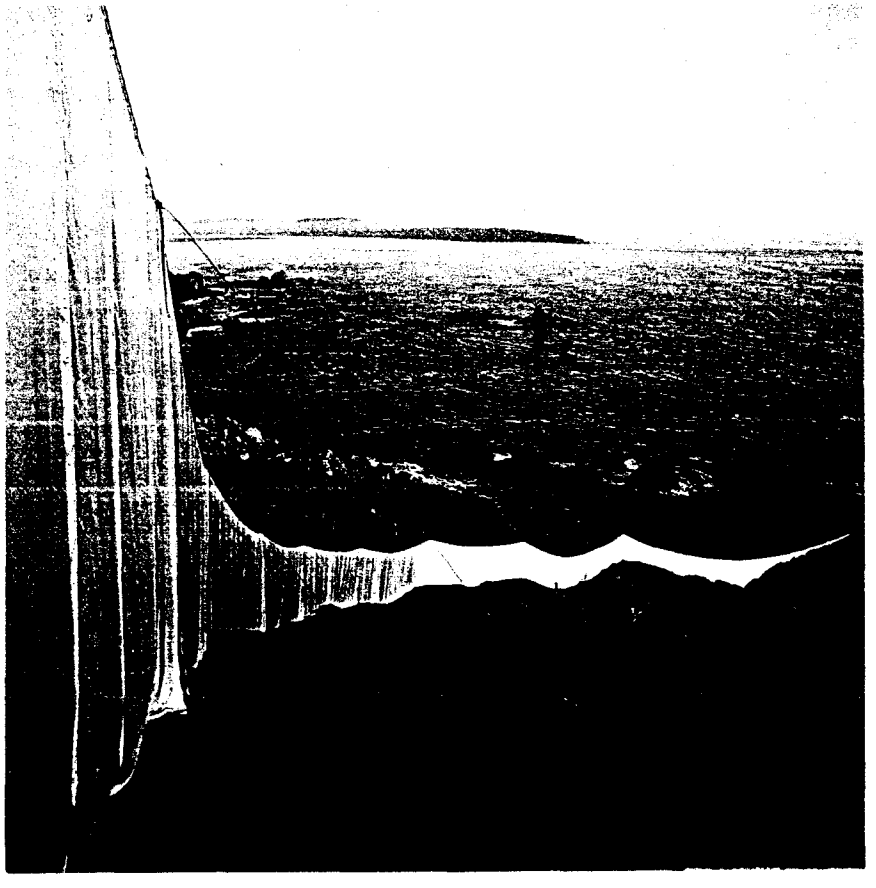
"Earthworks" or "land art" have proliferated since then and have taken on new dimensions in terms of form and materials. There are now parks, structures, sculptures and gardens demonstrating unique relationships to their settings.

There is precedence in the presumption that people's relationship to landscape is a significant expression of culture and that the landscape itself has sacred qualities. Prehistoric remains, 17th Century French gardens and 18th Century English picturesque parks are examples of man's perceived relationship between God and Nature. Man's relationship with the landscape has historically proven to be adversarial suggesting that a large proportion of built objects have negated the culture of the landscape. Indian

Nancy Holt (b. 1938). *Sun Tunnels,* 1973-76. Lucin, Utah.



Christo (b. 1935). *Running Fence,* 1972-76. Sonoma and Marin Counties, California.



mounds, cliff dwellings, temple gardens in Japan, and environmental land sculpture are other antecedents of contemporary projects.

Americans seem to be ambivalent towards nature, exploiting it with technology on one side while conserving and nurturing it on the other. The most successful stance would be like that of a Wright or Olmstead - developing and building but with a respect for and understanding of nature's meaning and relationship to man. Some contemporary artists strive to improve the environment and engage urban problems that accompany industrialization through land reclamation, creation of parks and a heightening of people's awareness. Some pieces are thought to be radical and anti-urban, yet they often reach a sacred level and "aspire to the quality of revelation."

Besides those mentioned above, works by Nancy Holt, Richard Fleishner, Christo, James Turrel, Richard Long, Andy Goldsworthy, Charles Simonds, James Pierce, Isamu Noguchi, Beverly Pepper, Maya Lin and others are represented.

EDUCATION OF VISION

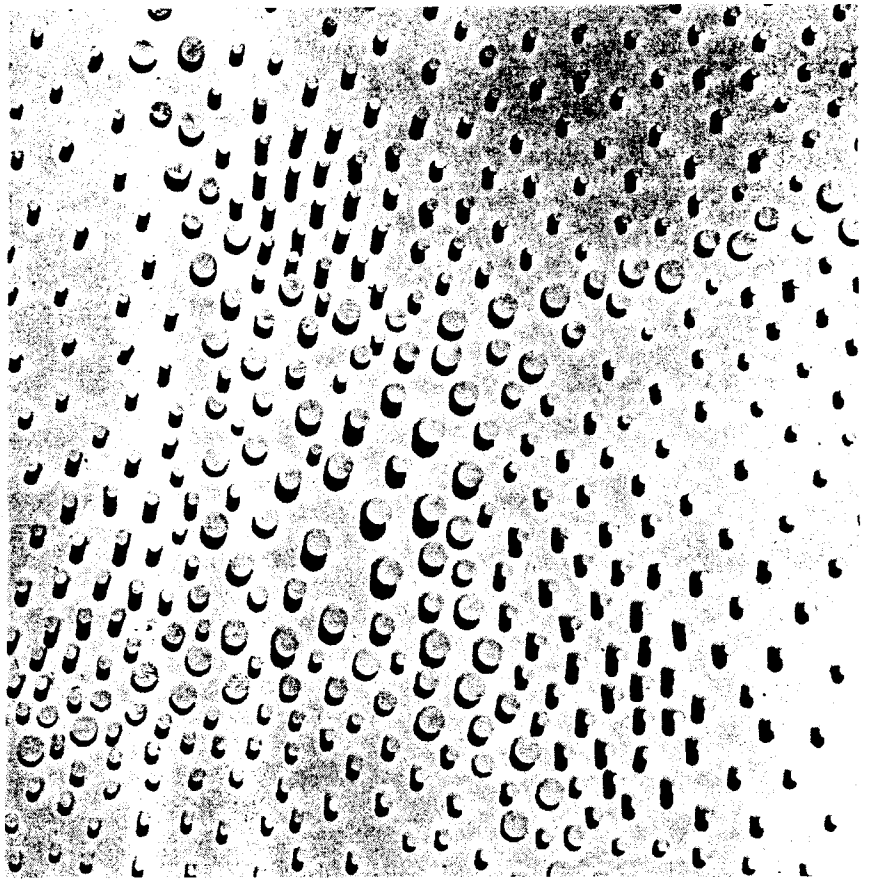
VISION + VALUES SERIES
Gyorgy Kepes, Editor
George Braziller, New York, N.Y.,

Every functioning human being transforms the visual signals that are received into structured and meaningful entities. Without the perceptual ordering of the senses into images of things in space, the human being is lost. Without shaping the physical environment in accordance with those images, the human entity cannot survive. Thus vision, the creative response to the elements of the environment, is basic and is central to the shaping of our involvement with the world around us.

Through the evolution of the artistic expression, the image created is an ordered, coherent and living form. For an image to be more than a mere expression it must rely on a unity of structure and form - color, lines and shapes corresponding to our sense impressions. Kepes has organized a series of essays that explore the depth of the artistic experience - an experience grounded in the perception of form and the ordered world. The deeper the artist's experience of the form the stronger the inner need to communicate that form.

Toward this end, Education of Vision organizes the articles along three lines of thinking. First, a systematic investigation into the role of vision; second, competent methods of

Light Textures from Light and Color course, MIT. Gyorgy Kepes, in charge.



Anatomical model of a Basic Cell. Will Burtin. Photo by Ezra Stoller.

developing visual perception; and third, the mapping of concrete territories where creative vision is to be explored. In Visual Thinking, Rudolph Arnheim suggests that our senses are not merely auxilliary to the intellect but that visual thinking is a thought operation in itself - a powerful and basic means of knowing and reasoning within its own realm.

The second part of the book explores the physical aspects of vision as a tool for understanding the built world. In Design and Communication, Will Burtin presents a series of visual models designed to reveal and explain, demonstrate and organize the functioning of structures, organs and processes of the human body. This for the express purpose of enhancing and cultivating communication toward easier understanding of complex ideas and images and to create a higher visual and auditory retention of data. In the third part of the book, Tomas Maldonado in the essay, Design Education, investigates the term "design" as it applies to visual perception and the education of visual thinking. By examining a series of interrelated objectified forms, he draws the conclusion that visual thinking finds its roots in a visual form directly connected to current social phenomenology. Paul Rand's Design and the Play Instinct, explores the condition and application of visual perception through the love of play; play as a creative process that is organized around a series of rules which set the limits of the game as well as on the fact that there is a fundamental interdependence between perception and conception.

ELEMENTS OF URBAN FORM

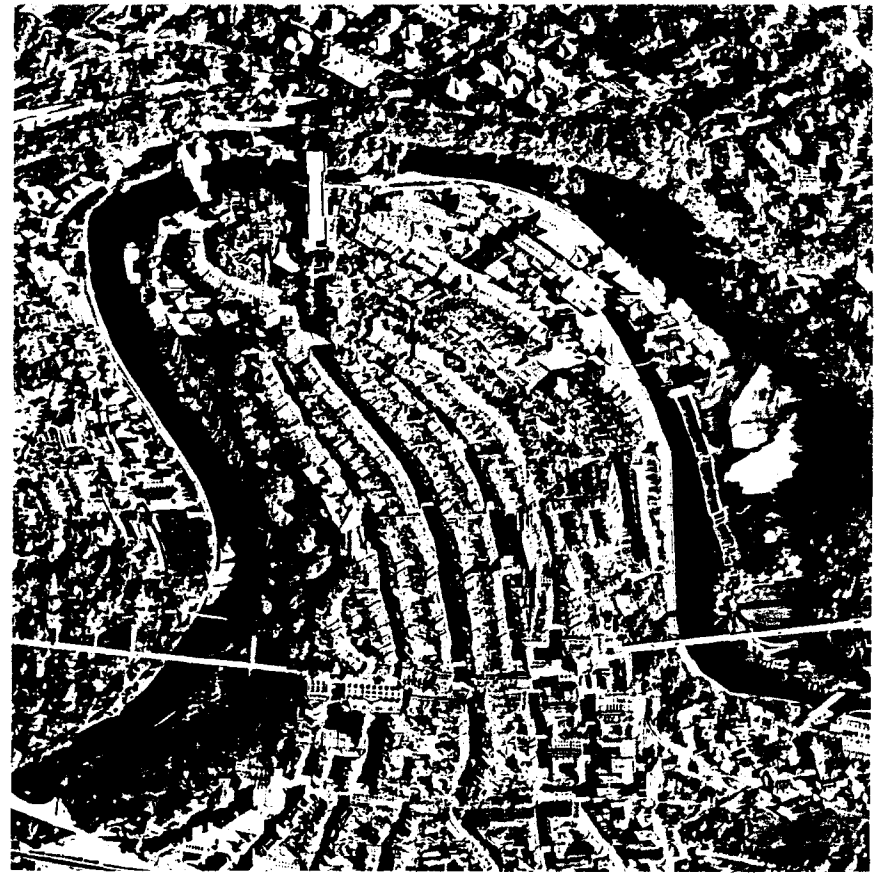
George Banz
McGraw-Hill, New York, N.Y., 1970

Forces that shape today's cities are different than in the past. Many past facts and concepts have become obsolete and inadequate to cope with present urban growth. Yet man's fundamental needs and nature's limitations remain the principal determinates in planning and design.

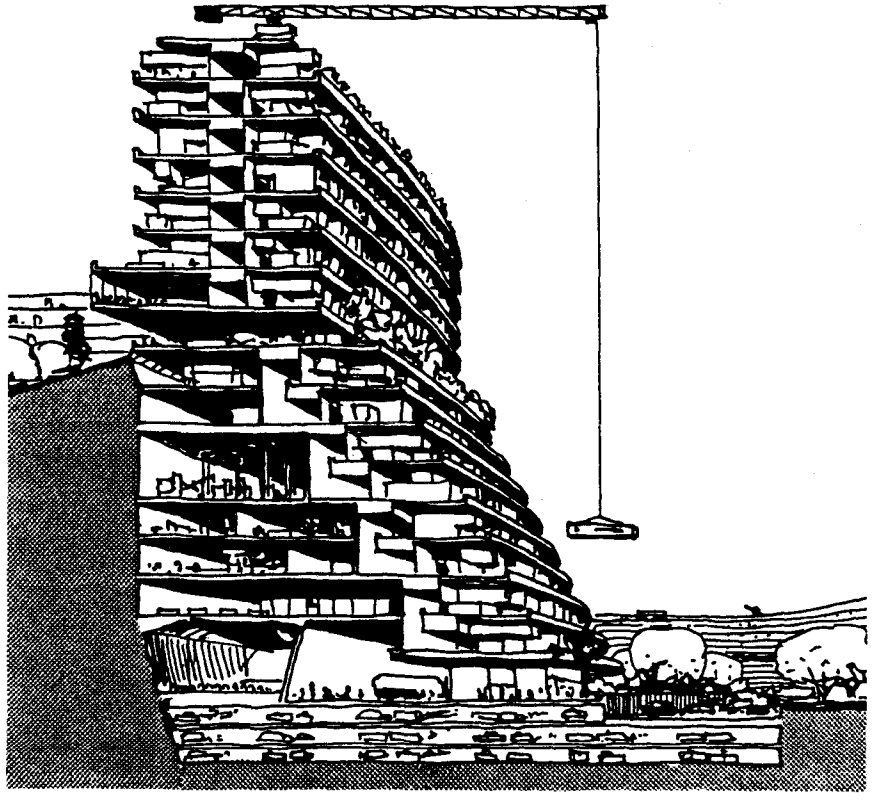
The modern city is no longer encircled by nature. It was freed by industrialization, then transportation and now communication. Connecting our urban centers and evaporating existing boundaries, highways extend the urban habitat into the natural environment. Communications no longer relate to place or to individuals within their specific surroundings. Man is released from his local bonds.

Contemporary man climbs into his capsule and escapes from his normal position. His conquest of space is a mosaic of sequential views and images. Relations between encapsulated individuals become impersonal - no more than distorted images. The velocity imposed by the need to achieve a connectivity of place denies the personalization of movement. Modern movement, therefore, steadily increases in speed and threatens to increase alienation between individuals and objectification of experience.

Aerial view of the old part of Bern, Switzerland.



Mobile homes could be installed in urban megastructures. George Banz.



Freeways can be a major form determinate at the urban scale. As artificial boundaries they can be powerful tools in the hands of those who understand the complex feedback relationship between the habitat and human motivation and have "a strong will to form." Freeways take the place of natural boundaries and give rise to linear habitation.

Technology is growing beyond the capabilities of a single man or group of men to analyze and control it without the aid of the computer. The computer can be applied to planning and design through a systems approach to urban problems. "Technology may have become simply too strong to be brought back under direct human control. But by investing technology with artificial intelligence, its progress may be redirected if its 'brain' is kept accessible to human manipulation."

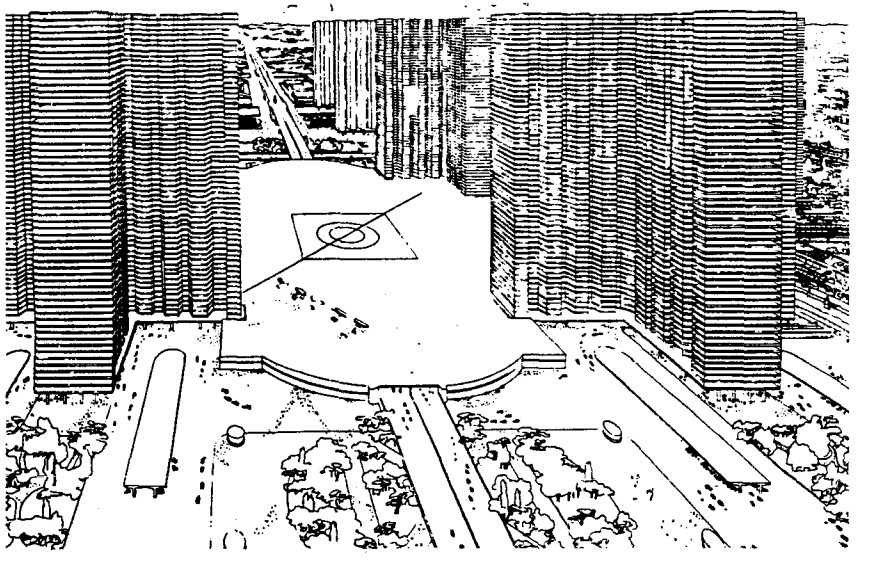
THE FITNESS OF MAN'S ENVIRONMENT
SMITHSONIAN ANNUAL II

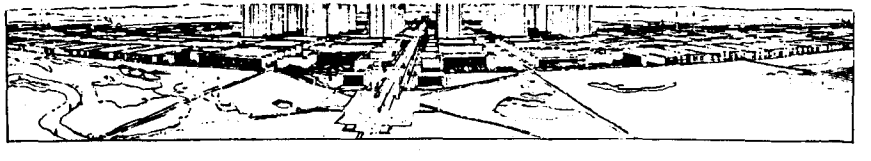
Jennie Lee, Editor
Smithsonian Institution Press, Washington, D.C. 1967

The papers in this book attest to the extraordinary interest created by the public realization that something is wrong with man's relations with his environment. Man has neither learned to shut out nature - to defend from it - nor indeed has he learned to live in cities as a humane individual. As Edward T. Hall points out, the hidden structures of culture are among the most consistently ignored features of 20th-century life.

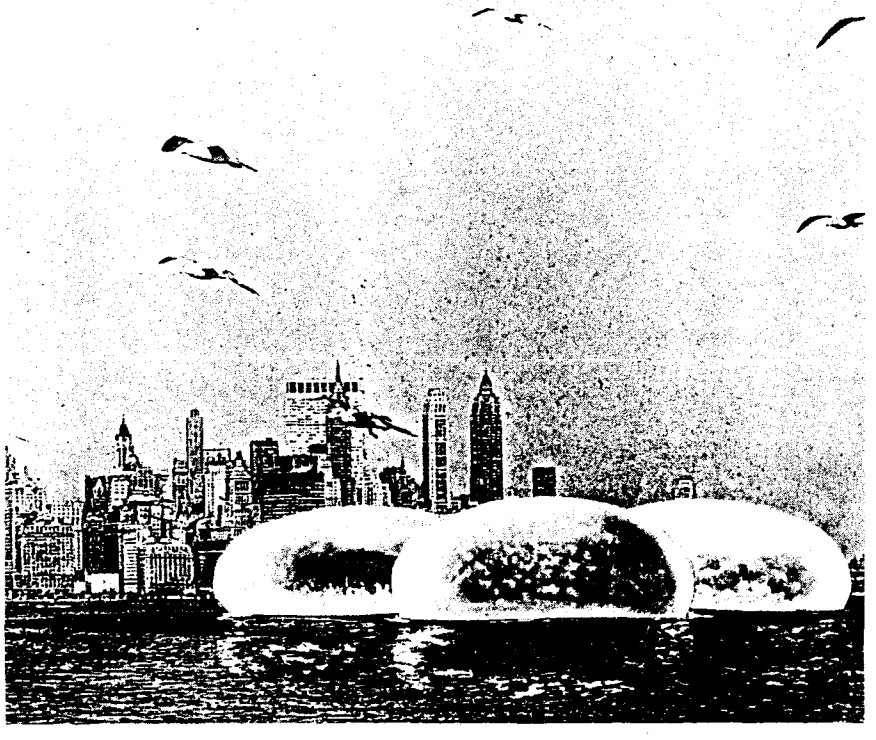
In this series of essays, biologists, anthropologists, architects, planners and artists present a point of view stressing the relatedness of society and its environment. Wolfgang Braunfels in his essay, Institutions and their Corresponding Ideals, posits that every architectural piece of art pre-supposes the framework of a strongly defined institution, hence it follows that architectural forms created in the service of one set of ideals can never be adopted unchanged in the service of any other. He uses as an example of this theory a simple farmhouse. In its original form it becomes a living being with its own personality but when modified in its purpose, (ie, restaurant) the fabric is maintained but it is deprived of the ideal and necessity it was built to serve. The essay, The Sense of Place, by Asa Briggs regards places as "creative things", "ethnic domains

City for Three Million, 1922. LeCorbusier.





Ecosystem bubbles floating in New York Harbor.
Juan Navarro-Baldweg.



made visible, tangible, sensible" is in direct contrast to the 20th-century shift from place to "placelessness." Architect Philip Johnson states that the ideals espoused by society counter those of reality. In Why We Want Our Cities Ugly, Johnson's thesis is based on the view that society will not be able to truely utilize the cities nor the setting until the values of people change. By comparing the funds allocated for highway-beautification with those allocated for highway-construction suggests that society is not able to initiate change so long as the "It costs money" slogan prevails.

In the article, The Conservation of Cultural Property, human life, while enriched by a technologically based society has become impoverished. Daifuku illustrates a number of examples where cultural landmarks, historic properties, sacred places, edifices and monuments have been destroyed due to the neglect of a society unwilling to preserve its heritage while in another article Ian McHarg states that western man remains pre-Copernican, believing that he strides the earth round which the sun, the galaxy and the very cosmos revolve. In Values, Process and Form, McHarg suggests that the environment shapes the individual who inhabits and ultimately takes on the physiological characteristics of that environment. The despoilation of the environment produces a society incapable of monitoring its health, biological and natural resources.

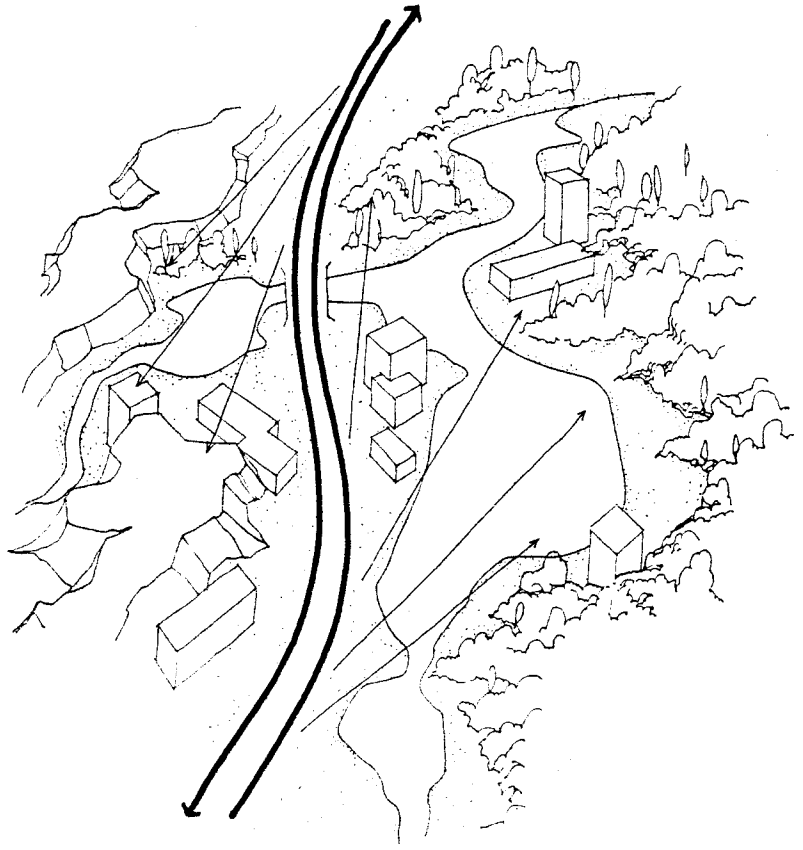
THE FREEWAY IN THE CITY

The Urban Advisors to the Federal Highway Administrator
U.S. Government Printing Office, Washington, D.C., 1968

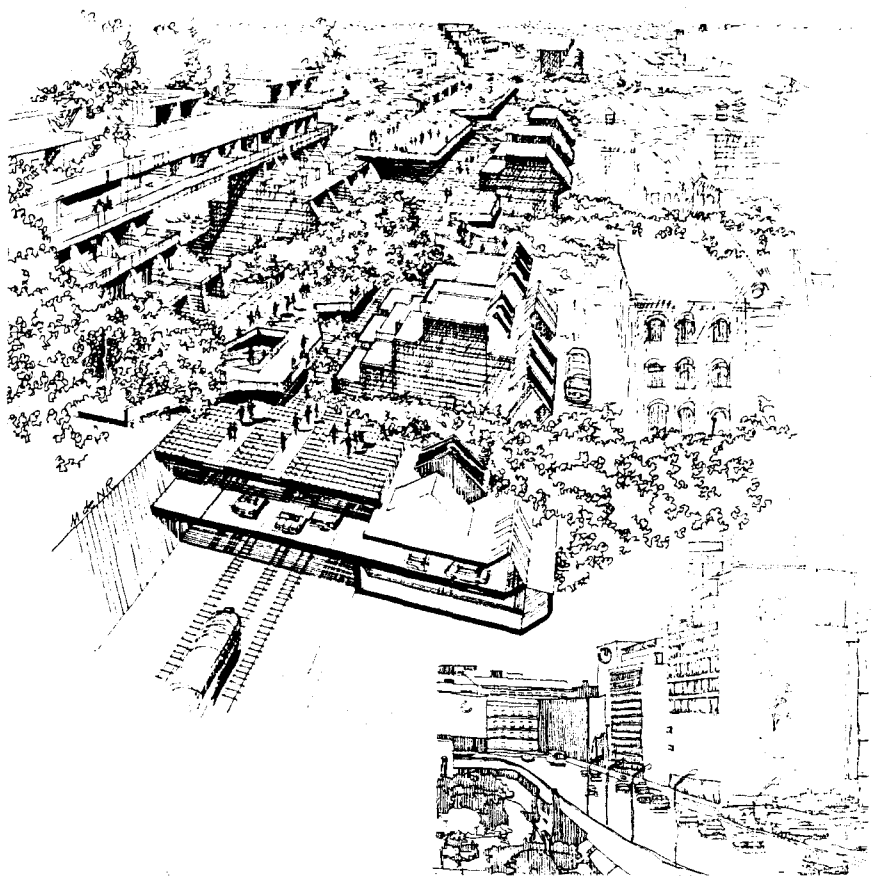
This report was prepared by the Urban Advisors to the Federal Highway Administrator in 1968. Concern over the "quality of life" and "standard of living" in America is the focus of this study. The standard of living is directly dependent on the personal mobility of the individual. Highway transportation is the basis for an unprecendented degree of personal freedom that requires the continued growth of highway transportation systems. On the other hand, highway transportation cannot be allowed to function apart or conflict with its environment.

There is an elemental conflict between the highway and the urban centers populating the landscape. In order to maintain the standard of living, the highway must interact with the landform in terms of parks, playgrounds, historic or cultural sites, housing, schools and neighborhoods. Inevitably, the potential for adverse reaction is obvious. Reducing or curtailing highway improvements might eliminate such conflicts but in the long run would not solve the problem. Therefore the situation cries out for new approaches, particularly in the nonengineering aspects of highway development. Freeways have not been treated as a part of the urban machinery and as a result have not been infused with the "soul" of the city. This report makes 16 major recommendations ranging from expansion of

A Freeway made to explore and reveal the best views of the landscape.



Proposal for *Linear City* in Brooklyn. Mark de Nalovy Rozvadovski.



techniques of system analysis and operations research in the planning and designing of urban freeways, to the encouragement of a high visual quality that contribute to the inherent beauty of the city. The major theme unifying the recommendations is the concern for the quality of the environment which can be achieved through the establishment of new design guidelines that stress the aesthetic approach to urban freeway design.

The visual enjoyment of the highway is sometimes an experience beyond analysis but such experiences are as a rule haphazard being marred by guardrails or concrete parapets. The authors argue that much of the inherent beauty in the urban freeway lies in three distinct areas: the sweeping forms of the highway; the unique forms of the city and their interrelationship. They advise that multiple useage of the highway corridor combined with visual links to the urban fabric can improve the relationship. Numerous examples of potential solutions to a variety of visual and technical links are presented.

The report concludes by outlining five basic factors which affect the man-made systems: the natural environment; the state of the technology; organizational policies; economic conditions and human factors. Each of these factors must be brought into the decision making process when any form of urban freeway is to be designed.

FREEWAYS

Lawrence Halprin
Reinhold Publishing Co., New York, 1966

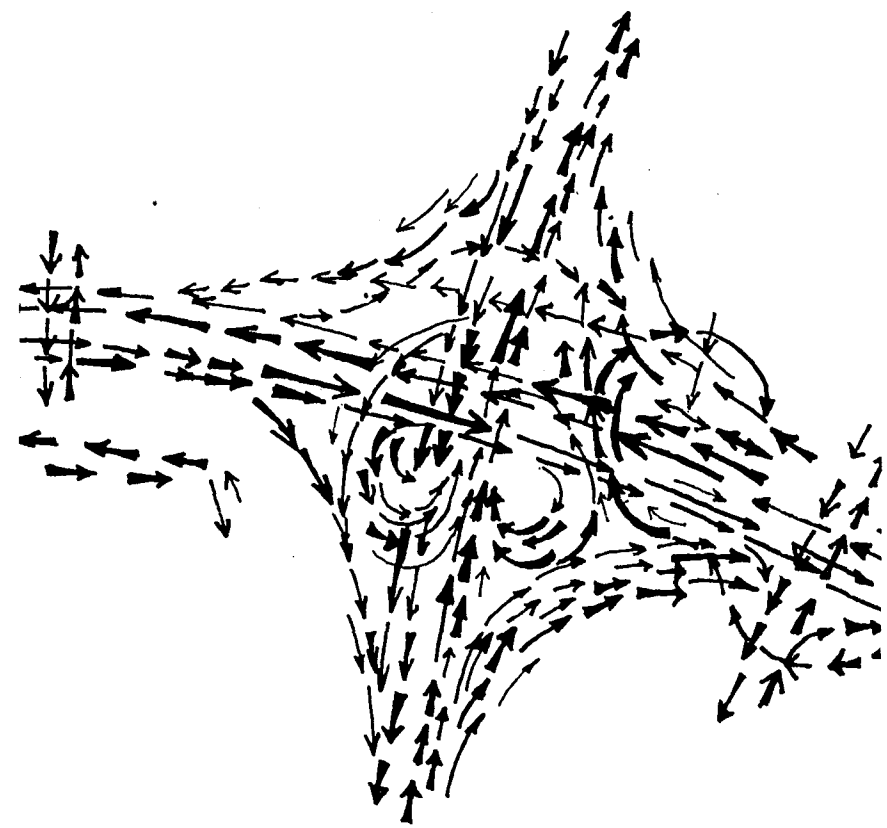
Lawrence Halprin is very much interested in motion and the ramifications of the experience of motion. Another book of his, Scores, deals with annotating motion and experience through time. His photographs illustrate his conception of kinetic events and the architecture springing from them.

Travel has always evoked certain images to Americans - so recently pioneers. The automobile is loved by them and symbolizes something important in the minds of most.

The high speed of modern travel has created vast and beautiful structures, " flowing cantilevers rippling above the local streets stand like enormous sculptures marching along architectonic caverns .... freeways out in the countryside, with their graceful, sinuous, curvilinear pattern are like great free-flowing paintings in which .... sensations of motion through space are experienced."

Many of these large scale works have, however, ineptly demeaned the areas they meant to serve. In cities especially, urban design values are ignored in favor of the expiditious.

Halprin outlines nine criteria for country freeways and lauds their potential ...." Its sculptural qualities can be enormous; it speaks of movement and the kinesthetic qualities of driving on it are vastly exciting ... as a design problem .... (it is) a form of action calligraphy where the laws of motion generate a geometry which is part engineering, part



painting, part sculpture but mostly an exercise in choreography in the landscape."

Approaching San Francisco from the airport.
Lawrence Halprin.

He discusses the ideal solutions possible when the designers can control the mutual relationships and form-giving potentials of the city and the highways that serve it. He believes in a different aesthetic here - rejecting rural values and accentuating contextual ones. " The integration of the freeway in the city with its own landscape should be understood to mean integration with the urban environment. This means an integration with architecture and urban form, not with plantings."

Evaluations of six freeway types - tunnel, depressed, at grade, elevated on embankments, elevated side by side, and elevated stacked - by four criteria serve to classify the basic methods. But he stresses that one criterion, community impact (perhaps the most important), is subjective and therefore difficult to deal with.

Cities change and man's view is always changing. Halprin feels that new study techniques have to be developed for urban aesthetics and movement through space. "These linear highways are the tracks of motion; their only purpose is movement through space and once on them the entire experience of the environment is through motion." He has developed his own notation he calls *motation.*

The last portion of the book discusses historical precedent and present construction. It reveals myths, failures, successes and future hopes relating to high speed travel and the freeways.

HIGHWAY BEAUTIFICATION: THE ENVIRONMENT'S GREATEST FAILURE

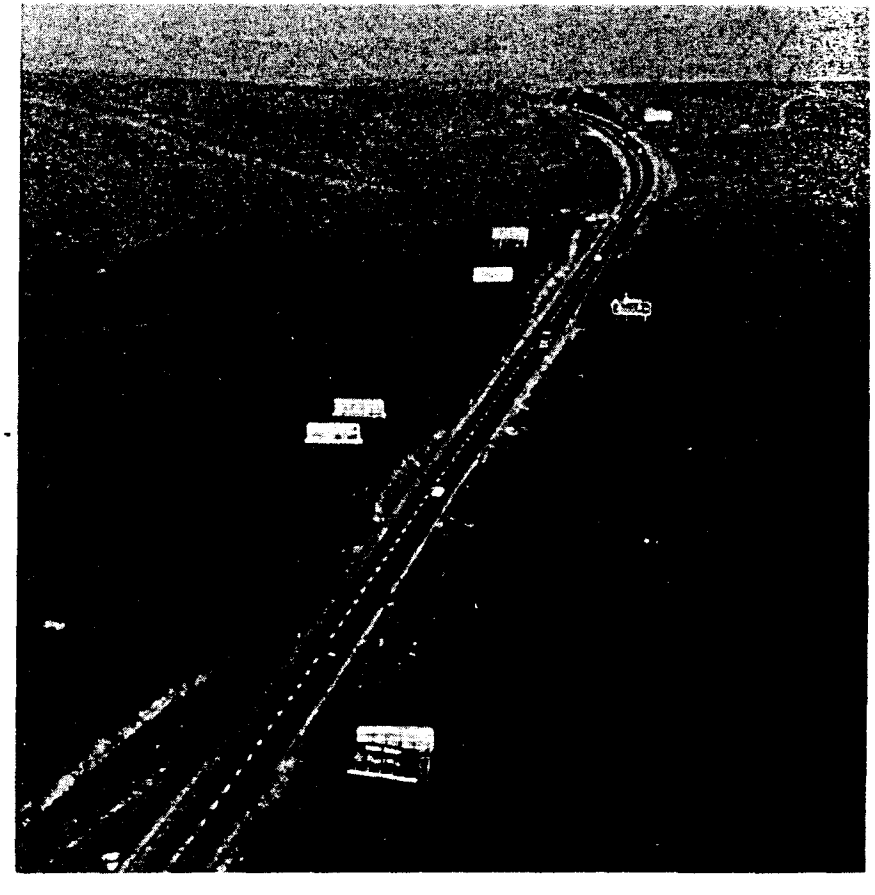
Charles Floyd and Peter J. Shedd
Westview Press, Boulder, Colorado. 1979

The Highway Beautification Act of 1965 had as one of its overriding priorities the control of billboards and other commercial intrusions on the highway driving experience and the highway aesthetic. This Act was perceived as a great threat by the large and influential billboard advertising industry and resulted in a progresive imasculation of the Act through amendments.

Despite the historic legal precedents establishing the role of advertising as an integral part of the highway environment, the road was built primarily for the public welfare and benefit. To date, industry has claimed that the use of private land adjacent to the highway strip must be open to commercial development. This type of activity has flourished as a result of lobbyists wielding sufficient leverage to influence legislation to their benefit. Besides this arguement over private property rights, the billboard industry claimed that, for the sake of the driver and commercial and industrial interests, billboard advertising communicated necessary and beneficial information for the highway user.

By citing a number of actual examples, Floyd and Shedd demonstrate how large-scale advertising billboards and

Rural billboards destroy natural vistas.



"Logo Signing" for the Interstate

their indiscriminate use along the highway has blotted out or even obliterated some of the most valuable scenic vistas in America. They argue that there are numerous examples where distracting, poorly sited and scaled billboard advertising can represent a major hazard to driver safety. Cases of vandalization of natural elements such as trees, bushes, ground cover and landforms on the public right-of-way by advertising companies in order to improve the "viewing" of their signs has furthered the deterioration of the highway aesthetic.

Documentation is presented that shows how certain states have permitted this type of large scale destruction through zoning. *Unzoned commercial* and *industrial* classification is so loosely defined that many areas with only obscure industrial or commercial use have little or no control over the placement of billboards, lighting or other types of signage with respect to the highway.

This report presents several examples that demonstrate that advertising information can be clearly and effectively presented using a standardized billboard format. For the billboard to be effective, it must be strategically placed and requires far less surface area. The authors conclude by arguing that the public clearly needs to take back its right-of-way and reclaim the opportunities for experiencing the natural landforms the highway traverses.

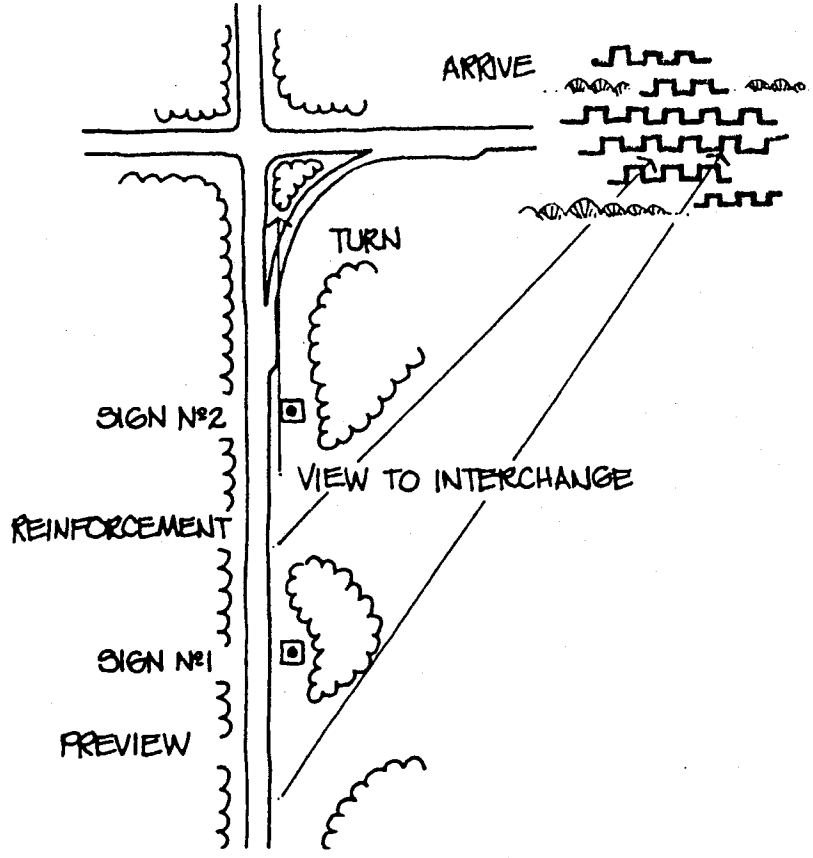
HIGHWAY ESTHETICS: FUNCTIONAL CRITERIA FOR PLANNING AND DESIGN

Peter L. Hornbeck, Editor
Harvard University, Department of Landscape Architecture
Cambridge, Massachusetts, 1968

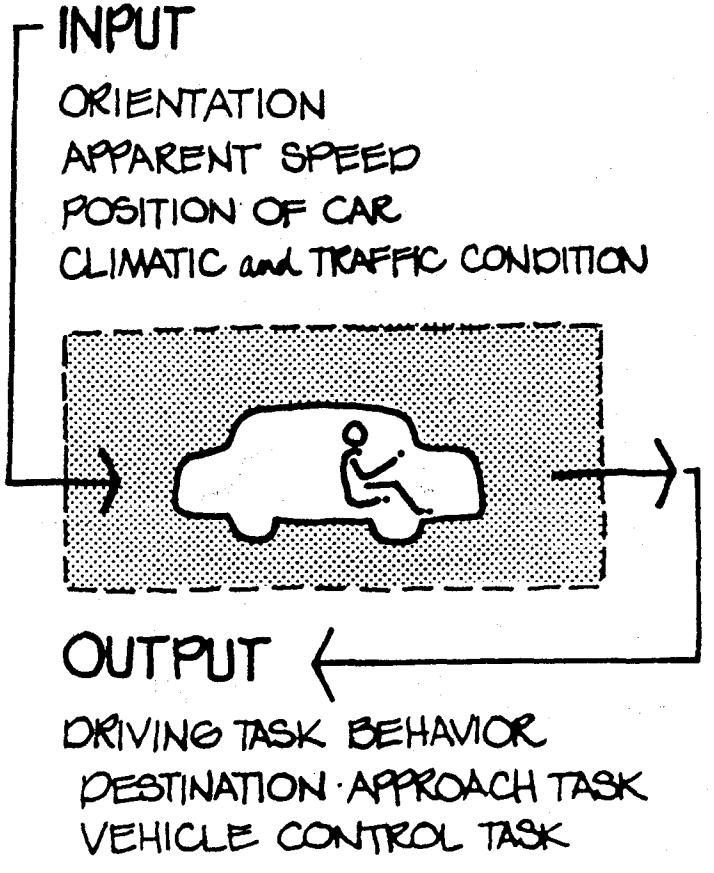
This report examines the function and use of aesthetic criterion in the highway planning and development process. Having undertaken a review of the historical precedents and concepts of highway aesthetics, the governing theme of the research stresses that "aesthetics" should be a product of comprehensive highway planning. The aim of the study was to place the highway planning process upon a broader conceptual base by investigating three divergent issues: identification of the visual parameters of the highway planning process as relative to a broad spectrum of disciplines; proposition of a methodology which integrates visual and behavioral criteria for a more complete planning process; and recommendations for future directions of research necessary for a comprehensive planning process.

The visual experience is essentially qualitative, thus taking on aesthetic value. One of the most important qualities of the road is the visual setting. Aesthetic values are integral to that setting, giving it form, meaning and congruency. Visual aesthetics are only one component of highway development but elements of behavior such as patterns of attention, vision, cognition, expectation, pleasure, comfort and meaning illustrate basic needs that must be identified as criteria in highway design. The study stresses that visual

Sequential Orientation: Cues at an exit.



Driver System: Input-output relationship.



aesthetics, from an artistic or scientific point of view offer little insight into the problem of highway design. However, it does suggest three strategies that would contribute to the solution:

a. concensus-taking: samples public opinion on desirable qualities relating to "beauty" and the public highway. This process is not positive or analytical enough.

b. concept of misfits: studies the notion of ugliness having determined that people have a better notion of what is ugly than what is beauty.

c. visual "embellishment": process of developing the existing value of landform through art to enhance the "beauty" of what already is.

All three criteria are contributing factors to the aesthetic highway experience since each emphasizes fundamental factors: physical and mental health, sensory and participatory pleasure and social and economic value. In short, there is more to the highway planning process than mere "cosmetics".

A HISTORY OF ROADS

Geoffrey Hindley
Peter Davies, London, England. 1971

In the author's note that opens this book, he asserts that "the history of roads is also the history of the traffic that has traveled over them."

The book is aimed at giving an indication of the general lines of development in the history of the world's overland transport and at linking this with the nature of the societies that constructed and used the roads. The book is not a technical study but a general survey to supplement more specialized reading.

The chapters present, in a chronological sequence, the development of roads from prehistoric times, through the roman era of remarkable road building, through the medieval European road building experience to the development of roads in Britain before the railway age. The author's attention then turns to the new scale of road building in the twentieth century and sites examples in Europe, Asia and North America.

The turnpike at Harrodsburg, Kentucky in 1885.

One of the tombs lining the Via Appia.

THE HUMAN USE OF THE EARTH

Philip Wagner
The Free Press, New York, N.Y. 1967

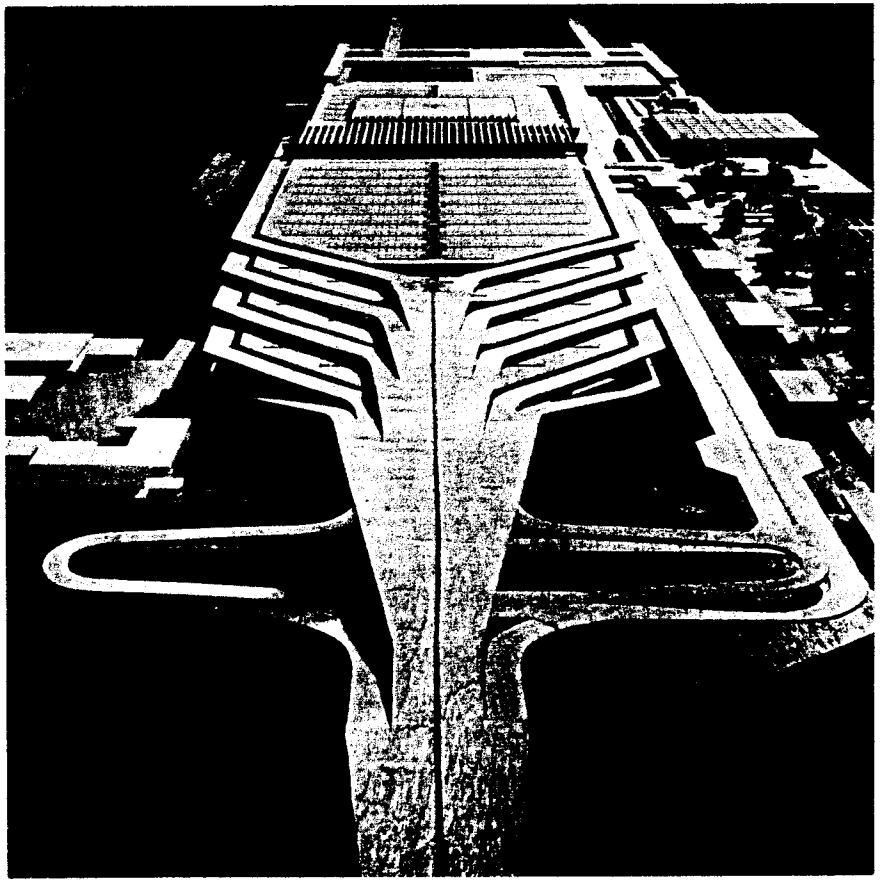
Aerial view of a rice field.

The theme of this book incorporates both geographical and ecological concepts by relating the distribution of surface features of the earth and their association with man's relationship to the environment. Human society has a relationship of an "unusual and peculiar sort" with nature. Wagner points out that the most distinctive features of man on the landscape are the artificial environments and their respective dependencies.

The living conditions of individuals within a society are governed by the interaction of man's modification of the land and its own natural changes. This creates a distinctively modified environment which reflects the society's culture, social organization, technology, relations with domestic organisms, and the character of the land itself.

The territory occupied by any human group is distinctive. Artifactual features appear in many diverse forms on the landscape. The arrangement of these artifactual features of a territory reflects both the nature of the land and man's work to shape the land. The meshing of these natural and man-made features suggest that at no two sites are the arrangements of site and routes identical but differ in their

New Service Center of Venice, Italy, 1963.
Manfredi Nicoletti.



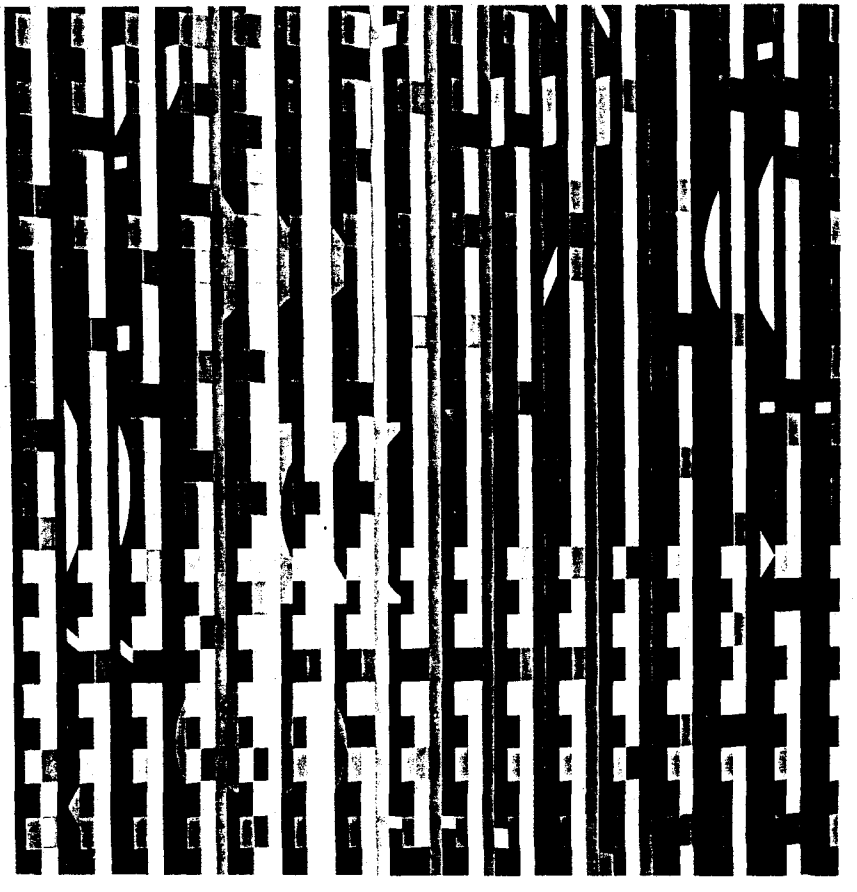
work component. Human work is directed toward the utilization of natural resources based on "time, place and form utility". To utilize the environment to its fullest, Wagner considers five classes of productive installations: natural resource sites, circulation routes, manufacturing sites, cultivated lands and service centers. Routes make the reticule on which are strung the sites of work and rest; they are the paths along which the human processes are transported. These artificial installations require a degree of control in order to stabilize the life process; natural, societal and technical limitations must exist to exercise some control over the elements in the entire artificial complex.

Within the framework of natural processes, Wagner suggests that human interaction with the landform occurs within the artificial sphere and that man is "modified" through that association. Service centers provide a vehicle through which the human can interact. He concludes by suggesting that the process of "artificiality" is the continuing remaker of the synthetic world man has chosen to invent.

ORIGINS AND DEVELOPMENT OF KINETIC ART

Frank Popper
New York Graphic Society, New York, 1968

Yaacov Agam. *Nouveau solfege,* 1966.



Since I860 there has been a kind of parallel development within the areas of science and art. Impressionist art began with its first contributions during that decade - signaling the isolation of sense data - color, line, tone and movement - which prepared the way for pure or abstract art. Herbert Spencer's First Principles, Darwin's On the Origin of Species, Fechner's Elemente der Psychophysik and Lotze's Mikrokosmus were all written during this period . Treatises on movement and stereoscopic vision as captured by photography had far reaching repercussions also. There is in all this a tendency to move from the concrete, objective and observable to the dynamic, subjective and theoretical.

Popper generally ascribes to the Impressionists and Cubists an objective sense and to the Expressionists a subjective. He chooses a new category, "conceptual movement, for the Futurists, who seem to stand halfway between. He sees movement as being an inherent element of all the important art movements of the 20th Century: Vorticism, Rayonism, Suprematism, DeStijl, Constructivism, Fauvism, Der Blaue Reiter, Surrealism, Action Painting, etc.

"Kinetic" as a term in art was probably first used in I920 by

Julio Le Parc. *Instabilite, continuel-lumiere*, 1962.

Gabo and Pevsner, but was not truly accepted into the jargon until 1954. Kinetic Art covers all works in actual or virtual movement. It gets its inspiration from natural manifestations, mechanical inventions, and psychological states of mind. There are three basic groups: those that are stable but stimulate physiological reactions in the spectator (moire); those which challenge the spectator to physical action; and those which are themselves in motion. Of special importance to this study is the type that relies on active participation by the spectator.

Recent developments towards audio-visual spectacles, media events, and the growing participation of the spectator tend to lessen the distance between the work and the viewer. The work is liable to disappear as it integrates with real life.

Since 1965 there has been a tendency among Kinetic artists to enlarge the physical size of their projects. The works become the environment. The space occupied by the work and the space occupied by the spectator are no longer separated. Thus the artificial barrier around the plastic arts is superseded and the works can enter the spheres of architecture and urban planning. The spectator is free to pursue his own activities in a space which symbolizes and/or integrates his wider environment. There is the implication that the work can modify the evolution of man's life and character.

MAN-MADE AMERICA - CHAOS OR CONTROL

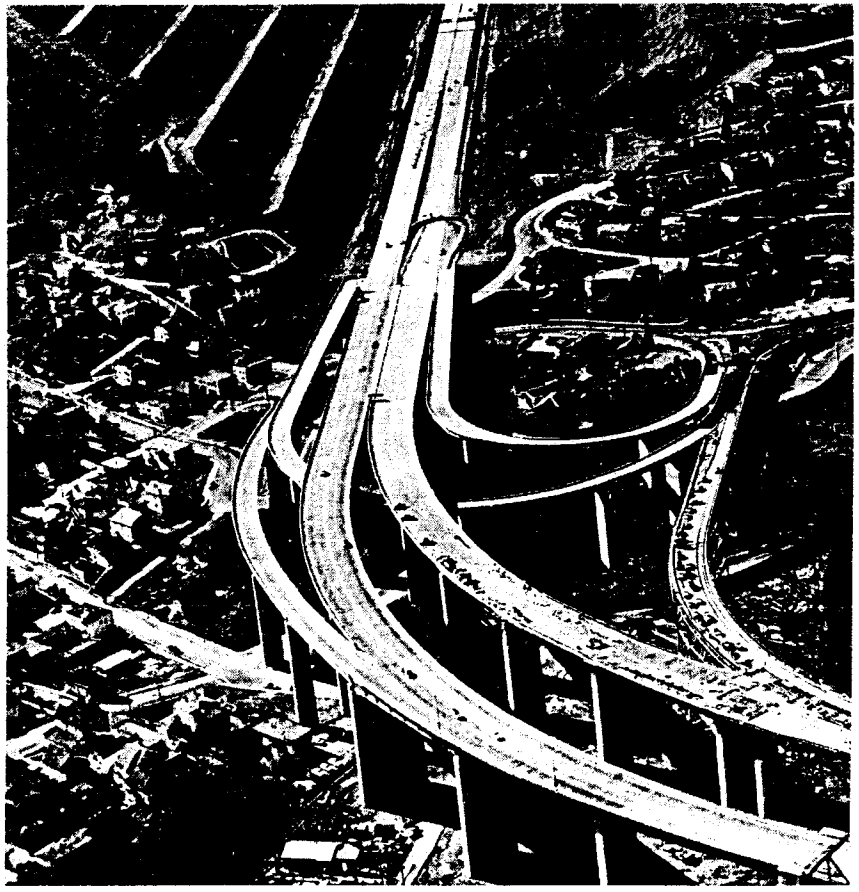
Christopher Tunnard and Boris Pushkarev
Yale University Press, New Haven, Connecticut, 1963

In Man-made America-Chaos or Control, the co-authors, both respected writers and commentators of urban planning and the urban aesthetic, present a broad and comprehensive view of the American landscape and the condition in which it finds itself. Using sane and pratical proposals for reclaiming "the mess that is man-made America," the co-authors investigate the various aspects of highway planning. They concentrate on areas around and between large U.S. cities and develop programs for revitalizing and transforming them into an "environment worthy of man."

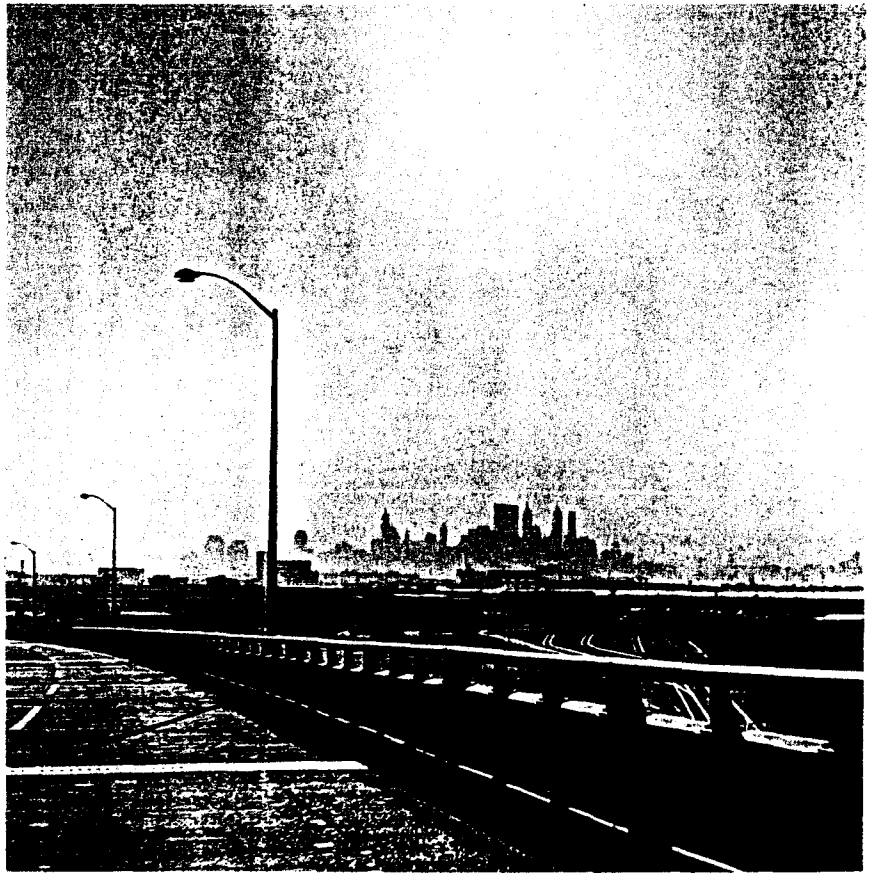
The text, photographs, drawings and charts demonstrate not only the faults but also the aesthetically rewarding potentials of a planning process that emphasizes good planning and a design aesthetic.

The book is organized into six parts, each beginning with an essay devoted to visual values, followed by a factual exposition of the historical development and present status of the problem, and a presentation of the ideal visual principles to be sought after. The six topics under discussion are: the landscape we make; suburban housing; highways; industrial developments; recreation areas; and historic preservation.

Carquinez Straits interchange, Valona, California.
A nine-million yard cut.



Downtown Manhatten from Interstate 78.



Of particular interest to the present study is the section on the freeway -"The Paved Ribbon: The Aesthetics of Freeway Design." In this section the authors analyze the freeway as it developed over several decades. Components within this section deal with the internal and external harmony of the freeway; that is, its own inherent form as sculpture, unrelated to its impact on the external environment. As pure abstraction, the freeway has a sculptural quality experienced only by driving along it, and this chapter analyses brilliantly the qualities to be sought after in this experience of mobility at speed.

To further the cause of freeway as sculptural form, the authors describe the freeway's function, parts and relationship to the rest of the environment. They show what makes for good or bad design from the point of view of persons in vehicles traveling through the landscape at sixty miles an hour. It is the idea of speed and the ability to see the landscape that forms the central core of the first section.

The second porition of the section looks at the need for careful integration of the roadway with the environment it passes through, the impact on adjacent communities, the inherent conflicts between highway planning, land use planning and the landform, and, finally, the techniques by which, through care and talent in such matters as grading, planting, spatial analysis, and the structural design of the freeway and its components, the freeway can become a positive addition to the landscape and have minimal impact on the environment.

THE MAN MADE OBJECT

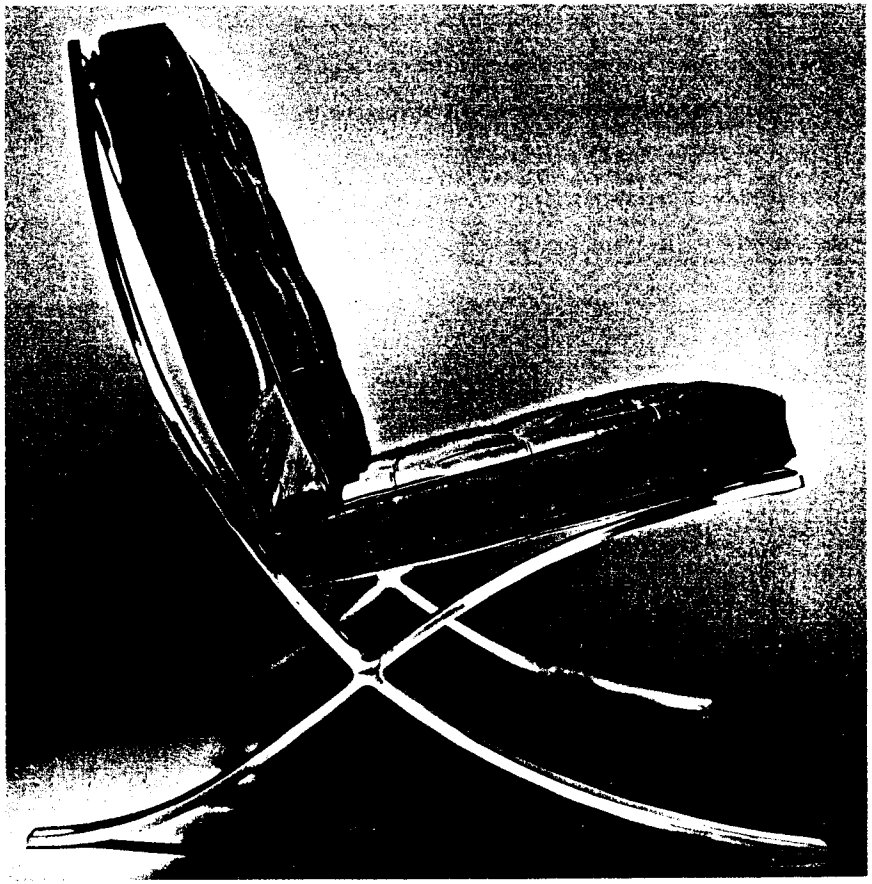
VISION + VALUE SERIES
Gyorgy Kepes, Editor
George Braziller, New York, N.Y. 1966

Photo courtesy of *Action Sports.*

This volume in the Vision + Value series presents a general evaluation of the man-made object as an important environmental factor in shaping our 20th c. mores, feelings and values. The object, mass-produced and of limitless variety, reflects our ability to express cultural values and historical past and clearly gives focus to future paths. Modern technology has radically altered the man made object, the furnishings of our homes, and the landscape as well. The man-made object has become the new symbol for each successive generation striving to improve the condition of their lives. Kepes has organized a series of essays that view the object from a mere trifle to the large scale building from a formal, aesthetic, psychological and sociological point of view.

The first group of essays treat the origins of the man-made object through photographs, dialogues on historic and contemporary settings. Gillo Dorfles, in the essay, "The Man-Made Object. Object Forms and Functions: Contrast and Analogies." examines the need to *create* objects as an extension of man, a manifestation of the physical being. In this sense, the tools are viewed as limitations to the making of objects. By contrasting the hand-made and machine made object, Dorfles points out the anthropological nature

Barcelona Chair, 1929. Ludwig Mies van der Rohe.



of the human-made object and its importance, Christopher Alexander's essay,"From a Set of Forces to a Form", defines the term *force* in two parts: the exact circumstances under which the force arises; the exact conditions which the force is seeking. Since force generates form, as in natural systems, Alexander argues that object-making is a product of forces (analyzed within a numerical framework) organized into real material as form. The exact methods for determining the form derivative emerge from numerical, analog, and relational forces methodologies. Through the scientific method of applying the three methods of force analysis, with no restriction on their variety, form can be generated which is stable with respect to all three force types.

In "The Object as Self-Image," Frederick Wright suggests that object-makers can be broken down into two major categories: those who reflect on what they do and those who find reflection a hindrance. The objects valued by society are those to be found within the realm of conscious thought processes and that image-objects must reflect the time and intellectual concerns for man to see the made-object.

In the final essay, Francoise Choay in "The Object and "Realism" in Contemporary Art," proposes that the actual, unfigured presence of *found* objects as elements of sculpture and art is proving to be one of the characteristics of contemporary art in an industrial society.

THE NATURE AND ART OF MOTION

Gyorgy Kepes, editor
George Braziller, New York, N.Y. 1965

In this contemporary society, the increasing precision of human understanding of motion in the physical world has led to the recognition of motion as a pervasive aspect of nature. The dynamics of the outside spatial world are ever changing but in spite of this fact, the essential characteristics of the world as we perceive it are constancy and stability. Our frame of reference exists within a stationary spatial construct. Motion then is irrevocably tied to individual perceptions while the objects within the world remain constant. Perceptual studies have revealed a paradox that shapes creative vision in that the patterns of optical signals that touch our retina and consequently reach the brain are never static.

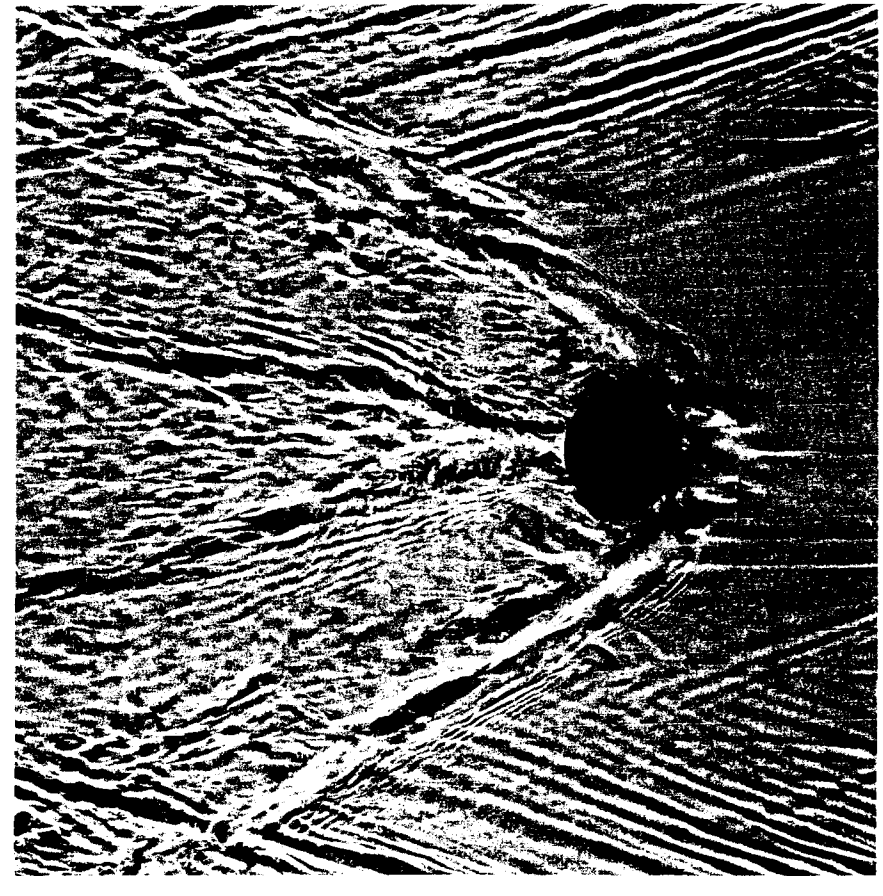
In this series of essays, physicists, philosophers, artists, psychologists and art historians explore the aspects of motion that lead to the discovery of three fundamental aspects of artistic vision:

a. complementary unity - an understanding of relationships between the observer and the observed, of order and vitality and of constancy and change.

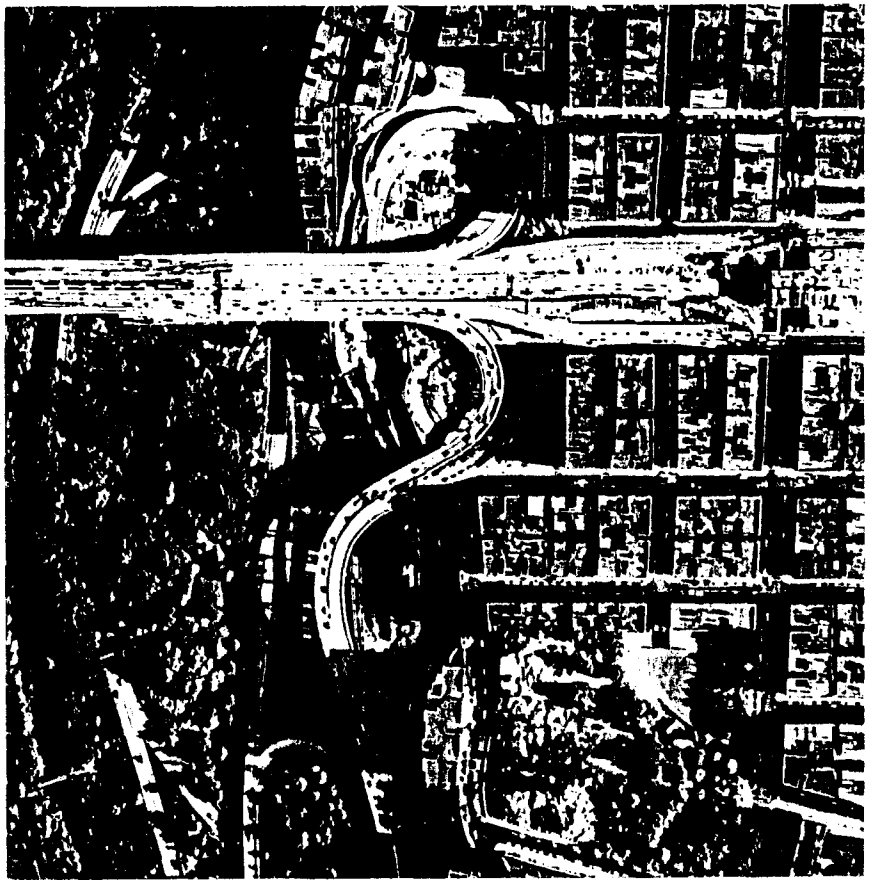
b. rhythm - basic to all living processes, and so too to the creation or reliving of an artistic configuration.

c. sequence - a relationship to the life-span of the

Fluid passing an obstacle.



New York approach to the George Washington Bridge.



created experience.

Each author addresses a unique aspect of how images are created and perceived as structured sequential patterns inherent in all created forms.

While the essays of the first part of the volume deal with general aspects of motion, subsequent essays deal with structural problems of successive images. Particularly relevant to this study is the essay by Donald Appleyard regarding the visual future of the highly dynamic urban environment. Each of the essays argues for two basic ways in which the revision of visual thinking may process - through either technical invention, or through artistic intervention. The essays suggest that with the help of these extended visual tools and through new methods of seeing, coupled with a renewed cooperative impetus within the technical and artistic communities, our physical, emotional, and intellectual needs for constancy and stability can be met.

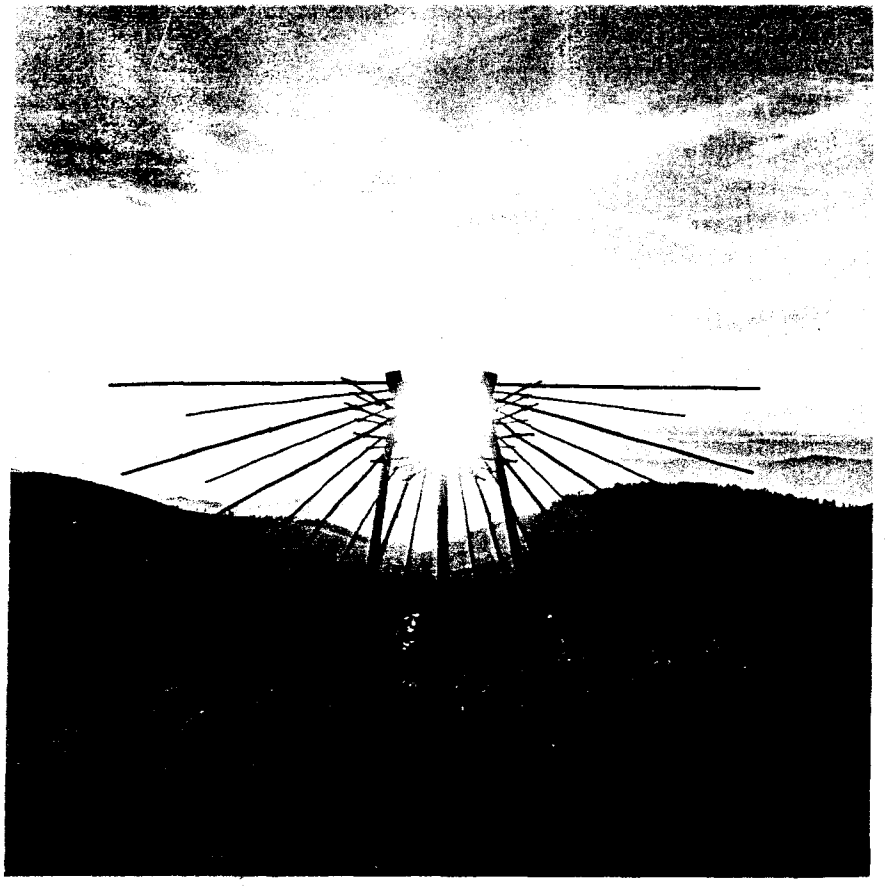
Particularly relevant essays:

Wallach, Hans, Visual Perception of Motion.
Gerstner, Carl, Structure and Movement.
Appleyard, Donald, Motion, Sequence and the City.
Dorfles, Gillo, The Role of Motion in our Visual Habits and Artistic Creation.

NATURE SCULPTURE

Wurttembergischer Kunstverein
Stuttgart, West Germany, 1981

Nils-Udo (b. 1937). *Sonnenskulptur*, 1979.

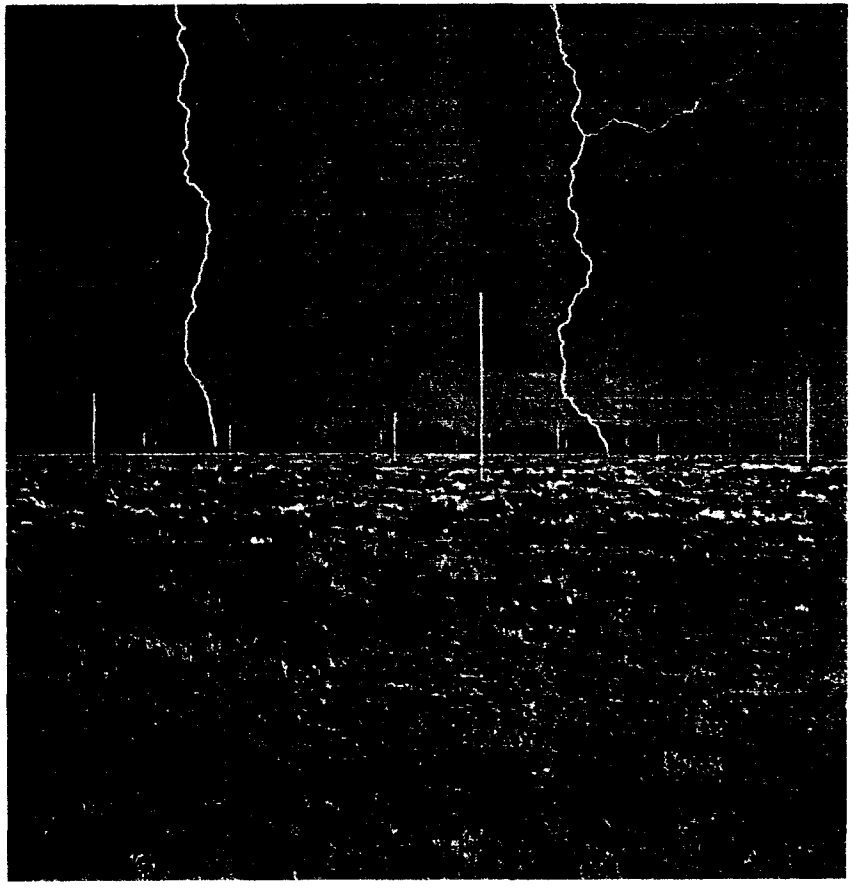


Since the early 1960's a movement has formed in which artists involve themselves with using and exhibiting in specific natural sites. They are interested in an integration of art and natural landscape as a means of expressing and confronting that dialectic between nature and man, the objective and the subjective. This dialectic has led to an alienation between man and nature, a conflict finding expression in the built world.

The artistic aim of this book is to enlarge man's awareness of nature within himself. It is an attempt to solve the contradictions between the individual and the whole through a meeting of human and natural forces. The process is one of the artist creating a sculpture as an expression of personal experience while using materials at hand and incorporating natural processes such as growth and decay. These sculptures take on a variety of dynamic relationships with their siting based on two conditions, space and time. The sculptures exist as a part of nature despite the subjective reasons for their creation.

Artists included in this book are Alice Aycock, Jean Clareboudt, Hamish Fulton, Michael Heizer, Manfred Hoinka, Richard Long, Dennis Oppenheim, Robert

Walter de Maria. *The Lightening Field*, 1947-77.



Smithson, Cecil Abish, Dominique Arel, Victoria Bell, Karl Ciesluk, Jan Dibbets, Eberhard Eckerle, Hawoli, Nancy Holt, Jan Meyer-Rogge, Karen Shirley, Rudolph Wachter, Michael Enneper, Richard Fleischner, Mary Miss, Karina Raeck, Michael Singer, Nils-Udo, Carl Vetter, Christo, Andrew Leicester, Robert Ressler, Gary Rieveschi, Alan Sonfist, Jan Sullivan, George Trakas, Thomas Woodruff, and Susan Zurcher.

A PROPOSED PROGRAM FOR SCENIC ROADS AND PARKWAYS

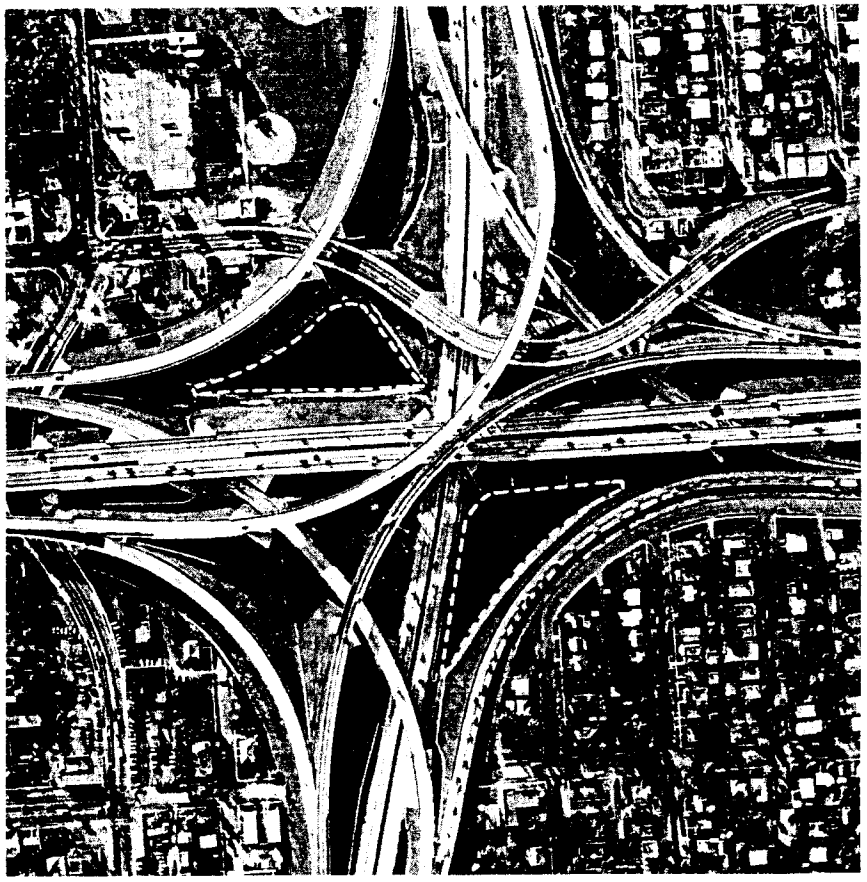
U.S. Department of Commerce
U.S. Government Printing Office, Washington, D.C., 1966

Prepared in 1965 by the U.S. Department of Commerce under Secretary John T. Conner, this report was delivered to the President's Council on Recreation and Natural Beauty. It was the result of recommendations by the Recreation Advisory Council established in 1962 and the subsequent Highway Beautification Act signed by President Lyndon Johnson in October 1965.

The report calls for the establishment of scenic roads and parkways as a response to the fact that at least a third of automobile travel is for social, recreational or vacation purposes. In 1965, driving for pleasure was the most important outdoor recreation activity - surpassing swimming, boating, fishing or any of the outdoor sports.

Scenic roads would provide access to prime recreational areas such as parks and private facilities, but should in themselves be considered as part of the aesthetic experience of vacationing. It is recognized that scenic beauty and highway safety are interrelated. It is demonstrated that outdoor recreational activity enhanced by scenic roads would benefit the nation's economy, defense and overall health. The report calls for a minimum of $4 billion to be allocated between 1966 and 1976. The

"Highway beautification" resulted in a ponding installation at a three-way Interstate highway interchange in Miami, Fla.

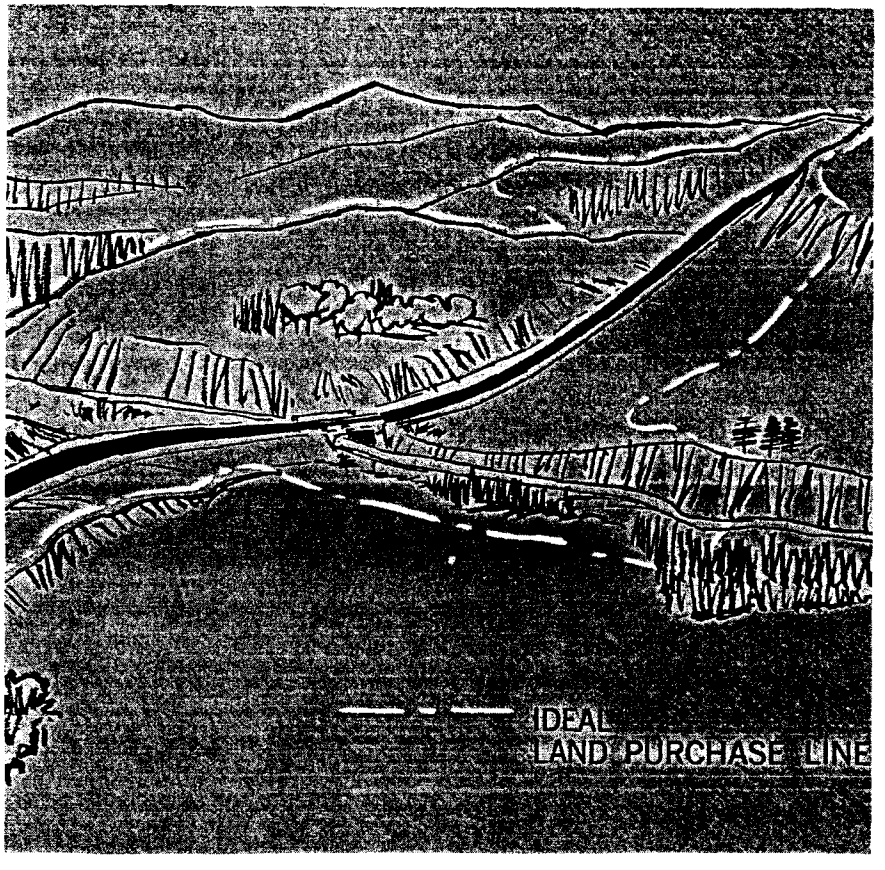


size of the program was calculated by defining:

a. projects resulting in maximum service to population centers, greatest amount of actual use, best payoff on investment and

b. gasoline taxes generated by recreational driving.

It was recommended that the program be administered by the Department of Commerce with the cooperation of the Department of Agriculture, Interior, and Housing and Urban Development. When the program becomes operational, planning at the state level would be indispensable with money for research and development provided by Congress.



The most advanced methods of landscape architecture and highway engineering are described. Plans for improving all existing public roads are listed. Financing, administration and planning of scenic roads is addressed.

Some existing scenic roads are studied and evaluated. These include the Bronx River, Hutchinson River, Saw Mill River and Cross County Parkways of New York; the Boston area Muddy River, Franklin Park and Wood Island Parkways; a well developed system of scenic roads in California; the VanDuzer Corridor in Oregon; Upper Port Caddo Road in Texas; Potash Road in Utah; The Great River Road stretching from Minnesota to the Gulf of Mexico; Mount Vernon Memorial Parkway in Virginia and Maryland; Blue Ridge Parkway in Virginia; The Natchez Trace in Tennessee, Alabama and Mississippi; The Baltimore-Washington Parkway; Colonial Parkway in Virginia; Foothills Parkway in Tennessee; The Kancamagus Scenic Road in New Hampshire; the Gunflint Trail in Minnesota; Carson Pass Forest Highway in California; Tellico Plains-Robbinsville Road in North Carolina and Tennessee; the Choctaw Trail in Oklahoma and Arkansas; and an extensive system of scenic roads in Wisconsin.

PUBLIC ART: NEW DIRECTIONS

Louis Redstone
publisher

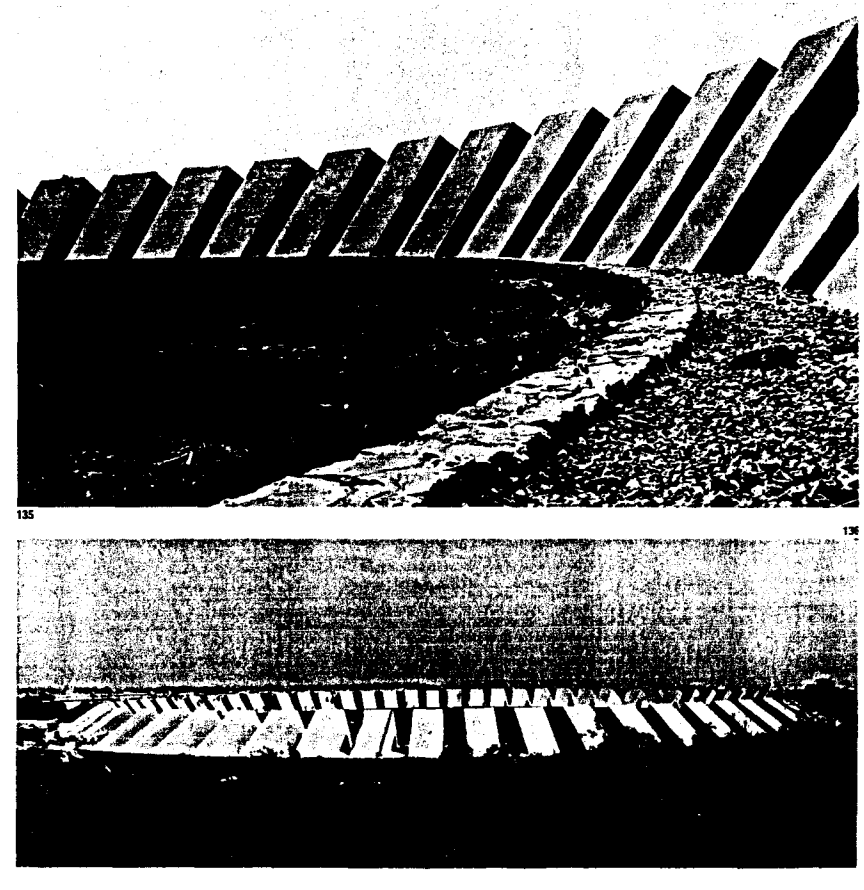
Public art was, in the past, generally relegated to the domains of temples or palaces. Today it has reached out into the streets, shopping centers, office centers and even the highways.

There was an upswing during the 1960's and 1970's in the recognition of the importance of art in general life. This is demonstrated by the growth of funding from governments at all levels, educational institutions, commercial and industrial corporations and art patrons.

The General Services Administration revitalized the Arts in Architecture program, introducing new forms of public art such as environmental sculpture, earthworks, lightworks, murals, and building crafts such as ornamental grilles, stained glass, wood, fiber, and fabric arts. The GSA encouraged the integration of artworks in the conceptual phases of architectural design. In 1963 the GSA established an allowance of .5 to 1 percent of construction costs for each new federal building for the arts. Between 1962 and 1978 one hundred thirty six works were commissioned.

The National Endowment for the Arts was established in 1965 by Congress. This led eventually to a program entitled

Center of Sculptural Space. National University of Mexico.



KTH by Lennart Mork. Subway Station. Stockholm, Sweden.

"Livable Cities" encompassing architecture, urban design, city and regional planning, interior design, industrial design, etc.

Universities and colleges, especially through expansion projects, have increased commissions for works of art for their grounds and buildings. Regional shopping centers have recognized the importance of the presence of art and the public's appreciation for it. Corporate offices, hotels and theaters generally include art in their total plan.

Urban areas unaffected by governmental, institutional, and commercial groups require a different approach and scope of activity. Murals on building walls have been very successful at brightening drab neighborhoods.

Projects in some foreign countries are a result of legally required art in public and institutional buildings. For example, since l964 Canada has allocated 1 percent of the building costs of all Canadian federal projects for works of art.

SPACE IN ARCHITECTURE

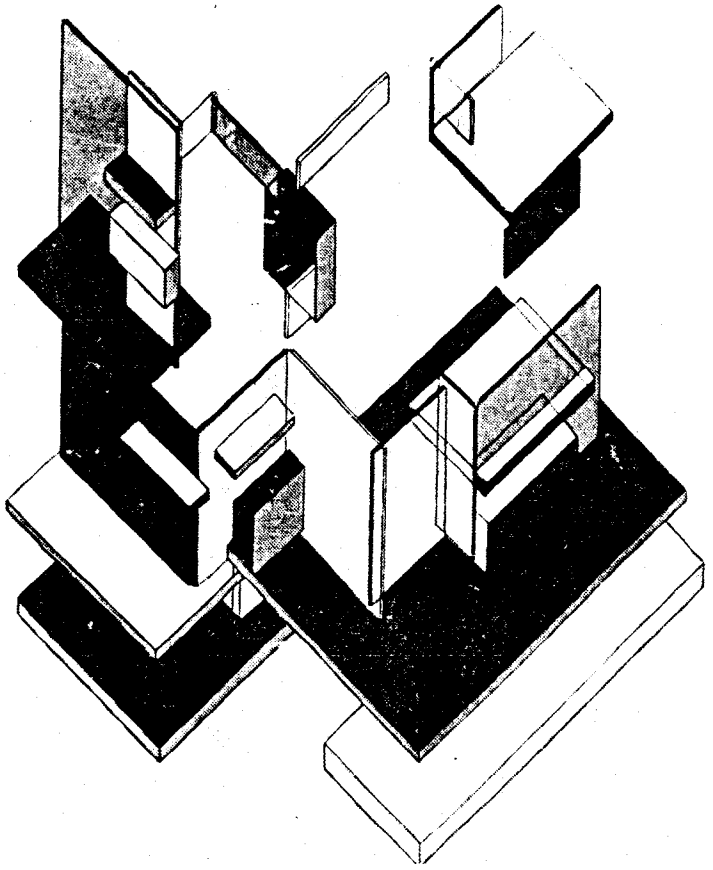
Cornelius Van de Ven
Van Gorcum Assen, The Netherlands 1980

The concept of architectural space is a relatively new one, being born in the middle 1800's. Modern architecture appears to be based within a spatial framework that has evolved from oriental and western philosophy, science and physics and a concern over religious aesthetics. Van de Ven concentrates on a variety of ideas, within the Hegelian tradition, of "architectural space" such as the birth of materialist and functionalist concepts of space.

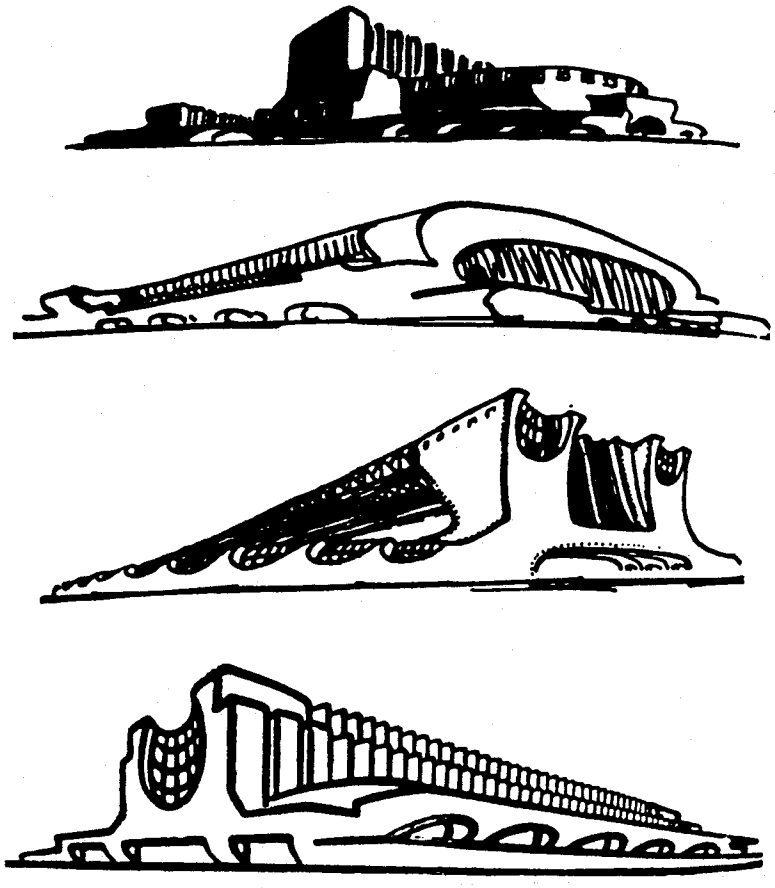
A discussion is presented starting with the Chinese philosopher Lao Tzu and continues by examining the spatial ideas of Plato and Aristotle. He investigates the various interpretations through the theory of empathy and the discovery of the concept of simultaneity in perceptional psychology as crucial factors in the modern definition of architecture as the art of space.

By using a psychological approach, Van de Ven stresses that the human development is nothing else than the awareness of greater spatial dimension. The new architecture takes into account not only space, but also time as an aspect of architecture. The unity of time and space gives architectural form a new "plasticity". The new ideology, rooted for example in Mies Van der Rohe's

Theo Van Doesburg and Cor Van Eesteren.
Project for a private house. 1922.



E. Mendelsohn. Studies for large public buildings. 1914.



Armour Institute of Technology, rearranged the concepts of space into a materialistic hierarchy. "In its simplest form architecture is rooted in entirely functional consideration" states Van der Rohe; space achieved through the rationalist perspective. Van de Ven stresses the notion of space can be organized around four critical elements: illusory space that springs from the intuitive and the metaphysical; mathematical space that springs from the need to measure and draw; material space emerges from the tactile and perceptual requirements; and artistic space which represents the spiritual idea of space.

The appreciation of architectural space is tied to the time-aesthetic which measures spatial perception as a body in movement through that space. In conclusion, the author argues that space must be conceived of as planimetric, space time, three-dimensional and imaginary. To fully perceive the extent of the spatial experience, the space must incorporate one or more of these phenomena which in turn helps shape the meaning of the built environment.

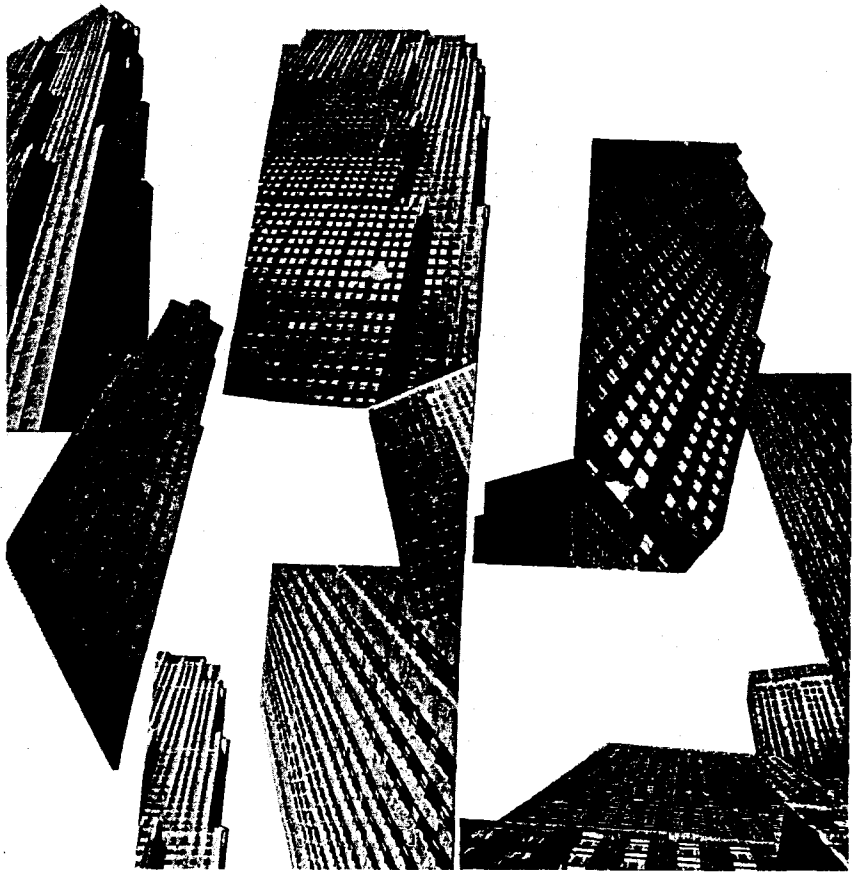
SPACE, TIME AND ARCHITECTURE

Sigfried Giedion
Harvard University Press, Cambridge, Mass. 1967

The central theme of Space, Time and Architecture is the separation between thinking and feeling. It explores the unconscious parallelism of methods employed in art and science. During the early 1960's, architecture as well as urbanism became enriched due to the contributions from countries other than the United States - an evolutionary movement toward universality. In an attempt to answer the larger question, How do we wish to live?, Giedion structures the development of a "universal architecture" as the next step toward "new regionalism" - a method by which the inherent characteristics of place shape the conception of space. The present space-time conception - the manner in which volumes are placed in space and relate to one another, the way interior and exterior space are separated or intertwine is in a constant state of flux. To recognize and evaluate what is happening today and posit a tomorrow needs a longer perspective than the immediate historical past.

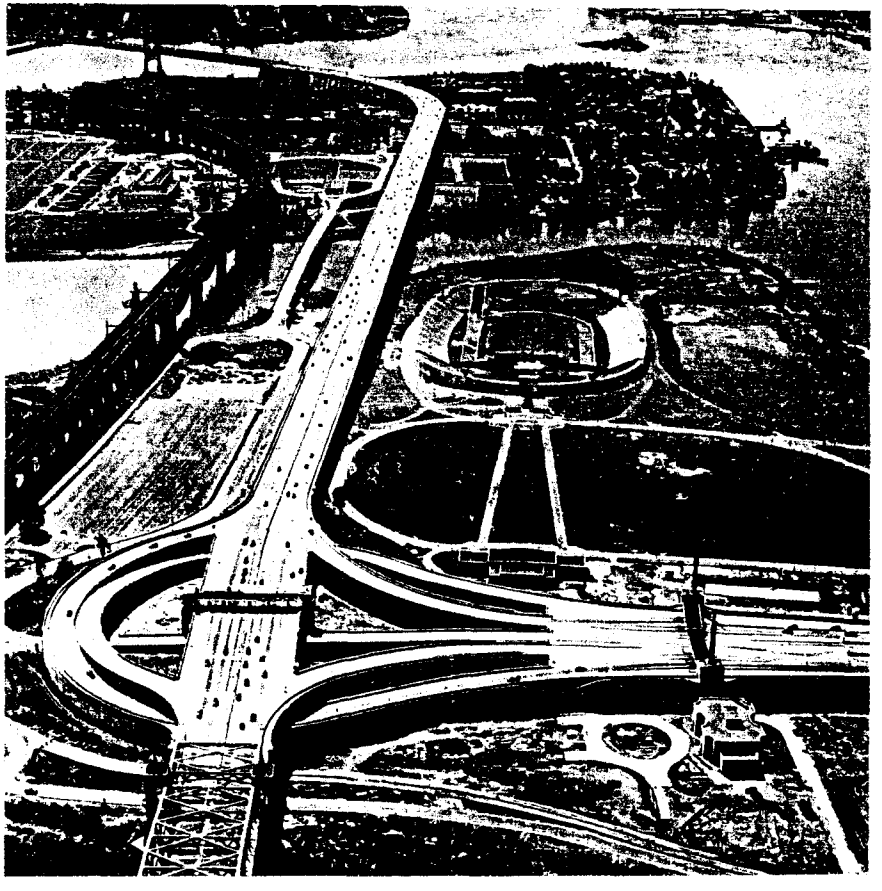
There are three space-time directions in architecture that emerge from the historical past: space as an interplay between volumes, interior space; and perceptual space. Since our period is seen as a period of transition, the spatial impulses manifest in architectural form allude to a

Rockefeller Center. Photomontage.



split personality - a division within. Artists and scientists have lost contact with each other; they speak the language of their time in their own work but cannot understand it expressed in work of a different character.

Randall's Island cloverleaf with approach to Triborough Bridge, New York City, 1936.



The 19th and 20th century development in the sciences, impelled by the great tradition of the previous two hundred years, has produced a similar schism within our civilization. The problem of today is not to popularize science but is to gain an understanding and a general view of the dominant methods in different fields of human activity. Our culture appears to be rooted in an age of specialized disciplines of such narrow scope and nature that can only encourage further movement toward specialization. Giedion argues: to counter this thrust, unification of the arts and sciences must occur within the parallelisms that our culture embodies. The degree to which the methods of thought and feeling coincide determines the equilibrium of an epoch. Through an exploration of the roots and growth of modern architecture, the "unity" of the future and its relation to our past and present can be realized.

VIEW FROM THE ROAD

Donald Appleyard, Kevin Lynch, Meyer
MIT Press, Cambridge, Mass. 1964

The View From the Road was the first comprehensive attempt to consider the urban highway as a positive visual experience that organizes motion, space and view to achieve aesthetic enjoyment.

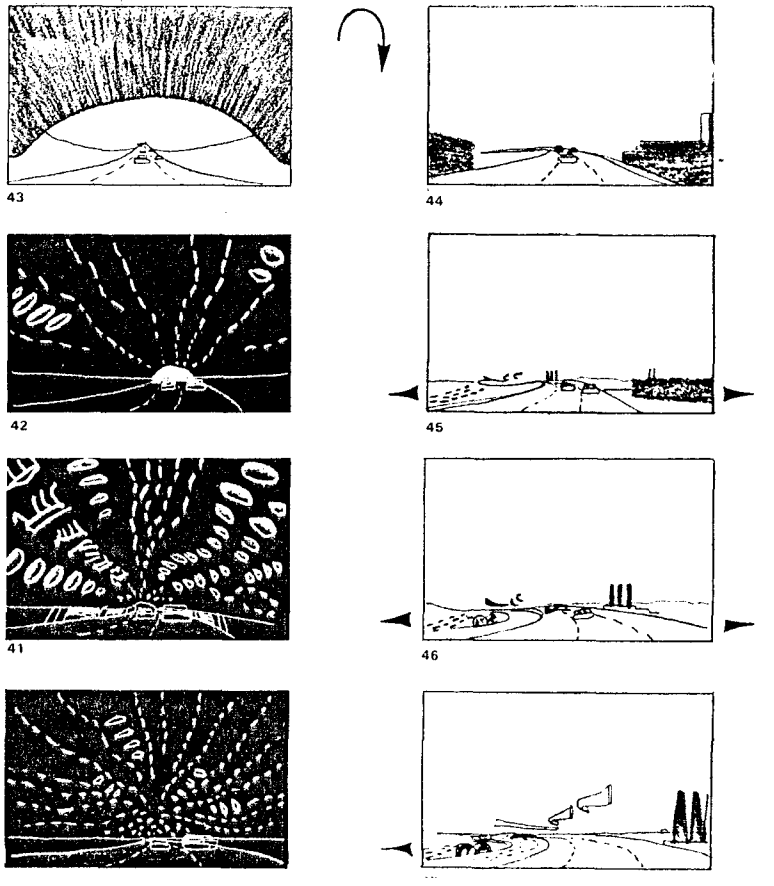
The book is concerned with the aesthetics of the highway with particular reference to the way the road and its context in the city looks to the driver and passengers.

Two major contributions made by this work are the attempt to continue the research into notation of the three dimensional environment as the viewer passes through the scene, and the extension of this analytical method into a design tool that allows the highway designer to explore options for highway design, routing and views of the city from the highway.

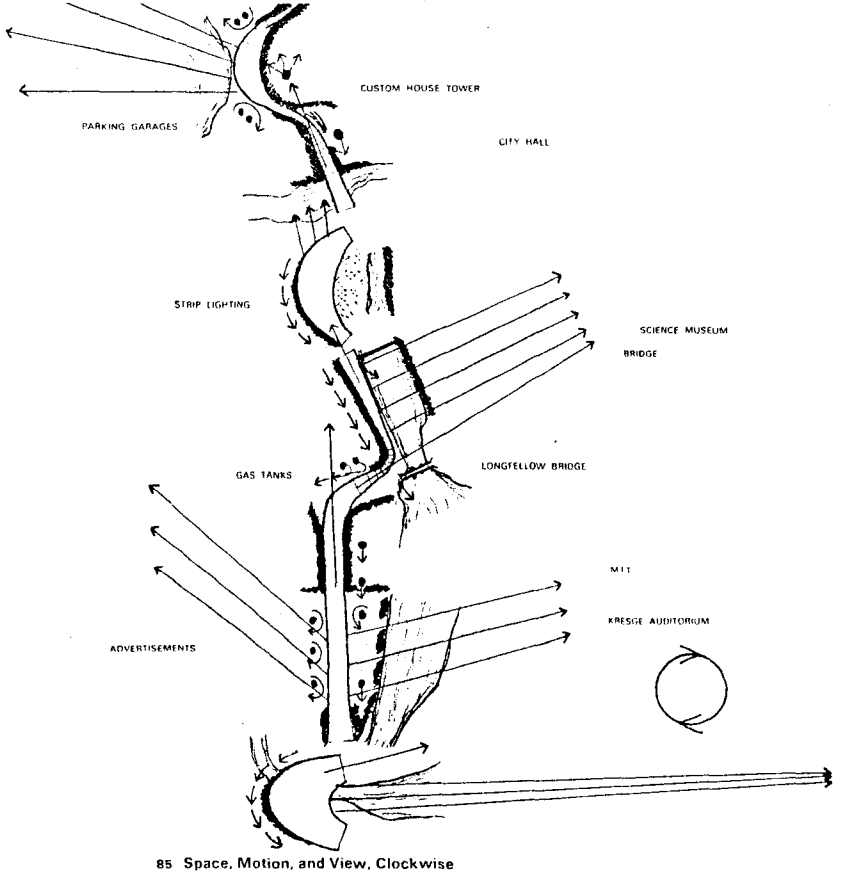
Drawings and perspectives are necessarily selective and highway designers, as do all designers, choose the viewpoints or vantage points that best illustrate selective ideas of what a highway ought to look like.

Several techniques can be employed to convey the experience of moving through space at high speed. These

Sequential views of a trip on an imaginary highway.



Portion of a Space, Motion and View diagram.



85 Space, Motion, and View, Clockwise

may include the use of motion pictures, 'cartoon' movies, or urban simulations such as those later developed by Appleyard at the University of California-Berkeley Urban Simulation Laboratory. These are often cumbersome to use and because of this several languages have been created for symbolizing the elements of a sequential experience in a single two-dimensional drawing. The elements to be recorded and represented may include change of view, enclosing space, apparent motion, sound, other activity, light and shade, and many other factors.

The work represented in Gordon Cullen's Notation, Philip Thiel's A Sequence-Experience Notation, and Lawrence Halprin's Motation are all attempts to develop and master similar recording techniques for documenting what Cullen called Serial Vision.

The book opens with the broad perspective of the highway landscape documenting the highway experience, elements of attention, the sense of motion, issues related to road alignment, apparent relative motion of the field of view, and the sense of space when traveling along the highway. It also explores issues of orientation, meaning, rhythm and continuity, and sequential form in the urban landscape.

The authors test their approach on existing stretches of urban freeway, extensively document the study of the Northeast Expressway in Boston, and then undertake the design of alternative proposals for the inner ring road in Boston.

YOU ARE HERE: BOSTON CELEBRATIONS

Center for Advanced Visual Studies, MIT
Institute for Contemporary Art, Boston, Massachusetts, 1976

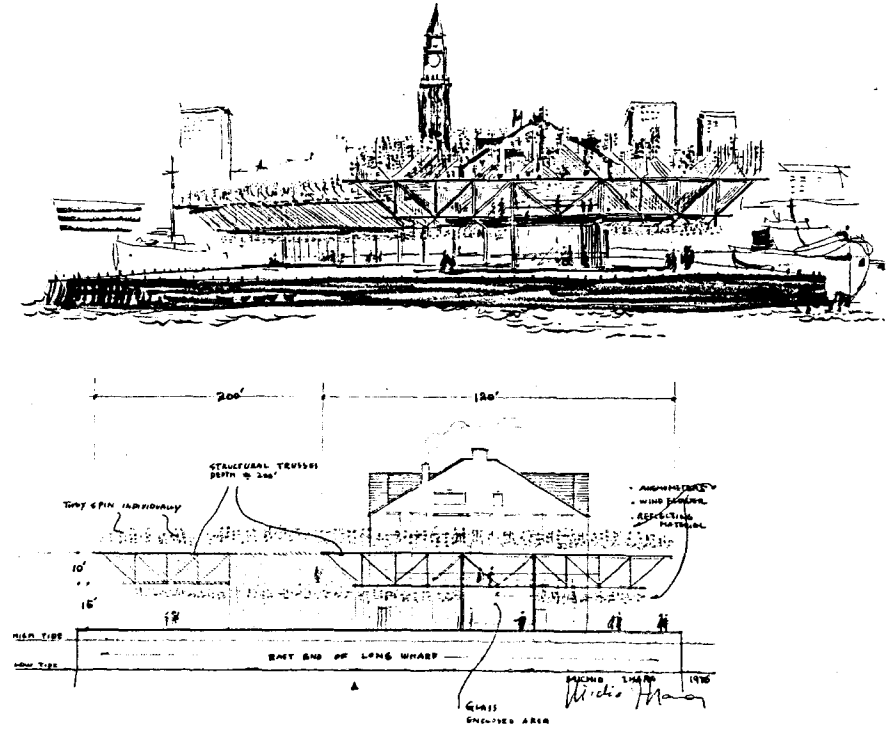
The second collaborative effort between the Institute of Contemporary Art and The Fellows of the Center for Advanced Visual Studies at MIT, these projects offer designs which could eventually become permanent monuments to the city of Boston commemorating its Bicentennial.

Long Wharf was chosen by the Boston Redevelopment Authority as the most appropriate site because of its historical significance and its central location.

Six artists were chosen to participate - Lowry Burgess, Michio Ihara, Gyorgy Kepes, Carl Nesjar, Otto Piene and Harold Tovish. Their work was reviewed by a panel composed of architects, developers, city officials, university administrators and art administrators as well as by a panel of the artists themselves. There was also a chance for the public to offer opinions.

Director of the Center, Otto Piene, states, "Environmental art can no longer be viewed or practised as a set of separate concerns of architecture, planning, art, media or spectators. On the contrary, and positively speaking, environmental art results from the integration, or reintegration, of planning,

Sketch for Long Wharf project, Michio Ihara.



Our People, 1976. Harold Tovish. A wall covered with cast stone life-masks of neighbors.

architecture, art, media, user participation, and - in all of these - modern technology. Usable, glorious interior and exterior spaces large and small are needed - inviting and evocating exciting entertainment; ceremony; joyful or mournful and dignified celebration - lending themselves to expressive experientiation."

Kenneth Baker believes that environmental art serves to connect us to our immediate surroundings. Gyorgy Kepes uses the word environment as "the interconnectedness of forces and things that sustain the conditions we take for granted, such as livable temperatures and breathable air." Environmental art seeks to de-objectify the earth and emphasize our feelings for society and fellowship with the natural world.

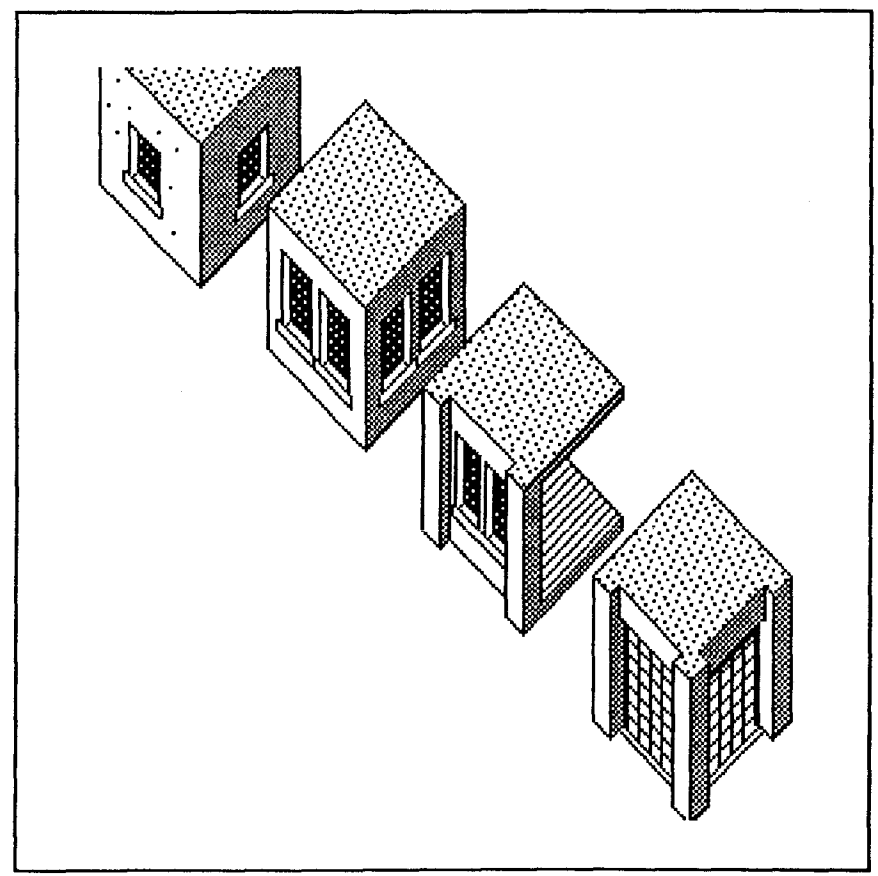
DESIGN HANDBOOK

Introduction

Vision is a fundamental aspect of human insight. It is central in shaping our physical, spatial and aesthetic world, in grasping and experiencing the aspects of nature, and above all, it is central to our self view. The ability to see ourselves as a part of a much larger environment is a major component in the process of living We are equally dependent on the artist, sculptor and designer who heighten our perception of the joys, innuendos and sorrows of life. They have, in a majority of cases, a special sensitivity to the human condition. The immediate and direct response of the artist to the aesthetic qualities of the world helps us establish a rapport with out present and a view of the future.

In Structure in Art and Science, Georgy Kepes states that, "The most powerful imaginative vision is structure-oriented." As the past fades, the artist seeks out new ordering principles which in turn are accepted as fundamental realities. Each artistic interpretation furthers the understanding of the natural world and in turn imparts considerable knowledge concerning the structure of the world. Creative exploration in the arts has yielded significant parallels with scientific and technological investigation. While the technological imperative has been responded to, and is clearly in evidence in the breadth and depth of national interstate highway system, artistic creativity on the roadway

Prefabricated modules can house the enclossure requirements of shelter within the rest areas

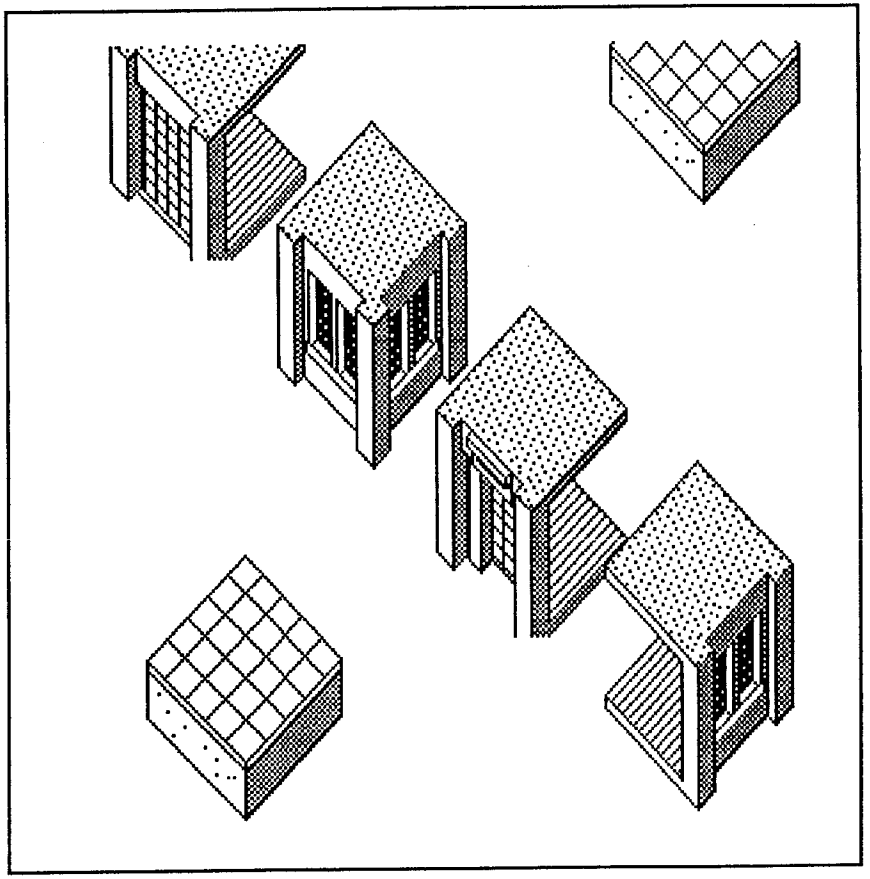


has been seriously restricted.

It is this very limitation that has forced this project into existence. A recognition that our national highways have not been seen as a creative venture but as a venture of expediency. This project has been designed to introduce artistic *structure* to the roadway environment. Structure, in its basic sense, is the created unity of parts and joints of finite entities. It is a pattern of "dynamic cohesion" says Kepes, "in which noun and verb, form and to form, are coexistent and interchangeable; of interacting forces perceived as a single spatio-temporal entity."

It is the intention of this handbook to establish conditions that will lead to a singular goal: the introduction of artistic intent into the planning, design and construction of the highway environment. While it is recognized that the designer must, from a technological point of view, be able to decide the type of bridge or road alignment, the size of cuts or embankments, the possibility of whether or not to eliminate obstructing supports - all elements which are decisive in determining the functional workings of the roadway solution - the knowledge of artistic and creative enterprise is absolutely necessary and indispensable. The creative vision will introduce a *formed* response in which the technological and functional solution will be fully integrated within an aesthetic setting and not simply the reverse. It is not the intent to merely provide a handbook of sculptural or artistic form for the designer to "place" within the roadway, but rather, to *structure* the roadway, where the structure, so to speak,

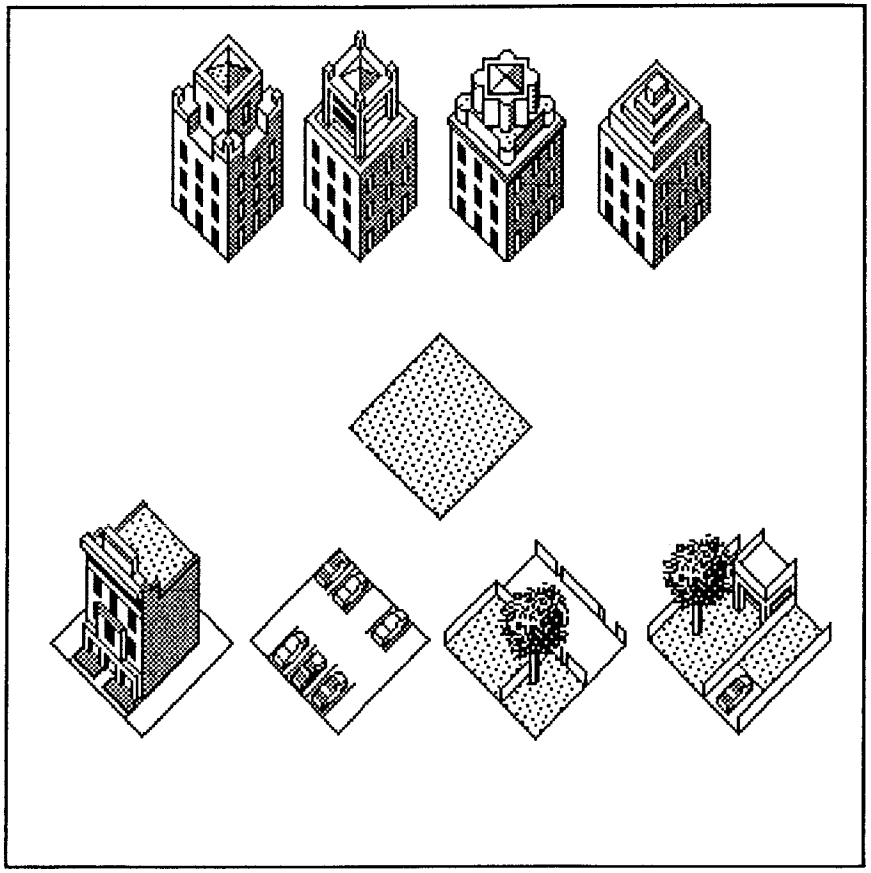
Toll booth modules can vary in style and type as well as scale and placement.



sinks beneath the surface, is latently present and only indirectly discernable. The latency of structure emphasizing the "expressive content" of the designed response. The aesthetic image as such is so clearly established that it reaches it full effectiveness independently of the underlying structure. The desired goal is to achieve and aesthetic balance between those elements that constitute the highway "strip" and the landform on which it rests.

It is clear that the circulation system is most prone to technological development, and therefore, it must be adaptable to change. The elements that compose the roadway must change, not only to meet new demands, but also, to respond to new attitudes about the human and natural environment. As a fine highway expresses the nature of vehicular movement, a poorly designed one reflects all the negative characteristic of its design. This relationship has been proven time and time again throughout the highway system. Because of the prevalent ugliness of much of our movement system, we consider roads as regretfully necessary things that must be supplied but should be concealed from public view. Roads, electric lines, parking areas, water towers and billboards, to name a few, are either eliminated, camouflaged or hidden behind vast quantities of flowering trees, bushes or chain-link fences. It is our contention, that what is needed, is an even clearer visual expression of the essential elements of the movement system. Power lines, bridges, television and radio towers, billboards, etc., can be aesthetically integrated into the expressive content of the highway system.

Highway furniture building blocks in a range of sizes, types and styles!.

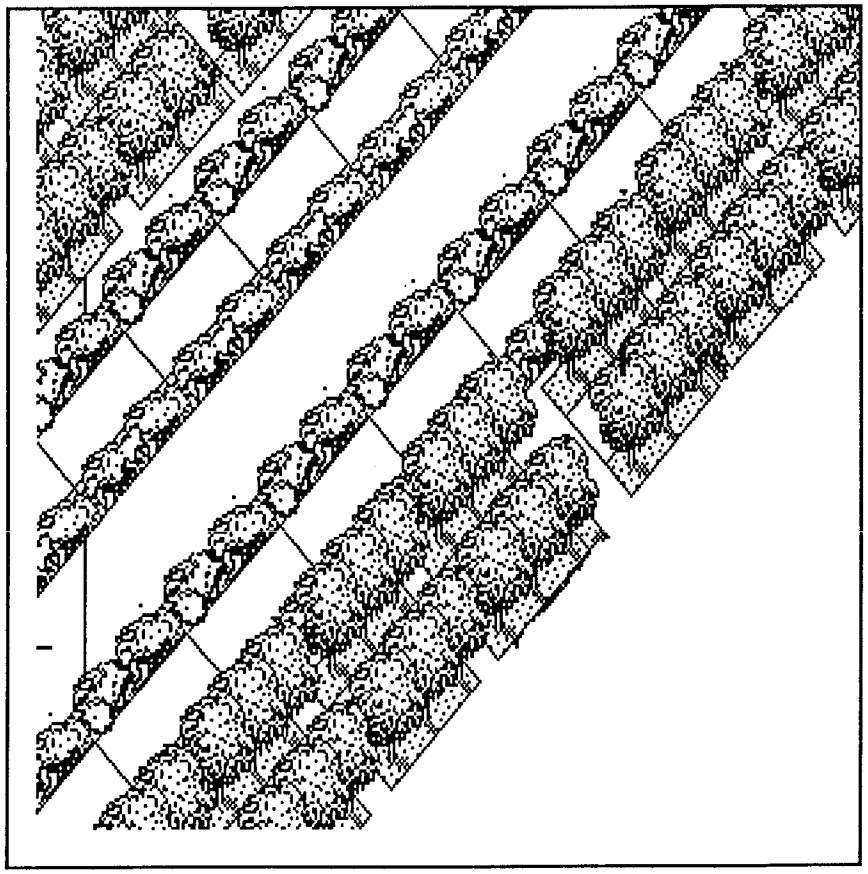


These very elements that populate the highway strip can be seen as furniture - highway furniture. Whether lighting standards, guardrails, bollards, bridges, toll booths, rest areas or scenic overlooks, the highway is defined by its furniture. The selection of highway furniture is not unlike that same process used to select furniture for the office, residence, hospital, school or recreation area. Issues of color, style, forms, scale and historical period and content are but a few of the design constraints. The overall image conveyed, and the means by which the furniture is arranged to suit circulation patterns, is also important. Similar principles apply to the selection, placement, arrangement and distribution of furniture along the roadbed. As the effect of the room is judged by its sense of totality, so will the expressive content of the highway.

The American interstate highway system is undergoing a rapid change due to the rebuilding of the roadway infrastructure. The time to introduce change is the present. Through the introduction of environmental sculpture, highway furniture, art forms and earth structures, in conjunction with the changing technological requirements, the highway will become better suited to meet the transportation needs of a changing society.

To demonstrate the potential for future change, six distinct categories of elements were developed to demonstrate the application of a "designed approach" in the planning, and construction of the roadway corridor. Each proposal cannot be considered as a solution but rather, a designed intent. Each one

Trees placed on regular intervals
along the corridor can create visual patterns

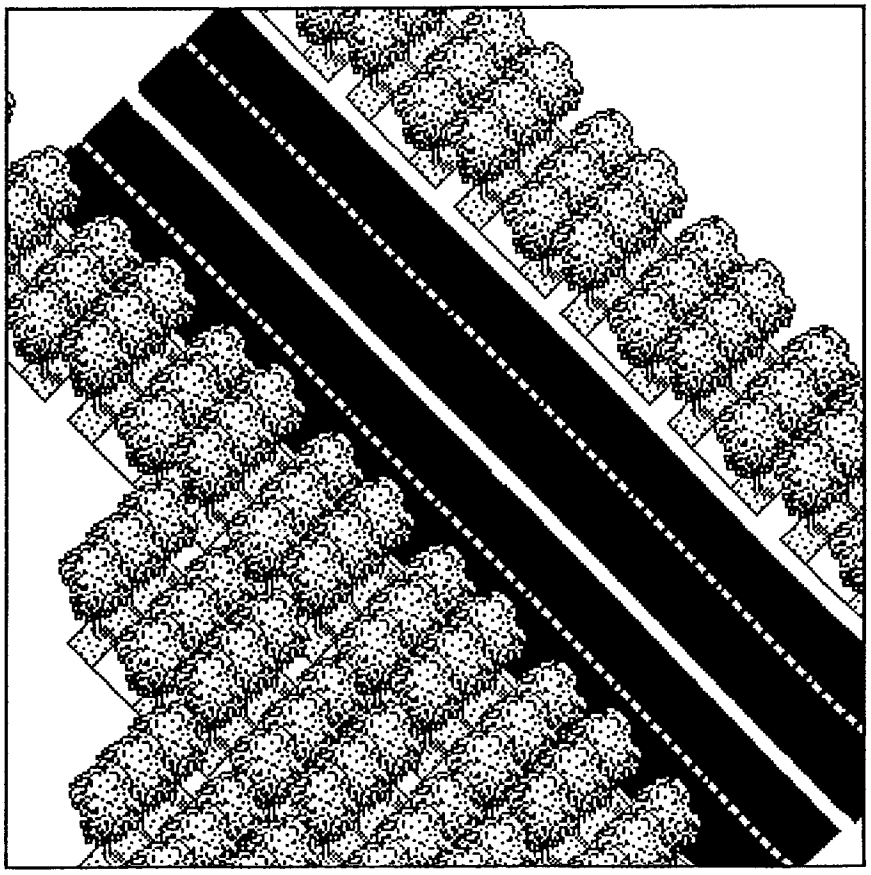


represents a concrete art form where the inherent law is that of the underlying structure. The arrangement, placement or applicability of the ideas presented in this section, is intended to stimulate design attitudes rather than act as an inhibitor. Each category addresses one aspect of the highway environment. The role of the handbook, and the ideas contained within, is presented with the notion that each generation will leave its imprint on the highway strip. Whether, architect, artist, sculptor, planner, landscape architect, historian or contractor, etc., each will insert a new vocabulary of ideas that will bring new focus to the condition of the highway environment. This handbook represents the means to achieve that imprint.

Each category of designed element is presented in a variety of settings and conditions. The range of ideas and images reflects current concerns about the physical state of the highway. Each category should be seen as only part of a much larger image. It is important to understand that the elements, objects, places and spatial forms contained within, are designed to present the highway design profession with a broader range of aesthetic attitudes, images and ideas that, if accepted, will change the aesthetic climate of the highway.

The overall design philosophy is one that advocates the introduction of sculptural form and artifact into the highway environment to increase its inherent value to society. The artifacts are merely objects through which we understand ourselves, how we live and work, and the nature of our dreams. The ideas are

Irregular planting patterns can provide acoustical and visual buffereing



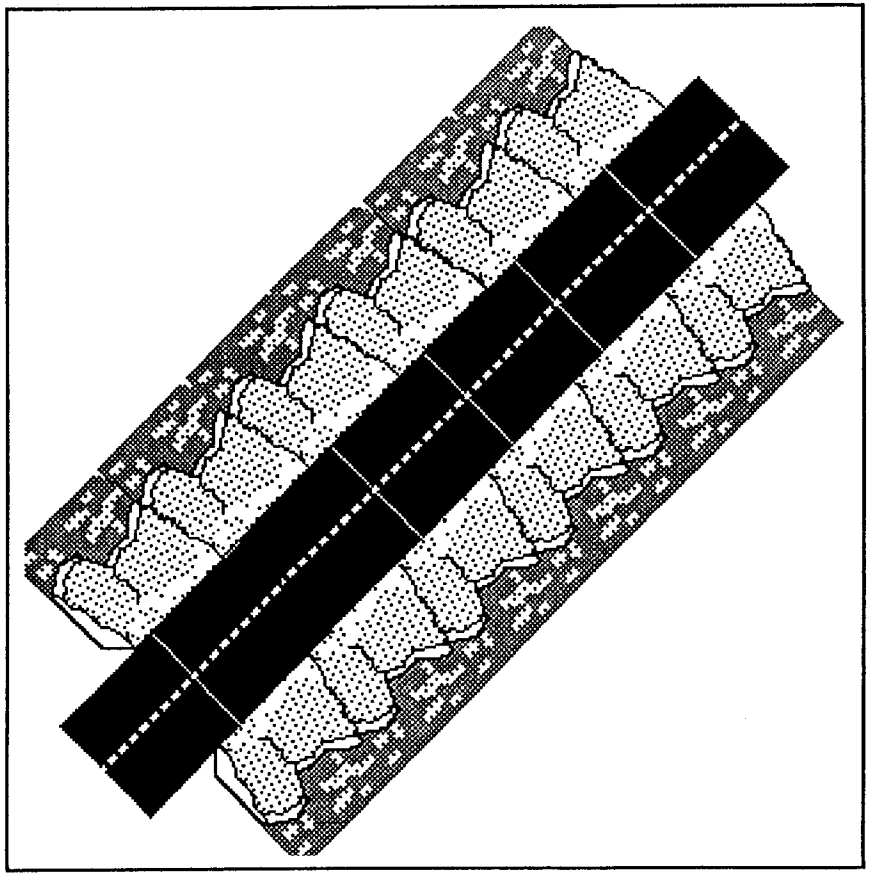
designed to generate pleasure within the framework of the driving experience. They are intended to stimulate the driver, passengers, and those who are within the influence of the highway corridor, through visual, tactile and intellectual means. In addition, they are designed to increase the safety of the roadway and introduce a means by which our national highway system can regain its expressive content. This handbook stresses the aesthetic identity over that of the technological one. In many respects, the central argument that underlies this project is: ART SAVES LIVES.

Roadway Elements

The roadway element represents the first level of highway furniture. These are the objects that are normally found throughout the roadway in the form of highway markings, reflectors, mileage markers, guardrails, lighting standards, signs, directions markers, rest facilities, toilets and toll booths, etc,. These are the objects that are most readily viewed by the motorist as well as being the furniture elements the most frequently replaced. The opportunity of periodically replacing furniture elements is a means by which the visual continuity of the roadway may be enhanced. Each element offers to the motorist, a small-scale sculptural element, whose aesthetic lies in the uniqueness of its form.

This section on roadway elements, as highway furniture, emphasizes the object quality. All possibilities are not represented, however, those presented are intended to focus interest on the objects themselves in contrast to the sensuous movement of the landscape. Lighting standards are designed to enhance the continuity of movement by being interconnected along the route. Signage takes on another meaning by using super-scale letters that function both day and night. Guardrails are designed to protect the driver as well as conform to the shape of the embankment. Trees, shrubs, ground-cover and ornamental

Elevated roadway through a water obstacle can provide visual continuity



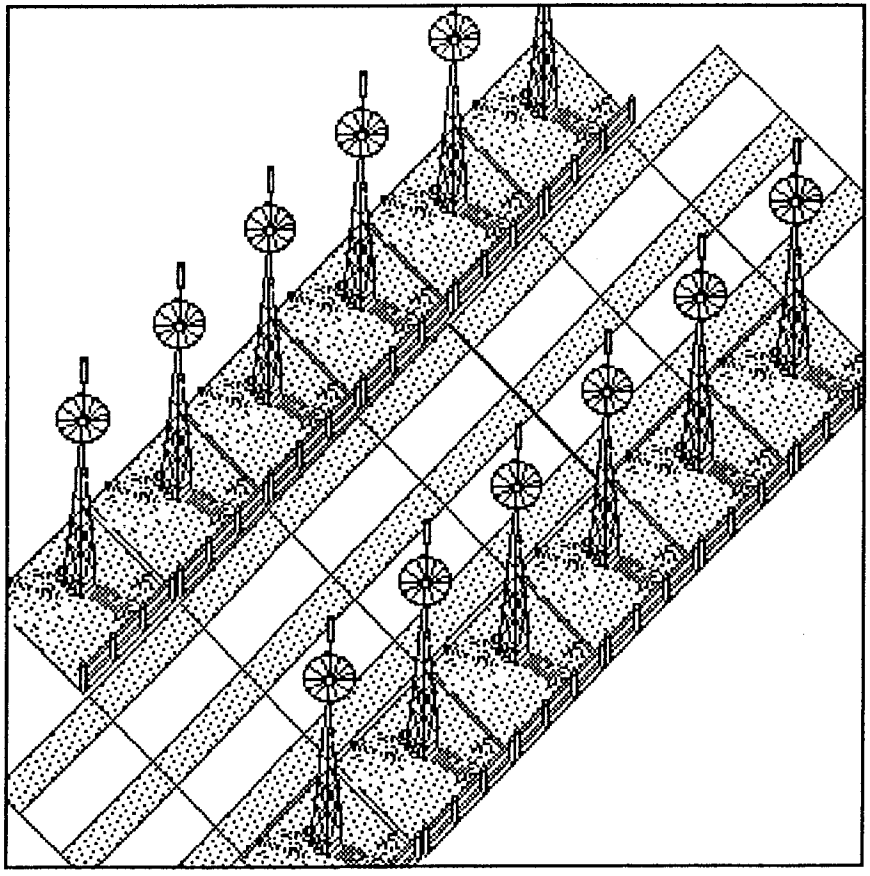
plantings are placed at random intervals in sufficiently large areas to enhance visual interest. According to Tunnard and Pushkarev, the placement of small-scale sculptural forms or blocks can enhance the "kinesthetic sensation of tilting, turning, dropping, and climbing." The plastic harmony inherent in the small-scale sculptural object can contribute to the larger "expressive content" of the roadway.

The nighttime roadway is perceived quite differently from that of the daylight hours. Through the careful placement of lights, signs, electronic information displays and limited access radio transmissions, the motorist can be informed, educated, stimulated, and encouraged to be aware of the roadway and the events that are occurring during the voyage.

Tollbooths and plazas, which are a normal part of the driving experience, should be designed as highly visible sculptural objects. By selecting better designed and more dynamic forms, the plaza environment could be transformed from a purely functional accessory to a visual and spatial experience.

Opportunities for the use of artistic talent in the design of roadway elements is almost unlimited. The sameness of the existing infrastructure must be modified. Every once in a while, it is a pleasant surprise to see a unique sculptural form or a piece of highway furniture break the visual and mental monotony of the highway passage. The "designed" roadway element is one of many means by which that goal can be accomplished.

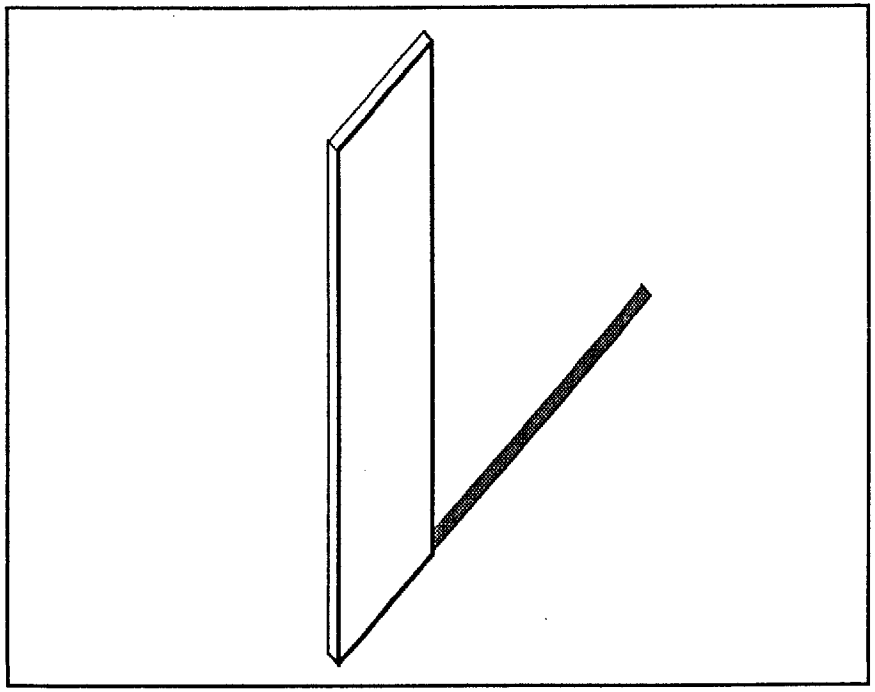
Tower elements placed in a regular pattern creates sense of passing.



Roadway Elements

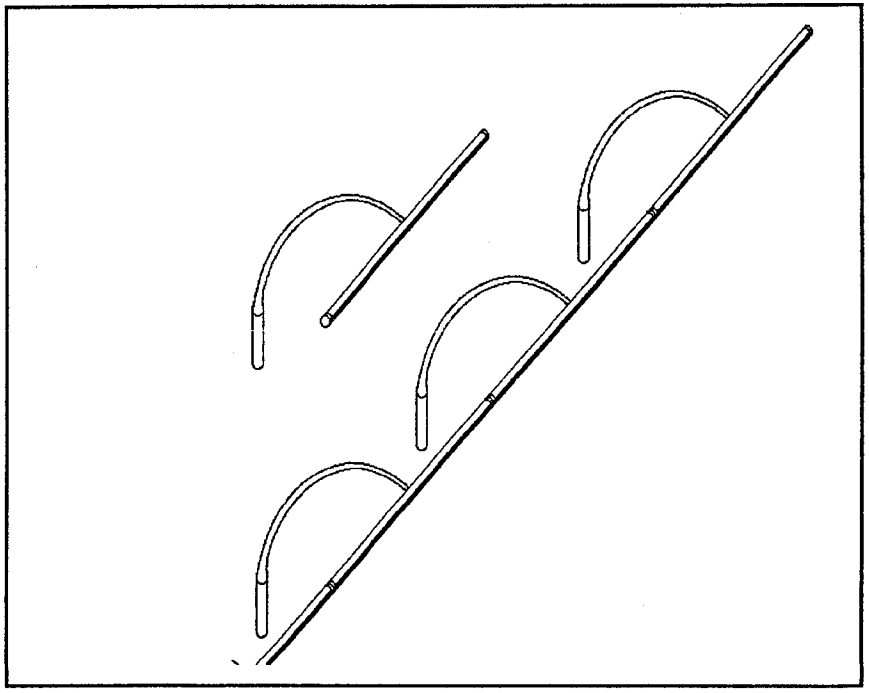
Signage

Illuminated planar sign elements provide short, intermediate and long distance information for the motorist. Automated signs provide changing information about road conditions or information relative to distance, region, time and weather.



Lighting

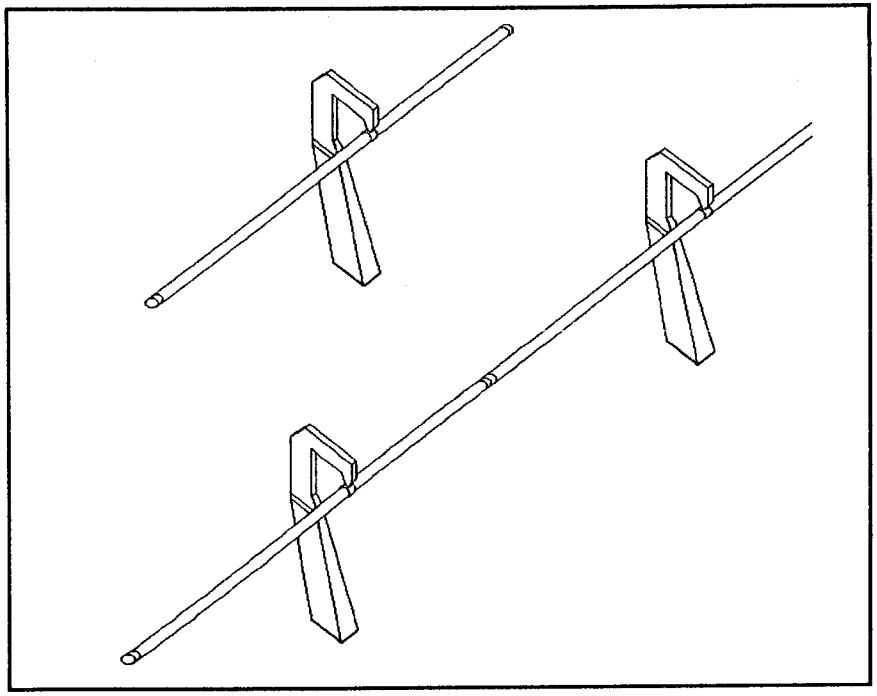
Lighting elements placed along linear elements can provide visual information about the direction of movement to the motorist. Properly placed, linear lighting can create nightime sculptural forms or electronic signage.



Roadway Elements

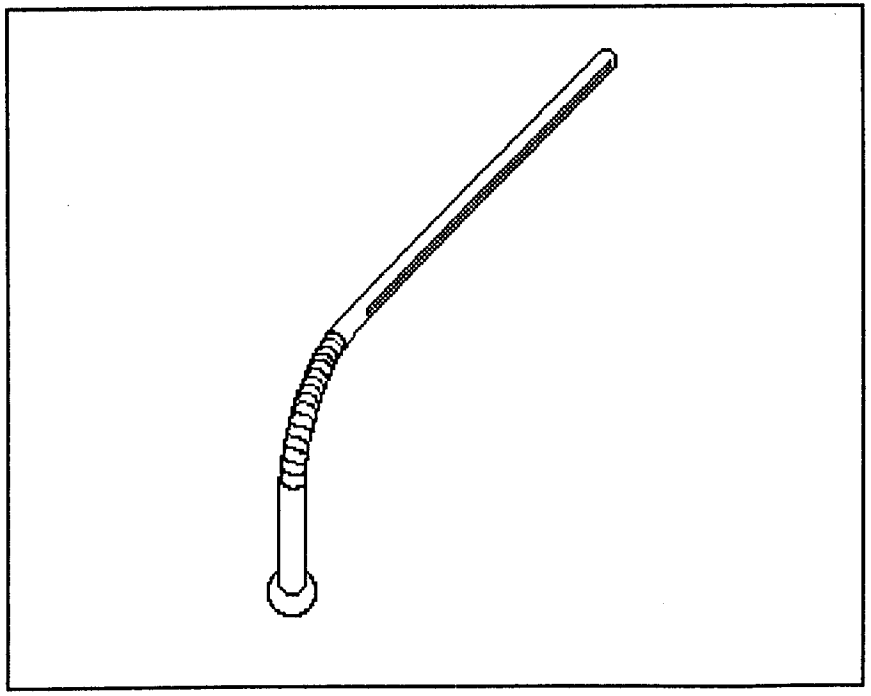
Lighting

These integrated lighting standards not only provide continuous illumination for the roadway, intersections and bridges but can be used to enframe areas of interest such as historic places.



Lighting

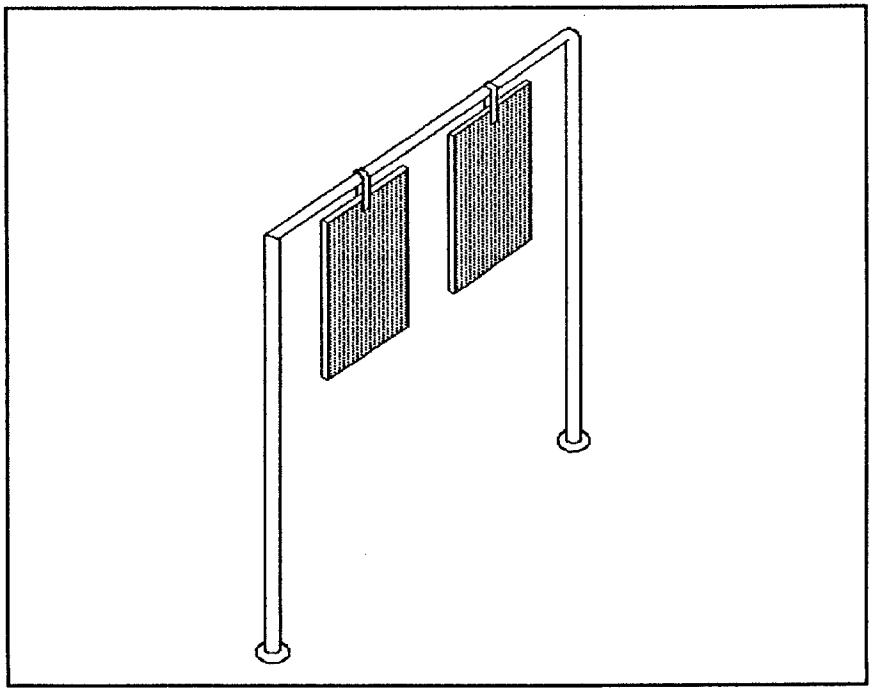
The use of carefully spaced lighting standards can suggest direction and continuity or statically mark time and place. Standards can range in height and be varied in terms of height and color to control visual interest.



Roadway Elements

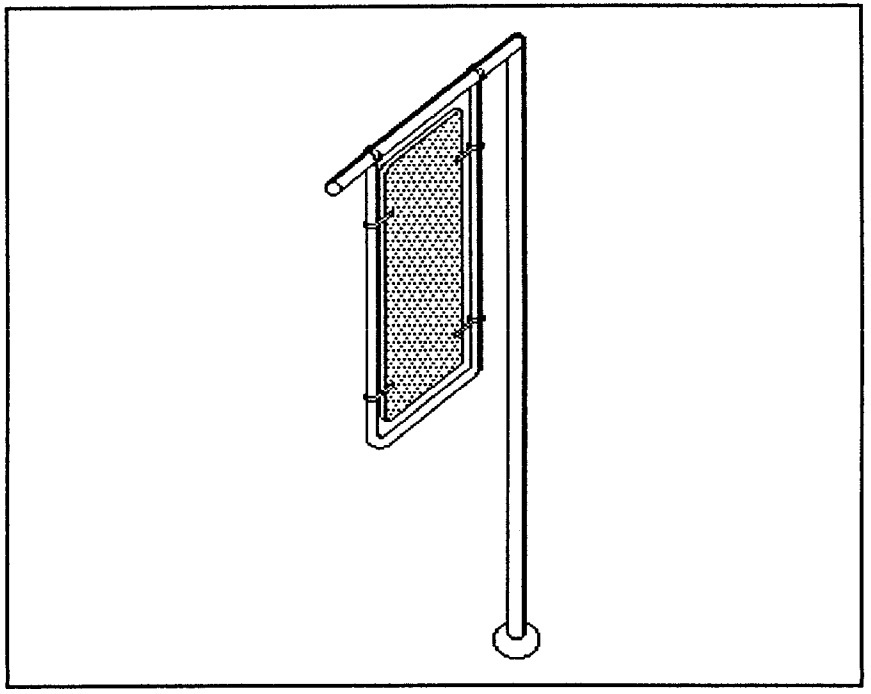
Signage

Using a rigid frame, sign element can be suspended or integrated within the frame. The sign can convey meaning through form. Readily recognized forms, even if only implied, deliver information that is commonly understood.



Signage

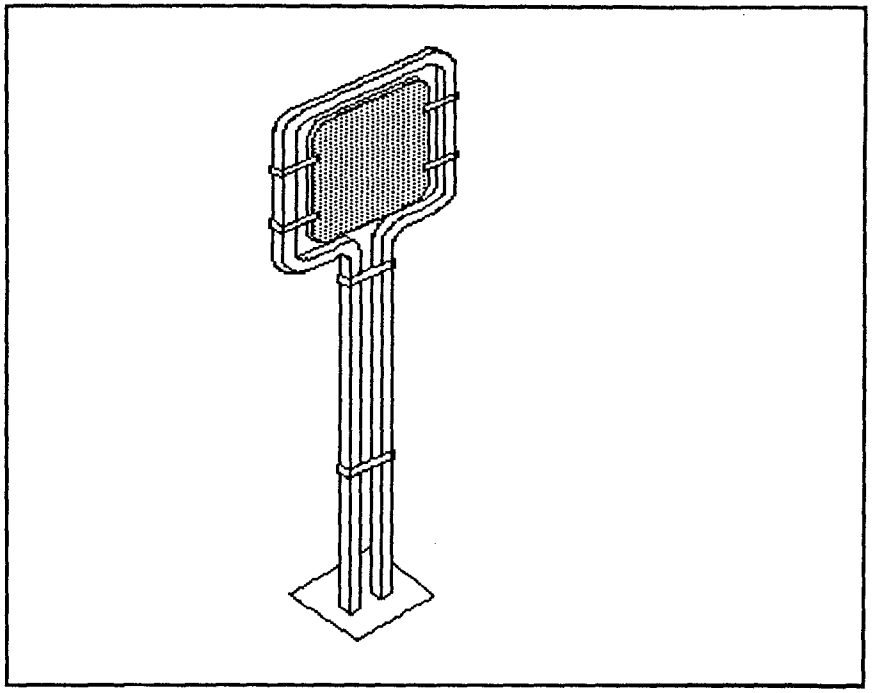
Electronic information delivery is fast becoming a new method for communicating with the motorist. Using solar energy cells for power, these signs can provide the motorist with instant changes in weather, road conditions or warnings.



Roadway Elements

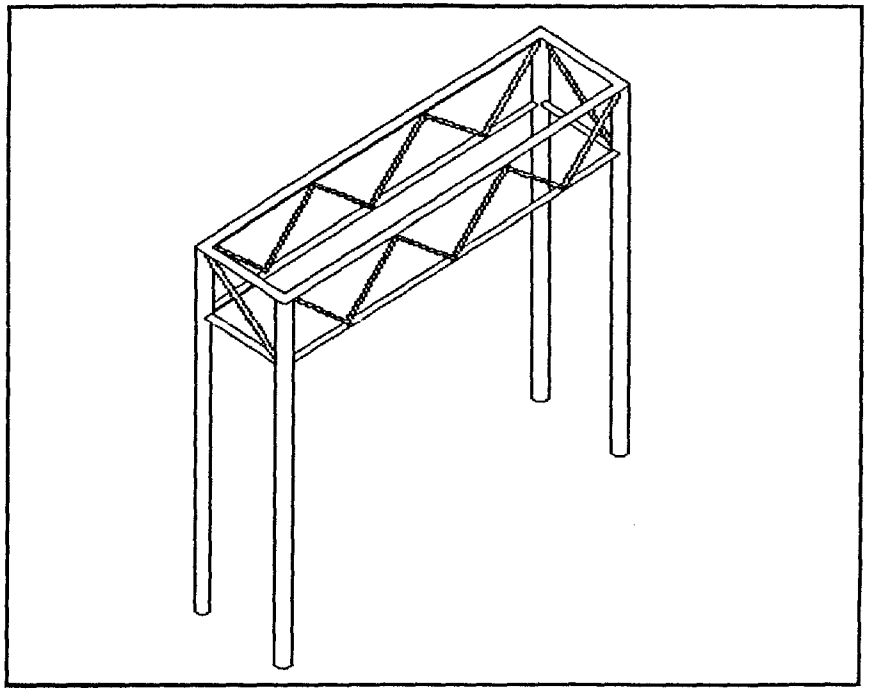
Signage Elements

Electronic information displays can be integrated into rigid frames to provide speed limit information. These signs can be used both day and night and when used in a sequence, can alert drivers to upcoming hazards.



Signage Element

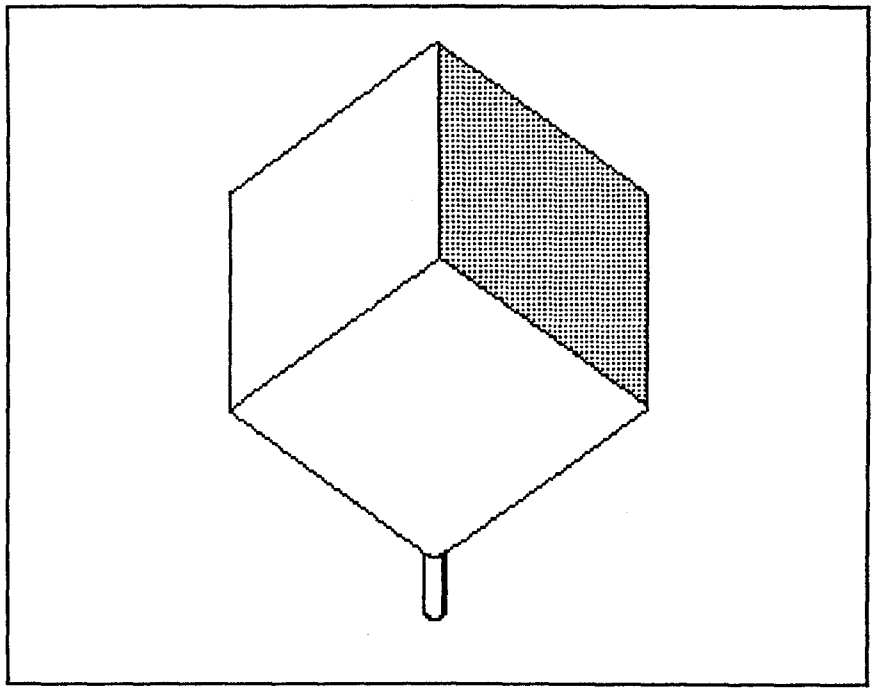
Rigid steel frames are used to span the highway on which a variety of signs are attached. These same frames may be used in a variety of heights to provide signage parallel to the direction of traffic flow.



Roadway Elements

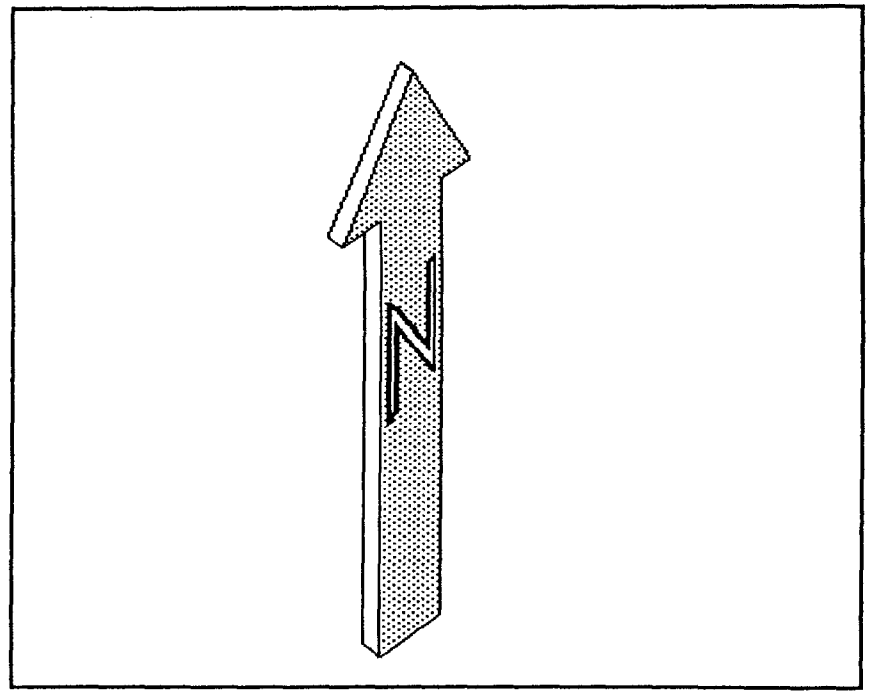
Sculptural

Abstract geometric planar or volumetric elements can provide an unusual or unexpected event along the highway corridor. Using random spacing or formal placements, these sculptural objects contribute visual interest to increase highway safety.



Signage

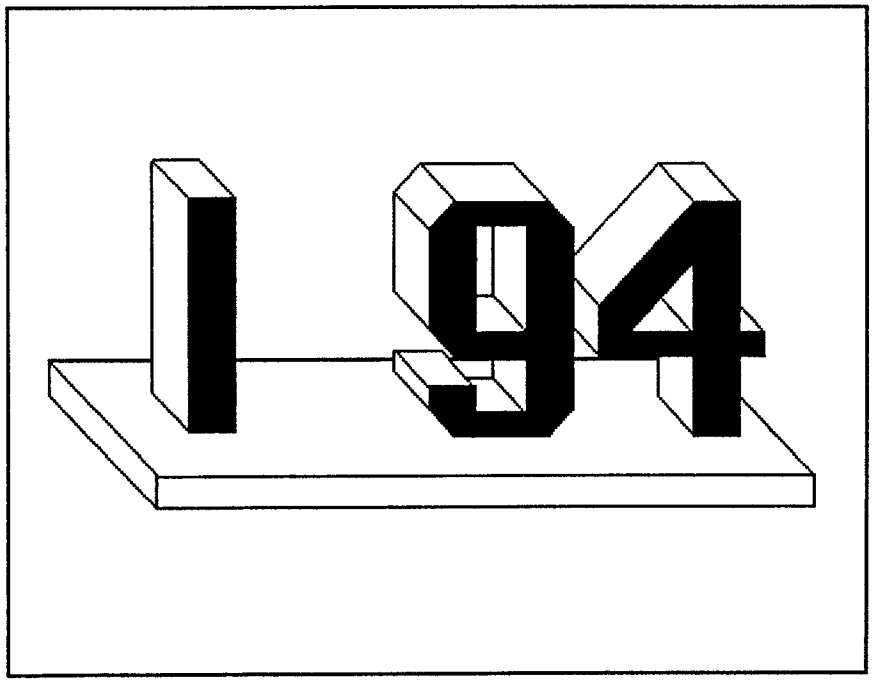
Super-graphics are readilly comprehended at high speed and extend the visual information necessary to communicate direction, speed limit or upcoming exits to the driver. An oversize arrow, plain or illuminated is one example of this type.



Roadway Elements

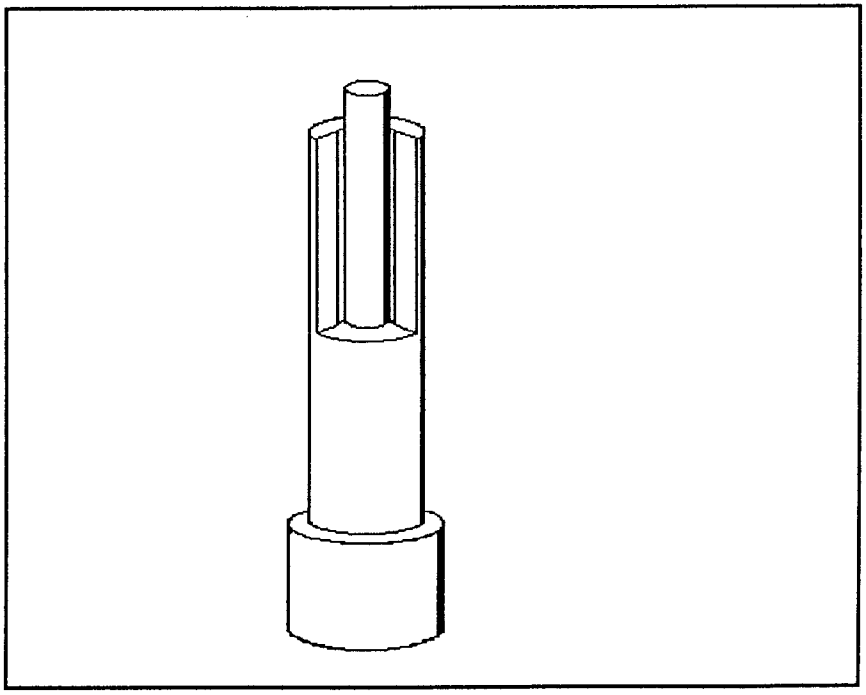
Signage Elements

Many signs are often obscure and visually boring offering the motorist little visual change from sign to sign. Super graphics letters, used in random situations, offer great visual stimulation and interest to the road user.



Lighting Elements

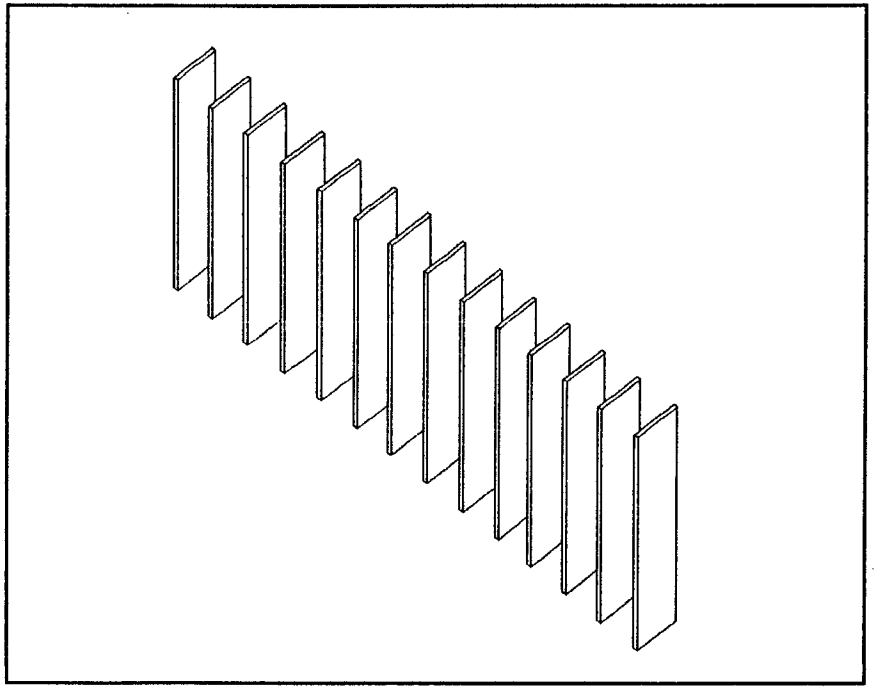
Highway lighting performs a necessary role in highway safety. The repeating pattern of identical lighting standards offers the driver little visually. Sculptural aerodynamically designed standards can contribute to the aesthetic form of the highway.



Roadway Elements

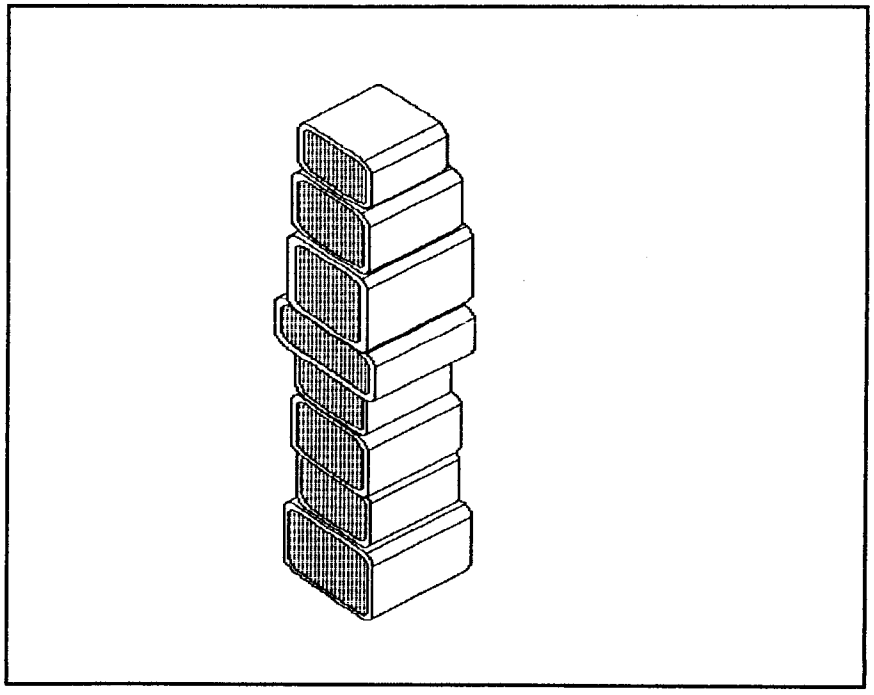
Screens

To protect residential communities, large scale walls are built along the edge of the urban highway corridor to isolate the roadway. The screen can effectively hide the highway and isolate the area from acoustical interference.



Signage

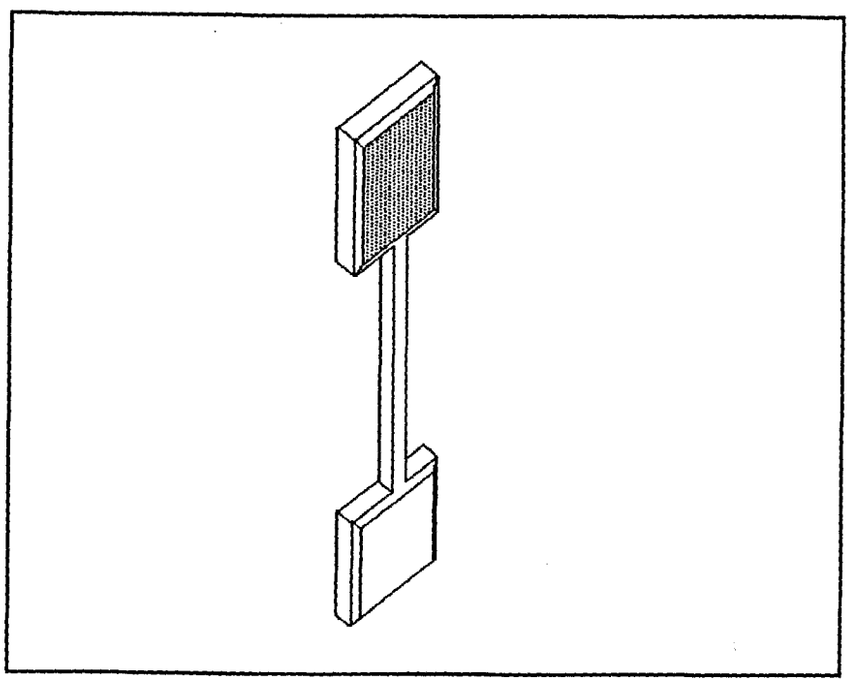
Modular graphic systems can provide flexibility and freedom to the the demands of highway signage. Using a combination of electronic, illuminated and static signage, greater visual awareness will be drawn to the highway directive.



Roadway Elements

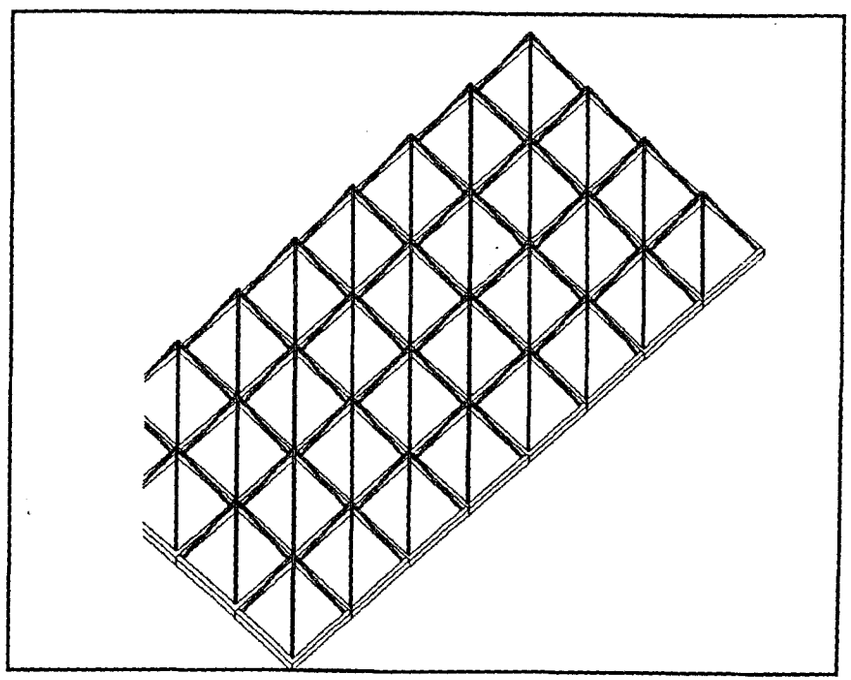
Signage

The use of free-standing vertical sign frames has become a permanent part of the highway environment. By introducing a variety of sign frames, the signage can take on a particularity unique to a state, regionl or local community.



Shelter

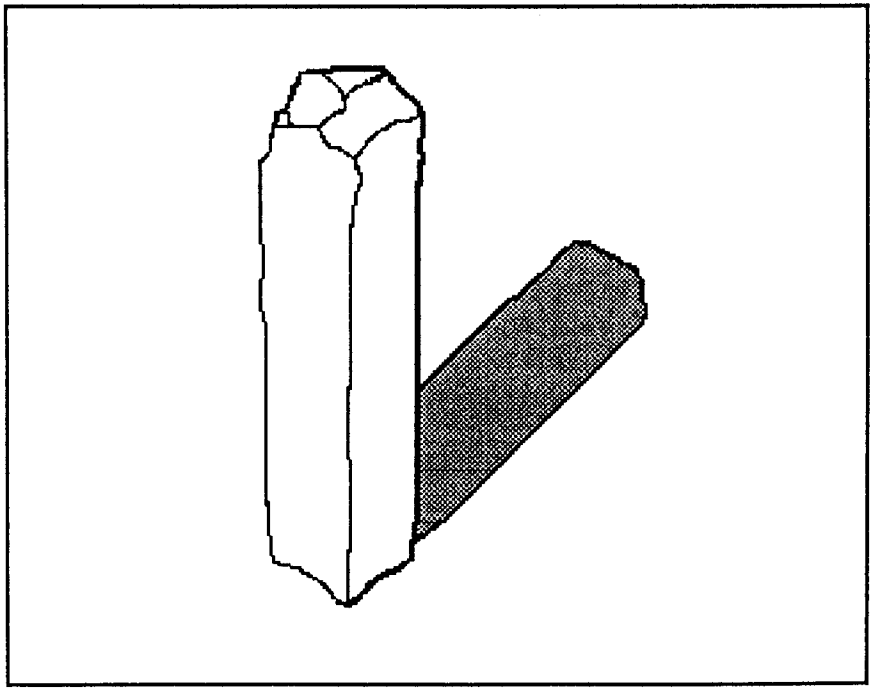
Shelter along the highway strip is often limited to rest areas with toilet facilities or minor leanto shelter. Providing more substantial shelter facilities, such as this view of a space frame roof shelter, will substantially reduce the highway accident rate.



Roadway Elements

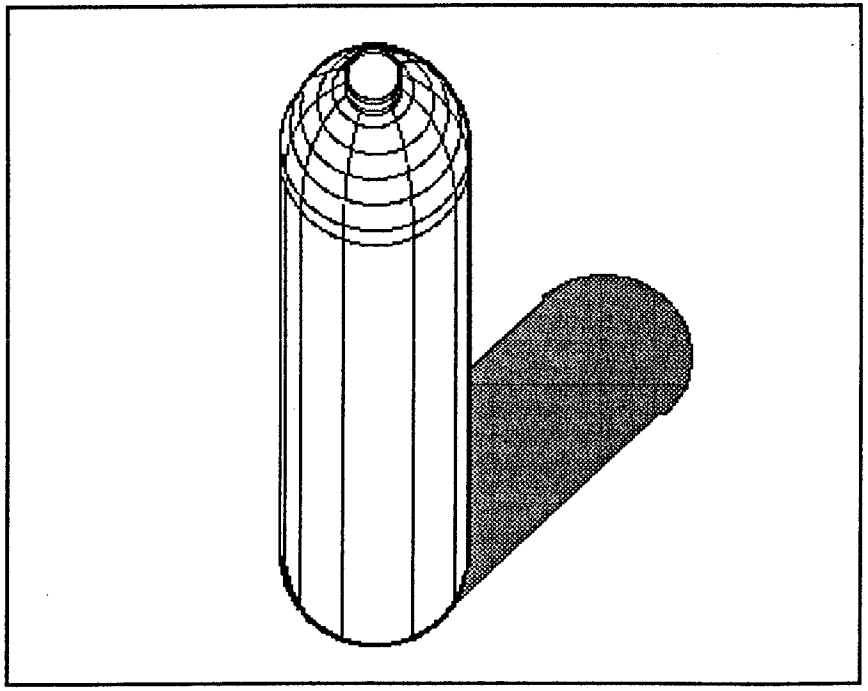
Columnar

The use of columnar elements set in a particular style to represent an historic period can provide a potent reference point along the highway corridor. This Neolithic stone column can highlight a particular historic place of national interest.



Columnar

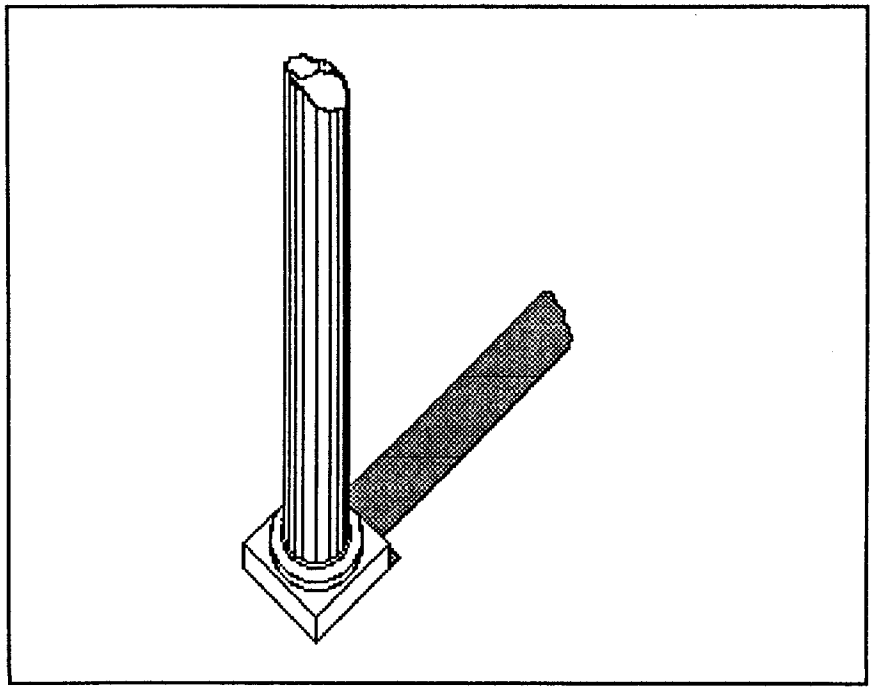
The vertical illuminated column can become a beacon if used in relationship to a specific locale or area. As a lighthouse announces a safe harbor, the illuminated column can become one of many symbols used to denote a rest stop.



Roadway Elements

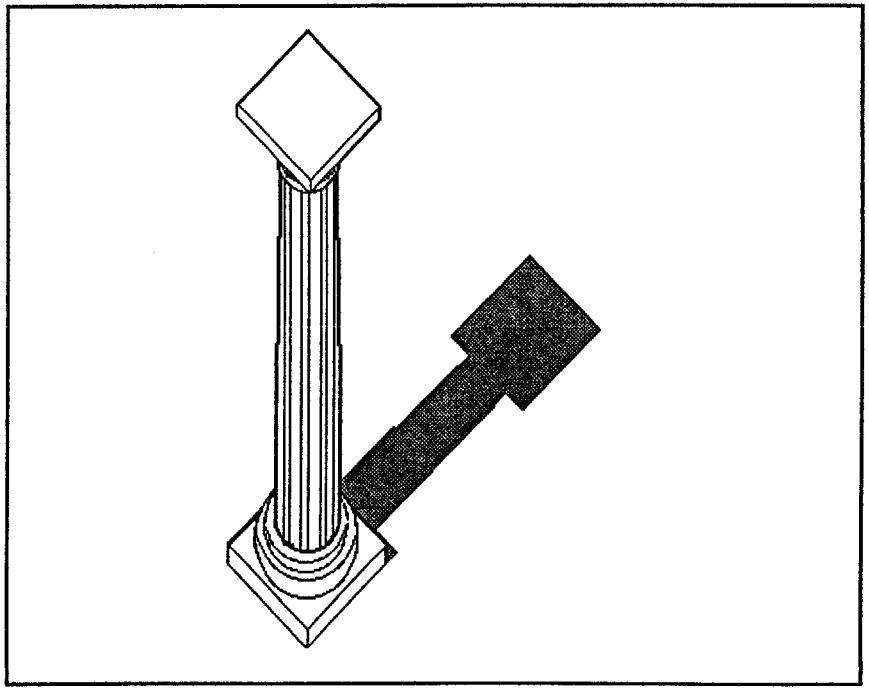
Classical

This classical style column, incomplete and free-standing plays an important role in highway design. Through the repetitive placement of single columns in a variety of geometries, stabile landmarks may be established along the route.



Classical

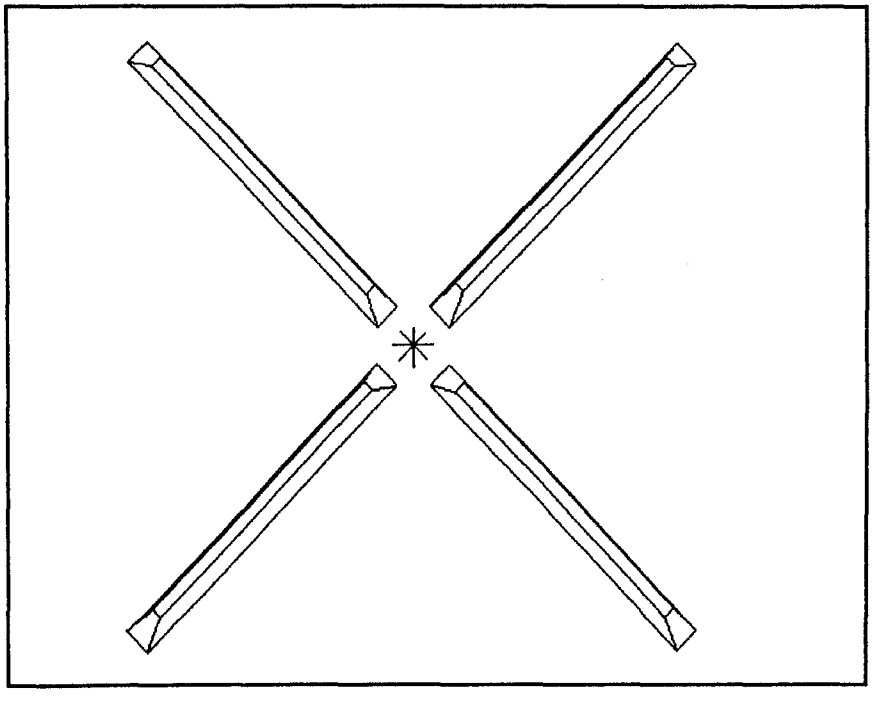
This free-standing column is over 40 feet tall and stands alone next to the roadway. Its large scale can be seen from a distance. Made from concrete or stone, this classical column can provide visual interest along a rural or urban stretch of highway.



Roadway Elements

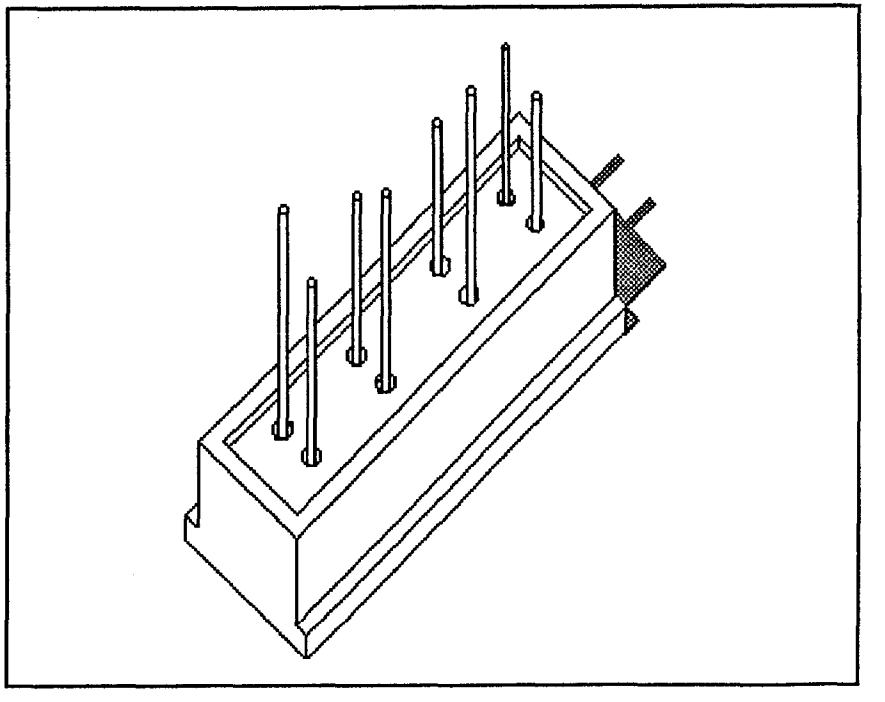
Earth Sculpture

Earth sculpture of monumental proportions such as this design, connect time an space and seem to look beyond man's limit. Placed on a tilted plane to the roadway, the large-scale earth sculpture become the subject, mixing meaning and identity.



Earth Sculpture

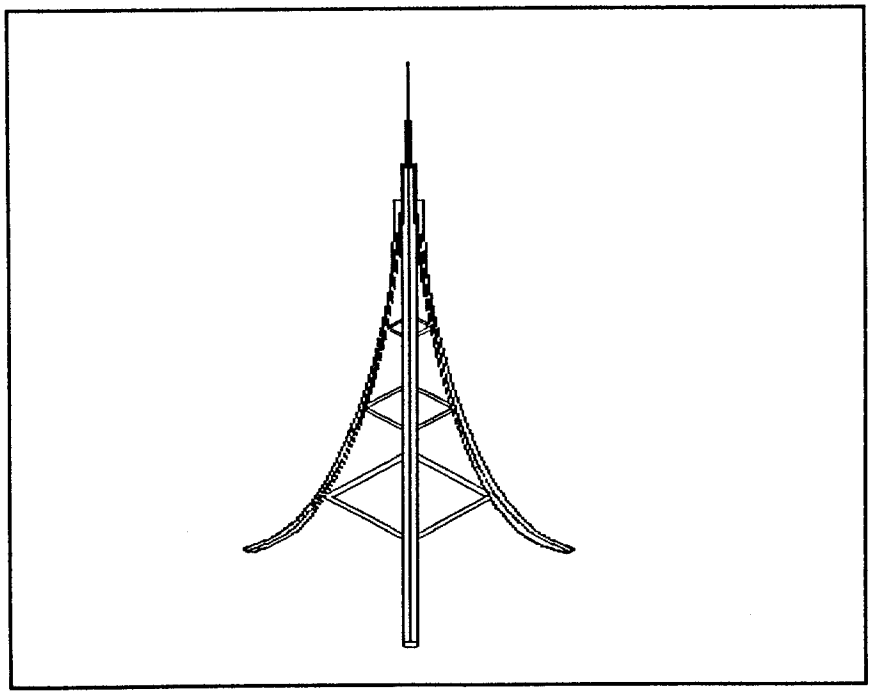
To develop the expressive content of the roadway environment, the introduction of large scale earth sculptures placed on a pedestal become anomalies to the highway and thus generate a level of visual interest and landmark potential.

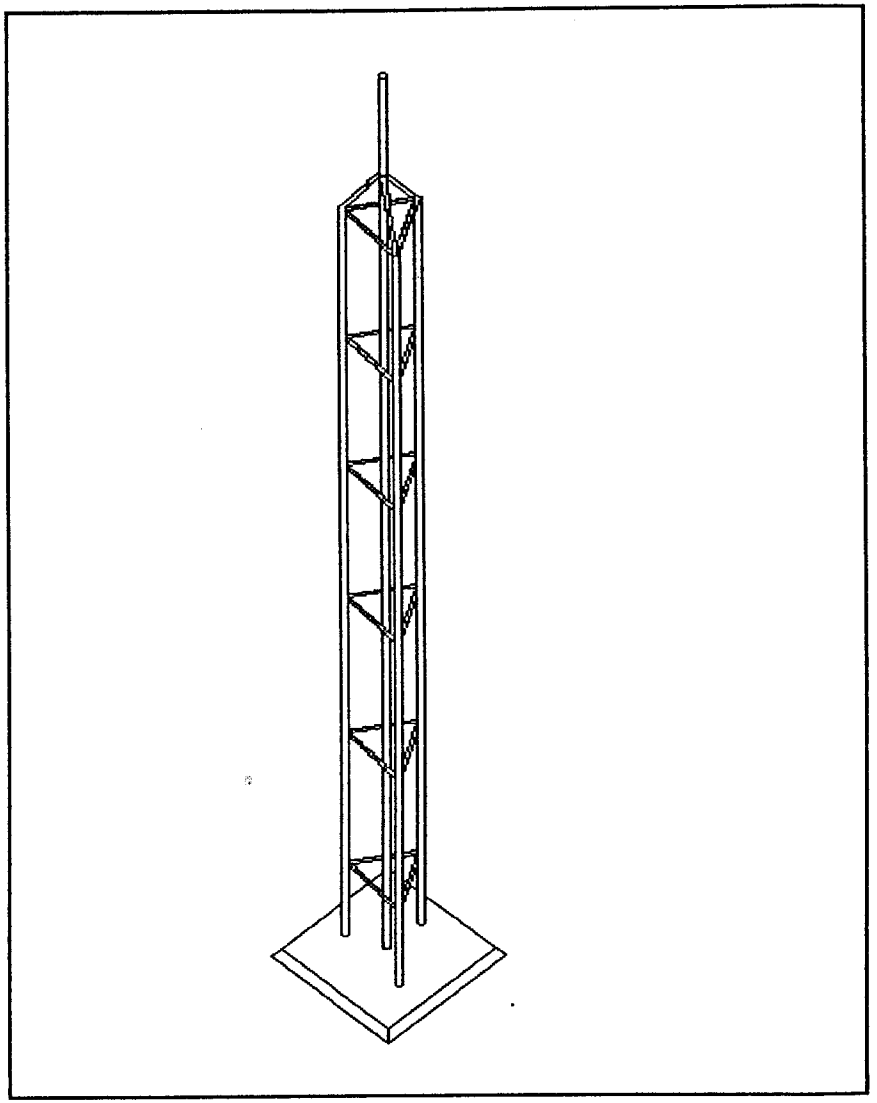


Roadway Elements

Towers

Tall structures do double duty by functioning in their functional mode as well as acting as sculptural elements and three-dimensional reference points along the highway corridor. The windmill and the radio tower are excellent examples.

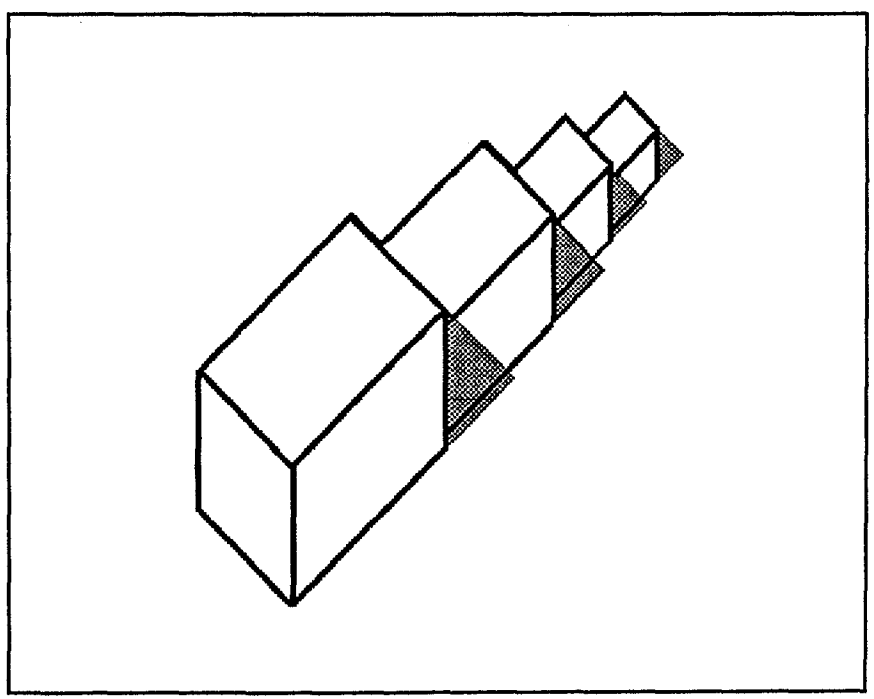




Roadway Elements

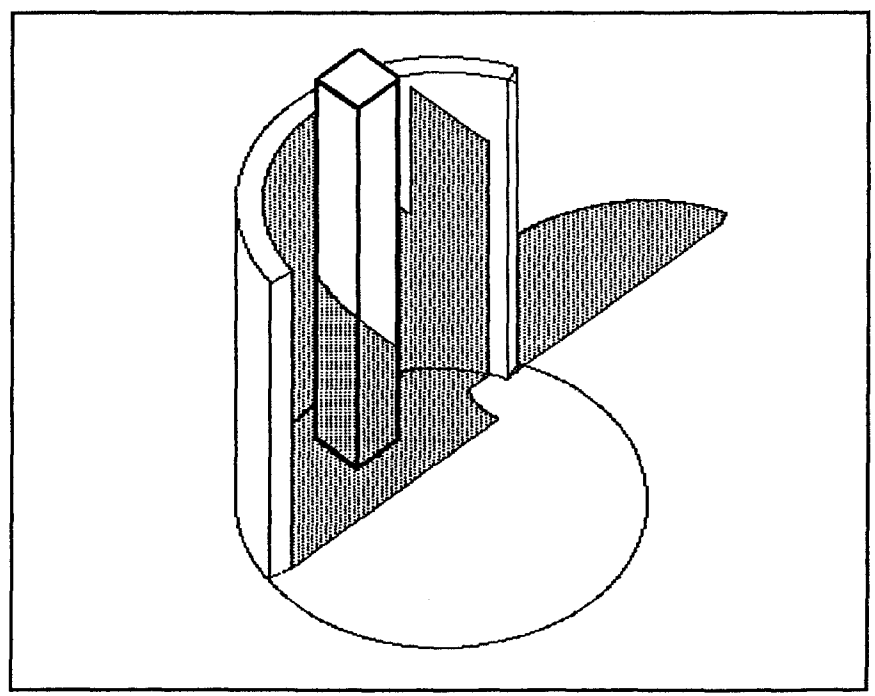
Sculpture

While the use of roadside sculpture is not new to European highways, it is seldom found on our national highways. Placing a large scale element within the center median strip or simply in adjacent fields or right-of-ways creates a visual aesthetic.



Sculpture

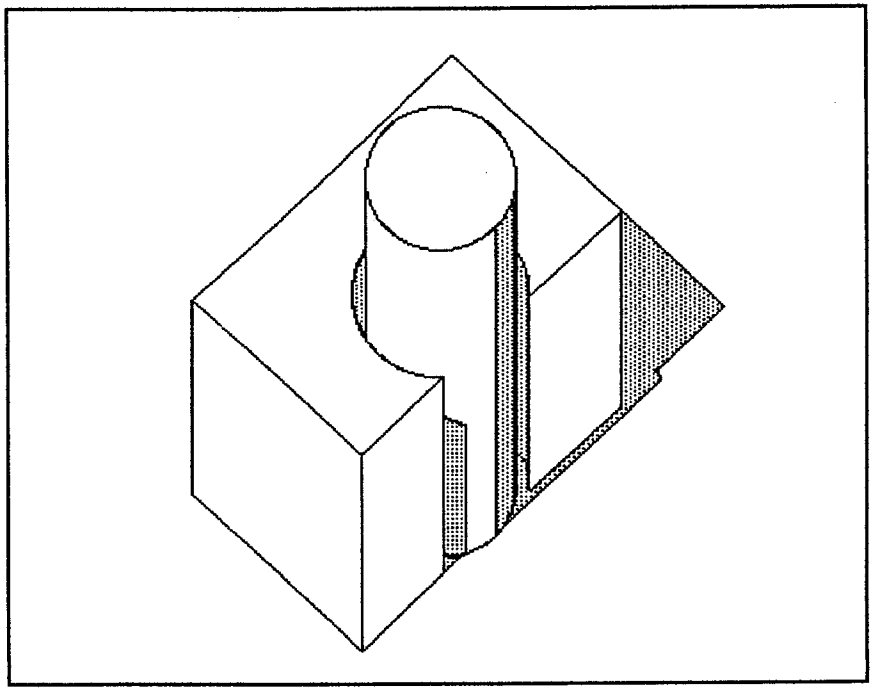
The rest areas that populate our highway system are often so stripped of any visual amenity that they offer the greatest potential for placing roadside sculpture. Small environmental pieces such as this one provide a unique identity to the place.



Roadway Elements

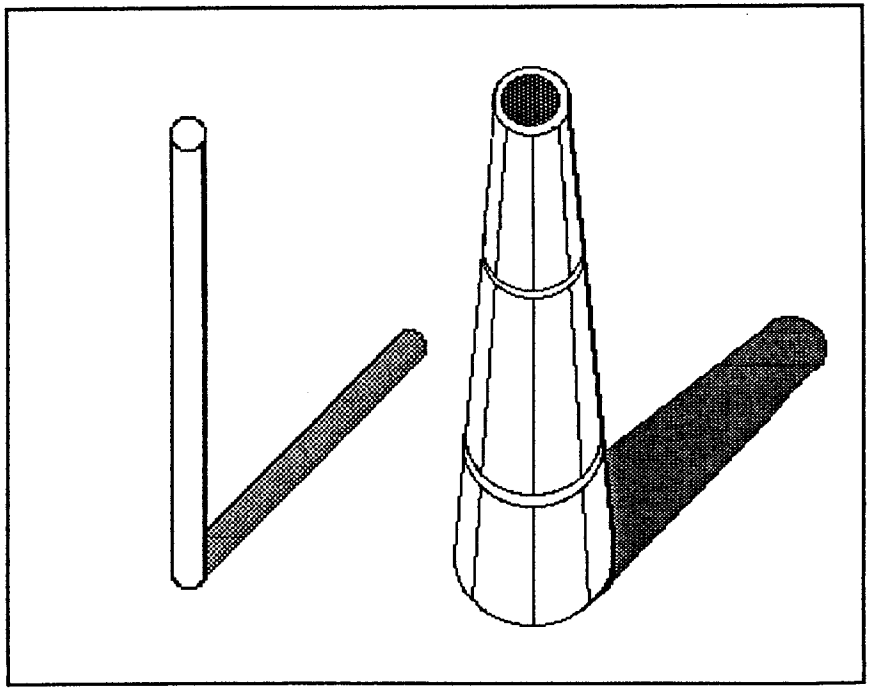
Sculpture

The roadside rest area or scenic overlook presents a unique opportunity to view environmental sculpture. By placing artistic works in selective locations, the automobile trip becomes something far more informative as well as interesting.



Columns

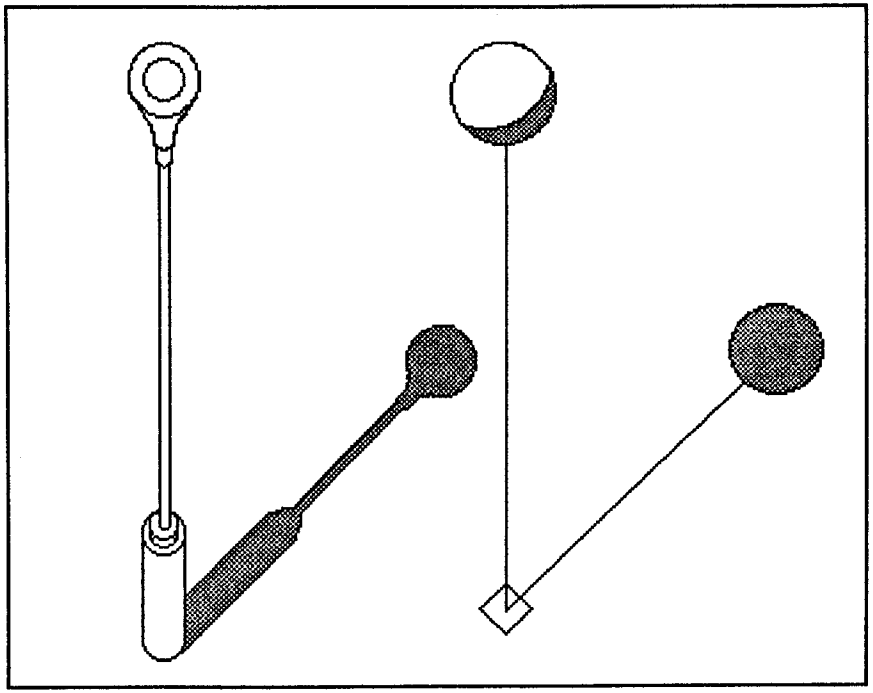
Radio and television towers, silos, water towers, and smoke stacks have a distinct recognizability on the horizon. Expressive content may be enhanced by populating selected areas with vertical columnar elements.

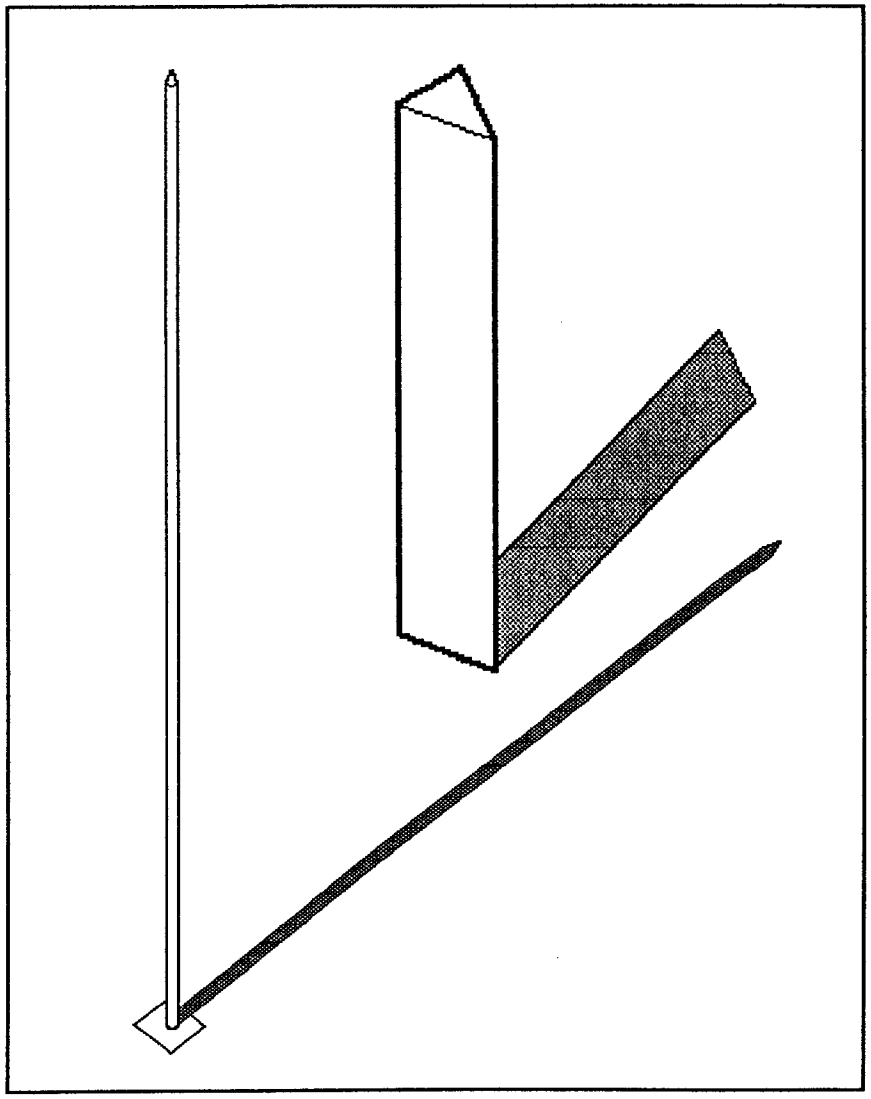


Roadway Elements

Columnar

Environmental sculpture is dedicated to making the viewer far more aware of the natural landscape. Often, the contrast between the man-made and the natural landform reinforce the unique aesthetic qualities of each.

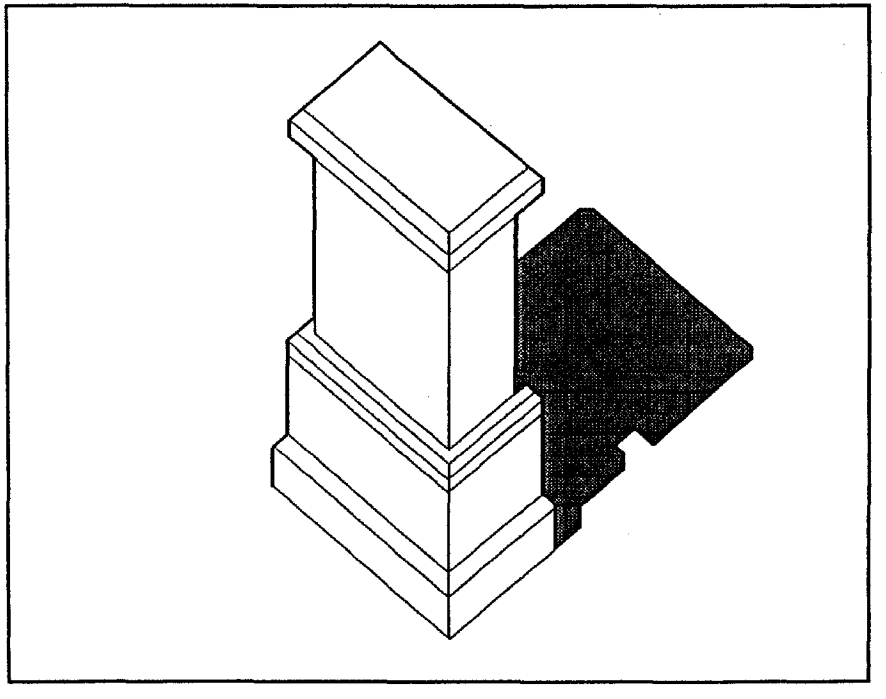


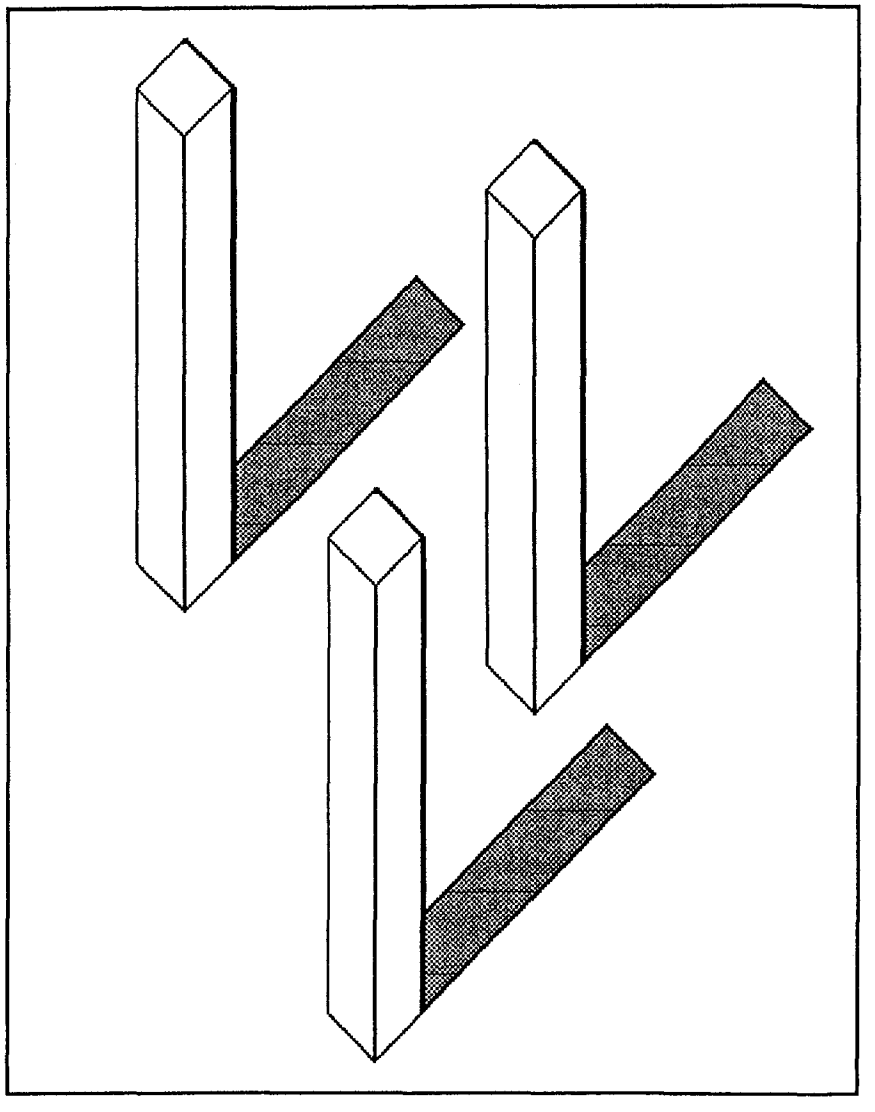


Roadway Elements

Gateway

The use of single or paired objects such as stellae or large scale fencing to announce arrival or entry into a specific zone of activity. Gateways are a means of preparing the driver for a change in vehicle motion.

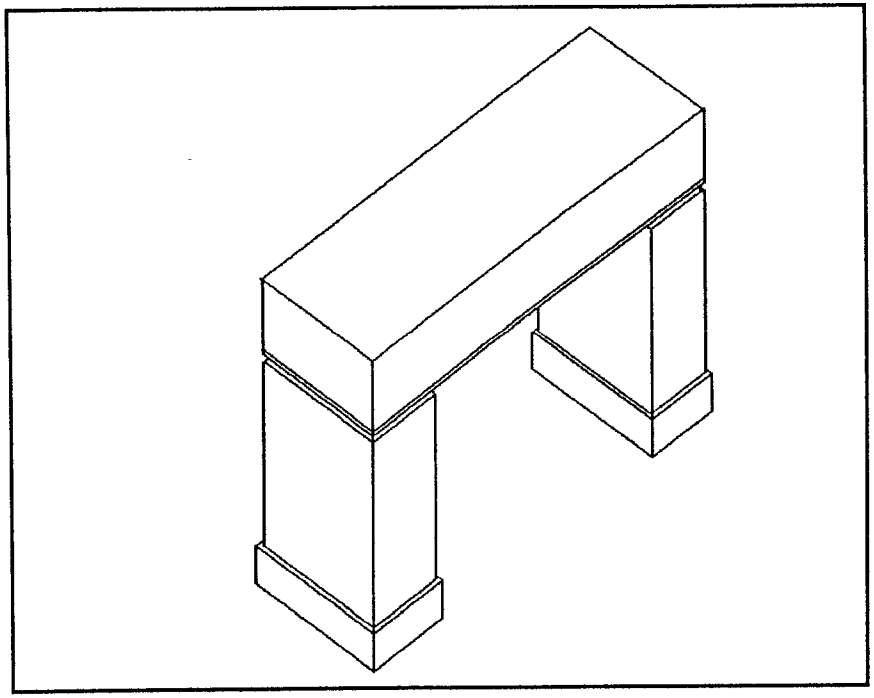


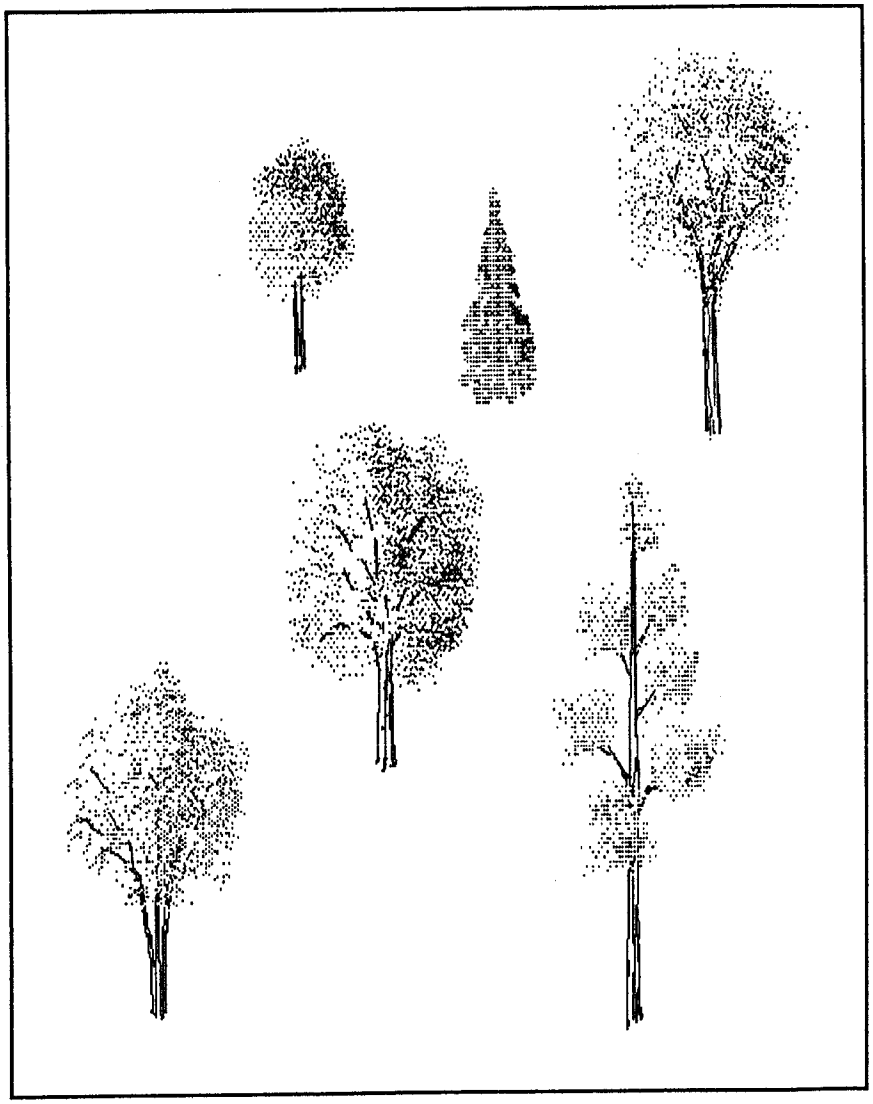


Roadway Elements

Gates and Trees

The use of plants, trees, and shrubs in combination with portal elements can add meaning or visual interest to a specific setting. The application of these elements to small scale areas at rest stops would enhance the highway experience.

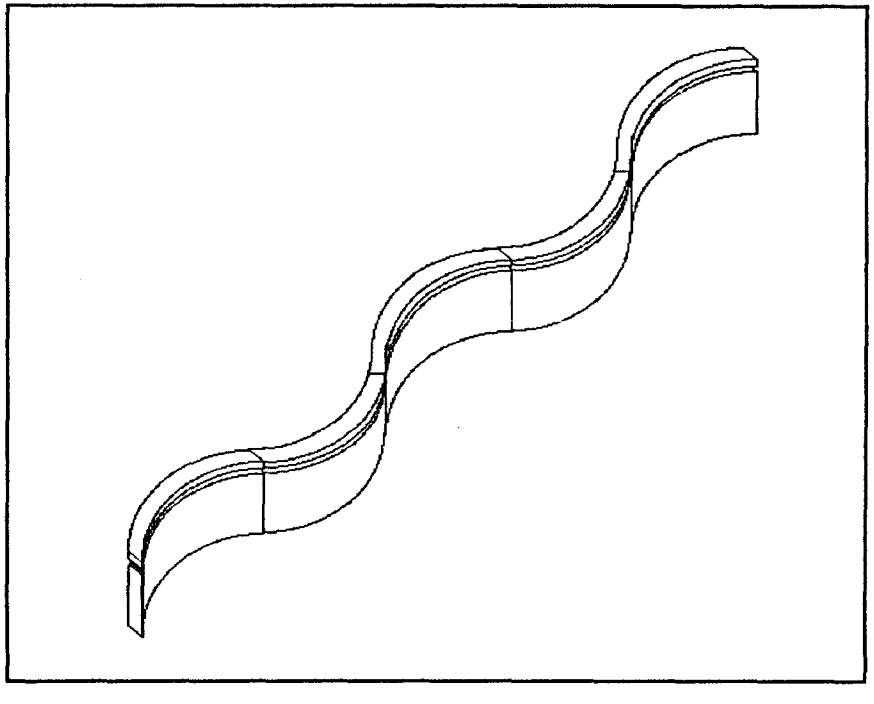




Roadway Elements

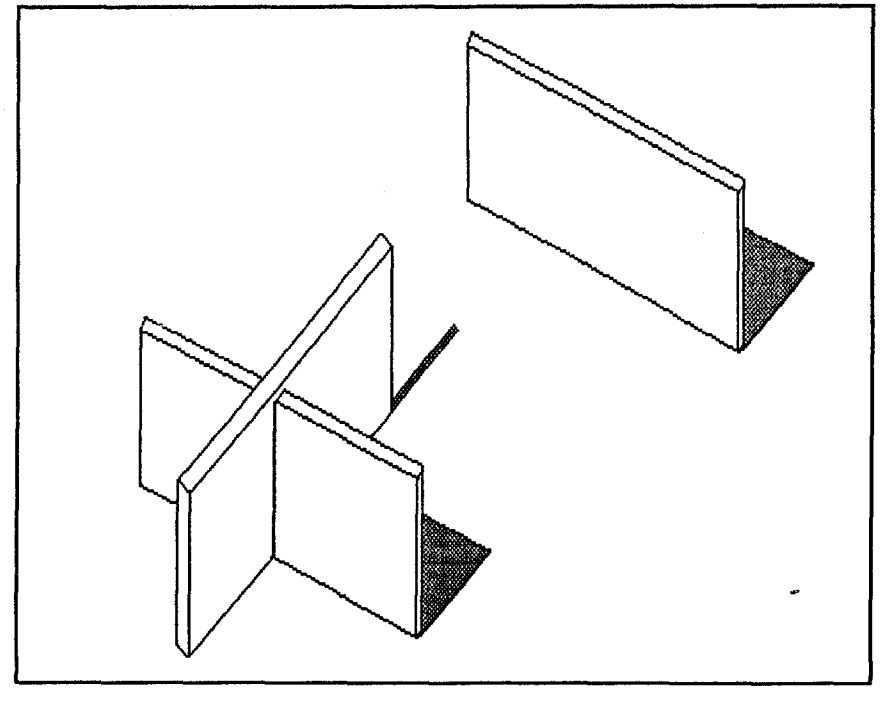
Wall

The protection of the highway corridor is often relegated to chain link fencing. While effective and inexpensive, it lacks the aesthetic value while wall elements of various styles, sizes and colors would provide a more solid definition to the roadway.



Wall

The requirement for protection of the highway strip works to keep people and animals out for safety reasons, it also keeps people, animals and cars contained. It is important that a wall be used as a sculptural element with the landform.

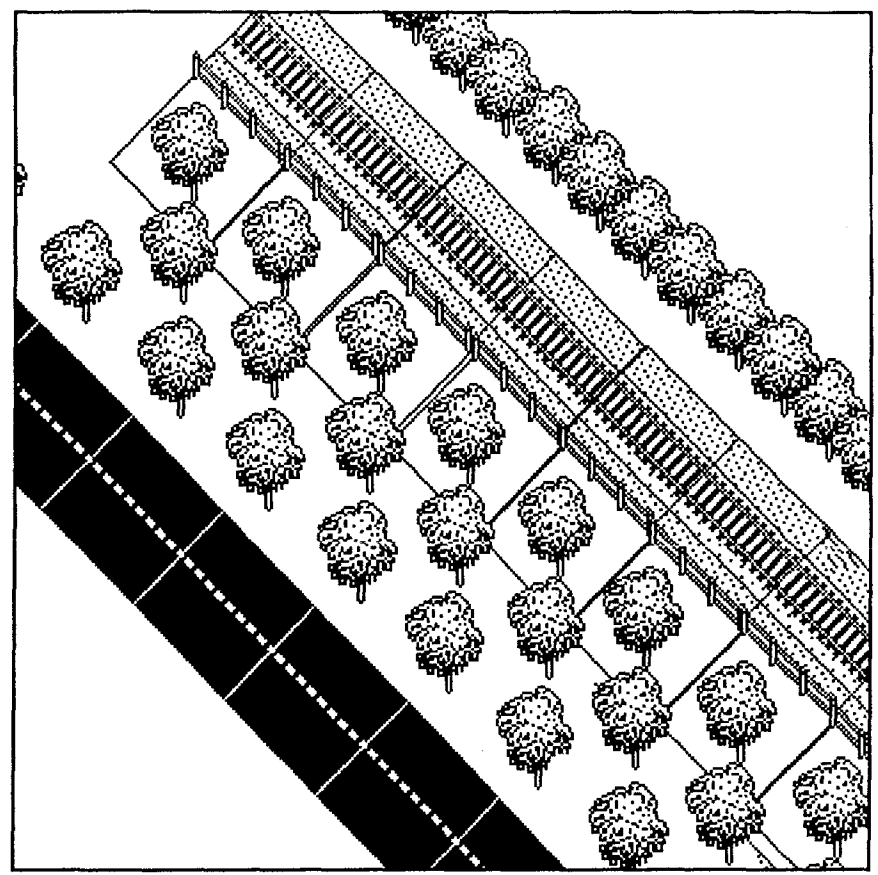


Median Elements

The land strip on which the roadbed is placed, represents a significant area of the landscape that is stripped of every natural featur during the process of construction. The flatness and openness of the median strip is visually monotonous and oftentimes dangerous. To counter the existing condition, areas, textures, silhouettes, contrasts of masses and enclosures, assymmetrical and kinetic shapes are used as median elements. Median elements can provide visual and intellectual relief through the design manipulation of the strip. The continuity of the roadway need not be seen as a barrier or wall isolating opposing sides of traffic. Through careful placement, and composition of median elements, the quality of the lateral space can be preserved as well as visually enhanced.

The design projects presented in this section stress the movement through, in or around a spatial event. The distance between the roadbed varies from several feet to several hundred feet. The movement of vehicles can be attenuated through the placement of man-made objects within the framework of the median strip. The visual experience becomes a tridimensional passage and a "happening" that can leave a lasting impression of the traveled route. Depending on the scale of the "event", the placement can engage the driver's attention

Layering the roadway with other modes of transportation can increase sense of movement.

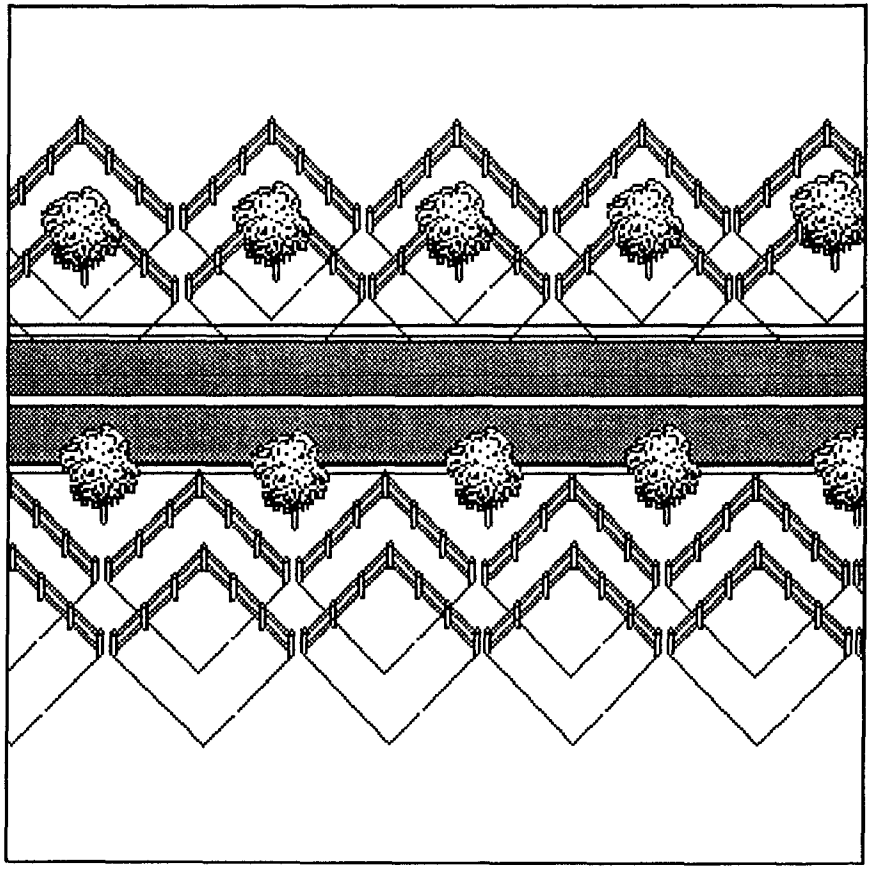


at a great distance leading to a higher level of anticipation. The middle-ground experience is one of curiosity and the drive-through completes the spatial "event." The projects stress the importance of the lateral space within the median strip. The median elements, placed in a random pattern along the roadway, can provide formal articulation where little exists.

Using a variety of platonic forms, surface mounted or embedded into the median strip, the compositional aspect of the spatial assembly emphasizes the form as well as the actual event. This approach establishes the highway landmark as a major component of roadway design. Either singly, or in groups, the objects are placed in random patterns, with changes in scale, color and texture identifying locational differences. Form motifs can be introduced that extend out from the highway in either a parallel or perpendicular arrangement. Where tall embankments or deep cuts are necessary, the insertion of the median element can not only stabilize the surface material, but provide visual interest and focus from the roadway.

Color, within the median strip, plays an important role in the maintenance of bridge structures as well as establishing the bridge aesthetic. Using paint, in an artistic sense, can transform any bridge structure or median element into a highly original work of art. Color is used extensively in European highways to accent or give form to an otherwise featureless autoroute. Primary colors, used in a free-form manner, can add textural relief to the ordinary and repetitive highway landscape.

Limited access fencing along the highway can provide more accentuation of the landform.

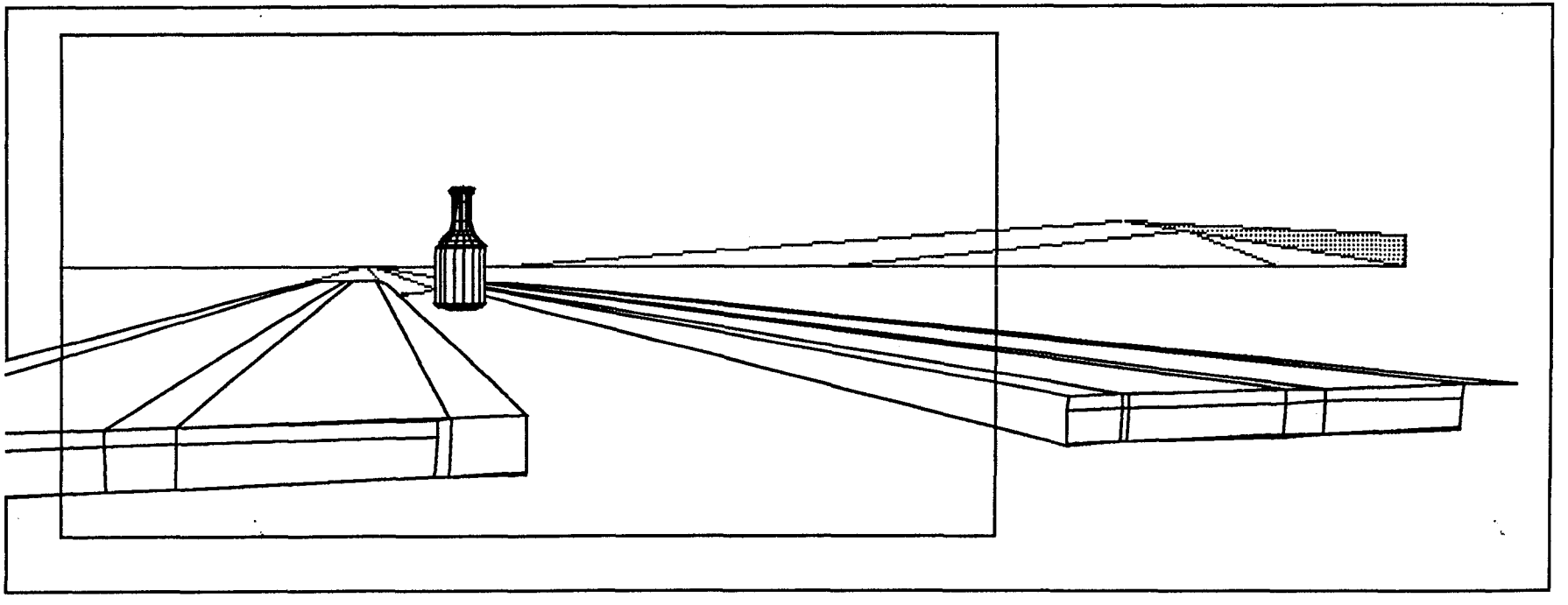


Median Elements

Object: **Superscale Bottle**

The American landscape and the natural and man-made elements that shape it can form an image that has expressive content. The median strip offers the highway designer great opportunity to maximize the visual interest of the roadway. A superscale object placed within or adjacent to the median strip can enhance the visual interest of the highway.

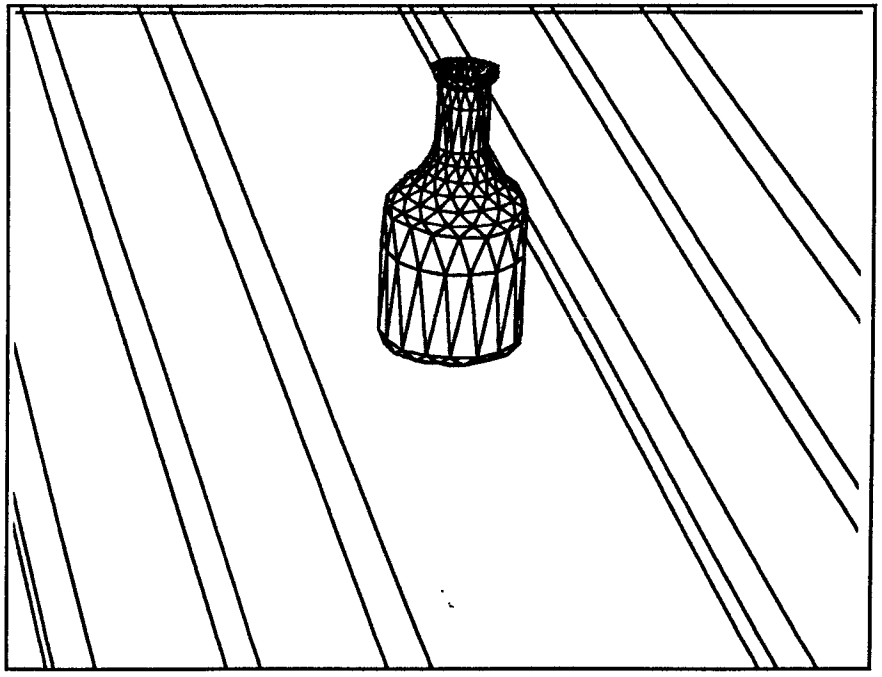
In this example, a superscaled bottle is placed within the center of the median strip providing a very potent three-dimensional symbol. The simplicity and recognizability of the form is important to maintain driver interest. The three-dimensional aspect of the object is necessary to maintain driver safety. A giant tire, located to the west of Detroit, Michigan has similar character-

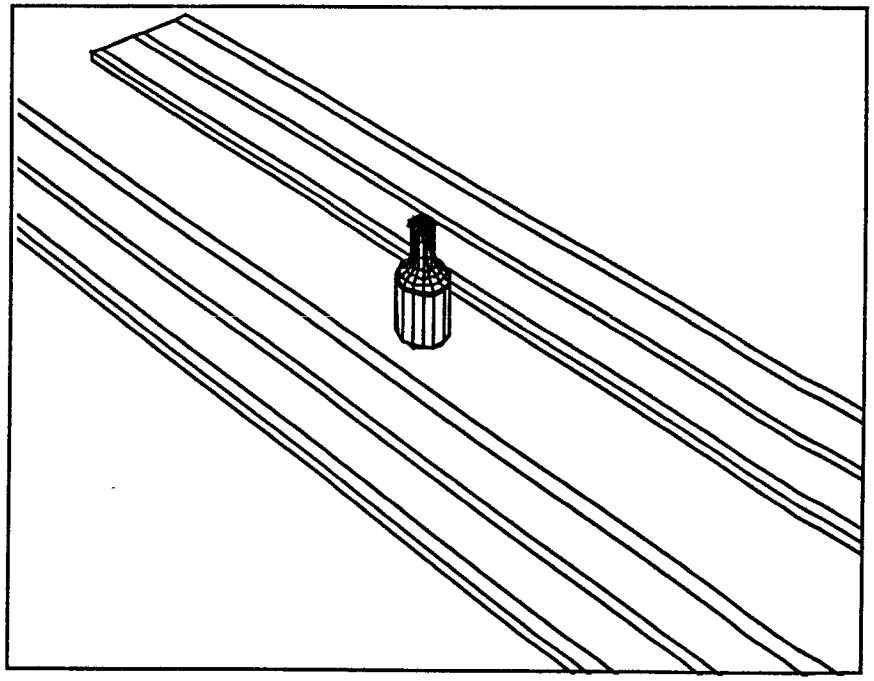


istics to that of the bottle. In the case of the tire, a unique local or regional symbol, coupled with a high-volume artery, plays an important role as a landmark for the entry or exit from urban centers. The landmark along the route is necessary to increase driver safety.

The bottle, approximately 60 feet tall with a diameter of 30 feet, would be placed on a concrete pedestal between the opposing roadways. The bottle would be constructed from ferro-cement which is a high strength low-weight concrete, with the surface painted. There would be the possibility of a national underwriter financing the construction. The bottle would be entirely free-standing and would not be repeated on that particular segment of the roadway.

Other objects that would fulfill the visual requirement might be provided by local and regional community resources. The main requirement being that the object selected has high form recognition, be of sufficient scale to be seen at great distance and that there is sufficient maintenance for a 25 year period.

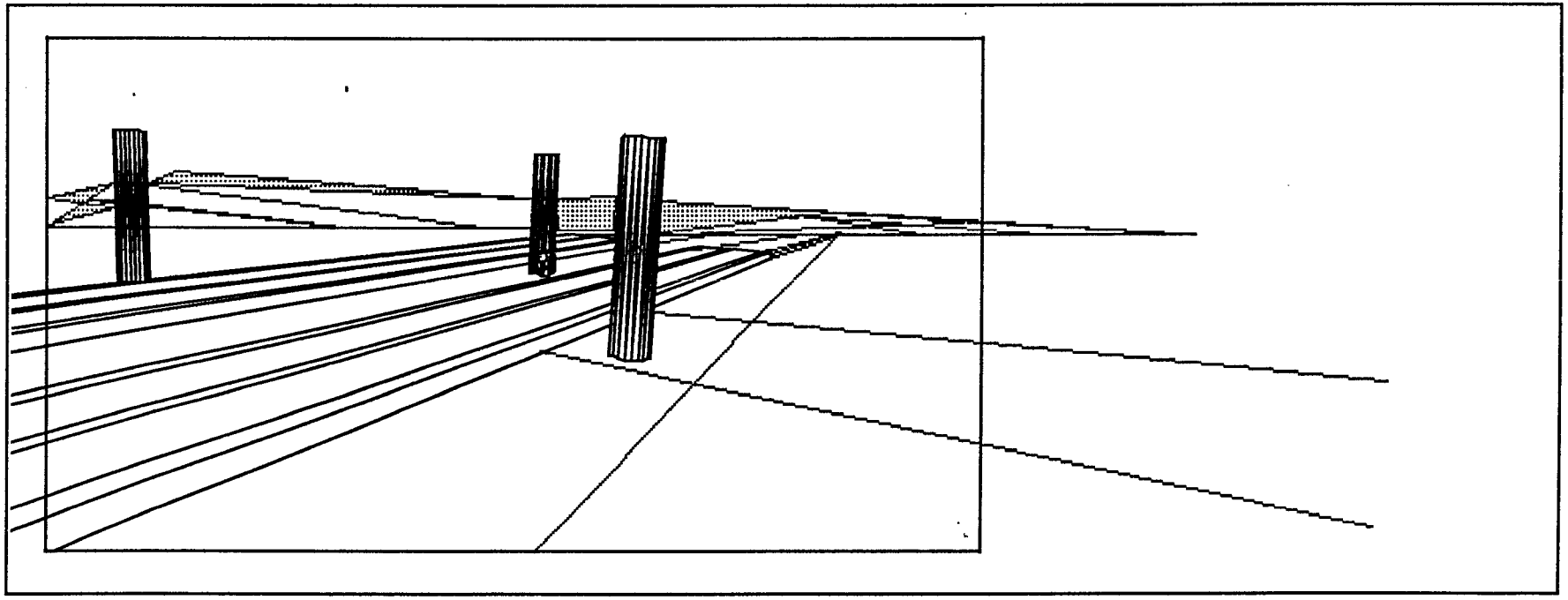




Median Elements

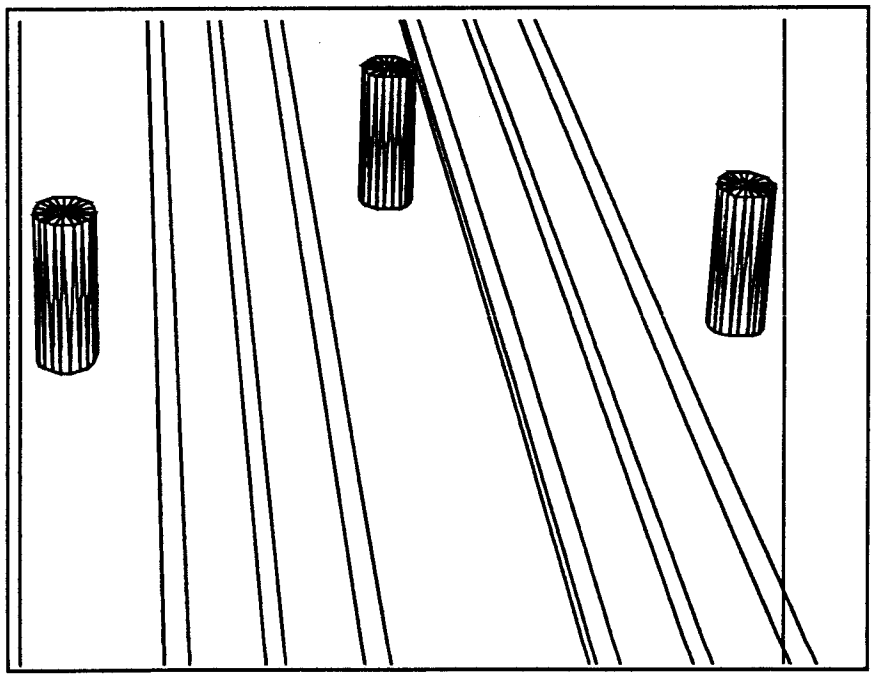
Object: **Spaced Columns**

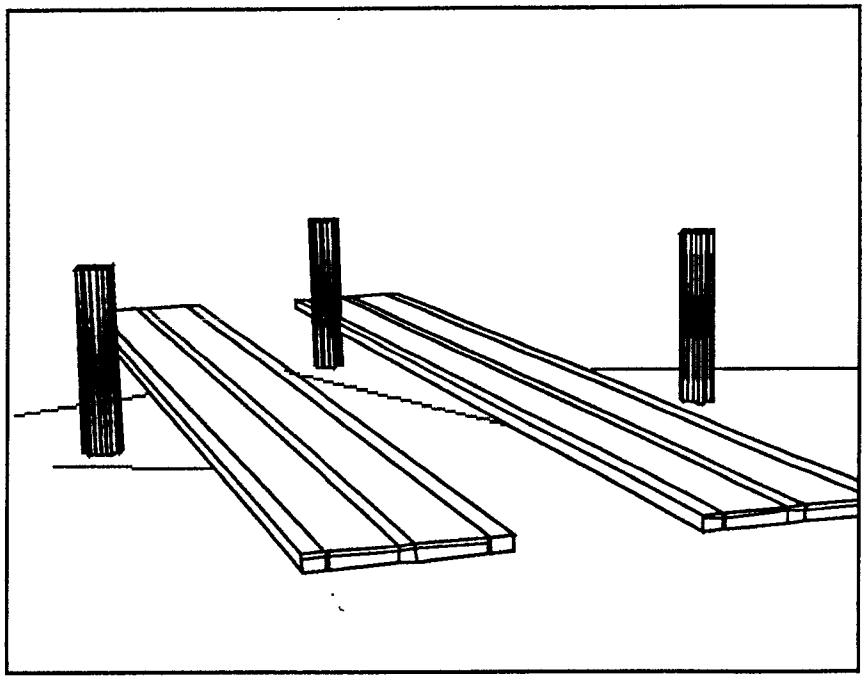
The use of spaced columns within the median strip is a means of providing a means of "gating" for the motorist. In this proposal a single triad of columnar elements is placed across the roadway. It is the intention to develop groupings of the elements over a great distance for the purposes of demarcating distance, speed, landmarks or places of regional, geological or environmental interest. The effect of gating is to enhance the overall interest and alertness of the driver from point to point. The placement would be more frequent than the more traditional rest-stop area and would be un-announced as to location, distance or frequency. The columnar elements would be fabricated from poured-in-place concrete or ferro-cement and would be set on concealed pedestals. Depending on the



number used, three as a minimum, the columns would be arranged in a triangular, circular, oval or rectilinear manner. The variation in the geometry and frequency of placement would provide an unusual path for the motorist and would increase driver safety due to heightened awareness and curiosity about the columnar elements.

By introducing different colors, heights and surface textures on the columns, each location would have an identifiable character. Maintenance would be kept to a yearly cycle as the material and placement of the objects would require minimal repairs. The "gate" effect would provide the motorist with a means to measure vehicle movement and progress along the route. The triangular gate becomes a means of increasing driver safety through the development of the expressive content of the landscape.

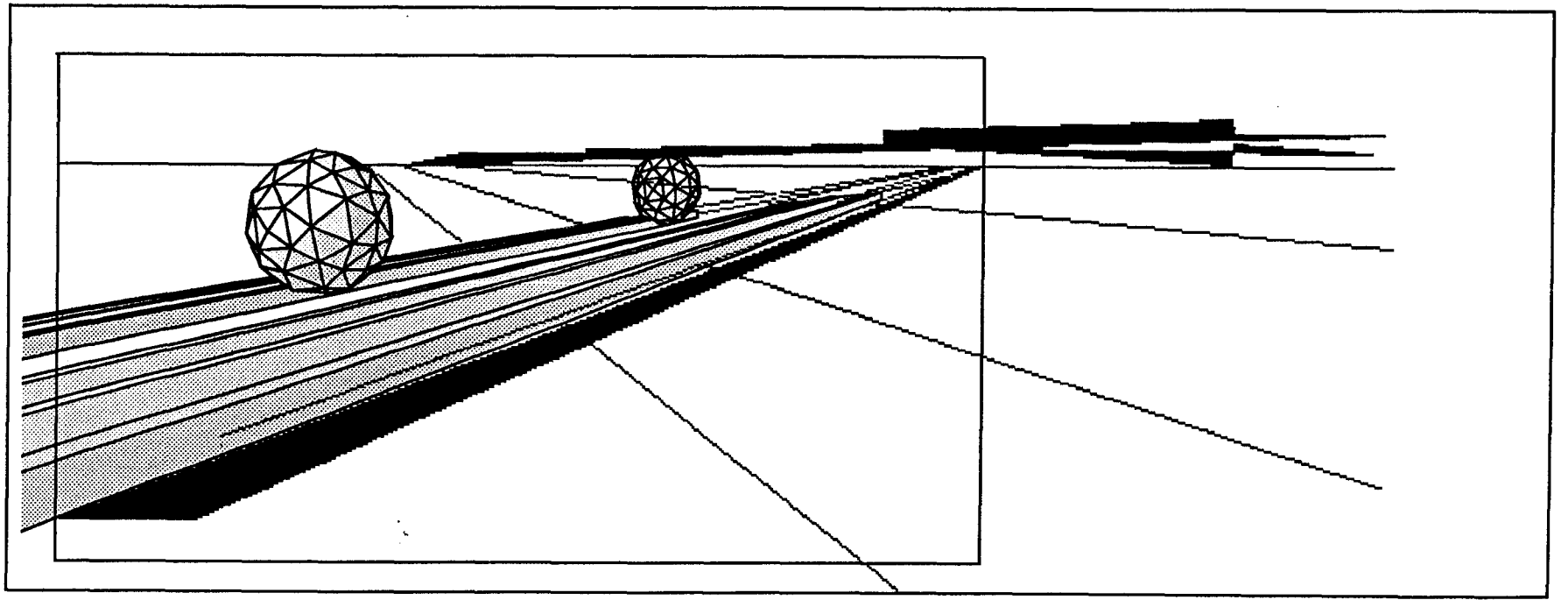




Median Elements

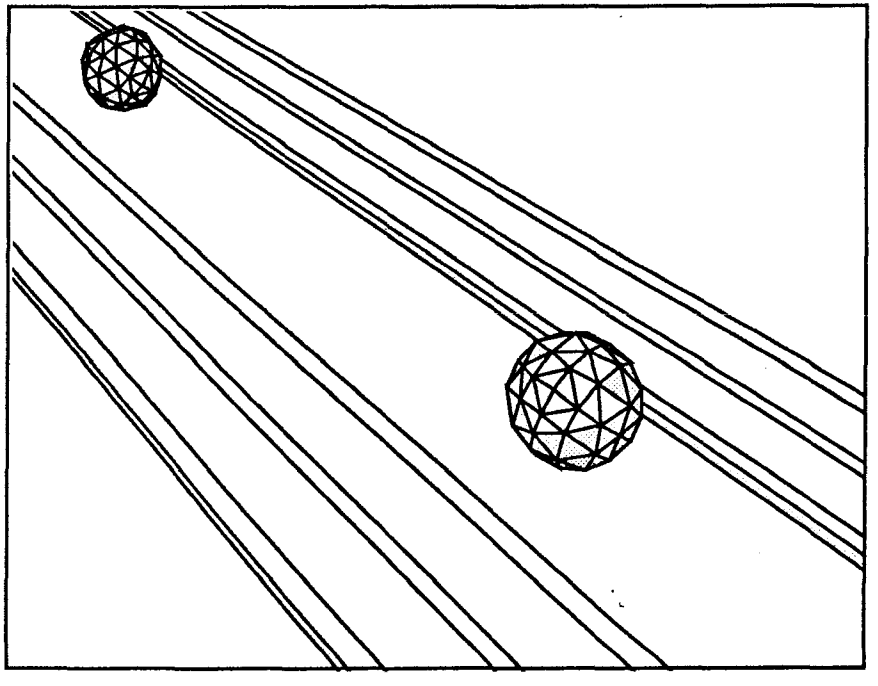
Object: **Large Scale Spheres**

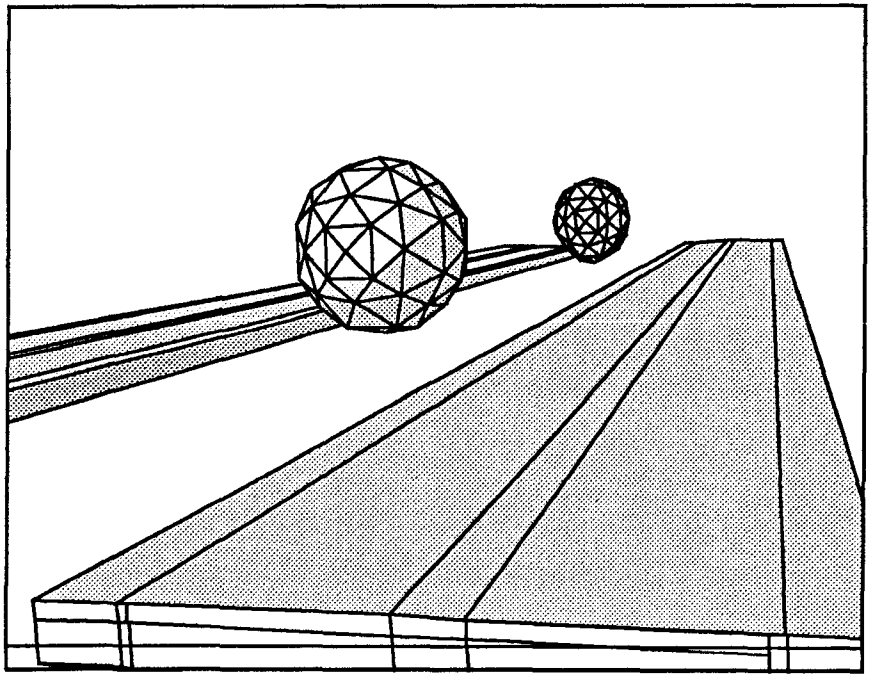
The sphere has traditionally been considered a universal form as it is recognized as having symbolic meaning. In the context of the American culture, the dome has been used in a variety of ways for the World's Fair in Flushing Meadows, New York, Montreal, Canada as well as Osaka, Japan. The universality of the form and its applications make it eminently suitable for use along the national interstate highway system. Each sphere would be 40 - 60 feet in diameter and placed within the center median. The sphere itself would overhang the roadway above the 14' maximum height restriction. The purpose of the overhang is to define the spatial edge of the sphere and increase its visual connection to the roadway proper.



The sphere would be constructed as a prefabricated piece made of reinforced concrete or light-weight steel elements. If steel elements were employed, the sphere would resemble a Buckminster Fuller geodesic dome. Since this form is recognizable at great distances, its meaning would be derived from its particular location and could be used to mark or locate a natural feature or regional place.

The sphere or dome is suitable for placement in urban, suburban and rural areas. It is recommended that suburban and urban application is more appropriate due to the cost of manufacturing and maintenance. In addition, the dome can be artificially illuminated for night-time application. This would increase its form visibility over a greater distance.



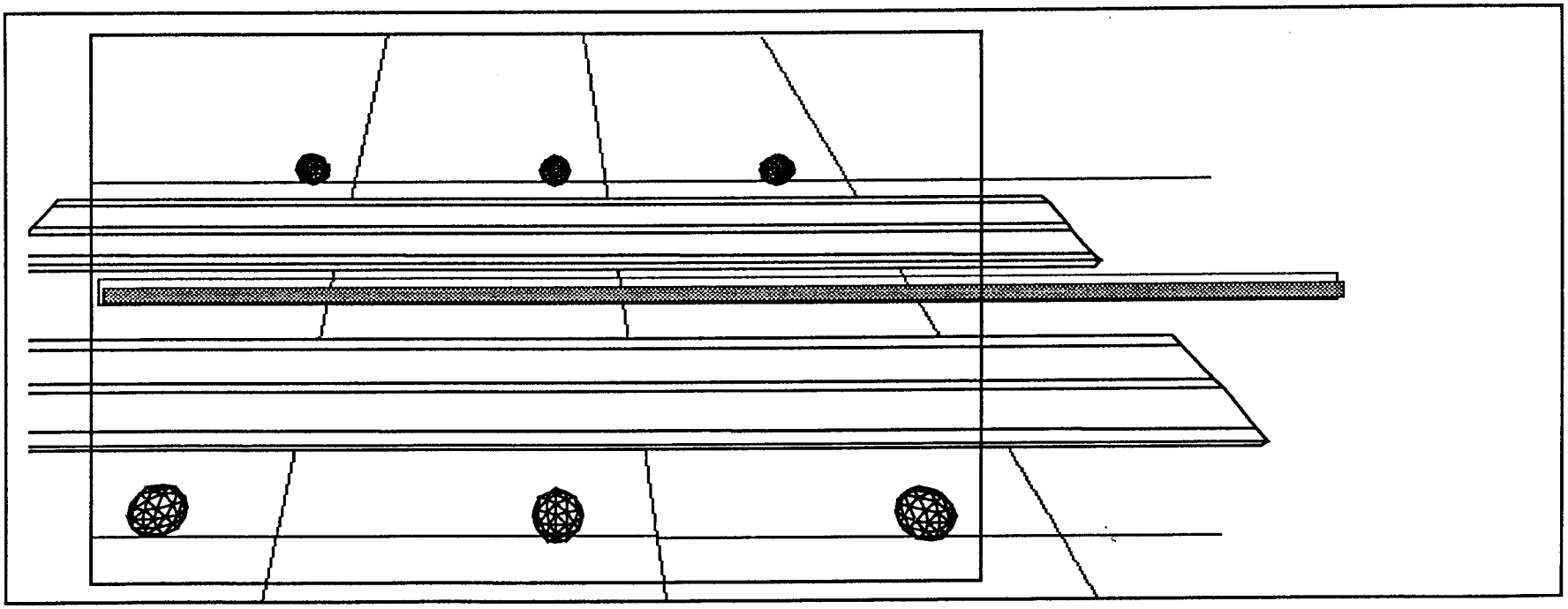


Median Elements

Object: **Small Scale Spheres**

With the linear placement of small scale spheres along the median strip, the movement of the vehicle is accentuated. The processional atmosphere of driving through a series of spheres or similarly scaled objects, is intended to enhance the sense of movement and increase the driver's visual awareness. By manipulating the frequency of the spheres the highway designer is able to modify driver behavior in terms of the cone of vision and in turn, vehicle speed. Symmetrical placement of the spheres is necessary to keep driver vision balanced. Asymmetrically placed elements can divert the central focus of the driver thus increasing the potential for accident.

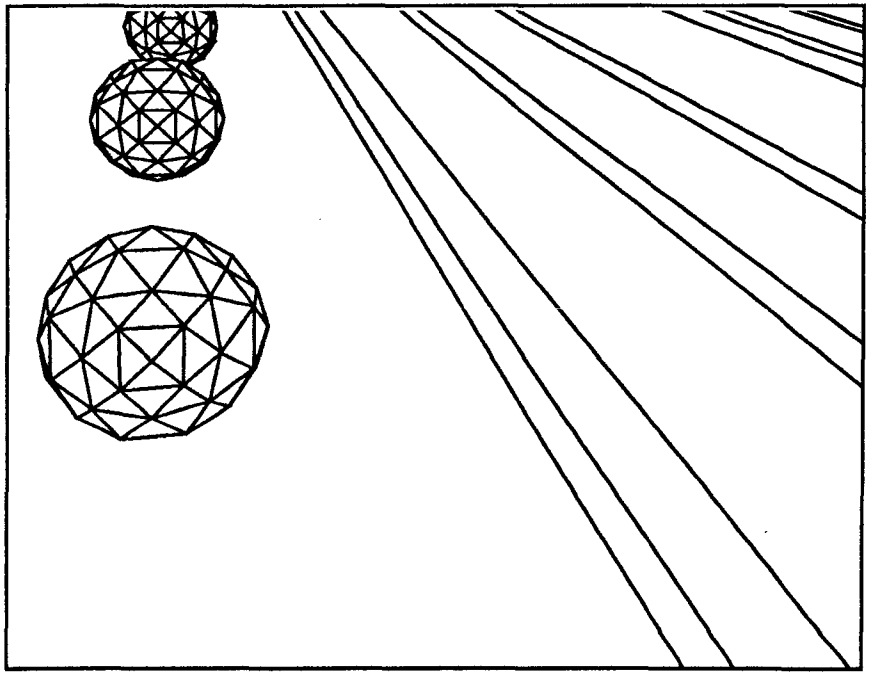
The spheres are placed so as to appear to float along the

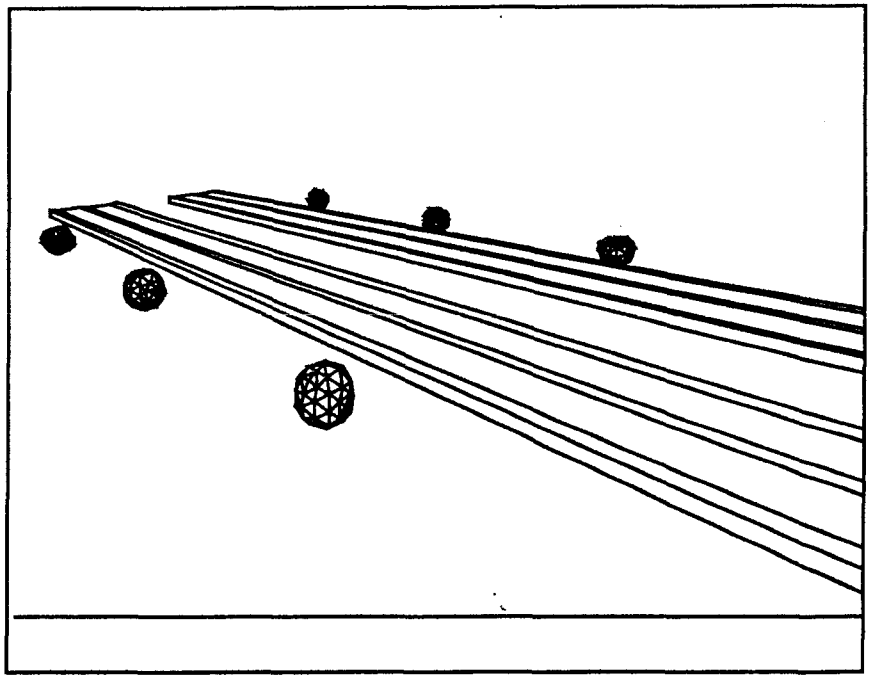


highway roadbed.to enhance the feeling of vehicular movement and to separate the man-made object from the natural landscape as much as possible. The landscape is maintained in its natural state to emphasize the man-made object.

The spheres would be placed at intervals ranging from twenty-five feet up to one-quarter mile apart.The distance between groups of spheres can range from one to one-hundred miles.The effect of long distances coupled with irregular placement of groups of spheres can increase driver safety Similar placement of objects along European autoroutes has proven to reduce the frequency of accidents within the vicinity of the placed objects.

The spheres, ranging from 3 to 6 feet in diameter can be constructed from steel, plastics or concrete. All spheres can be internally illuminated for night-time application. The small scale spheres may be placed at the urban, suburban and rural scales.

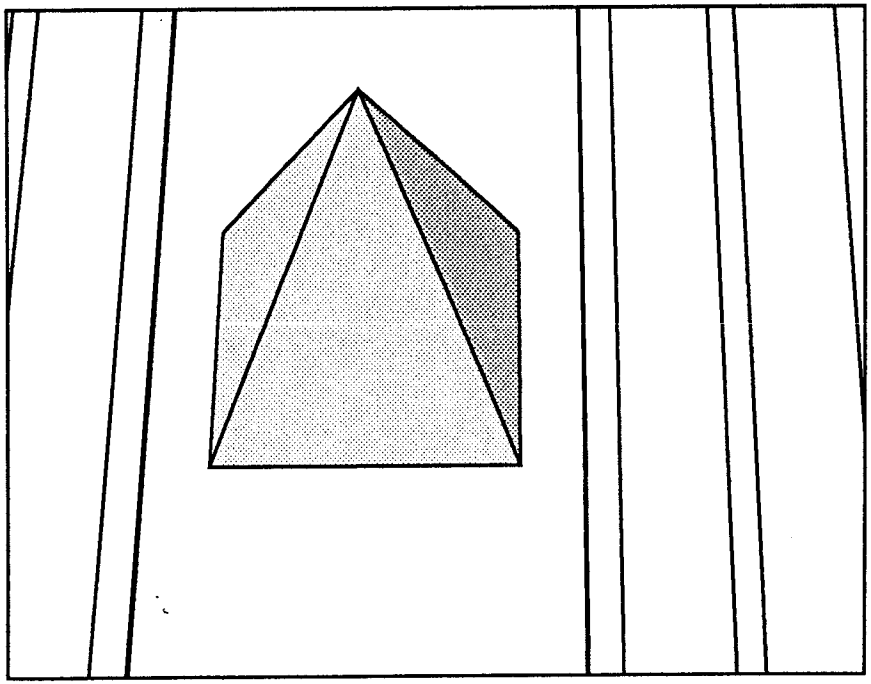


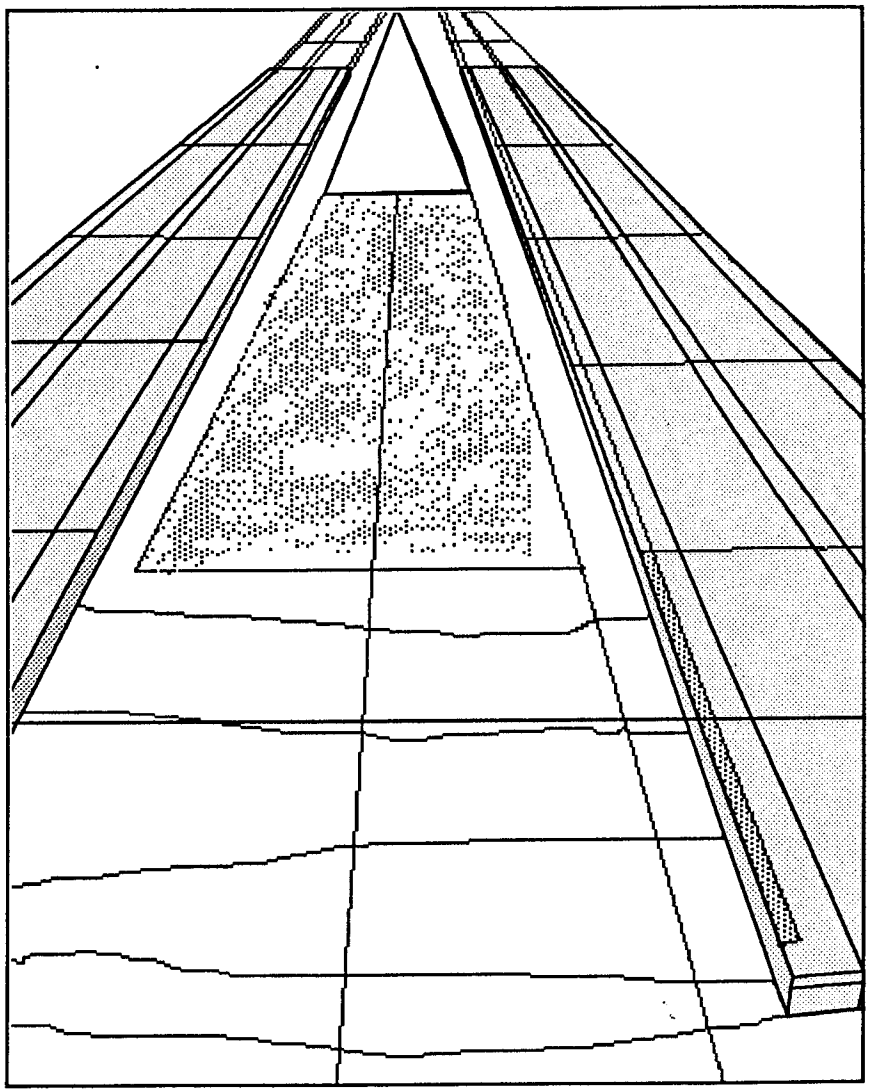


Median Element

Object: **Large Pyramid**

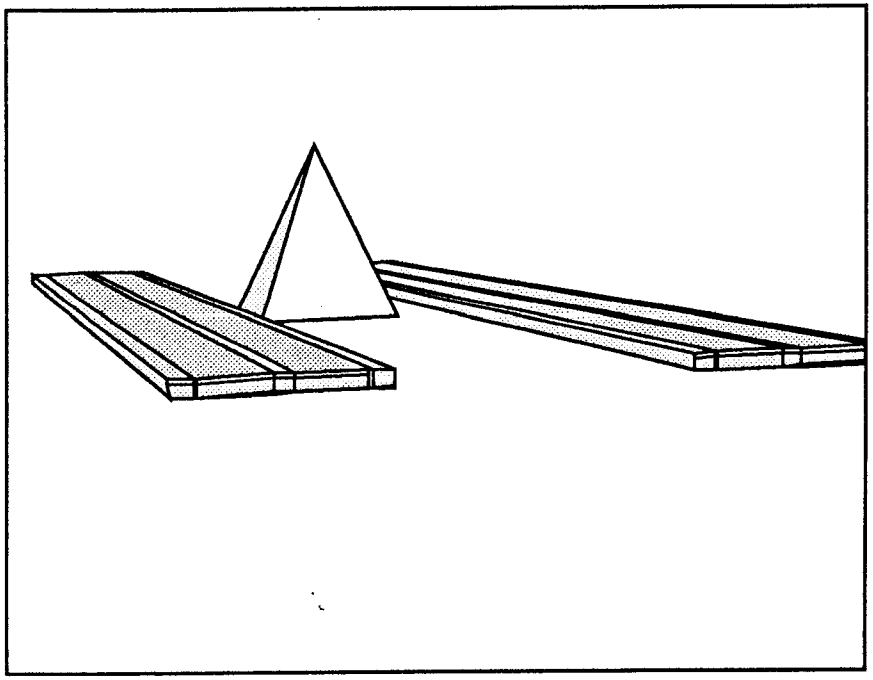
The large scale pyramid placed within the confines of the median strip can provide a form centered object to the motorist but also provide a means of establishing the character of a site specific place. The scale of the pyramid provides the

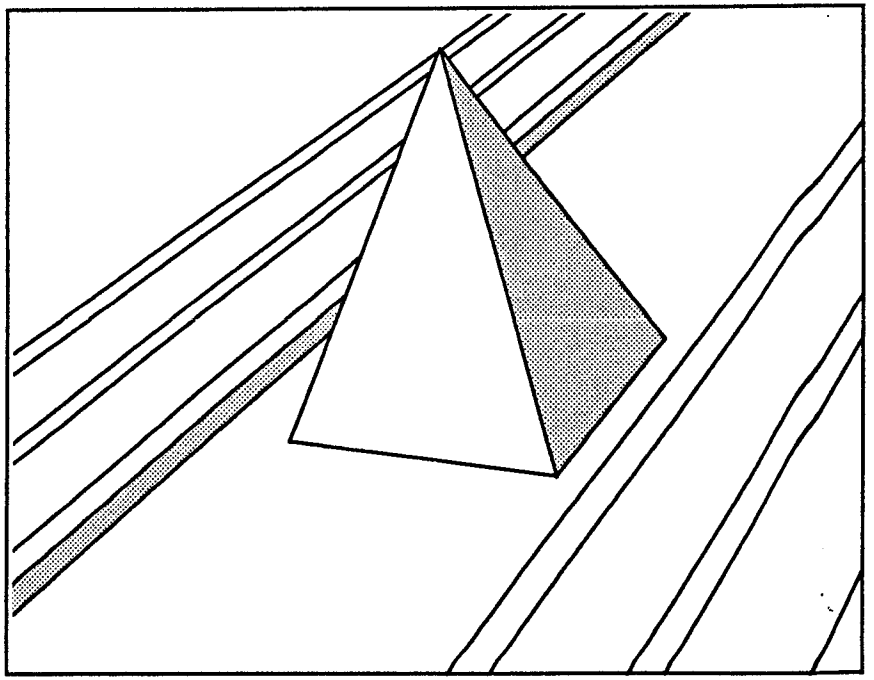




motorist with a recognizable form on the distant horizon on which to focus. The large scale pyramid can be employed to provide an identifiable place along the route. The pyramid can become a local or regional phenomena similar to the Pyramid House along I-94 in northern Illinois and Wisconsin state line. The house has become a landmark for the region and is frequently visited by tourists. It is that special quality imparted by the object that can effect a change or anticipation in the driving experience.

It would stand over 60 feet tall and would have a base dimension of 60 by 60 feet. The pyramid could be hollow or include observation platforms at a number of levels. The pyramid would be constructed from heavy-timber or steel depending on the extent of the closure required. The structure could be surface finished in a variety of materials to enhance or contrast with the surroundings.

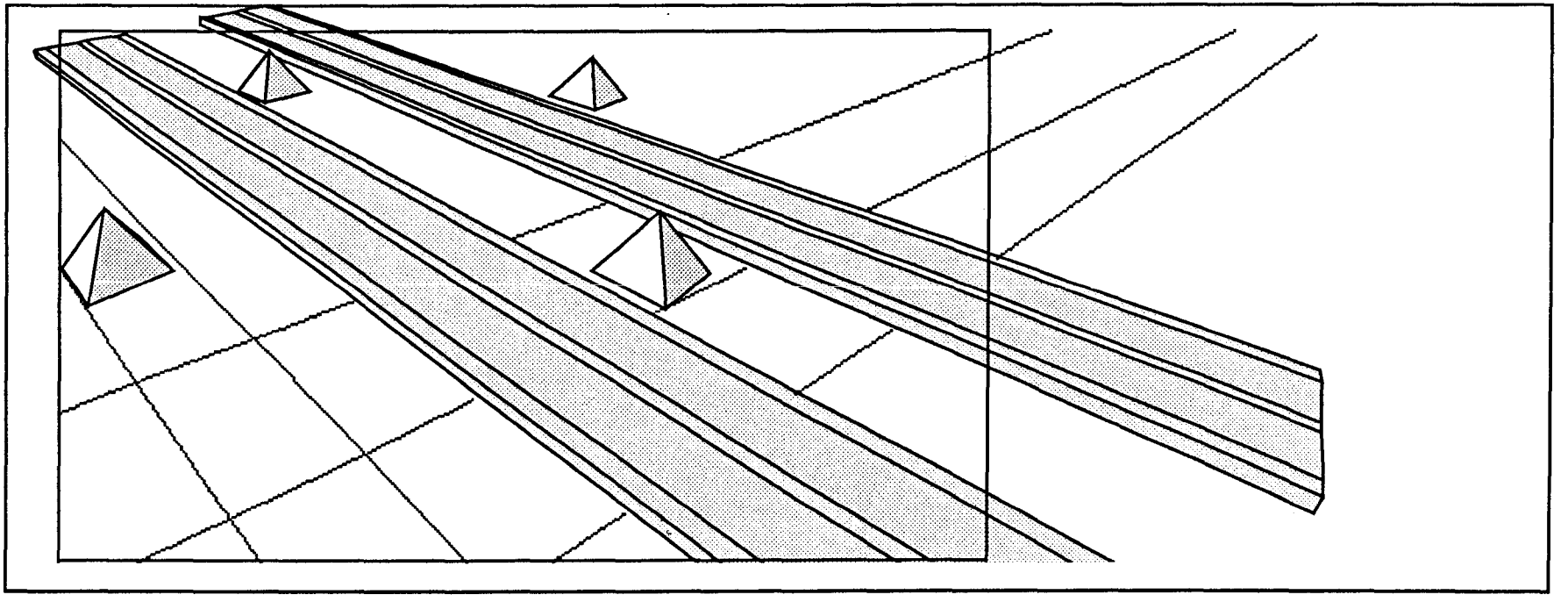




Median Element

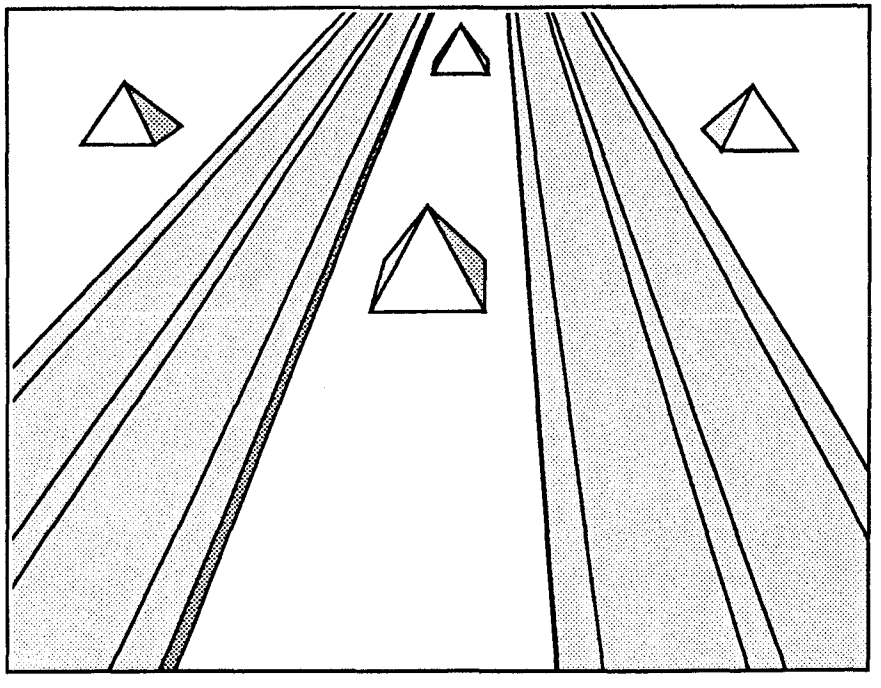
Object: **Small Scale Pyramid**

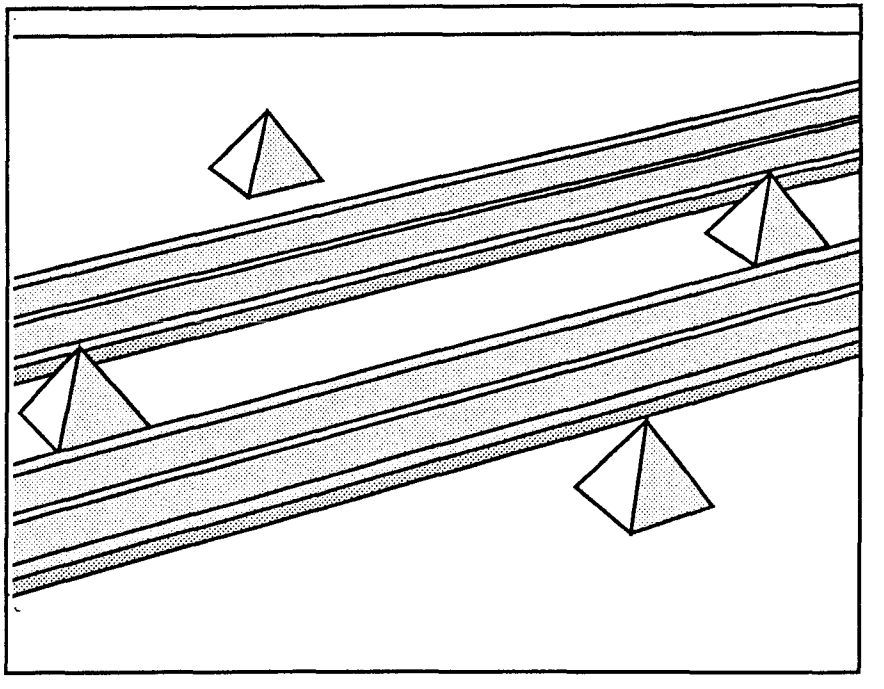
The use of small scale objects randomly placed along or around the median strip form the basis of this design. The placement of the small scale pyramids is critical to increasing the visual experience of the motorist and highway safety. Through the use of symmetry and skewed perspective, the objects become guidelines for the driver. By placing the objects in lines, triangles, circles, squares or in irregular blocks, the linearity of the roadway is accentuated. The contrast between the small scale objects and the landscape draws focal interest to the objects since they appear to be out of place in that environment. By changing the position of the objects in relation to the roadway and the driver's cone of vision, the three-dimensionality is increased.



The small scale pyramids, or similar objects, would be 8 feet high and would be placed 20 to 30 feet off the edge of the roadway. The base dimension would vary from 4 to 12 feet and all the objects would be opaque. The pyramids would be painted a variety of different colors that would either compliment or detract from the surrounding area.

All of the objects would be constructed from prefabricated concrete or steel and would be ground connected through a pedestal base. This design would work quite effectively at all three scales.



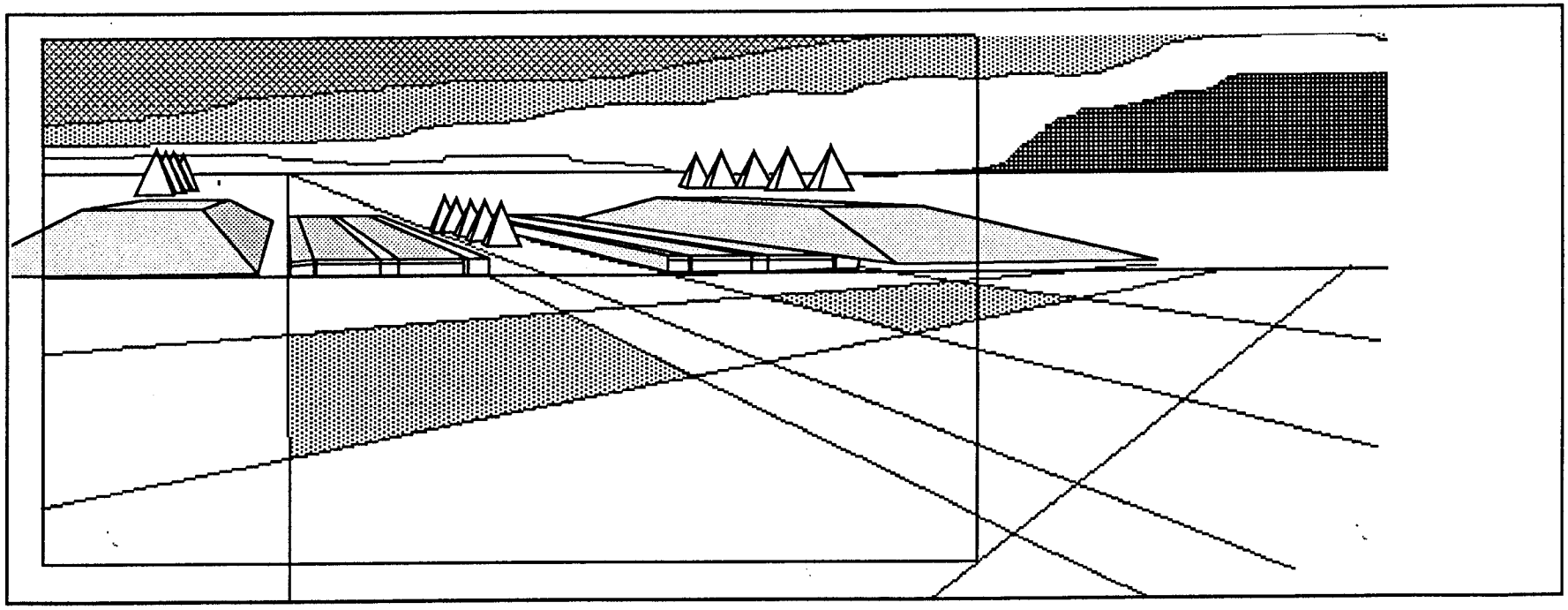


Median Elements

Object: **Multiple Small Scale Pyramids**

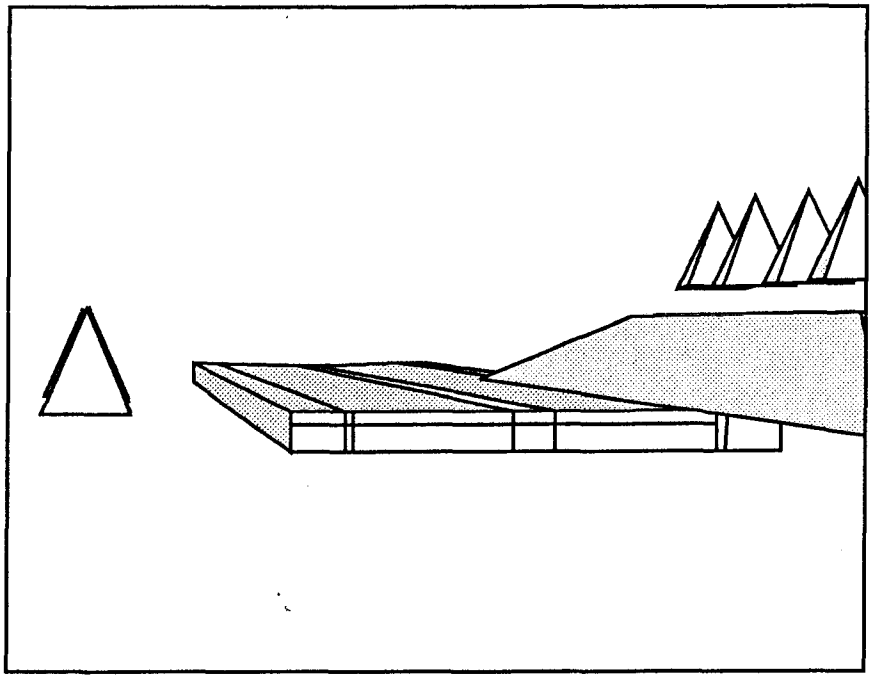
The highway embankment is underutilized in the design of the highway system. Often left uncovered revealing the geological strata or the remains of a cut and fill operation, the embankment has been undertreated from a visual standpoint.

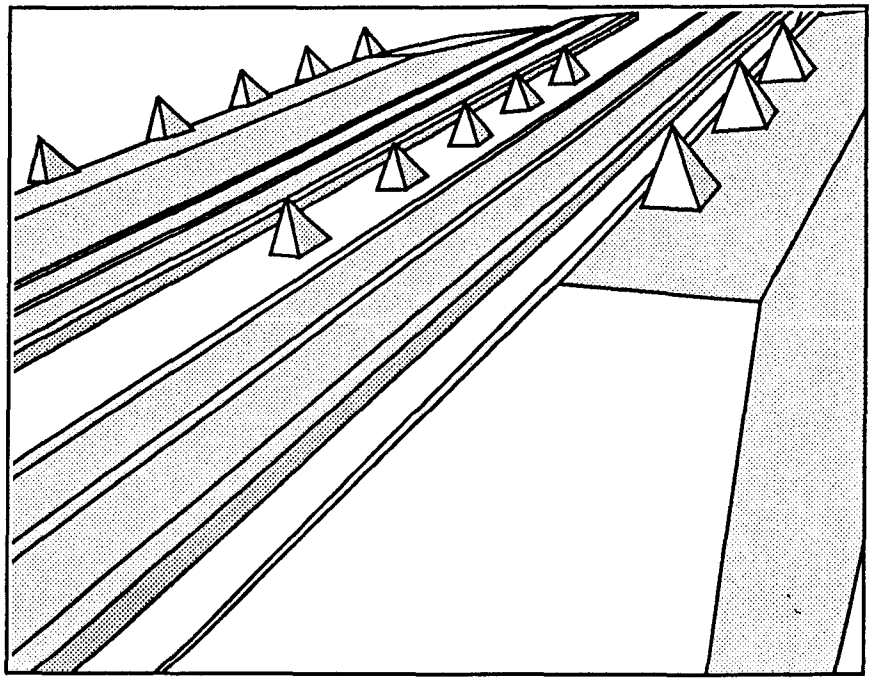
The placement of small scale pyramids or similar objects along the ridge of the embankment or parallel to the plane of the slope can create a visual aesthetic that articulates the natural landform. The intention is to create visual interest in the natural elements that are a byproduct of the highway construction process. If covered with crown vetch or similar natural vegetation, the embankment can be integrated in a more pleasing fashion.



Using small scale pyramids set on a concrete pedestal, the embankment can be utilized as a plinth or base for the sculptural forms. Using a variety of colors, hues or sizes, the small scale objects can be used to accentuate the natural landform.

Built from fiberglas or similar light-weight material, the objects can be illuminated for night-time use to create forms other than those of the landform.

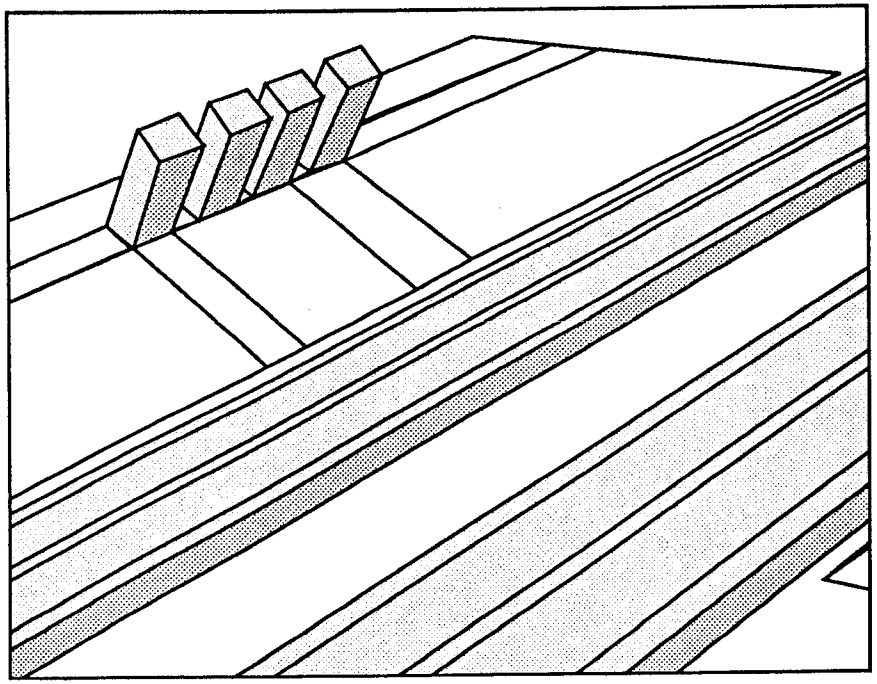


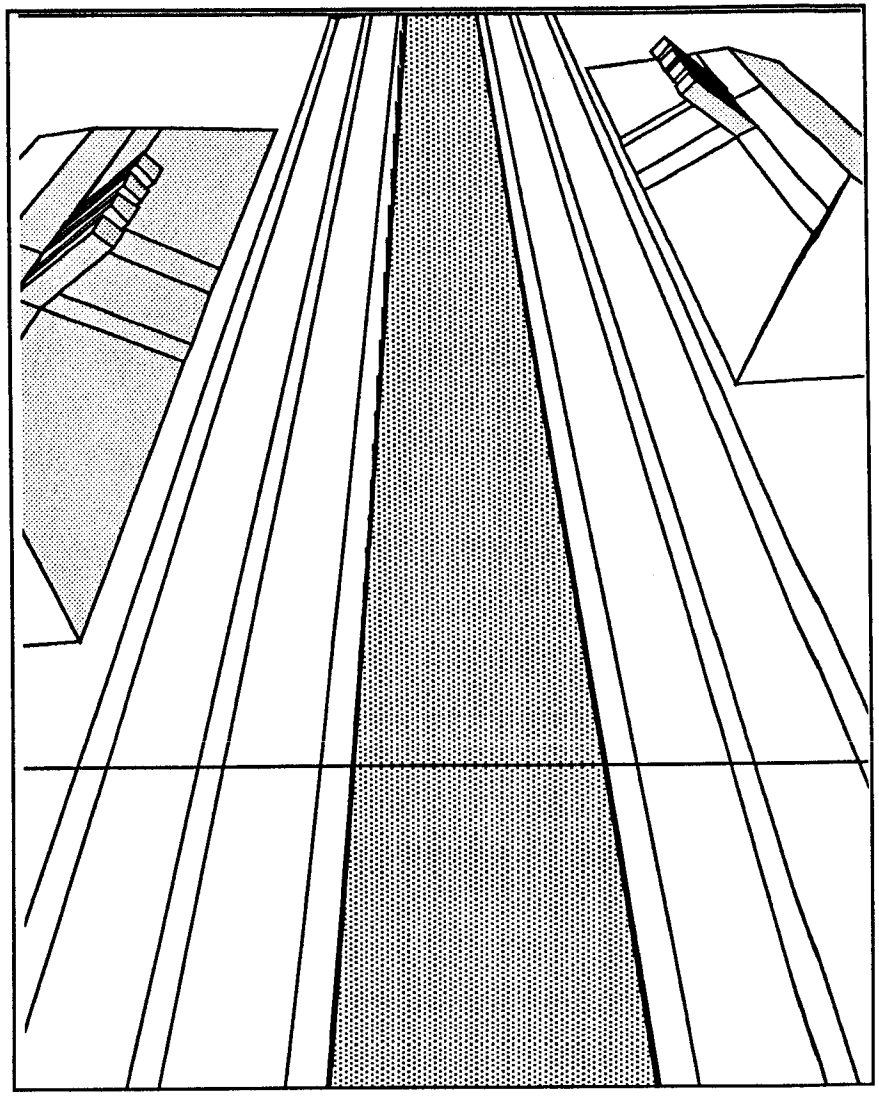


Median Element

Object: **Rectangular Solids Embedded**

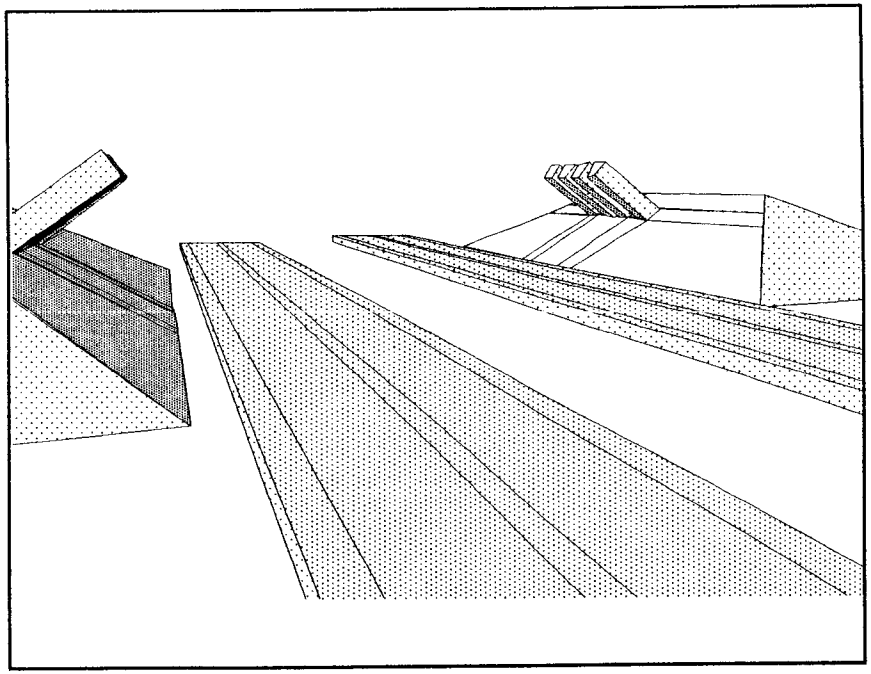
The national interstate highway system currently has a number of landmarks that populate its length. In Texas, one particular project is known as Cadillac Ranch designed by the group Ant Farm. They embedded a number of Cadillac automobiles in

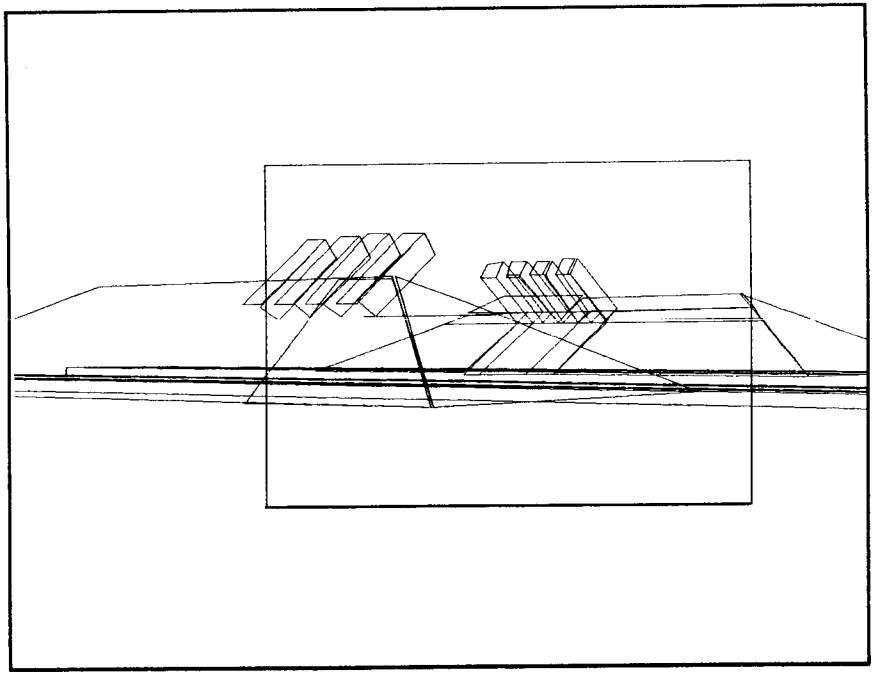




concrete so that the tail ends of the cars appear to stick out of the ground. The cars are lined up parallel to the highway and are arranged on an annual stylistic basis. This novelty has drawn visitors from around the country to view this unique expression of American Art.

Through the careful placement of rectangular objects, set on end, the edges of the highway system can be aesthetically enhanced. The embankment becomes the base on which the rectangular solids are embedded. The solids could be constructed of reinforced concrete and painted in a variety of vibrant colors. The angle of the slope and that of the objects is important to impart direction. The entire assembly is seen as an event along the highway in the same way as Cadillac Ranch has become a national landmark.

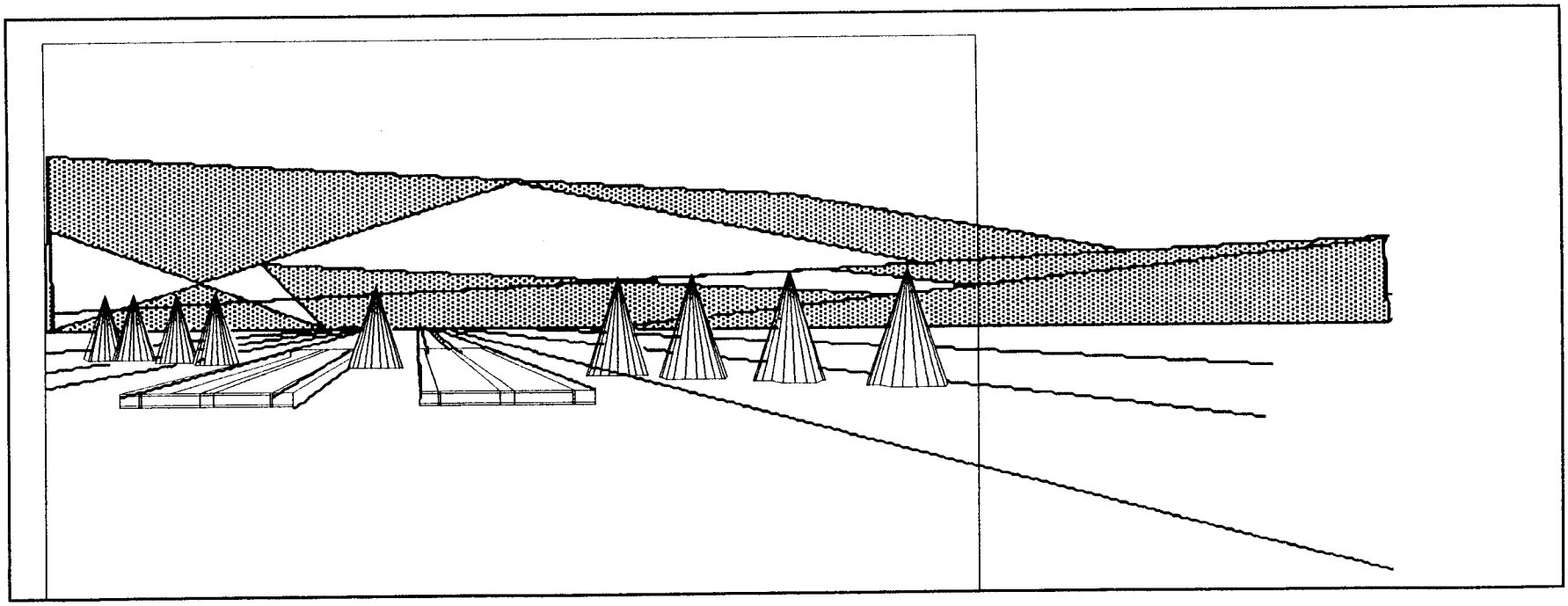


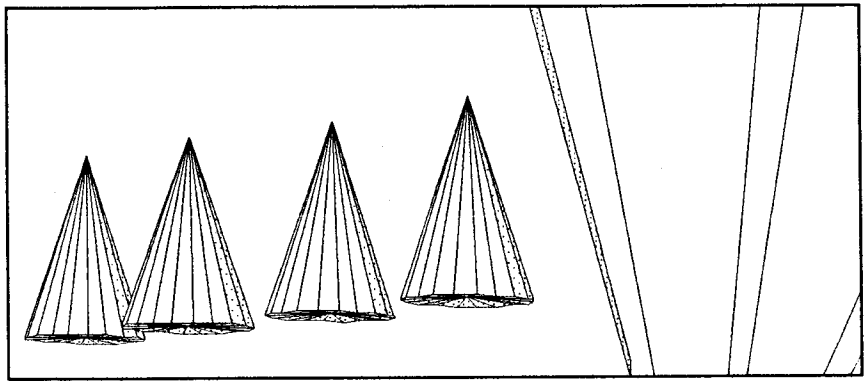


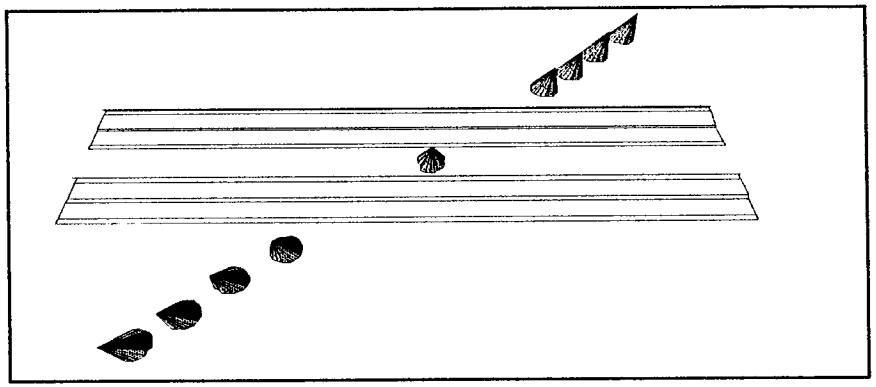
Median Elements

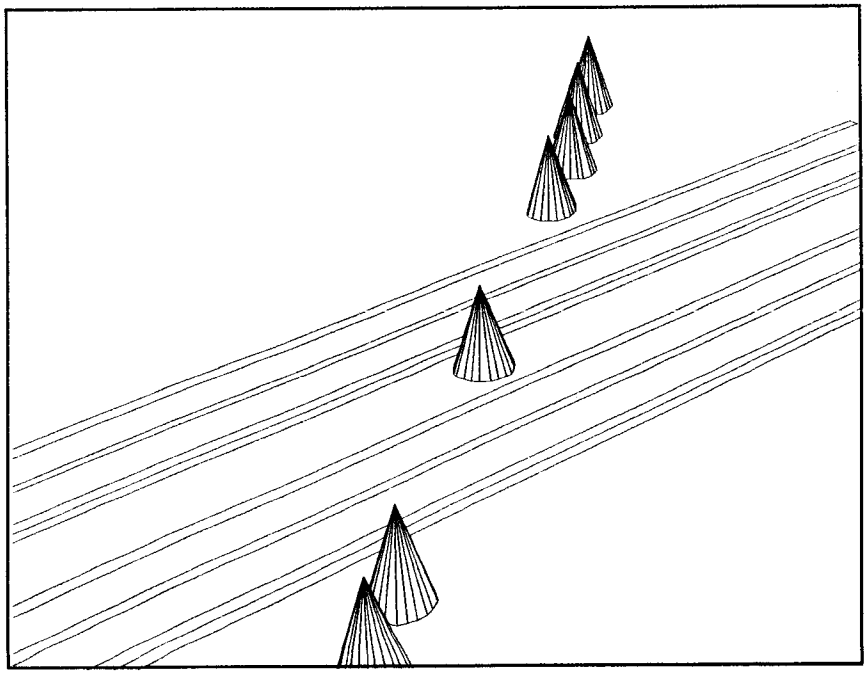
Object: **Small Scale Conical Forms in a Plane**

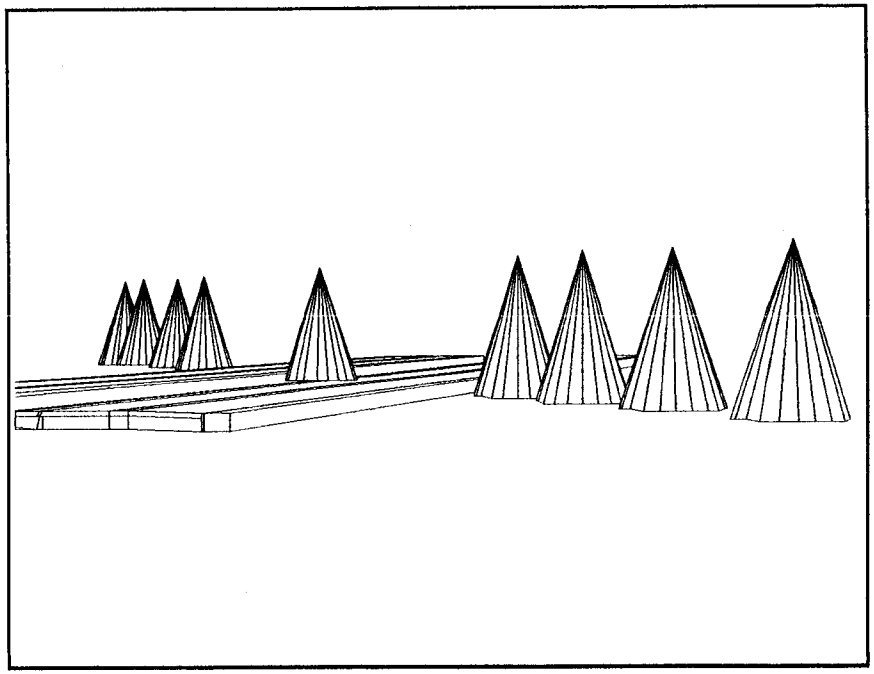
The use of man-made natural plant or tree forms is not new to the highway environment. In Southern California, synthetic plants were placed within the center median strip to act as a buffer and a light screen between lanes. In this proposal, conical tree forms are placed as a screen across the highway strip. The plane of the "trees" can act as a screen to hide or to isolate elements within the highway corridor. In addition, the trees can act as an entry through which the motorist passes. If these planes are placed repetitively, the effect is a forest of parallel planes. Constructed from ferro-cement or light-weight steel shell, the trees are placed on concrete pedestals. Trees would be painted to fit the existing context.







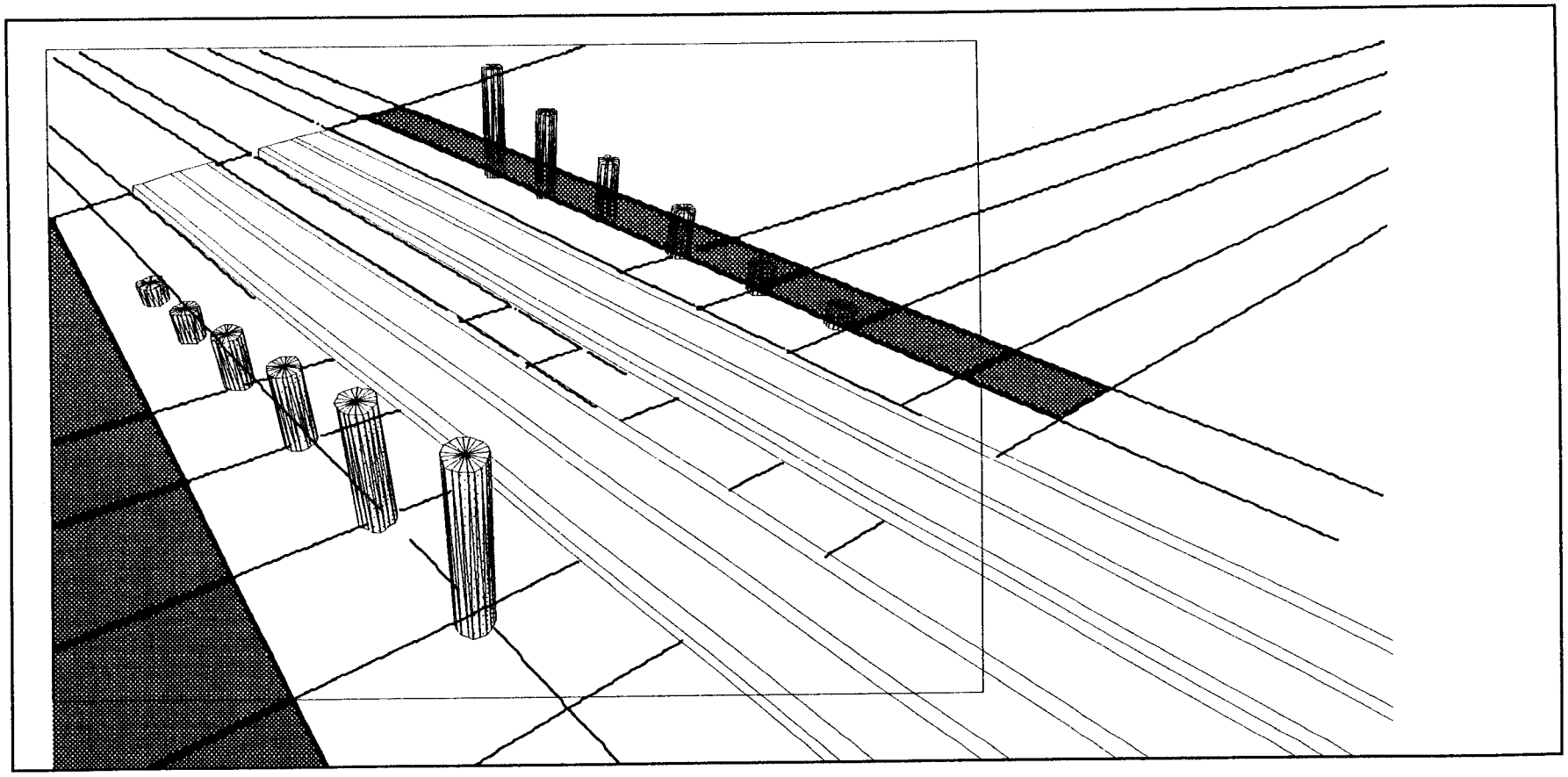




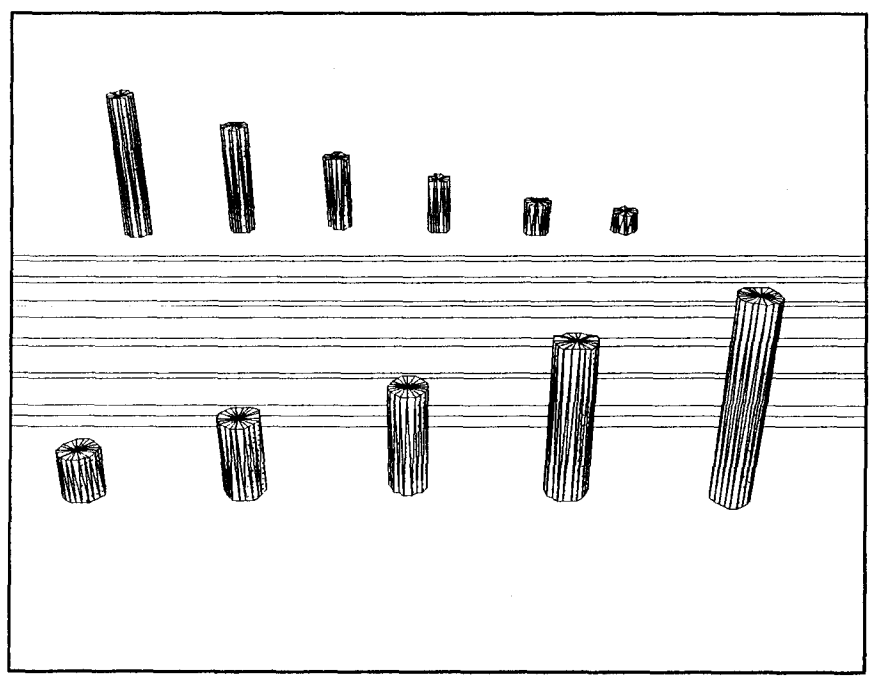
Median Elements

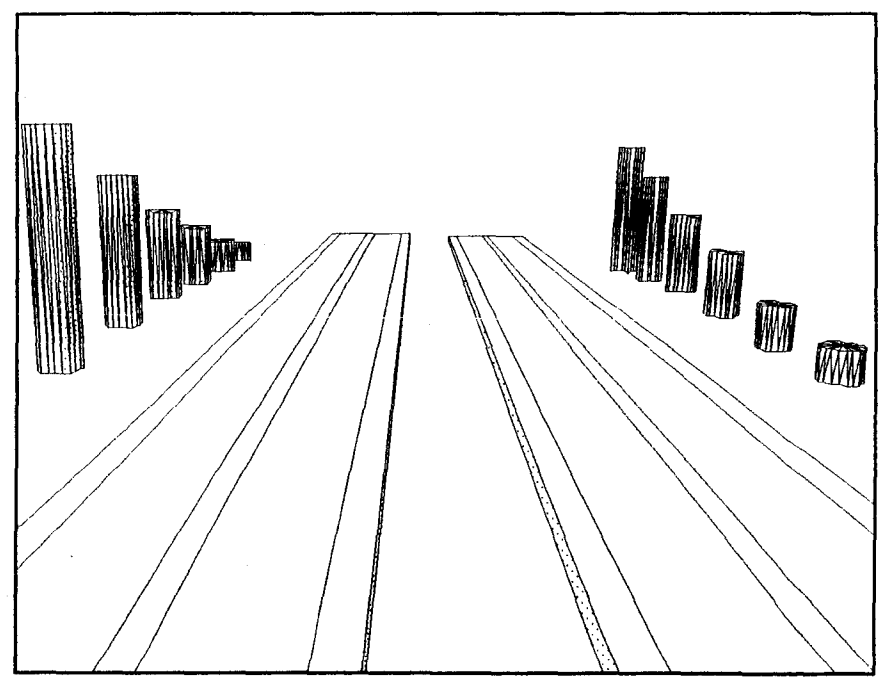
Object: **Scaled Cylinders Opposed**

The introduction of opposing scales is the basis for this proposal of scaled cylinders set up in a pattern where the low to high scale is with the direction of vehicular movement. The cylinders, each three feet in diameter, create a specific spatial



zone that is passed through. The assemblage would be built over a distance of 200 feet. This would provide ample distance to experience the ascending scale of the cylinders. The distance between cylinders would be 40 feet. While the entire driving experience would only last 2.5 seconds, the overall impact of the changing spatial experience would have a much longer impact. In this proposal, the effect of the experience is the key to understanding the visual sequence. As the driver approaches the cylinders, the first recognized pattern is that of the overall form. As the driver enters the middle-ground, the form takes on its vertical meaning but it is not until the driver has proceeded through the spatial form that specific information about the construction becomes apparent. The heightened awareness of the driver and passengers stems from the uniqueness of the overall experience and the questions that remain unanswered. The cylinders woould be constructed from poured-in-place concrete with a concealed foundation. This assembly is suited for urban, suburban and rural areas.

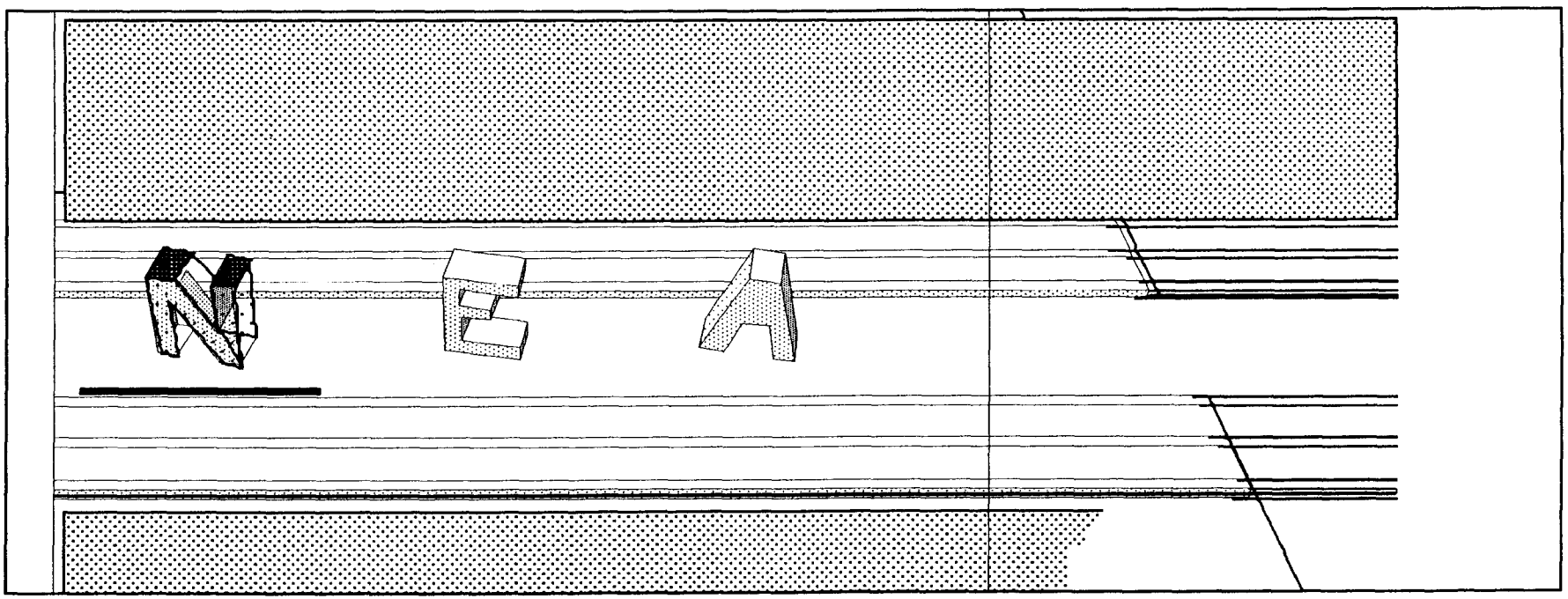




Median Elements

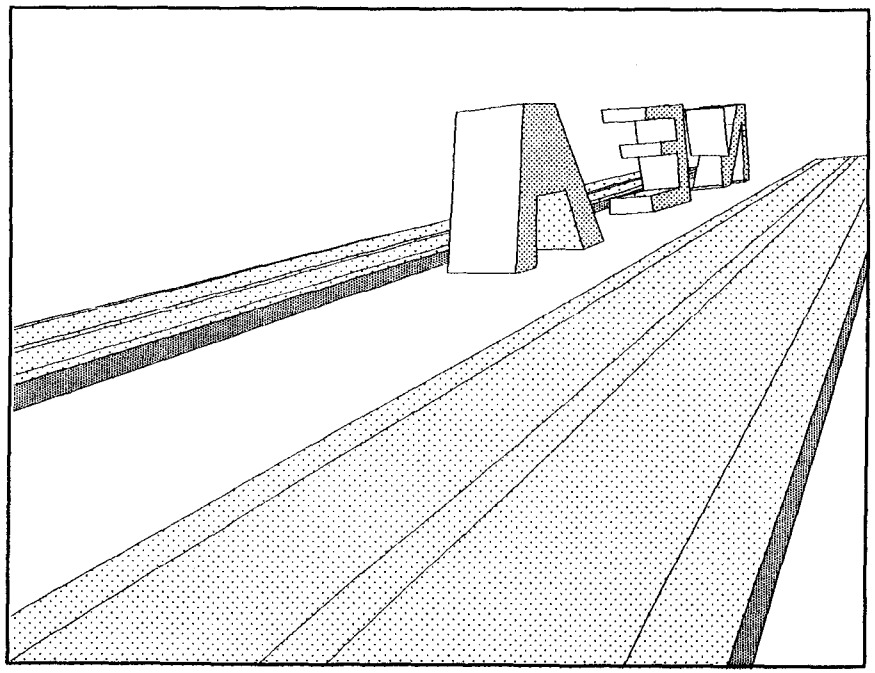
Object: **Superscale Letters**

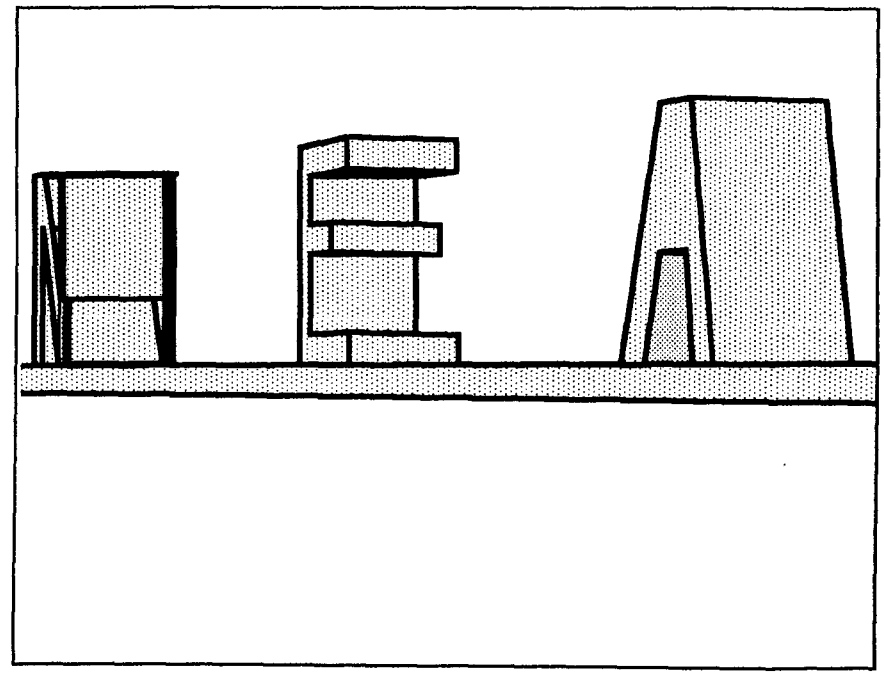
The use of superscale letters is not new to the roadway environment. Initially used in commercial signage, superscale lettering has become a symbol for a new art form found throughout the United States. In this proposal, the letters are placed within the center median strip and are intended to be read from both directions. The purpose of this proposal is to create the potential for a learning experience from the highway trip. Frequently, the roadway simply conveys the passengers without utilizing the educational aspects of the highway experience. Coupled with natural or man-made landmarks, the superscale letter or word can add a level of understanding about that particular region or object. In an urban setting, unique features could be called-out to the passing motorist



utilizing inexpensive advertising space - the urban corridor.

The overall configuration of the letters and their respective placement can be modified from one part of the country to another. The letters, ranging in height from 16 to 30 feet would be constructed from steel or ferro-cement. Each letter can be demountable and the actual word or words employed can be changed on a regular basis. In this proposal, the letters are rotated from the perpendicular 22.5 degrees so that a driver will recognize the forms in the distance. The letters become recognizable as the driver approaches the middle ground and the message is fully understood before the assembly is passed. Another use of this type of signage would be to convey messages along the route over great distances similar to the Burma Shave advertisements that populated the highways from the 1930's.



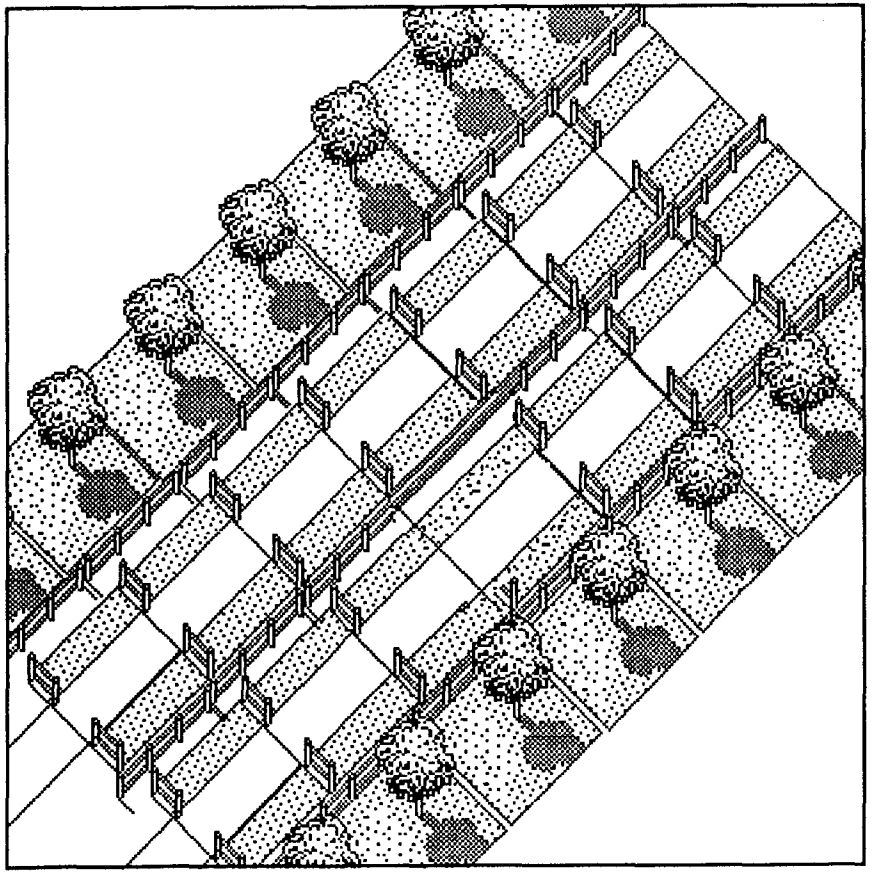


Enclosure Elements

The freeway generates noise, fumes, headlight glare and a lot of headaches, which are continuous reminders of the obtrusion in a residential or commercial area. Set backs, right-of-ways and eminent domain are a few of the methods employed to isolate the roadway from its immediate environment. The complaints of the citizenry have generated a number of "designed" solutions. The standard designed response has been to introduce large-scale, formless walls between the offender and its context. Another solution has been to modify roadway alignments by depressing the highway into a claustrophobic trench. Simply building barriers is not an effective solution to the problem. Distance between the roadway and the surrounding area, frequently seen as a physical means of overcoming noise and air pollution, merely spreads the problem to a larger area. A better understanding of some of the design options, and their associated costs, can assist the design professional in resolving the problem.

This section introduces the enclosure element. The enclosure element is based within a formal vocabulary of: walls, recesses, enclosures and edges. By recognizing that the roadway and its environment must co-exist, the introduction of enclosure elements can provide a means by which a balanced solution can

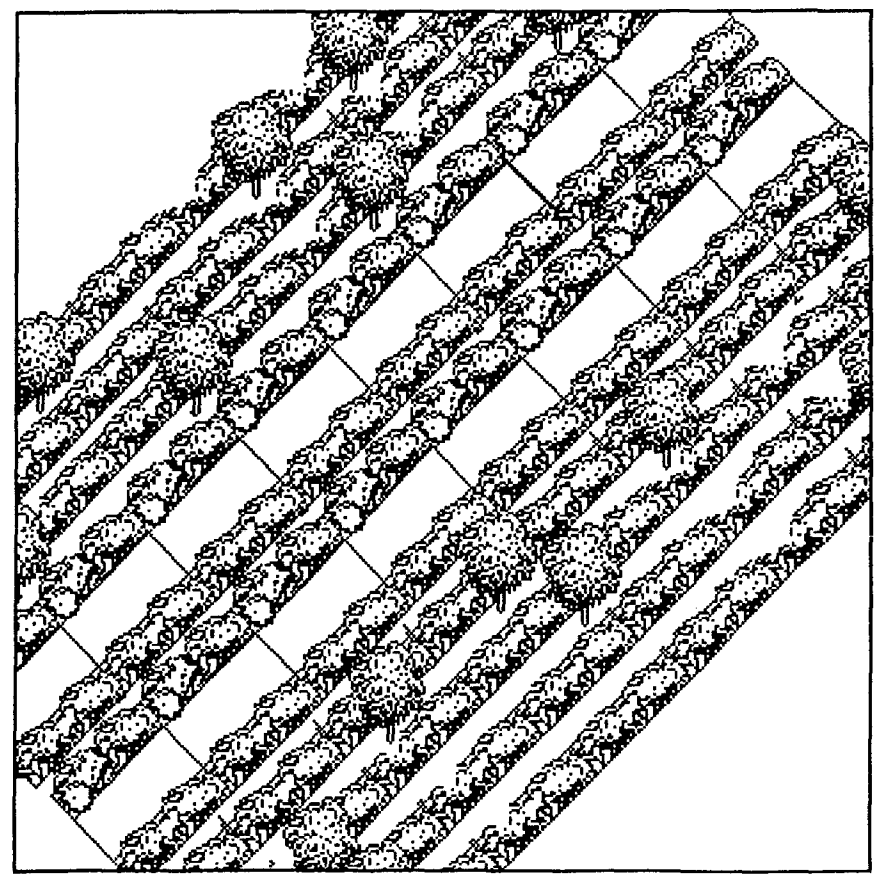
Road construction can be planned to incorporate the horses as part of the roadway furniture.



be achieved. The influence of a highway, passing through a residential area, goes far beyond the market value of an adjacent residence. The physical and mental health of the residents can be seriously impaired. The acoustical wall, can be designed to act as an isolator without the expected negative side effects. Serpentine, zig-zag or staggered acoustical walls, acting in conjunction with embankment slopes, ditches or underpasses, can be used far more effectively than the accepted repetitive and visually sterile acoustical solution.

The enclosure element, in the form of a recessed passage, can be made into a formal event with large scale sculptural forms acting as buttresses edging the highway. The development of tunnels, underpasses or overpasses are a response to the need to cross the highway strip. These elements can be designed to respond to more than just the functional need. Using sculptured forms, textures and color, the enclosure element can effectively contribute to the overall aesthetic of the roadway. Contrary to current design philosophies, individuality of elements can be a desirable quality. Variation on the theme does not imply visual chaos but rather, a positive change in the visual and spatial characteristic of a featureless highway experience. The enclosure element may be seen as large scale ornamentation that works in conjunction with the landscape rather that overpowers it. The use of roadway landmarks, that have character in and of themselves, is one of many artistic means available to the highway design professional to combat roadway ugliness.

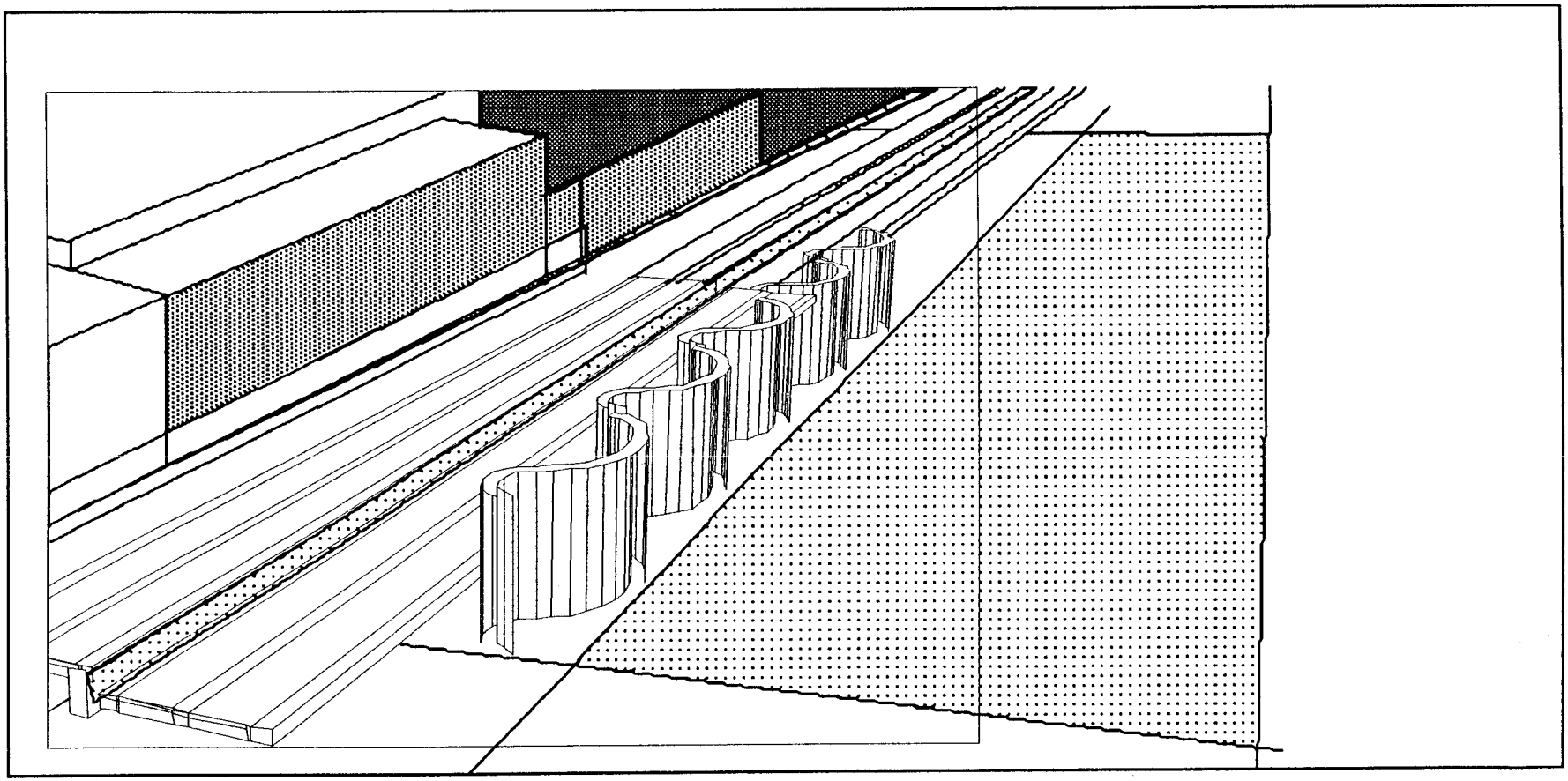
The direction of movement can be enhanced by reinforcing the natural edge.



Enclosure Elements

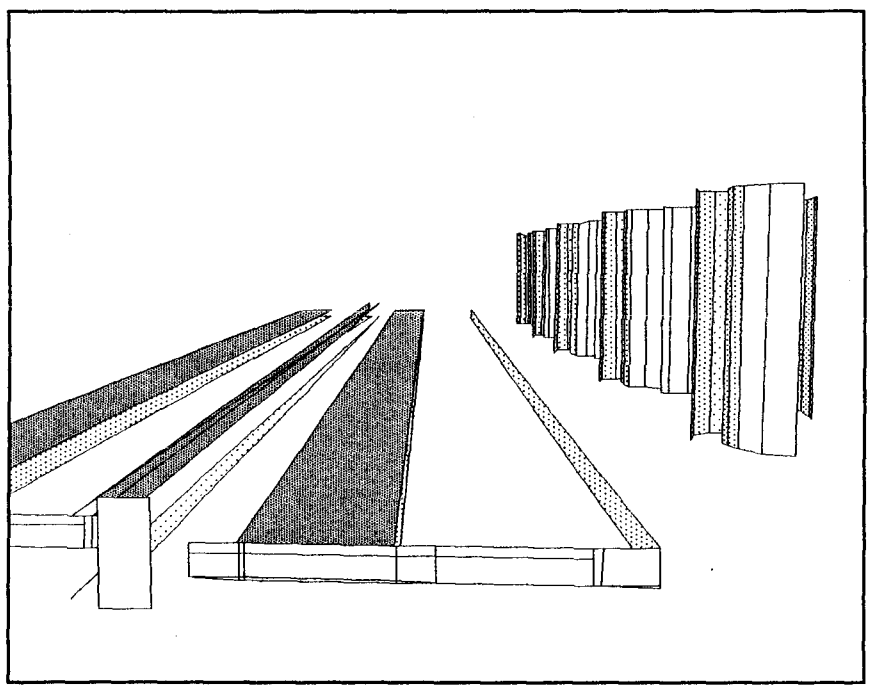
Object: **Serpentine Wall**

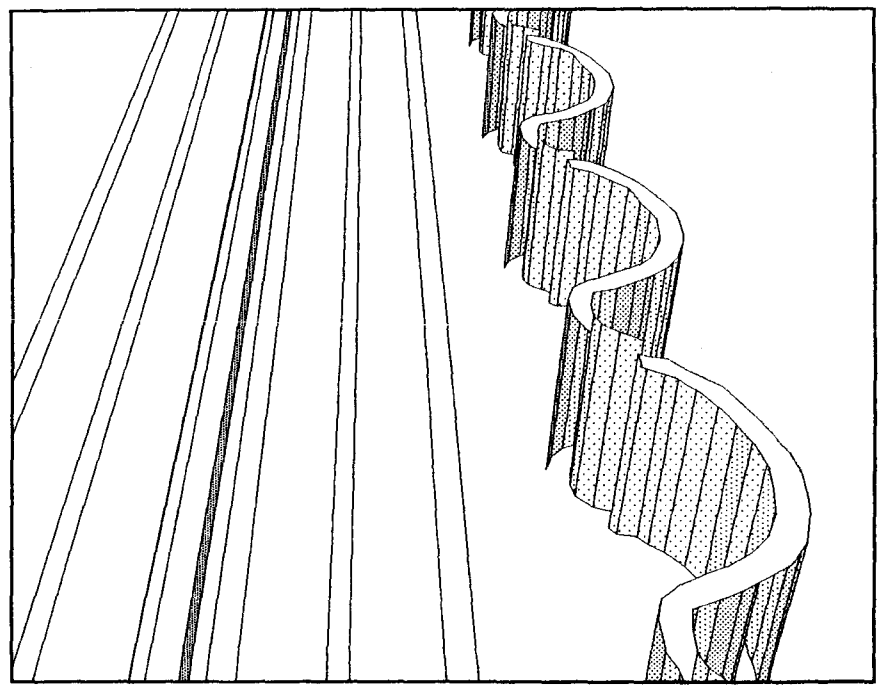
The urban highway corridor has been isolated from the community which it serves with large scale fences, embankments or tunnels. The "tunnel vision" aspect of the urban highway has been well documented as having negative aesthetic value.



Some communities have invested in large scale fencing, acoustical walls, privacy screens and barriers to reduce the environmental impact of the highway. In doing so, little value has been added to the expressive content. In the case where screening, acoustical barriers are required, a greater concern for the formal design aspects of the remedy must be expressed. In the case of a simple isolating wall, a serpentine form or a form other than a pure linear one enhances the sense of edge as well as the feeling of movement.

In this proposal, a reinforced brick masonry serpentine wall is placed along the edge of the roadway. The masonry color and the form add a pattern or texture to the edge that makes the visual experience far more tolerable. In cases where a linear wall is necessary, large scale textures, graphic art or murals may make a significant differenece to the highway traveler. The potential for the community to advertise itself is enormous considering the inexpensive wall space available.

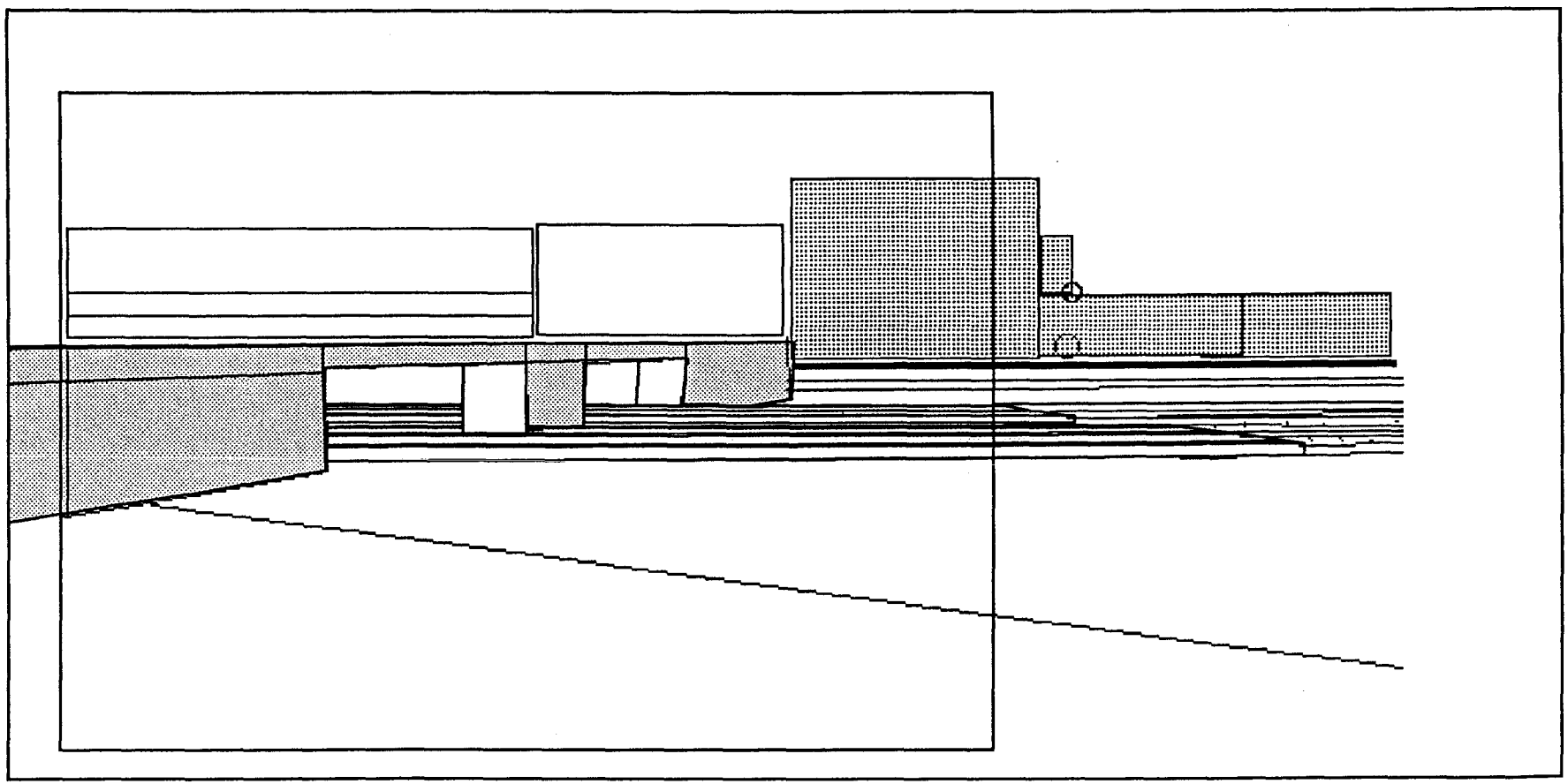




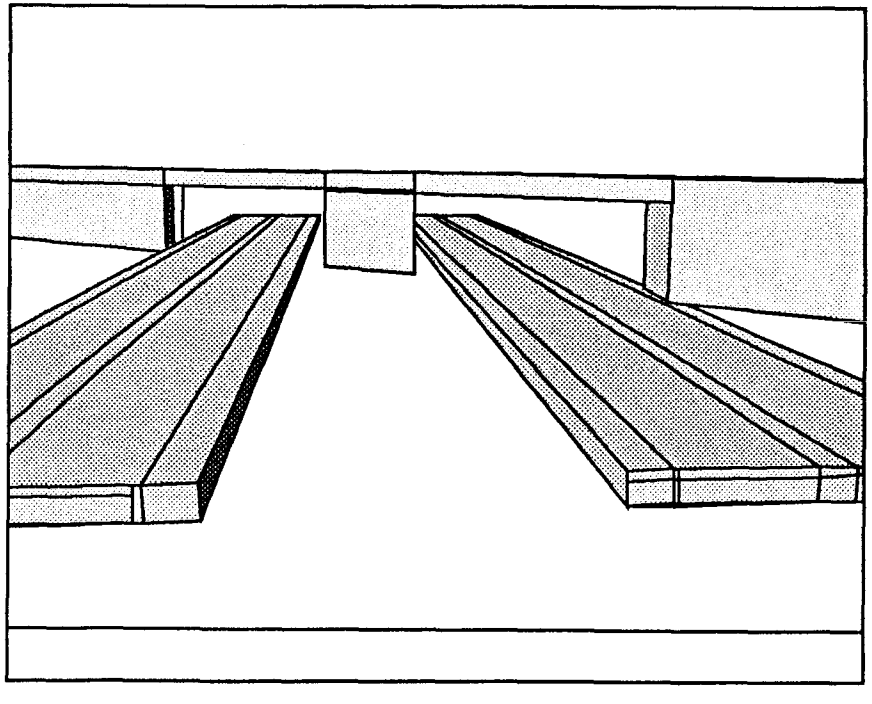
Enclosure Elements

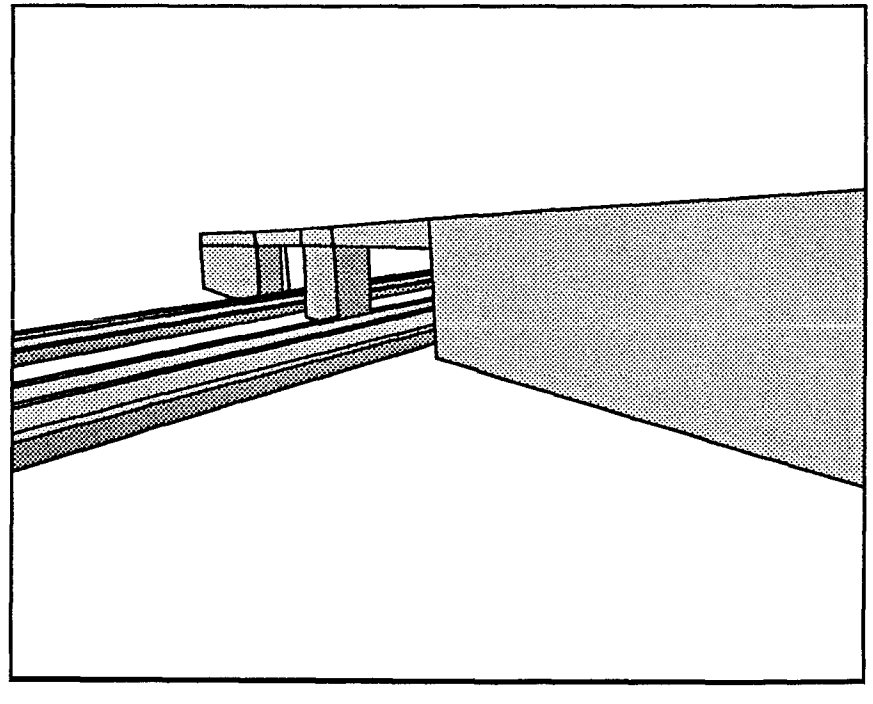
Object: **Cross-Roadway Wall**

The barrier that exists between the roadway and the landform is similar to that of a wall and the outside space. The roadway is seldom seen as a means of unifying space but rather a wall that demarcates a place. The wall becomes inpenetrable and



therefore has little to do with its contextual setting. When applied to the highway strip,the wall becomes a means of enclosing or defining edges from the inside-out. In this scheme, the wall is placed across the highway strip in a fashion of a fence. The openings for the highway form the only entry point through the wall suggesting a complete isolation from the other side. The driver, approaching the wall, will have a heightened awareness of the transition from one side to the other. The wall can act as a transition from the contained highway corridor to a local, regional or national landmark, a rural or suburban community or demarcate an area of special interest. The wall could incorporate a path across the highway connecting scenic areas or rest areas. The work of the artist Christo is quite similar to this proposal as the wall has the potential to act as a unique reference point between man and the landscape.

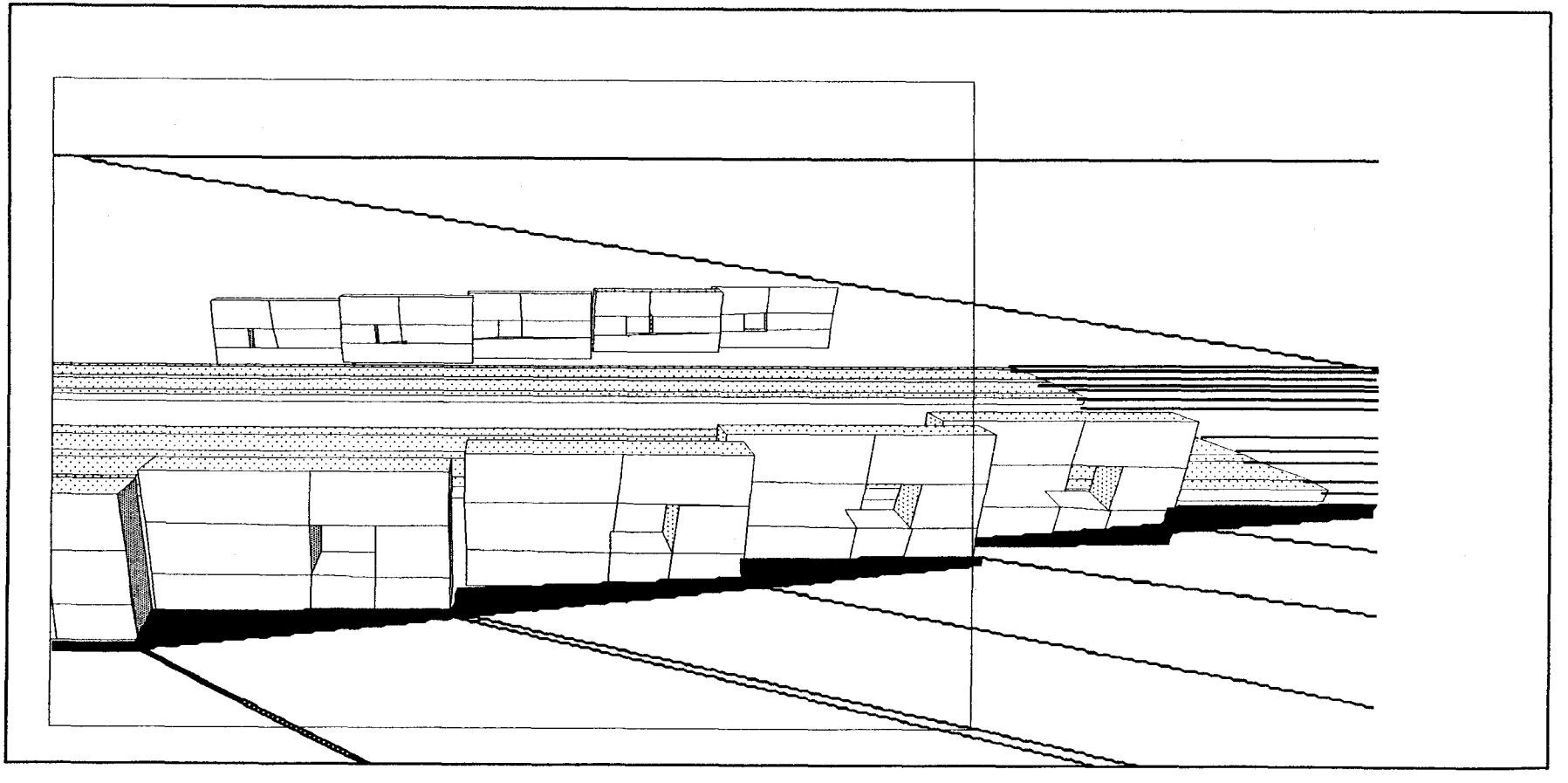




Enclosure Elements

Object: **Punctured Wall**

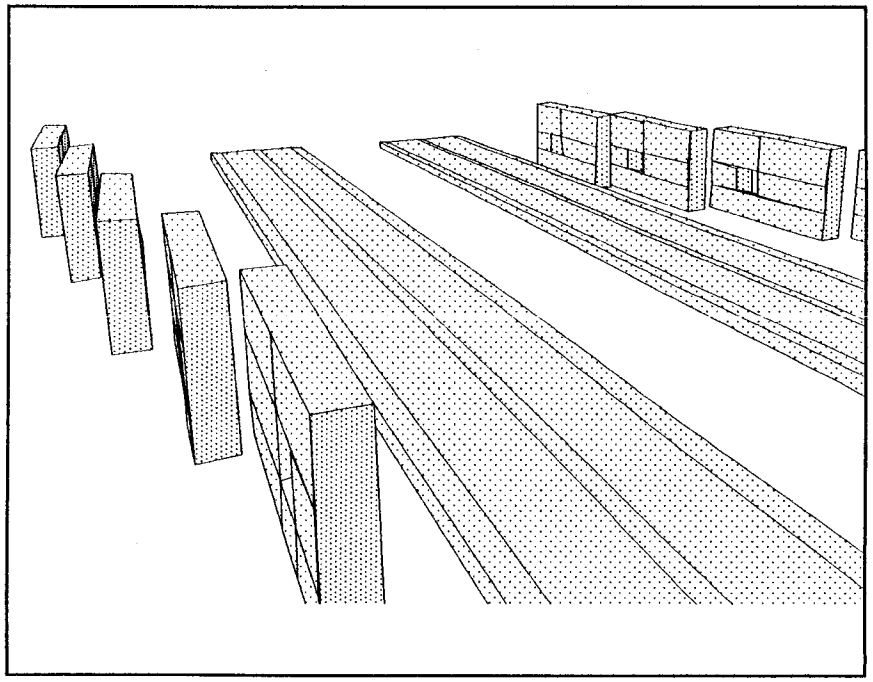
A wall is designed to enclose, divide or protect an area that has a special value. This society uses the wall in a physical sense to demarcate legal boundaries or to separate one piece of property from another. The punctured wall is a means of

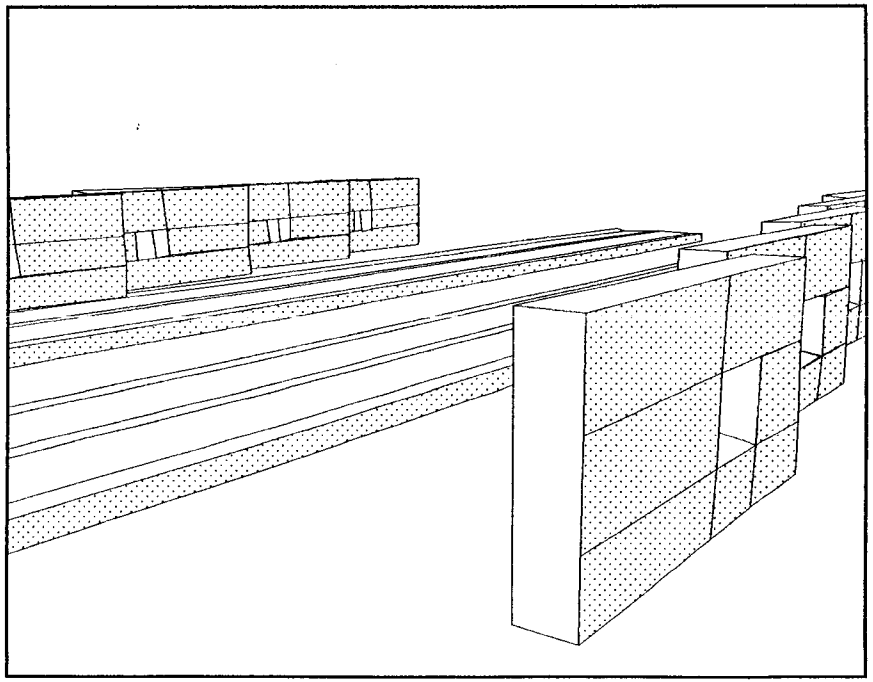


reducing the absolute separation by providing an large enough opening sufficient to provide a visual link between sides.

In this scheme, wall elements are offset from each other and are penetrated with a large scale opening. The random nature of the openings is intended to not only provide visual interest from the motorist's viewpoint but to those viewers on the outside looking-in. The openings are placed to frame selected views of the highway as well as the landscape. This method has been used quite frequently in Europe where acoustical separation was required but a visual link was necessary. Through the careful placement of wall openings with a transparent panel, French designers were able to meet both requirements. The need for a changing environment to heighten driver interest is effectively provided for with the punctured wall.

These punctured walls are suitable for urban, suburban and rural scales and can vary in height, texture and form.

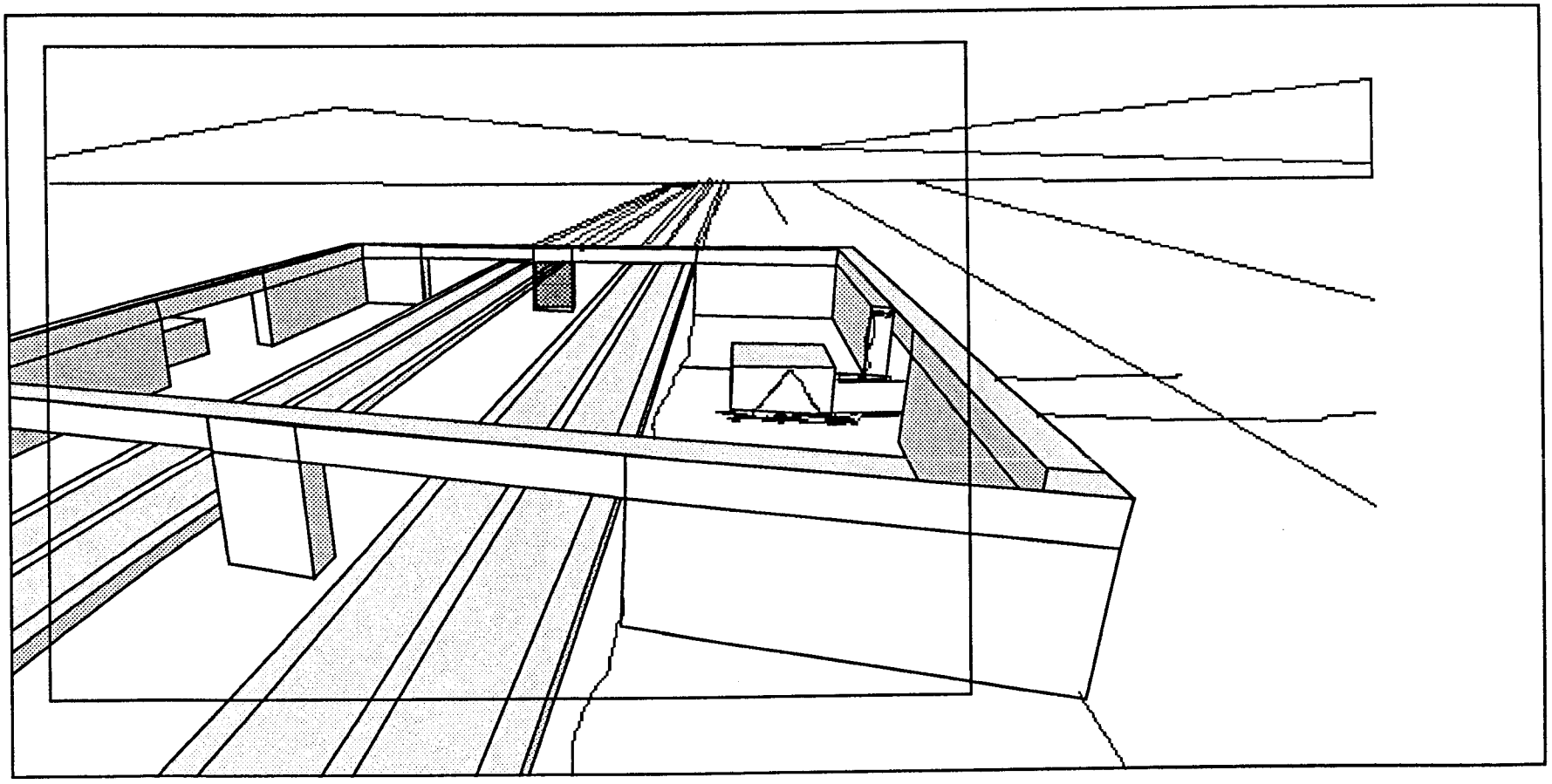




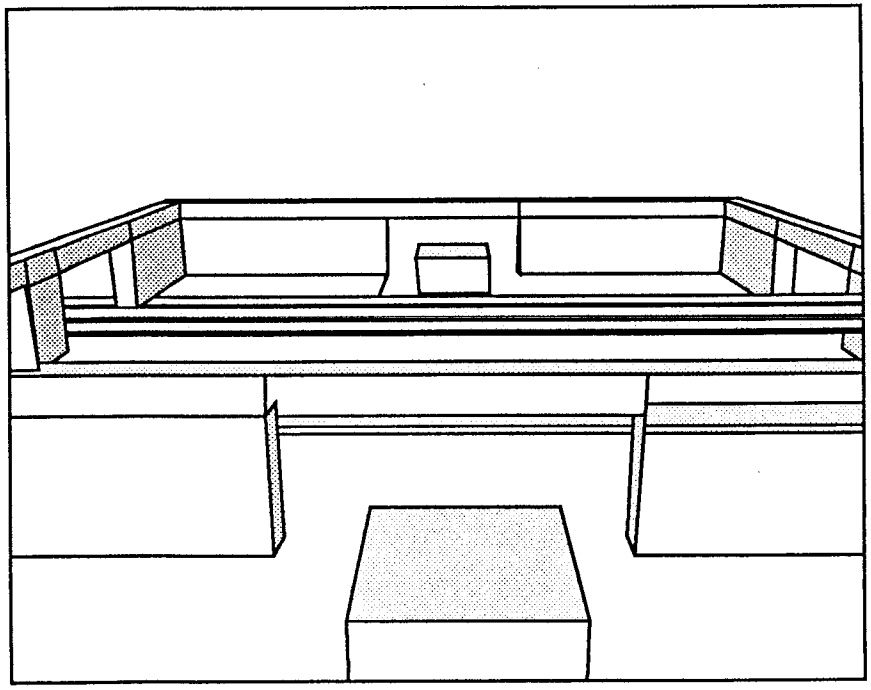
Enclosure Elements

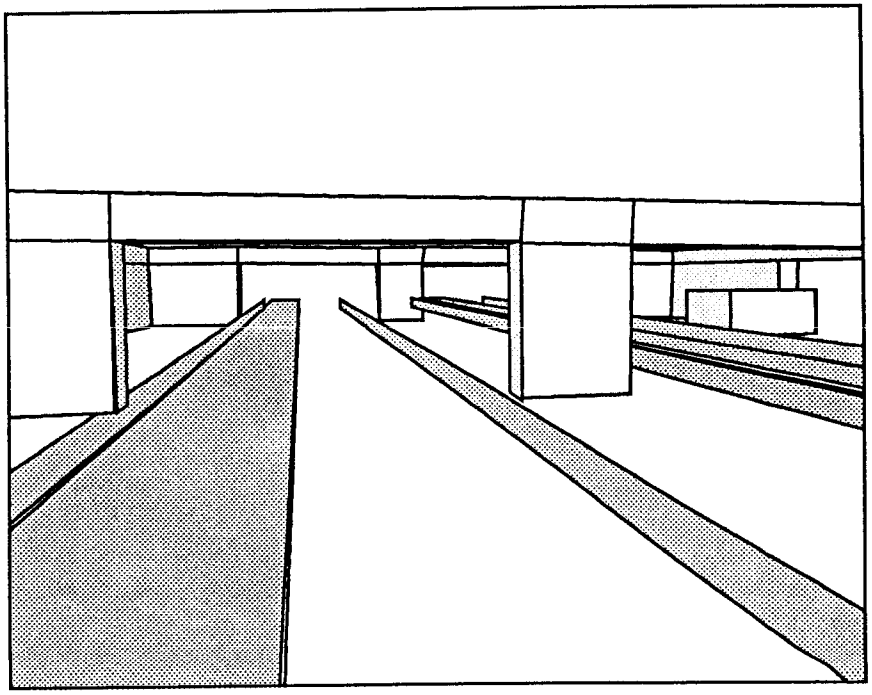
Object: **Walled Space with Objects**

During the automible trip, distance is seen mainly as a element of time. Time is the one element that is a constant. Distance is measured in hours of driving, not in the actual mileage. The concept of distance is important in driver safety for many



reasons. Distance between vehicles, distance to an exit and the velocity of the vehicle are among the most important. Distance that is not dependent on the element of time is another means of heightening driver awareness. In this scheme, an enclosed space through which the vehicle travels is the means by which the concept of distance is transmitted. The enclosed chamber, open on four sides, represents a unit of distance. Measuring 600 feet to a side and filled with Platonic solids, the chamber is a means of creating an identifiable and unique space along the rural highway. In one particular setting, the enclosed space becomes the refueling stop or rest area where the entire space is separated from the outside except for selected openings. This is similar to those rest stops that span the highway and yet are undefined as to their boundaries. The central idea is that the enclosed space is different from that on the exterior and thus becomes a shelter from the highway environment. The enclosure could be solid or transparent or simply a frame that demarcates the sanctuary.

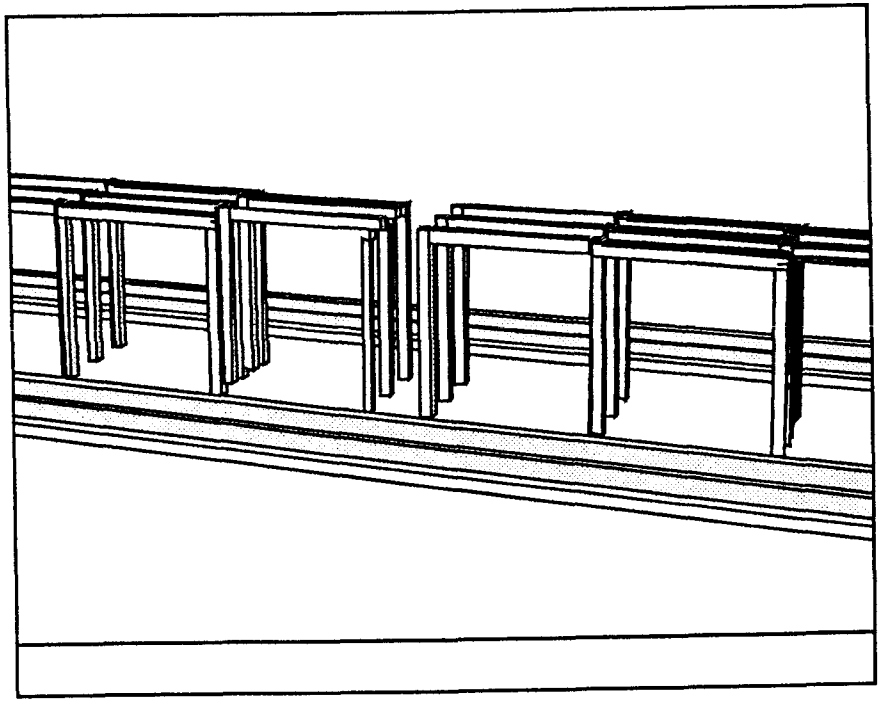


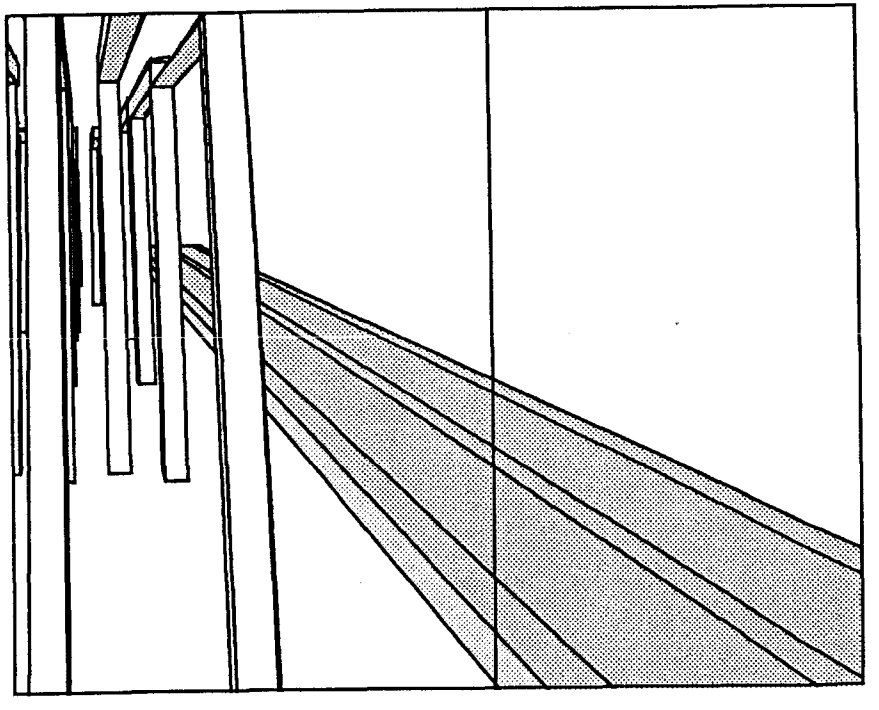


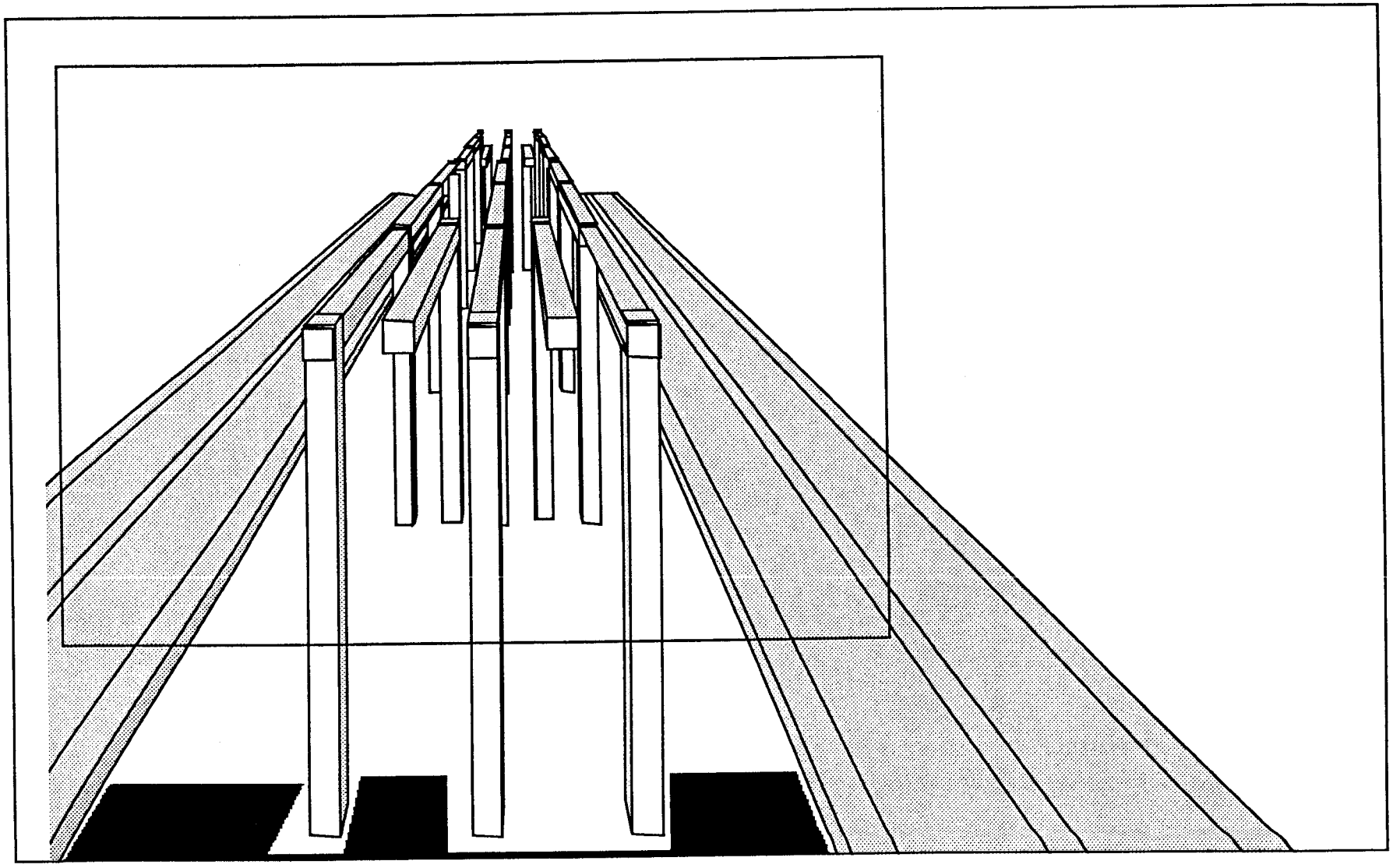
Enclosure Elements

Object: **Open Center Wall Elements**

The center strip represents the division between two different directions of movement, speed and destination. It is often filled with steel or concrete guard rails and is seldom used as a formal element in the design of the highway. The Taconic State Parkway, being a notable exception to the rule, reflects a sculptural aspect missing in most interstate highways. In the framed center element, a series of concrete portals frame the opposing lanes of traffic to act as a singular sculptural element. Used over a long distance, the placement of the frames could coincide with areas needy of heightened driver awareness or of specific environmental factors affecting driver safety. The frames would be multi-colored and possibly illuminated for night-time use.



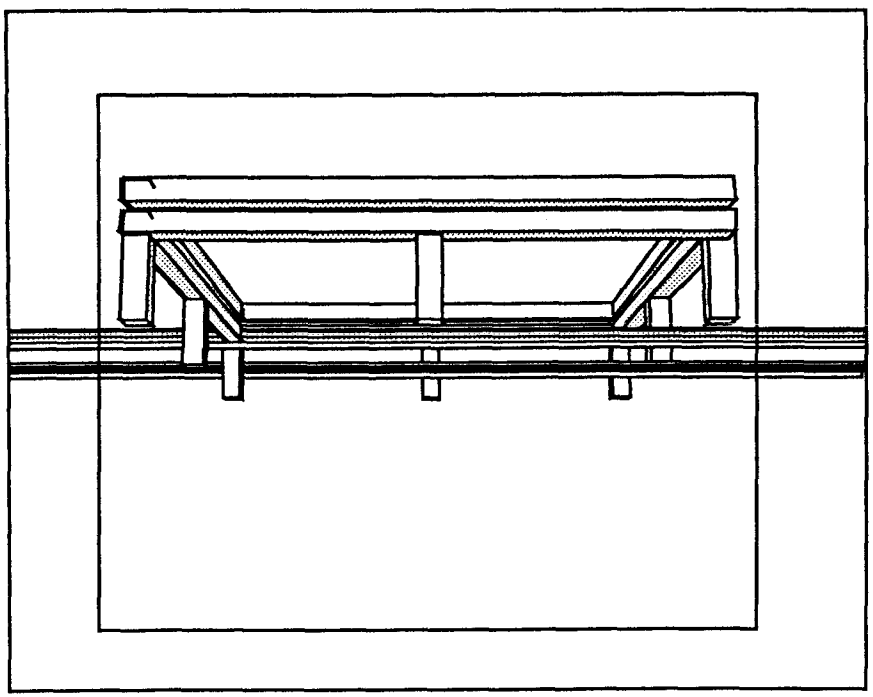


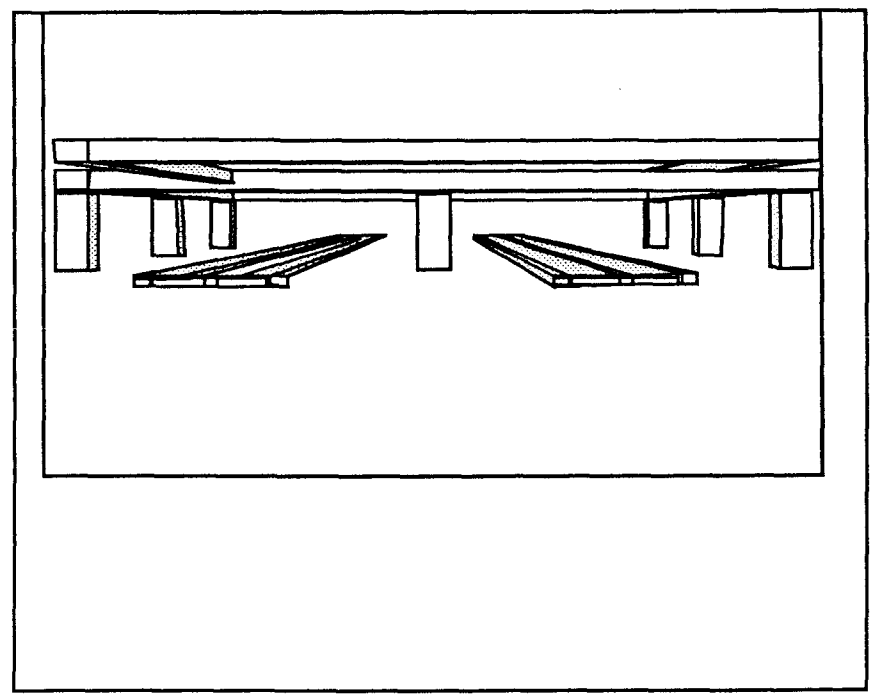


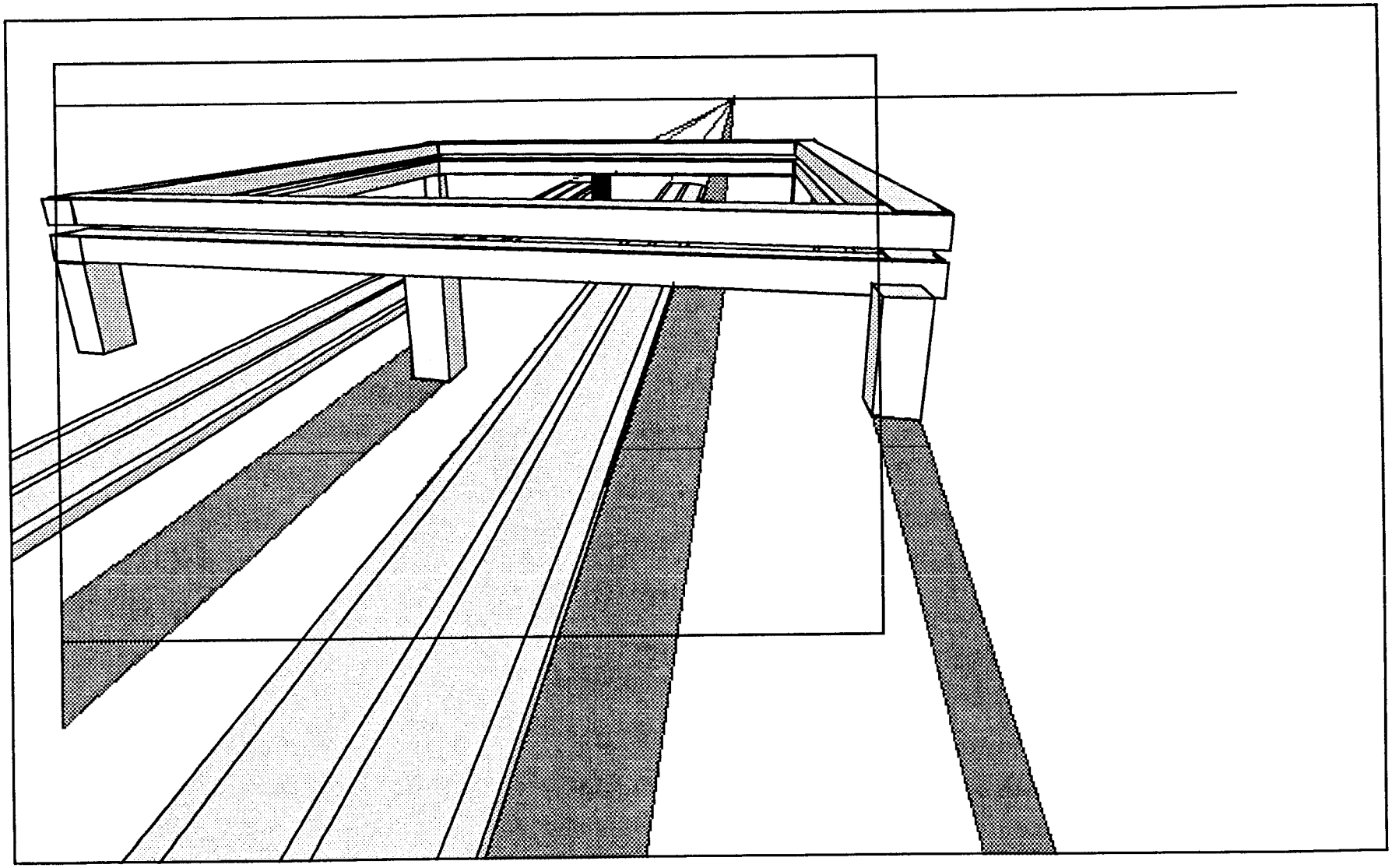
Enclosure Element

Object: **Space Enclosure - Frame**

The time it takes a driver at 60 mph to travel 600 feet is approximately 7 seconds. During that period of time, the driver has shifted visual focus to a distant point. In this scheme, the driver is aware of a spatial change due to a change in the shape of the cone of vision imparted by the geometry of the rigid frame The frame creates a defineable space that modifies the driver's field of vision and provides a point of interest along the route. This scheme is similar to the enclosed wall in that it relies on controlled access between the interior and exterior spaces. The frame extends the feeling of the horizon from the car window. The frame need not be rectangular but can acommodate a variety of shapes at the super scale. The frame would be constructed from reinforced concrete and would be painted.



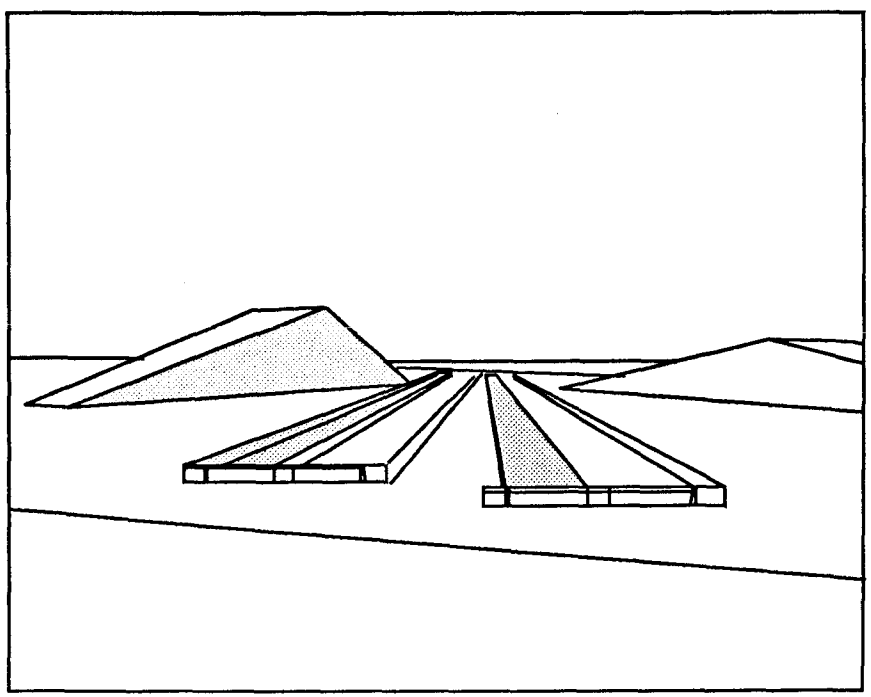


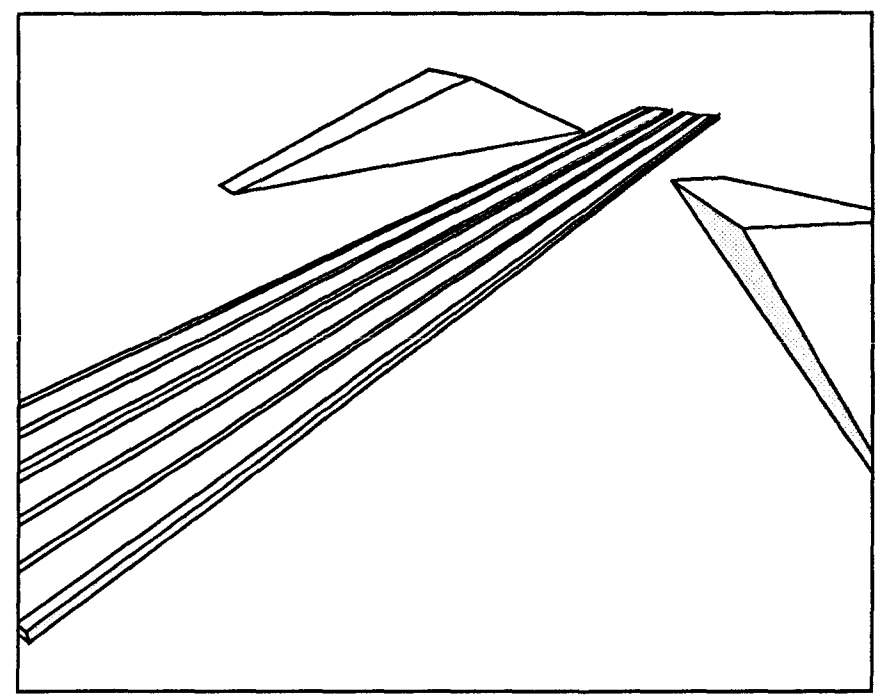


Enclosure Elements

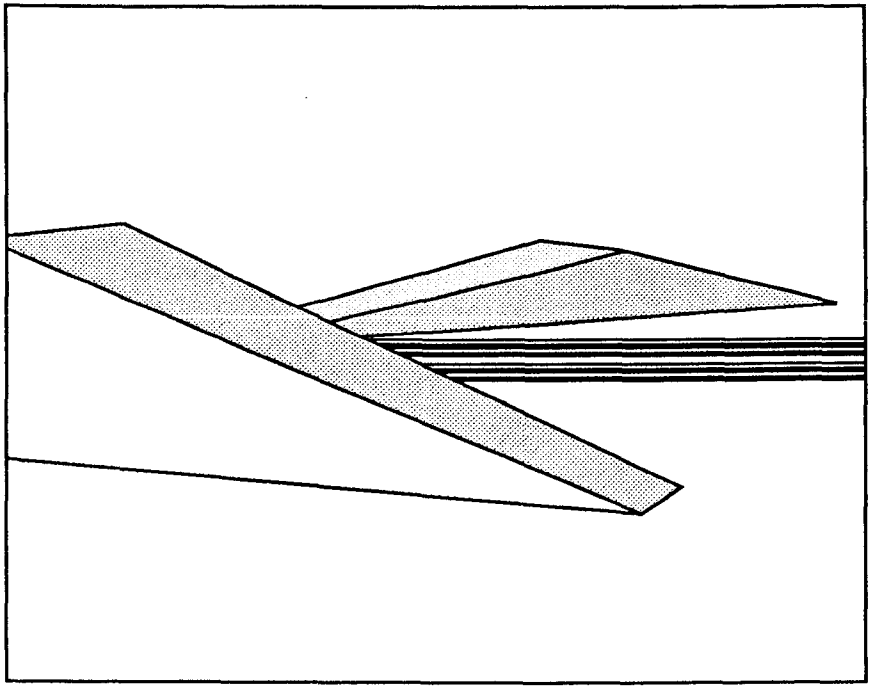
Object: **Landforms - Concrete**

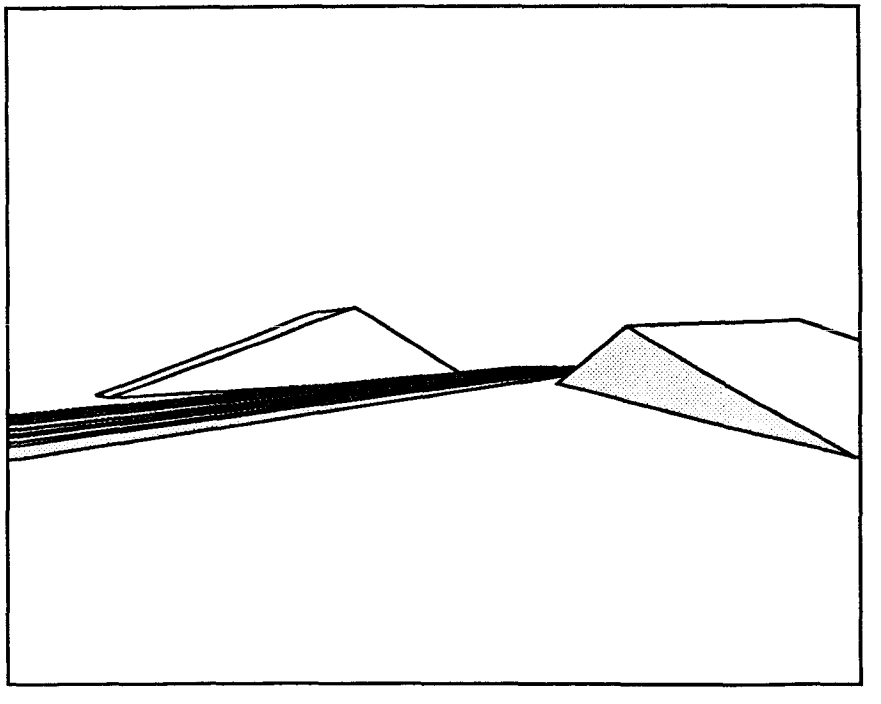
During the past decade, environmental scuplture has begun to populate the landscape. Large earthworks or landforms in the shape of spirals, fissures, mountains, geological or natural phenomena have become national landmarks and in some cases have made the artist's name a household word. There exists the potential for greater interaction between the environmental artists and the landform as it relates to the highway. A major aspect of environmental art is the educational value of the work. Using forms suggestive of dinosaurs or similar reptiles from times past, the artist could mold specific sites along the route to convey information of that particular time period. This form of education would not require the motorist to stop but the information could be communicated over a great distance.





In this scheme, large scale earth forms, supported with concrete walls and edges are formed to represent geological strata found in the region. These forms, placed along the roadway, are designed to impart a certain amount of information. Coupled with the visual form, signage placed at strategic points would provide additional information about the subject. In certain areas, a restricted local roadway radio broadcast would provide the audio component. The experiential aspect of the forms, coupled with the educational component would increase the value of the highway experience.

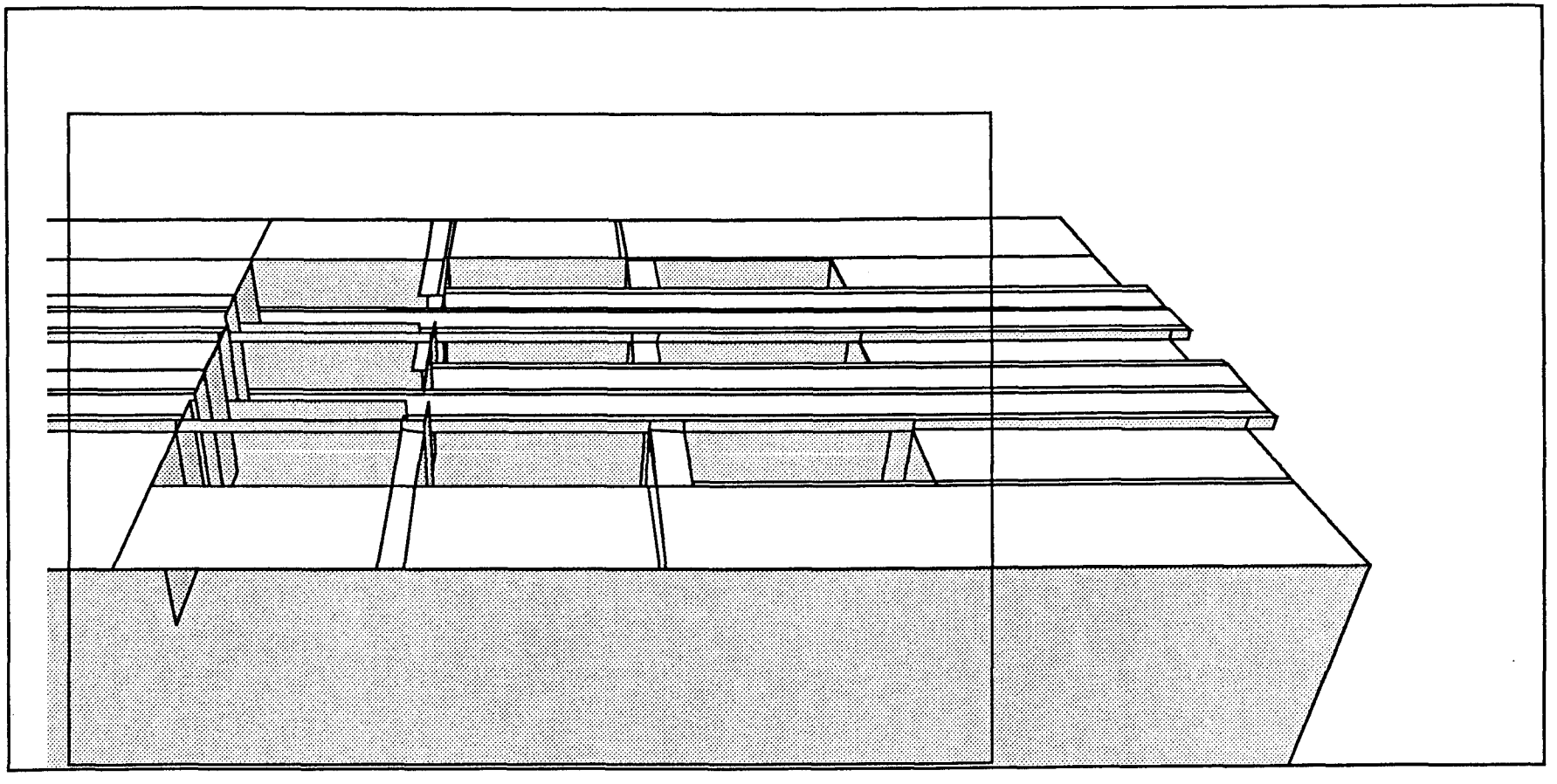




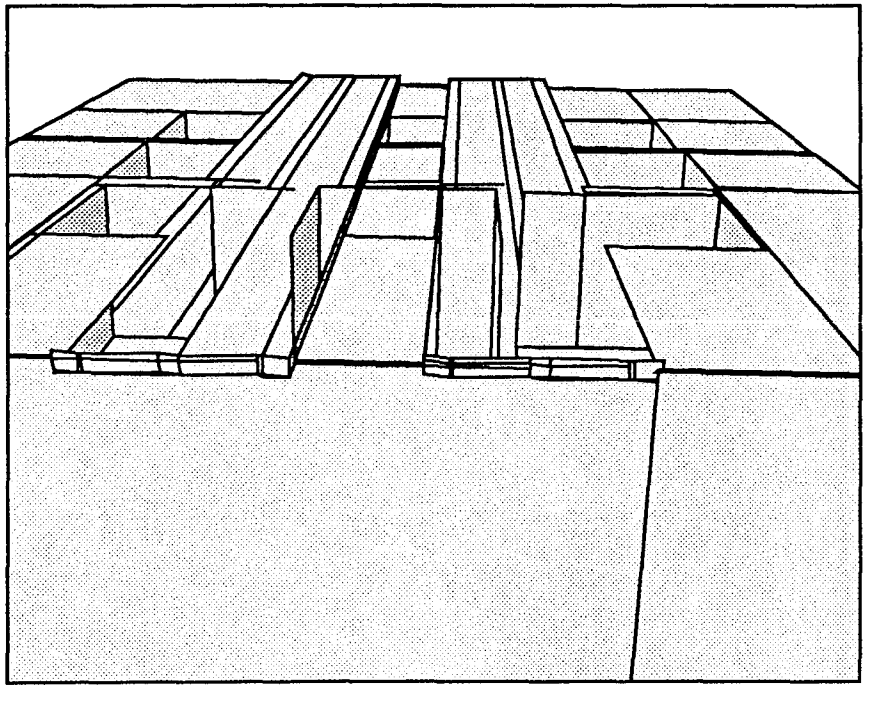
Enclosure Elements

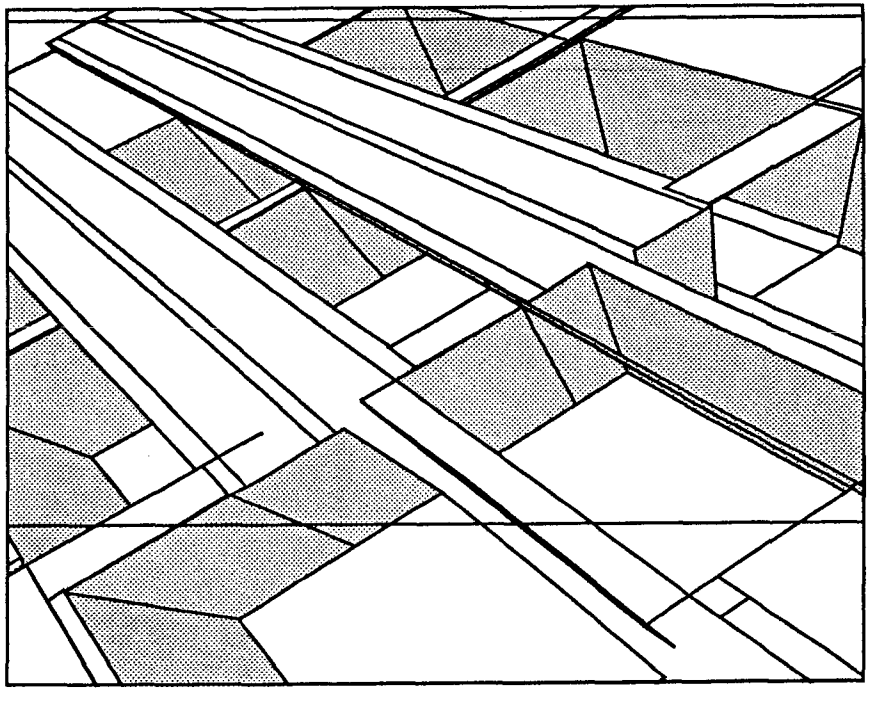
Object: **Recessed Negative Grid Elements**

The highway is a horizontal plane that acts as a datum for bridges, embankments, slopes, tunnels and overpasses. Any natural feature such as a lake, river, stream or pond is set at a lower elevation for safety and aesthetic purposes. The driver of



the car seldom is able to see the larger panorma due to a minimum height advantage. Any depressions in the landscape are obliterated with the horizontality of the roadbed. This scheme creates a series of negative depressions that could be used for water storage, fish cultivation and the like. This depression is designed on a grid and the highway spans through the depression in the form of an overpass. The depressions would be staged over several miles so that the motorist would have a sense that an unusual event was taking place. As speed bumps are designed to alert the driver of an upcoming event, the depressions perform a similar service. The depressions, ranging from 4 to 15 feet deep are constructed from a textured reinforced concrete. They have the capcity of being drained and in very arrid climates could contain natural habitats for the local ecosystem.

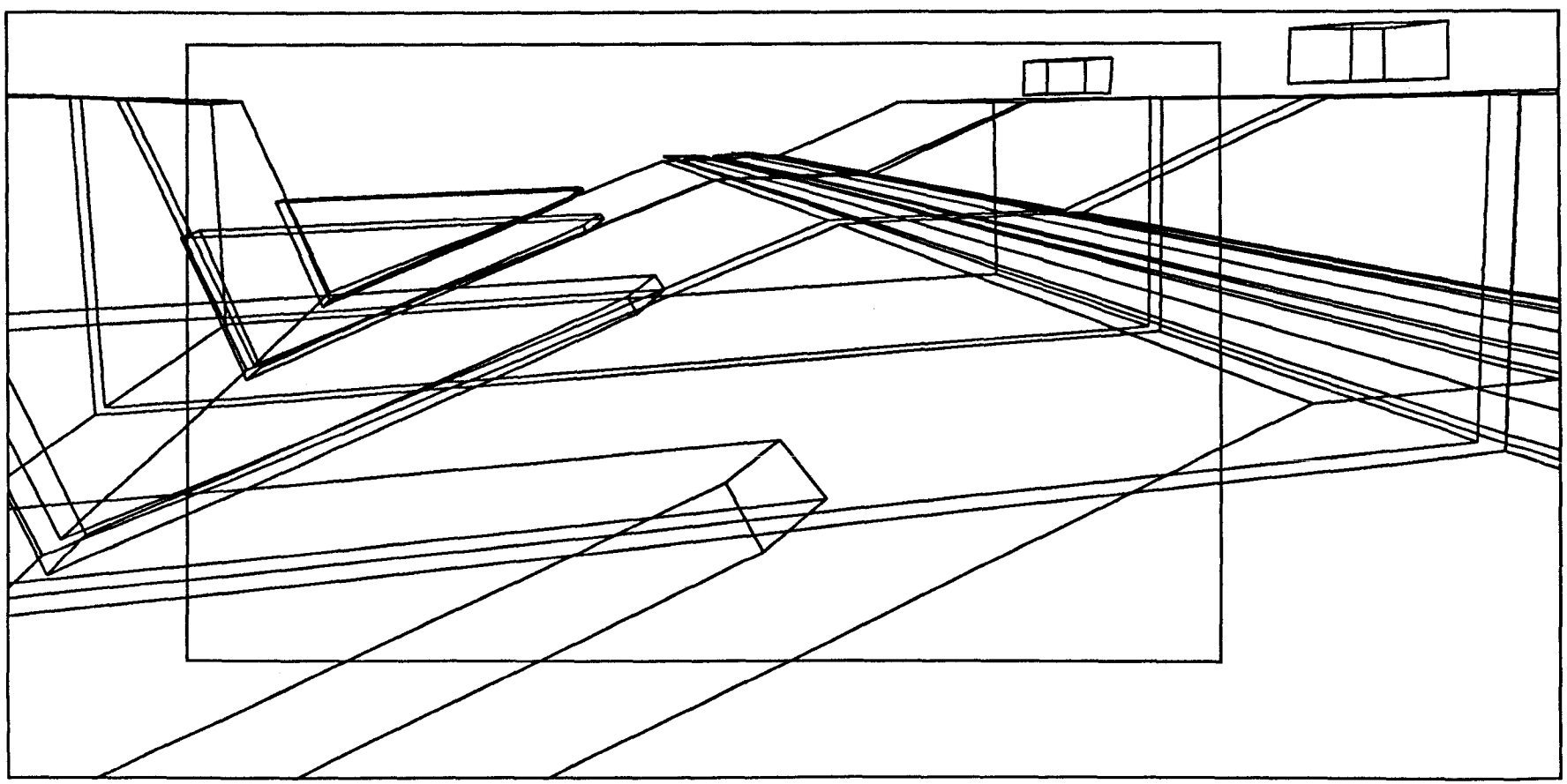




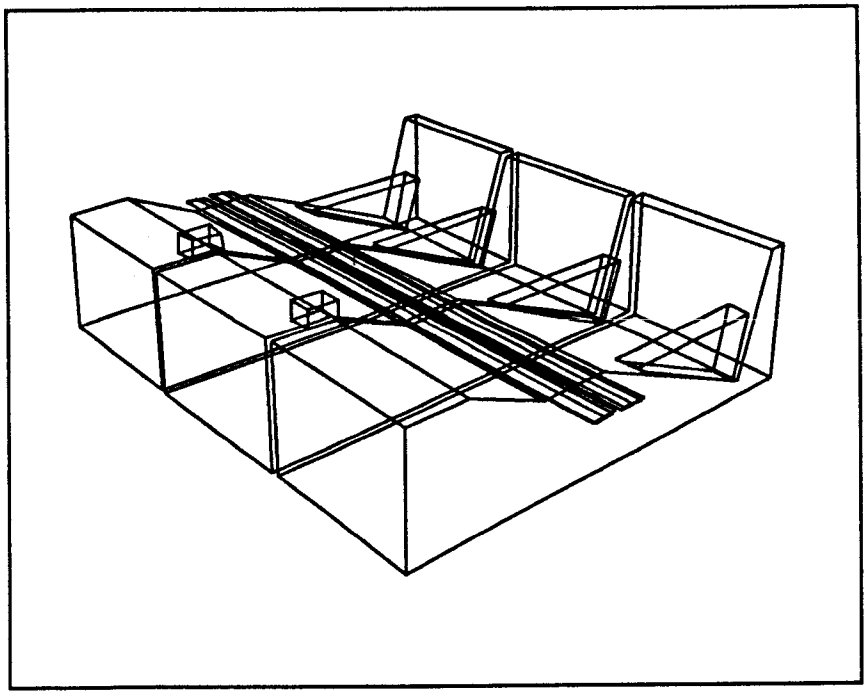
Enclosure Element

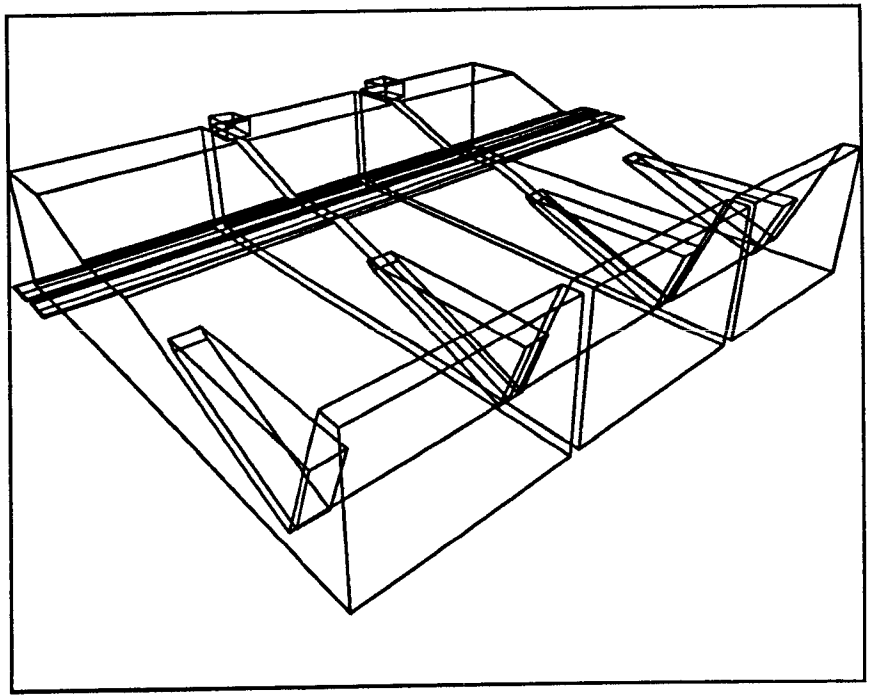
Object: **Recessed Earth Basin**

In this scheme, a series of basins are placed parallel to the flow of traffic. They are water storage basins and are controlled by pump houses located on the other side of the roadway. The motorist is presented with a view looking down into the basin



structures. In the highway construction process, the natural landform is disfigured to such an extent that only a major overhaul of the surface could bring the landscape into its own. While this condition is not prevalent, the landscape needs to be reworked. By recognizing the geology and topography of the area, the designer can insert a large scale project that creates visual interest and evokes the expressive content of the area. The water storage basin is such a project. The form can be modified to accept large variations in surface form and geological strata. The basins may be ornamental or functional and are constructed from reinforced concrete.



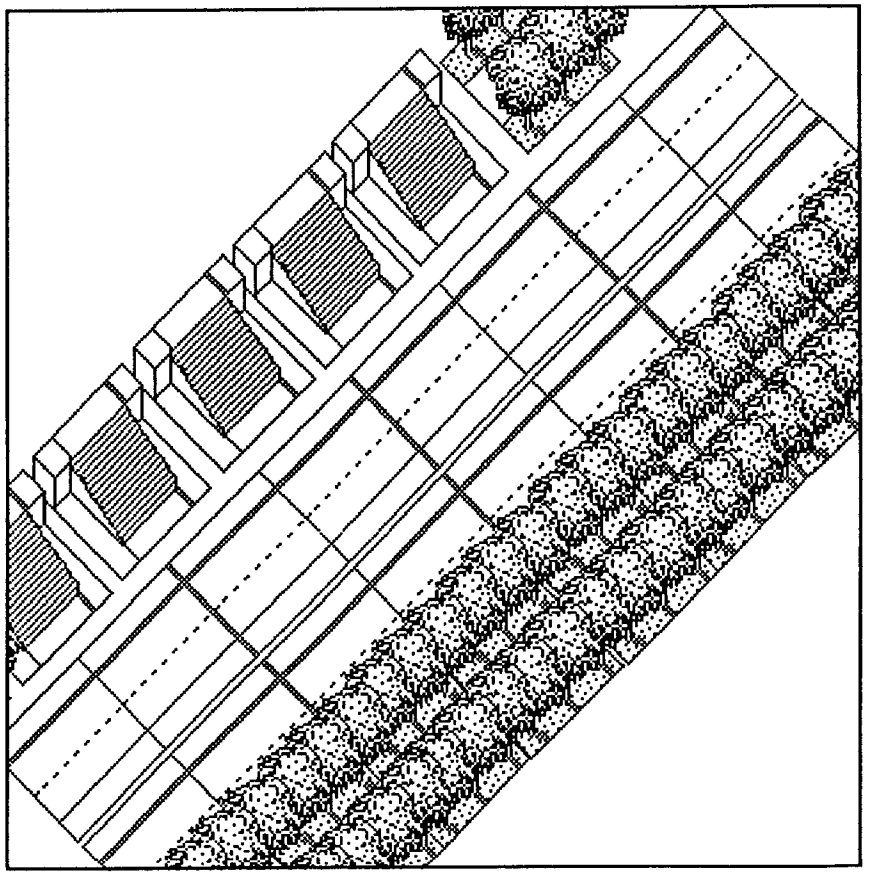


Landscape Elements

The functional rather than formal aspect of highway design has controlled the landscape on which the roadbed sits. Contemporary society's desire to control its world is most evident in the planning, design and construction of the highway. The landform, that underlies the roadbed is treated as a platform or receptacle, has lost much of its inherent character. Movement at high velocity engages massive quantities of surface areas of the landscape to accommodate alignments, curvatures and slopes. At the same time, the aesthetic qualities of the landscape are erased to meet the functional dictates. Trees, natural features, surface materials as well as archaeological sites are stripped to meet the safety requirements. There are far to few roadways where the design intent was in harmony with the landscape. As a result, the overall aesthetic of the interstate highway system is negative and noted for its singular lack of "expressive content."

This section of the design handbook stresses the landform over that of the roadway by presenting ideas that develop the ecological, geological, and topographical qualities of the region. The central motif, in employing landscape elements, is the large or massive scale of the natural landform. The sculptural quality of the landscape and roadway strip can be enhanced to

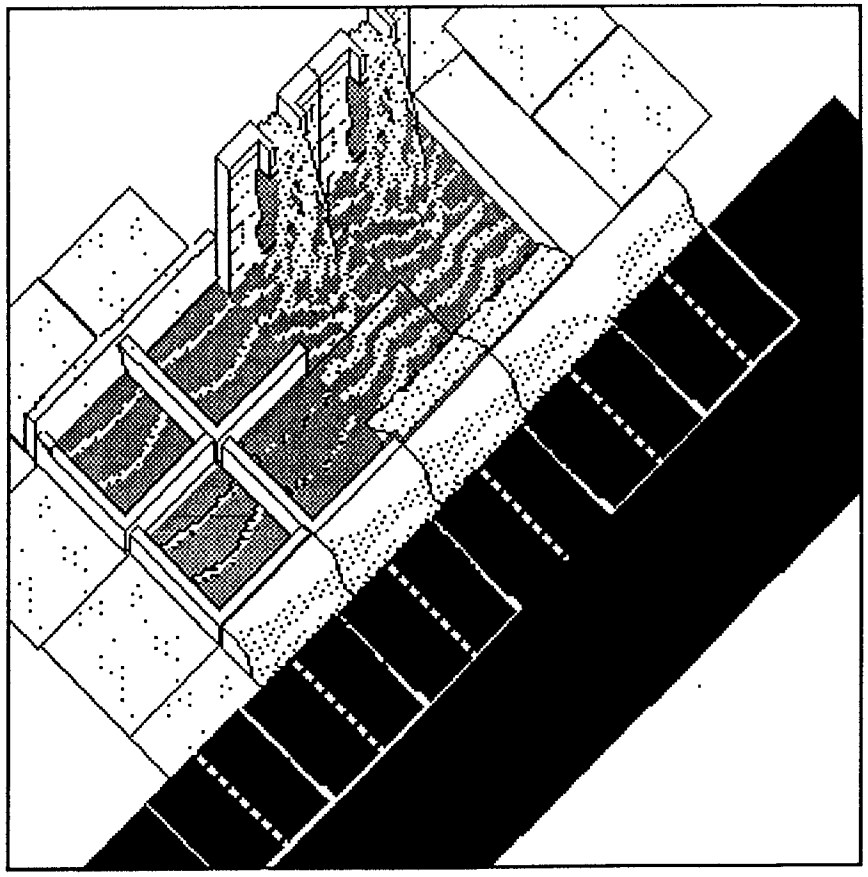
Stair forms edge the roadway lending landmark interest to a particular section.



express the natural aesthetic.Where the visual expression of the technology is necessary to support the roadway, the sculptural form can be emphasized. One idea is based on the collection of water and its method of storage in water basins along the highway. Another series of project ideas utilize the geological structure underlying the roadbed as a means of increasing driver attention and safety. Planted forms are used to isolate the highway from the surrounding context or to create forced vistas highlighting historical or landmarks within the landscape. This method is used extensively in Europe. Other schemes stress the visual quality of formal gardens that are tilted to face the flow of traffic.The gardens, set in a variety of historical styles and designs, are planted with trees, shrubs, perennial flowers. The roadway garden presents to the passing motorist, a sense of the landform and its inherent aesthetic quality while still meeting the functional requirements of slope stability and erosion control.

The educational potential inherent within the landscape is expressed in a project where a large organic form, placed within the median strip, is made to resemble a hump-back whale or a prehistoric dinosaur. The visual landmark accentuates local geological history. The use of earth berms, and natural landforms, can assist the highway designer in introducing all sorts of visually stimulating forms and landmarks. Major surface areas have been reclaimed and redesigned into parks, recreational zones that provide benefit to the motorist as well as those in the surrounding area.

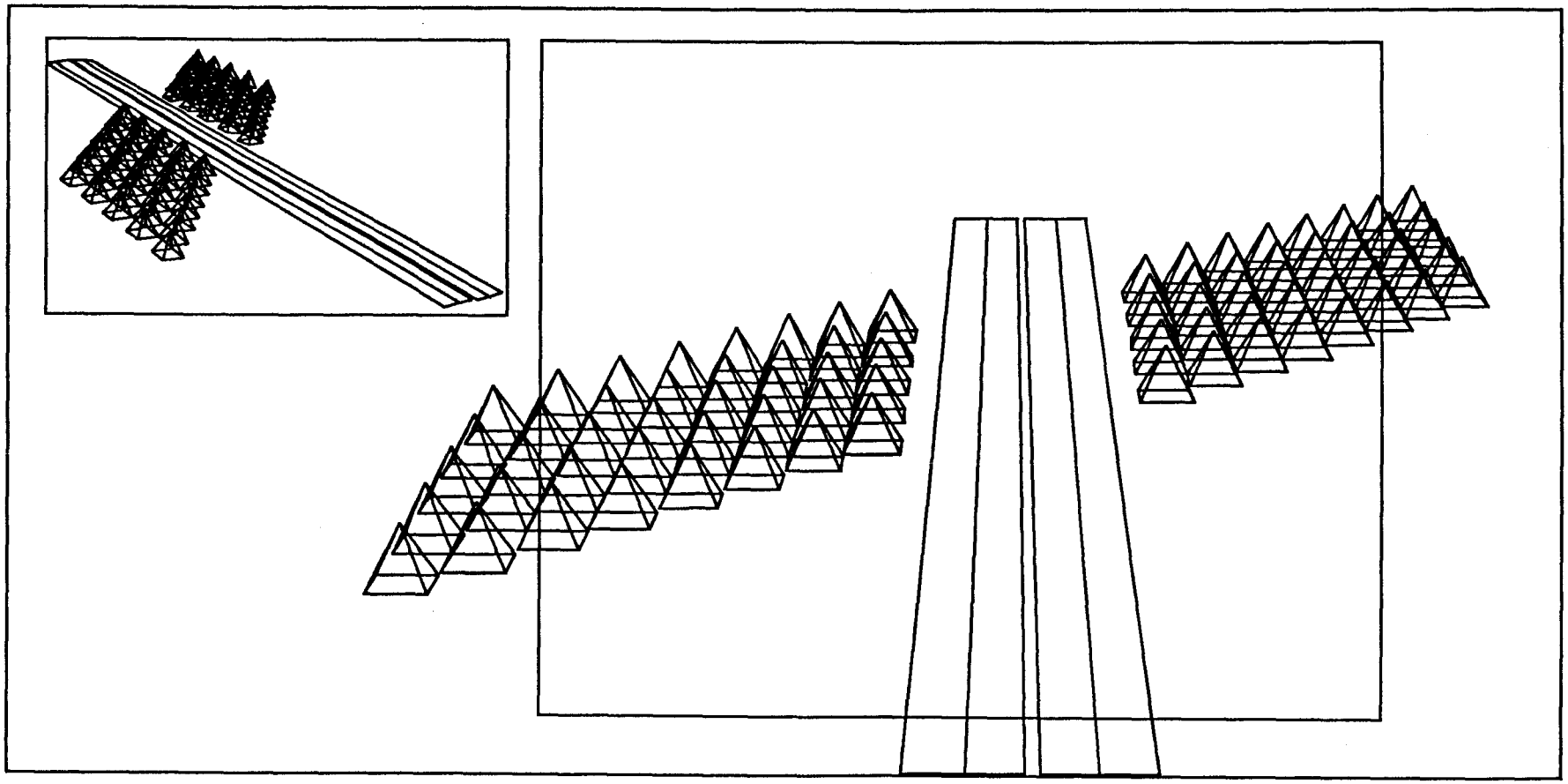
Waterfalls are placed along the route to heighten visual interest.



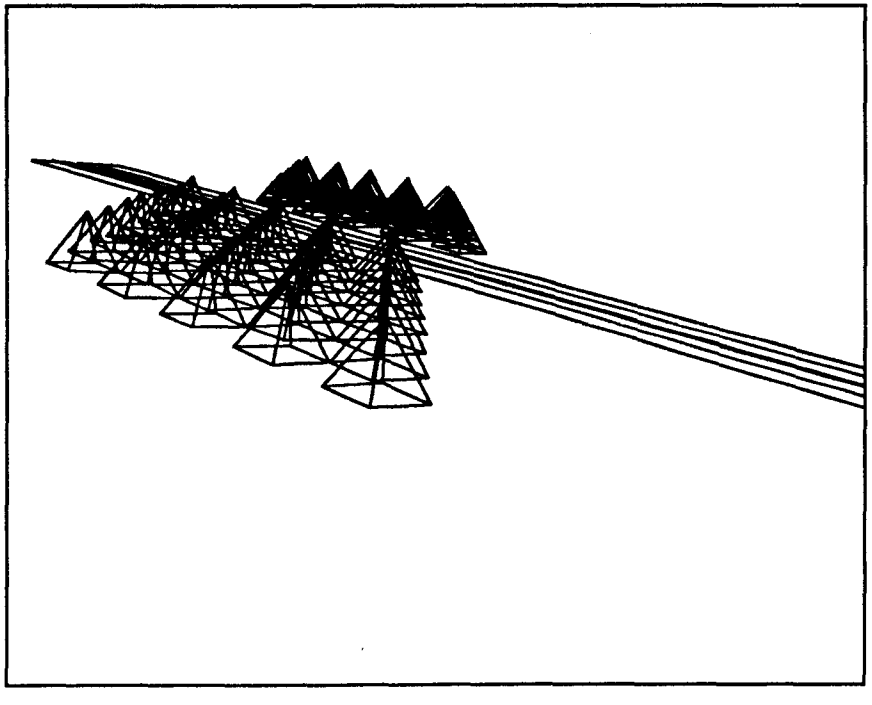
Landscape Elements

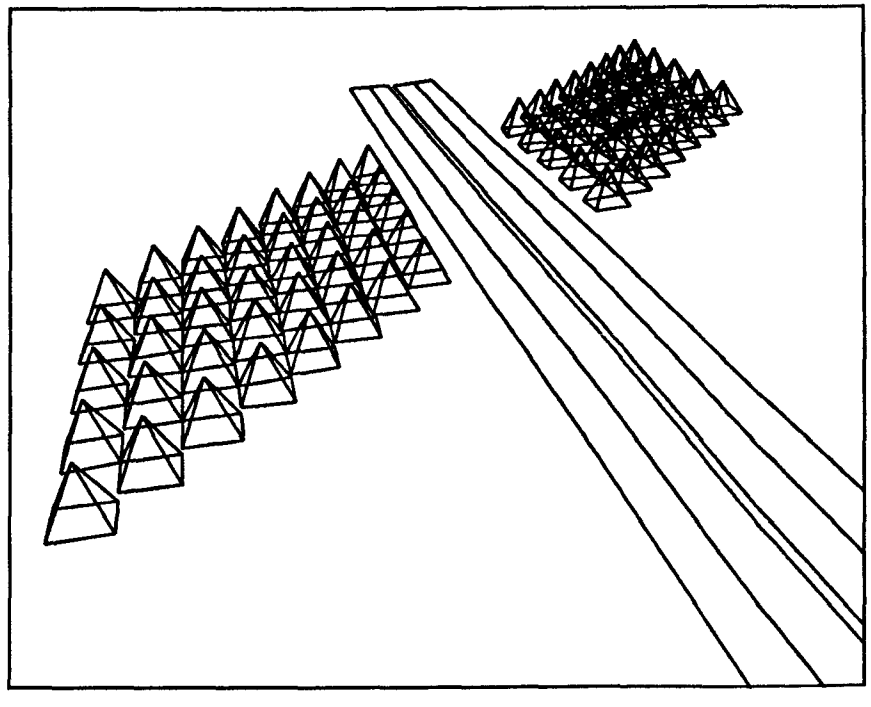
Object: **Formal Tree Alignments in Perspective**

The effect of highway construction project is enormous. Its impact is felt across the entire landscape. The cut and fill operations combined with the wide swath cut through the landform has a long-term impact. Surface vegetation in the



vicinity of the roadway is stripped and discarded. Surfaces are smoothed and ground cover is placed. The result is a highway corridor free from obstruction and devoid of life. The Taconic Parkway or the Garden State Parkway offer the motorist a view that is obstructed between lanes with vegetation. The trees are placed randomly throughout and around the median strip. The trees include coniferous and deciduous and flowering shrubs which are selected for their annual color. The tree is used as a design element to enhance or reinforce the expressive content of the area. In this scheme, coniferous trees are placed in such a fashion as to emphasize the diagonal and parallel quality of the planting. This type of planting is frequently used in commercial forestry and the potential exists for expanding the growing area into an extended median strip.Using a variety of tree, flowering shrub or alternating swatches of different types of ground cover would provide a higher level of visual interest.

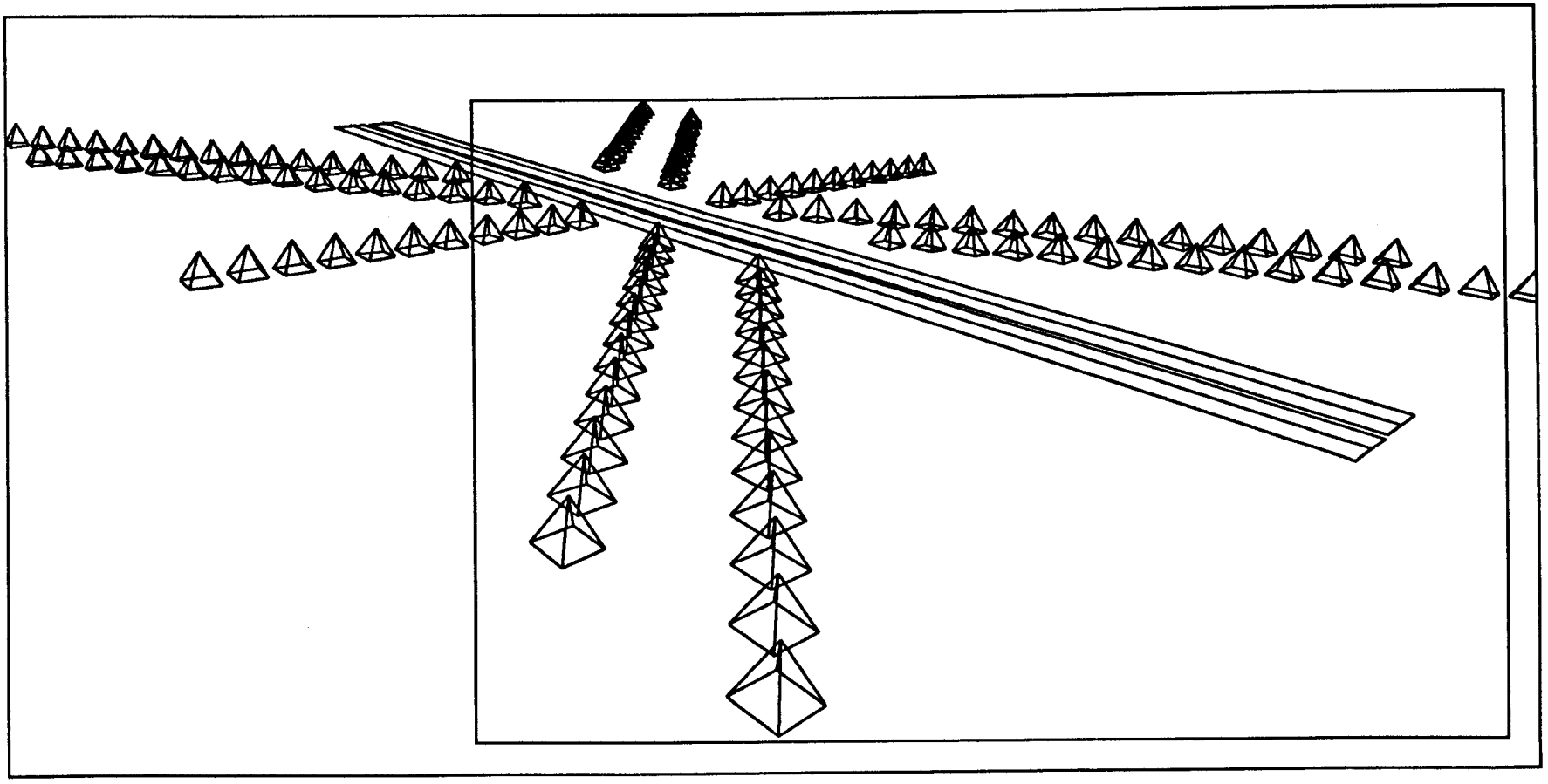




Landscape Elements

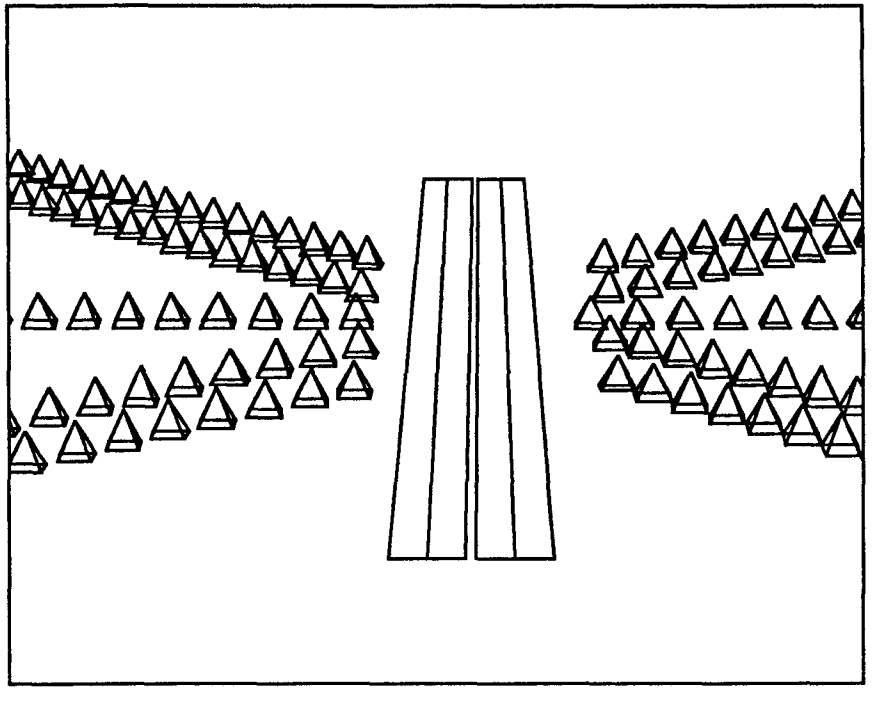
Object: **Linear Perspectives using Treeforms**

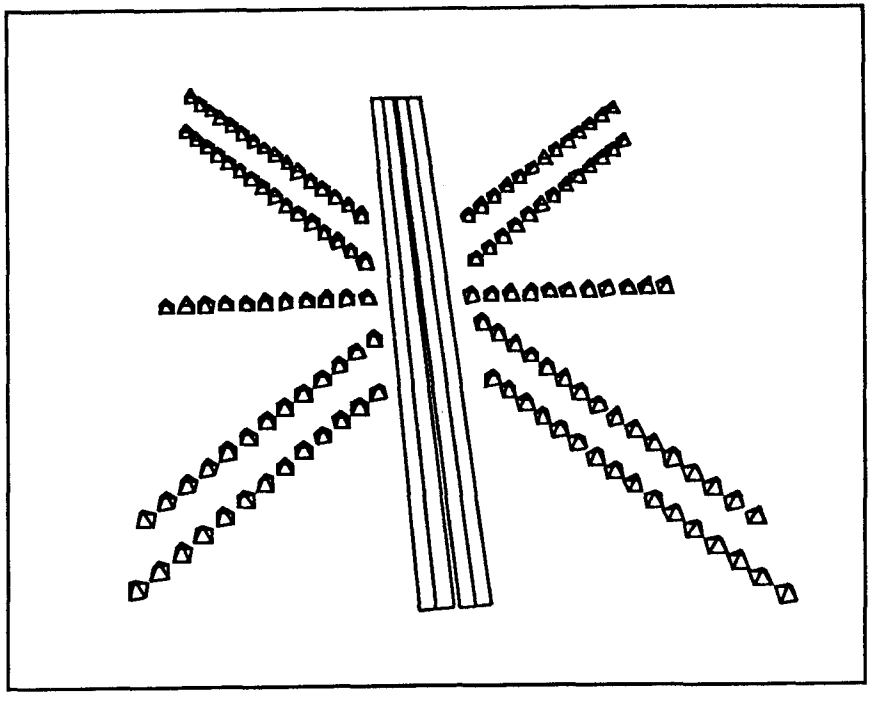
One of the major ingredients that must be considered in highway travel is driver fatigue. The reduced state of driver alertness has been a major contributor to highway accidents. One means of increasing highway safety is to introduce landscape



elements that have both visual meaning but also ask a question. This scheme is designed as a random experience that plays with the driver's intellect while at the same time providing an event along the route. Using a mixture of tree types, the highway is criss-crossed with diagonal lines creating changing perspectives. As the vehicle moves through the assembly, certain vistas open up and then close creating an external dynamic. The visual content of the landscape is enhanced by placing the trees in single or multiple lines. Whether placed in a straight line or curved, the sense of change afforded the motorist not only maintains driver interest but highway safety as well.

These assemblies can be placed in a random interval along the corridor. Type of tree, height and density can be controlled to offer greater screen effect for the surrounding area.

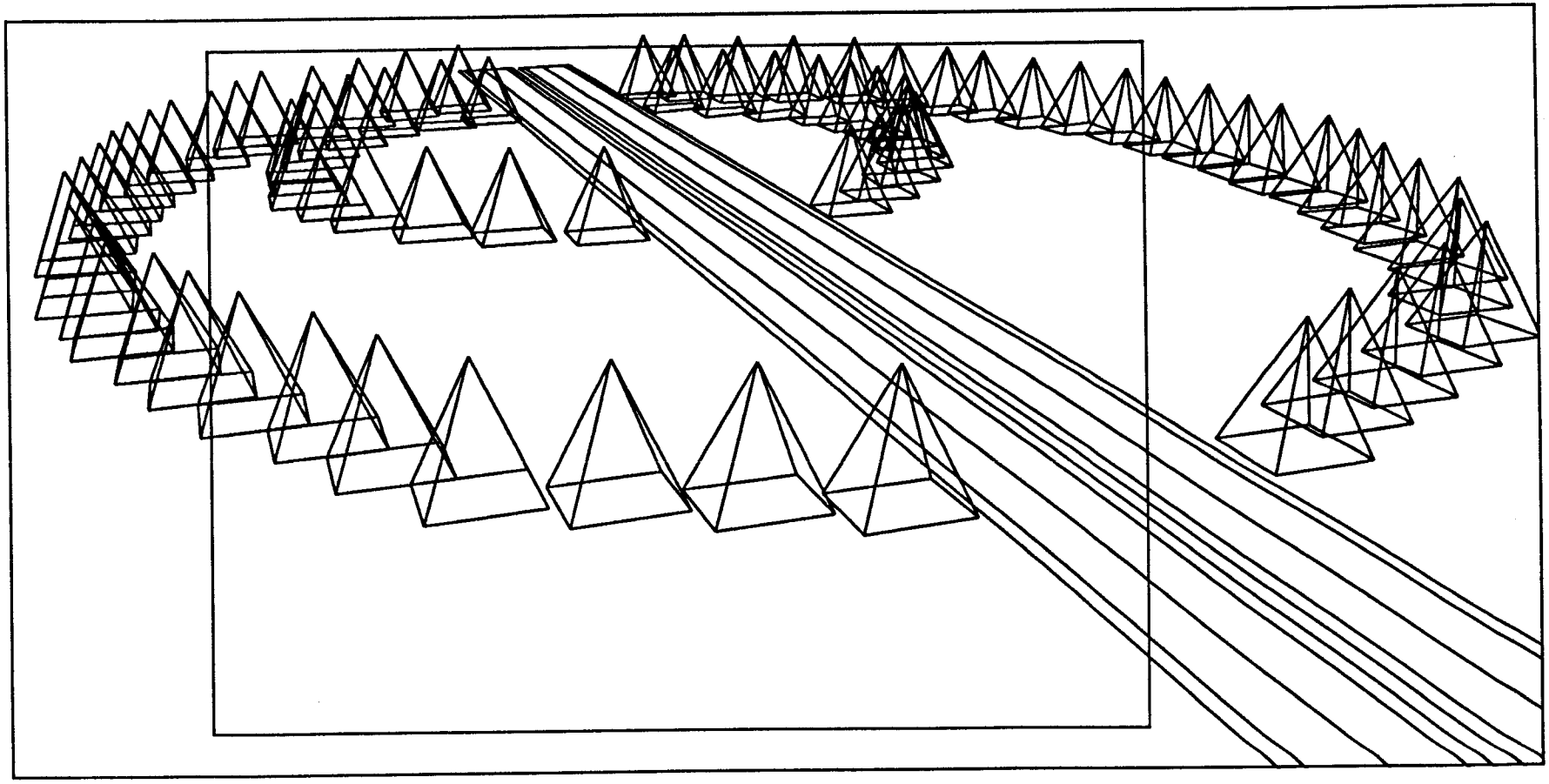




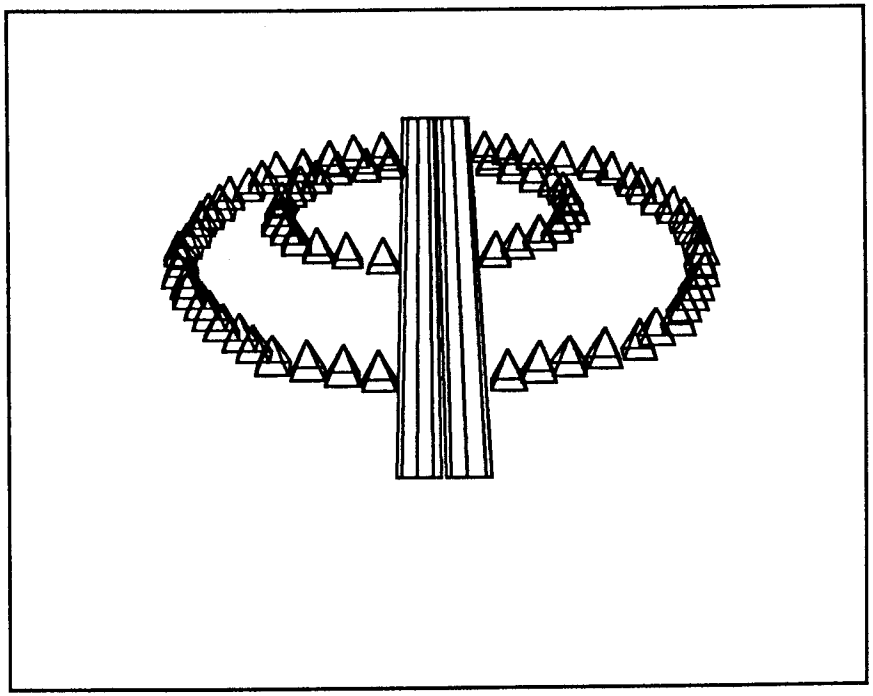
Landscape Elements

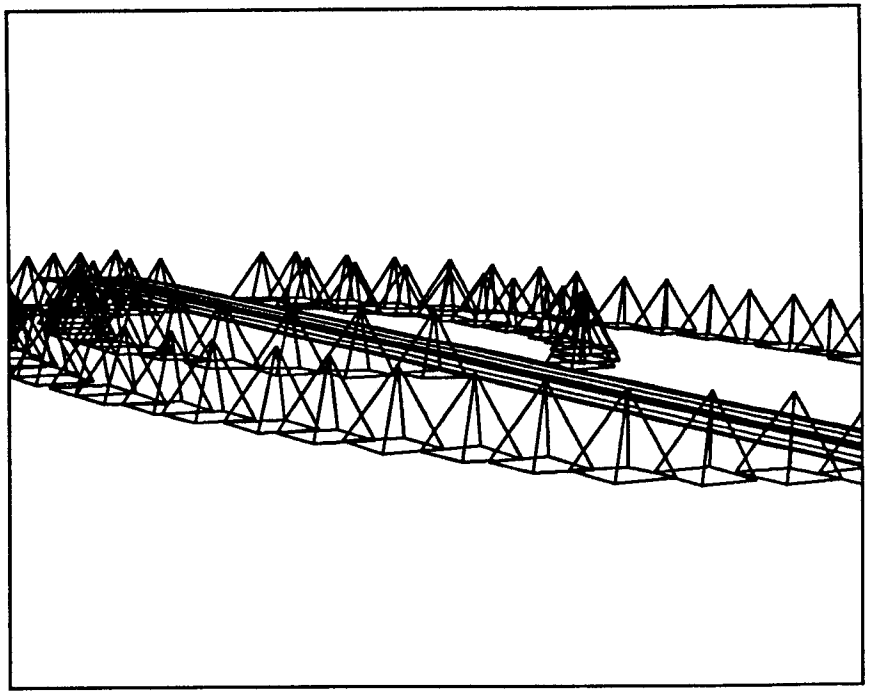
Object: **Platonic Plantings**

Every stretch of interstate highway has some location where the expressive content of the landform works. Certain parts of a typical roadway appear to have a higher visual aesthetic than further down the road. One of the unique characteristics of such



a spot is its sense of "place". Place is that location where a combination of certain formal qualities and visual meaning leave a lasting impression. This scheme is based on the creation, through natural plantings, of just that place. Using trees in a double circle to form an outer and inner space, the sense of place is established around the movement of the automobile. The driver, approaching a stand of trees in the distance, is presented with two distinctly different scales of place. As movement continues through the construction, one place opens into another. The eccentric placement insures a difference between the two directions of movement. The composition may be triangular, square, oval or free-form, however, the main concern is that there are two identifiable places that the motorist would perceive.

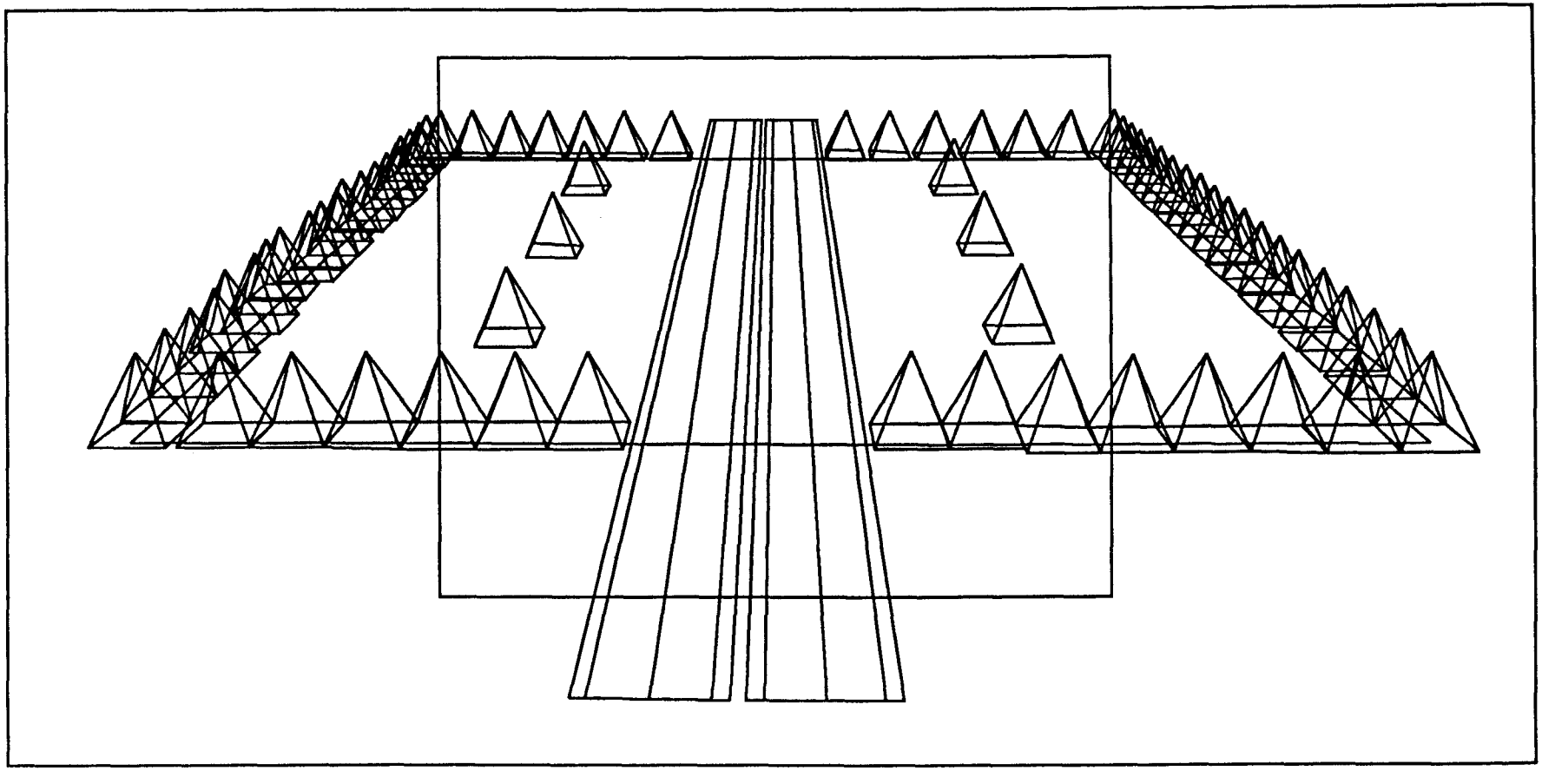




Landscape Elements

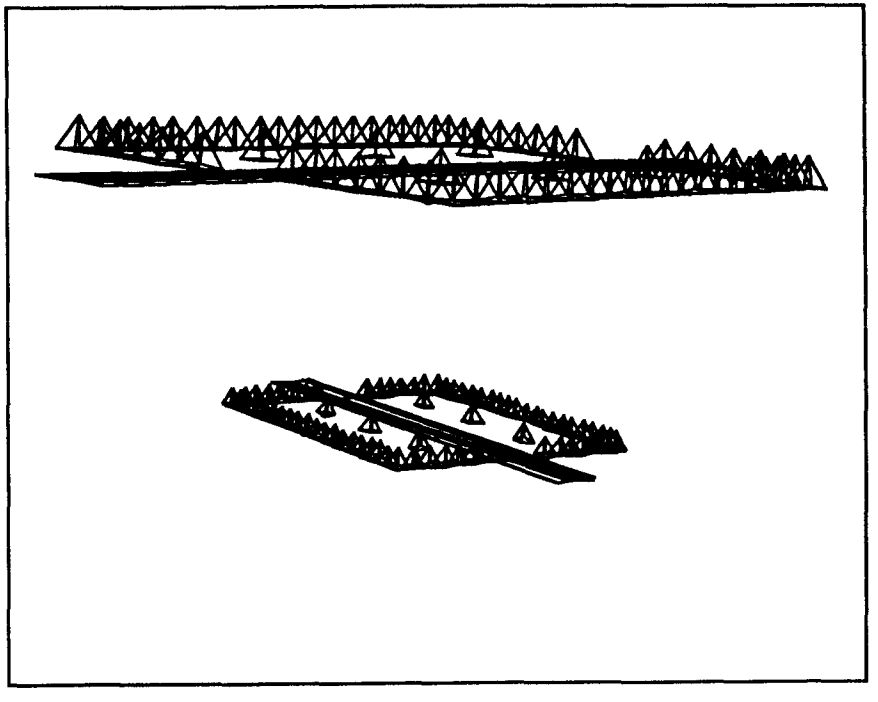
Object: **Platonic Space Enclosure**

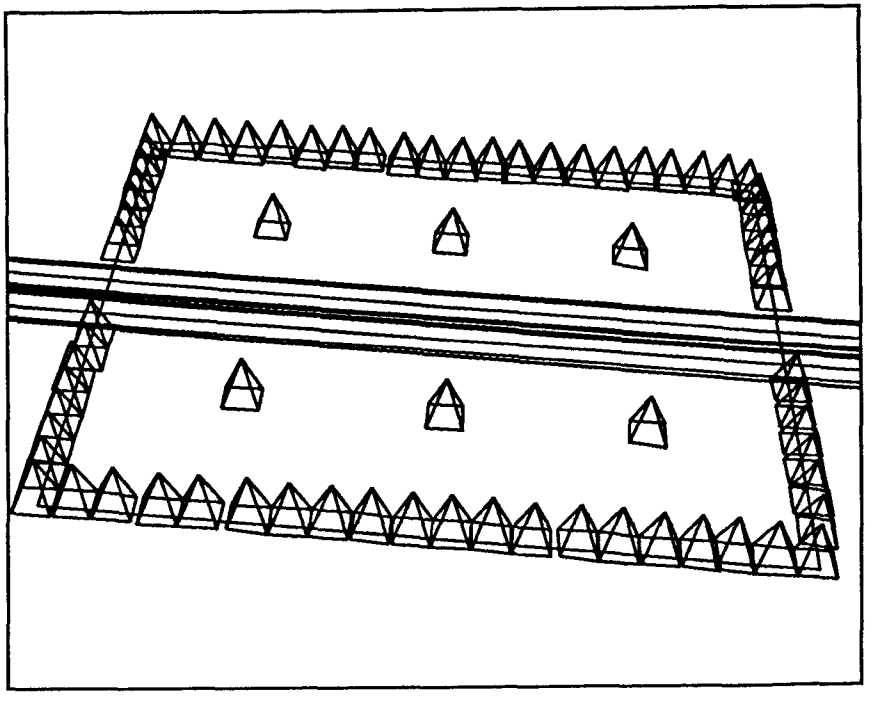
The Greek *temenos* or precinct is the theme of this scheme.A large open area is surrounded by a natural screen of trees. The scale of this project can range from 600 feet to several miles in length. Where high winds affect highway travel and the need for



wind screening is necessary, the precinct is an excellent solution. The enclosed spaces may be repeated on a regular or irregular basis. Each space may have certain identifiable characteristics. In Germany, the *temenos* is used to isolate and preserve streams, ponds and small lakes that parallel the autoroute.

The trees, that form the edge of the precinct, act as a screen or shelter for the interior space. The space may be tapered to give the driver a sense of visual compression before exiting into the next sequence or an open stretch. The sculptural potential of this scheme is open to variation in tree height, density and type of foliation. In addition, the shape of the precinct may be irregular or skewed to the roadway.

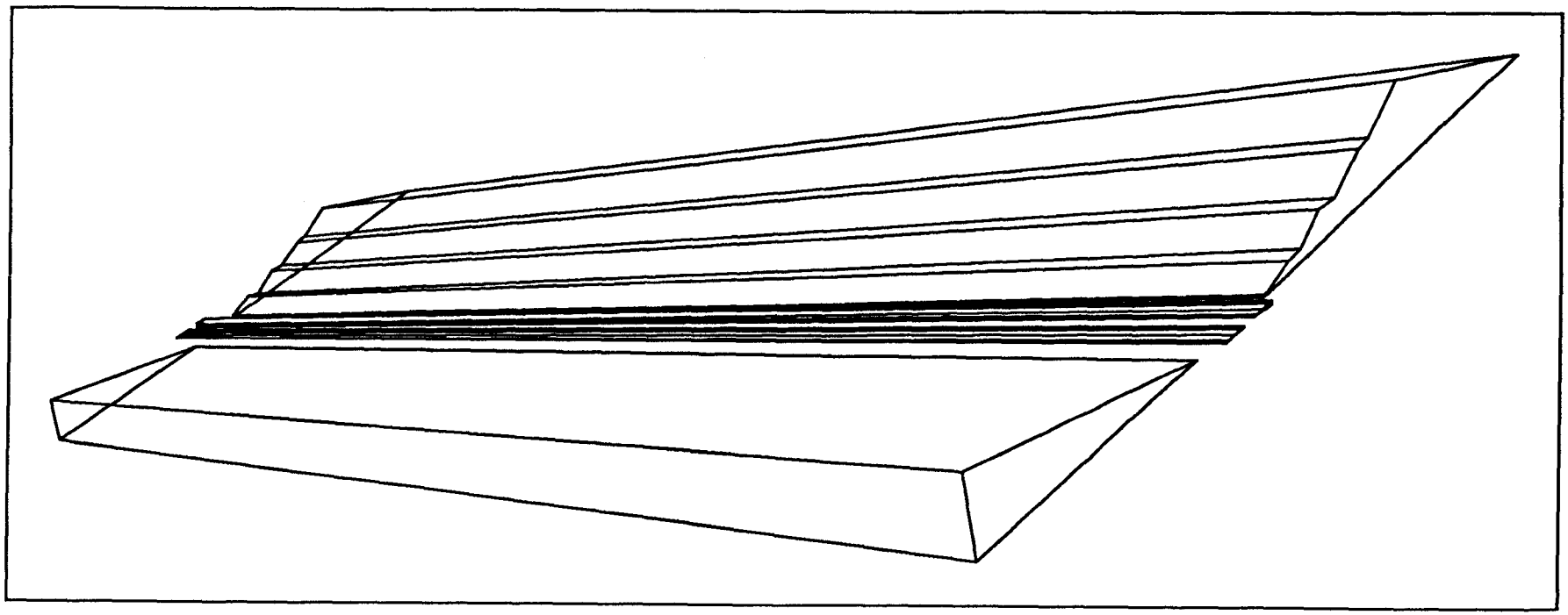


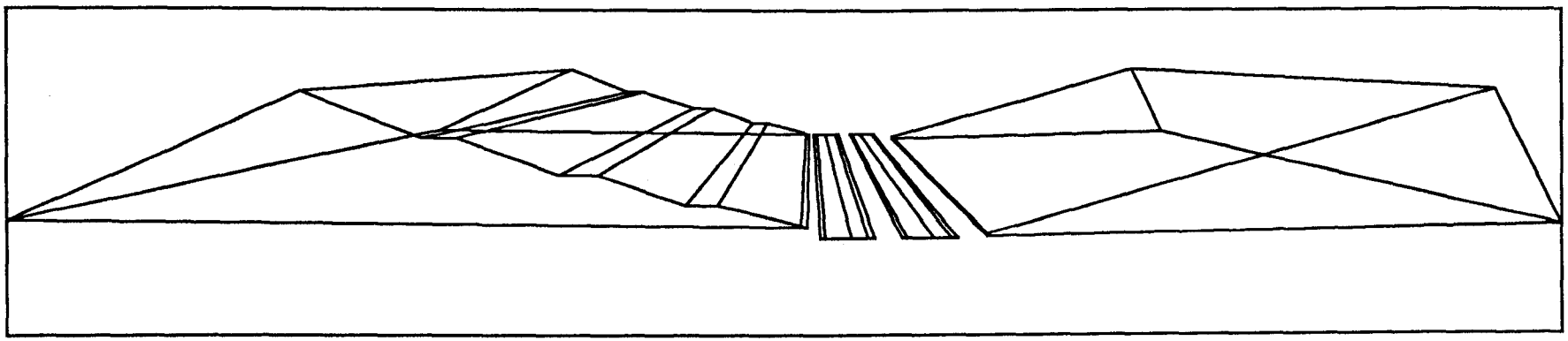


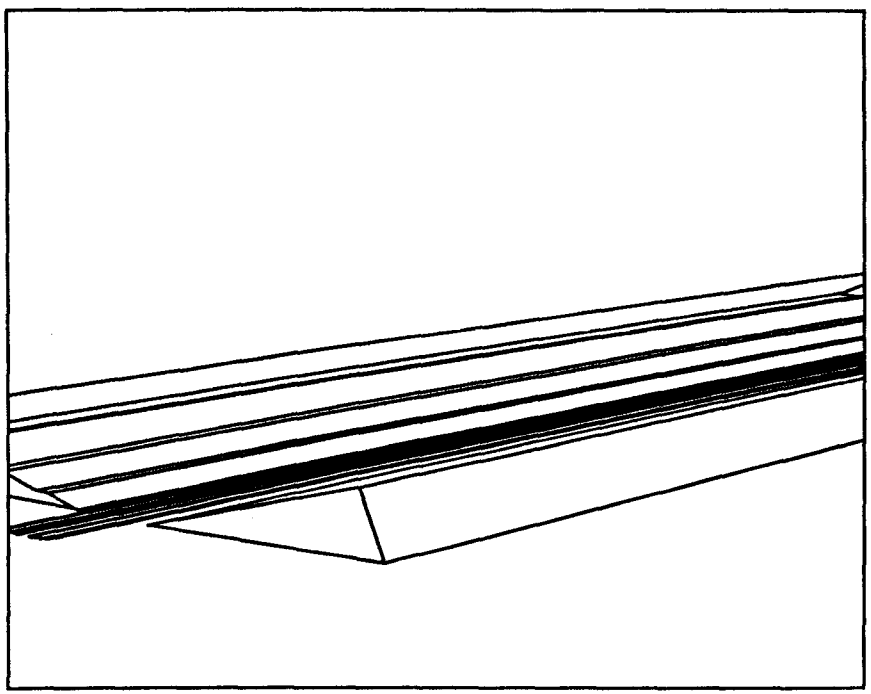
Landscape Elements

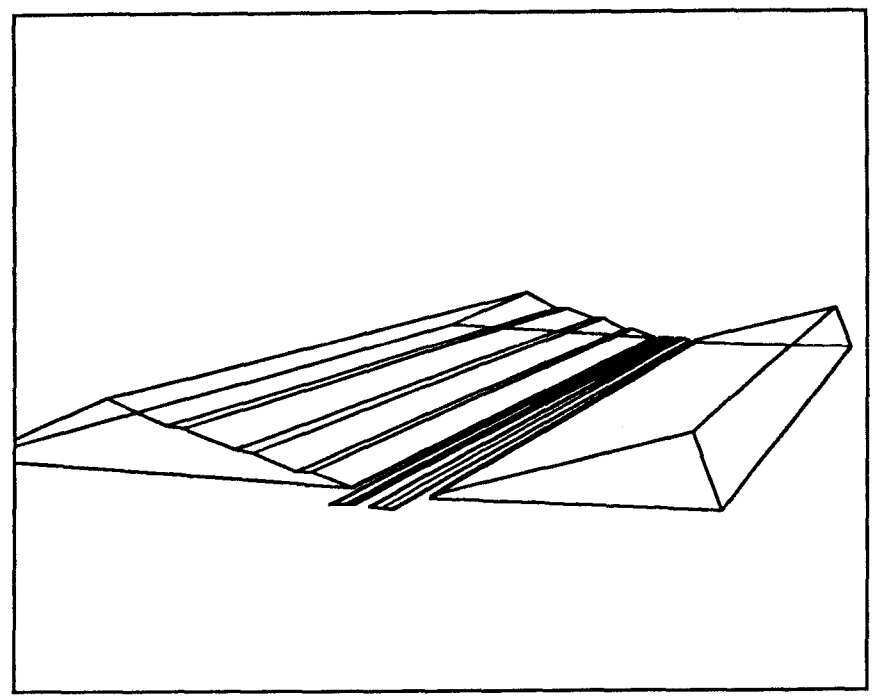
Object: **Earth Berms with Opposing Textural Form**

The use of earth berms to create sculptural form along the interstate highway system has unlimited potential. The vast quantities of earth that are pushed around to develop a stabile roadbed can be also used to create forms that enhance the visual experience of the roadway. In this scheme, the embankments are treated in two different ways: one is composed of small scale terraces that can be constructed in a linear manner or in a controlled criss-cross, and the other is a planar surface that would be covered with a uniform natural ground cover but of different colors or foliation. In addition, planar sculptural forms in a variety of shapes can be attached or embedded in the sloped portion of the berm to create geometric patterns.





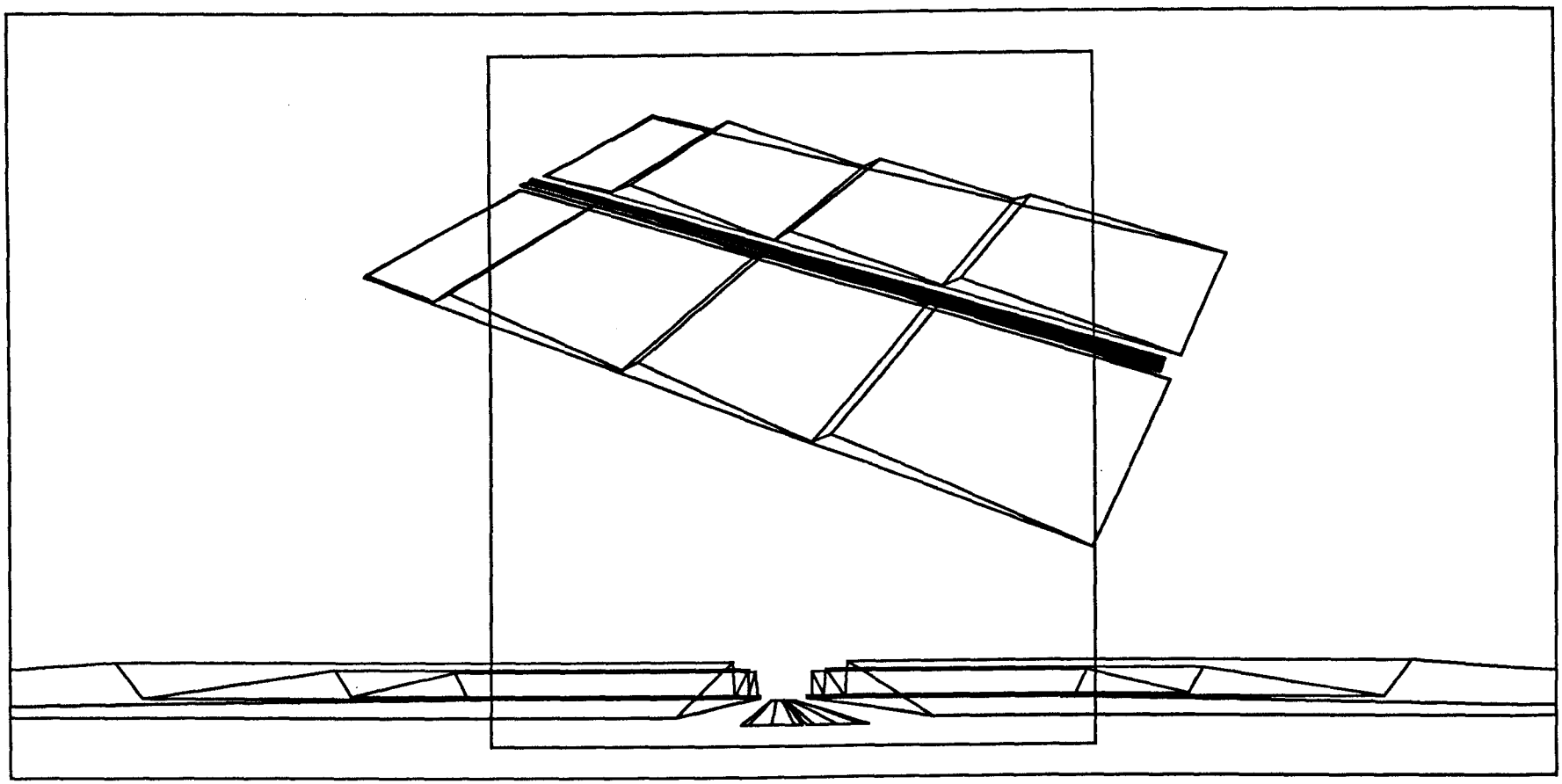




Landscape Elements

Object: **Earth Berms in Wave Form**

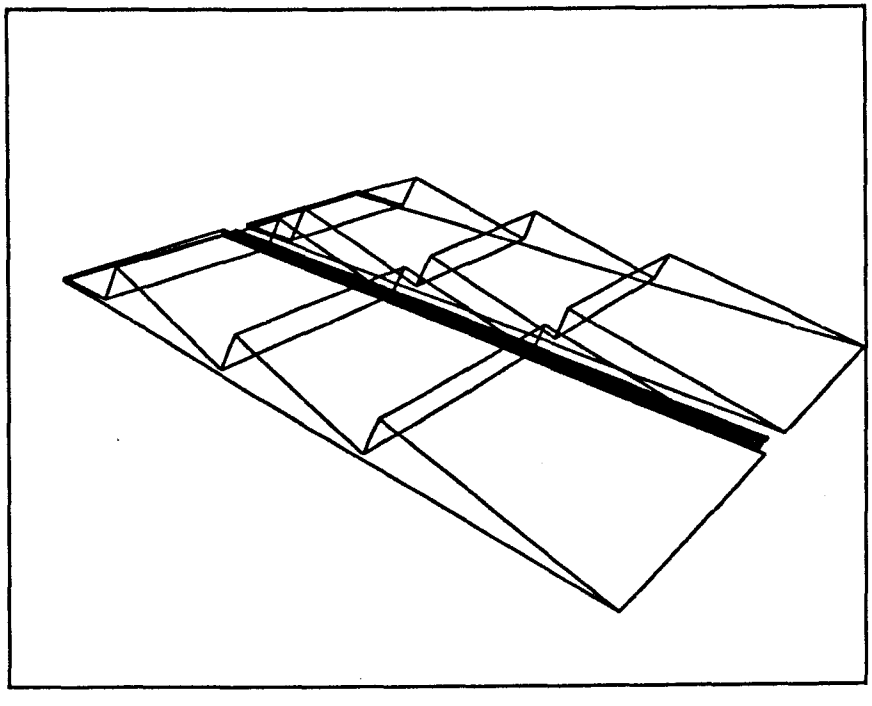
The motion of the landscape relative to the motion of the automobile is disceiving. While the distant view remains static, the automobile is moving at a certain velocity. The imbalance between the two can create a hazardous condition. This

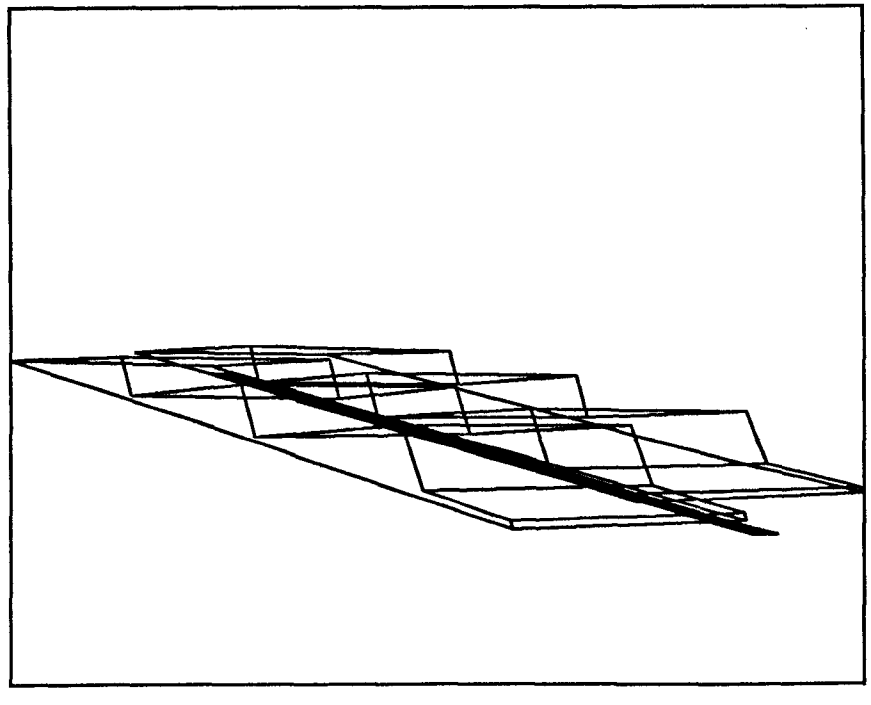


scheme is designed to counteract the effects of imbalance. By introducing large scale wave forms, the visual effect of speed is narrowed. The rise and fall of the wave motion, shown in a singular direction, will open and close the horizon to the driver. This will narrow the field of vision thus equalizing the differences in apparent velocity.

The wave forms are built of earth with a ground cover finish. Their forms may be modified in height, frequency and interval.

By reversing the direction of the wave and offsetting the valleys, a greater alternating pattern of view will be evident. The driver will be presented with a varying perspective. If greater visual interest is necessary, trees, flowering shrubs or sculpture can be placed on the sloped side toward the direction of traffic.

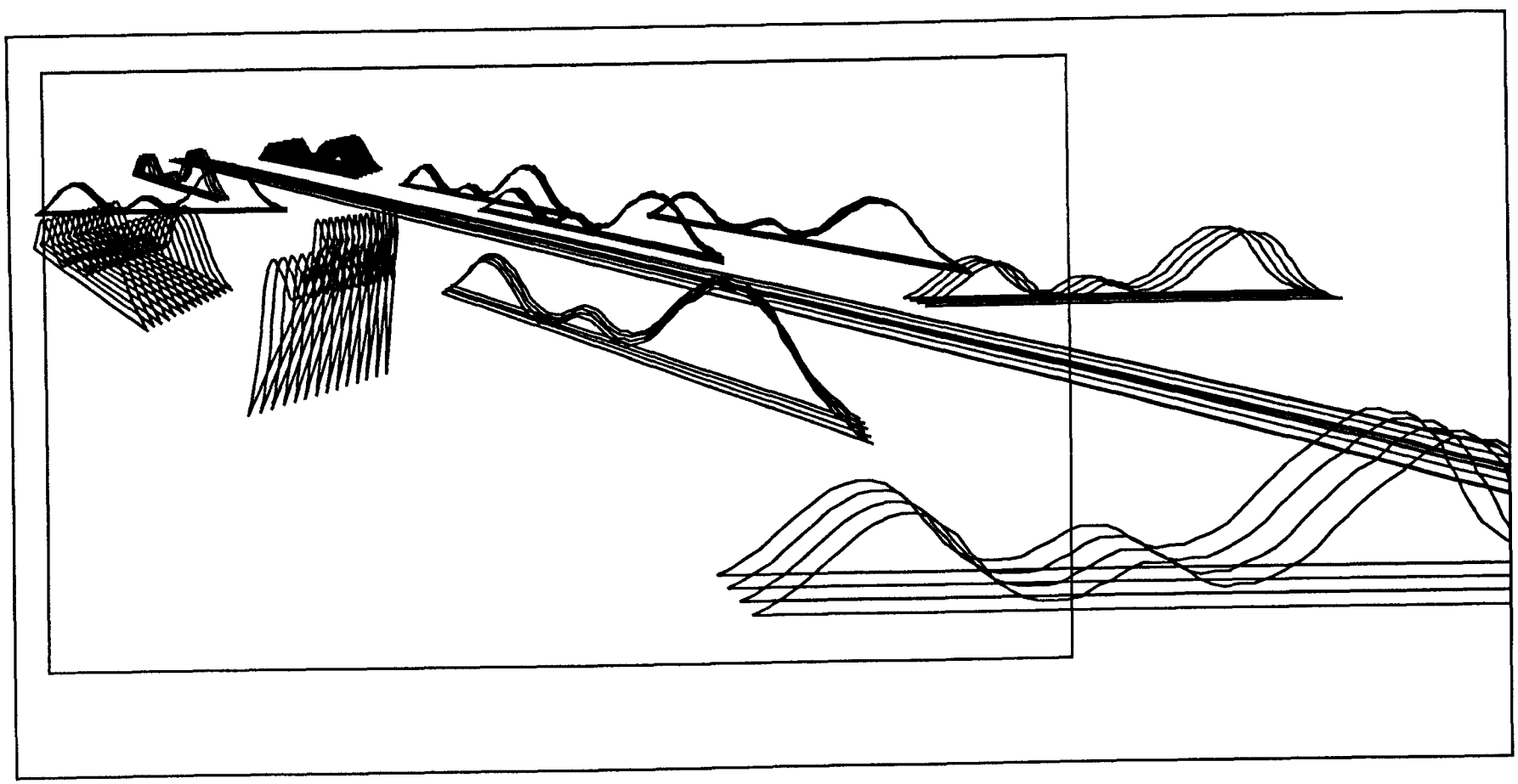




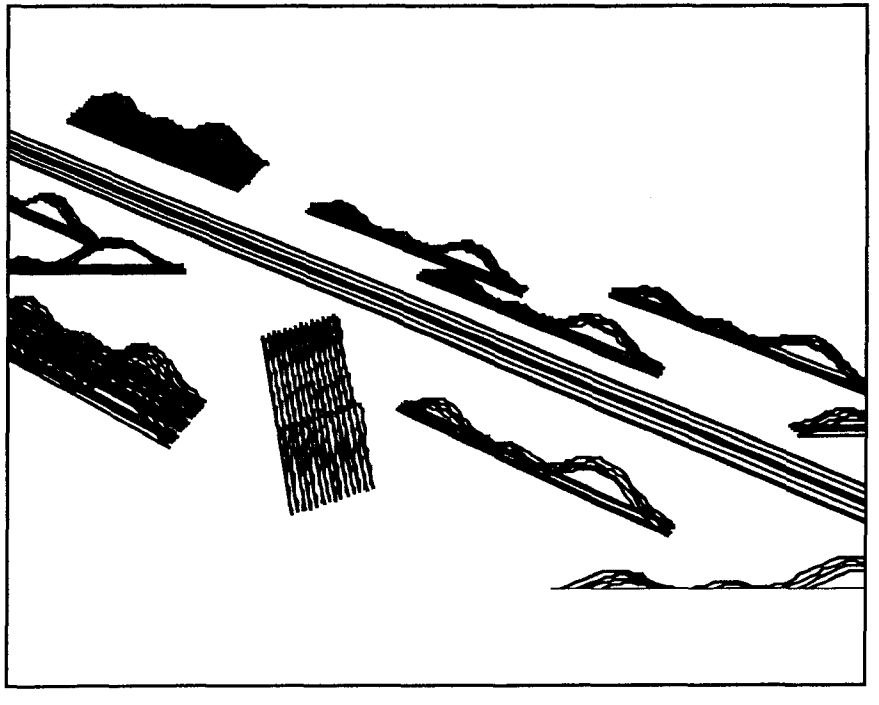
Landscape Elements

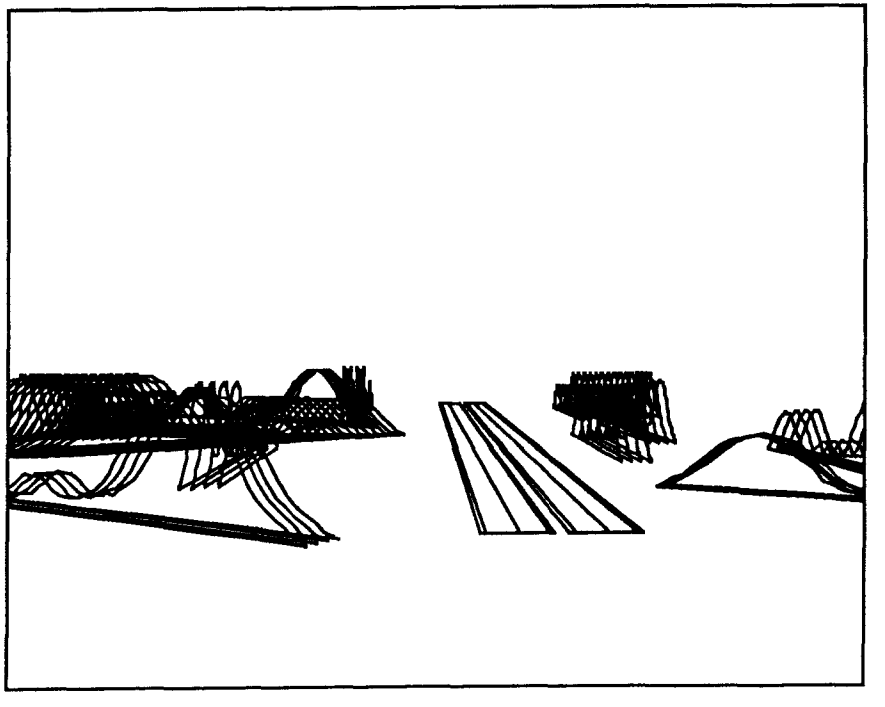
Object: **Free-Form Earth Berms**

This envronmental sculpture uses the landscape as an integral part of its design. The landscape in its natural form is not viewed as having a designed aesthetic and therefore the man-made sculpture provides a means by which the expressive content or



art content is developed. This proposal uses a series of amorphous forms that evoke visual interest and emotional interest. The artist is at liberty to develop forms that evoke memories of the past, present or future. The forms are shaped from earth or natural byproducts of the highway construction. The berms are placed in a random pattern and at different angles to the direction of traffic flow. Each form can be treated in a very unique manner through color, texture, vegetation and scale. Other possibilities include serpentine forms, recreating North American Indian campgrounds or other cultural or natural phenomena.

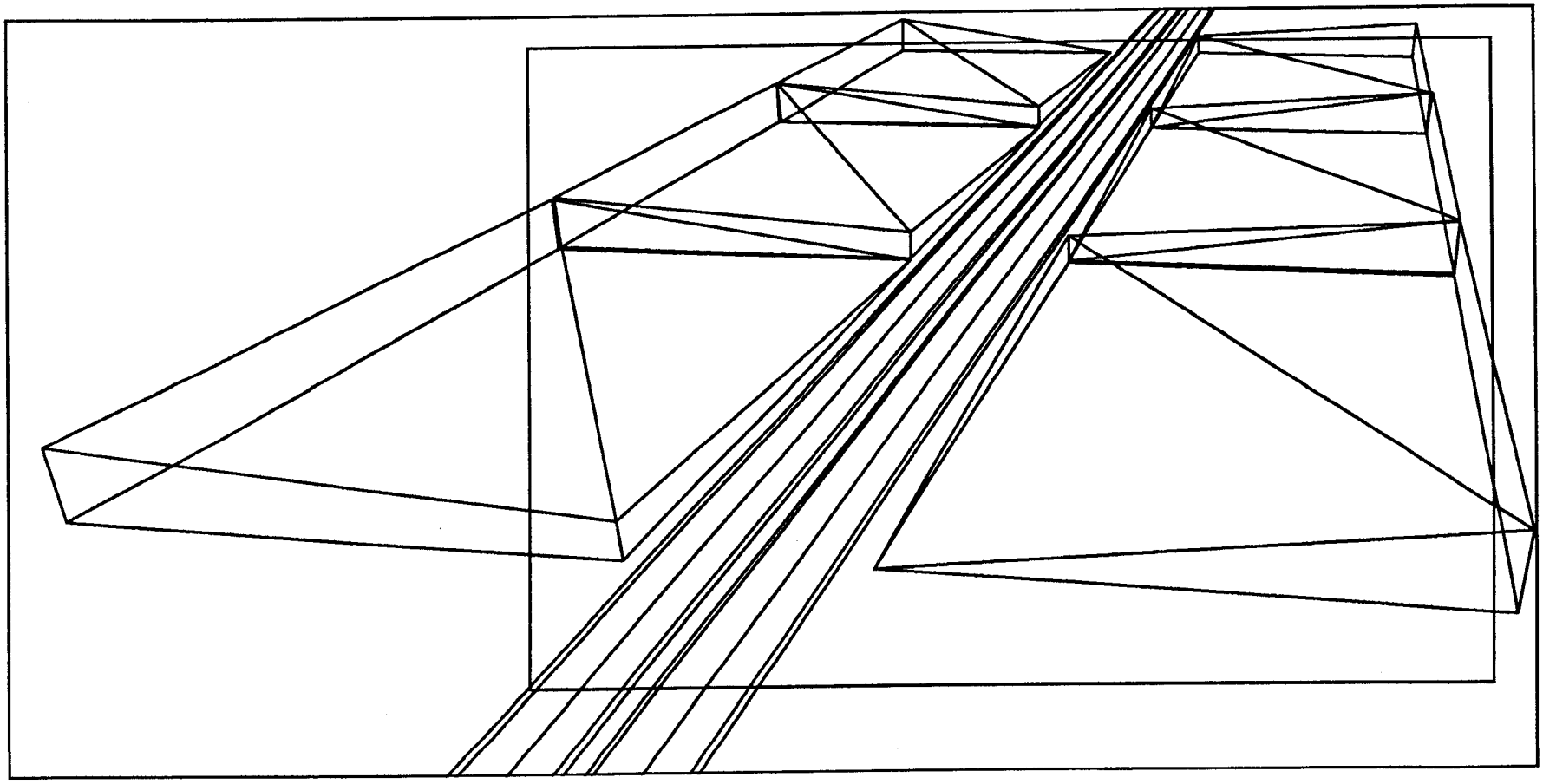




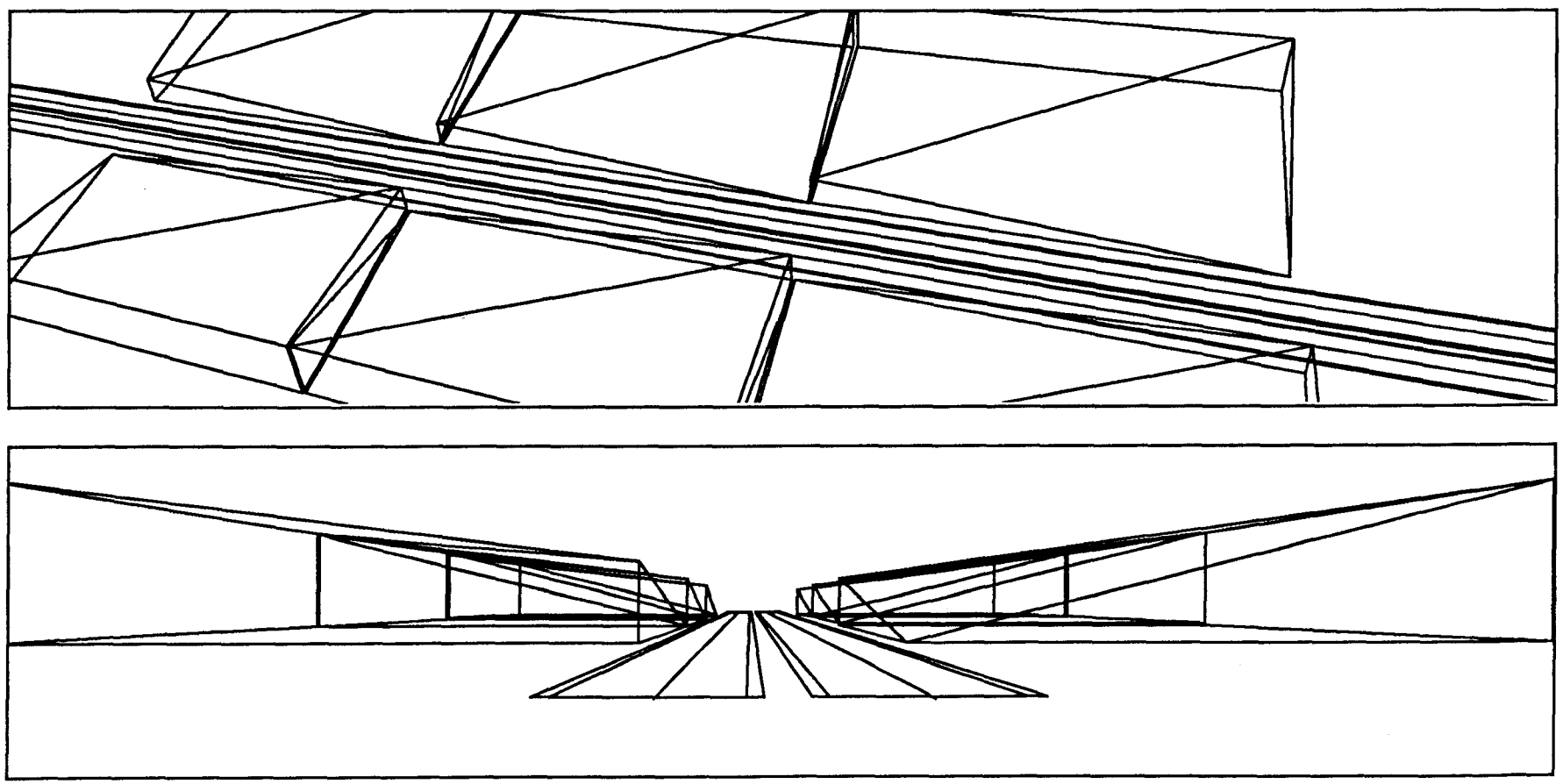
Landscape Elements

Object: Tilted Gardens - Sequence

Scenic quality is defined as that specific distance from the roadway, and in suburban and rural settings contains the land that is most vulnerable to visual modification. Scenic quality is based on existing conditions and when those conditions are de-



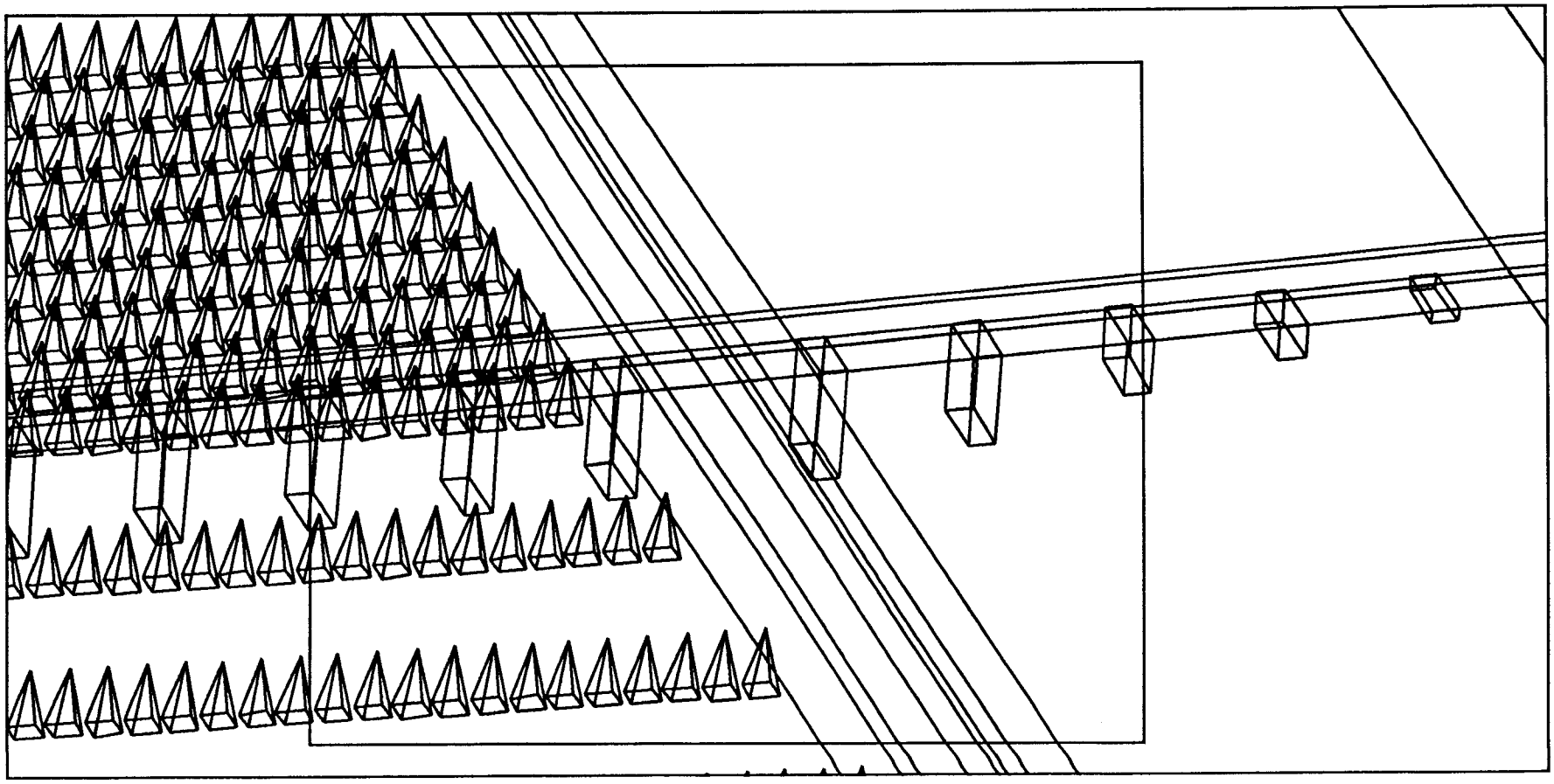
graded, the opportunity exists to introduce sculptural land forms. In this design scheme, tilted gardens are presented to the motorists view as a means of upgrading the visual zone. A landscape of varied topography will accept and absorb this type of development. The garden, replete with a variety of perennials, some set within a historical period (ie. Baroque) could intensify the expressive content of a landform and contribute to the normative character of the region.

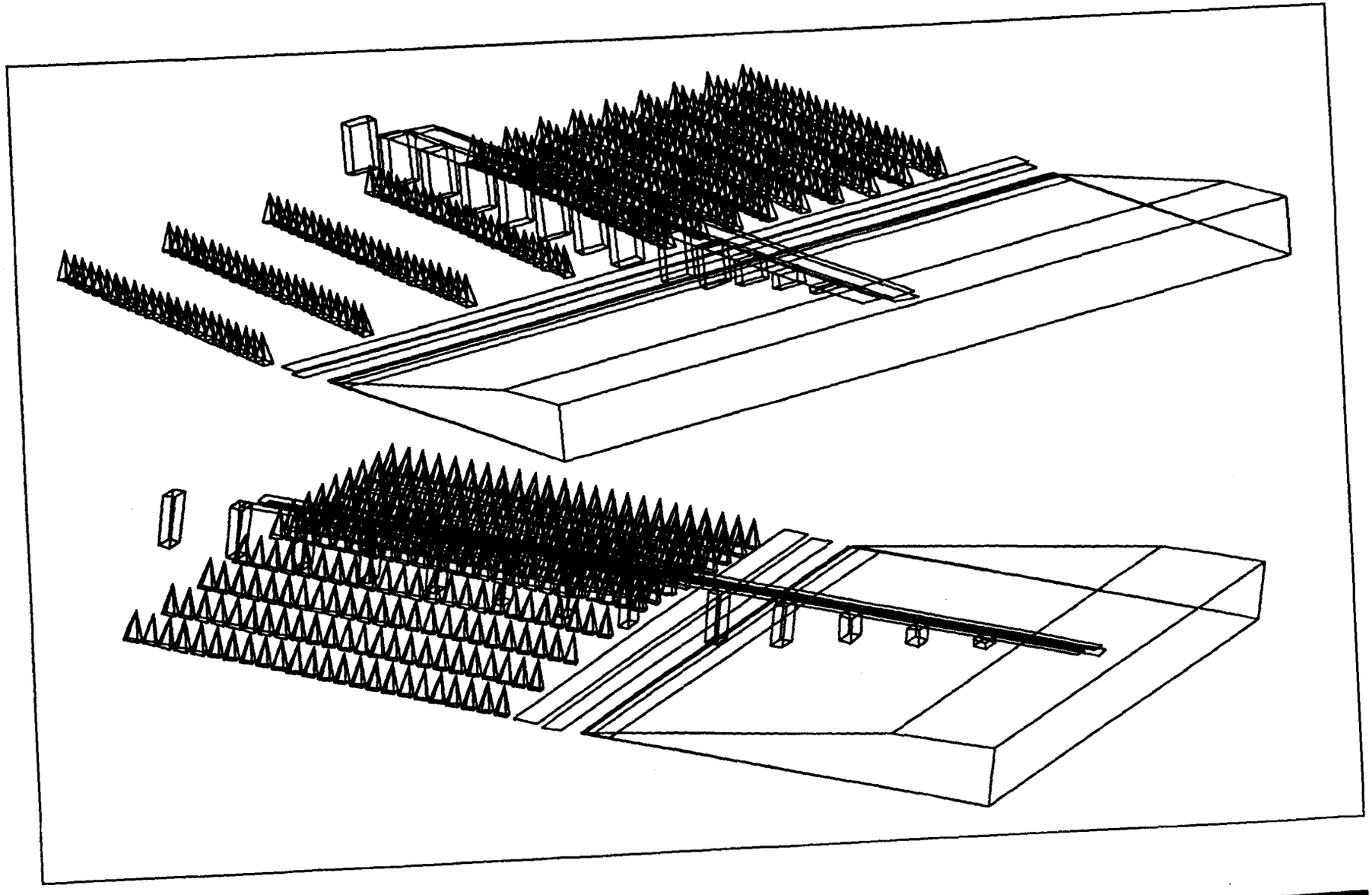


Landscape Elements

Object: **Existing Artifacts and Trees**

A major resource for developing expressive content on the highway are discarded artifacts such as bridges, walkways, abandoned railroad beds. By introducing plantings, berms, vegetation and trees they can be aesthetically integrated.

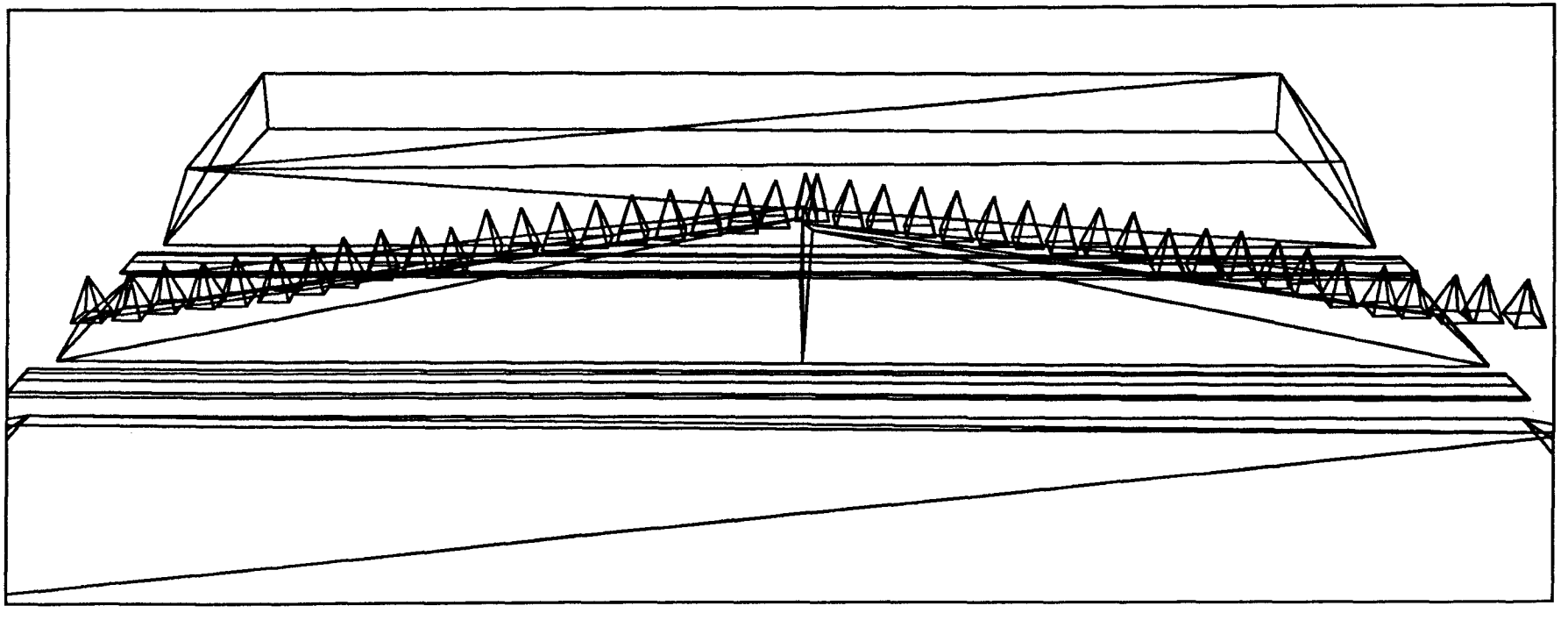




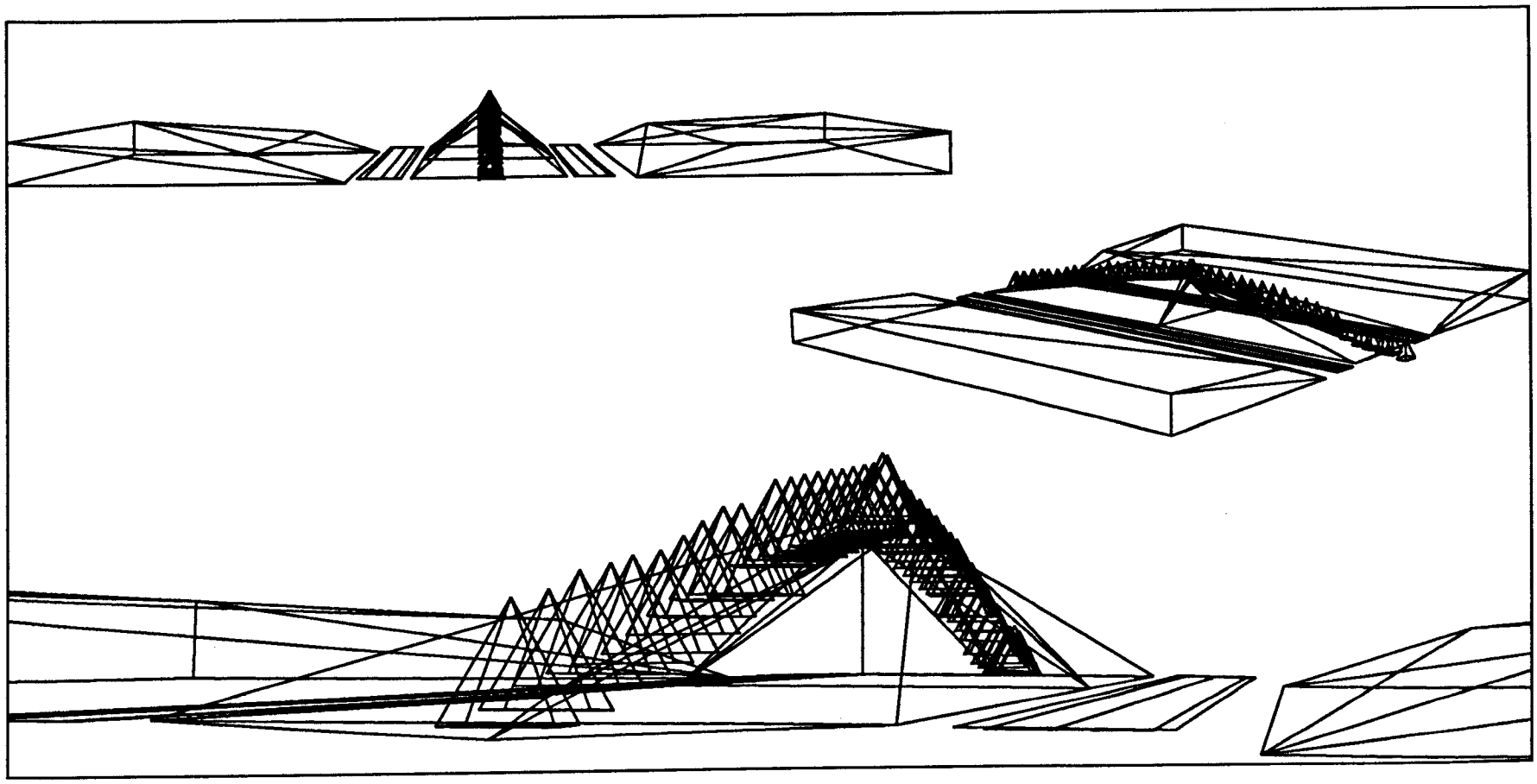
Landscape Elements

Object: **Geological Median Forms - Paleolithic**

In the design of the highway corridor, the vast distances of undifferentiated landscape often represent an insurmountable design problem. In areas where the scenic road potential is low, the introduction of forms suggestive of the geological history of the area may overcome some of the negative visual qualities of the roadway. In areas with low scenic character, or where the scenic value is limited, the use of large scale forms may be appropriate. In an area such as Wisconsin, where the landscape was shaped almost exclusively by glaciation, there are unique sculptural forms resulting from the scouring action of the glacier that could be reintroduced into other areas of the landscape. In areas where towns have concentrated their open space programs around the highway, the use of geologically



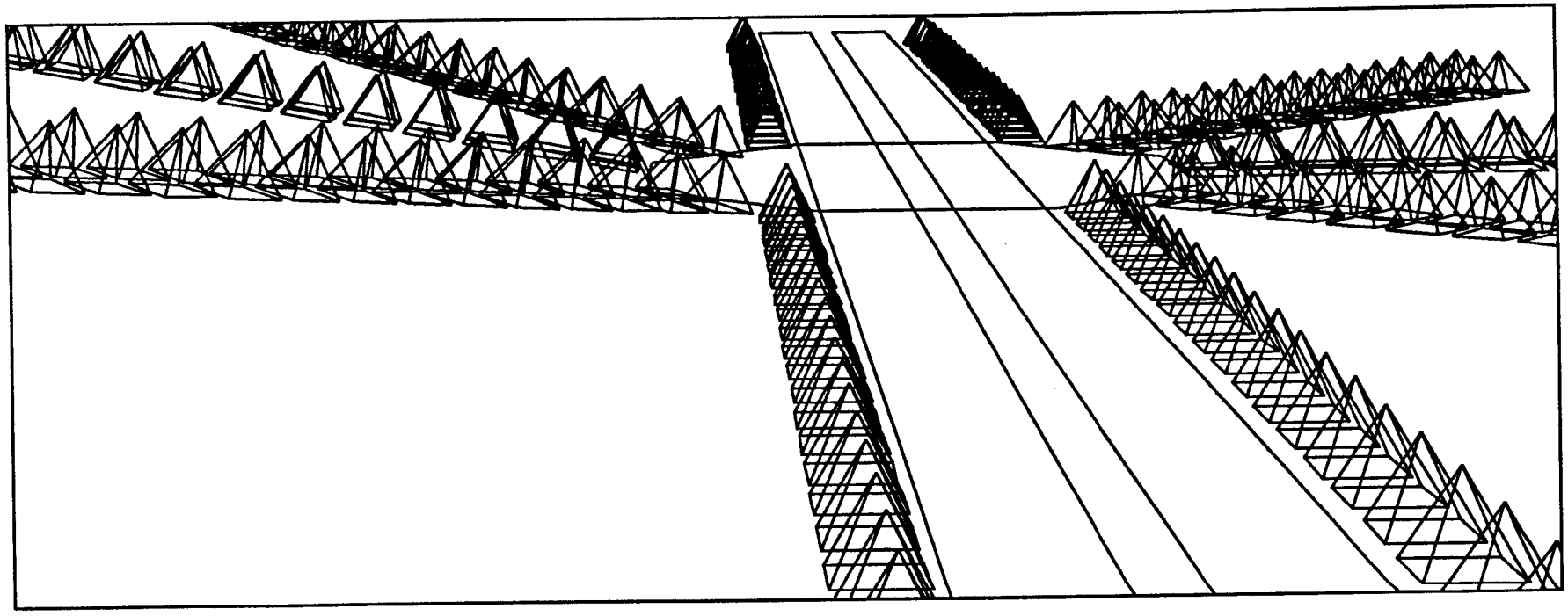
based forms could enhance the immediate environment as well as provided screening to the highway strip. The benefit to the motorist is education and safety while allowing the community to maintain their open areas as a buffer. In this scheme, a large scale hump form, reminiscent of a submerged whale or similarly scaled form, with trees placed along the ridge line to further simulate a paleolithic creature emerging from the landscape.



Landscape Elements

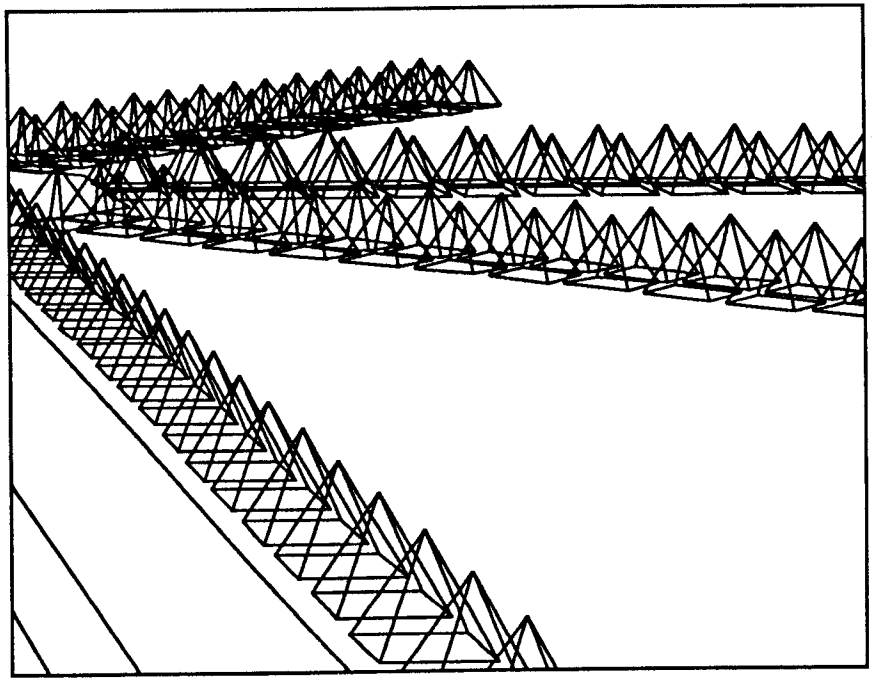
Object: **Extended Gardens**

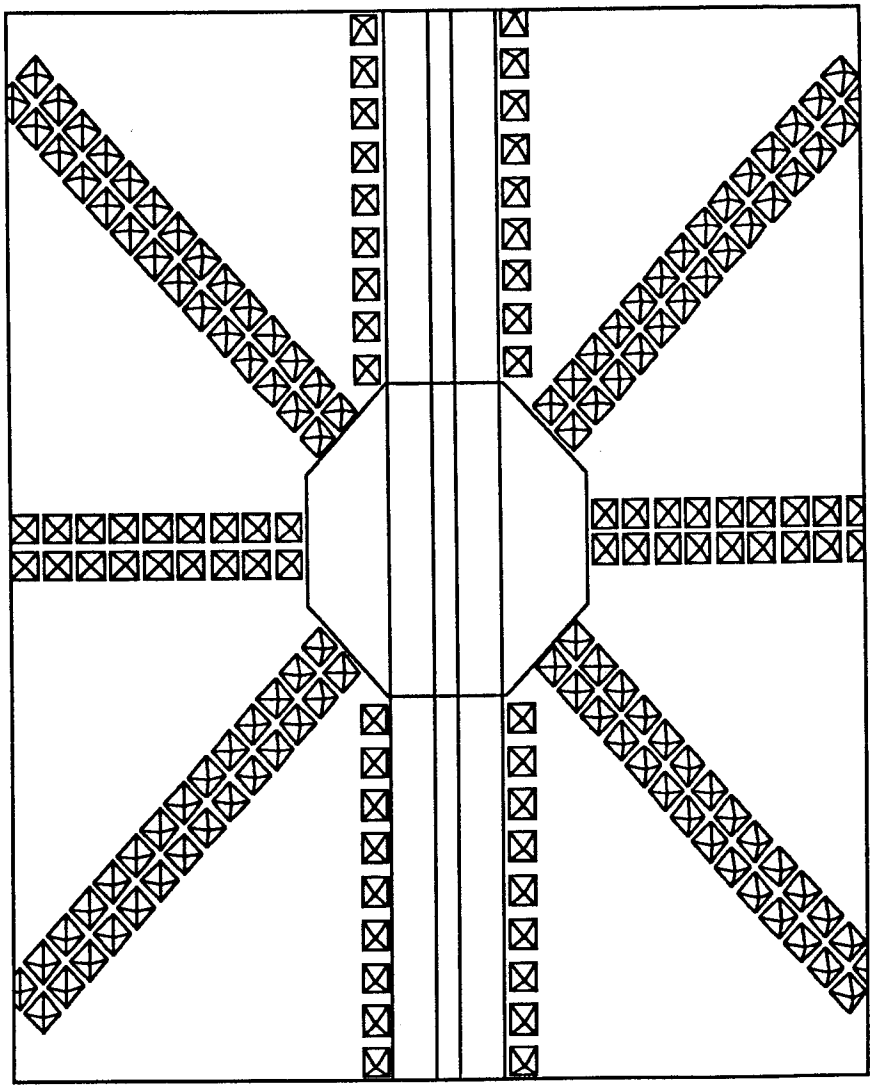
Historic preservation and conservation of the landscape is central to the continued growth of the United States. The value of the land has recently become a major issue in the planning of new highway connections. The character and the quality of the landscape provide the scenic imagery of any locale. The landscape represents the "open space" based upon natural factor characteristics that deserve preservation so that their present role in the environment is not significantly altered or lost to competing land uses. Superimposed on these "open spaces" are areas of high cultural or historical value, which should be considered for conservation. While a conservation area may be used and altered by man, such alteration should occur only within the limitations that will permit the protection of the area's



special value.

This landscape design uses the highway corridor as an integrated edge to the conservation area. Using both flowering and needle bearing trees, the highway is crisscrossed by lines of trees and landforms to create a changing perspective for the motorist. The containment of the highway through the reinforcement of the landscape offers the highway designer/planner a means to achieve "expressive content."

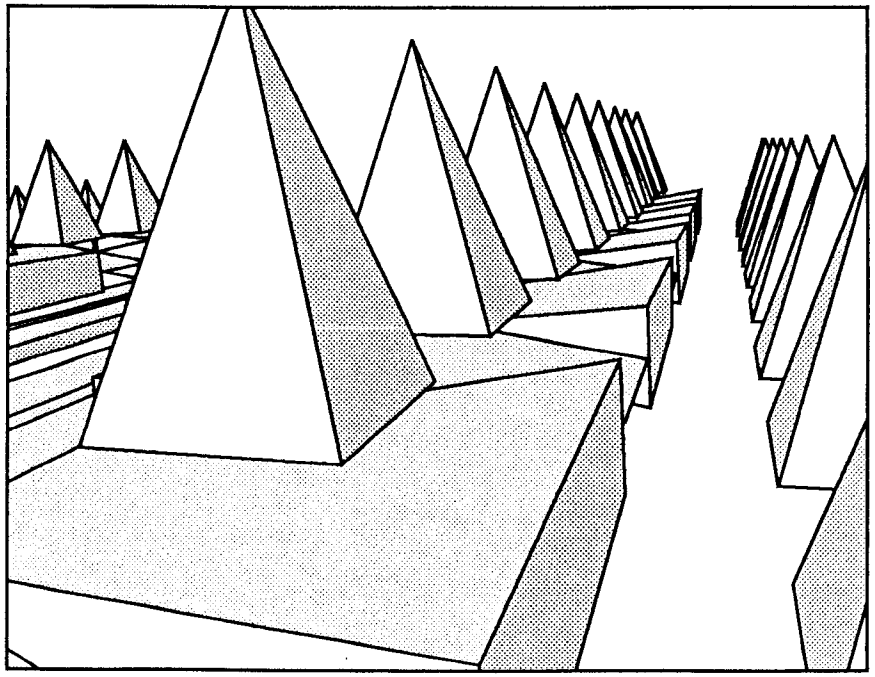


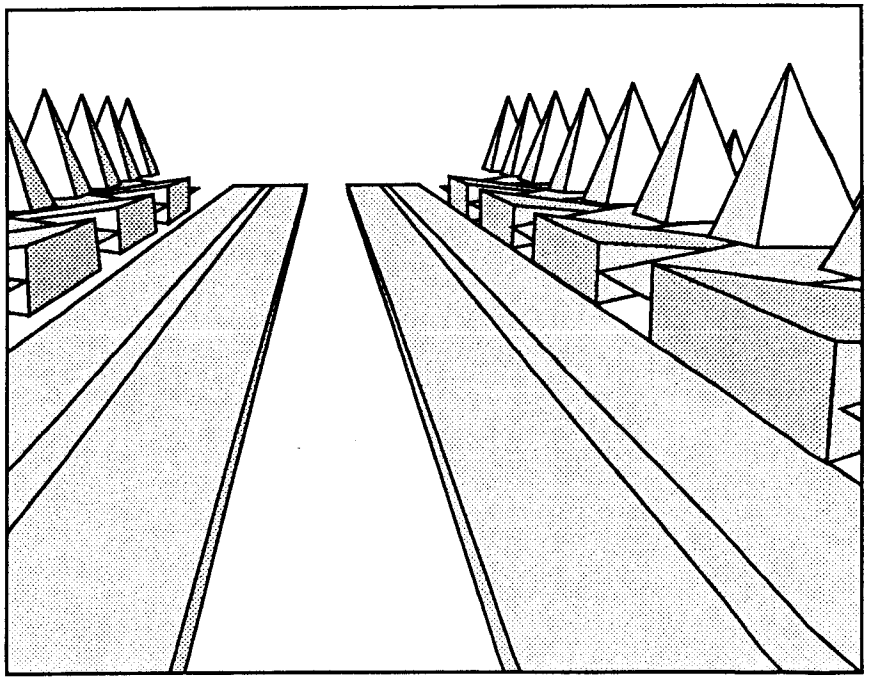


Landscape Elements

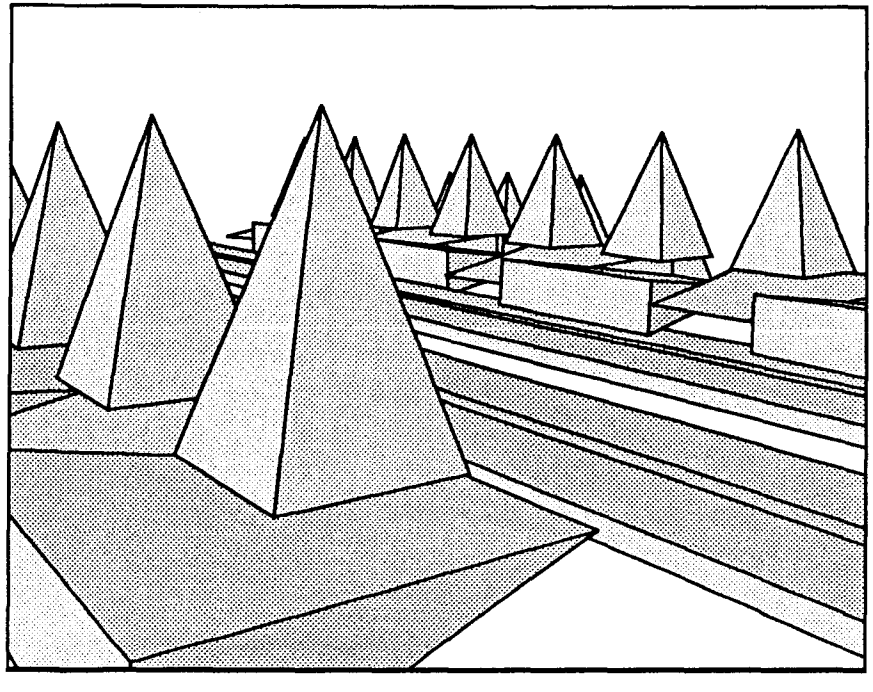
Object:**Contained Landform**

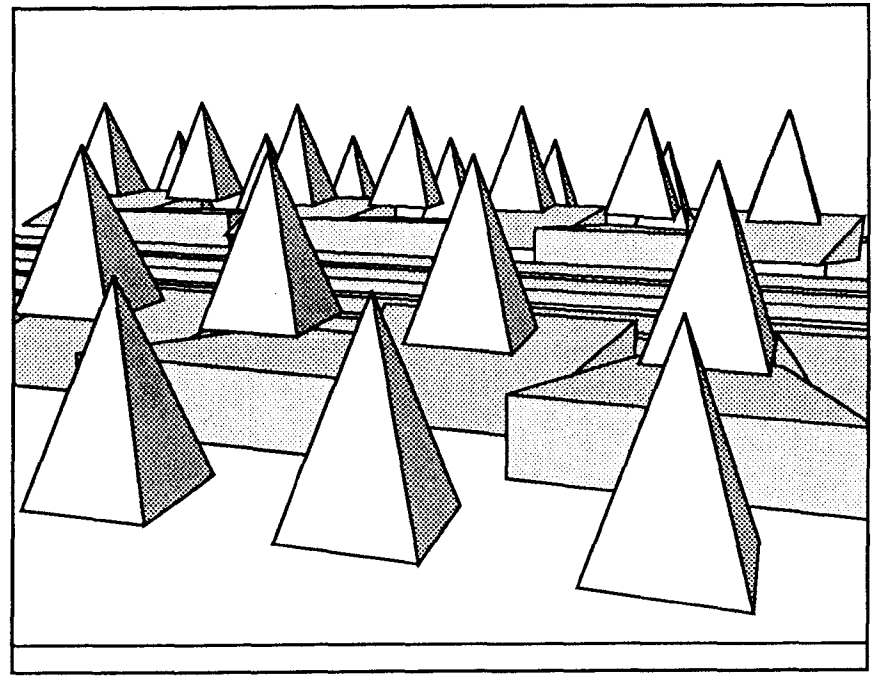
Containment delineates lands that are nearly flat and enclosed or contained by surrounding topography or water. Historically, these "contained" areas were preferred locations for settlement. Residential growth will inevitably seek sites that are accessible and open, hence most vulnerable visually.Such changes will cause a dramatic change in the rural or suburban appearance of the region. The potential for incompatability between new development and existing landscape patterns is the central problem. The placement of the roadbed becomes critical since sites with dramatic views which are especially attractive will occupy land most likely to be used for the highway. In many cases, the highway is placed along marginal land which offers little design incentive to the planner. The





scenic road is typically located along ridge lines which provide focal attractions and distant views or along wide valley bottom lands where agricultural activity predominates. Because visual boundaries are often extensive, controls that will preserve scenic roads and panoramic views are difficult to establish and enforce. A scenic road may have a combination of nearby focal views and sweeping panormaic views. The nearby, or foreground, view is the zone most sensitive to disruption and a single building, improperly sited, can effectively block a significant long range view. As more and more marginal land is claimed for highway construction, the scenic value must be"fabricated" and what natural features remain after the construction must be cosmetically enhanced. This project presents a view of the possible containment through the creation of a scenic pathway extending toward a natural feature. Surrounded by lines of flowering and needle bearing trees, the pathway becomes the central focus for the contained area.



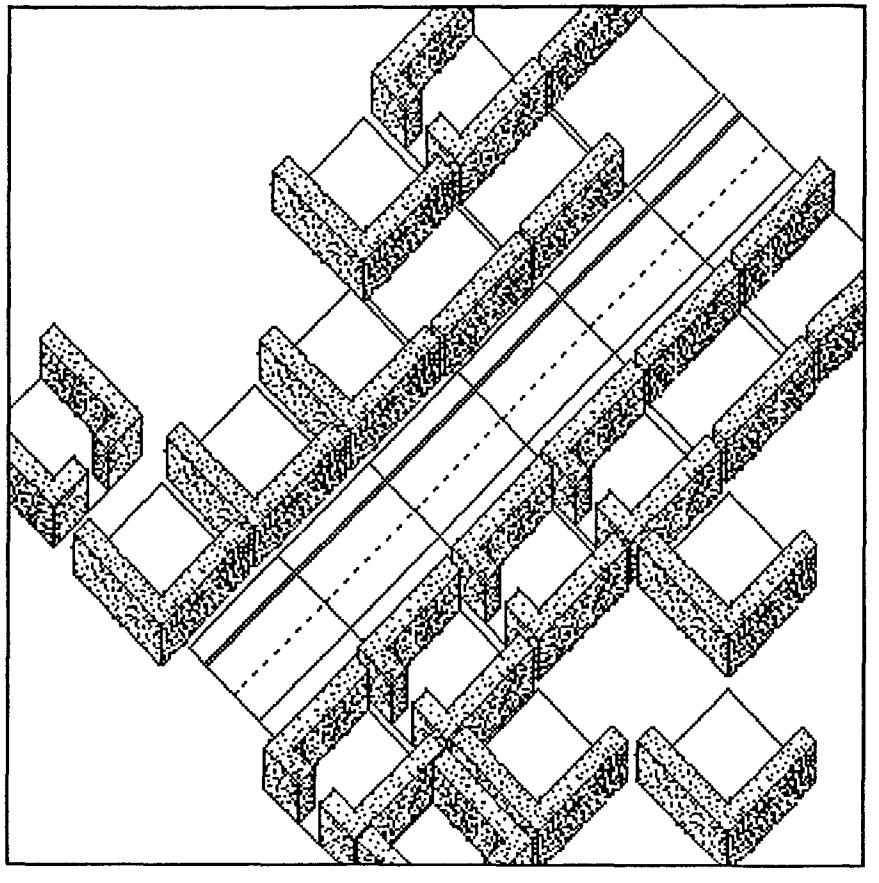


Spanning Elements

A major symbol of the interstate highway system is the bridge, overpass or underpass. The standardization of the construction process and the selection of the material have produced a visual sameness in the design of the spanning element. The German philosopher Schopenhauer remarked, that the conflict between gravity and rigidity is the sole aesthetic material of architecture. When this concept is applied to the design of bridges, a greater emphasis on the sculptural aspects of bridge design would be in evidence. The structural behavioral aspects of bridge design have been well proven along the roadway. However, the bridge represents more than just a resolution to an equation, it is an articulation within the landscape. The bridge can be seen as a landmark, denoting place and defining space. If the expression of sculptural and functional form can be integrated within the design of the bridge, the expressive content of the roadway can be increased.

This section on spanning elements is intended to bring the idea of form to the nebulous world of supporting columns, beams, abutments and approaches. The unity of the structural system must be preserved throughout the span of the bridge. The traditional post and lintel solution can be expanded far beyond the current vocabulary of form. In long span situations, two

A natural labyrinth serves the motorist and the community in which it is located.

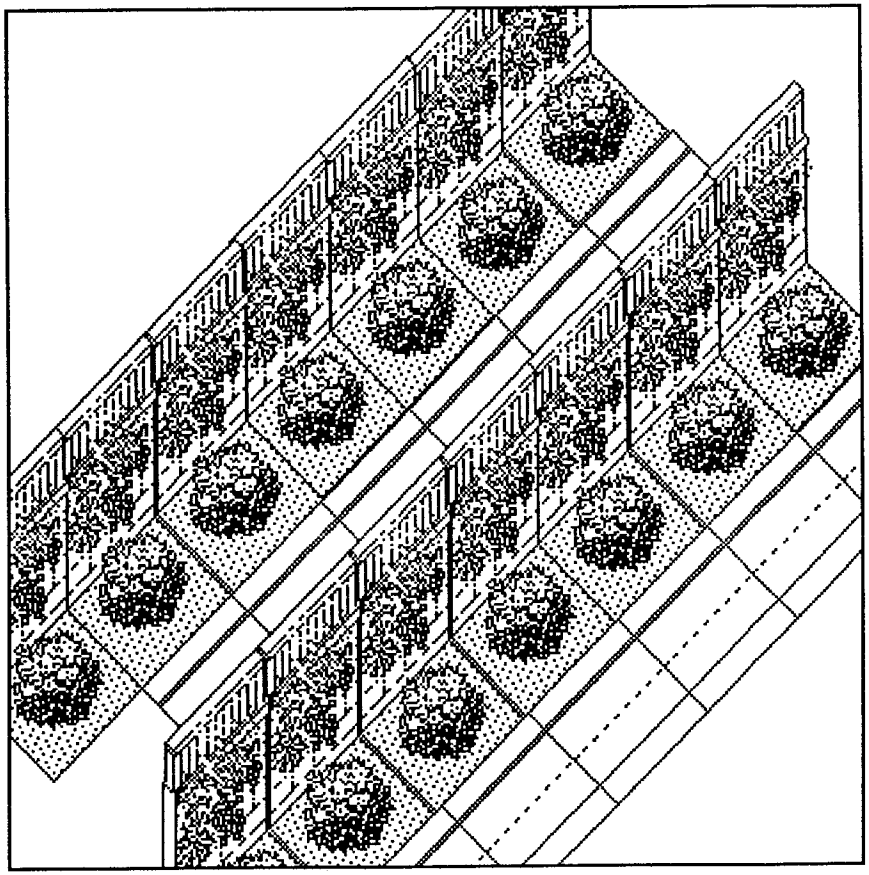


different structural systems can be made to work as one. In small span conditions, it is desirable to have the structural system express the visual and behavioral relationship of span and support. The continuity of the roadway must also be expressed within the continuity of the bridge member. The project ideas contained in this section stress the connection of the horizontal bridge to the vertical support. Through the use of a variety of geometric forms, the bridges and their support systems become identifiable artifacts along the route.

One area that is suggested is the bridge as part of the roadway lighting system. By integrating lighting elements into guardrails, horizontal beams, abutments or columnar supports, each bridge will take on the nighttime character of a gate or portal. This will increase driver awareness of the three-dimensional movement of the automobile.

While the bridge is often seen as an obstruction to the visual continuity of the roadway, its silhouette can be shape to be particularly responsive to the surrounding context. Blending or accentuating a particular bridge form with the landscape can create a larger awareness of the aesthetic content of the landscape and the unique meaning of the highway located within it.

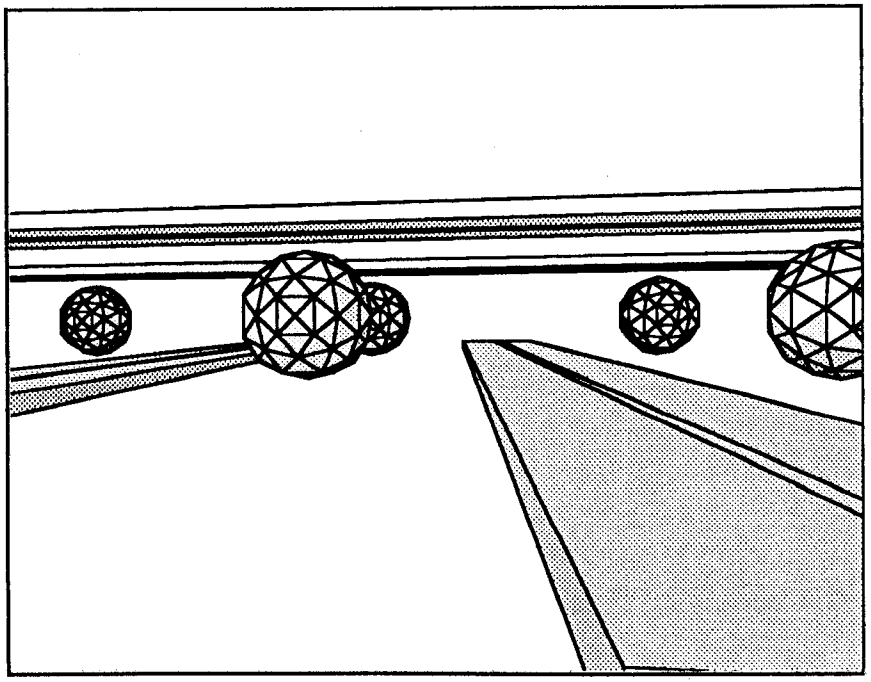
Acoustical walls, covered in greenery, can provide a visual aesthetic for the roadway.

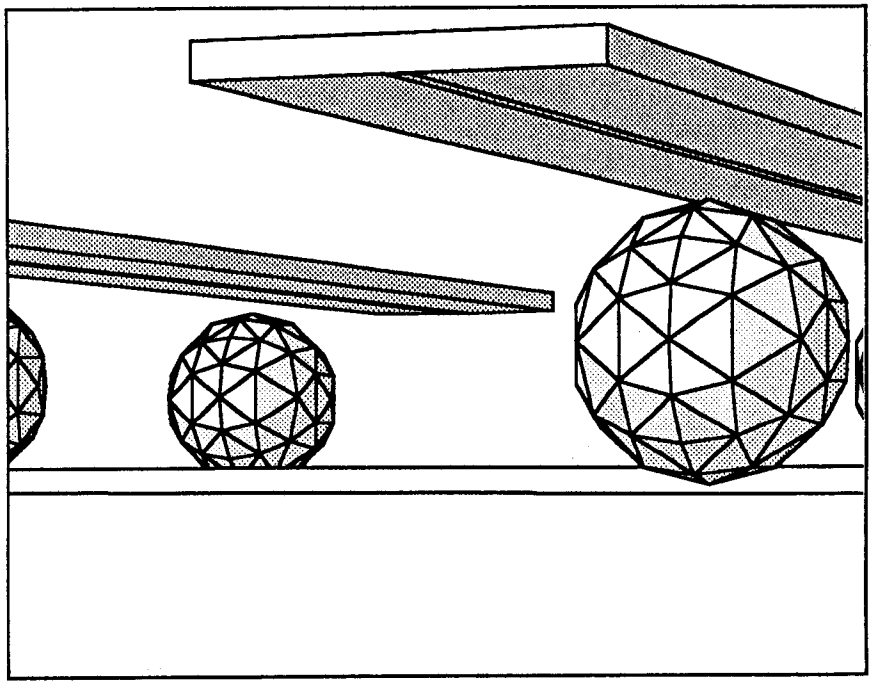


Spanning Element

Object: **Bridge Support**

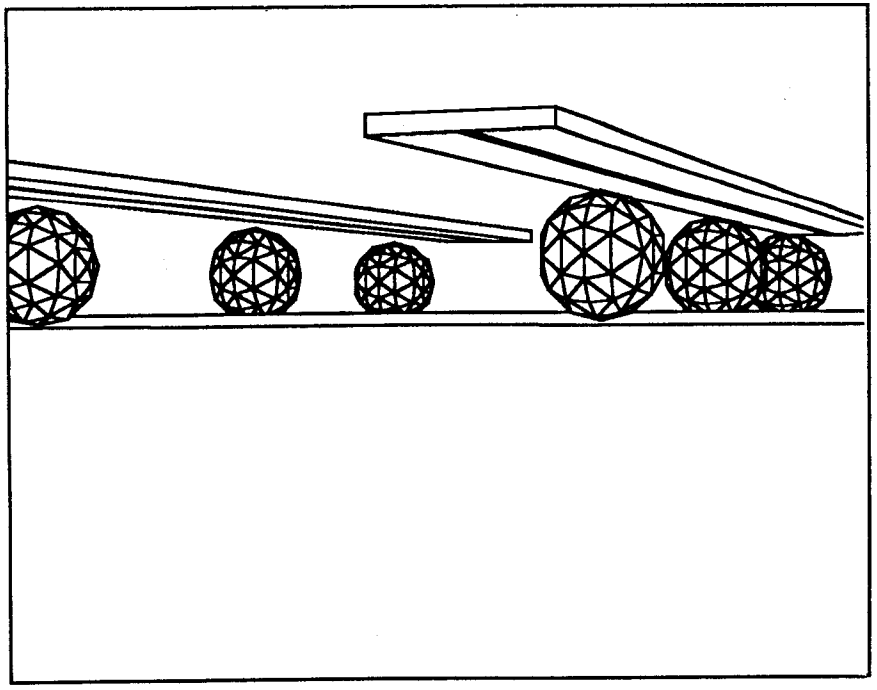
The highway bridge is designed to meet the functional requirement of spanning from point A to point B in the most direct manner. This intent is well met by the interstate bridge as it meets that goal head-on. The primary difficulty is that in a majority of cases, the bridge sacrifices the aesthetic form for function alone. To this end, the American bridge lacks the larger visual appeal of its European counterpart. While the same functional requirements of a spanning element must be met, the European bridge designer is able to integrate an aesthetic that glorifies the nature of span through an articulation of material, structural principle and sculptural aesthetic. The economic constraints, based on current research, appear to be equal. Therefore the emphasis on expediency and economic consid-

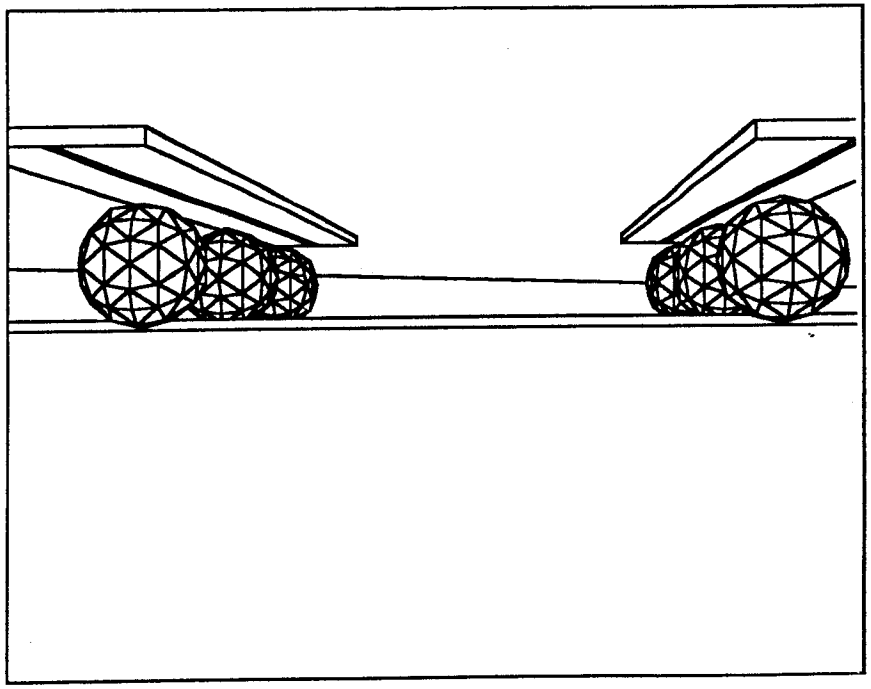




erations prevelent in American bridge design could be modified to accept a greater artistic latitude with the material, structural principle and sculptural aesthetic.

In this scheme, the relationship between the roadway and the bridge is standard, the main difference being in the bridge supports. The uniformity of the rectangular box support or the circular column support is replaced with a spherical form. The sphere is intended to generate a sculptural aesthetic apart from that of the norm and as a result increase driver awareness of the differences between bridges. This method was employed quite effectively on the Merritt Parkway in Connecticut where each bridge has certain unique sculptural features.



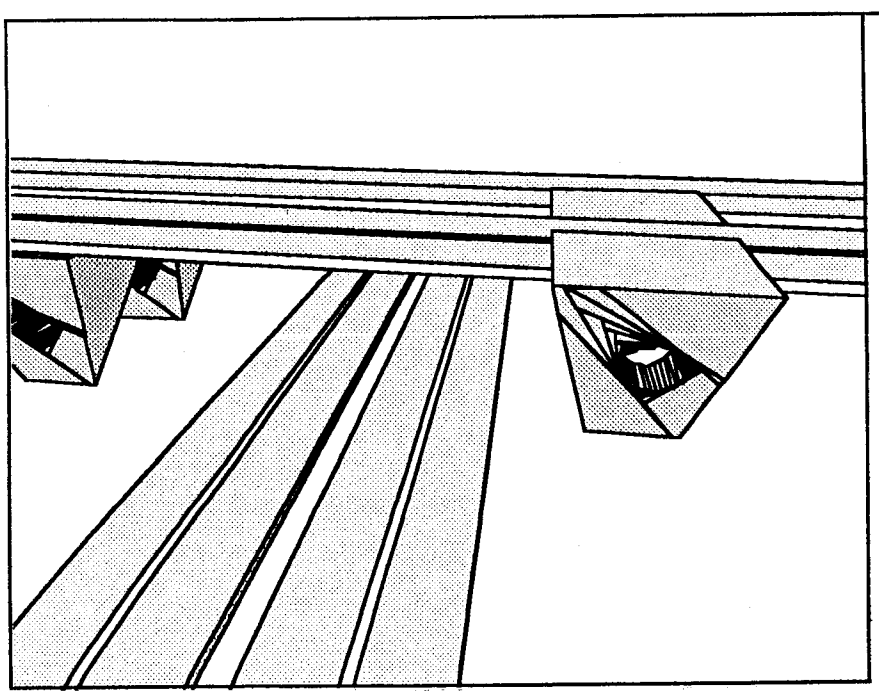


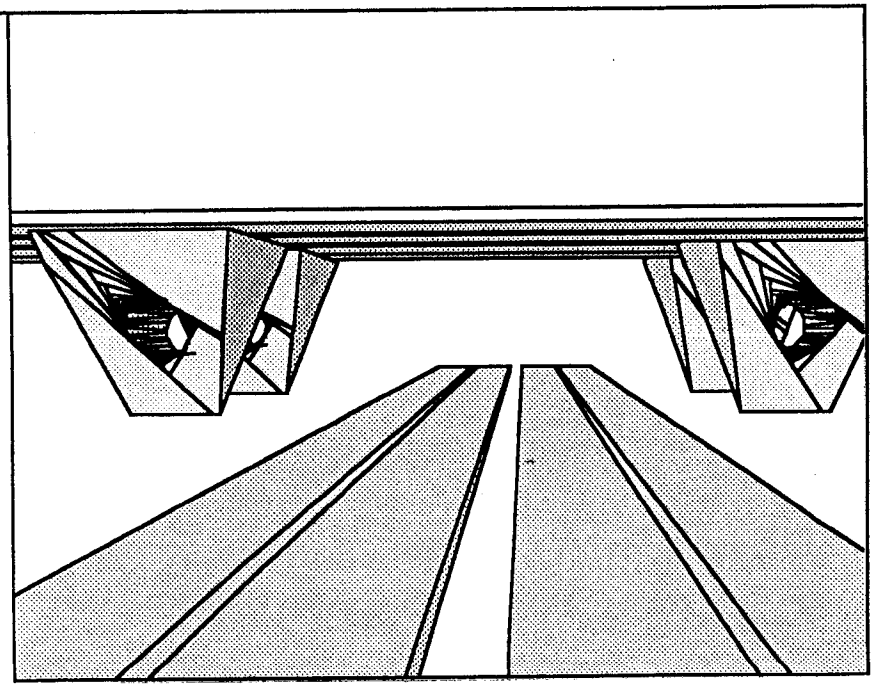
Spanning Element

Object:**Bridge Support**

A two lane bridge structure will have a different solution than that of a four lane or even a single lane bridge. Specifically, the load transfer requirements and the structural behaviour of the structural element can be articulated in a manner different from that of a multi-span arrangement. In the work of the Swiss engineer Robert Maillart, concrete supports are curved into the horizontal spanning element to create a smooth and fluid visual aesthetic.

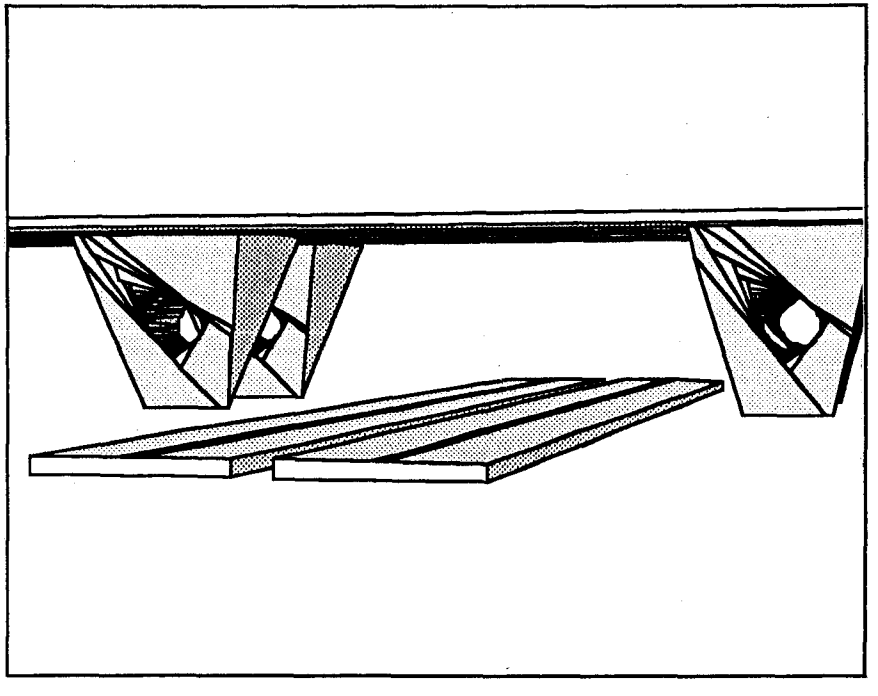
In a recent bridge project by the Chicago, Illinois, architect Myron Goldsmith, even greater design latitude may be achieved through the curving of the roadbed element over the spanned distance. In this scheme, Goldsmith uses cables of

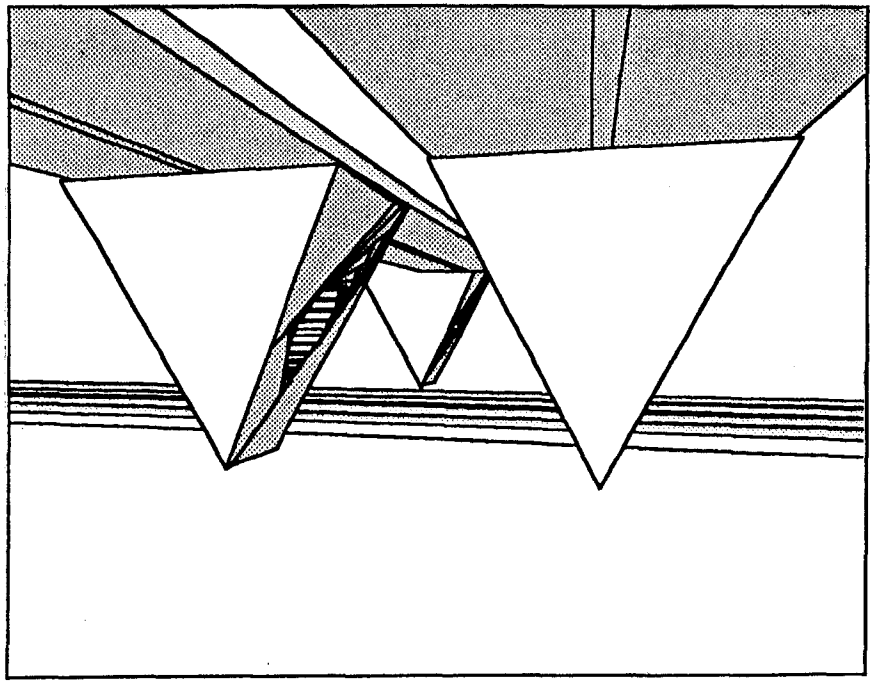




various lengths anchored into the hillside that in themselves take on a visual quality apart from the supported structure.

In this design, a triangulated support system is employed to increase the sense of gate as the vehicle passes through the defined opening. Set on a diagonal or perpendicular to the roadbed, the bridge support system modifies the more accepted practice of uniformity of support. Built of reinforced concrete, the bridge supports can be textured or colored to visually mesh with the surrounding area. Through the modification of scale, roadbed elevation and manipulation of the ornamentation, tremendous variation on the bridge support theme may be achieved.



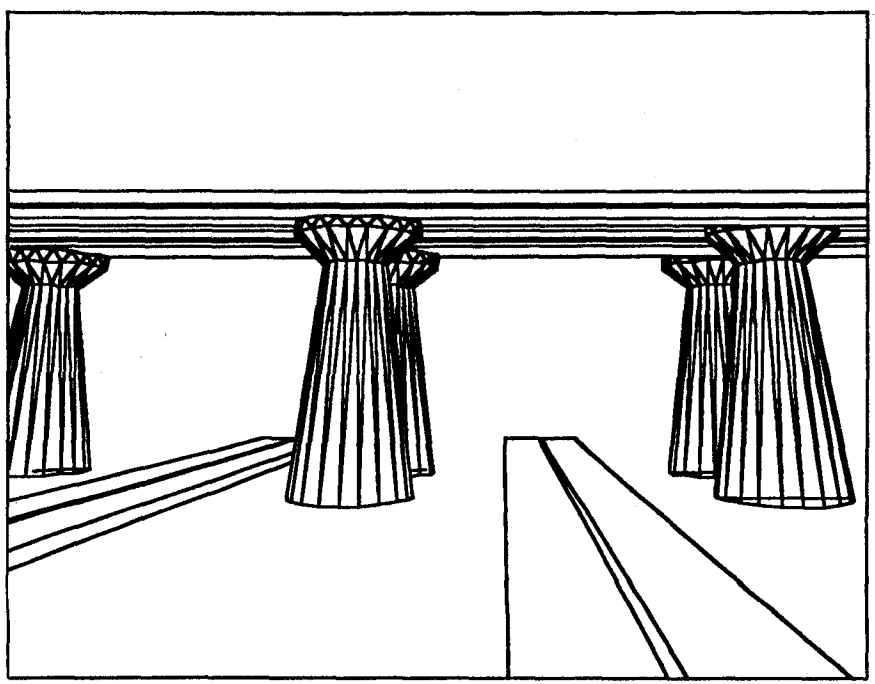


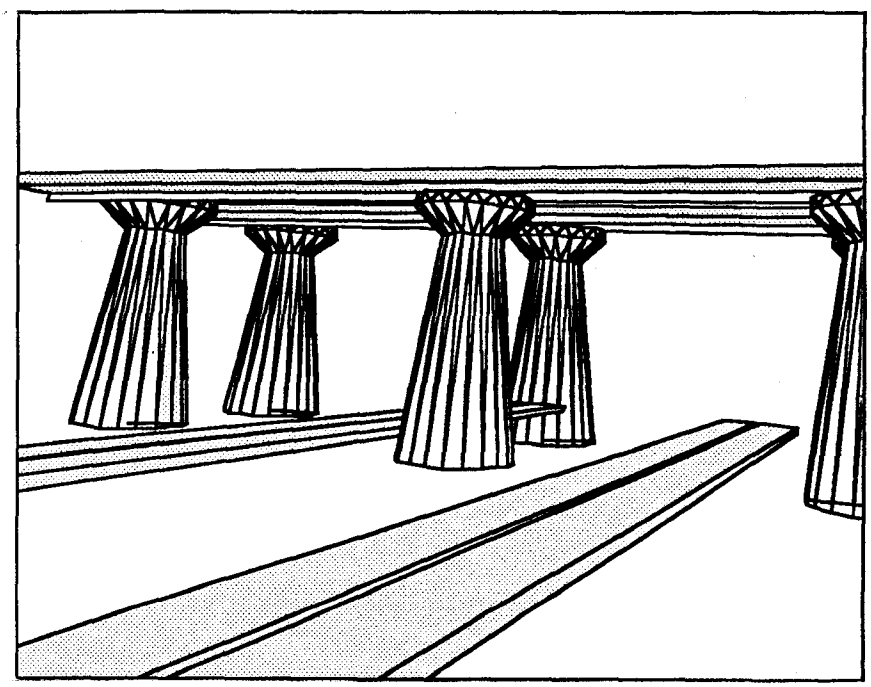
Spanning Element

Object: **Bridge Support**

Along the national interstate highway system, certain bridges, viaducts, tunnels and passways have developed their own unique identity based on the quality of their respective designs. The Verrezzano Narrows Bridge, The Golden Gate Bridge, The Brooklyn Bridge, The Chesapeake Tunnel and the Florida Keys Highway are but a few of those respected designs.

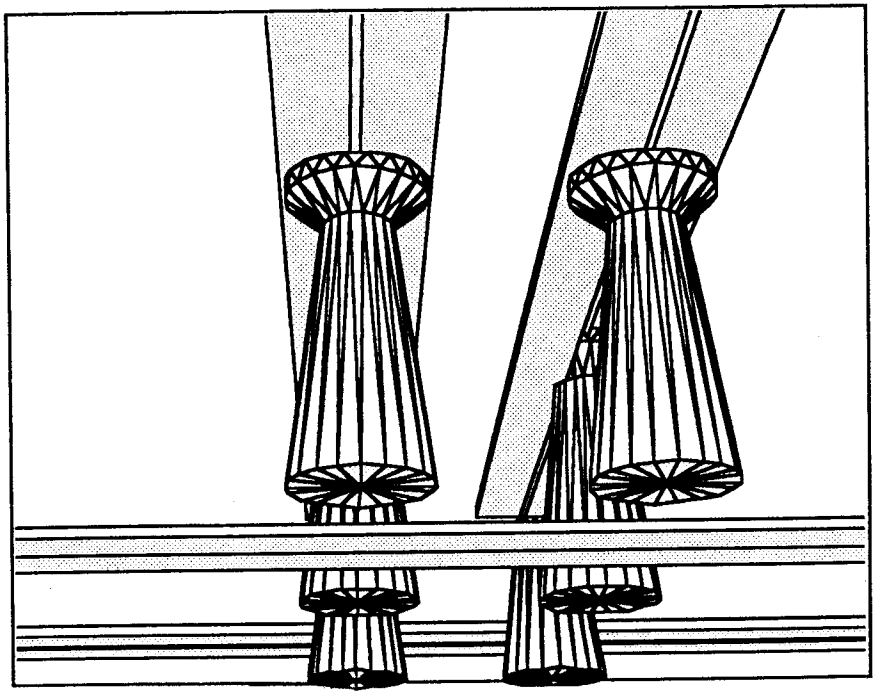
Through close inspection, those bridges met the function and technical aspects of the design requirement while at the same time imparting a formal design aesthetic. They appear to be unlike any other bridge design and yet offer an interpretation that extends the meaning of bridge. In this scheme, the bridge support system emulates that of a Doric column from a Greek

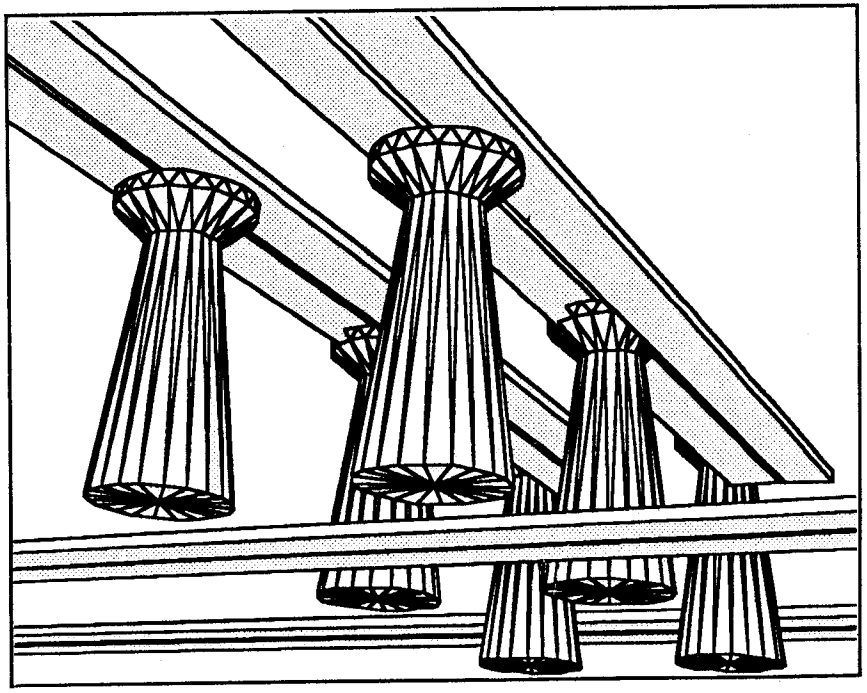




temple. While this design may not be appropriate in all areas of the nation, the antebellum South and the Eastern part of the country would find the design quite acceptable.

Formed from reinforced concrete, these gigantic columns add a historic or cultural framework to the highway corridor. While the column style may vary, variation in the bridge structure may also respond to cultural or historic factors.



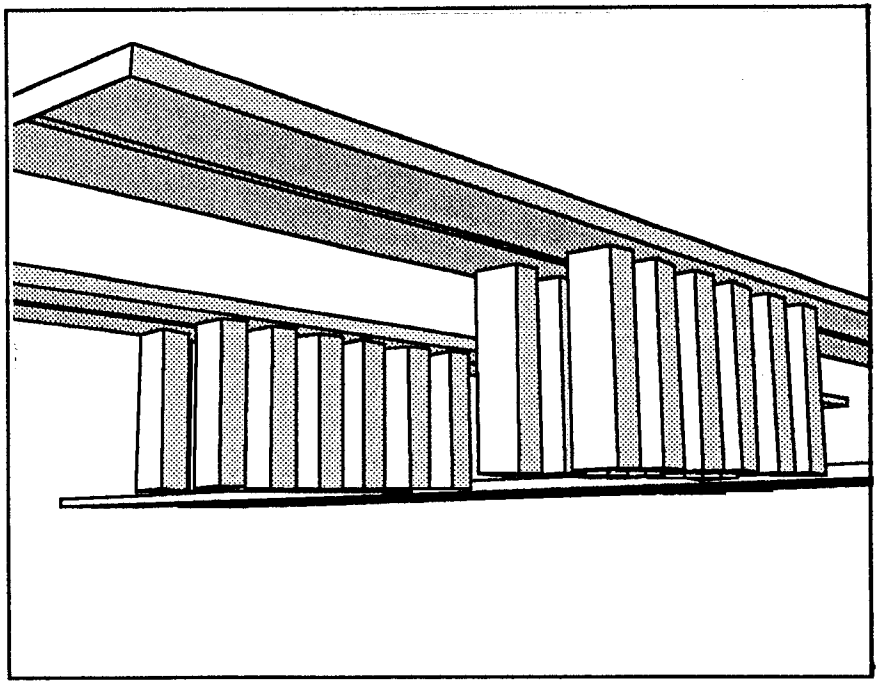


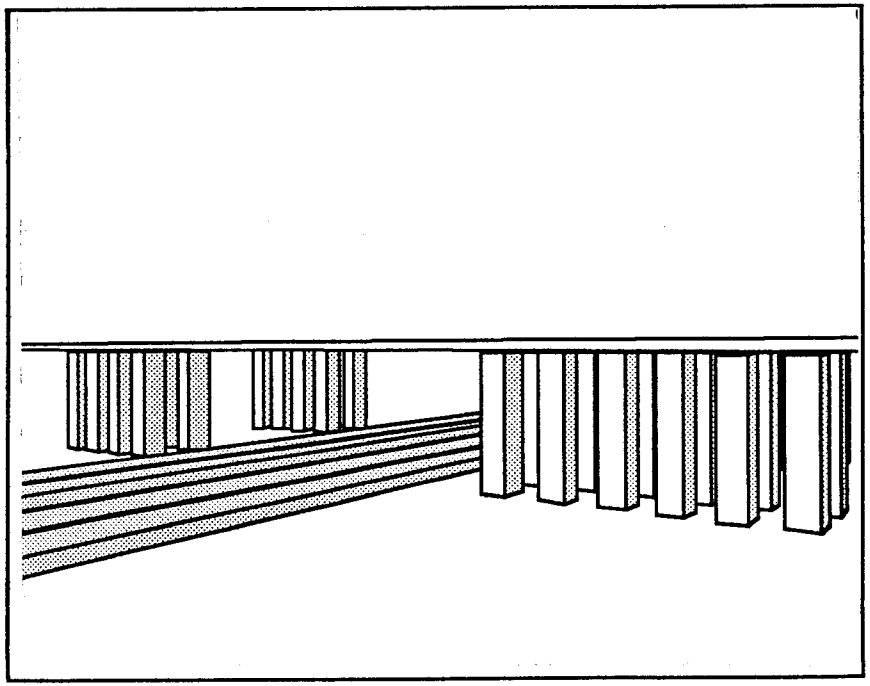
Spanning Element

Object: **Bridge Support**

The repetitive quality or sameness that appears to be the liet-motif of our national highway system is at the heart of the problem. It is projected that within the next twenty five years, 50 to 60 percent of our current highway system will have to be rebuilt or modernized to accomodate the increase in traffic flow. The bridges are a part of the national highway infrastructure and therefore suffer a similar problem. The economic cost associated with re-construction is enormous.

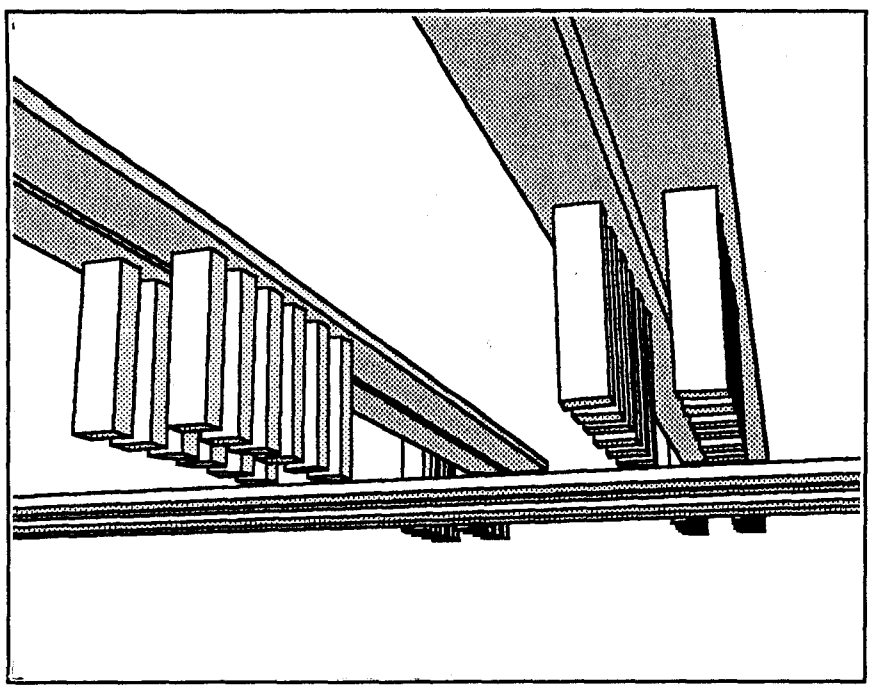
It has been demonstrated both in this country and in Europe that the cost of introducing a unique identity to a bridge support system is very slight compared to the larger cost of reconstruction. The revitalization and rebuilding of the infrastructure is

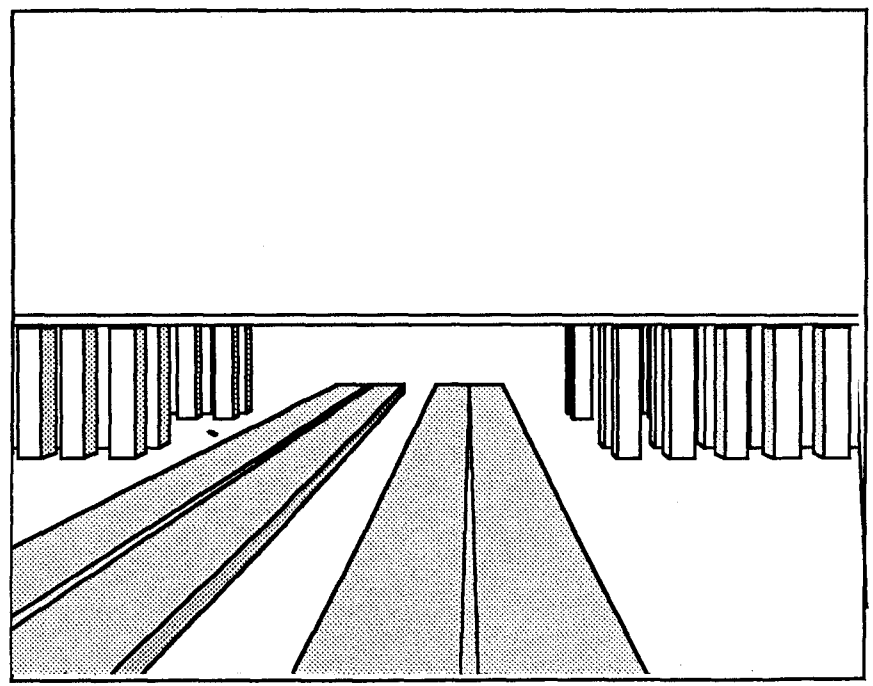




critical to the continued economic growth of the country. In order to maintain and even improve the American way of life, the population will become ever more dependent on an efficient transportation system.

In this scheme, paired reinforced concrete columns act as planar elements supporting the bridge. Specific attention is given to the connection of the columns to the underside of the bridge in order to visually separate the elements. This articulation heightens the difference between the sculptural quality of the column and the horizontality of the bridge.

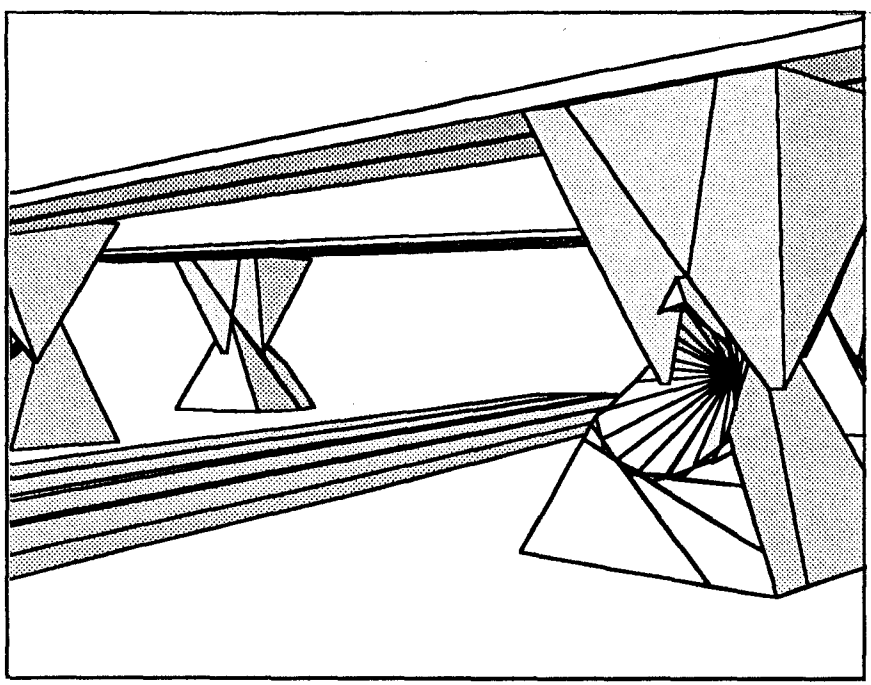


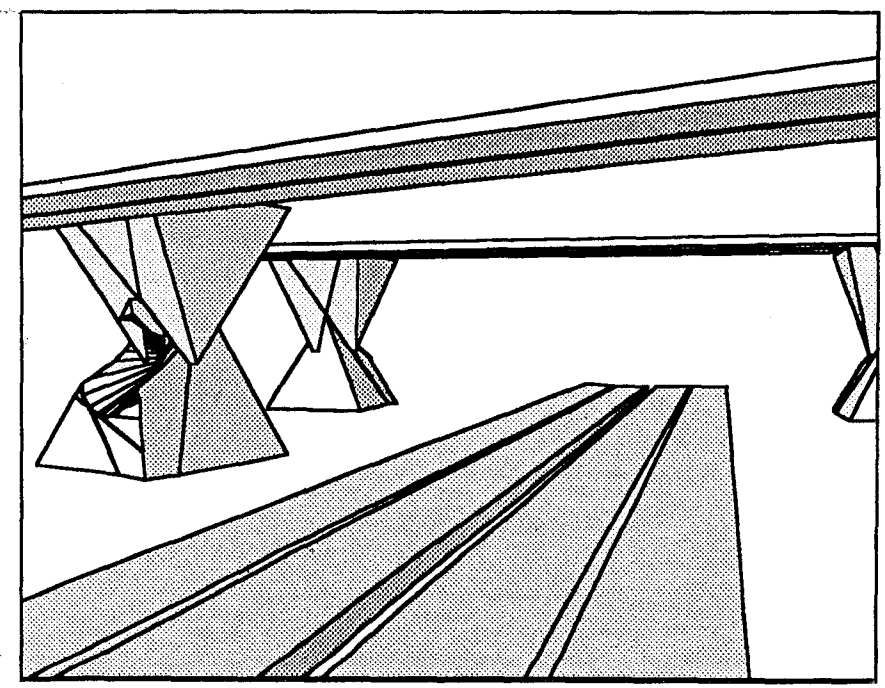


Spanning Element

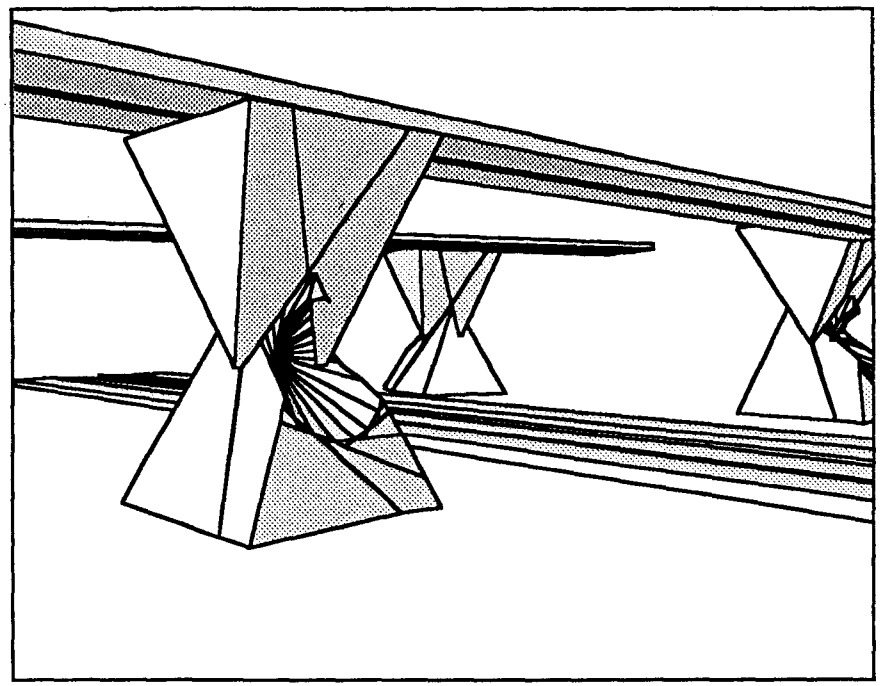
Object: **Bridge Support**

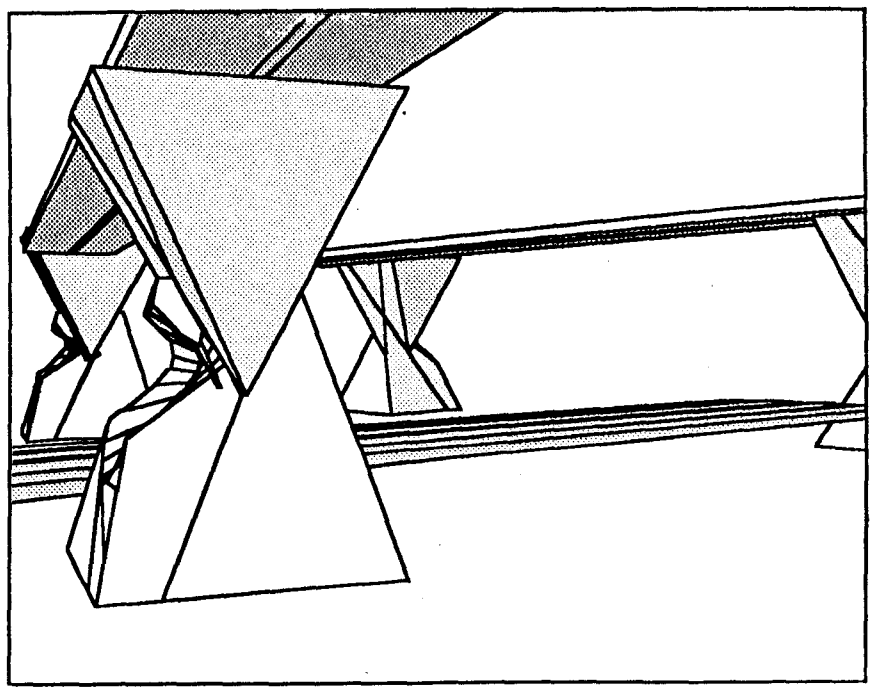
The bridge, historically, has always had as its primary purpose to cross natural depressions in the landscape. The emphasis on the techno-material aspects of bridge design left little room for a bridge aesthetic to express itself other than that expressed by the functional form. Currently, bridge design has been taken over by highly efficient computer programs that can generate a complete set of drawings once the basic load and span parameters are introduced. Unfortunately the program cannot respond to the specifics of sculptural form or aesthetics. The art component in bridge design need not change the entire bridge form or even threaten the computer generated solution. As shown in this scheme, a uniform bridge element can be supported by a variety of supports.





To reproduce the same form over and over generates a sameness that permeates our culture. The use of the cylindrical and undifferentiated column support with no capital or base suggests that a functional minimalism is at work rather than a concern for the quality of our environment. The expediency of technology has made the highway designer dependent on formula and not on the holistic image. This proposal attempts to modify the traditional concept of column by changing the formal proportions and methods of connection between the elements.

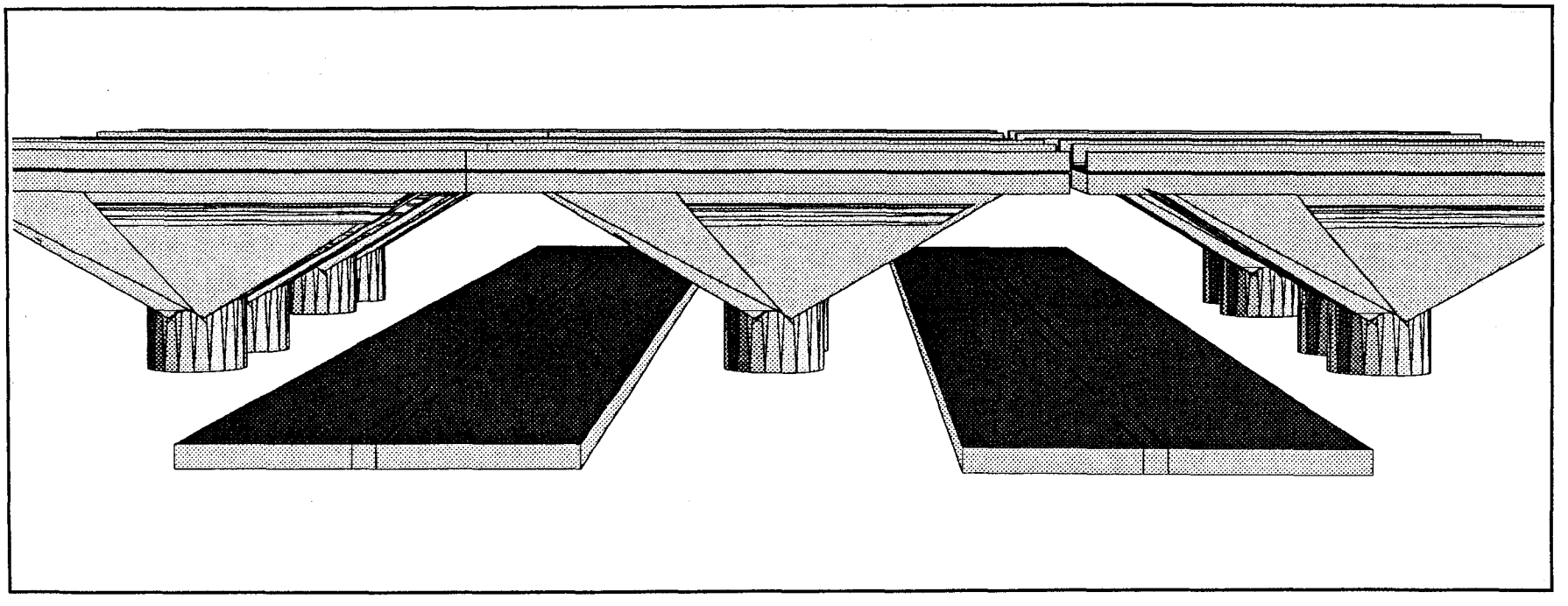




Spanning Element

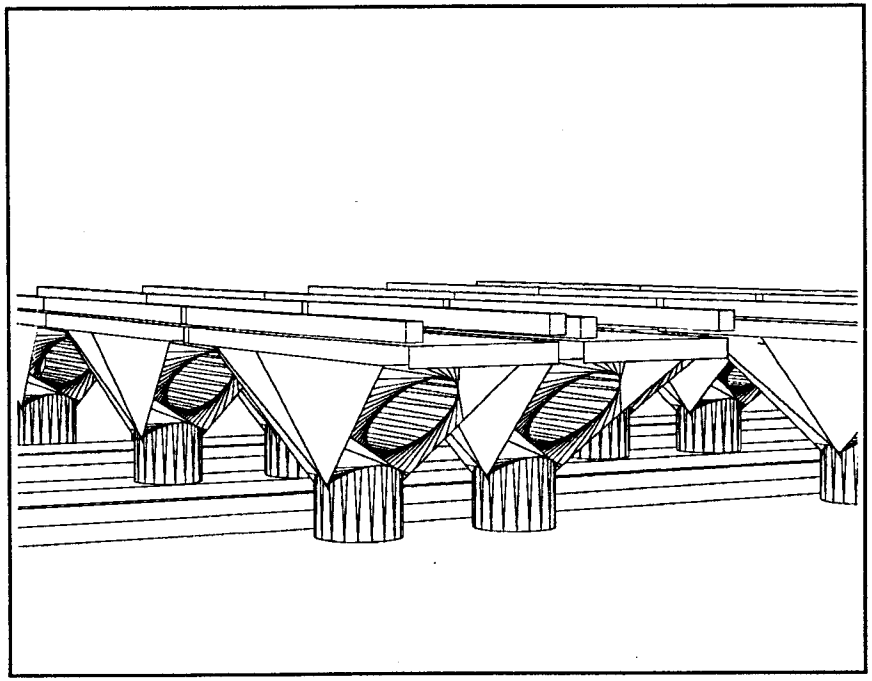
Object: **Bridge Support**

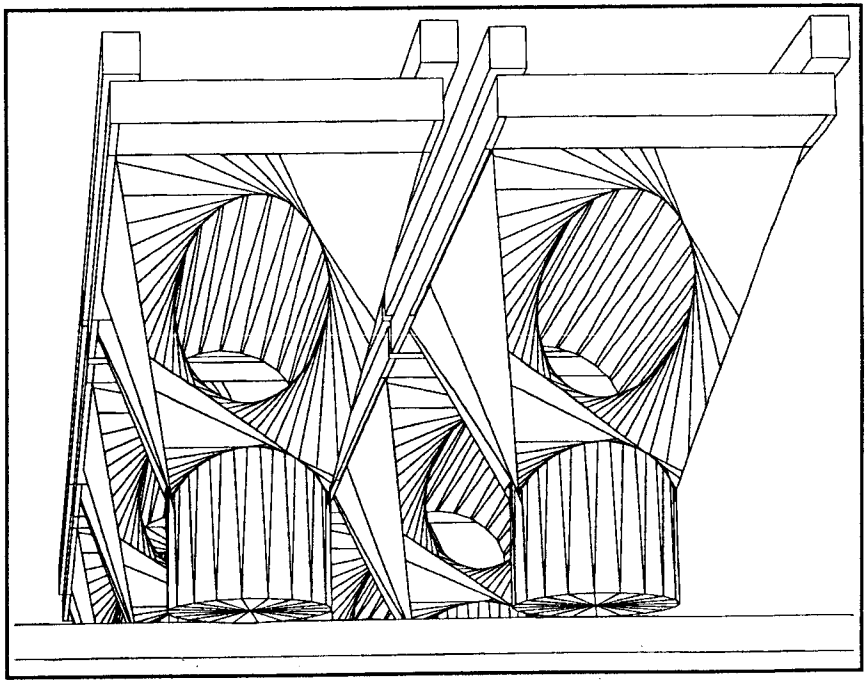
In many urban interchanges, the motorist drives through a forest of trees in the shape of bridge support columns. These columns respond to the gravity load requirements of the spans they respectively support and have little to do with the visual enhancement of the driving experience. The position role of vertical elements, such as columns or bridge abutments, is an important asset in designing the highway. The motorist, confronted with long distances, loses contact with the three-dimensional world passing by. Passing under bridge supports is one means of developing a greater awareness of the three-dimensional aspects of the roadway. By considering more than just the pure functional aspects of supporting the bridge, the highway designer can utilize the vertical elements to create the



sense of movement and space. By responding to both the functional and spatial requirements, supports may be placed in a variety of ways. Bridges on the diagonal alternating with bridges perpendicular to the highway can produce a rhythm or pattern of three-dimensionality. By increasing the width of the column beyond that required for stability can enhance the visual sense of movement.

In this scheme, over-scaled columns are placed in pairs to create a gateway to the highway beyond the bridge. The movement from one bridge gate to another establishes a spatial pattern and enhances the driver's awareness of the third dimension. The increased alertness of the driver will provide for greater highway safety as well as an appreciation for the sense of change in space.

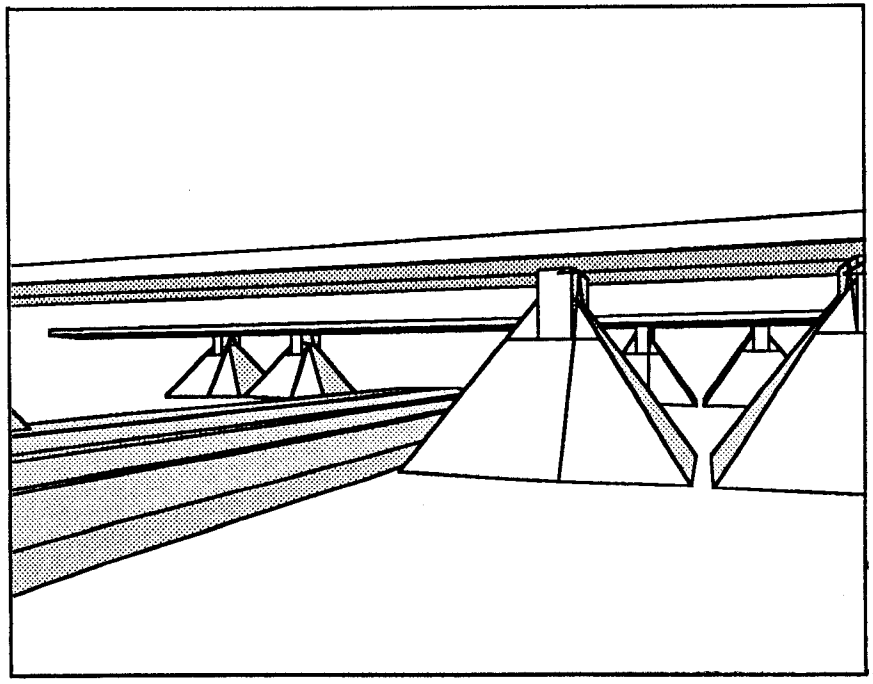


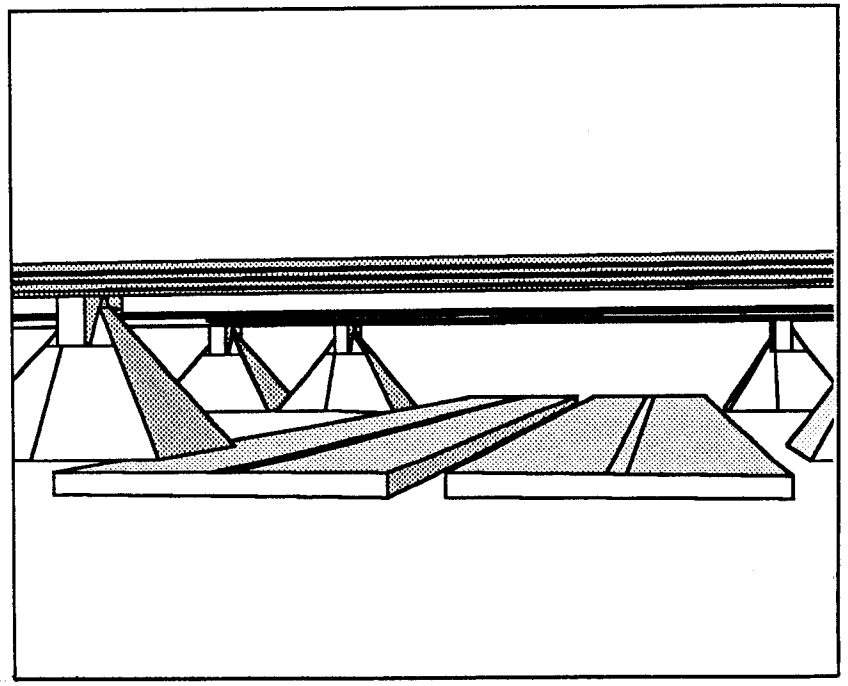


Spanning Element

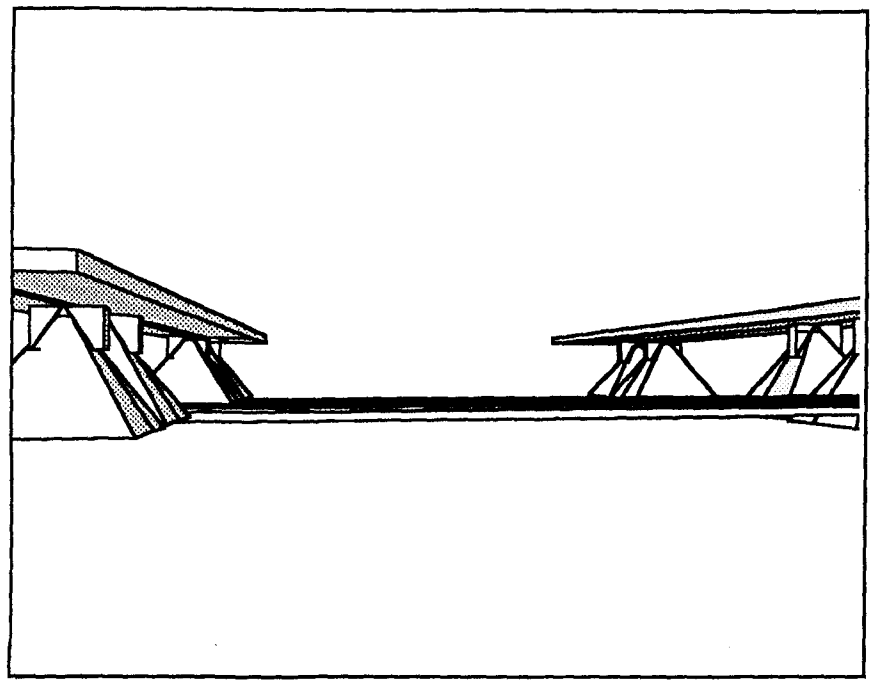
Object: **Bridge Support**

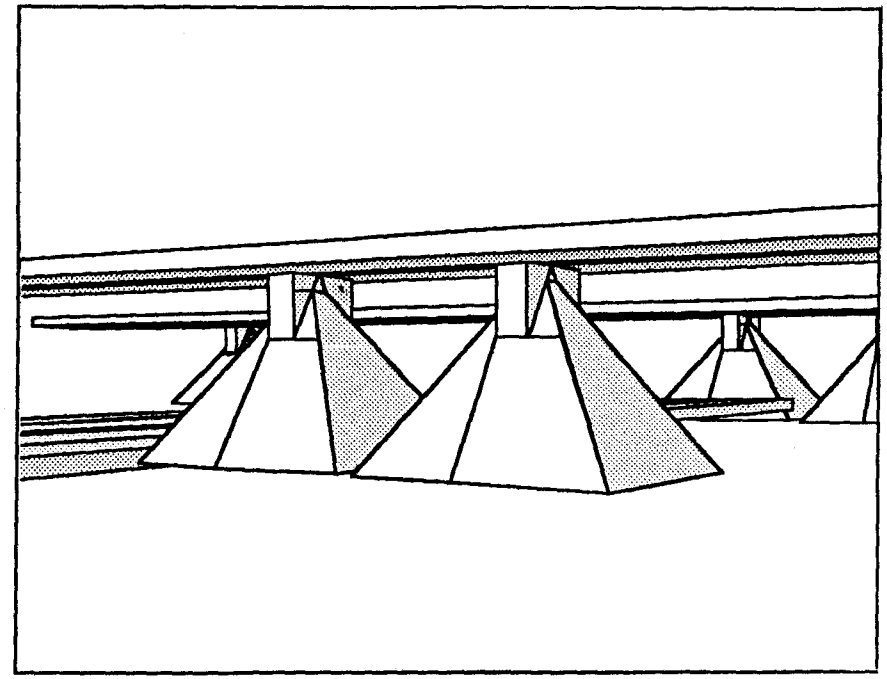
The interstate highway bridge is designed to connect two opposing sides of the highway together. The differences being one of position, elevation, form or direction. One of the great potentials of the highway bridge is that it does not need to connect equally to both sides of the road. In this sense, a difference in elevation between one lane and another could be taken into consideration in the design of the structure and the connecting roadbeds. A difference in orientation as demonstrated in this design is also a possibility. The spanning road approaches the highway from two different directions. Each direction is treated as a single bridge so that the overall effect is a series of spans at different angles and elevations to the flow of traffic.





The breakdown in the traditional perpendicularity seen on most roadways is at the heart of this design. In addition, the use of large scale column capitals, shafts and bases set at various angles to the bridge structure offer visual change to the passing motorist. These columns would be painted in a variety of colors that could be selected by local artists or design aesthetic boards concerned about the quality of the roadway environment.

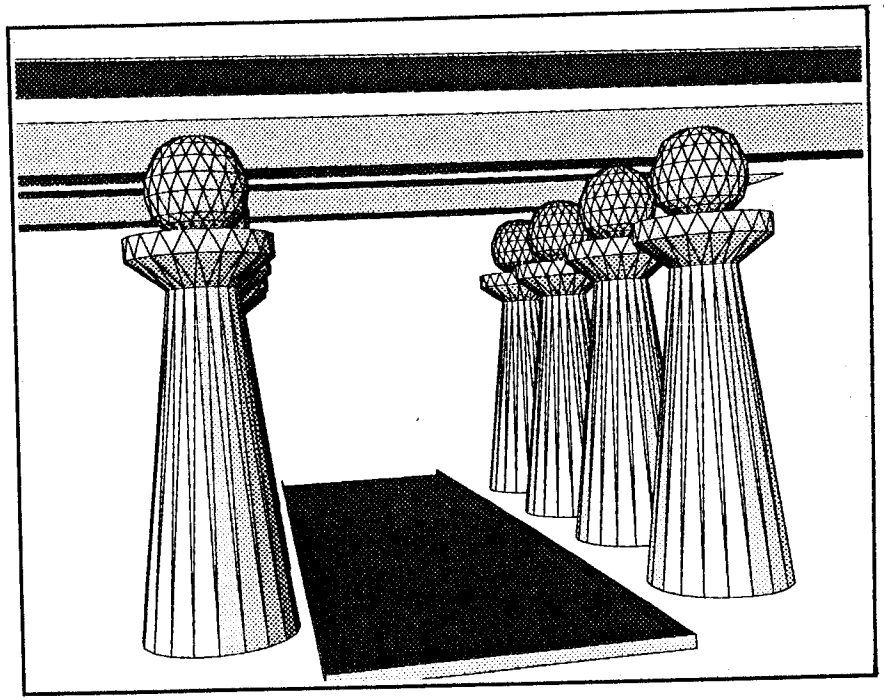


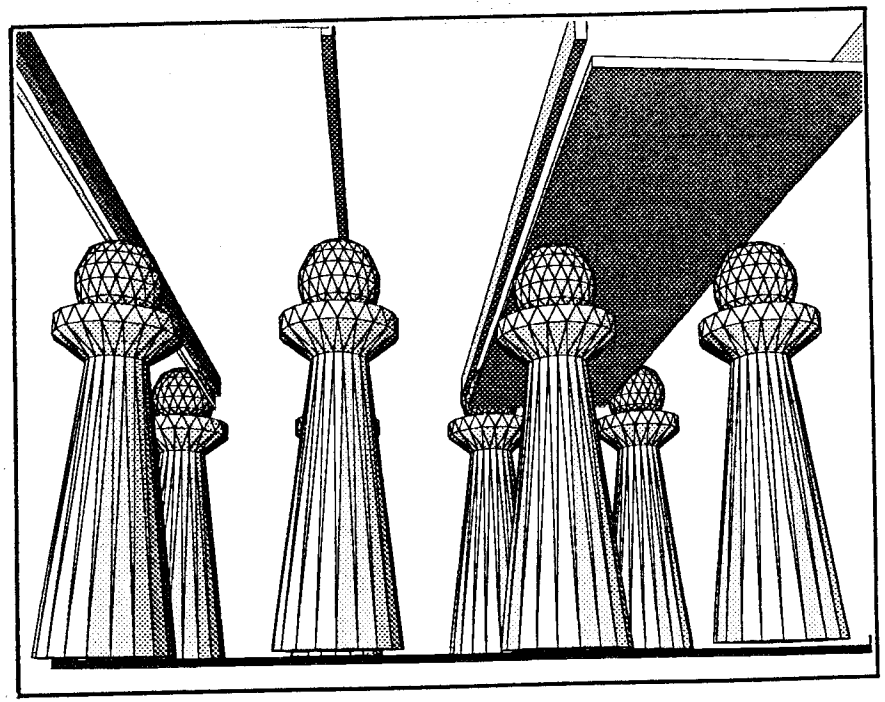


Spanning Element

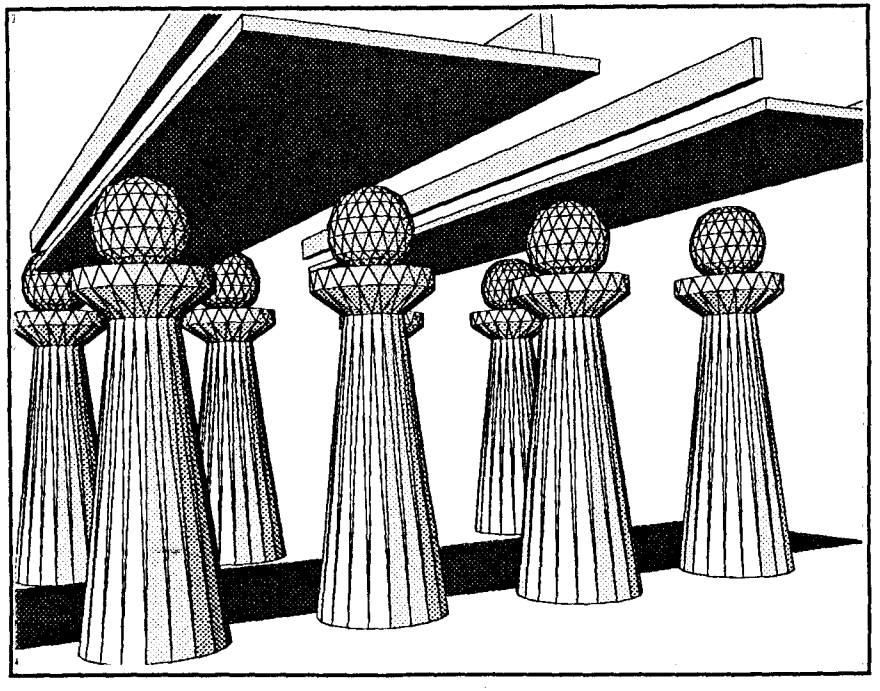
Object: **Bridge Support**

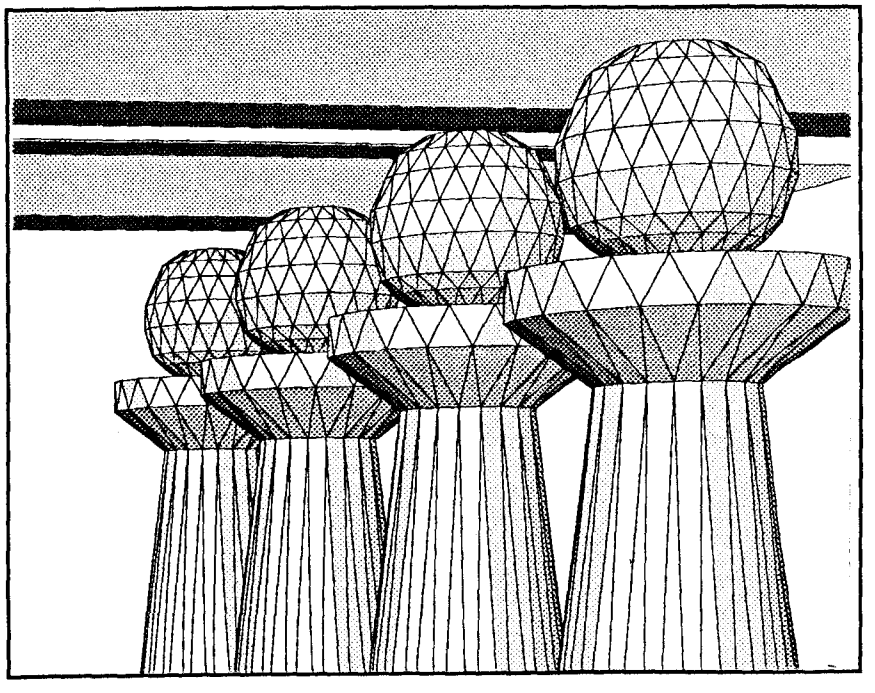
The urban highway bridge connecting the center to the highway system must be seen as part of a much larger design issue. The form of the city is not simply that dictated by the functional transportation requirements, but in conjunction with the aesthetic shape and form of the city. An industrial district may be seen as characterless even though the individual buildings may be competently design and landscaped. The low structures, surrounded by cars are often dotted over a flat landscape. While the view from the highway is considered to be important, both its advertising and its scenic value, the identity of the area is usually handled by large and ugly signs. It would be far more effective to open up the roadway so that approaches can be made legible and the bridges far more distinctive.





The urban core represents similar design concerns for the highway designer. The simple solution of placing a bridge from one edge to another avoids the design problem. In this scheme, a recessed highway passes under several bridges. By integrating lighting and a part of the visual aesthetic, the bridges take on a more distinctive quality. The large spherical supports accentuate the gravity connection while at the same time providing illumination for the roadway below. The shape of the column can be derived from the architecture of the city or from the regional culture. Roads, bridges, approaches and ramps are not simply unpleasant necessities to be maintained and kept as neat as economically possible. Roads, dams, bridges, pylons, quarries and cooling towers are magnificent objects if well shaped. They are big enough and meaningful enough to take their aesthetic and formal place in the landscape. They are part of our culture and explain the technological heritage of our civilization.

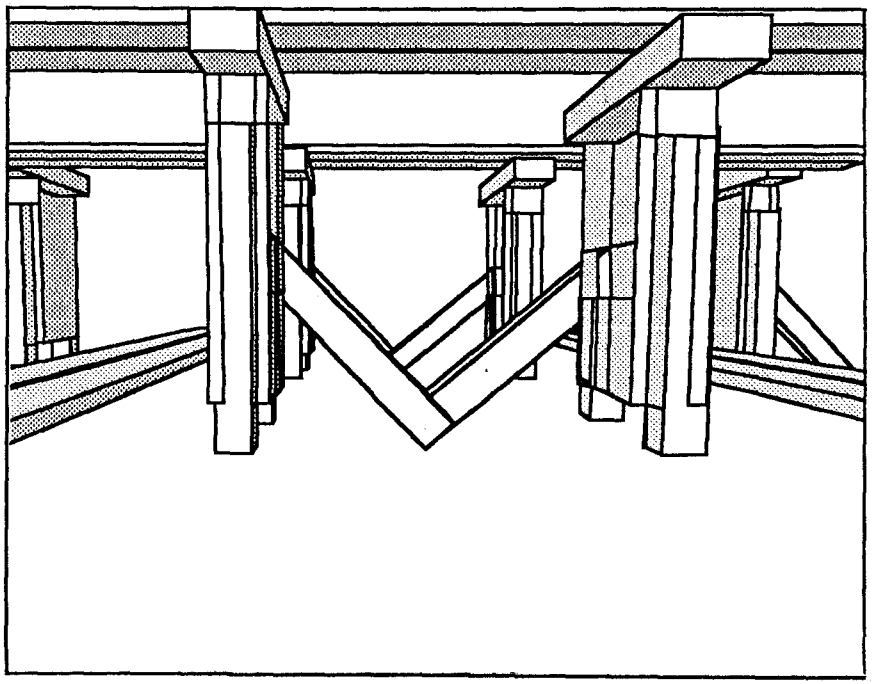


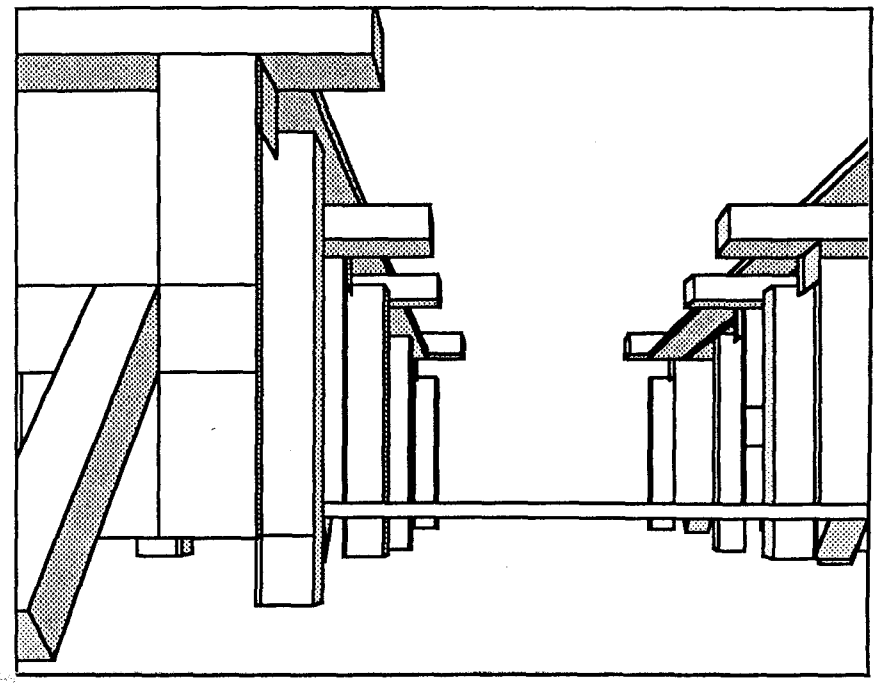


Spanning Element

Object: **Bridge Support**

Where our American landscape used to move artists, it now more often moves cars, trucks, buses and motorcycles. One of the purposes of urban design is to allow it to move both and, in addition, accomodate all our vast new construction in an aesthetically pleasing and harmonious manner. Urban design is a matter of arranging material objects and therefore it is a plastic art, concerned with how things look as well as how they operate. From this viewpoint, beauty in the cities must not be an afterthought, it is a necessity. The horizontal emphasis of the roadway and the bridge introduce a compositional element into the fabric of the city that is frequently overlooked. A bridge, a highway, ramps and underpasses must be considered as city furnishings, each with its own identity and sense of place. This

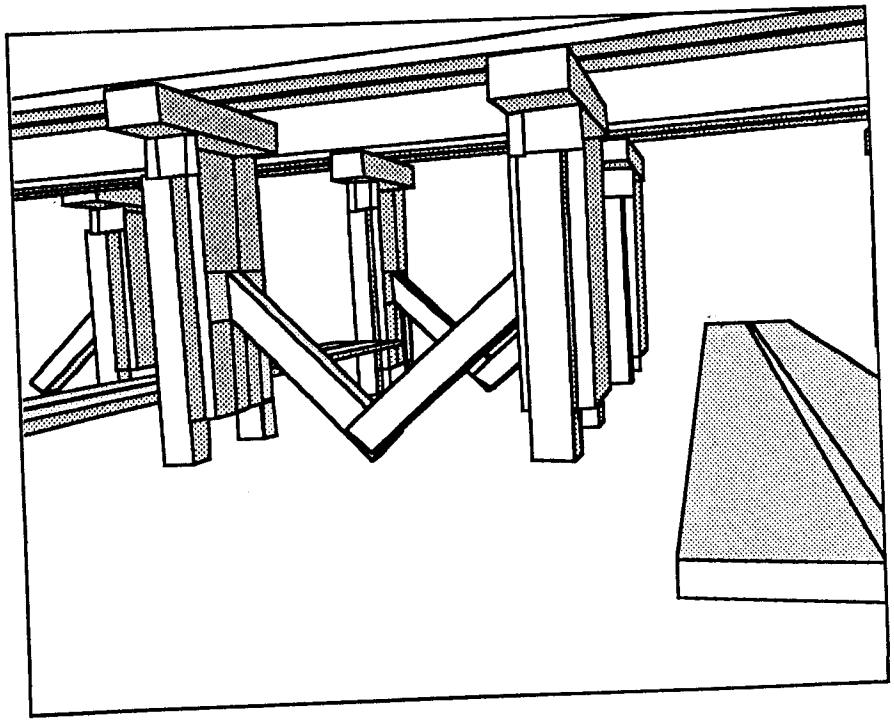


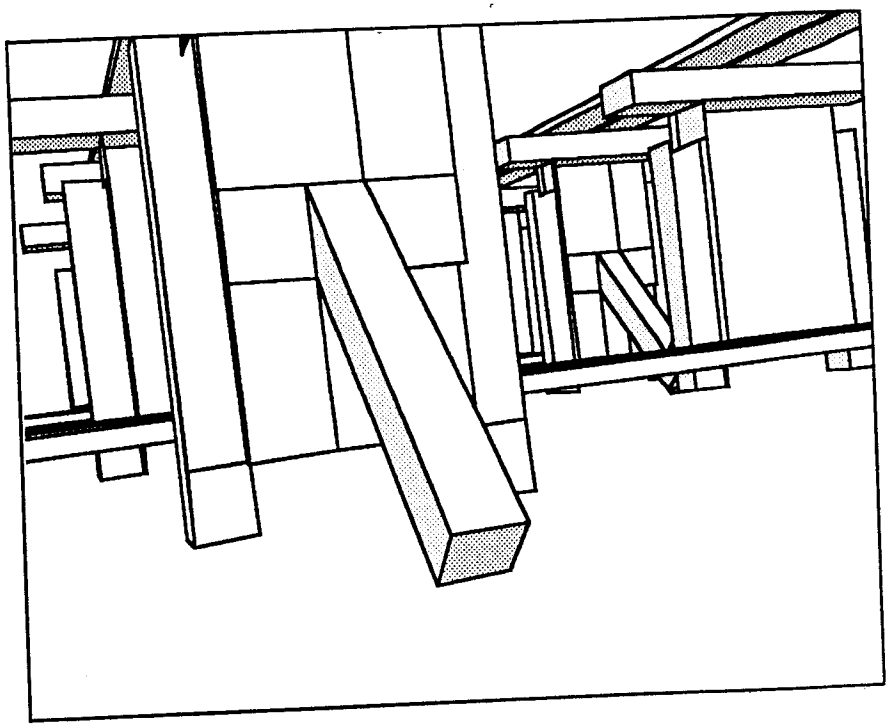


clarity of character can help in orienting the motorist to the city.

This bridge design scheme reflects the extension of the urabn grid by creating a unique bridge form for each street above. A passing motorist can quickly identify a particular area of the city through the character of the bridge and support mechanism. By using super-graphics in combination with shaped columns, the highway designer is able to develop a modulated visual sequence.

Through this approach, the architecture of the city is expressed through its street furnishings.

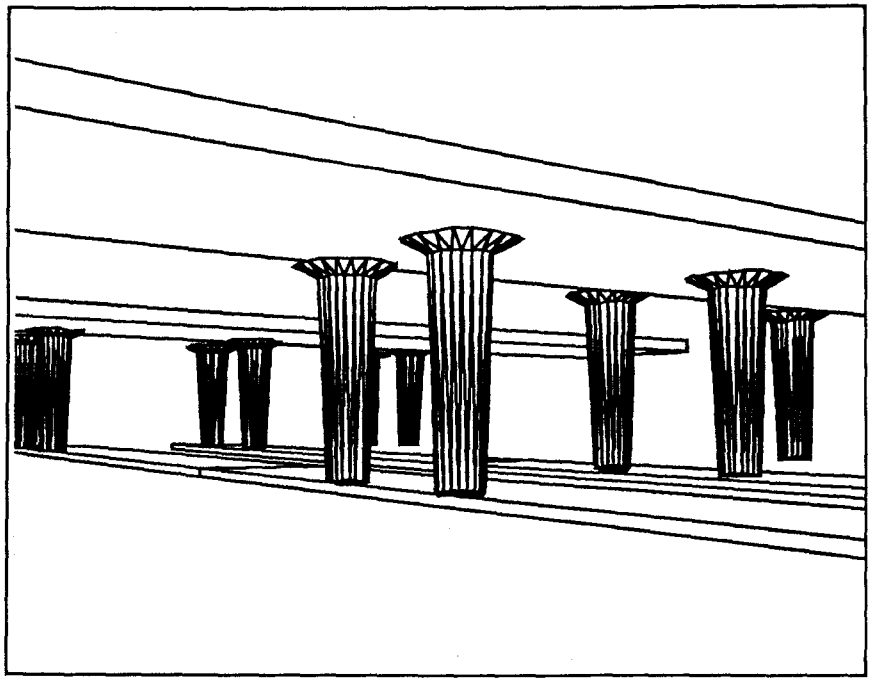


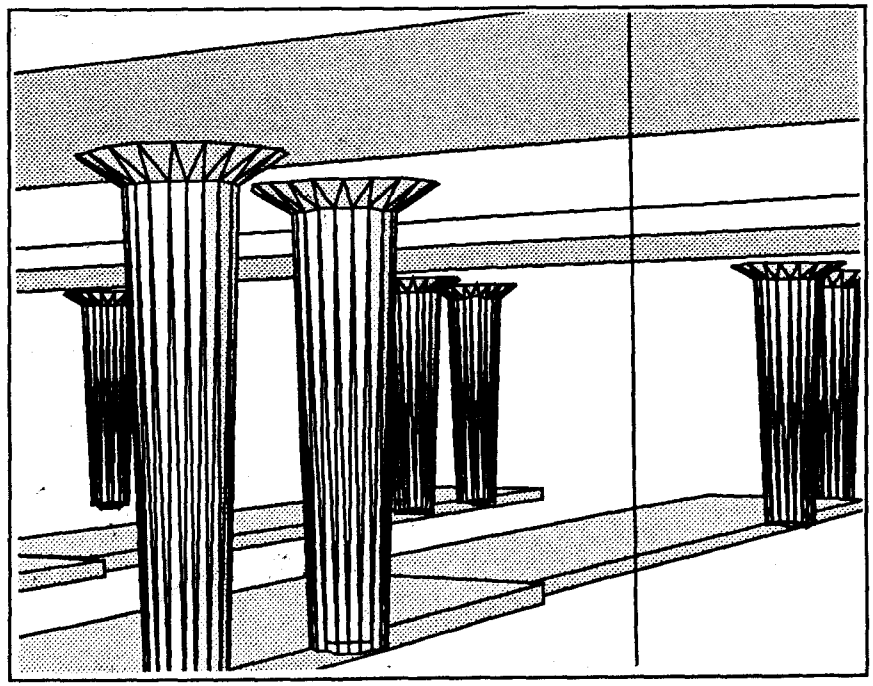


Spanning Element

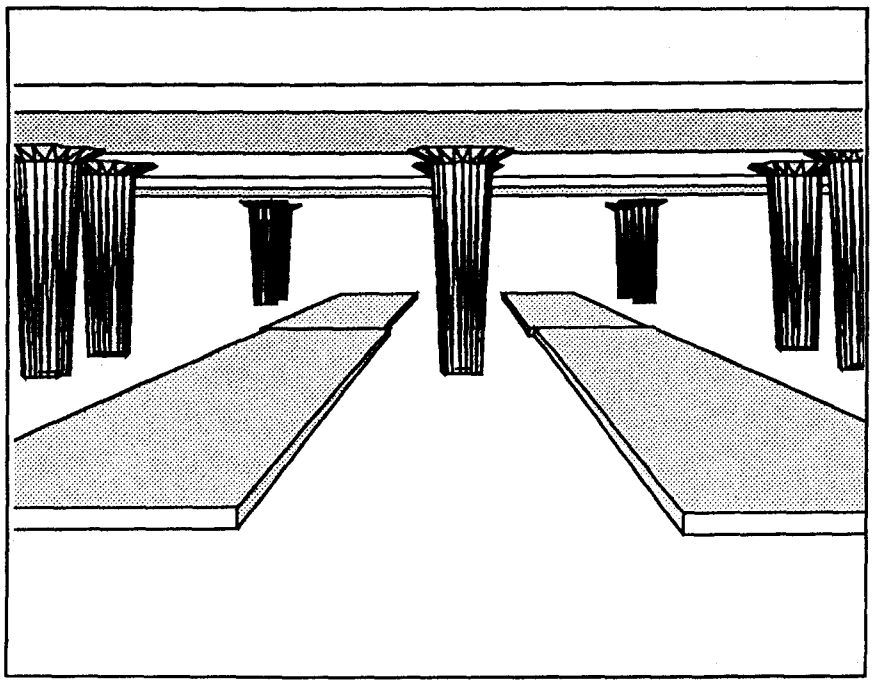
Object: **Bridge Support**

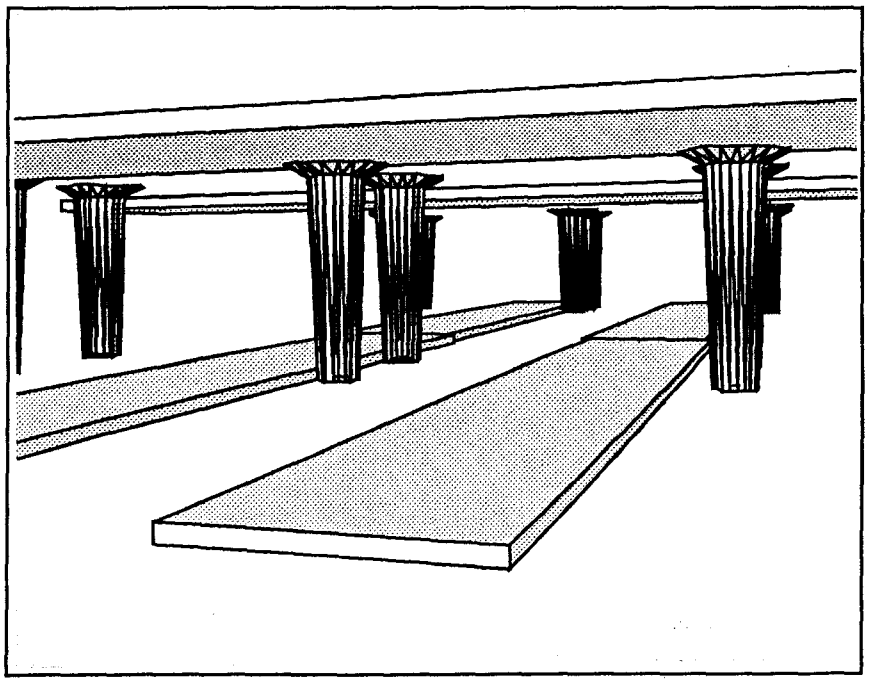
Whether located in the urban core, a residential district or in the open countryside, the highway is a symbol of cultural history.The style of the roadway reflects a specific time and place in the development of the highway system. The patterns created by the highway reflect a changing attitude about the value of the landscape. The automobile is now the predominant means of passenger transportation in this country. The interchanges between the various transportation systems represent a major problem in highway design. While design methods for alleviating highway congestion exist, pre-existant patterns of usage retard or even prohibit their introduction. The retention of highway forms and furnishings is therefore a design limitation but also represents a major challenge. The bridge and its





support mechanism must be re-evaluated along these lines of thinking. A bridge, situated in the country, may have a greater design latitude because of greater area available for construction. The urban bridge has far more design constraints due to existing traffic patterns, time and economic limitations as well as area restrictions. This proposal is designed around a modular prefabricated bridge system manufacture from factory cast reinforced concrete. Systems such as this can be introduced into the highway infrastructure with a minimum of disruption. Using small scall interlocking pieces, properly connected to an existing foundation, a prefabricated bridge system could fundamentally alter the bridge aesthetic while at the same time reducing the overall unit cost. This approach moves away from the more traditional custom construction procedures while maintaing a high degree of design flexibility.

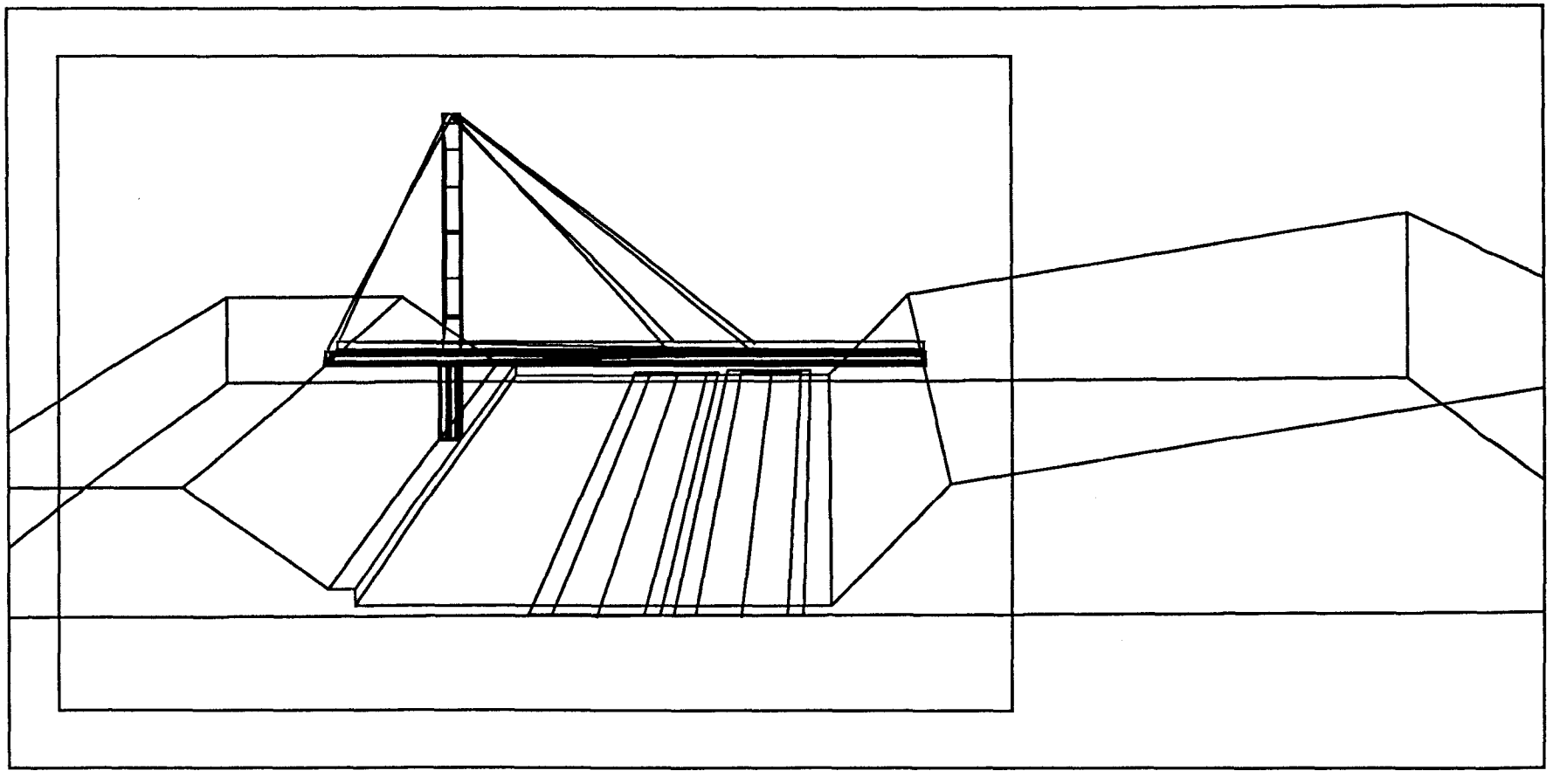




Spanning Element

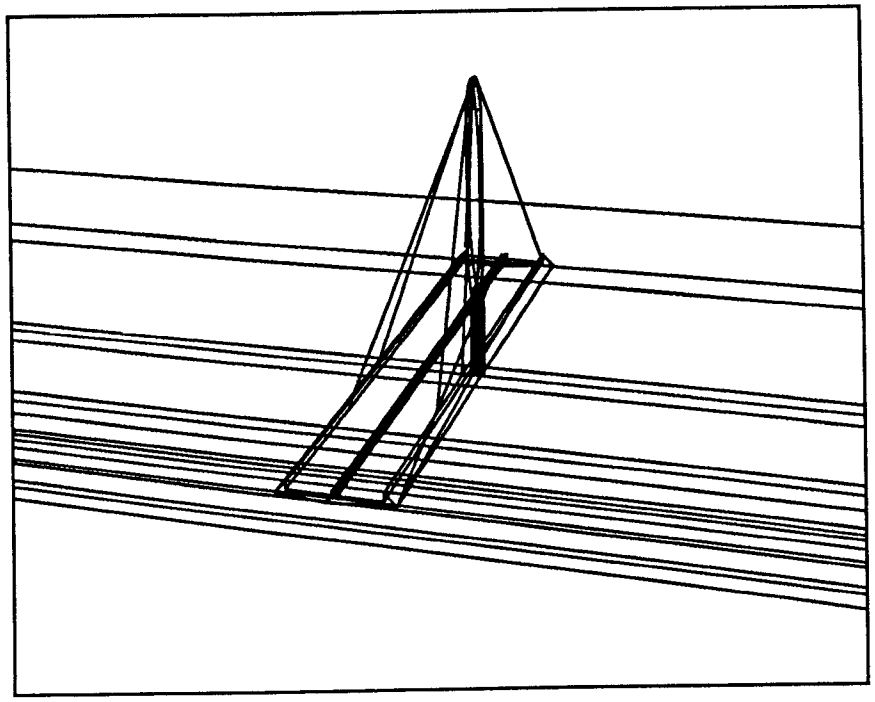
Object: **Single Pole Suspension Bridge**

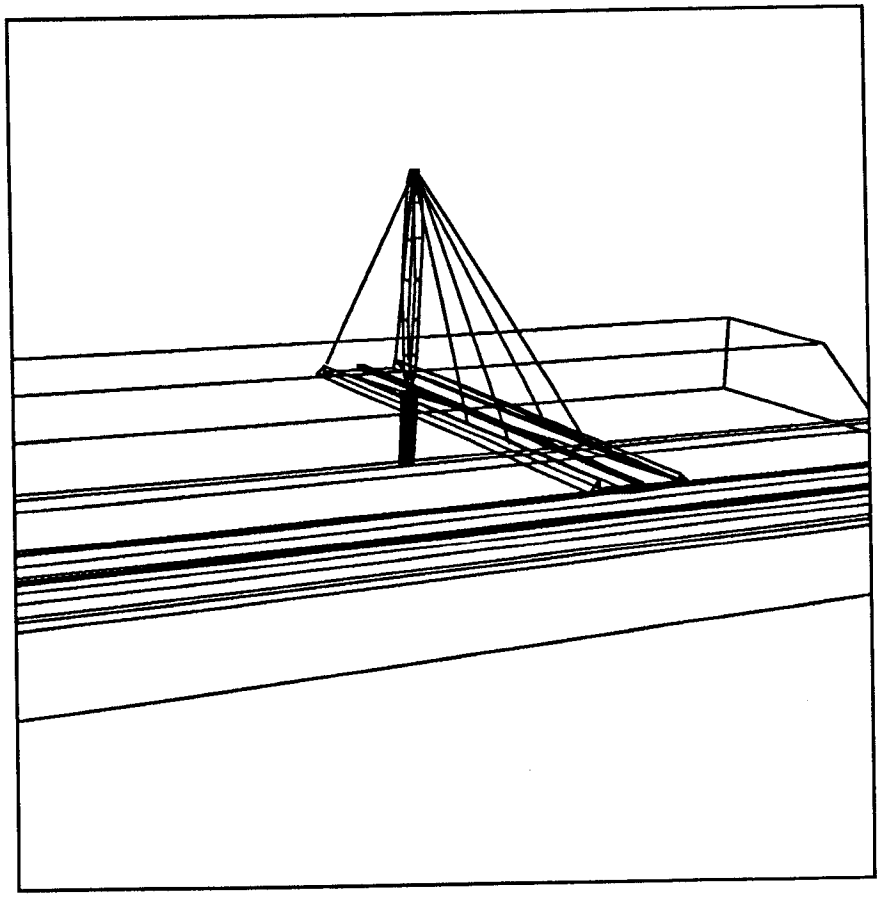
The role of the material is important to the nature of the spanning element. A single span requires a different support system, reduced material and gravity load transfer compared to a multiple span bridge system. This difference may be articu-



lated in a variety of ways.

One particular way is to use a single pole suspension system with a cable stayed bridge support system. The appropriateness of this type of system depends on the span requirements in terms of distance, gravity load support, soil conditions for foundations and environmental constraints affecting the immediate area. The single mast provides a focal object for the driver and contributes to the overall aesthetic of the roadway as a major sculptural element. The suspension cables, in contrast to the horizontal bridge element create a diaphanous web over the roadway which can act as a visual screen for the surrounding area.



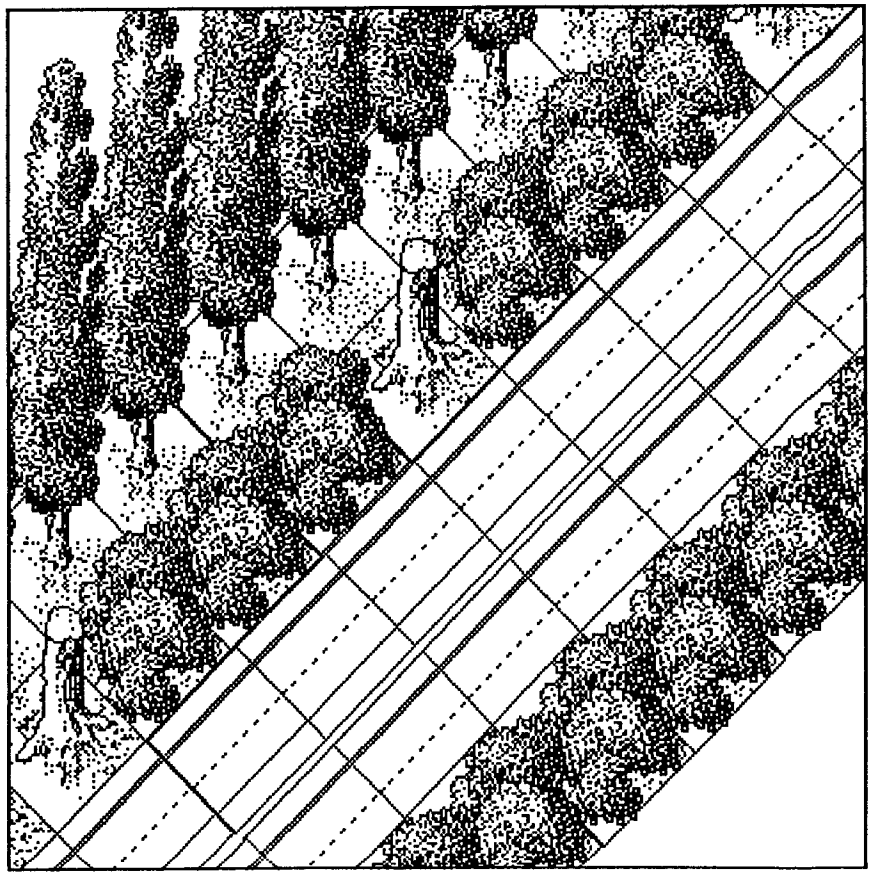


Gate Elements

The transition from one part of the nation to another via the interstate highway is a gradual or staged process. The awareness of location of the vehicle along the roadway, depends on signage, topography and a good road map. So much of the roadway appears to be the same that sense of movement is measured in hours rather than in miles. Hours traveled from point to point becomes the measure of movement and speed. The demarcation of the landscape into cultural or historical zones is almost non-existent. The sameness of the highway experience renders the trip to a singular uniformity of place where any distinguishing features are lost. Certain landmarks and natural features defy eradication from the landscape but offer little information to the motorist as to vehicular movement. Distinguishing features spaced at irregular intervals can offer the motorist a sense of movement through space.

This section introduces a design idea that extends the role of signage far beyond the two-dimensional display. The concept of "gating" the driving experience is the theme of this section of the handbook. Using "gates" to demarcate regions, events, exchanges or one state from another meets the functional needs of the driver while at the same time, increasing the aesthetic content of the highway.

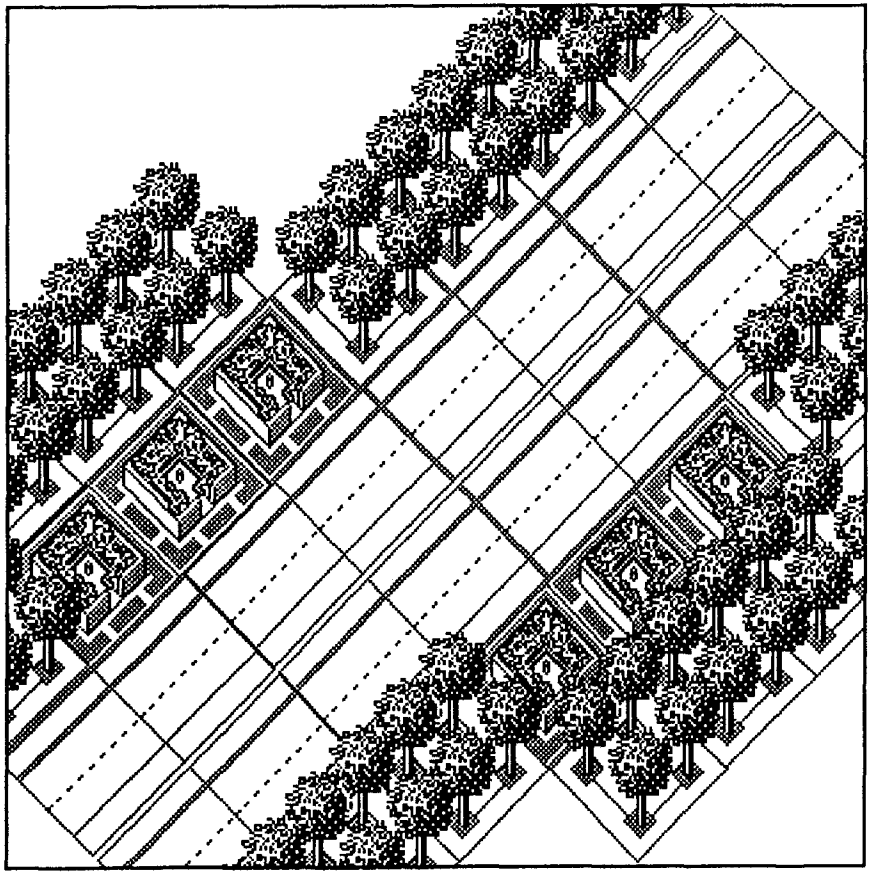
Sculptural elements in the form of tree stumps placed along the roadway add interest.



The toll plaza or rest area are typical forms of gates scattered along the highway. Their primary purpose is to meet the functional needs of income generation, refueling and rest. The movement from one state to another, often denoted by a small "Welcome" sign, is the them of one of the proposed projects. Using the state line as a major spatial event or happening, a super-scaled portal or gate would be placed across the roadway. The gate would generate the same visual interest as the St. Louis arch generates for the crossing of the Mississippi River.

Other projects contained within this section are designed to announce the arrival or departure from geographical areas such as: natural geological formations, land bank or conservation areas, metropolitan or regional zones, and local, regional or national landmarks. The portal element can be designed to provide a unique character or identity to the entry into Canada or Mexico or to announce the entry into the Alaskan Highway. Specially marked national routes could be reinforced with portals highlighting aspects of the landscape. While the possibilities are almost limitless, the role of the gate or portal must be seen for what it is - a focal point on the landscape. The gate is merely an entry point to the discovery of the beauty of the natural landscape.

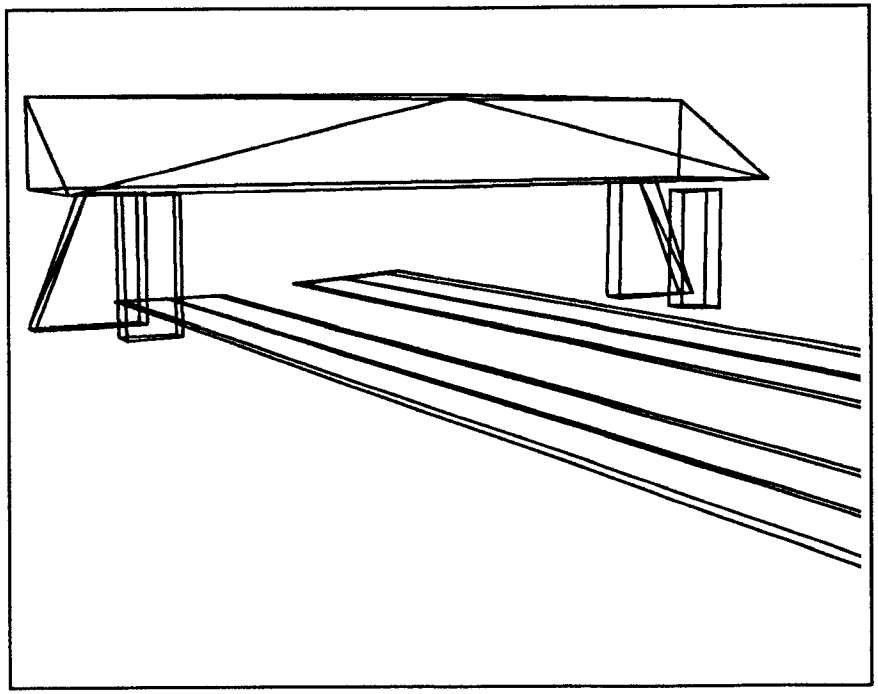
Sculptural forms in combination
with trees can provide a better definition of edge.

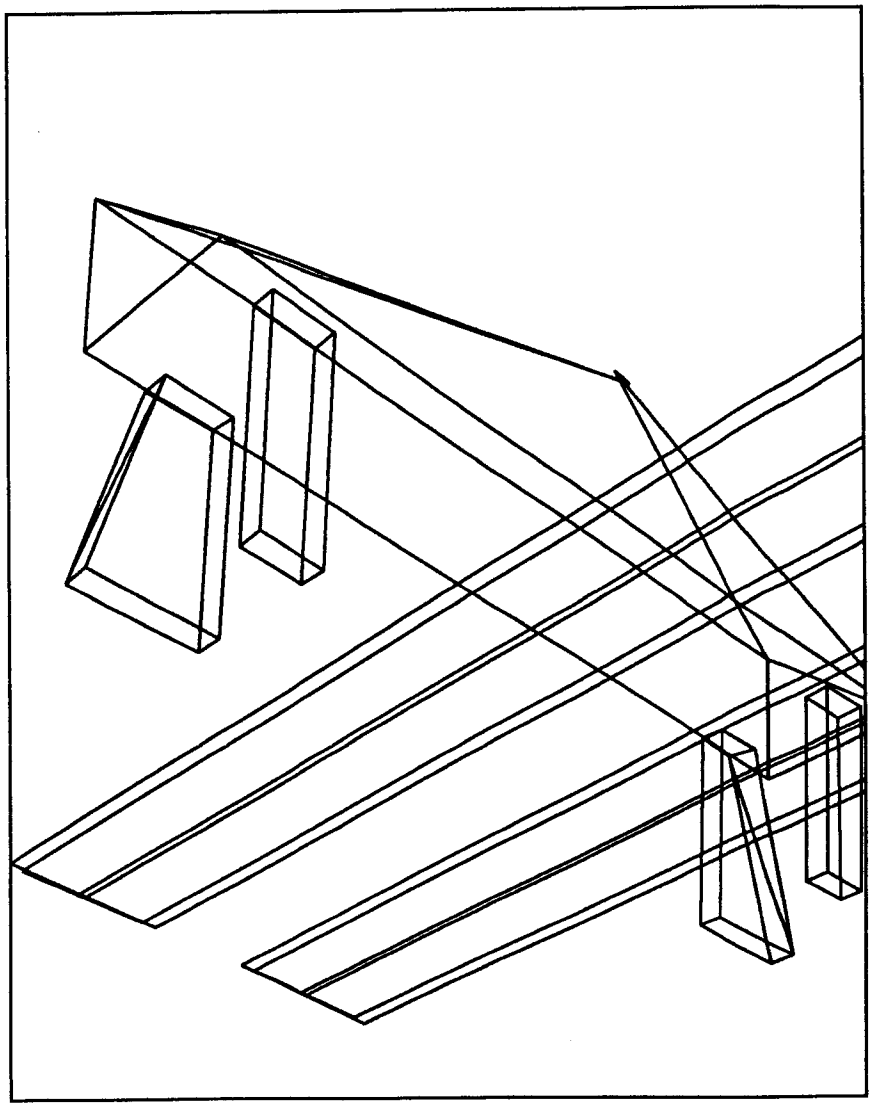


Gate Elements

Object: **Entry Portal**

The triumphal arch has performed a major role in the articulation of the highway. Used extensively throughout the Roman Empire, the triumphal arch symbolized the power and the glory of Rome while at the same time providing a defined entry into

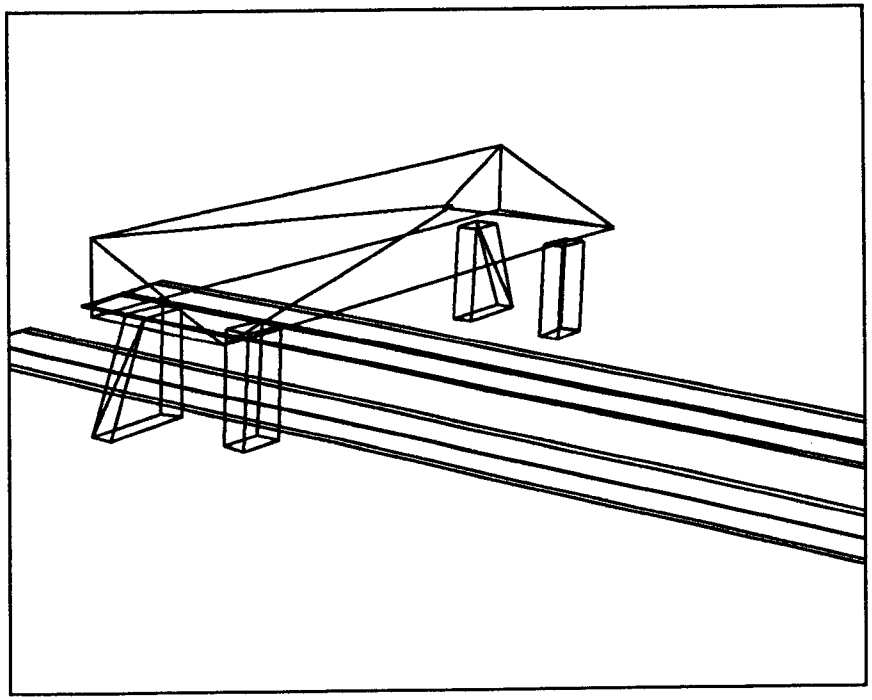


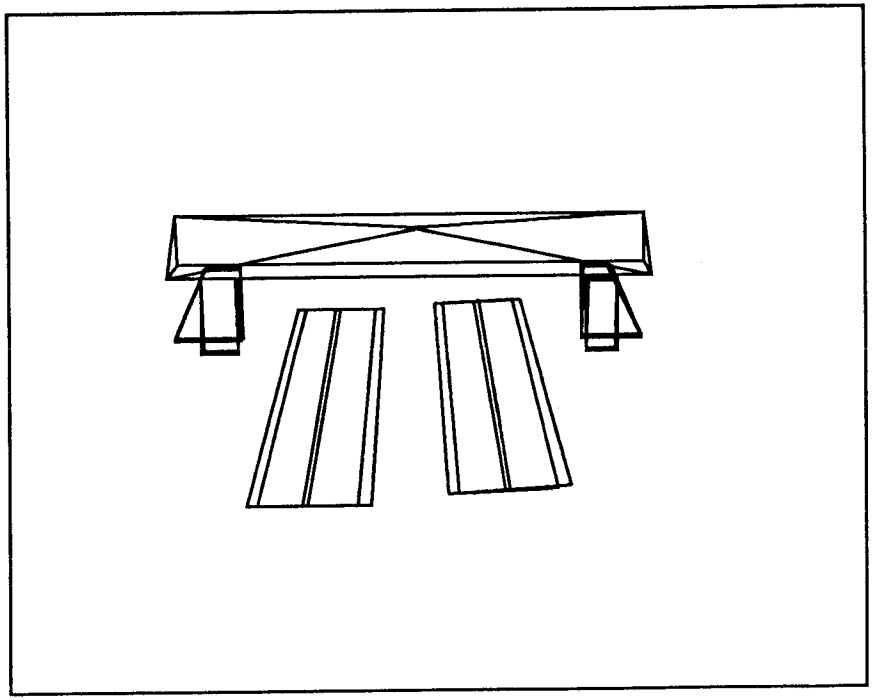


the City of Rome. The placement of the arch at each of the gates of Rome, complete with inscriptions, suggested the breadth and depth of the empire. Each gate, therefore, became a recording of what had passed through over a period of time.

In this proposal, a triumphal gate is placed at the various entry points to the city. Each highway artery that enters the core would have a triumphal gate dedicated to that particular location or a specific cultural aspect of the community or region.

Each gate is designed to span the highway with a pedestrian walkway connecting two rest areas at either end. The gate, constructed of light-weight steel has an illuminated electronic signage system built into the structure. Each gate would have a different character, such as height, shape, structure, scale and color, in order to stress the various orientations into the city center.

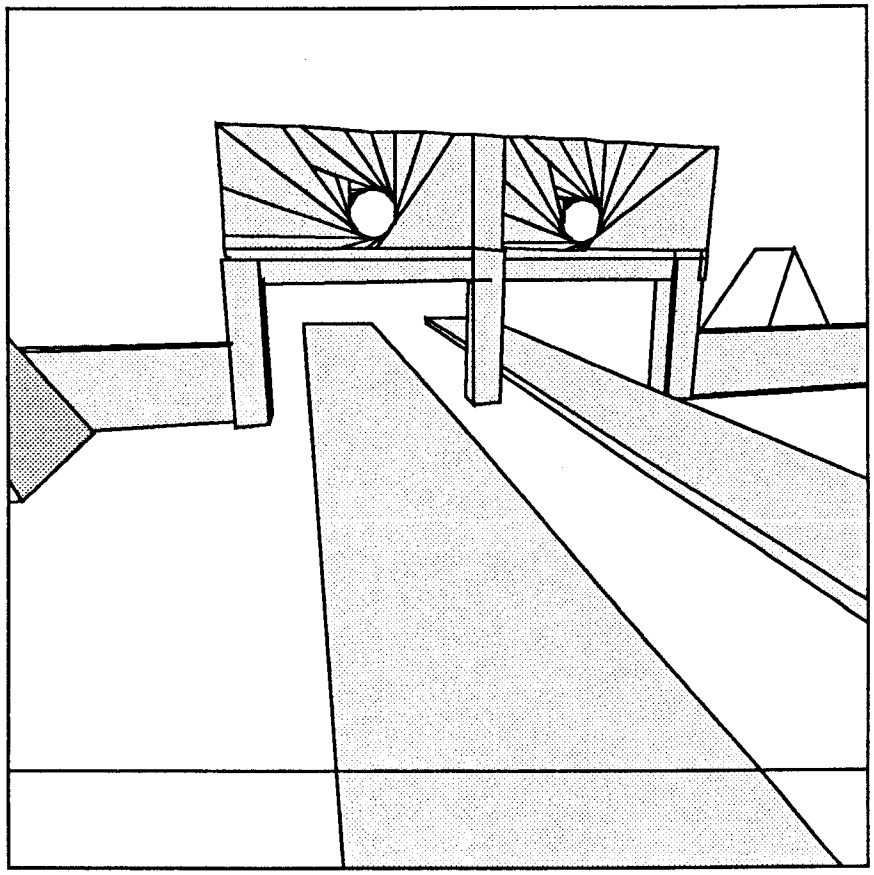


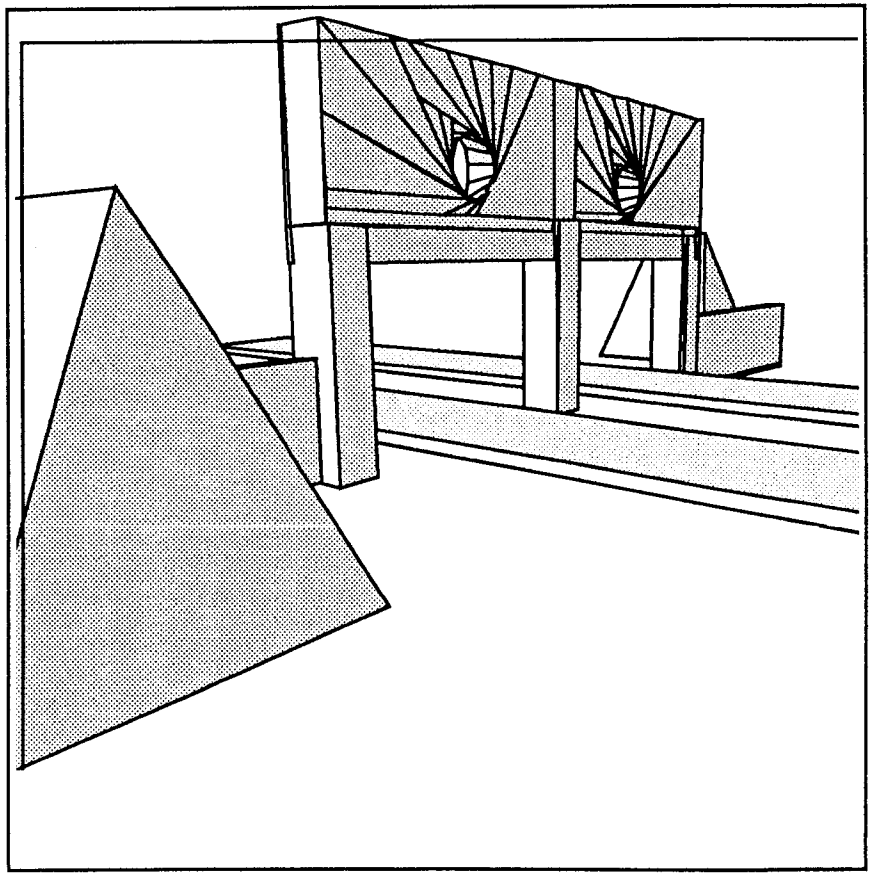


Gate Element

Object: **Triumphal Gate**

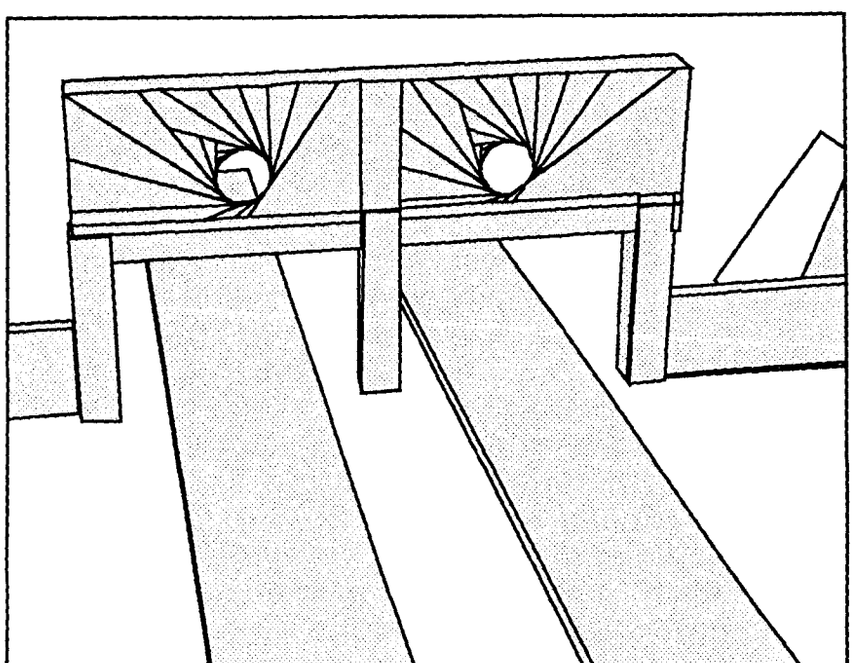
The St. Louis Arch, designed by the architect Eero Saarinen, has become a national landmark in a relatively short period of time. Its placement along the Mississippi symbolizes a gateway to the West while also providing a sense of place to the City of

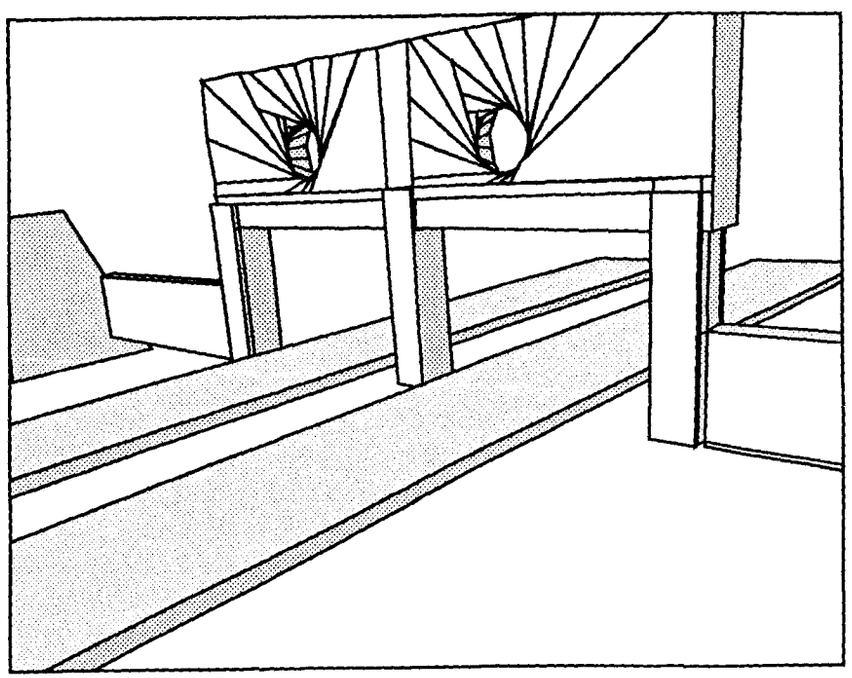




St. Louis. The arch represents an entry or exit between the states of Illinois and Missouri.

The establishment of territories which later became states is the basis for this design proposal. The state line, traditionally seen as simply a small welcome sign or merely a change in the texture of the highway pavement, becomes celebrated as a major event through the placement of an arch or gate form that spans the highway along the state line proper. Since the gate could represent the contiguous states, each facade could provide a different story. The symbolic entry from both sides acts as a means of reinforcing historical, cultural and regional boundaries through the geo-political placement of the gate. The gate therefore acts as an intermediary between the states and can assume landmark status not unlike that of the St. Louis Arch.



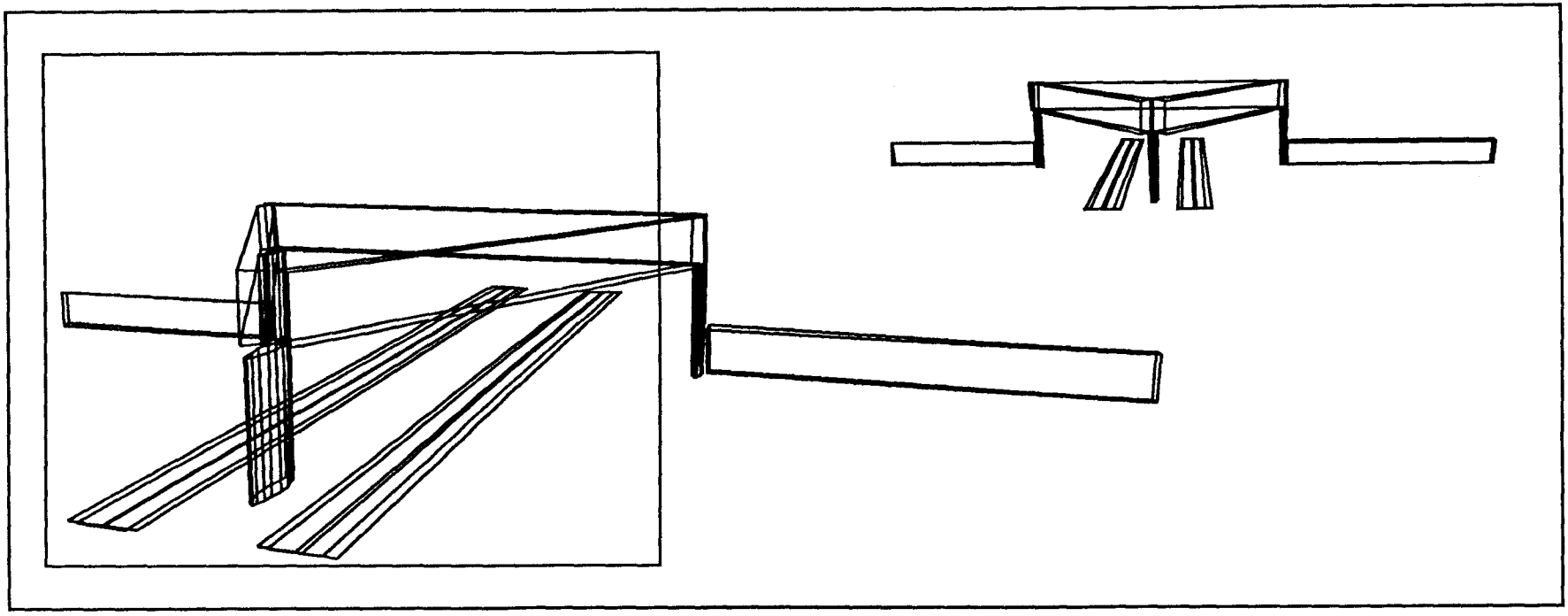


Gate Element

Object: **Triangular Portal**

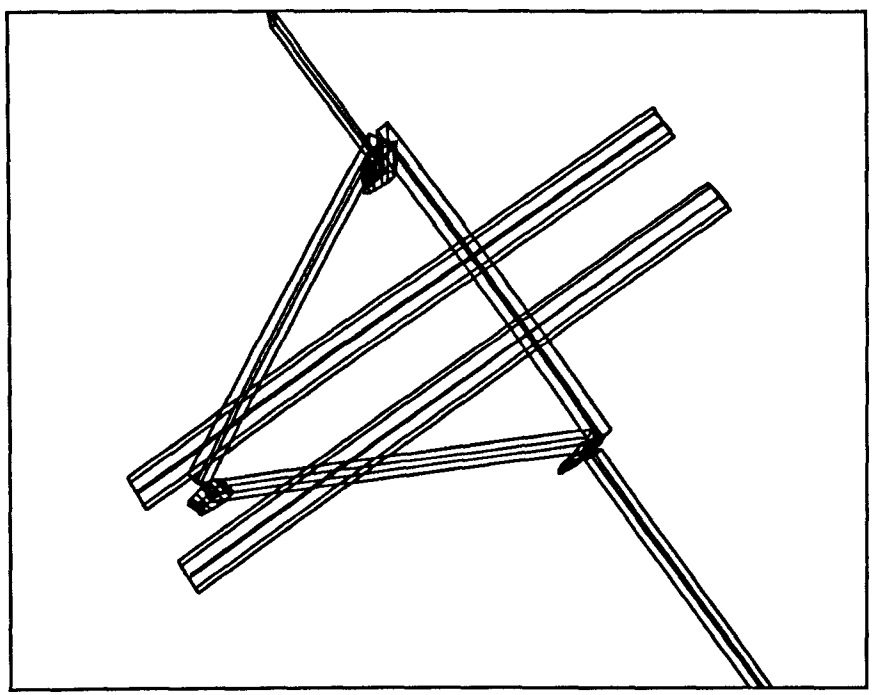
The use of highway furniture has been limited to a very narrow palette. Toll booths, signs, guardrails, markers, ramps, bridges, lighting and abutments comprise the majority of elements used in the design of the highway. The furniture, while suited to its particular task, has proven to be quite uncomfortable and awkward in its placement. One major criticism has been that the furniture has not fit its particular task as well as it should. Through a re-evaluation of design requirements, highway furniture can become better integrated and an aesthetic part of the highway environment.

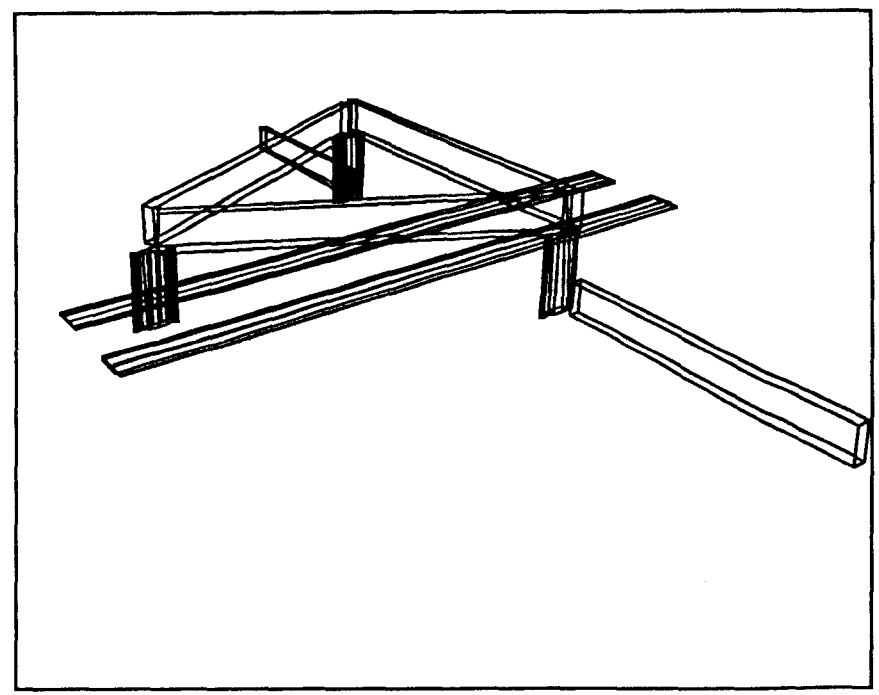
This design proposal is for a toll booth plaza. The views suggest that a dominant feature is the three-dimensional enclosure of



the plaza. The scale can vary accordingly, but the most important aspect is providing a specific spatial signature for each plaza. The sameness and repetitive quality of the toll booth plaza makes it difficult to locate the position geographically. As a result, each toll plaza is an identical experience.

Using closed or open geometrical systems such as the circle, square, triangle, rectangle and oval, a unique spatial signature can be developed on a state by state basis. The interstate highway system represents more than just a transportation system, it is a daily experience in a majority of our lives, and as such, the furniture should fit and enhance the highway experience.

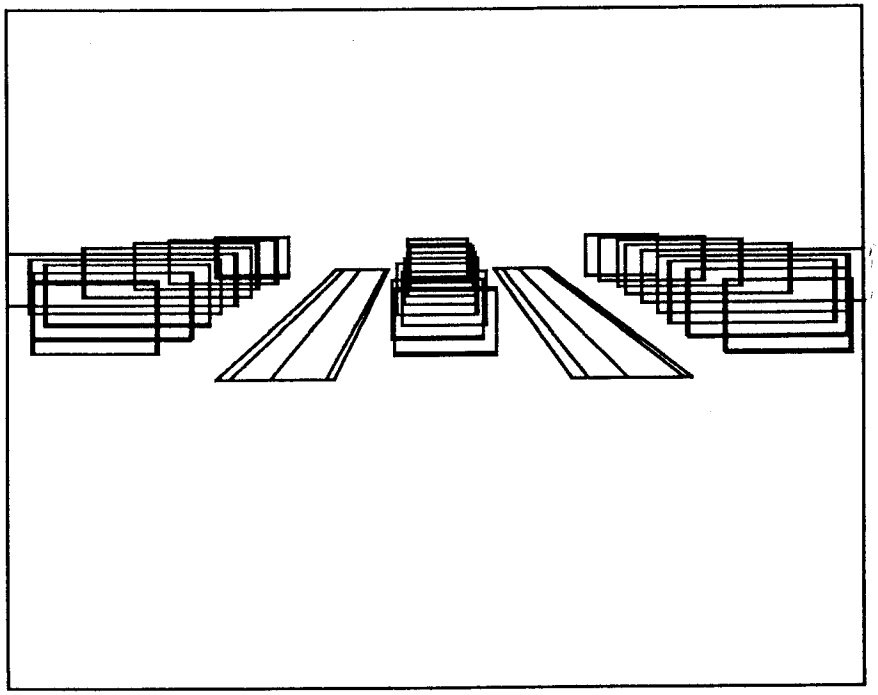


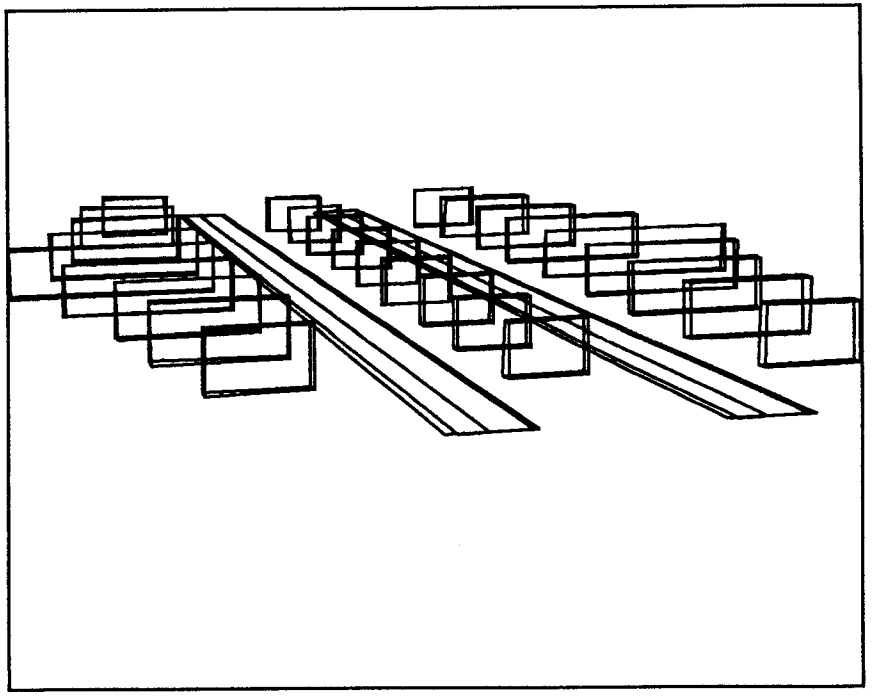


Gate Element

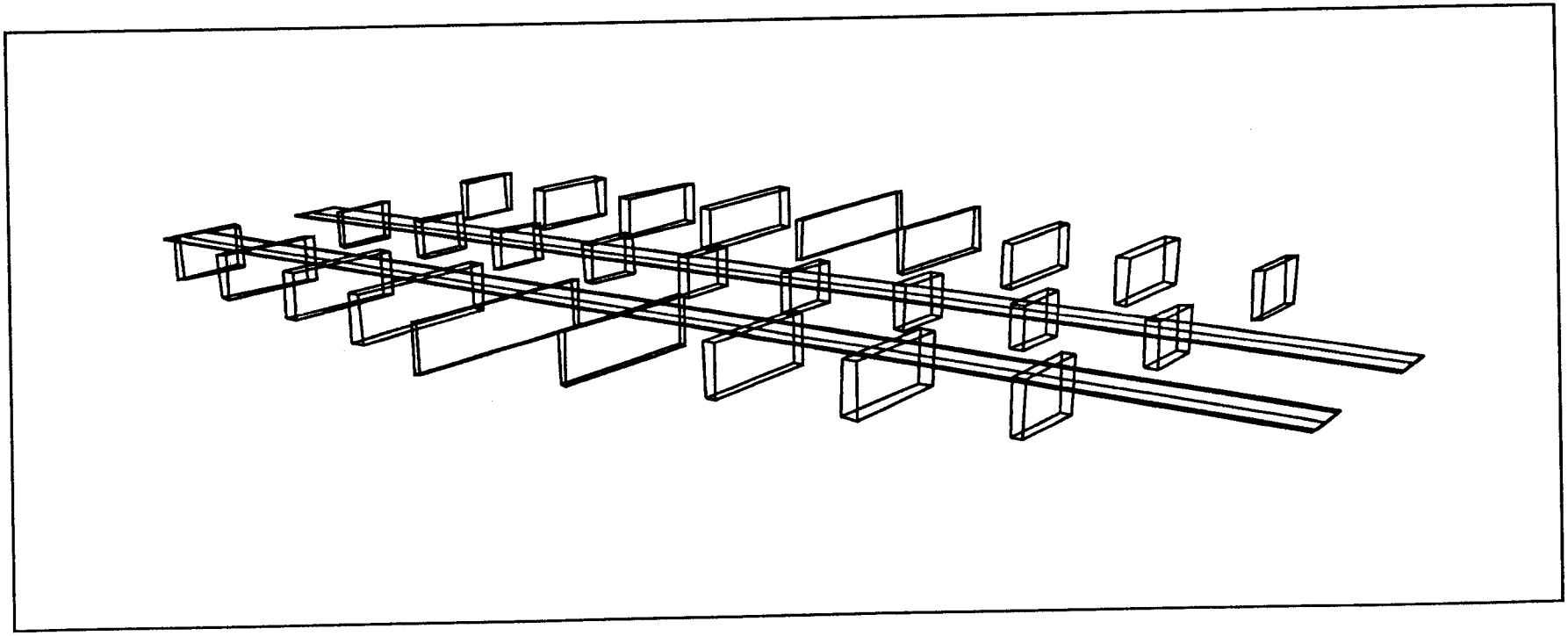
Object: **Sequential Planar Gate**

Travel through the city creates a sequence of visual experience. The sequence is a moving encounter with the environment. The vertical city scale combined with a narrow field of vision creates a heightened awareness of movement and changing vista. Each experience is relative. The experience of the sequence may be enjoyed purely as a sensuous dialogue with the environment or it may be used to glean information about the city, its structure and meaning. The rural highway traveller does not have the same visual sequence to experience. The extended horizontality of the landscape combined with the monotony of the route creates a relaxed and sometimes dangeous atmosphere for the driver. The prolongation or repetition of any experience brings forth the need for change.





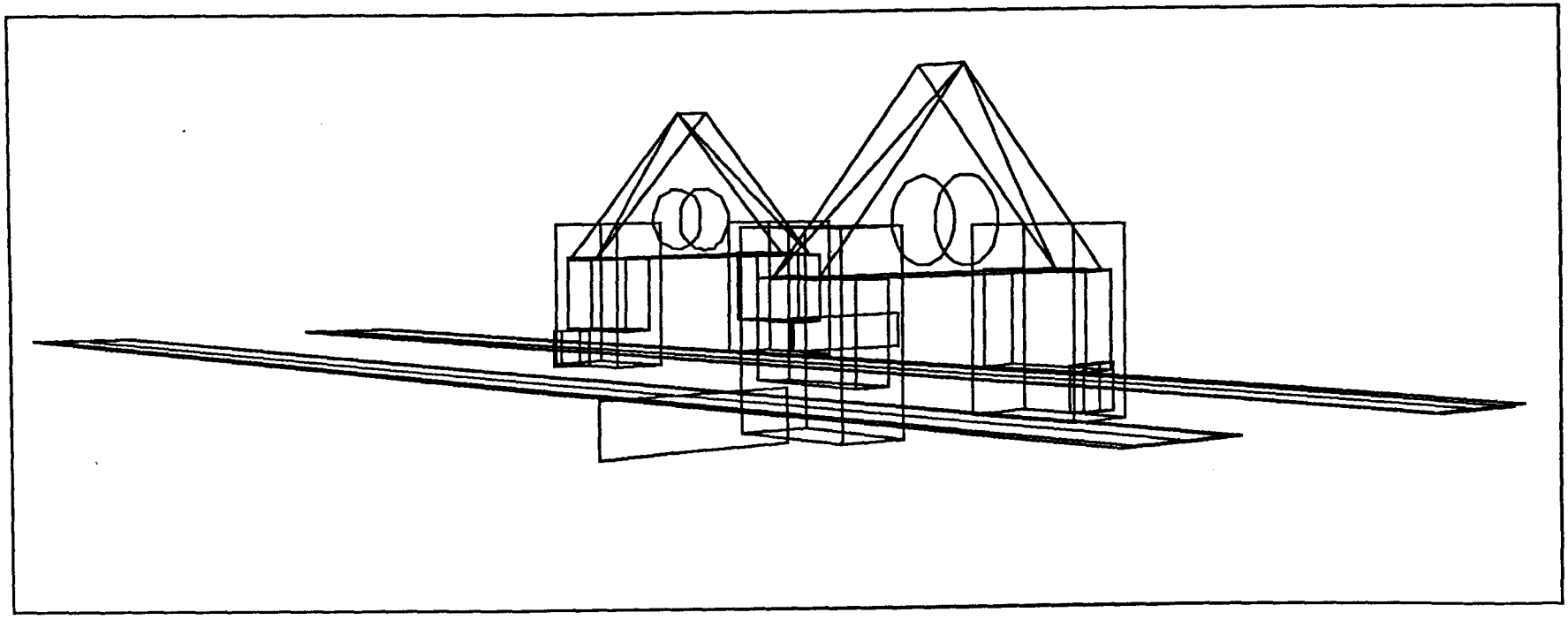
This scheme establishes a spatial sequence that acts in contrast to the rhythmic quality of the flat highway. While many forms of sequencing exist, they all embody some of the following elements: sensuous form, image disclosure and structure of attention. Through a succession of motion, mass, space, light, texture, detail and activity a sequence of elements is developed. The path that is disclosed to the driver is one of alternating heights, colors, textures and forms. Developed over a mile in length, a constant tempo is maintained that is either increasing or decreasing in intensity. The sculptural aspect of the planar gates is perceived as a distant goal. On the approach, the sculptural setting still is not recognized thereby heightening the climax. Once through the sequence, the departure experience lies in the sense of relief after the intensity. It is a beginning rather than an end.

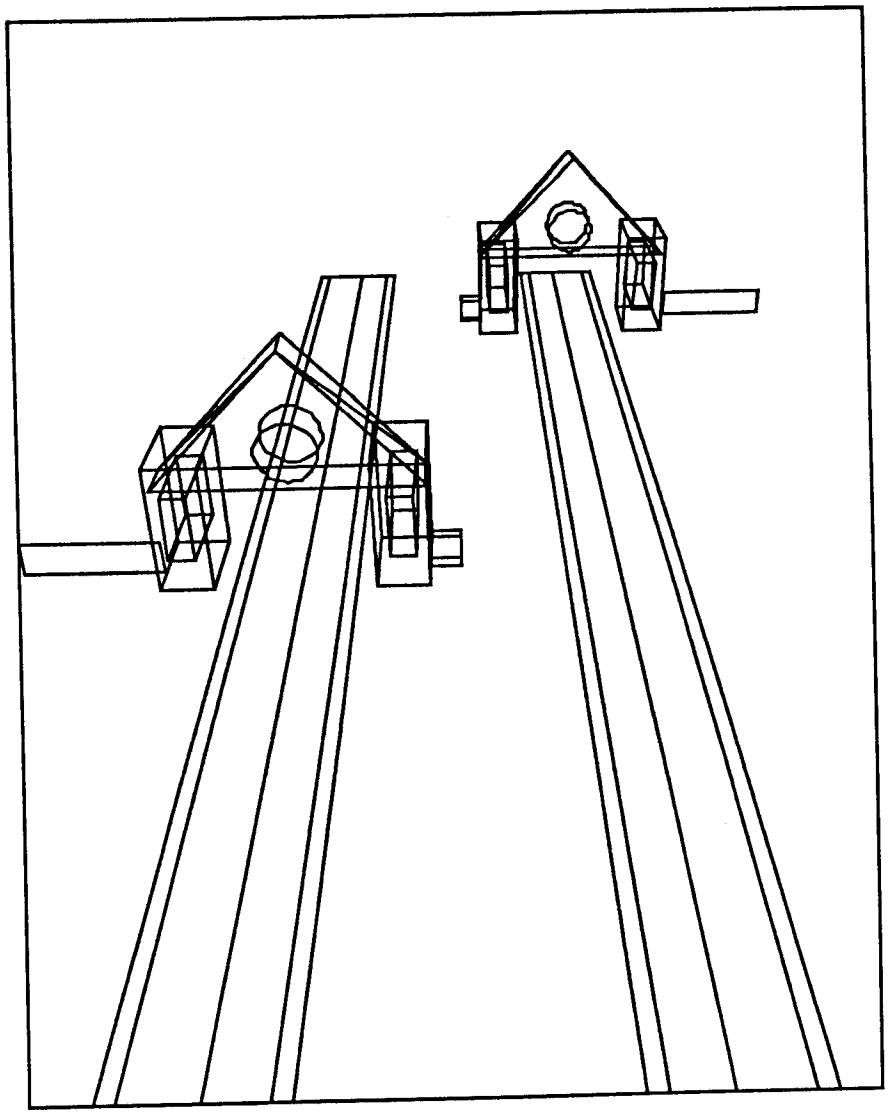


Gate Elements

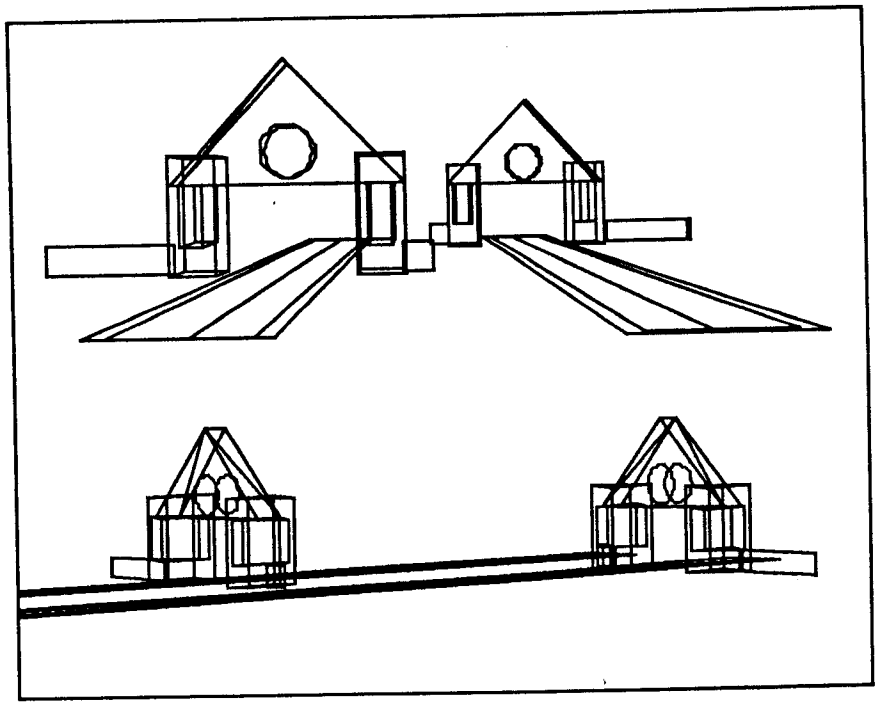
Object: **Twin Portals**

As the highway motorist navigates through the general environment, the traveller is engaged in a strategy of search. The commuter can check on pre-formed images, the visitor is constantly scanning to establish place. The path ahead is of immediate concern. The clues of future direction are picked up and become goals to recognize and then pass. These goals may be elements of the path itself - bridges, intersections, toll areas or natural landmarks. When a goal is revealed for a long time, its impression begins to fade and the driver loses interest. If, however, it temporarily disappears, or is partially masked, attention returns at the threatened loss. Its presence has become conditional. This design scheme is intended to establish those points along the route that establish orientation





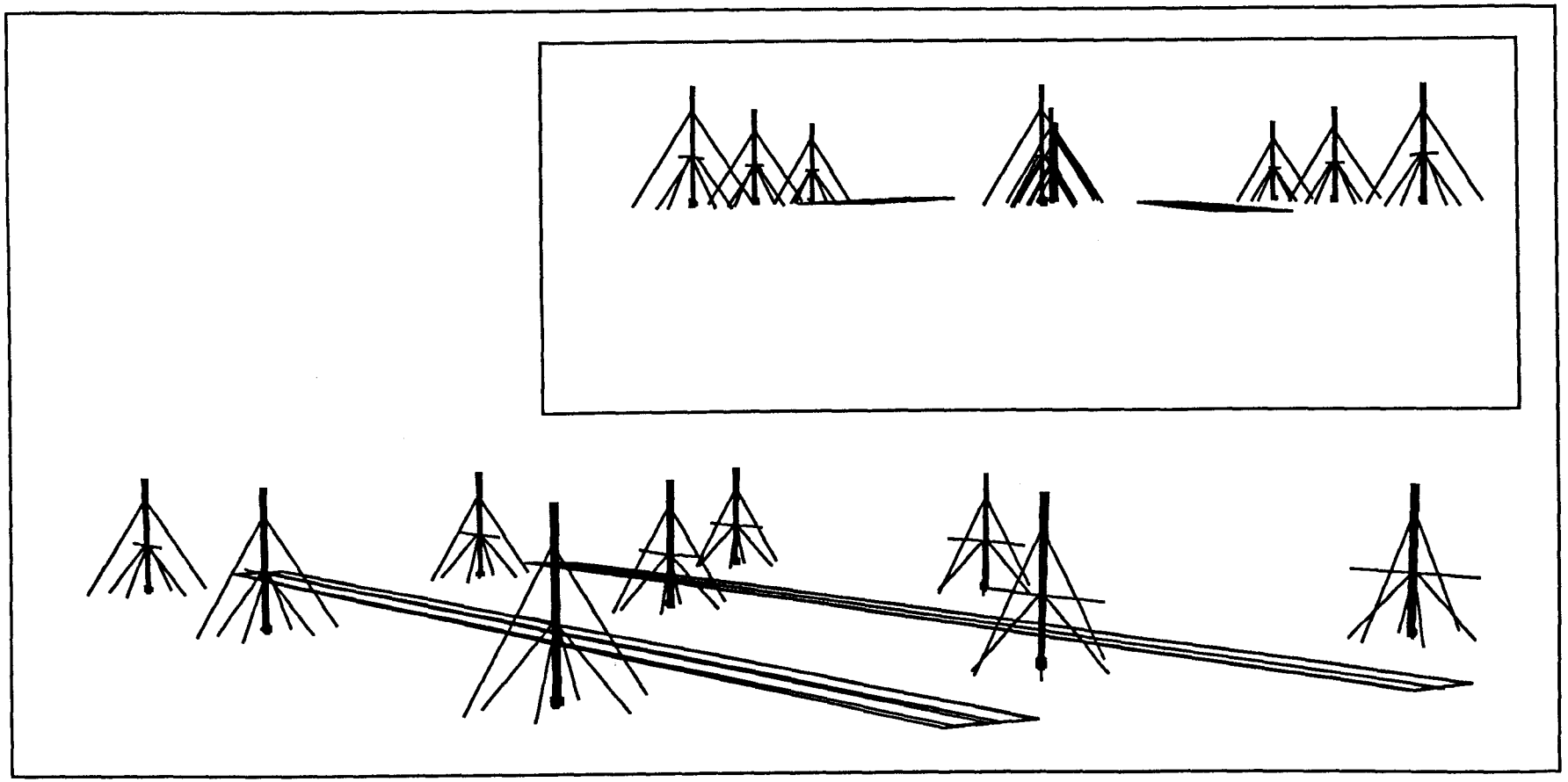
through overlapping goals. Since any route may be entered at several points and travelled in either direction, a sense of position and directional orientation is necessary. By placing gateway structures in a random pattern of overlapping goals, a set may be observed at any one viewpoint, then singled out individually creating a path of rhythmic alternation. The elements of the visual pattern must correspond to the elements of the functional, physical and social pattern to be effective. The design aesthetic must be present to make the goals effective.



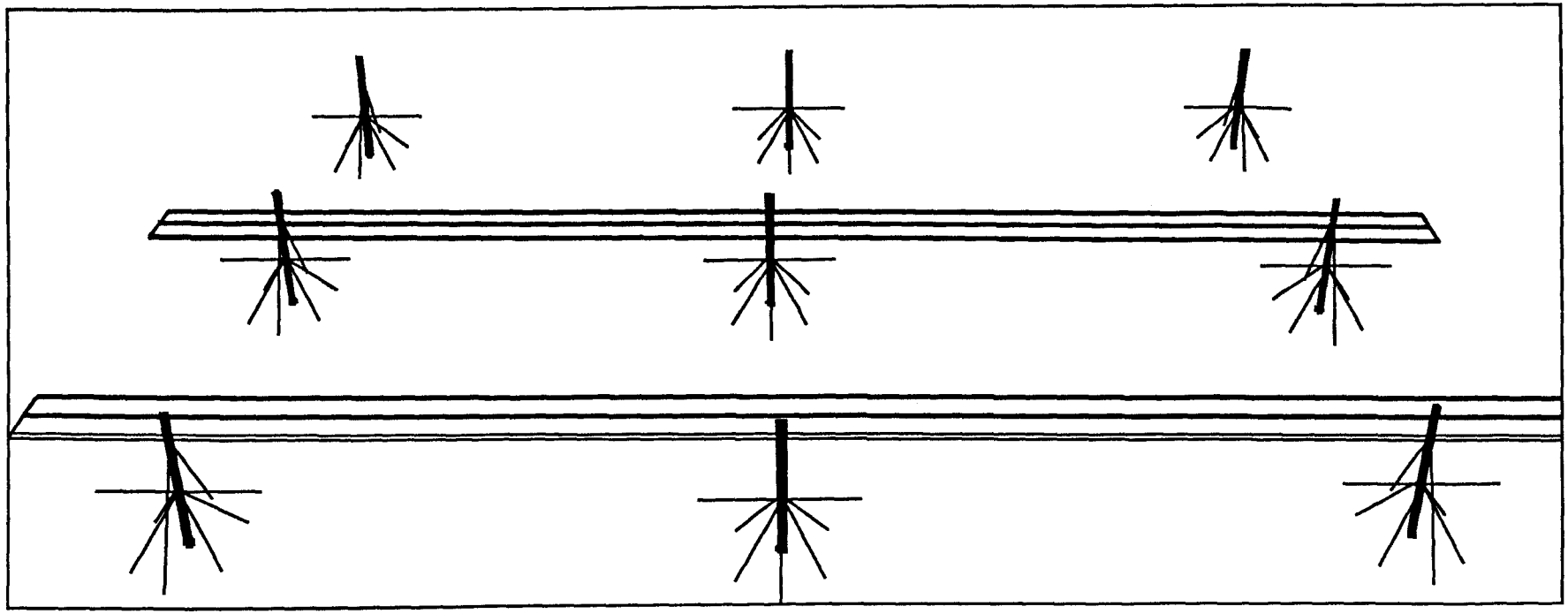
Gate Elements

Object: **Vertical Cable Stayed Masts**

If the motorist can only see in a plane, he can observe a line but not an area. If he can place himself above or below the plane he can observe an area. Since the motorist must be able to observe depth, freedom of movement is critical. In this scheme,

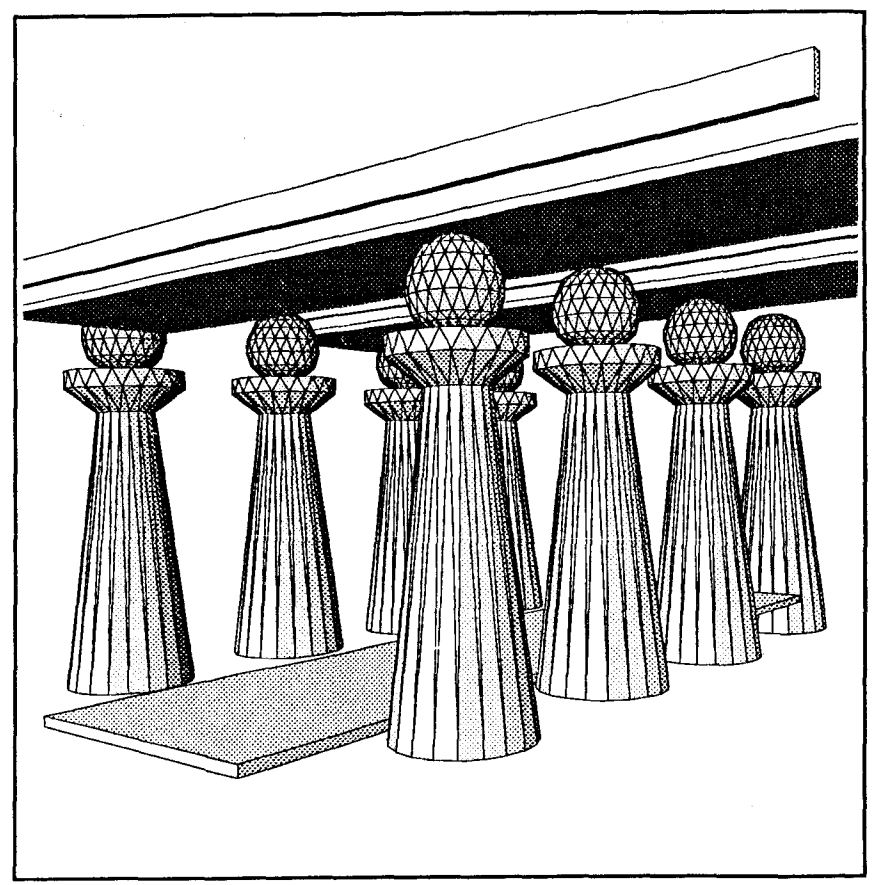


several cable-stayed towers are exactly in line. For the driver to perceive depth, an element of time is necessary. This element of time (miles per hour) proceeds in our ordinary experience in one direction only. Thus the equivalent of motion in graphic terms becomes the motion of the eye of the motorist viewing the tower configuration. The displacement of the motorist relative to the placement of the towers is how the motorist connects with the third dimension. The experience is assymetrical. In this scheme, the design arrangement is symmetrical but the experience of volume is assymetrical. The continuous change of orientation of the towers relative to vehicular movement increases driver awareness of three-dimensional space and therefore depth. This environmental sculptural becomes a means to introduce a broader definition of artistic space to the roadway as well as encourage a greater sense of passage on the part of the motorist.



CONCLUSION AND RECOMMENDATIONS

Gate Element across lanes
can act as a highway marker

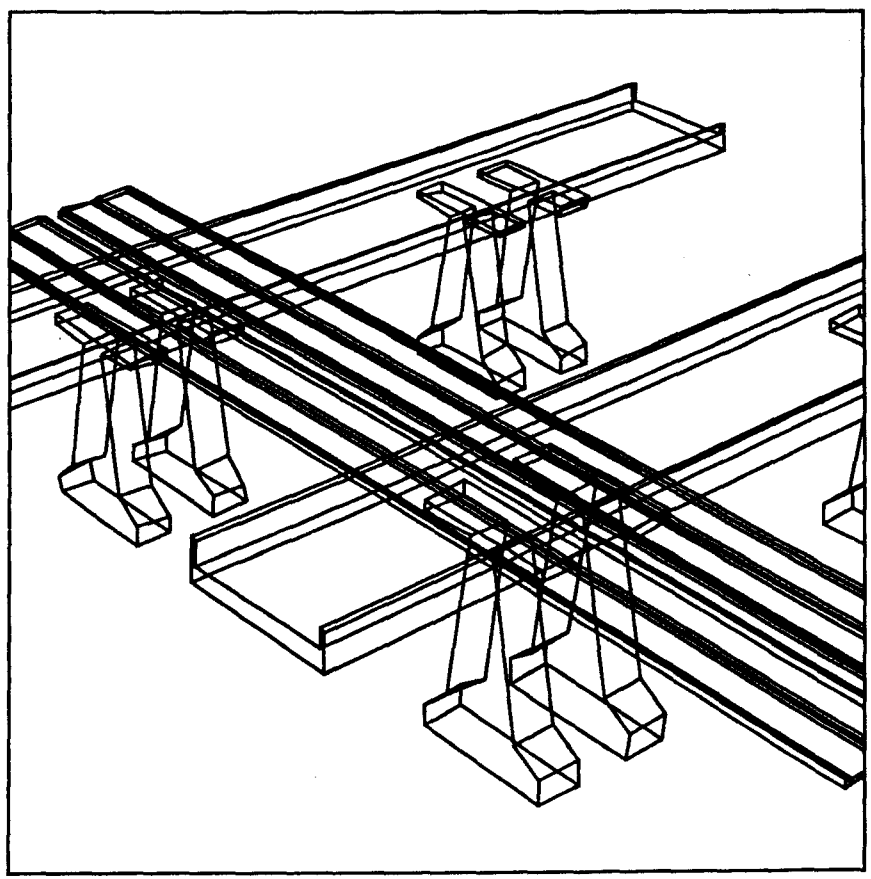


This project has undertaken to examine the nature of the Interstate Highway System based on the principles of "expressive content." It has been shown that the history of the American roadway has been one that has emphasized the function and technical aspects over those of form and a concern for the landscape. Issues of economic expansion and technological development have tended to shape the highway system to the dictates of establishing an American "quality of life." This has permitted the nation to be almost totally dependent on the automobile and an efficient and safe roadway system.

Through the careful examination of the existing "state of the art", it can be seen that the roadway designed along technical and structural guidelines has had little concern for the aesthetic aspects of highway planning and design. The sameness of the highway experience makes this observation apparent. To this end, this research project introduces a "design method" for evaluating the existing context between the landscape and the roadway and a "design handbook" for introducing several approaches to increasing the expressive content of the highway experience.

The abstract research points out one of the major problems

Bridge elements can provide for a variety of sculptured forms for the highway corridor.



associated with highway planning and design - a singular lack of dedicated literature or projects that emphasize the aesthetic issues. This limited resource is indicative of a separation of the techno-functional attitudes from those of the aesthetic since there are a significant number of resources support the structural and safety aspects of roadway design. The major reason for the imbalance is socio-economic factors. The general attitude on the part the Department of Transportations, at the national and state levels, has been to place economic limits on design programs. With the cost-per-mile increasing at an alarming rate, the effect has been to strip the aesthetic issues to a "bare" minimum.

Recommendation One

To increase the aesthetic content of the national highway system, the allocation of 6 percent of the project design and development budget be instituted at the national and state level. These funds will be dedicated to the evaluation, design and implementation of projects that enhance the "expressive content" of the roadway.

The role of the artist, sculptor, painter, graphic or environmental designer, architect or landscape architect has yet to be understood in relation to the design of the roadway. The research has shown that a number of projects, sculpture and assemblage, have been placed along the roadway. However, little has been done at the national level. The artistic interpretation can repre-

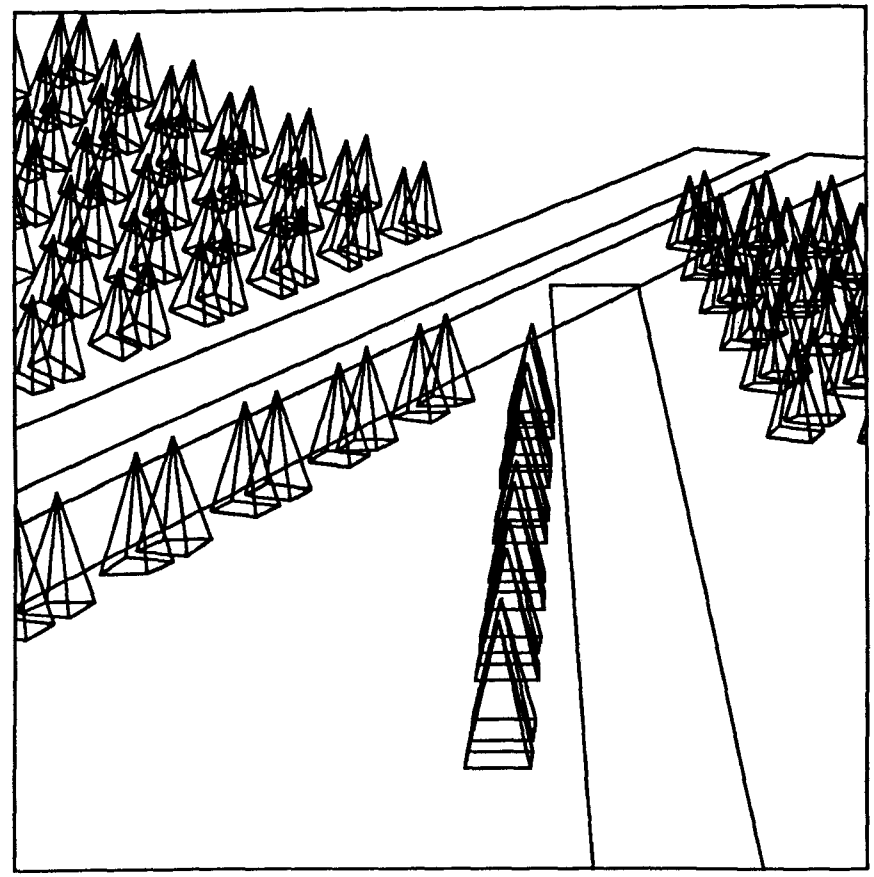
sent a more powerful force in the design development of the roadway. The untapped resource of our national pool of artists is a means to introduce: historical perspective, cultural values, landscape conservation and natural factors. The artistic volition is a means of increasing driver awareness through the aesthetic image.

Recommendation Two

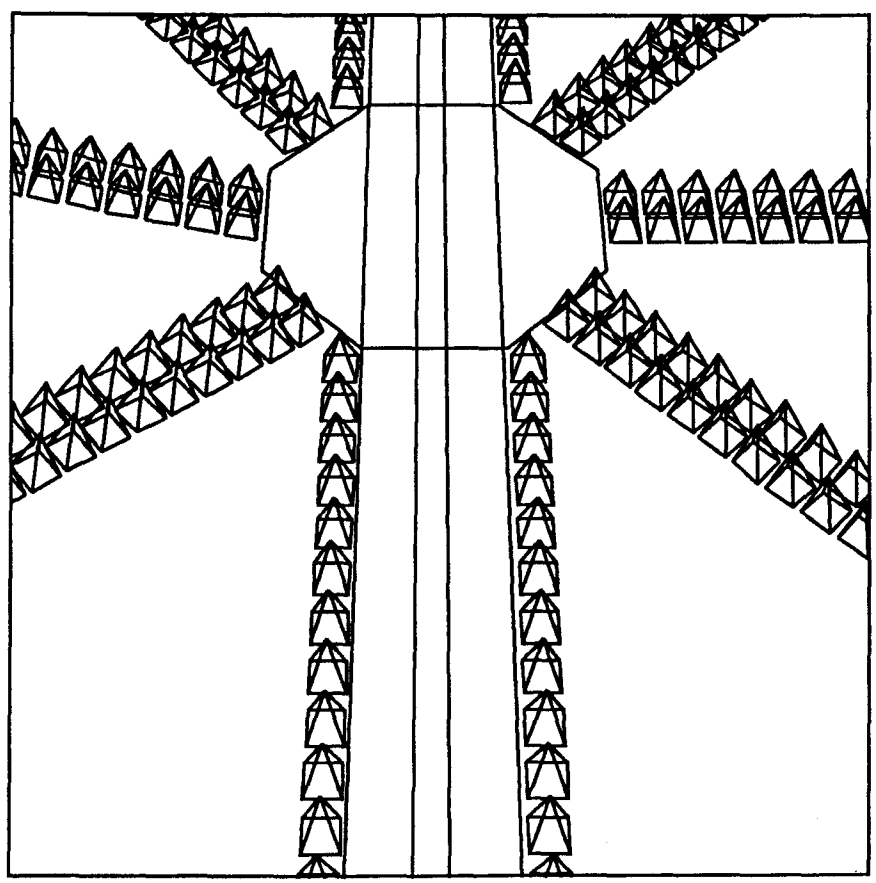
To increase the aesthetic content of the national highway system, a multi-disciplinary advisory board be established, at the state level, to select, contract and to assist in the implementation of artistically oriented projects into the national highway system. A fund of one and one-half percent of the allocated budget would be established for commission, design and administrative fees. The remaining funds would be allocated to the construction, installation and maintenance of the art works.

The design of the roadway path, and subsequently the effect of that path on the landscape, has been relegated to the urban or regional planning facilities. The technical domain has been relegated to civil engineering interests. While the design professionals have emphasized the functional aspects of alignments, curves, materials, clearances and safety, the "design team" has lacked the "formal design" input. There are a limited number of cases where the landscape and the highway were designed a a singular idea, this has been the exception rather

Highway gardens can add visual interest and protection.



Geometric designs of plants, trees and shrubs can ornament the highway strip.



than the rule. A broader representation of all interests must be accommodated to reduce the number of poorly designed roadways. The potential to eliminate all "bad" design from the roadway is impossible. However, the complexities and contradictions of one part of the highway will be justified by the resultant rationality of the whole, or certain negative characteristics of a highway section will be compromised for the whole image. To this end, the design professional must be willing to accept greater responsibility for the part as well as the whole.

Recommendation Three

To increase the aesthetic content of the national highway system, a multi-disciplinary design team, dedicated to representing all factors, within the area influenced by the highway, be developed. The design team would institute as part of its "design mandate" a mechanism for self and public evaluation. The environmental impact statement would be expanded to reflect areas of cultural, historical, and regional concerns.

The landscape is a resource that has been continuously exploited by the designers of the national highway system. The destruction of surficial geology is simply one of a number of insults that the landform has undergone. The apparent variation in soil structure, formation, elevation and natural features have tended to be overlooked for the expediency of a homogeneity of the technical aesthetic. Where once the highway

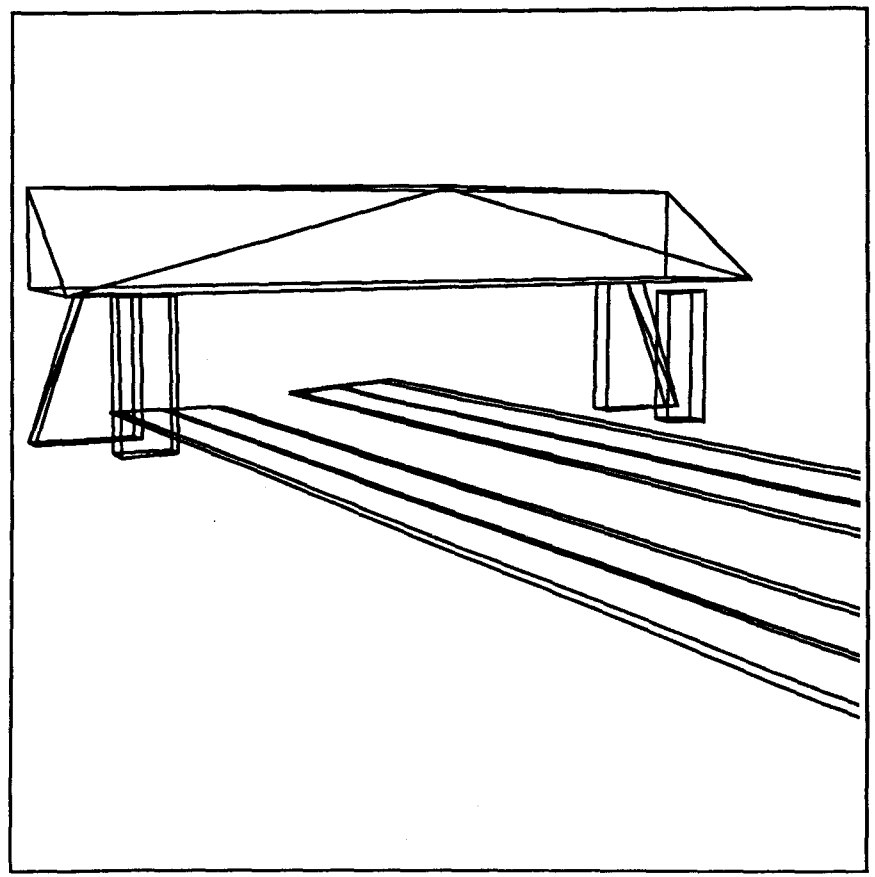
followed the ridge-lines, the highway now rests within the valleys, following alignments that can only be perceived from the air. Where the highways once followed the ancient paths and trails of the Native American Indians and settlers, the highway now cuts across natural, cultural and historic boundaries with impunity. The landscape is a natural resource that cannot be replenished and therefore must be carefully conserved as well as preserved.

Recommendation Four

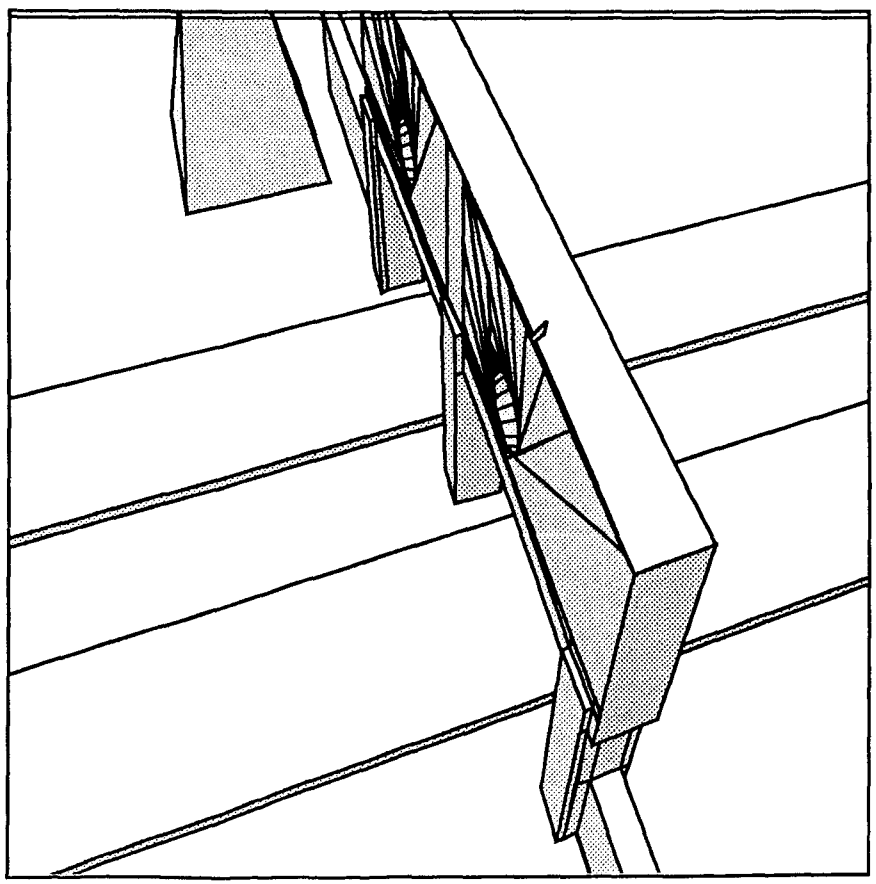
To increase the aesthetic content of the national highway system, the landscape and its conservation, preservation and cultivation must be given the highest priority in the planning and design process. It is critical that whatever the highway modifies or destroys, of the natural landform, the design must replace that with equal "natural" value.

The research, design ideas and projects contained within this document are applicable to all aspects of the highway planning and design process. While urban areas may have more extensive and complex design program requirements, it is important to understand that the investment at all scales is a beneficial aspect of a design aesthetic dedicated to enhancing the expressive content of the highway experience. The roadway "experience" can be an endless journey with little reward. With the introduction of environmental sculpture, highway furniture in the form of garden, median, enclosure, roadway or gate ele-

Portal elements can represent the cardinal points along the roadway.



Portal elements can be employed
to divide states or announce coming events.



ments, at the rural, ruburban, suburban and urban scales, the expressive content of the highway system will be enhanced but driver safety as well.

Recommendation Five

To increase the aesthetic content of the national highway system, the adjacencies and superadjacencies of contrasting scales, directions, contradictions in the design elements is critical to the survival of the highway system, its user group and the landscape. To preserve the quality of life one must invest in the art form itself. Art not only replenishes the soul but ART SAVES LIVES.

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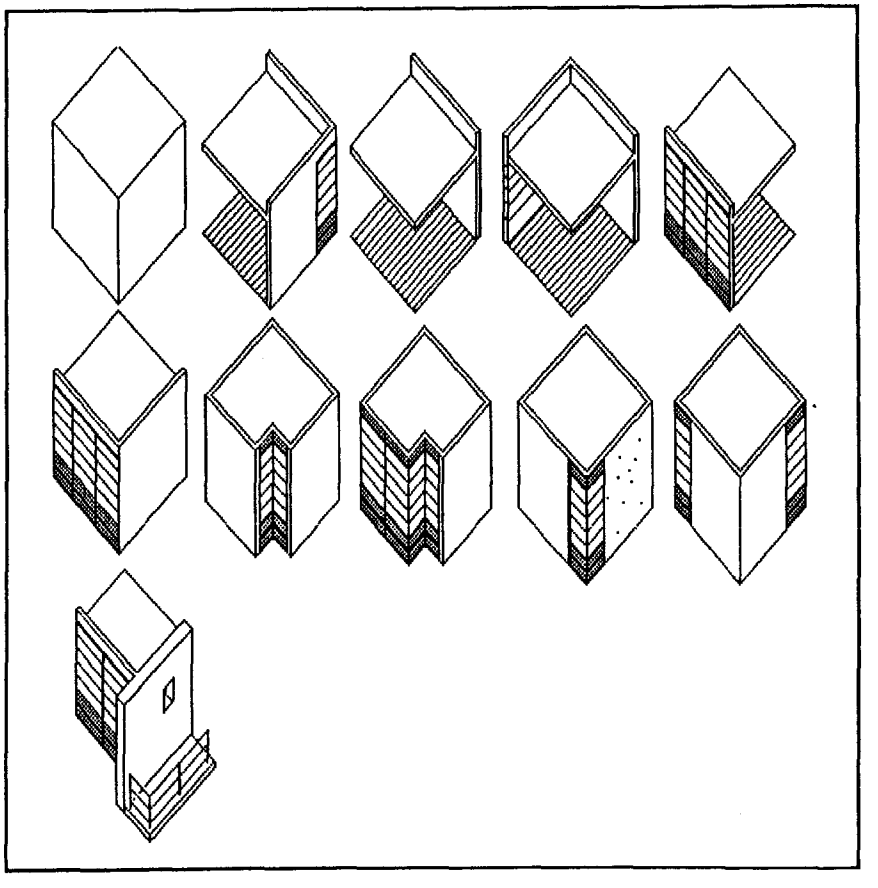
Sculptural blocks placed randomly along the roadbed creates visual form



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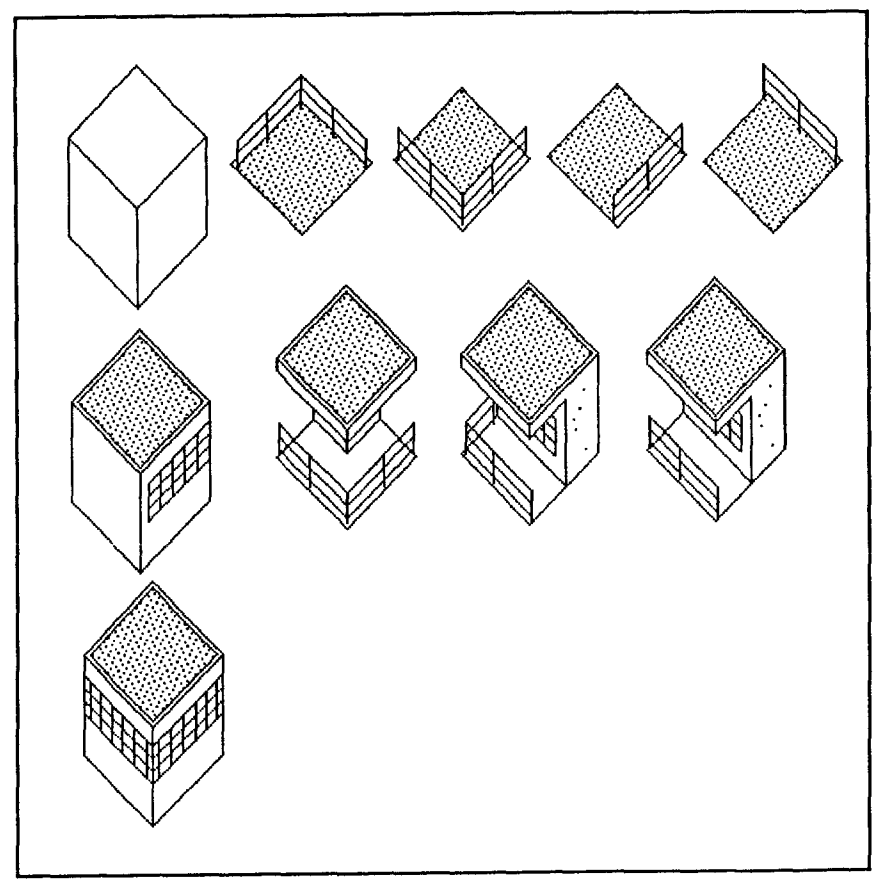
Garden blocks placed within rest areas define a sense of place



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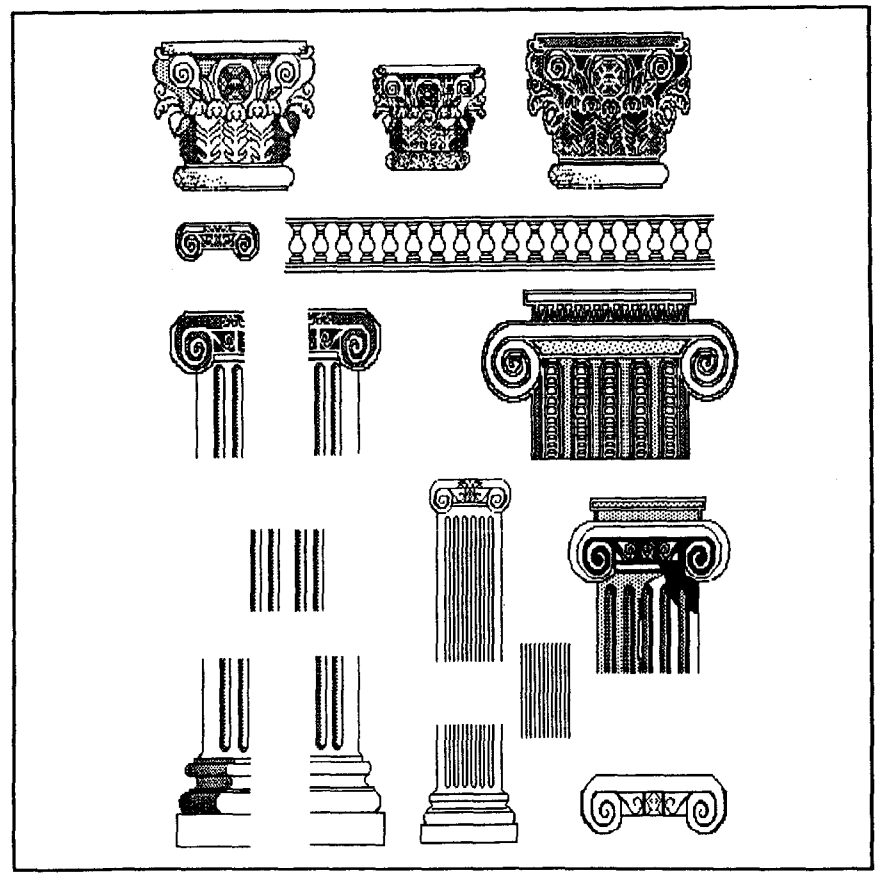
The use of classical elements in roadway furniture creates historical interest



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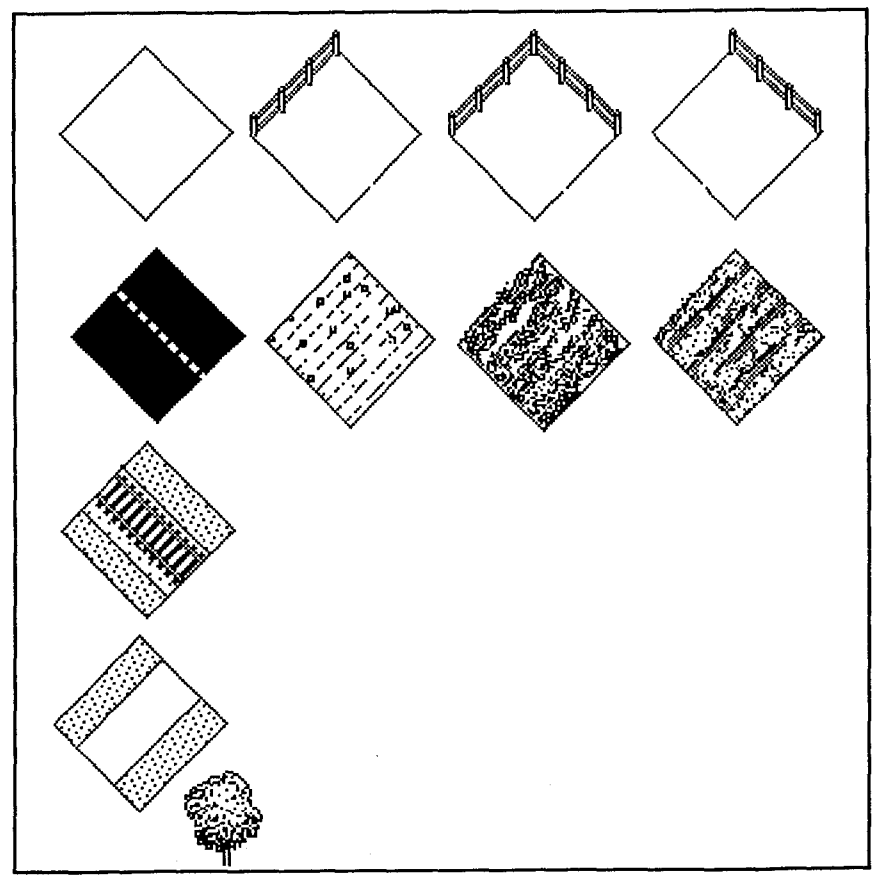
Earth blocks scattered randomly throught the median strip offer textural interest



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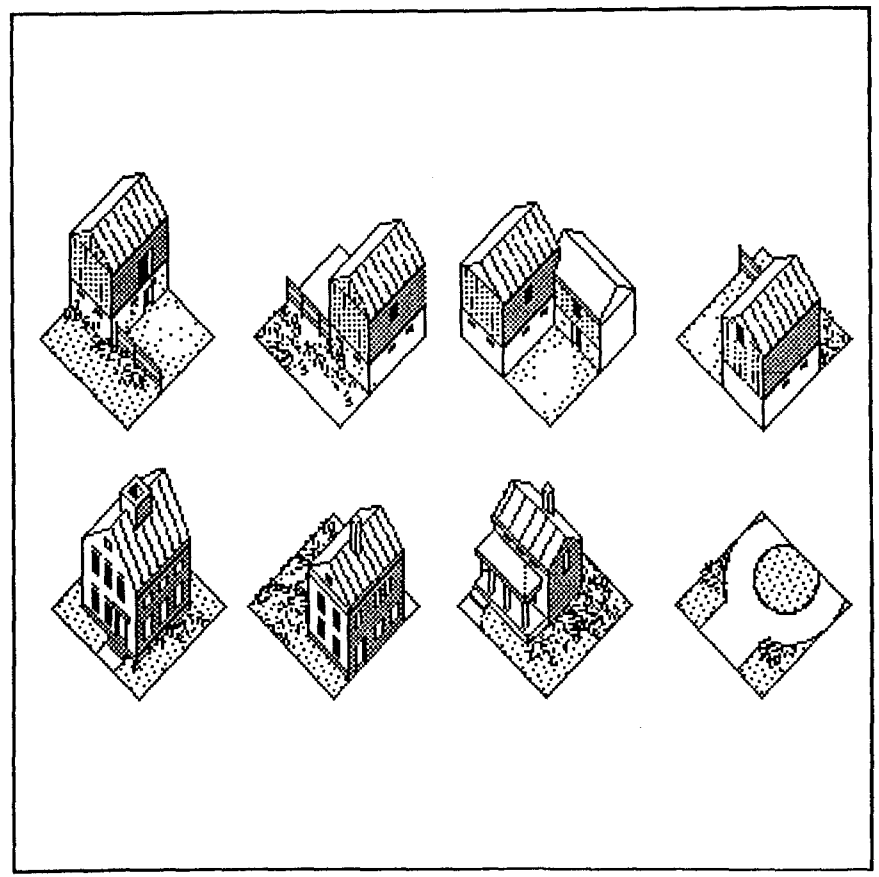
Small scale farm sculptures can be used to enhance roadside reast areas.



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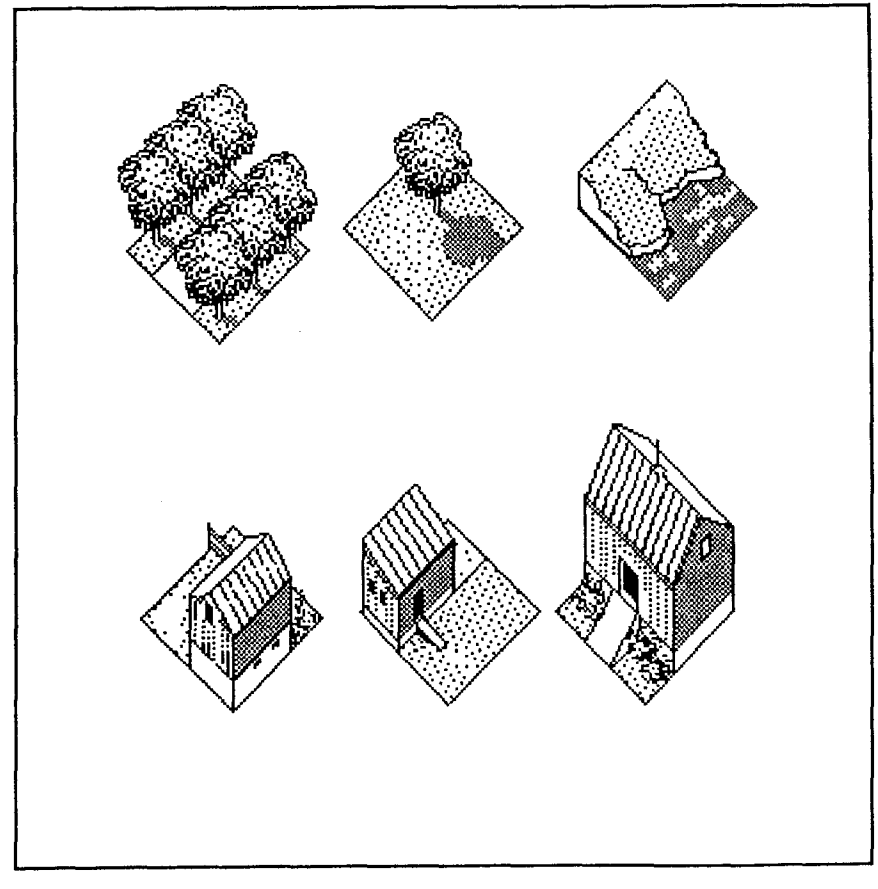
Small scale sculpted block forms are used to define areas or act as signage.



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TECHNICAL INFORMATION

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Page Layout:	**Pagemaker 2.0a** Aldus Corporation
Paint Program:	**Superpaint** Silicon Beach
3-D Programs:	**Mac3D 2.1** Challenger Software **Pro3D** Enabling Technologies

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