

Aesthetics in Transportation

U.S. Department of Transportation

Aesthetics In Transportation

Guidelines for Incorporating Design, Art and Architecture Into Transportation Facilities

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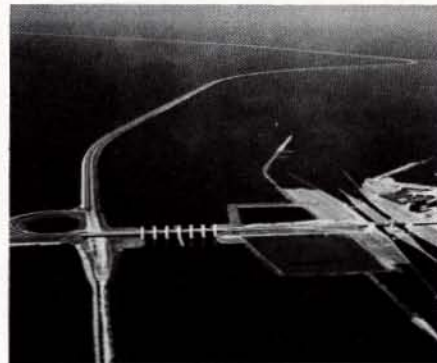
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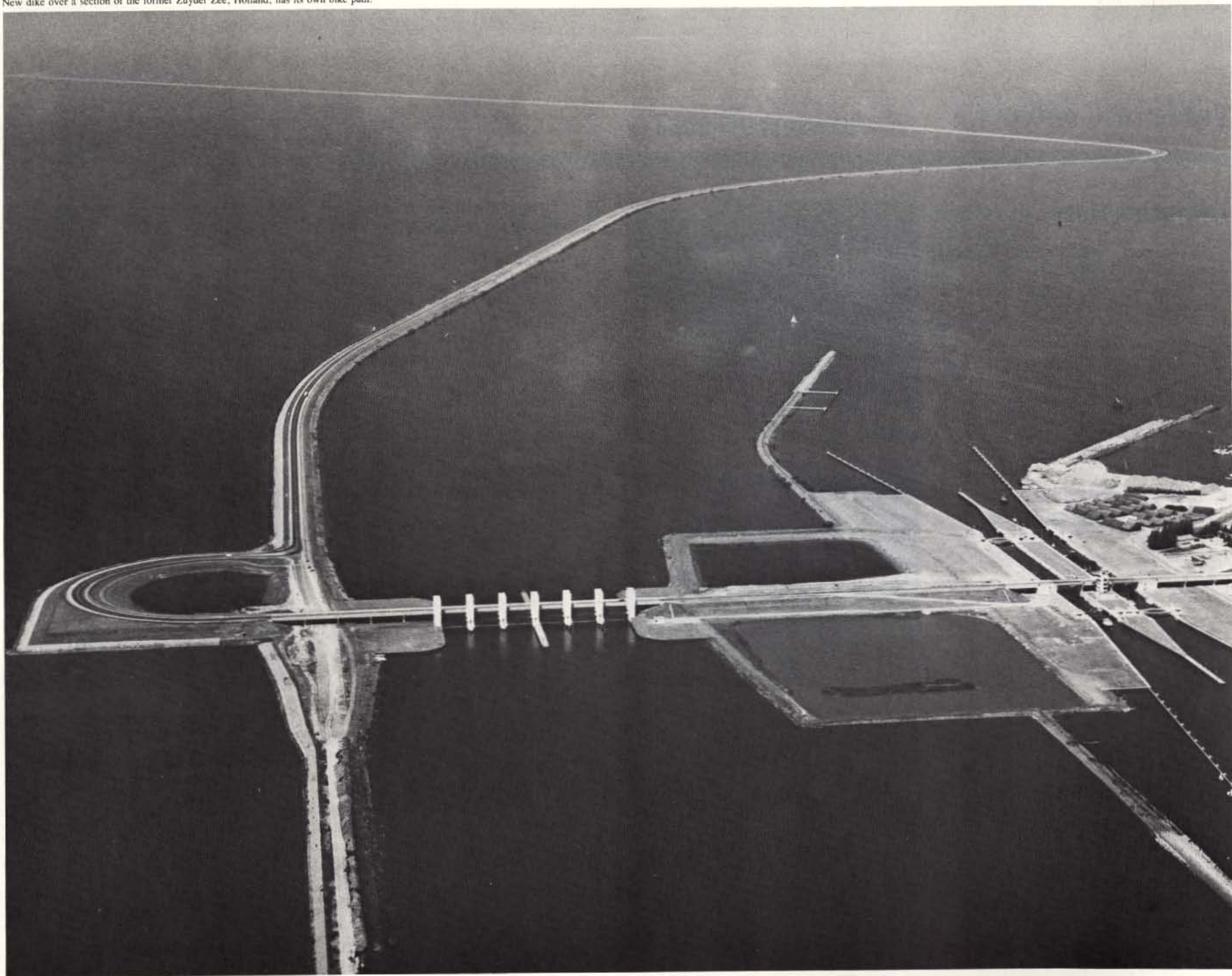


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New dike over a section of the former Zuyder Zee, Holland, has its own bike path.



Introduction

The Balinese, a people known for their richly decorated artifacts, respond when asked by Westerners, that they have no art, they simply make everything as beautiful as they can. By contrast, in American society aesthetics have come to be regarded as a specialist's concern. There is also, all too often, a view of aesthetics as a frill which can only receive attention after all the important "functional" requirements have been met and which can always be added on afterwards like a coat of paint.

Aesthetics, art and design are concerned with beauty, defined by Webster as "a quality that delights the senses or exalts the mind." Some transportation facilities have accomplished this. Soaring bridges and sweeping curves of freeway structures are among the most striking features of the American landscape. The view of a large city from an airplane at dusk is unforgettable. Vehicles have been designed as symbols of style and personality for generations of Americans. Unfortunately, however, these examples of aesthetic quality are more the exception than the rule.

The public environment in the United States seldom "delights" or "exalts." Many transportation facilities are unsightly. Parking lots are frequently bleak, highways overwhelming and divisive, arterial roads cluttered and bland, buses ill-smelling and noisy, and subways desolate and disorienting. This lack of aesthetic quality has a deep and pervasive effect on our collective lives, on the sense we have of ourselves and on the way we are seen by the rest of the world. Visitors from abroad are often genuinely puzzled that a country with the wealth, power and accomplishments



Afghan trucks are decorated as a way of accommodating them within the traditional culture.

of the United States can allow many of its public places to be so unattractive.

While the aesthetic design of transportation facilities is important in the open countryside, it is particularly critical for the urban areas of the United States. Negative experiences with transportation are concentrated in the cities in the form of congested roads and streets and neglected public transit and pedestrian environments. Cities must be made more attractive if they are to be successfully revitalized. Since transportation facilities are the dominant elements in the public urban environment, making them more attractive is an essential component of attracting people back into the cities.

The daily journey through the city could be changed from what is now often viewed as a necessary ordeal into an exciting experience. Design and artworks can transform transportation facilities into focal points which can help to revitalize the cities. Streets and pedestrian ways, well integrated highways, and transit systems can be designed for the pleasure of the user. A positive image is necessary for attracting retail business, real estate development and a variety of cultural and social activities. Whether we choose to emphasize aesthetics in the design of transportation facilities is critical to the health and vitality of cities.

The cost of aesthetic quality is not always higher than the cost of poor design. In any event, attractive projects bring much greater long-term benefits to



Street scene, lower Manhattan 1887.



Stockholm subway tunnel has been designed to retain its cavelike walls, with artistic interpretations at each station.

the public by increasing the development potential of communities. If additional funds are required for aesthetic design and art, they can usually be justified in terms of identifiable, long-range economic benefits.

Aesthetics in transportation are not limited to a spectrum from "good" to "bad." A design solution or artwork can respond to opportunities in a variety of creative ways. Artistic expression may vary from minimal abstractions to representational and experimental works. Many architects and designers are shedding the functionalist, austere style of the modern movement in favor of "Post Modern," an evolving potpourri of eclectic decoration, historic reference and formal shaping of public spaces. This report does not attempt to critically evaluate these competing styles. It focuses instead on identifying opportunities for aesthetic design and art in transportation facilities.

However we choose to bring aesthetic quality into transportation facilities, we must take into account the way the facilities are now planned, built and managed. Most of the decisions affecting aesthetic quality are made by the many local transportation agencies and their consultants; the best designs and artworks are produced in response to a specific situation. Standardized formulas and rigid guidelines would not improve the current situation and could easily make it worse. The most practical and useful guidance can be gained by illustrating the aesthetic opportunities, examining successful examples, and describing procedures that may bring the right people and resources together at the right time.

Integrated design is an important element for insuring aesthetic quality. This means considering all aspects of the environment, including the transportation facility and its surroundings. Visual integration and compatibility between these elements will create a sense of order and well-being for the facility's users. A continuity of pedestrian paths, shops, and activities will enhance the ecology of cities. Joint development of transportation facilities and private ventures can bring benefits to both. Thus, administrative innovations are required to insure that the designers of a transportation project have the mandate to integrate it with other uses.

Artists and designers are the initiators of aesthetic concepts. At times, they may have to act as energetic advocates for these concepts. The public or responsible official may have to be convinced by illustrated presentations before a paying client can be found. This type of advocacy has been a source of many of the more original ideas illustrated in this report.

Community leadership is also an important ingredient in design and art programs. The community at large (including transportation officials) needs to understand, value, and support aesthetic design and art in order to insure that these concerns are pursued effectively.



a. Waterfront park at Penn's Landing, Philadelphia.



b. The Montreal Metro offers a comfortable and quiet ride.



A unique sculptural bench was created by the community for Grant's Tomb, New York.

The U.S. Department of Transportation has begun to exercise some national leadership on this issue. In January 1977, a Task Force on Design, Art and Architecture in Transportation was created to study how the Department should encourage the conscientious use of the design arts in planning, construction and operating transportation systems. The work of the Task Force resulted in the promulgation by the Secretary of a policy statement on design quality in transportation, and his approval (on September 1, 1977) of a series of initiatives to encourage improved aesthetic design, art, and architecture in transportation. Most of these have been, or are being, implemented.

This report contains few generalized discussions or theoretical statements and puts forward no fixed standards, guidelines or formulas for aesthetics. Rather, it is based on observations of the aesthetic problems and opportunities in different transportation-related situations. The report relies heavily on built examples and lessons that can be drawn from them.

The five chapters form the major divisions in the book. Chapter 1 addresses all the issues related to the use of artworks in transportation facilities, including procedural issues and examples. Chapter 2 deals with the design of facilities by mode. Chapter 3 presents a selection of critical issues in integrating transportation facilities with the built environment. Chapter 4 identifies procedural problems related to administration, funding, consultant selection or management that may now impede aesthetic design, and recommends improvements. Finally, Chapter 5 provides references, sources, legal issues, a bibliography and case study contacts.

Each chapter is divided into sections, the structure of which varies somewhat from chapter to chapter. Each section is generally self-contained with a summary paragraph and list of contents at its beginning. The structure was developed so that readers will be able to focus their interest on particular sections without needing to review others.

Case studies are used in Chapters 1 through 4. Most of the case study discussions are based on direct site visits and analysis, but a few were excerpted from published literature. At the conclusion of each case study a list of "lessons" is provided to highlight some of the transferable successful aspects of the projects. The Case Study Reference in Chapter 5 lists all of the case studies and provides the name and address of a person to contact for more information.

Though the case studies and the examples represent successful works or projects, this is not to say that transportation projects are usually successful in their aesthetic design. Missed opportunities are much more common than those fully realized. Persistent problems are discussed in the report to some extent. It is clear, however, that the most promising way to promote aesthetic design and art in transportation is to show what has worked well and discuss the practical benefits for sponsors.



a. Aspen's Pitkin County Airport provides a warm environment and fits well into the setting.



b. Art nouveau rail by Hector Guimard was a gift to Montreal from the City of Paris.



Wall painting, Blue Sky, 1977, Columbia, SC, allows the viewer to imagine beginning a fantastic journey.

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1

Art In Transportation

Introduction Chapter One

Art challenges our imagination and nourishes our spirit whether it is found in museums, in galleries, on the streets, or in transportation facilities. But art has done even more than that; it has also brought credit and recognition to its sponsors, and in the case of some transportation systems, increased patronage and expanded community acceptance.

This chapter covers ways in which art can be brought into transportation facilities, those often visually impoverished places where much of our waking lives are spent. It is intended as a stimulus and a guide for the transportation and arts communities to bring art's inspiration into transportation.

There is an apparent paradox at work here. Art thrives in freedom—much of its excitement lies in the inventive and unpredictable ways artists respond to the environment—but transportation agencies need an established framework in order to function.

That paradox, as this chapter will show, is easily resolved. Agencies, by concentrating their efforts on shaping procedures rather than on deciding the shape of artwork, can give artists their required freedom and still manage a modern transportation system.

This chapter is organized in sections which follow chronologically the decisions an agency will make at each stage of establishing an art program. It can be read in order, or used as a reference to

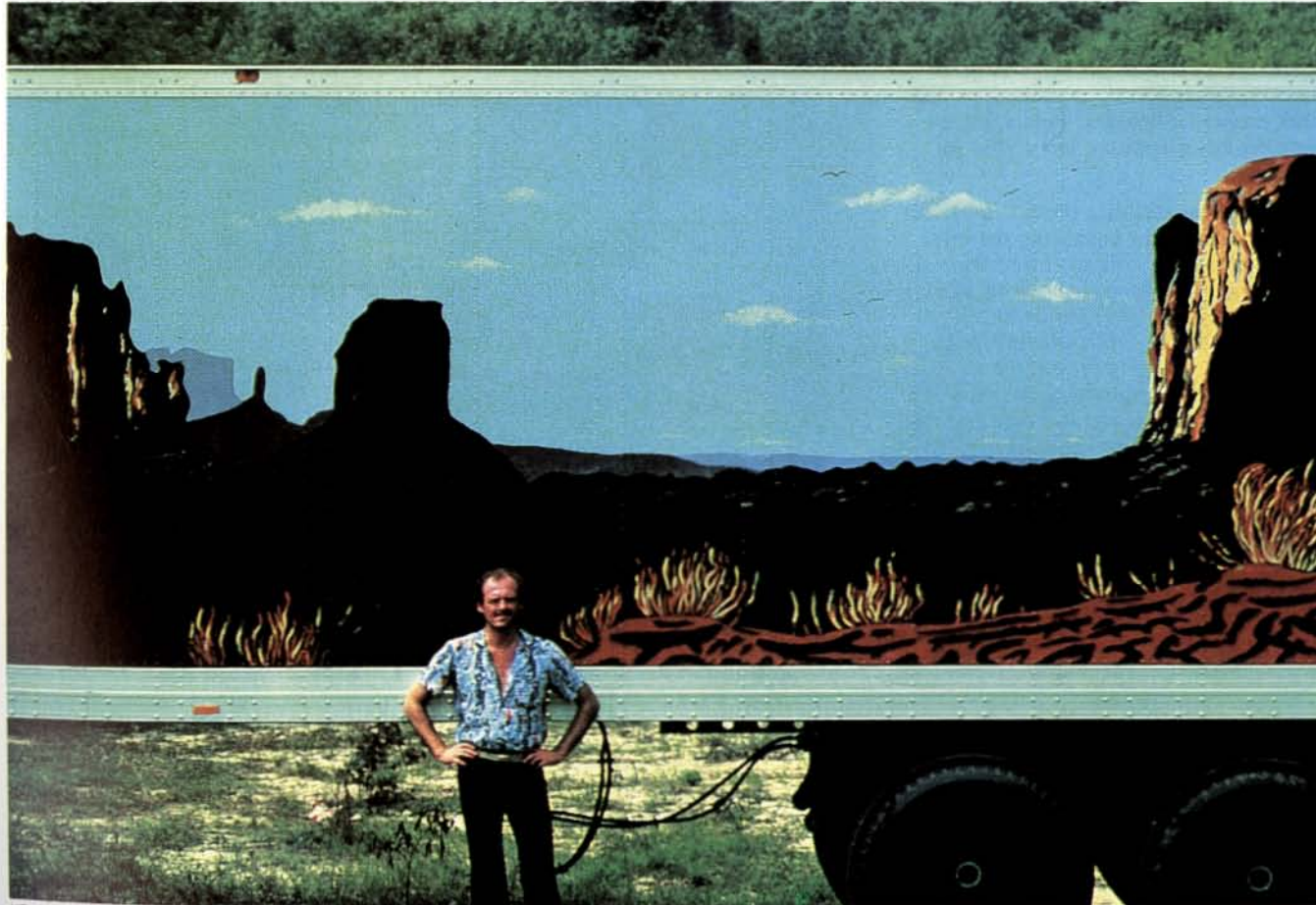
answer specific questions. In any case, the major questions the chapter answers are these:

- What are the benefits of sponsoring art? (Section 1.1)
- Which transportation sites are suited for artwork? (Section 1.2)
- What type of art will be most appropriate for the site? (Section 1.3)
- What administrative and funding programs need to be set up in order to obtain the artworks? (Section 1.4)
- How do you work with artists and care for their art once it is installed? (Section 1.5)

The chapter provides guidance for these and other issues involved in setting up an art program. The case studies are brief examples intended to illustrate the main points of each section. Procedures are further addressed in Section 1.6, which presents some procedural models used in successful art programs.

Keep in mind, when using this chapter, that the guidelines are general ones. Art has a way of constantly creating innovations. Any guidelines or procedures used should nurture artistic expression, not starve it.

Benefits of Sponsoring Art



"Rolling Billboard," Richard Fajans, 1979, produced by Mega Arts, San Francisco.

Public art in transportation facilities does more than please the eye or provide a few moments of respite from the workday world. It holds benefits that the transportation agency, as well as the aesthete or rider, can appreciate. Public art can improve the image of transportation facilities, bind communities together, and reduce vandalism. In this brief section, the benefits of public support for the arts in general are discussed with a particular focus on art in transportation facilities.

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Art and Public Benefits

"The Calder" in Grand Rapids, Grand Rapids, Michigan: Case Study 1.1a

Art and Public Benefits

The principal reason for increasing government involvement seems to be a deep recognition that art and cultural development are vital to the health of a nation and the vitality of its towns and cities.

A 1975 study, 'Americans and the Arts II' by National Research for the Arts, Inc., measured people's willingness to pay taxes to support the arts. On a national level it was discovered that 58% of those surveyed would be willing to pay an additional \$5 a year to support arts and culture. 51% would pay \$10, 46% would pay \$15, and an amazing 41% would agree to contribute \$25. from % for Art (ref. 27)

Since the establishment of the National Endowment for the Arts (NEA) in 1965, government support for the arts has expanded considerably. The quote on the left reflects the basic rationale and the public interest that justify increased spending for the arts. It has also been found in a special study by the greater Philadelphia Arts Alliance in 1974 that public investment in the arts can generate even larger private contributions and other economic benefits. Public dollars spent on art, it appears, are a wise investment.

Transportation facilities provide a variety of opportunities for enhancing the traveler's experience with art. From the transportation authority's point of view, these added attractions are more than extra gestures. They are important for attracting patronage, improving general public image, strengthening the interface with local communities and reducing opposition to specific projects. Community art projects have even succeeded in reducing the level of vandalism directed against transportation and other facilities.

Different types of art programs bring somewhat different types of benefits to their sponsors. Participatory, community art projects are likely to make an immediate change in community relations. Festivals and other major "happenings" may directly increase ridership. Monumental pieces have become symbols for the sponsoring agency.

Truly great works of art can accomplish all of the above and more. They can bring government officials, business people and other members of the public together in cooperation and enjoyment. In this regard, a September, 1977 New York Times editorial commented as follows on a public sculpture installation in Chicago:



Statue of Liberty, New York Harbor.

"... any government that has the wit and spirit to put up Claes Oldenburg's Bat Column . . . can't be all bad. Administrations and city councils come and go but the arts go on forever . . ."

CASE STUDY 1.1a

**“The Calder” in Grand Rapids
A Piece of Art Becomes A City’s**

**Symbol
Grand Rapids, Michigan**

The sculpture “La Grande Vitesse” (a pun on “Grand Rapids”) by Alexander Calder was installed in 1969. It is located on the central plaza of the downtown and forms the centerpiece of a large urban renewal project. Fifty-five feet long, forty-three feet high, and weighing forty-two tons, it was fabricated in steel and painted bright orange/red. People using the plaza can walk around, under, and through it as they walk among the government buildings surrounding the plaza.

The artistic strength of the sculpture stems from its command of the scale of a major urban space. It creates a visual focus and interest in this otherwise routine architectural setting. But the most relevant aspect of this project as a case study is the favorable public response and the benefits brought to the sponsoring agencies.

“La Grande Vitesse” was the first sculpture sponsored by a matching grant from the National Endowment for the Arts (NEA) under the Art in Public Places Program. It was greeted with skepticism, bafflement and criticism at first. However, seeing it every day on its prominent site and repeatedly experiencing its inviting and energetic shapes, charmed, disarmed, and eventually converted the people of Grand Rapids. This conversion was so complete that the Calder became “our Calder”, a symbol of the city. It is now featured as a logo on the city’s official letterhead, on the trucks of the Public Works Department and on the cover of the Chamber of Commerce promotional brochure. The success of this piece benefited the local arts by paving the way for a major exhibition of outdoor sculpture in the downtown streets and plazas in 1973-74. It

also is thought to have had a positive influence on federal support for the arts during the mid-1970’s.

Costs

In 1969 the sculpture cost \$130,000, with \$45,000 provided by NEA, and \$85,000 from private funds. No local tax monies were used.

Lessons

- The sculpture attracts pedestrian movement across the plaza where it other-

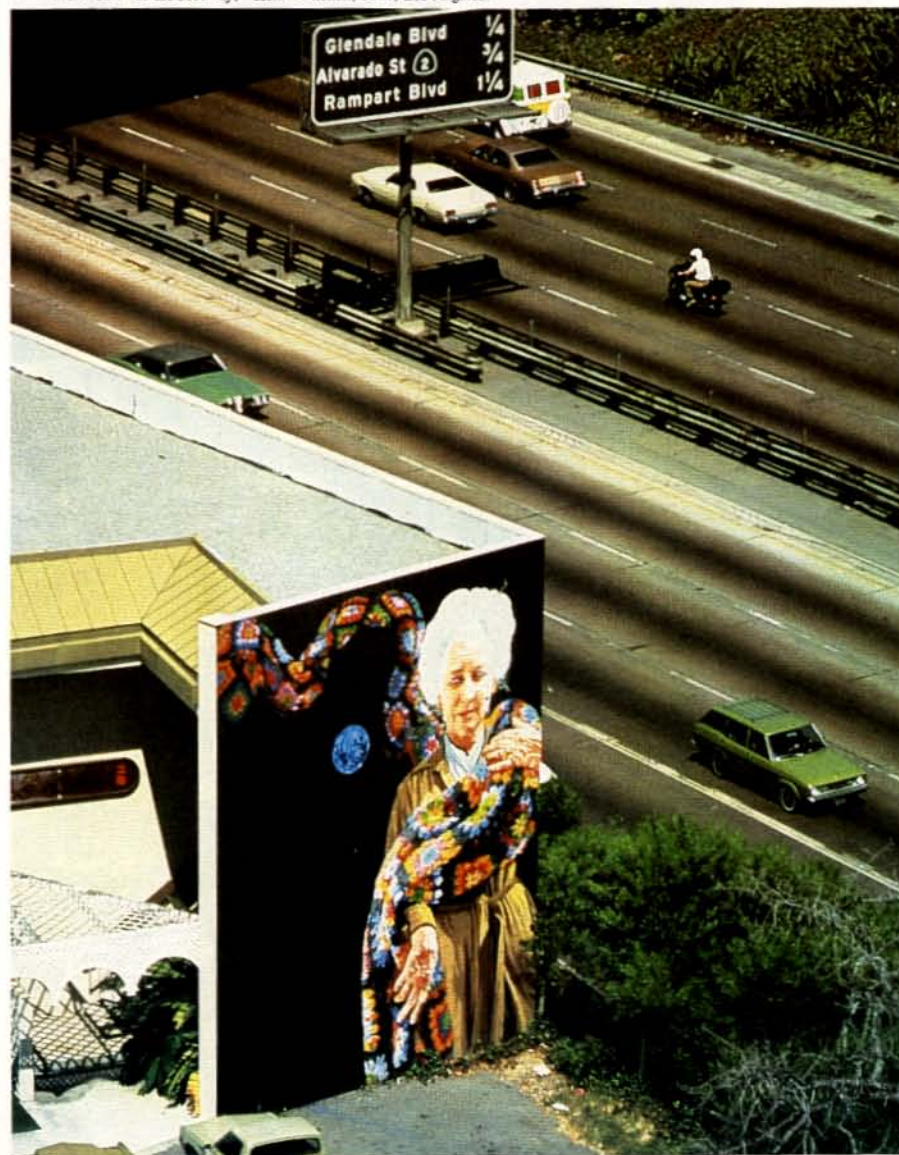
wise might be discouraged by a large barren space.

- This sculpture has become the focus of positive cooperation among government, business and the public.



a. b. The sculpture provides a civic focal point and has become the City’s logo.

a. "Old Woman of the Freeway," Kent Twitchell, 1971, Los Angeles.



b. "Create-A-Creature," Mayers & Schiff, 1971, New York.



c. "Ghost Parking Lot," S.I.T.E., 1978, Hamden, CT.



Sites and Opportunities



Transportation facilities, because of their varied and complex natures, contain a great many sites and opportunities for the placement of artwork. This section inventories some of the more common sites suitable for artwork, and evaluates the kinds of art fitted for those sites. The section also examines some unique opportunities that the facilities hold for the creation of art. This listing of potential art sites cannot be complete since artists are likely to discover new sites, but it will still aid agencies making decisions about art and art programs (see Sections 1.3 and 1.4).

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"Running Fence," Christo, 1972-76, Sonoma and Marin Counties, CA, Height: 18 Feet, Length: 24 miles.

Cityscape

The plane landing in New York approached in an arc around lower Manhattan. It was early evening on a clear fall day. The sky was still full of light but the electric lights throughout the city had already been turned on. The island was like a shiny, intricate jewel; one could make out familiar streets and buildings in great detail. From the sky, Manhattan seemed to have a clear and beautiful order, in sharp contrast to being overwhelmed by chaotic activity while walking some of those same streets.

Transportation facilities often provide the only vantage points that can make an American city comprehensible. They are also some of the most prominent physical elements in the cityscape that can become either landmarks or eye-sores. The overall images they provide greatly influence people's feelings for, and understanding of, the city.

The shaping of such large scale elements of the environment is influenced by a great number of conditions which cannot be manipulated for the sake of art. Still, there are some precedents and a number of opportunities for benefiting from the artist's sensibilities in shaping and interpreting transportation facilities and overall city space.

Opportunities

- When large new facilities (such as airport expansions) are developed, artists could act as consultants in shaping their overall image. The influential artist, Robert Smithson, served as consultant to the design team for the Dallas-Fort Worth Airport. The possibilities for earthworks designed to be seen from the air, which this collaboration suggested, have been largely unexplored since Smithson's untimely death.
- Photographers and painters have often responded to views both of and from transportation facilities. The mural of the Brooklyn Bridge by Richard Haas shows the mystery and power of that structure and its surroundings. Transportation agencies could logically sponsor art competitions and exhibitions with their facilities, and the views from them, as subject matter. Large scale "photo murals" are now sometimes used in air terminals and could be displayed on highway billboards.
- Again, thinking of overall views, erection of new monumental works of art (or the protection of existing ones) comparable in scale to the Gateway Arch in St. Louis may be co-sponsored by a transportation agency. Its patrons may be the primary beneficiaries of viewing such monuments, which may in turn convey something about transportation (in this case, a sense of having arrived).
- The lighting of such monuments and monumental transportation structures can greatly enhance the perception of the city at night.
- Several artists work with light and laser beams as a sculptural medium that can be scaled to large areas of a whole city (e.g., Lowry Burgess, Gyorgy Kepes, and Otto Piene) and heighten the views for the transportation user.
- Special events, particularly those using light, can temporarily transform the



South Street Seaport Wall Painting, Richard Haas, 1971, New York City.

whole city space into a magical visual event. Citylights, a project sponsored by the American Institute of Architects in Philadelphia had all the downtown buildings in the city turn on their lights at a given moment and accompanied this with fireworks set off from the three tallest buildings in Center City.

Art For Fast Motion

Driving through the plains of Nebraska, the gas station signs appear on the horizon like giant totems. They seem impossibly tall, hovering in the distance over the cornfields. Even driving at high speed, it takes a long time to reach them. When one finally arrives, the signs seem ordinary, somehow not so tall after all.

Fast motion creates special effects for visual perception. Repeating elements can blend into ribbon-like or rhythmic patterns. The size and scale of objects can appear to change dramatically with the tilt of the road. Normally unrelated objects can momentarily appear together as dramatic compositions. Objects quite far apart can be recalled and seen as a continuity. Moving lights at night can trace intricate linear patterns.

Only a few finished works of art have taken advantage of special qualities of motion, although there have been many experimental proposals. The Leicester sculpture erected by the roadside at Art Park, shown here, is a modest, completed example. It consists of a collection of apparently scattered elements that coalesce into a single sculptural form from one point along the road.

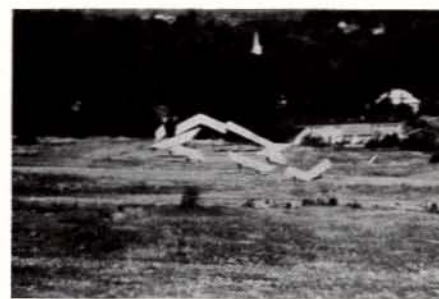
Some art works have taken their cue from commercial advertising that has long understood the potential for capturing the attention of passing motorists. The billboard art in Los Angeles (shown at right in photo) as well as Kent Twitchell's "The Old Woman of the Freeway" (p. 7) have the bold poster-like quality that is often required for images seen from the highway. These works can be seen from a distance and quickly recognized, yet have a lingering, haunting quality that make repeated encounters interesting.



a. "Flamingo Hilton," Foster and Kleiser, 1973, Sunset Strip, Los Angeles.

Light, in relation to motion, is a particularly appropriate sculptural medium. A mile-long laser light sculpture by Rockne Krebs over Philadelphia's Parkway was best experienced by moving rapidly under it (p. 27). Dan Flavin, another artist working with light, has executed a work on the platforms in New York's Grand Central Station which relates to arriving in, and departing from, a vast dark space on various tracks.

Provocative visual images located along highways must be considered from a safety standpoint. Generally, if the images can be seen well in advance and are within the normal cone of vision of the driver, they are not a hazard. However, particular conditions of road alignment, traffic flow, etc., must be considered when siting art along the highway.



b.-e. "Diamond," Andrew Leicester, 1978, Lewiston, NY.

Gateways

A boatload of Hungarian immigrants approached New York. Even before landfall everyone was on deck expecting to see the Statue of Liberty appear on the horizon. Everyone knew the statue as the marker of the entrance to New York. So it was a little disappointing to discover that Long Island and Brooklyn came into view before the great statue. Only when it finally appeared, even though it was somewhat dwarfed by the downtown skyline, did the travelers really feel that they had arrived.

Traditionally, gateways marked the distinct place where one entered a more private and more special place, generally on foot. The art and ornament lavished on a gate were intended to symbolize the owner's image of him/herself. Expressions varied from homely house door decorations and stylized Japanese garden gates to the overpowering portals of gothic cathedrals.

As mechanized travel expanded, new gateway functions appeared. These included entrances, points of transition between different modes of travel, and markers for places along the path of vehicular movement. Some traditional gateway vocabulary was adapted to these new functions. The triumphal arch facades of 19th century railroad stations and the bridge portals ornamented with sculpture are examples.

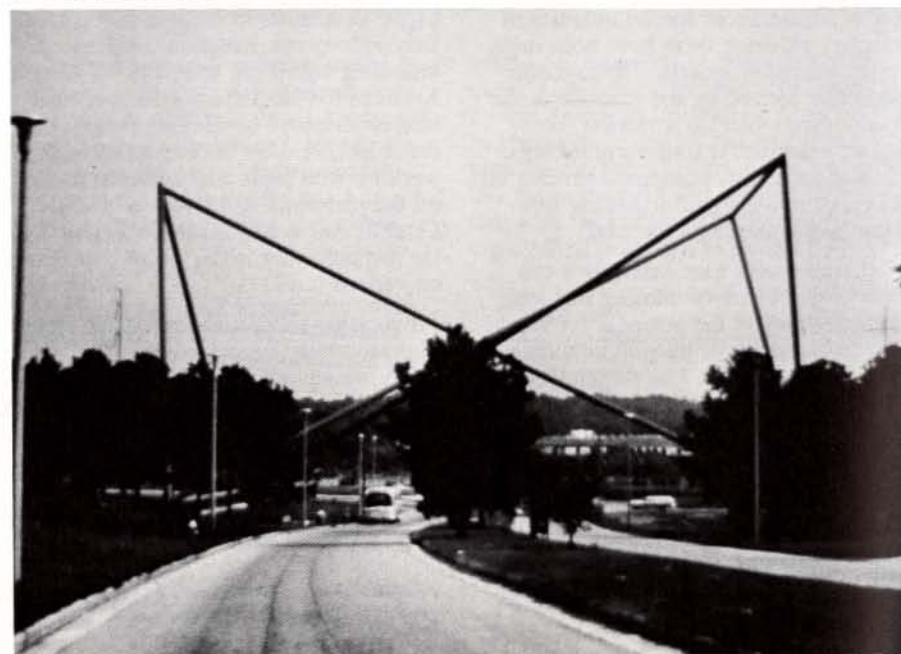
However, much of modern arrival is no longer marked in this way. Arrival occurs in parking lots, garages, or underground subway stations, completely utilitarian environments lacking in symbolic forms and embellishments. One passes through in a hurry, losing the ceremony and dignity that should be part of an arrival.

Opportunities

- In many gateways that pedestrians pass through on their way to and from various modes of transportation, the traditional forms of gateway art could be reinterpreted and applied.
- Gates that are passed by rapidly moving vehicles can be successful if they are simple and bold, such as the sculpture forming an entrance to an industrial park shown below.
- Subway stations can be made memorable by art at ground level or on the concourse or platforms below. The Art Nouveau gates for the Paris Metro are famous for the graceful way they accomplish this. The monumental Clothespin by Claes Oldenburg in Philadelphia serves as a landmark on the surface and as a surprise when emerging from below.
- Parking lots and garages are now largely neglected but could often profit from art and decoration at both their auto and pedestrian access points.



a. Bridge portal, New York.



b. Gateway sculpture, Peter Forakis, 1976. Atlanta.



a. "Clothespin," Claes Oldenburg, 1976, Philadelphia.

Passageways

Transportation facilities often include long, unrelieved pedestrian passageways such as corridors and escalators at airports and subways, and walkways within parking lots and garages. Those passing through are usually in a hurry. Thus, the potential for art is in relatively simple, continuous elements or pieces that consist of a series of fast impressions, each easily grasped, and fitted into a sequence.

Opportunities

- The special nature of these spaces, and the movement and direction of pedestrians, should call for new approaches by artists. Since traditional gallery conditions cannot be provided, attempts to "exhibit" or "display" works in a conventional manner often fail. These spaces present opportunities

for work which relates to their processional character. Lucas Samaras's mirrored corridors, Dan Flavin's passageway light installations, and Charles Ross's artificial light and prism installations are prototypical of environmental approaches to such spaces.

- Supergraphics are perhaps the most common response to these situations. Unfortunately, they have been over-used so that seeing colored stripes on the wall is no longer a notable event. More imaginative linear treatments such as light sculptures or painterly compositions can still have a striking impact.
- The walls of long escalators in the London Underground have been used for displaying collections of small works of graphics and photography.
- Brick or tile walls can be dramatically changed through the subtle sculpting of these materials.



b. Neon sculpture in subway passage, Samuel Lebowitz, 1971, New York.



CASE STUDY 1.2a

“Grey Portal in an Afternoon Garden”

Enhancing a Subway Entrance with Art Oakland, California

The concourse of the subway station opens onto a courtyard which catches the emerging passenger by surprise. It is a rich collection of unexpected elements: a waterfall, pools, bridges, plantings and soft brown pavement. Even though it is traversed by thousands each day, it feels like an intimate and quiet place. The strongest presence in the courtyard is created by the multiple elements of a sculpture. The variety of abstract bronze shapes appear like a set of distinct, almost human characters. One becomes aware of oneself in relation to them in the space and has the curious feeling of having joined their party. The portal structure aligned with the stairs creates a feeling of ceremonial arrival.

The sculpture shown in the photos consists of eight forms, all but one smaller than a man, made of polished bronze. The exception is a twelve foot grey concrete portal. The piece encompasses an area of 50 by 50 feet and is set in a sunken courtyard leading to the concourse of a subway station.

The strength of this piece is in its careful human scale and subtle evocative relationships. It has created a space in which pedestrian paths are part of the sculpture. The small bronze elements can be sat or leaned upon. The forms are playful. The shiny sensuous surfaces invite touch. Yet, in spite of this approachable, playful quality, the ensemble commands the whole courtyard.

The Bay Area Rapid Transit (BART) Art Council invited twenty-six artists to compete for a commission for a major sculpture to be placed adjacent to the new entrance at the 12th Street Station. Eighteen artists responded, sixteen of

them San Francisco Bay Area residents. Five finalists were selected on the basis of slides. These finalists were each given a \$1000 honorarium to develop a model. The BART Art Council ultimately submitted three finalists, listed in order of preference, to BART Board of Directors. The recommended first choice was accepted.

The sculptor, Harold Paris, worked directly with the Oakland Redevelopment Agency (ORA) and the landscape architects. The courtyard was already planned but modifications were made in the positions of the waterfall and trees and in the color of the back wall. Originally, Paris wished for a contoured brick ground but adapted his pieces to a flat plaza surface.

Though not specified in the contract, maintenance was understood to be the responsibility of the ORA. The artist submitted directions for maintenance; however, he felt the need to perform some of the tasks himself. When Harold Paris died unexpectedly in 1979, full responsibility for maintenance was left with the ORA.



Credits

Sculpture by Harold Paris, 1976.

Costs

\$55,000—provided by 50/50 matched funds from the Oakland Redevelopment Agency and the National Endowment for the Arts (NEA).

Lessons

- This sculpture is one of the most successful works of art in a transportation facility.
- The “staged competition” selection process and close cooperation between the designers and the artist can produce excellent results.
- The sculpture shows that art, in combination with sensitive public space design, can make a new environment memorable and intimate.

Waiting Places

For the past twenty years, the main thing to look at while waiting for the subway in Harvard Square has been the advertising posters for two competing funeral parlors. Many regular passengers learned the words of those posters by heart out of sheer boredom. A while ago, one of the funeral parlors produced a new poster with a large reproduction of a Corot painting. It is a poor quality, monochrome reproduction, but it probably gets more viewing time than any other painting in the Boston area.

Waiting places such as subway platforms, bus stops and airport lounges are ideal for the display of art. They have a captive public of bored, restless people. They tend to be less dramatic than the other transportation sites but they provide the opportunity for extended and repeated exposure and intimate observation. Highway rest stops and the interior of transit vehicles provide settings for similar involvement.

Poetry on the Bus posters have been installed in many cities.

SPRING

Hawks
killed winter
this year.

Today two struck
from the sky
deep into my woods

Above
the barn
they wheel,

talons empty,
and winter
lies dying on the hillside.

Poet: Roger Bower
Artist: Alvin Dunkle • 1977

POETRY ON THE BUSES is supported in part by the Department of Transportation, the National Endowment for the Arts, and the Pennsylvania Council on the Arts. Copyright © 1978 POETRY ON THE BUSES: Carnegie-Mellon University Press.

Opportunities

- Many kinds of art normally viewed in galleries could be accommodated in waiting areas with proper lighting and security. Rotating and permanent art exhibits can be placed in these areas. Airport waiting lounges such as those at Seattle-Tacoma Airport (Case Study 1.4b) can be designed to provide a livingroom type of environment where art can be displayed with minimal protection. Subway platforms and bus stops generally are more exposed to wear and vandalism and require security measures.
- Decorative arts such as the mosaic tiles used on New York City subway platforms are particularly appropriate for adding interest to waiting areas.
- Bus stops can become the focus of modest, community-based art programs.
- Poetry and word images often are effective on platforms and in vehicles. In the "Poetry on the Buses" program, funded by the Urban Mass Transportation Administration, NEA, and the Pennsylvania Council on the Arts, 11" by 28" placards combining poetry and poster art are available for purchase and display in the standard bus advertising panels. Atlanta, Boston, Detroit, Philadelphia, Pittsburgh, San Francisco, and Washington transit systems have displayed these on an experimental basis with favorable community response.
- Performers such as musicians, mimes, or magicians have been very popular in Boston's subway stations. The Massachusetts Bay Transportation Authority sponsored the "Music Under Boston" program for an experimental period. The reconstructed Harvard Square subway station will provide an informal amphitheater on the surface for the kind of impromptu performances that are already very popular in the area.
- Highway rest stops have been the focus of at least two major art programs: one on Nebraska's I-80 and the other

on Vermont's I-89 (see Case Study 1.4a for the latter).

- Public waiting areas, including their wall and floor surfaces, can be made memorable by craftspeople. Stained glass windows, mosaic floors, ornamented doors and ornamented furniture were common in older buildings, and the practice of many of these crafts is currently reviving.



CASE STUDY 1.2b

**Stockholm Subway Art
Providing Memorable Waiting Places
Stockholm, Sweden**

Stockholm's T-Line, in operation since 1957, is a good example of integrating artwork with facility design. Descriptions of the stations themselves are included in Section 2.5, p. 123.

Since the late 1950's, new stations have incorporated works by outstanding Swedish artists in order to individualize the stations, and "to compensate for the loss of contact with the (above ground) landscape". As a result, the system has been compared to "a medieval cathedral in different stages of construction and embellished by several generations of artists." (ref. 29)

Artists' contributions have ranged from color selection to the creation of whole, fantastic environments. Early pieces were mostly paintings on tile or enamel, and wall coverings of prisms, mosaics, and ceramics. In the twenty-one stations formed as caves, however, artistic expressions reached a new plateau. Each cave was decorated by one or two artists, who usually were involved from the beginning of the design process.

Each station is unique. Some emphasize the mystery of caves, with primitive designs or magical arrangements. Others attempt to balance these effects with painted allusions to natural landscapes and the sky. Some deny the cave-like form by whitewashing the walls and covering them with realistic murals. In others, objects are displayed in glass boxes, or are sited to contrast to the technology, the rough cement walls, and the shadowy forms.

Artistic collaboration is planned well in advance, since many years may elapse between the two phases of construction: blasting and cement work, and interior layouts. Special details concerning the sprayed cement, ceramics or steel must



Kungsträdgården Station, Stockholm.

be synchronized with artists' plans in order to integrate the artworks and construction fully.

Artists are selected by the Traffic Art Committee of the Stockholm County Council, in cooperation with the Greater Stockholm Public Transport Company and the Swedish Artists' Union. Representatives of these organizations form working groups for one or more stations, and choose three or four possible artists for each. The artists then present sketch ideas to the working group, which recommends one to the Art Committee. They must approve the concept for further development.

Credits

The Stockholm County Council has responsibility for overall coordination of the subway system. Operations, including station interiors; are under jurisdiction of the greater Stockholm Public Transport Company.

Lessons

- A richly conceived and evocative environment (i.e., the caves) can stimulate a strong artistic reaction.
- Although daring, the subterranean and often surrealistic theme is a success, largely because of the consistently high

quality of the artworks and their fabrication.

- This system, especially the cave stations, shows that a true collaboration between artists, architects, and engineers is possible in the design and construction of transportation facilities.

Streets and Plazas

The streets in the Chicago Loop are broad, straightforward spaces full of busy, business-like life. Unexpectedly around a corner, one encounters an enormous red/orange object perched like a creature over a small plaza, Alexander Calder's sculpture "Flamingo". It is startling, beautiful, funny and outrageously invites one to play in the middle of hard-working downtown Chicago.

Streets and plazas are our public living spaces and accommodate a whole range of movement. Driving, hurried walking, leisurely shopping or relaxing on a bench provide a variety of perspectives for experiencing art.

Opportunities

- Art on the streets can range in scale from an intimate, ad hoc display of small paintings to a mile-long laser beam sculpture (p. 27). The character of the art can be anything from dignified civic monuments to temporary festivals. Expressions have varied from minimal abstract sculptures to architectural decorations and commercial signs.
- Murals have been a particularly successful form of street art. Large blank side walls of buildings visible from many blocks down the street are very common in American cities. Such walls have often served as large canvases for sophisticated abstract works, ambitious and innovative paintings chronicling neighborhood events or bold protests against political or social ills. (Case Study 1.3d)
- Functional and fanciful street furniture, such as the George Sugarman sculpture in Baltimore (right) can be created by artists. Artists and community members have collaborated in making street furniture and pavement that can give a public space a special identity, such as the mosaic-covered forms at Grant's Tomb (p. 42).
- Fountains are a traditional form of street art that have always delighted the public. The Halprin Fountains in Portland and in Seattle's Freeway Park (Case Study 3.2a) and numerous fountains designed by other contemporary artists attest to their continuing relevance to the streetscape.
- Street festivals can turn otherwise drab streets into magical places and celebrate visual arts, ethnic holidays or other special events (p. 43).



a. "Flamingo," Alexander Calder, 1974, Chicago.



b. "Baltimore Federal," George Sugarman, 1978, Baltimore.

CASE STUDY 1.2c

Chelsea Square Art for the Community Chelsea, Massachusetts

In Chelsea a lot of people stand on street corners. One of the stories they tell about this sculpture concerns a man who stepped up to the figure of the former schoolmaster in the group and slapped it, saying: "I have waited thirty years to do this." The men on the corner laugh when they tell this story and reminisce about the ways of the old schoolmaster.

The sculpture consists of three life-sized bronze figures, standing in a casual, conversational group on a newly renovated public square. Two of the figures were modeled after well-known townspeople, the third after the artist's daughter.

The sculpture is set in Chelsea Square, which had been very run-down and under-used before the streetscape program. The landscaping, the renovation of the



fountain, and new street furniture, along with the sculpture, were intended to revitalize the square.

Chelsea is a working people's community with many longtime older residents. The sculpture, memorializing known local characters, has proved to be very popular.

The project was developed with federal Economic Development Administration (EDA) funds for local public works, a program designed to generate local employment. One percent of the original \$3 million budget was set aside for art, an amount later increased by another one percent for a total art budget of \$60,000, which included commissioned works by three other artists, in addition to the sculptor, Penelope Jencks.

The artist was selected by the designers through an informal review of local sculptors' work. The designers had conceived the idea of a realistic, informal group of figures and found an artist who was interested in doing it. The artist, Jencks, prepared a scale model which was approved by the mayor. She then selected the people who modelled for her piece through an advertisement in the local paper and recommendations by community members.

Credits

Sculpture: Penelope Jencks.

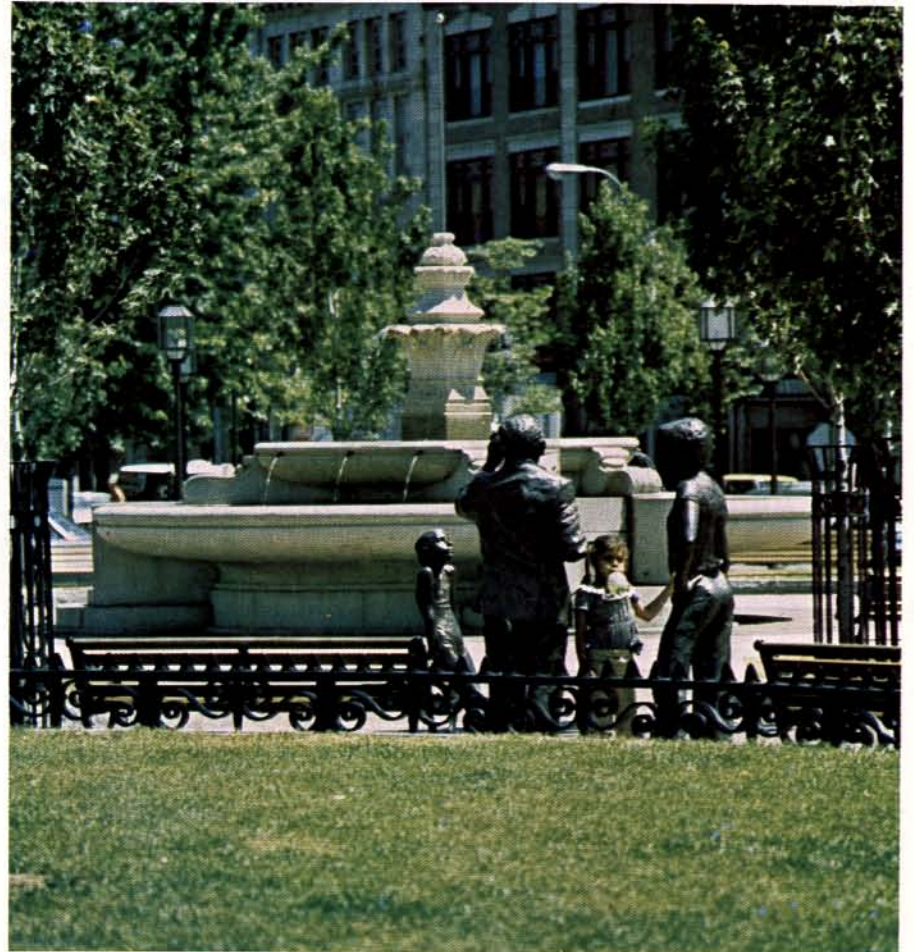
Costs

\$20,000, in 1978, excluding footings and installation.

Lessons

- This is a very literal piece that is easily accessible to, and well-liked by, the local public. The artist has remarked that it could have become a stronger piece if more time had been available to translate the subject into a more personal sculptural statement.

- Many towns the size of Chelsea have no arts councils or other active art organizations, so advocacy for, and selection of, art often falls to the designers of new projects.
- In this example, the artist was given the narrow mandate to represent members of the community. This restrictive approach, while often used by clients and designers, may limit the artist's contribution to site design and restrain the development of new ideas.



Renovating Old Civic Art

A symbolic group of sculpted figures on top of Grand Central Station was devoted to the glory of the railroads and the Vanderbilts who built them. The figures, now dark with dirt and seen against the facade of a large office building instead of the sky, are still impressive as a focus for Park Avenue. The current conditions of railroads and the fall from grace of grandiose symbolic expression make this sculpture an anachronism. Yet as a piece of history and of grand urban art, it deserves to be carefully preserved.

Nineteenth century transportation facilities were often richly embellished with sculpture and decorative arts. Many avenues and plazas of the period were focused on grand fountains and monuments. The aesthetic of the "Modern Movement" in the arts has turned away from these traditional art works, and their defacement or destruction has occurred without outcry from the arts community. Preserving and restoring historic art works has now become a major concern.

Opportunities

- Traffic management and streetscape improvement programs should include the respectful renovation of civic art. Successful examples include the restoration of a monumental fountain as the centerpiece of a renovation of Fountain Square in Cincinnati and a similar project in Chelsea, Massachusetts (adjacent to the Jencks piece, Case Study 1.2c).
- Remodeling of railroad stations and safety improvements on historic bridges should include careful restora-



"Transportation," Jules-Alexis Coutan, Grand Central Station, New York.

- tion of their decorative artworks (see Section 2.6).
- Older subway stations, in spite of their overall bleak appearance, often include small gems of decorative art that should be restored as part of modernization programs.

CASE STUDY 1.2d

**“Dedicated to Mechanics”
Renovating a Piece of Historic
Sculpture
San Francisco, California**

This monument was renovated and given new prominence as the focal point of a public plaza at Bush and Market Streets near the Montgomery Street BART Station. The location is in the busiest part of the financial district. The Plaza was designed as part of a series of city-sponsored improvements that occurred simultaneously with the BART construction under Market Street.

The design was sensitive to the strength of the monument and avoided any new architectural elements that would compete with this historic sculpture. Simple seating, pavement, and a few trees were sufficient to create a pleasant plaza. The seats face the sun and focus toward the monument. The Plaza is an excellent location for lunch, sunbathing, or watching people and is heavily used. A study published in *Landscape Architecture* magazine by Nancy Lindsay (November 1978) concluded that Mechanics Plaza is a more successful place for attracting people than several of the more elaborately designed plazas along Market Street.

Credits

Plaza design: Market Street Joint Venture Architects (Ciampi, Warnecke and Halprin)

Monument sculpture: Douglas Tilden

Lessons

- Older artworks and monuments can be successfully used as focal points for streetscape improvements.
- The historic associations and fine quality of such works can often create a richer place than modern design can.
- The subject of the piece—a celebration of workers and their tools, rather than of some now-forgotten personality—makes it particularly appropriate for revival.



Recycling Obsolete Machinery

After almost all of the old Waterfront Freeway was demolished, a group of citizens including artists and members of the Historic Preservation Society succeeded in preserving a short section of viaduct and part of a curving concrete access ramp. They had argued that the Freeway was an important cultural monument to the automobile era and that it had outstanding sculptural qualities. The Museum of 20th Century Art has received sufficient private donations to insure the upkeep of this piece of the Freeway after its expected landmark designation.

An early 21st century news report.

Transportation facilities have had strong cultural associations and dramatic sculptural forms throughout our history. American images were dominated by wagon trains, railroads and harbors in the 19th century, and by highways and airplanes in the 20th. Giving new meaning to these powerful objects has a strong impact on the consciousness and perception of the viewer and can justifiably be discussed in the realm of art.

Opportunities

- Some prominent American art has already been based on transportation machinery, such as the crushed car sculptures of Cesar and Chamberlain. While these works are in museums and galleries, their concepts could be expanded and applied to transportation sites, as was done for the "Cadillac Ranch" sculpture.
- A kind of folk art has been achieved by turning parts of buses into kiosks, railroad cars into restaurants, and jet planes into playground equipment.
- Turning a now-useless fragment of a San Francisco Freeway into a monument by sculptural modification of a ramp was recently proposed by artist Robert Irwin.

a. "Lines of the West Side Highway," Stephen Korns, 1970, New York.



b. "Cadillac Ranch," Ant Farm, 1974, Amarillo, TX



CASE STUDY 1.2e

Gasworks Park Recycling Giant Machinery into a Park Seattle, Washington

An obsolete gas manufacturing plant located on a 20.5 acre promontory on the north shore of Lake Union was converted into an active public park. The park design reused many elements of the old plant. The boiler house became a picnic shelter and the exhausters, a children's playbarn. Some of the older machinery was removed. The rest was cleaned, painted in bright colors, and now serves as sculpture, play equipment and an interpretive exhibit. Six generator towers and the pre-cooler towers were made safe by removing stairs and other hazards and were left standing as giant sculptures on the waterfront.

The site was purchased in 1962 with city bonds. Richard Haag, retained by the city in 1970, conducted an extensive

analysis of the gas plant. He eventually proposed selective preservation of the plant, and development of an active, unconventional park. The biologically sterile soil and the sculptural qualities of the artifacts became the main determinants of the design. Highly skeptical initial public reactions were overcome in 1971-72 by an educational campaign which included the recycling of one of the structures for the designer's office as a pilot project.

The client, the Seattle Park Commission, provided strong support for the project throughout. Initial stages of the project were completed in 1976 and further developments are still planned.

Following its controversial start, the park became well loved and well used. Active play, concerts, and spectacular day and night views of the Seattle skyline are the primary attractions.

A "great mound" was created accidentally when the city allowed a contractor

to dump excavated material there. Now planted, the mound has become a spectacular overlook. A beautiful bas-relief sundial of bronze and cast stone by artist Chuck Greening (see detail, right) is located on top of the mound. It was financed by a private donation.

Credits

Landscape Architects: Richard Haag & Associates
Artwork: Chuck Greening

Costs

Park and structures: \$900,000 in 1975
Sundial: \$20,000

Lessons

- The project shows that apparently useless, but sculpturally powerful, machinery can be turned into environmental art. It is easy to imagine similar treatment of a great deal of obsolete transportation-related machinery:

harbor structures, railroad bridges, highways, etc.

- The tenacity of a designer over seven years, and a supportive client agency, were critical ingredients of success.



c. Sundial, detail.



a. View of the Plant from the park.



b. Children's Play Barn.

Large Scale Art in the Landscape

The physical scale and speed of movement associated with transportation facilities can create sites and a viewing public for large scale works of art in the landscape. Examples include Christo's "Valley Curtain" and "Running Fence", and "Spiral Jetty" by Robert Smithson.

As the following case study illustrates, artists and public agencies are beginning to plan projects together for the reclamation of large, up to now wasted, land areas. Such areas are particularly common at airports and highway interchanges. Artworks can help to turn cumbersome solutions to environmental impact problems into exciting visual images. Thus, when a noise barrier must be constructed, it can also be treated as a piece of sculpture. When land must be vacated because of airport noise, it can be turned into earthwork art, visible from the air.



"Valley Curtain," Christo, 1971-2, Grand Hoback, Rifle, CO; Span: 1200 feet, Height: 185-365 feet; 200,000 square feet of nylon polyamide, 110,000 pounds of steel cables; Project Director: Jan van der Marck.

CASE STUDY 1.2f

Earthworks

Land Reclamation as Sculpture King County, Washington

This land reclamation program sponsored by the King County Arts Commission (KCAC) addresses artistic possibilities and public policy issues involved in land reclamation. Aspects of this case study have potential applicability to transportation projects.

Project 1 includes two commissions for earthworks currently in execution: the reshaping of a 3.69 acre surplus county gravel pit by Robert Morris, and the redesign of an eroded park area in the City of Kent by Herbert Bayer.

Project 2 covered a second phase where six artists were involved in a design symposium. They participated in a series of public forums, panel discussions and slide lectures to acquaint the public with the issues related to land reclamation. They also prepared designs for six additional sites. Two of these are related to airports. One proposal, by Dennis Oppenheim, covers an obsolete Naval Air Station. The other, proposed by Mary Miss, covers the free-zone at Seattle's airport, an area where single family residences have been purchased and removed due to noise impact. The other sites involve gravel pits, mining areas and refuse-landfill. They range in size up to several hundred acres.

Aside from the artistic potential, a case was made for the earthworks on the basis of cost effectiveness. The estimate for the restoration of the first gravel pit site to its original contours was \$190,000. The reclamation of the site by the Morris sculpture was estimated at approximately \$150,000, a possible savings of \$40,000.

Selection was made by a three-member jury from a list of invited artists who had submitted letters of interest. All the

artists had previously worked on large scale pieces in the landscape, and most were well known.

Funding came from a great variety of sources. The County provided \$140,000, and the present owners contributed the sites. The National Endowment for the Arts matched funds using both the Art in Public Places and the Design Communication and Research Program, for a total of \$67,750. Sponsorship and contributions by the U.S. Bureau of Mines, the Port of Seattle and the University of Washington showed that these agencies believed that this project had serious potential for focusing attention on reclamation programs. Other sponsors included municipalities, public agencies, private businesses and individuals. The complex program was organized by the KCAC.

Lessons

- Although the results are not complete, the program is certain to give exciting new insights into the potentials for sculpture as reclamation, and help address a major problem of the day.
- The possible applications to transportation include all of the opportunity areas noted on the preceding page.
- While the cost effectiveness argument was advanced to help sell the project, there are also non-monetary benefits for this use of art.



Earthwork Sculpture by Robert Morris, 1979.



a. Dump truck kite, Curt Asker, 1978, Stockholm.



b. "Four Trees," Dubuffet, 1972, New York.



Finding Suitable Art



Gas Tank mural, Sister Corita, 1971. Boston Gas Company, Dorchester, MA

Since there is a tremendous range of artworks and artists suitable for sites discussed in Section 1.2, a transportation agency will need guidance, and some professional assistance, before choosing an art program. This section will help agencies make decisions about the kind of art wanted by explaining how to survey the range of artwork describing important qualities of art and briefly detailing innovative, but underused, ideas for public art.

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The Need for an Overview

When a transportation agency decides to purchase an art work or establish an art program, it faces many choices. Art today encompasses such a wide range of works that finding suitable artwork can at first seem a difficult task.

The effort to obtain art will often be initiated by members of the administrative and technical staff (possibly at the urging of local arts agencies or artists). Decisions, therefore, will be made by an interested group or formal committee, not by an individual. To make intelligent choices about art, the group will need to get an overview of artwork available and of types of sites that may be suitable for artwork.

There are several ways of obtaining this overview. A review of art journals and consultations with art professionals, public art agencies, local artists and museum professionals can be a great help, as can examining the slide registries of arts agencies and galleries. Inviting local artists to show slides of their work and of other's work can help as well. If art professionals or public agencies in the area have conducted art programs, they can aid in an overview. Visits to a few selected sites may also be necessary to get a clear sense of an artwork's impact.

The selection committee should keep in mind that because commissions for public art have been relatively scarce in recent years, there is a wider range of choices available to them than they will actually view. This argues for obtaining the aid of a sensitive art professional, who can aid in both the selection of an artist and in the administration of a program.

The selection committee should also remember that the quality of an artwork depends on the vision, skill, and energy

of the artist. The selection of a particular artist is ultimately more important to the quality of work than the type of art selected. While the group may make general decisions about the direction the artwork should take, it should be careful not to prescribe its exact physical characteristics. As an artist and a client work together, exciting and unpredictable developments may take place. Both should remain open to this possibility.

Expressions and Attitudes

In reviewing different types of art, the client needs to consider aesthetic and material issues that will determine whether an artwork is a suitable one for the site and the community. The review should not lead to categorical pre-judgments, such as "we don't want abstract art" or "it should be made of bronze", but should culminate in a list of general issues and concerns, given to the artist selection panel or agent. The following is a brief review of some of the aesthetic and material issues that should be kept in mind when drawing up the list.

- The works can be expressed in a range from literal representation to abstract form. In older art works the client often explicitly defined the subject to be represented, but only a few of the good contemporary artists work this way (Case Study 1.2c). There is also a variety of symbolic expression by allusion and association, but insistence on this can lead to clichés, as in the case of some airport sculptures symbolizing flight.
- The work's mood can range from contemplative, as in much of modern sculpture, to fully participatory theater, as in Halprin's fountains. Artworks can reflect the local community in story-telling pieces, often with the community participating, express so-

cial concern or protest, or project tones of humor or seriousness.

- Art can blend with its environment, contrast with it or stand on its own. Architects and designers often prefer a blending, while many artists would opt for more independent expression.

"Sky Pie," Rockne Krebs, 1976, Philadelphia.



Innovative and Underused Ideas

The majority of art now commissioned for public places consists of large abstract sculpture. However, for many transportation sites such works are not suitable. This suggests that the sponsorship of art by transportation clients for such conditions could be a major and exciting challenge to the art community to explore less established directions. A number of exploratory works, though not well known, are included here to show that transportation facilities need not always repeat what is usually done by public commissions for formal plazas and building lobbies.

These alternatives include:

- Temporary events, festivals, or multimedia events, such as the collection of events sponsored by the Southwest Ohio Regional Transit Authority (Case Study 1.4c).

- Short term art experiments at transportation sites, such as the Washington WPA projects (p. 42).
- Changing exhibits of photos, graphics, and poetry.
- Murals and other relatively inexpensive installations which are not expected to last forever (Case Study 1.3d).
- A focus on the process of making art; some public art programs such as the Town Meeting Program for the State of California (Case Study 1.6b) deliberately set out to emphasize community involvement and education with the understanding that the quality of the art produced in this way may be more uneven. Christo's work (p. 23) is as much about the drama of getting people together as it is about the final results. If the process is to be emphasized, it is extremely important that the right artists are chosen. Some are natural showmen and enjoy this sort of exposure while others would be acutely uncomfortable working outside the privacy of their studio.

- Other examples of fresh responses are: photographic, film and video works related to overall city space and fast motion; multiple pieces geared to various speeds, from cars to the strolling pedestrian; reinterpretations of gates and entrances; decorative arts and small surprising pieces along passageways; graphics, poetry, or other intimate works in waiting areas and inside public transport vehicles; fountains, light sculptures, murals, decorative pavement or special street furniture for streets; art reflecting community life; older monuments given new life; giant works recycling transportation structures or using the landscape.

ing sites that are controlled and secluded to some extent as in the Grey Portal (p. 14); or blending the work with the architecture such as in Viewland (p. 48).

The work should not block passageways and platforms, compete with essential signage and information, or pose safety hazards. The structural materials and finishes should be durable and able to withstand or preclude vandalism.

Although artists can adapt their work to respond to such concerns, a predisposition on their part to this sort of accommodation is a reasonable selection criterion.

Physical Qualities and Site Constraints

The size, shape and materials of the work will help determine its suitability for particular sites because of its effect on the architecture and landscape. Also to be considered are the potential impacts of the surroundings on the art work and a series of functional compatibility, safety, and maintenance issues. The customary style and materials of artists should be reviewed with these factors in mind during the selection process, although with the proper technical assistance many artists can solve such problems.

One of the most common problems of public art in the city is that the work is overwhelmed by the complexity of the surroundings. Few works of sculpture can successfully stand up to the visual scale of the city and of transportation facilities. This has destroyed the effect of many otherwise good pieces. The scale problem can be solved by artists in many ways. Some examples include: working on an exceptionally large scale with bold forms; creating a special point of view that avoids any competition for attention, as in the Asaroton work (p. 31); choos-

"Nine Views of New Haven," Taplin and Wolff, 1978, New York.





CASE STUDY 1.3a
Landscape of Time
Integrating Sculpture with
Architecture
Seattle, Washington

This piece consists of five carved granite boulders located on the upper entrance plaza of the Federal Building in Seattle. The two tall elements are slightly larger in scale than human figures while the lower pieces are on the scale of furniture. The pieces create a strong presence in the plaza, and by their attraction change the entrance pathways to the building. The surfaces of rough red granite and the mysterious smooth depressions give an ancient, ritualistic quality to the scene.

This work is a particularly successful example of integrating sculpture with architecture. While many such collaborations take away significance from the artwork, this one enhances its effect. The colors and textures of the granite reflect and subtly amplify the materials of the building and the plaza. The overall effect is of great visual unity and quiet, but also of considerable excitement.

The sculpture was installed in 1975. It was commissioned through the General Services Administration "Art-in-Architecture" program (*ref. 39*), which provides that one-half percent of construction costs must be allocated for fine arts (Case Study 1.6a).

Credits

Sculpture: Isamu Noguchi, 1975.

Lessons

- Some artists can create works that respond to, and make use of, architectural features to intensify the piece's overall effect. Selection of the right artist and the artist's rapport with the architect are important factors in achieving success.

CASE STUDY 1.3b

Fountain Sculpture as Image and Logo Seattle, Washington

This commissioned piece was installed outside the entrance to the Seattle Water Department Operations Control Center. The sculpture consists of two large chrome-plated pipes which start at opposite ends of a small pool, contour over the lip of the pool and rise into opposing "S" shapes. Seen frontally, they connect to form a figure eight which is visually connected to the sides by water jetting out of the top ends of the tubes. The jets are adjustable by two control gauges, which are part of the sculpture. The piece is dramatically lit at night.

This commission just preceded the City's One Percent for Art ordinance (Case Study 1.6c) and acted as a prototype for many of the later procedures. In 1971, the Water Department had initiated the commission of a sculpture using water and reflecting the functions of the agency. It requested the assistance of the Seattle Arts Commission in selecting the artist. An open competition was conducted in mid-1972. Artists submitted sketches and models for the site, and Ted Jonsson, a well-established and respected Northwest artist, won the commission. The piece was installed three years later.

All seem to agree that the result was worth waiting for. The Water Department is very proud of the sculpture and uses it as a signature image in its advertising and brochures. The piece is often photographed.

Credits

Sculpture: Ted Jonsson, 1972.



Costs

The Arts Commission budget was \$30,000 in 1972, provided by the Water Department.

Lessons

- This piece is a happy combination of directly satisfying a client's expressed need for literal artistic response and creating a work of considerable artistic merit in itself. The key for accomplishing this was the selection of the right artist.
- In later years, the Arts Commission found invitational competitions or direct artist selection more manageable than open competitions. Open competitions were used only on rare occasions.

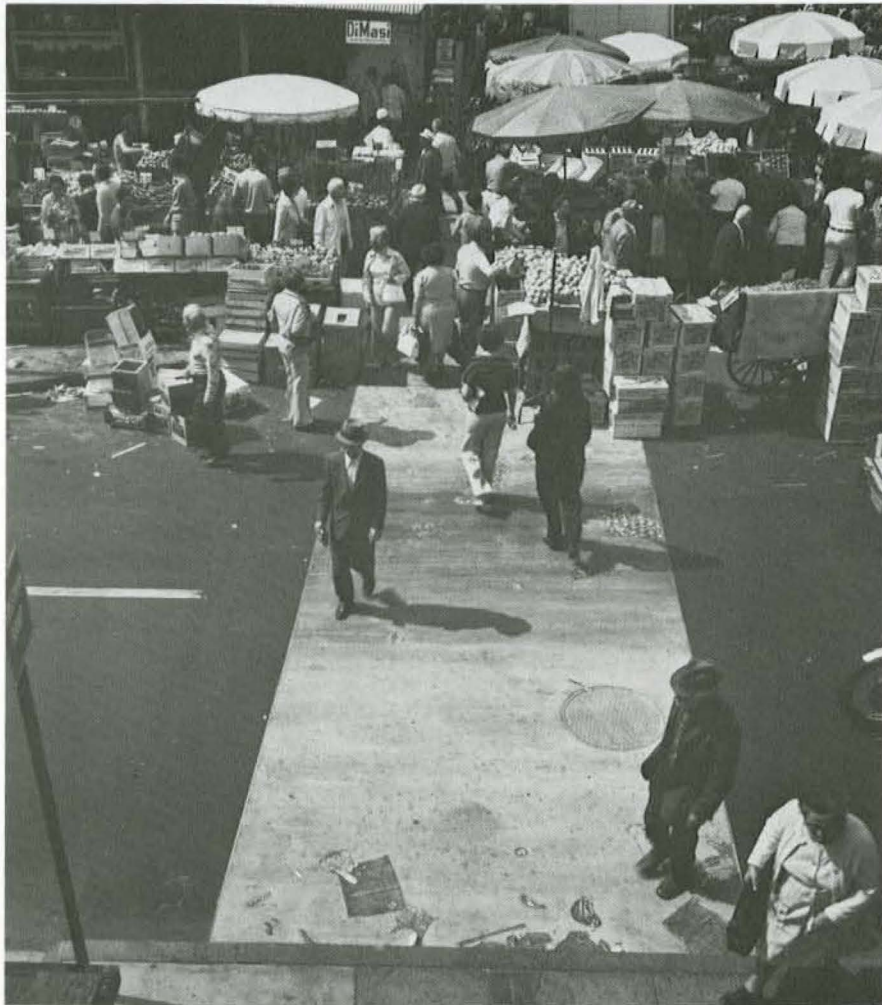
a. Detail.



c. Detail.



b. View from Expressway.



CASE STUDY 1.3c

Asaroton '76 Innovative Art in a Complex Site Boston, Massachusetts

The site is a busy, open-air produce market that occupies Blackstone Street during three days of the week. The piece, which consists of bronze replicas of everyday debris of the market embedded in concrete, is situated in a segment of the street forming a major crosswalk (55 by 10 feet). Heavy traffic, and pedestrians using the "Freedom Trail", which connects Boston historic sites, cross here. The site could not be more in the middle of transportation and urban activities.

The sculpture succeeds by inducing people to look down. This allows one to view the piece in an intimate way rather than in juxtaposition with the chaotic urban landscape. The scattered elements, though each small, create a complete environment. The carefully crafted, realistic detail provokes curiosity and close observation. Constant buffing and wearing of the brass by feet and tires is making the piece more brilliantly polished, abstract and mystifying over the years.

The piece uses time by its title's allusion to buried fossils. The title is taken from a 2nd century Roman floor mosaic, depicting the left-overs of a banquet, which has survived as a piece of fossilized history.

Response to the work confirmed that it is real "public art". People discover it without warning, often standing on it before they notice it. They are intrigued—Why? Who? What does it mean? Their spontaneous delight and responses can be very different from the way they view artworks in a formal setting.

The piece was the result of a two-stage, juried competition for the Boston Bicentennial Sculpture. A large number of regional artists were invited to submit slides and proposals. Eight finalists were selected and were given \$500 each to develop drawings and models. The winner was unanimously selected even

though none of the recommended sites were used. The jurors agreed that the artist had invented an original concept that was better than any anticipated in setting up the guidelines.

Due to the nature of the site chosen, many agencies had jurisdiction: the Pushcart Merchants' Association, the Boston Traffic and Public Works Departments, the local Little City Hall, and the Landmarks Commission. The artist worked directly with all of these groups and through the use of scale models and photo montages successfully persuaded many skeptical parties.

Credits

Sculpture: Mags Harries

Costs

The commission was \$10,000 in 1976, from Boston 200. All site work and concrete was contributed free. The budget turned out to be unrealistically low (about what the city would have paid for an ordinary cobble-stone crosswalk).

Lessons

- In commissioning a work of public art, the client can benefit by being open to proposals from the artist which challenge preconceptions about the site and type of art.
- Direct involvement of the artist in persuading administrators and community representatives may be necessary, and can be fruitful for all concerned.

CASE STUDY 1.3d

Mission Murals Expressing Community Sentiment San Francisco, California

Our interest as artists is to put art close to where it needs to be. Close to the children; close to the old people; close to everyone who has to walk or ride the buses to get places. We want art either out in the streets or in places where a lot of people go each day: the hospitals, health centers, clinics, restaurants and other public places . . . we offer you colors we make.

Mujeres Muralistas, San Francisco

The colorful and complex murals of San Francisco's Mission District are a form of public art which is conceived for a specific space and rooted in a particular social context. Not merely protests or simply large paintings on walls, they are an art form in their own right. Painted in an expressionistic figurative style, they contain references to the Mexican muralists, pre-Columbian designs, Chilean influence and commercial graphic art techniques. Many works are collaborative efforts by community-based groups organized for the purpose of painting murals for social communication. Their content is usually focused on a central theme depicting ideas of community concern.

One group working in the Mission District is the Mujeres Muralists, comprised of Hispanic women artists who work collectively. "Latinoamerica", pictured here, was commissioned in 1974 by the Mission Model Cities program for a wall next to a parking lot. "Para El Mercado" depicts a market day in a typical town. Commissioned by the owner of a taco stand for his parking lot, it celebrates the Latin American cultural tradition. These murals are characterized by their juxtaposed areas of bright, unmixed color (*ref.* 19).

BART's impact on the neighborhood inspired a mural which forms the backdrop to the subway's entrance plaza at 20th and Mission. It was created in 1975 by artists M. Rios, T. Machado and R. Montez, working for free with paint donated by a local merchant. The BART system approved of, but did not sponsor, the project. The mural expresses a local sentiment against the subway, depicting a slick BART train running on rails borne by human piers. Reflecting local pride and identity, the painting provides the station with both visual enhancement and a community focus.

Neighborhood murals of this sort can be found in many cities, and are often the work of artists from minority groups. During the 1960's they were part of a general social and creative activism, and were strongly related to national issues and community organizing efforts. These early works formed the basis of the contemporary mural movement, which now contains a variety of trends and motives (*ref.* 19). Some programs, such as City-arts Workshop, (p. 42) attempt to involve alienated youth. Others, such as the photo-realist murals of Venice, CA, are personal aesthetic gestures. Large, abstract supergraphics are popular elements in urban revitalization plans. Financial support for murals is mostly from local sources. Institutional funding, when available, is usually in the form of matching grants.

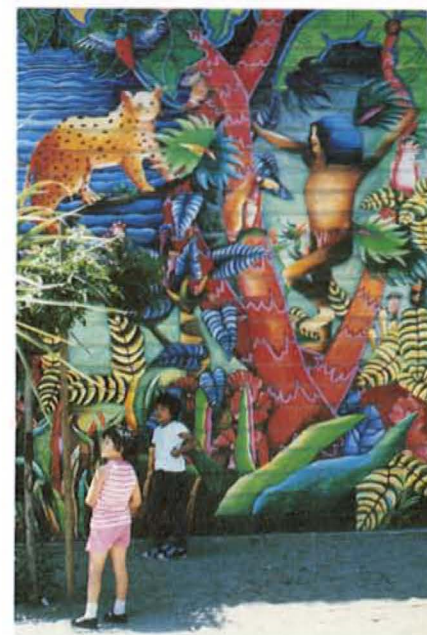
Lessons

- Due to their scale and dramatic impact, murals are an appropriate form of art for highways, streets and parking lots.
- Hispanic and other neighborhood muralists tend to be strongly rooted in their communities, addressing local audiences and issues. Such artworks can help integrate transportation facilities with the community.

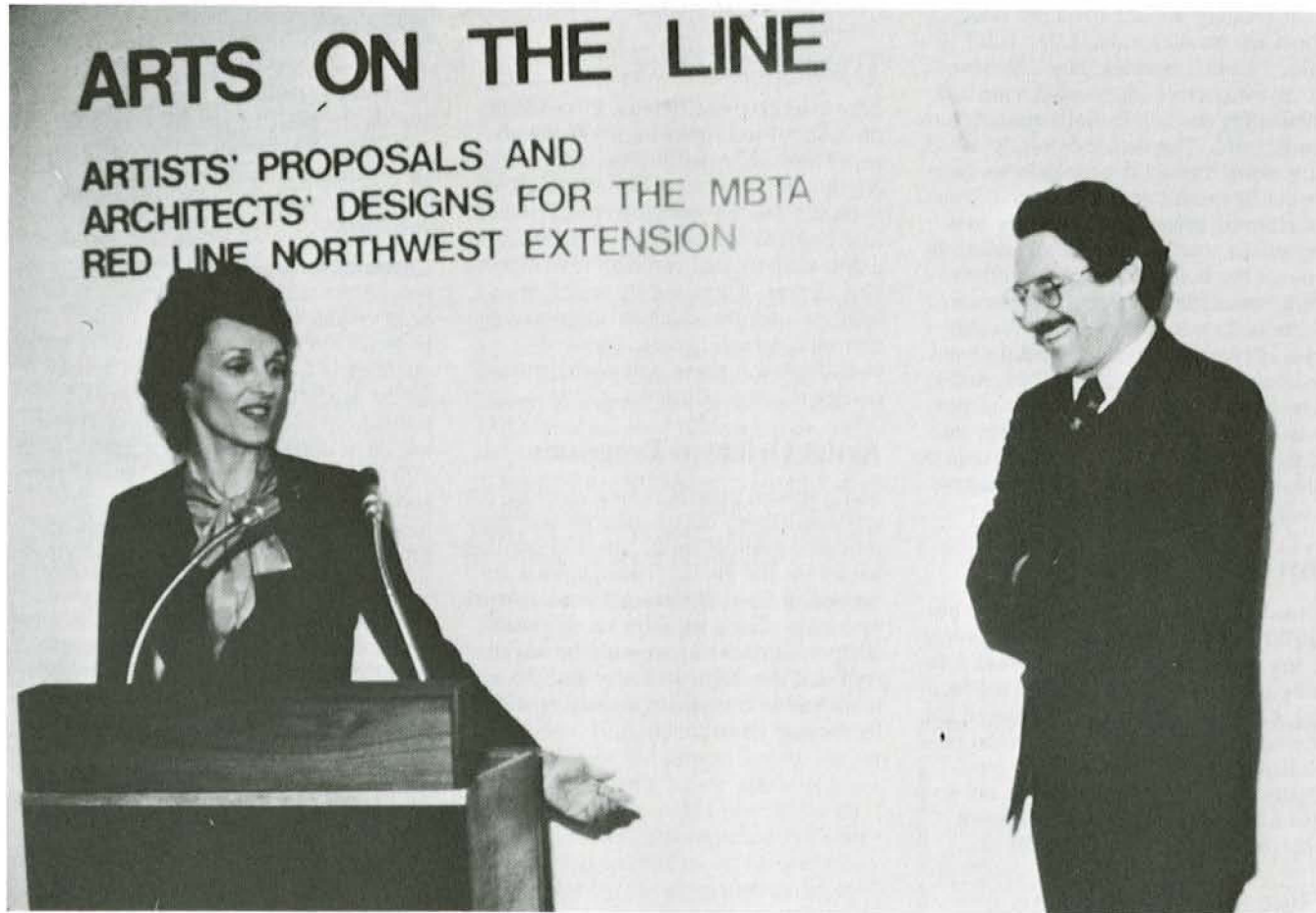


a, b. "Latinoamerica" and detail of "Para El Mercado," Mujeres Muralistas, San Francisco.

- These murals, which are often quite beautiful, bring together a concern for social communication, visual traditions and artistic talent.
- Murals are an effective, but not permanent, art form. In five to six years they will likely need repainting. Some recently developed paints may give a longer life, but they require testing.



Choosing A Program



Joan Mondale and Ted Lutz, UMTA Administrator, introducing the Arts-On-The-Line exhibit, Cambridge, MA.

After a transportation agency has reviewed the kinds of art available, it will choose an art program. Since public art programs have ranged from the purchase of a single piece to extensive commissions covering many projects, that choice may not be a simple one. This section will help an agency choose a program by examining a wide range of art program models. It will also cover artist selection and program administration. More specific information on selected program procedures can be found in Section 1.6.

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Choosing the Program

The key to getting an art program going is the establishment of a process—covering program alternatives and artist selection techniques—that administrators and interested parties can follow.

The first step in this process should be a clarification of the agency's goals (see "Art and Public Benefits"). For example, if it wishes to increase ridership on existing systems, transitory events such as festivals and performances may be the answer (Case Study 1.4c). If the agency is involved in major new facility design and wants to improve the environment and give the system a better public image, commissioning permanent works to be integrated with the design could be the best approach. Problems with vandalism or negative community reactions suggest the possibility of involving the community in the creation of works of art, which could be displayed in changing exhibitions. These kinds of program alternatives are discussed below.

Each program alternative will also be combined with various administrative methods and resources, including techniques for selecting artists and funding arrangements; these are also addressed in this section.

In any art program, the early involvement of artists is critical in establishing tone, and focusing on priorities. While an artist well experienced in public art programs may be able to sustain a program alone, few have sufficient experience, or the desire to become involved in the bureaucratic and administrative tasks necessary to the job. Arts agencies and arts administrators can be helpful in bridging the gap between the artist and client, particularly where complex programs and combinations of sponsors are involved.

Commissioning Works Integrated With Design

This option permits the fullest response to local conditions. It provides the most exciting opportunities for creating site-specific work. Examples range from the artist creating a piece for a pre-selected site (Case Studies 1.2a, 1.2b, 1.2c, 1.3a, 1.3b) to working as a consultant to, or member of, the design team and influencing the whole environment (Case Study 1.5a). The demands on the artists vary along this spectrum, and this fact should be considered in selection. The structure of design teams and the way the artist's role is specified contractually will set the boundaries for the artist's contribution. If artists are used as consultants, they need to be paid for this separately from any final commission, and this payment should be budgeted as part of the design fee. The type of program described here entails greater administrative efforts and expenses than do other types of programs (Case Study 1.6d).

Purchased Works

Already completed artworks can be purchased outright from an artist or gallery at any point during construction of a facility (or for an already completed facility). Costs involve only the price of the artwork, plus its transportation and installation. Administrative tasks are greatly reduced by this method, but so also is the integration of the artwork with the site (Case Study 1.4b).

Changing Exhibitions

A program of changing exhibitions may require that an area be designed into a facility for this use. A system must also be established for selecting and installing ongoing exhibitions. This kind of program requires administrative and financial commitments which continue after

the completion of the facility. It has the advantage of being able to address changing tastes and values. Such programs are often conducted in conjunction with an established institution. Examples include the Louvre for the nearby Paris Metro Station, and the Burke Museum for SEA-TAC (Case Study 1.4b).

Transitory Events

Like changing exhibitions, a continuing program of transitory events (festivals, performances, experimental work) would require ongoing commitments. Such an approach can be particularly effective in fostering the sort of dramatic increase in public activity that can help revitalize city centers. These events are often related to a regular calendar cycle and require the periodic commitment of considerable funding and administrative energy (Case Study 1.4c).

Artist Oriented Programs

Some special programs sponsored by the arts community have produced both significant advances in the arts and exciting works for the public. The symposia described in Case Studies 1.2f and 1.4a are examples. Transportation agencies can co-sponsor such events with the advantage that the major initiative and the administrative energy are already provided by the arts community.

Artist Selection

For commissioned works, which make up the major part of most public art programs, the single most important decision is the selection of the artist. Since public monies are being spent, these programs must be conducted in an open manner—one that can be justified in the face of possible challenge and political scrutiny. The choices must be supportable on the basis of artistic excellence and appropriateness of site. There is a range of options available to the client for artist selection which are summarized in the chart.

Curators are professionals with credentials in the arts. Some art programs have been conducted by asking a single professional to make selections for the client. The quality and type of art selected depends on the judgement of this individual. Museum and gallery shows are often done this way, sometimes with striking results, reflecting a strong, personal point of view. Public agencies, however, generally favor the panel approach where it is easier to publicly justify the choices made.

Architects or other designers of facilities have often acted as the agents for artist selection. This was true for the Atlanta and Montreal subways and for the early stages of the BART Art Program. The municipal one percent ordinances of Baltimore and Philadelphia left the choice of artists to the designers and their clients, subject to approval of the Arts Commissions. This type of selection has often resulted in art that served to decorate or fill up space left unresolved by the design. Recent trends in transportation as well as municipal art programs have been toward selection involving art professionals (see Case Studies, Section 1.6).

Professional Art Panels are usually constituted as a jury that can deliberate

and vote on potential choices. An arts agency or consultant is often involved in selecting the panelists, who may be practicing artists; museum, academic or gallery-based professionals; or independent consultants. A selection panel commonly has three or five members.

Community Committees may be constituted from the community where the art is to be placed. Case Study 1.6b describes a process that relies largely on such committees for artist selection. While this approach is the most democratic and possibly the most immune to community criticism, it runs the risk of excluding many of the artists and art styles that are not so immediately salable to lay people, and yet have lasting merit.

Panels combining community members and professionals have sometimes succeeded in providing both artistic quality and democratic representation. The main caution here is against making the jury panel too large, for it is often true that the larger the committee, the grayer the decision. The solution to this problem applied in the "Arts on the Line" program (Case Study 1.6d) was to have a professional jury of three voting members supplemented by community members and a representative of the designer. The community members and designer's representatives could participate in all reviews and discussion, and advise the jurors, but could not vote.

Any of these individuals or jury panels can employ any of the procedures listed on the chart:

Open competitions are conducted through widely advertising the size and requirements for the work and inviting proposals from any artist who chooses to submit. Selection is made by a jury. No compensation is paid for the initial entries. Sometimes a set of finalists is selected and then paid to further develop proposals for a second stage final selection. The advantage of this system is that it encourages a wide range of artists

to generate new ideas for the specific sites. The disadvantage is that for the initial entry a substantial amount of work is required from the artist for no payment. This, combined with a small chance of winning, makes many artists, particularly the more established ones, unwilling to compete. The current trend is to rely more on limited competitions and pre-selection based on qualifications. Nevertheless, periodically holding open competitions is a useful device for finding new talent that may be missed in the other procedures. SEA-TAC Airport (Case Study 1.4b) is a good example of using open competition for part of an art program and balancing it against other selection methods.

Limited competition involves a smaller number (three to five) of artists who are selected by the jury on the basis of slides and other qualifications, and are invited to submit proposals for a site. The artists are paid to develop drawings and scale models of their idea, and one is selected as the winner. Harold Paris's "Grey Portal" (Case Study 1.2a) and many of the other works described here have been selected in this way.

Pre-selected Invitation is the choosing by the jury of a single artist to develop one or more proposals for the site. The artist is paid for his or her work and one of the proposals is selected to be commissioned. Both this and the previous option rely on the jury to review the artist's qualifications before pre-selection. To insure access to this review for all qualified artists, a comprehensive slide registry and qualifications file must be maintained by the administrator of the art program. This registry must be continually updated, and artists must be encouraged through the press, artists, organizations, and art agencies to submit and update their materials.

Community involvement in artist selection raises several issues. Whatever selection method is chosen, it is important

to clearly publicize how the process will work, who will make the decisions and why it is set up that way. Public criticism often arises simply from perceptions that decisions are being made secretly. Community desires about the artwork should be communicated to the jury through representatives on the panel.

A more complex problem arises because good art often challenges established values and perceptions and can raise initial hostility in the community. There are many examples, some described here (Case Study 1.1a, Case Study 1.3c, etc.) where pieces received with initial hostility have in a short time become the pride of the community. While it is reasonable to expect the artist to meet with the community and explain the work, the agency and the selection panel should be prepared to back up the artist in case of controversy. The examples cited here of later acceptance of initially controversial projects may help in persuading skeptical community members.

Some artists' style of work includes a great deal of involvement on the part of local communities, even to the point of creating the work collectively. If this type of involvement and the type of art it can produce is deemed desirable, artists who can and want to work this way should be selected (Case Study 1.3d).

SELECTION MADE BY:

1. Curator
2. Architect or Designer
3. Professional Art Panel
4. Community Committee
5. Combination Professional and Community Panel

PROCEDURES FOR INVITING AND REVIEWING ARTISTS AND THEIR WORK:

- a. Open Competition
- b. Limited Competition
- c. Pre-selected Invitation

Funding

Monies for the artwork can come from several sources (see Chapter Five for more complete references):

- A percentage of the agencies' construction renovation budget—e.g., one percent figure of bricks and mortar budget (or one half percent of the overall station budget) was used for the Massachusetts Bay Transportation Authority's Red Line Extension Northwest. This resulted in an art budget of \$680,000 for new subway stations, an amount which was allocated to approximately twenty-five commissions.
- Percent for Art ordinances (*refs.* 27, 33 and Case Study 1.6c). In cities where these exist, their jurisdiction normally covers city-built and city-funded transportation facilities. Where such ordinances are absent, the percent concept can still be used as a model for similar arrangements, such as in the MBTA case listed above.
- Program funds within the agency, such as the public relations budget—e.g., funds from the annual budget allocated by the Southwest Ohio Regional Transit Authority for a performing arts program on Cincinnati buses. Over 160 professional performing and visual artists were hired for a one-year program (Case Study 1.4c).
- Public Art Funding Sources (National Endowment for the Arts, state and local arts council monies)—e.g., The National Endowment for the Arts provided \$50,000 to the Bureau of Cultural Affairs in Atlanta for the Atlanta International Airport art program. The Bureau's total budget of \$450,000 (for an expected sixteen commissions) breaks down as follows: \$200,000 from the Federal Aviation Administration, \$100,000 from the airline companies, \$100,000 from the city of Atlanta and \$50,000 from the NEA. This impressive package of mixed public/private, federal/local funding was made

possible by the initial grant from the FAA.

- Private Sources—Contributions from foundations or individuals can often be found to match public expenditures for art. Examples include the \$25,000 in private funds for "La Grande Vitesse" (Case Study 1.1a), and business and individual contributions to the Earthwork Symposium (Case Study 1.2f). Raising private matching funds usually requires the work of an aggressive arts administrator.

Administration

In the 16th century, when the Medici family commissioned Michelangelo to do works of art throughout the city of Florence, the patron and artist negotiated directly with one another. While this may still be the ideal situation, many of today's patrons are large government bureaucracies, and most artists cannot afford to take time to deal with the regulations required by such clients. For any large public art program, it is important to hire a professional administrator, experienced in working with artists. A good administrator will assure that the client's needs are met, and that the artist is allowed to work creatively, without unnecessary bureaucratic hindrances.

Administrators can be involved as follows:

Hired by the agency. This allows the administrator to work in-house and to have easy access to all departments within the agency for accomplishing the program. As a staff member of the agency, the administrator may not be able to leverage as much influence as in other situations.

Contract with local arts agency. This usually offers broader expertise in arts management, the involvement of more professionals, and an established relationship with, and respect from, the arts

community. An established local arts agency generally has more direct access to the city agencies and community groups than a staff member of a transportation agency would have.

Contract with architect or landscape architect, who acts as administrator.

Ideally, this procedure assures a close integration of the art and architecture. In the worst situations, professional jealousies and conflicts between the artist and the architect as creative individuals may arise. When the artist is treated as an equal party on the design team, this procedure is most likely to work well.



Yamo Mizui during the Vermont Sculpture Symposium, 1971.

Highway Art Programs

Artworks directed towards drivers have been created by a variety of means: specific works placed by artists or donors on property adjacent to the highway; individual sculptures, monuments or paintings commissioned for the highway right-of-way by public agencies or private parties; and special programs aimed at creating a whole series of works along a route to be experienced in sequence.

Simple monumental works in the highway right-of-way have great potential as gateway and marker structures. A particularly beautiful example of this is the monument at the Spanish border by the Barcelona team of Taller de Arquitectura. U.S. examples include gateway sculptures by Peter Forakis in Atlanta (photo 11b) and by Robert Irwin in Dallas. U.S. highway agencies have usually only provided the sites, with other institutions or private sponsors supporting the major portion of the cost.

When a series of artworks is to be installed, the administrative and programmatic elements become more important. The Eyes and Ears Foundation of California sponsored an exhibit of nine paintings on billboards donated by three outdoor advertising companies (photo 10a). In Nebraska, ten well-known American sculptors were commissioned to create monumental sculptures which can be seen along Interstate I-80. The sculptors were artists-in-residence in the communities abutting the highway while they produced their work.

CASE STUDY 1.4a Sculpture Symposia Finding the Unexpected Vermont Interstates 89 and 91

Eighteen sculptures in marble and concrete were designed and fabricated by sculptors from nine countries during the two symposia which culminated in Vermont's "Sculpture on the Highway" program. In most cases the works were sited in rest areas, out of the passing motorists' direct view. The sites chosen for the sculptures were intended to encourage people to approach the work on foot for a closer, more leisurely look. Although the pieces may seem large to a pedestrian, they are far smaller when seen from the road. Marble sculptures from the first symposium were not made with the highway in mind, but were sited there nearly three years later. The second series, in concrete, was made deliberately for the highway location, and in some cases in response to specific rest areas.

Paul Aschenbach, a sculptor and faculty member of the University of Vermont's Art Department, initiated and coordinated both symposia, with help from the Vermont Council on the Arts. In 1968, the Vermont Marble Company hosted the project and matched grants totalling \$10,000 from the National Endowment for the Arts (NEA) and \$5,200 from the Vermont Council on the Arts, with goods and services. The symposia were completed in three months, but it was not until 1971 that state and federal agencies, the marble company and the artists finally decided to site the sculptures in the rest areas which were then being built along Interstates 89 and 91.

As these installations were being completed by the State Highway Department, the second symposium was organized to create works for specific rest areas. S.T. Griswold and Co. was the host and matched grants totalling \$7,500 from NEA and \$3,940 from the



Concrete sculpture by Paul Aschenbach, Waterbury, VT, 1978.

Council on the Arts. In both symposia, artists received only room and board and a small stipend. Sculptures were created at the industrial worksites, during intensive eight-week work periods.

Sculptors were selected on the basis of their previous work and their desire to work in the symposium setting. Resumés and portfolios were evaluated by a jury which included members of the symposium, the Council on the Arts, and the University's Art Department. The works are owned by the sculptors but are on loan to the state. Most of the sculptors feel that the work was done for the state of Vermont, and have not sold the works despite offers.

Lessons

- Symposia are process oriented, placing more emphasis on the artists' experiences than on their finished works. The quality of the work has sometimes been uneven, but this can be controlled

in the artist selection process. The enthusiasm generated by such a program, however, can be instrumental in paving the way for future public art programs.

- Symposia can provide opportunities for sculptors to work together and to create large scale pieces they may not otherwise be able to afford or to manage technically. The community becomes involved since the process is public, local materials are used, and local craftsmen and tradesmen often provide assistance.
- Funding and implementation of this, at the time unprecedented, program was made possible through the ingenuity and perseverance of its coordinator, and the commitment and cooperation of key personnel in the associated institutions.

Subway Art Programs

San Francisco Area—The Bay Area Rapid Transit art program has gone through two distinct phases. Prior to 1975, artworks were selected by the station architects. With the establishment of the BART Art Council, a more formal selection process was used. Generally, the allocation for art has been less than one percent of stations' construction budgets.

The BART Art Council has nine members (three from each county in the District), each appointed for a two-year term by the BART Board of Directors. Members include art critics, museum curators, arts administrators and artists. A BART employee serves as Executive Secretary. The Council reviews both artists and sites and makes recommendations to the Board of Directors. The Council also evaluates proposed modifications to advertising, graphics, and other visual elements. Final decisions rest with the Board.

All artists are eligible for commissions. Generally, residents of the BART District area have been favored. The Art Council selected the highly successful "Grey Portal" piece (Case Study 1.2a) and two other major works at the Embarcadero station in San Francisco.

New York—Artworks are being planned for subway and rapid transit stations through the "Adopt A Station" program, run jointly by the Metropolitan Transit Authority (MTA) and the Municipal Arts Society (MAS), a quasi-public agency. In 1975, the Exxon Corporation gave \$25,000 to the Public Arts Council (an arm of the MAS), through the Arts and Business Council, to administer the Platforms for Design demonstration project. Four design firms were given \$5,000 each to redesign parts of four stations.

The success of this initial project led to a special Urban Mass Transportation Administration Section 3 grant of \$500,000 available on a project basis to match, dollar for dollar, private contributions for subway beautification. Grants may total up to \$500,000. In order to maintain a smaller scale, community-based component to the program, the MTA made available \$25,000 to match funds raised by local groups for neighborhood station projects.

An arts administrator hired as a consultant to the MTA oversees the entire program. Projects are coordinated by the MAS, which has hired its own designer, and approves all plans submitted by both private and public sponsors. A wide range of projects have been produced, including commissioned artworks, lighting installations, environmental designs, and restoration of historic facilities in an artful and educational way.

Cleveland—Rapid Recovery is a private, non-profit organization which is spearheading a massive clean-up and beautification effort along the Rapid Transit Authority's (RTA) 30-mile long right-of-way. Funding for the program is from local foundations (the Cleveland Foundation and the Gund Foundation), the Ohio Arts Council, National Endowment for the Arts (NEA), and corporate contributions of both time and money.

Artists are being sought locally, statewide, and nationally. Since the system is entirely above ground, sites are generally in areas between stations. Some sites may be seen from the open air platforms as well. Opportunities for artworks include retaining walls, abutments and sites for large sculptures.

A twelve member Graphics Committee meets four times a year to review all projects (which are developed by the artists for specific sites) with the assistance of the Art Coordinator, who is also an artist and arts administrator. So far three



"Plymouth Church of the Pilgrims," Johan Sellenraad, painter, Joe Stallone, ceramist, 1980, Clark Street Station, Brooklyn, NY.

selection procedures have been used: open invitation, direct commissions of four well-known regional artists, and a county-wide competition sponsored by the Cuyahoga County Board of Commissioners.

The RTA cooperates, but is not otherwise involved, with the program administratively. Whenever possible, local businesses are involved either directly as sponsors, or as coordinators of projects in their neighborhoods (as in New York's "Adopt a Station" program.)

Projects are aimed at revitalizing the surrounding community as well. A large sculpture by Robert Morris is being planned as part of the development of an 18-acre recreational park along the riverbank, downtown. This site is one of the most visually prominent along the route.



"Barren Ground Caribou" quilt, Joyce Wieland, 1979. Spadina Station, Toronto.

Atlanta—Station architects were given primary responsibility for choosing art work, and asked to design their station with art as an integral part of it. Each station architect prepared a total construction budget, including an appropriate amount for art. Artists were treated as subcontractors. Few general guidelines were established to direct the selection of locations or types of art. However, it was strongly urged that the art work be fabricated by construction contractors, to simplify administration and production, a practice which would have constrained the artist. The practice generally was not followed.

Baltimore—In order to select art for six of the new subway stations, the Metropolitan Transportation Authority decided to use the same Advisory Panel used by the City of Baltimore in its "One Percent for Art" program. The panel, composed of critics, collectors, artists, and arts professionals, selected locations within the stations, set general guidelines

for art works, and made recommendations on artist selection to the MTA. The panel also established its own formula for allocation of spending levels for each station, principally based on its size.

The panel selected five artists, but the decision-making process took on an unintended appearance of secrecy which led to criticism of this program.

Montreal—At the urging of the mayor, the original Metro stations were decorated with artworks financed by the Massey Foundation, a private business organization which donated the pieces to the city. Local artists were selected by the architect after the station had been completed.

Architects for later Metro extensions have been encouraged to work with artists during the design stage. These collaborations take place at the architect's discretion. Decorative finish treatments may be considered in the deliberations as well. Approximately one percent of the

architectural construction costs are allocated for art, but this is not a requirement.

Today, artists are still selected by the station architect, who also approves the detailed budget. Responsibilities of artist, architect, fabricator and contractor are spelled out in the construction specifications under "special work". As subcontractors, artists are paid by the contractor.

Projects have included decorative floor and wall tiles, ceramic bas reliefs, painted glass and enameled steel murals with historic and sculptural themes, stained glass, sculptured concrete surfaces, metal and wood sculptures, and an art nouveau entry by Hector Guimard, a gift from the city of Paris.

Toronto—Nine artists were commissioned to embellish eight new stations of Toronto's Spadina line. Porcelain enamel murals, glass mosaics, painted skylights, neon lights and a quilt were produced.

A capital grant of \$500,000 was available for art, based on one percent of the total station costs. These funds were matched by one-third corporate contributions and one-third from a provincial lottery. Funding per station ranged from \$25,000 to \$100,000 and was determined at the discretion of an advisory committee.

The advisory committee, which consisted of a museum curator, two arts council members, an art consultant, and the station architect, selected locations in each station and developed guidelines for maintenance, safety, durability and other technical matters. Artists were allowed some leeway in their interpretation of these guidelines.

Four hundred artists submitted examples of their work. Thirty-five were chosen and paid \$500 each to develop proposals. Twelve finalists were given \$1,500 to detail their ideas further. Nine were selected. The entire process took nine months.

Summary

When art programs are coordinated by the station architects, as in Montreal and Atlanta, the tendency is towards decorative pieces which can be most easily integrated with the basic station design and construction. Juried programs, as in Toronto, are well suited for commissioning more artistically significant works which explore new ideas. Programs aimed at involving local business and community groups can generate local enthusiasm which may substantially support revitalization efforts, as in Cleveland and New York City.

For subway art programs in the Boston area and Stockholm, see Case Studies 1.2b and 1.6d.

Airport Art Programs

Airports have acquired, commissioned and used works of sculpture, painting and decorative arts in various ways. Major commissioned sculptures are displayed at the Allentown, Bozeman, Cleveland, Miami, Seattle, and Tampa airports. The airport at Portland, Oregon has created an environment of silk-screened banners that hang overhead or enclose seating. The Cincinnati and Tampa airports have relocated 1930's murals salvaged from now demolished transportation buildings. The St. Louis and Seattle airports display, in special cases, exhibits sponsored by local museums. The JFK International Terminal in New York allocated one percent of its construction cost (approximately \$250,000) for the purchase of art and crafts, supervised by a "Committee on the Arts" representing the Airport Authority, the architect and local art professionals. In the San Francisco Airport expansion, one and one-half percent of construction costs, or \$1,707,000, will be available for acquiring art.

Not all the work at airports is top quality art. Some pieces have difficulty competing against the drama of airplanes and airport structures. When symbolism, a desire for regional identity, or other themes outweigh artistic considerations, the work can become weak and predictable. Where curators or professional committees are involved in art/artist selection, the quality of the work improves.

For further information on airport art programs, see *ref. 7*.

CASE STUDY 1.4b SEA-TAC Airport Art Integrating Art with Terminal Expansion Seattle, Washington

This airport has a collection of more than a dozen high-quality major works of art installed in the terminal. The pioneering decision to set aside \$300,000 for an art program was made in 1969 at the suggestion of The Richardson Associates, airport architects.

Site and artist selection was turned over to a nine-member committee in order to avoid criticism of the selection and to benefit from expert, balanced decisions. The committee membership included art collectors, arts professionals and two members of the architectural firm. The client's staff informally attended meetings.

Sites were all within the waiting areas of the terminal, in order to bring art to where people spent the most time, con-

centrate the art's impact, and give the waiting areas individual identities.

Different selection procedures were combined:

- One lounge was set aside for an open competition of Washington State artists. Over 100 artists entered with sketches, scale models and samples. The three winners were a 9 by 46 foot painting by Francis Celetano, a 5 by 5 by 9 foot sculpture by John Wharton, and a series of paintings by Christopher English.
- A limited competition was held for a monumental sculpture for the central interior plaza site. Four sculptors were invited and paid \$2000 each to develop models and sketches. Robert Maki was selected.
- Other commissions were made by direct selection and included nationally known artists Louise Nevelson, Frank Stella and Robert Rauschenberg, as well as a computer driven, "kinetic/electronic environment." Additional

local artists were commissioned, and special exhibit cases were installed for Northwest Indian artifacts from the Burke Museum.

The installation of the art works was completed in 1974. The response has been good. The art collection is indeed of "museum quality" as intended. One measure of the program's success is that the art, originally worth \$300,000, is now valued at a million dollars.

Lessons

- The SEA-TAC experience illustrates that a well-considered, professionally conducted art program is a major asset to an airport.
- The architects felt that although the selection process was successful, one or more artists should have been included on the committee.

Electronic environment, James Seawright and Peter Philips, 1974, SEA-TAC Airport.



Community Art

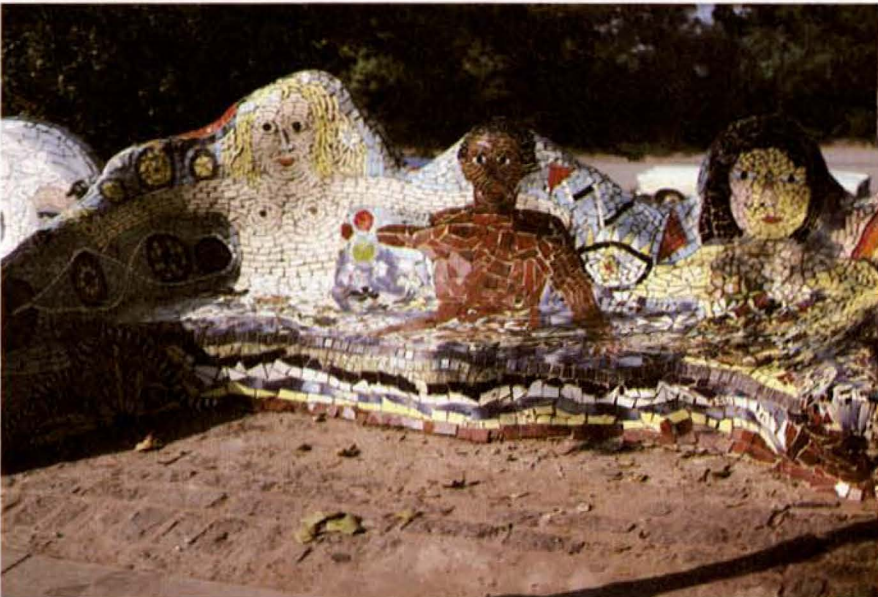
These programs have often emerged in response to some artists' desires to integrate their social and political beliefs with their artistic skills, and to create artwork which is relevant to the (often lower income) community. Potentially, community groups themselves might design and produce the work, with the support of an artist-organizer. Other possibilities include collaboration between the group and a workshop artist, or community involvement in the assemblage of a piece which has already been partially fabricated by the artist. Funding sources may include foundations, corporations, state arts councils, and local cultural affairs departments.

The Cityarts Workshop is a community art program which has begun in New York's Lower East Side, by organizing neighborhood teenagers to produce murals reflecting their ethnic identity, hopes and despairs. The program evolved to

include artists who planned collaborative projects dealing with broader issues of aesthetics and community development.

In 1976, the National Park Service invited Cityarts to co-sponsor a beautification project for the plaza surrounding Grant's Tomb, where local artists had already begun to add their own brand of graffiti. Project director Pedro Silva, a sculptor, designed a 450-foot long cement bench which flowed around the plaza. Neighborhood residents were trained in the art of mosaics in the style of Gaudi, and encouraged to decorate the bench. Funding came from the National Park Service, the City Parks, Recreation and Cultural Affairs Administration and the Canada Dry Corporation, as well as from the National Endowment for the Arts and the New York State Council on the Arts. (ref. 36).

a. Bench mosaic detail, Grant's Tomb, New York.



b. "Cowboy Boots," Bob Wade, 1979, Washington D.C.



Temporary Art

Temporary installations can introduce the public to avant-garde or experimental art which might otherwise create controversy. Such programs have been initiated by both arts councils and independent arts groups, using available public space such as vacant lots, streets, waterfronts, construction fences, and transit stations. Transportation agencies can facilitate these projects by providing sites, security or matching funding.

The Washington Project for the Arts (WPA) is sponsoring the Washington (D.C.) Art Park. This program will place three major pieces of outdoor sculpture in downtown Washington in a vacant lot across from the entry to the Metro Center Station. The lot is on loan from the city's Department of Housing and Community Development. These sculptures will be constructed on site,

and displayed one at a time for two months each. The program is intended to generate publicity for the art activity in the downtown area, and to build an audience for future public art projects, which offer an alternative to Washington's staid statuary. The pieces include a large set of cowboy boots by Bob Wade, an architectural fantasy by Alice Aycock, and a laser sculpture by Rockne Krebs. Also included in the project is a video installation about the Metro by Peter D'Agostino on view in one of the stations.

Funding is from the National Endowment for the Arts Workshops/Alternative Spaces Program, and donated materials are from local companies. The artists receive a commission, and construct their own sculptures. Additional labor is provided by the Summer Youth Program and student apprentices.



a. Murals under freeway, San Diego.



b. River Festival, Cambridge MA 1979.

Angry Reactions

The construction of transportation facilities has sometimes been painful for neighborhoods and has provoked angry reactions. These feelings have been expressed by some groups in the form of eloquent protest murals. Although the transportation agency may not enjoy seeing the explicit message of such murals, it might wish to support these expressions as a potential alternative to more destructive reactions such as vandalism. In some instances, these murals can help restore neighborhood pride after the scarring of the local environment.

Examples include the mural at the BART Station Plaza at 24th and Mission in San Francisco (page 32). This painting expresses some anger at the impact of BART construction on the community but is also the most memorable visual feature of this station area. The community murals on the freeway columns in San Diego express a similar sentiment. The graffiti on the outside of New York subway cars is the somewhat frightening assertion of teenage groups against more than just the subway, but is, on occasion, striking graphic art.

Festivals

Streets, parking lots, and large lobby spaces could often become good stages for performing arts events. At bus stops and in airports and subway stations, audiences are captive, for minutes or hours. Individual performers or small troupes of musicians or mimes can entertain waiting crowds and alleviate anxiety and boredom. Whole cities can participate in large urban festivals, like the annual Cambridge, MA River Festival, where residents parade from neighborhood streets from the four corners of the city to the major celebration along Memorial Drive (which is closed to traffic for the day).

Such programs are usually best administered by contracting with local arts agencies who know the artists and can plan and supervise the events. For Music Under Boston, a program which provided music in the subways, a small administrative fee was paid to a local agency to organize the program. Artists were subsidized by being allowed to "pass the hat". For larger festivals, transportation agencies may wish to co-sponsor the event with other agencies or may simply wish to cooperate by advising and assisting in the necessary adjustments in traffic patterns. The following case study is an example of sponsorship of such major events by a transportation agency.

CASE STUDY 1.4c

Queen City Metro Temporary Art Works for the System Cincinnati, Ohio

"At high noon the Queen City Metro bus pulled up to Cincinnati's City Hall, and a man, attired in white tie and tails, stepped out, strode over to the Steinway piano on the sidewalk, and began to play for lunch-time crowds . . . Ten minutes later, another bus dispatched Judith Claire, a soprano with the Cincinnati opera. Wearing a full length evening gown and tiara and carrying two shopping bags, she began to sing "Musetta's Waltz", from La Boheme (appropriately enough a song that takes place on a city street). Arias from other operas, all in English, and popular songs, followed for the next hour-and-a-half."

from "Bach on the Bus", George Clack; reprinted from *The Cultural Post*, July-August, 1976 (a National Endowment for the Arts publication).

In 1974, the publicly owned Queen City Metro, serving Southwest Ohio, began collaboration with Boris Goldmund, the country's first artist-in-residence employed by a bus company. A year-long public art project emerged after a series



a. The enthusiasm was infectious.

of small events, such as parking a bus downtown for holiday shoppers, with a harpist and carolers inside. The project was called "People, Metro and the Bicentennial" and took place from March 1976 through February 1977. The success of the first year's program led to its continuation for a second year.

The object of Metro's project was to "provide artists with increased opportunities for public exposure as well as to provide the public with opportunities to view a great variety of arts" (ref. 35). Metro's visibility was increased as well. Activities included live performances in the coaches as well as visual displays in the advertising spaces, redesigned timetables noting significant sites and architecture along routes, and a traveling historic exhibit in a coach remodelled by two artists. One hundred and sixty regional performers and artists were employed. One hundred and nineteen performances took place and 5,000 artworks were displayed. Sixty percent of these were created by area residents; the rest were commissioned artworks by jury-selected regional artists and photo-documentaries on artists and their work.

Prior to implementation, the project was advertised on the buses and through local media. Want ads solicited written proposals from performing and visual artists. Since many people were interested but did not know how to fit into the project, individualized counseling sessions were held with artists to help them explore ideas and develop proposals. To avoid this time-consuming process for the second year's program, guidelines for proposals were developed.

Artists for the first year were selected by the artist-in-residence who was advised by the Program Panels, consisting of community and arts leaders. For the second year, the selection process was placed entirely in the hands of the panels. Once selected, artists underwent a formal orientation procedure which introduced them to supplies and acquainted



b. Performances took place on buses.

them with the paperwork required for receiving payment.

Performances took place inside the coaches during off-peak hours, and at bus stops during rush hours. Performance buses were identified by flags and in the bus schedule, so people could choose whether to see or avoid a given event.

Public response was enthusiastic. A mid-year survey revealed a 72% favorable reaction, and showed that "people welcomed exposure to new art mediums and that this exposure encouraged their use of other arts facilities in the City of Cincinnati." (ref. 35)

Financial support was provided by the National Endowment for the Arts Special Projects program, the Ohio Arts Council, the Ohio Bicentennial Commission, the Kentucky Arts Commission and private donors. Funding for the first year broke down as follows: local share, about \$46,000; grants, \$34,000; and private contributions, \$30,000. The Metro provided publicity and paid the artist-in-residence's salary, when federal funds (CETA) ran out.

Lessons

- Implementation of this imaginative concept depended on the enlightened attitude of the transit company, which perceived its public responsibility in broad terms.
- The arts project required the help of all of the Metro's departments, and thus involved a large number of people with a variety of skills. One immediate benefit to the bus company was an improvement in its internal communications.
- Arts activities were an effective marketing device, as well as a means of involving the community. The success of these efforts was evidenced by continually increasing ridership and the public's enthusiastic participation in the project.

CASE STUDY 1.4d

Driftwood Sculpture
Spontaneous Art by the Highway
Emeryville, California

The mudflats between Interstate 80 and the San Francisco Bay at Emeryville, near Berkeley, California have been the site of a half-mile long, changing display of sculpture since the 1960's. These anonymous works are assembled from large driftwood and other debris continually washed ashore by the winds and tides from the Bay. The sculptures are oriented to the highway, which provides their only viewing public. Discovering the sculptures from the road has a wonderful, mysterious effect. The rich variety and continual change of the work has made avid observers out of many regular drivers of the freeway.

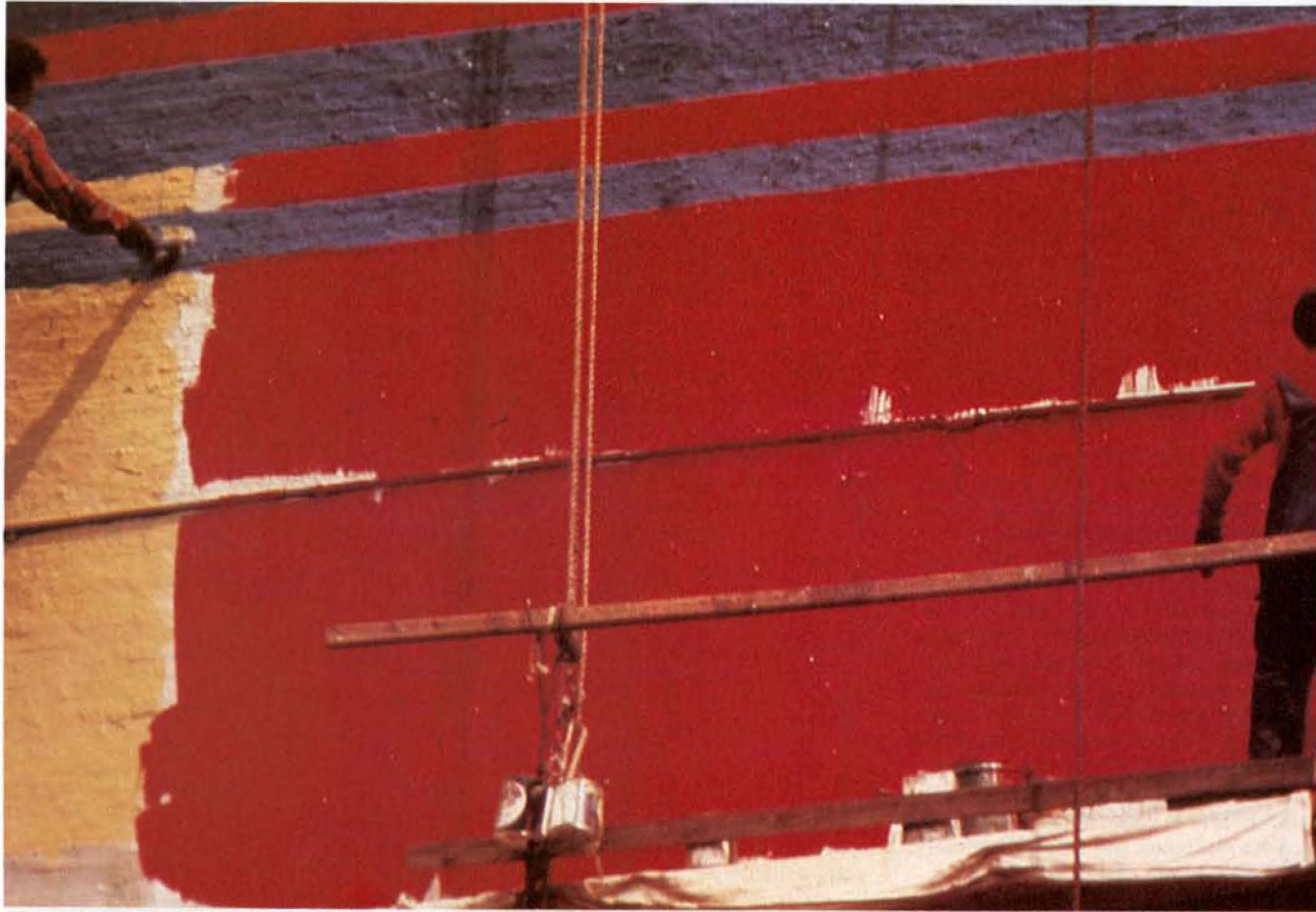
Throughout its history, artistic activity at the site has gone through different cycles but never stopped. The artists receive no support or personal recognition, and their identities are not generally known.

Lessons

- Artists can work with a surprising variety of raw materials and sometimes create on a grand scale without elaborate sponsorship.
- The tolerance of highway agencies, property owners, and others with jurisdiction seems to have been just the right thing to do. When art is happening by itself, leave it alone!



Working with Artists and Artwork



YWCA wall painting, Richard Anuszkiewicz, 1972, New York.

Once an art program has been chosen and artists selected, a transportation agency will begin to work with artists and their art. This relationship can vary from the simple, as in the case of a straightforward commission, to the complex, as in the case of a complicated collaboration between artist and designer. This section will review the various methods in which artists and an agency can work together. Since the sponsoring agency will be managing the artwork as well as working with the artist, various relevant technical issues will be covered. Examples of pertinent management procedures are presented in Section 1.6.

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Artist and Community

Artist and Design

Viewland-Hoffman Substation, North Seattle, Washington: Case Study 1.5a

Contractual Arrangements

Technical Issues

Structural Durability

Vandalism

Lighting

Insurance

Performance Bonds

Unions

Ownership and Maintenance

Artist and Client

As was pointed out in the previous section, most transportation agencies undertaking a major art program are likely to deal with the artists primarily through a special administrator. The administrator will assist in formulating the client's goals at the outset and will revise them through a series of reviews of the evolving art works.

If the client has chosen to administer the program in-house, its involvement will be much more substantial than if a local arts agency or the project architect are responsible for the supervision of the artists' work. The quality of the final artwork should be kept in mind as the ultimate goal, and the client should remember—as we have stated before—that the artist will need to work with a particular kind of freedom not normally associated with the daily workings of a transportation agency.

Artist and Community

If the client has decided that it wants to involve the community in a major way, it will also want to be certain that the artist selected is one who has had experience working with community groups. There will also be a need to provide for easy access to these groups. Even if not stated as an agency goal, many artists will want to design work which has a particular connection and reference to local cultures and traditions. It is important that these necessary resources be made available to such artists.

Artists are often much more convincing in presenting their own work and ideas than any intermediary can be. They can often bring their spirit and the freshness of their ideas to a community group and get an excited positive response, where a

more formal presentation might be received with suspicion (Case Study 1.3c). If the artists are willing to engage in such give and take, the agency and its arts administrator should monitor the process for potential problems, but as a general matter should not interpose themselves.

Artist and Design

Depending, among other things, on the chosen program and the administrative structure selected, the artist's role and relationship with the client will vary greatly. At one extreme: if a work of art is purchased for the agency by a curator, the artist may not be involved at all, or may only make suggestions about final siting. At the other extreme: if a major work is commissioned for a particular site, the artist could be involved from the earliest phase of the design process.

Good siting is a critical factor in the success of any public work of art. The artist must be allowed to have a prominent role in determining how his/her work will be positioned within the facility. If the artist is part of a design team, these issues will be worked out as part of the design. If the artist is working as a separate subcontractor, or a completed work is purchased, the artist or his representative should still carefully review the architectural development of the prospective site. There is the possibility of conflict between the artist and architect, and it is best to make sure that these issues are discussed and resolved as early as possible in the design process.

Artists can do more than produce specific artworks; they can also aid the design team in designing transportation facilities. This relationship, while rare today, was much more common in earlier periods of architecture. Case Study 1.5a provides a successful recent example of such an artist/designer collaboration.

Today, the artist commonly only has responsibility for insuring that the artwork is integrated with the site. To do this, the artist should review, with designers, the elements that affect artwork, such as supporting structures, lighting, compatibility of nearby materials, colors and other visual elements.

In this case, artists should be invited to develop their proposals based on the completed schematic design drawings

and models, and should work out necessary adjustments with the architects during design development. During preparation of working drawings and specifications, the artists should consult with the designers and engineers to see that technical problems are taken care of. It is to the client's advantage to incorporate all necessary elements for art prior to bidding for construction, since later changes are likely to cost more and result in unsatisfactory compromises.

Installing "Yellow Ascending," George Sugarman, 1978, New York.



CASE STUDY 1.5a

Viewland-Hoffman Receiving Substation Artists and Designers Collaborate North Seattle, Washington

The substation is the usual, slightly sinister collection of high tension wires, transformers and relays protected behind high fences and walls. But, past a high concrete wall at a corner, it becomes clear that the place has been invaded by an unusual, playful spirit. The substation is opened up to the street like a stage. A high concrete wall emphasized by a mural acts as the backdrop. The machinery and wires are coded in colors. The transparent chain link enclosure itself is playfully shaped and at one end creates an arched, semicircular viewing gallery cloistering a separate area—an area populated by fantastic, constantly moving windmill creations that seem to be the original source of all the colors.

This was a fully collaborative project between the artists and the architects. The artists contributed the mural, the cloister and viewing gallery, the posters and funky signs, and selected the “whirligigs”. The “whirligigs”, fabricated from a wide variety of found objects, are the creations of an old couple in rural Washington State and were discovered by the artists. The artists also worked with and influenced the designers in ways that included:

- The stage-like opening to allow the mechanics of the plant to be viewed.
- The rearrangement of the transformers and circuit breakers, and color-coding to encourage visual participation.

The site is in a blue collar residential neighborhood of small, one-family houses. The relationship of the station to the houses is carefully considered: in the front, across a landscaped area; in the back, across a pleasant alley created by the wall.

Artist selection was conducted by the staff of the Seattle Arts Commission. Letters of interest were sought, eighty artists responded, nine were short-listed, and finally three were chosen. The commission was only open to local artists with no previous experience on architectural work. It was a deliberate experiment in devising a fresh approach to the artist/designer collaboration.

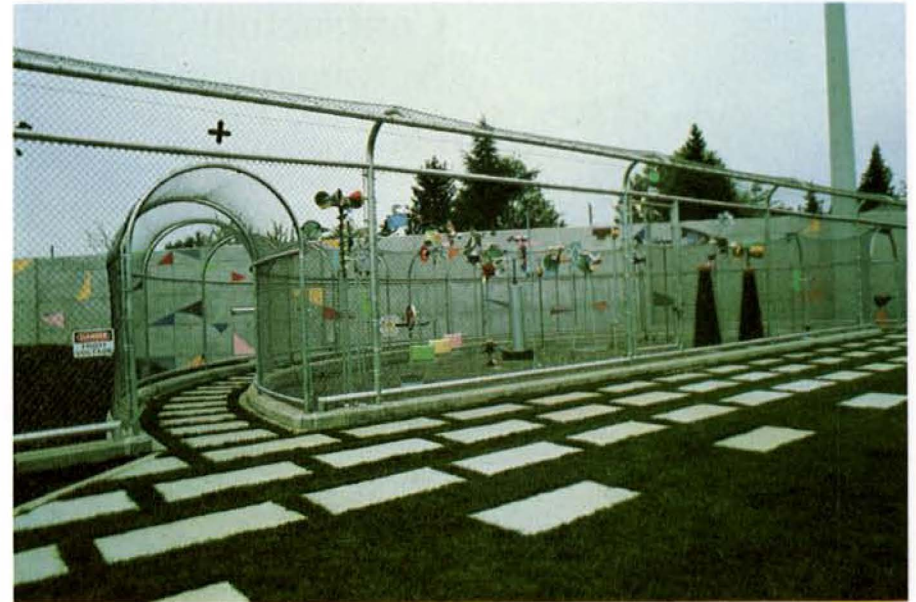
The overall reaction has, on balance, been positive. The project has already won three awards. Architects and artists both feel good about the experience and acknowledge that they learned a lot from each other. The artists' previous inexperience with this type of project caused some minor problems in meeting deadlines and production schedules. Community reactions were mixed, however, since the project didn't meet people's preconceived idea of either functional design or art. Several area residents already have wind-toys and other similar decorative elements in their yard which complement the Viewland design, and the project will probably be accepted and loved more widely in time.

Credits

Artists: Andrew Keating, Sherry Markowitz and Lewis (Buster) Simpson
Architects: Hobbs/Fukui Associates
“Whirligig” Creators: Emil and Veva Gehrke

Costs

Overall construction cost for the station was \$5,000,000, funded by Seattle City Light. One percent of construction costs (\$50,000) was budgeted for the purchase, making and installation of the art. This included salaries for the artists. The fees included consultation time with the architects over the three years of design and construction.



Viewing gallery and “whirligigs.”

Lessons

- The fully integrated artist/designer team created interesting, lively results. Legitimate debates as to whether this is “high art” may continue, but the experiment is a success and could be repeated in many different situations.
- Though this is not a transportation facility, the organization, operating style, and demanding technical requirements of a public utility company are sufficiently analogous to show that a similar approach could be applied in transportation.



Contractual Arrangements

Whether or not the artist is part of a design team, he/she will be contracted to work for a particular agency. Options depend, in large part, on how the program is to be administered. In all cases detailed contracts should be used to clarify issues which are outlined later in this chapter (see p. 58, sample contract). Artists may be contracted or subcontracted as follows:

Artist Contract With Client Agency

This relationship allows the client to have direct control over the artist and can often prove useful in surmounting problems which might arise between artist and contractor. It means, however, that the agency must be willing to make a major administrative commitment to arts programming which is not a normal function of a transportation agency.

Artist Contract With Arts Agency

This relationship assures that artists will be dealing with professionals who understand the artists' perspective and the workings of bureaucracies. It requires detailed subcontracting procedures, but relieves the client agency of much administrative detail.

Artist Contract With Facility Architect

Having the artist be a member of the architect's design team makes administrative sense. A close relationship between artist and architect is desirable in assuring the close integration of all aspects of design. Administratively, however, architects are not necessarily used to working with artists, and contractual issues defining the artists' responsibility and compensation must be clearly defined. This arrangement enables the architect to overrule the artist in case of disagreement. The client may want to submit such disagreements to a professional jury or arbitrator to insure objectivity.

Artist Contract With General Contractor

This method can only be used if the artist's entire involvement is to be completed during the construction or renovation of a facility—when the general contractor is working. It still requires some form of administration from the client or outside arts agency to handle artist selection and to assist the artist during fabrication phases. Frequently the contractor will require a percentage off the top of the art budget for overhead.

Compensation For Commissioned Works

It is traditional in public art commissions that artists be paid for their proposals, as well as for the finished work of art. Although there are no universal standards, the proposal fee should be enough to cover the costs of preparing models and drawings.

When an artist is selected, the proposal fee already paid is normally subtracted from the total commission fee. This, however, should not be done for fees paid to the artist as consultant during design.

Setting the amount for fees is a difficult problem. All too frequently, fees are so insufficient that artists do not break even, spending vast sums towards materials, fabrication, transportation and installation costs. These costs should be carefully itemized before the artist's contract is signed, and the artist should be treated as any other major contractor on the job, and paid for his/her services at appropriate rates, in addition to his/her expenses. The artist should carefully estimate all costs including materials, studio expenses, labor and assistants to insure that the size of the commission is commensurate with the scope of the work. Costs of architectural accommodation and site installation such as foundations, lighting, rails, etc. should

normally be covered separately in the construction budget.

Artists can almost never work on a reimbursement basis—as most other subcontractors can. It is critical to give advance monies (ten percent to twenty percent) to allow for initial purchase of materials. Further payments can be made on a stage-completion basis. A small retainer fee (five percent) might be kept until the work is completed and installed.

Compensation For Purchased Works

Generally, a purchased work is simply one purchased for a fee established by the artist. In some cases, an agency might want to hire the artist as a consultant to oversee installation and make recommendations on siting. A consulting fee should be agreed upon for this.

Technical Issues

Structural Durability After an artist has developed a proposal, it should be reviewed by an engineer to determine its structural integrity. The average life span of a transportation facility is between 20 and 60 years, and the artwork, if intended as permanent, must be designed and built to last at least that long.

Vandalism is a major consideration in planning any permanent art program. Siting a piece out of reach of pedestrians can be a solution. Selecting artists who work in durable materials (i.e., bronze, granite, steel, concrete, tile, etc.) can be another. Often, if a piece of art is well-liked by the community it can discourage littering and vandalism, since the community may develop a protective and proud attitude towards the artwork and its surroundings.

Lighting of an artwork is almost as important as its siting. Usually, a piece requires more intense and direct lighting than a facility's general light level. A few well-placed spotlights can turn a shadowy corner into a prominent and visible place for an artwork. The artist should have direct control over the lighting of his/her piece. Any special lighting should be determined in consultation between the artist and the electrical engineer and included in the construction contract.

Insurance Once funds are committed to an artist for the creation of an artwork, the agency will want insurance to cover theft, loss and damage. Liability insurance for the artists working at the site is also important, since artists may find it impossible to get such insurance. The agency or contractor should consider including the artist in its company policy if that is at all possible.

Performance Bonds Most agencies require performance bonds of their subcontractors. The majority of artists would

not be able to get a performance bond. If the artist is paid on a stage completion basis, the agency can be assured that the work is being done before compensation. If possible, the performance bond requirement should be waived for all artists.

Unions Few artists belong to unions, and most construction workers do. This can create difficult problems if the artist is going to be working directly on a union construction site. Discussion in advance with the union by the agency is recommended. If the artist is viewed as a "principal" or an "independent contractor," the unions usually have no legal claim and there are seldom problems. Problems do arise, however, if the artist hires non-union laborers. If the artist's work is so specialized that only his/her employees can perform it, it may be best to work after the construction site is closed. Negotiations are possible in individual cases. Unions usually demand (a) that laborers be paid union wage and (b) that their union workers be given the work.

Ownership and Maintenance

The ownership of the work usually rests with the purchasing/commissioning agency. Copyright, however, can rest either with the artist or the client. This can be negotiated at the time the artist is hired.

Maintenance is an extremely important issue and one that is all too often overlooked. Some cities set aside escrow funds at the time of the commission to assure proper maintenance. Seattle is considering adding one-fourth percent to its One Percent for Art Program to fund an arts maintenance program.

The King County Arts Commission in Washington has developed a sophisti-



Art Carnival Wall, 139th Street, New York City.

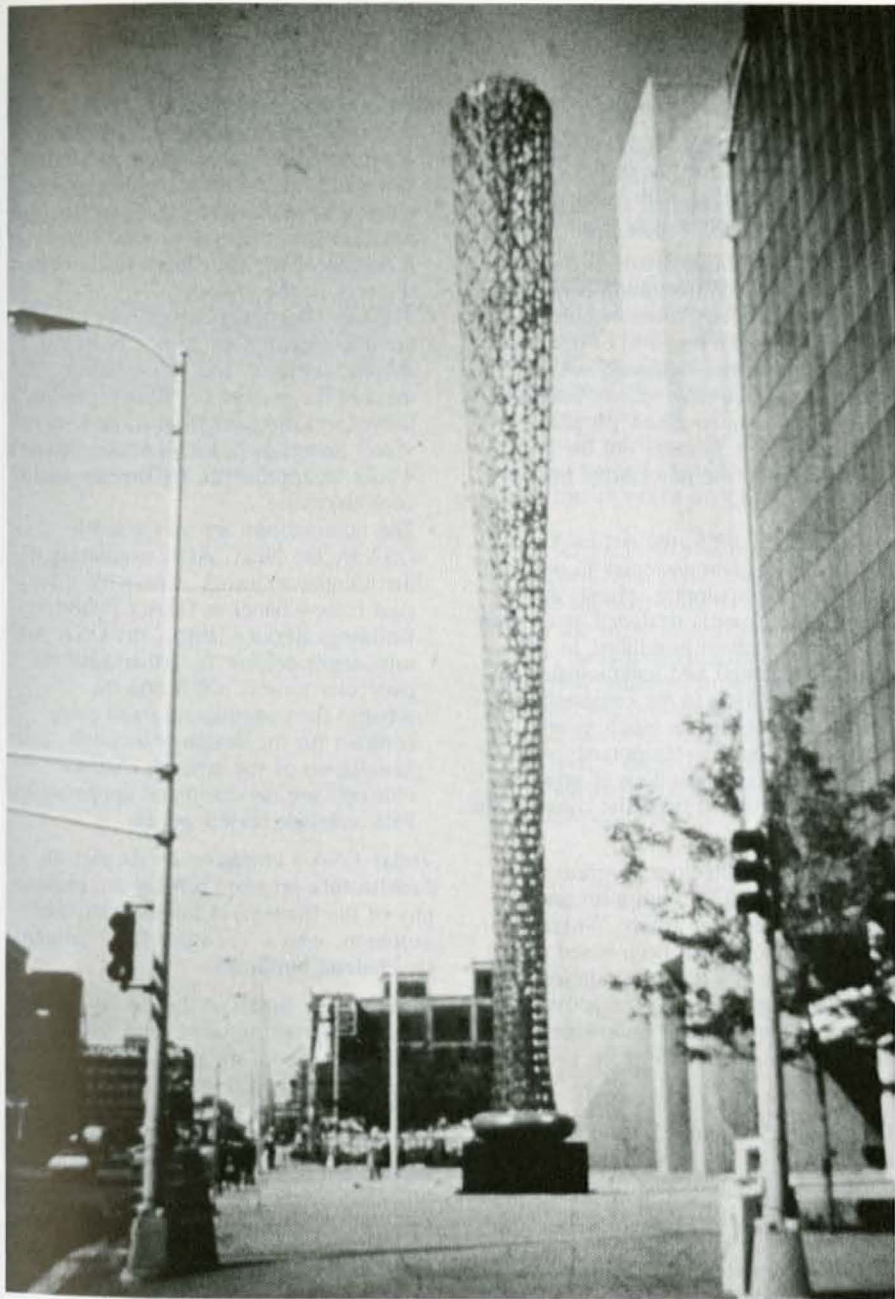
cated maintenance and evaluation public art program. At least once in every five year period, the entire art collection is evaluated and if a work is considered lacking on any one of several conditions (aesthetic or structural quality, severe maintenance problems, or sustained lack of community acceptance) it can be removed following an established process which includes several safeguards to the artist's rights (*ref.* 30).

With appropriate policy directives, the transportation agency's maintenance staff can be used to maintain art work. For example, the Massachusetts Bay Transportation Authority's maintenance crew in Boston's Park Street Station became very fond of the ceramic mural there and took extra care to keep it clean.

It is crucial, however, that a maintenance plan be developed with the artist at the beginning. In some cases, it is

most appropriate that repair work be done by the artist directly. In all cases, however, the artist should be consulted before repair work or unanticipated maintenance is done. These arrangements should be made with the artist in the initial contract (see Artist's Contract in Case Study 1.6c). The client should keep on file detailed structural plans of the artwork as well as the artist's specifications for special paints, finishes or parts.

There is nothing more frustrating than to see a non-functioning fountain or a rusted/scratched/graffitied sculpture. Once an artwork is allowed to become shabby, vandalism will increase and the work's lifespan will rapidly diminish. With good maintenance, a permanent artwork can last for many decades or even centuries, marking our aesthetic expression for future generations.



"Bat Column," Claes Oldenburg, 1976, Chicago.

Section 1.6

Sample Procedures

To succeed, a transportation agency's art program will need clearly defined management procedures. Through the case studies, this section describes four model programs which have used successful procedures. The case studies are presented, for the most part, in the words of the responsible agencies. The "Lessons" at the close of each case study are based on the authors' judgements.

Three of the four case studies do not focus on transportation. They were selected because transportation agencies' experience with public art is still relatively limited, while other agencies have developed workable models over several years of practice. By covering federal, state and city sponsored programs and presenting a range of goals and attitudes, these case studies can provide valuable lessons for future art-in-transportation projects.

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	1.6d

CASE STUDY 1.6a

**The Art-in-Architecture Program
Sponsoring Art in Federal Buildings
General Services Administration**

The General Services Administration is the federal agency with the longest record of sponsoring public art as a regular part of construction programs. The following program description is quoted directly from the agency's March, 1979 publication (*ref.* 39).

"The General Services Administration (GSA), the agency that oversees the design and construction of federal buildings across the country, is also one of the government's most active patrons of the visual arts.

Proudly and enthusiastically through its Art-in-Architecture program, GSA has commissioned many of America's finest artists, both emerging and established, to create works for federal buildings nationwide.

These examples of the art of today are diverse in style and media and include murals, sculptures and craftworks. They are conceived and executed by artists with established reputations, those just beginning to be recognized, by artists with traditional approaches, and those experimenting with new styles. Any artist in the United States is eligible, and artists in the area of each project are given full consideration.

Public art reflects the conscience and ideals of each generation. It records the spirit of an era. It leaves us a legacy that is unique and irreplaceable.

The United States has a long-standing tradition of government support for the arts. As early as 1855, the U.S. Congress commissioned Constantino Brumidi to paint frescoes for the House of Representatives committee rooms.

During the Depression Era, under the New Deal art programs, thousands of artists were commissioned to create murals, paintings and sculptures for federal buildings, post offices and courthouses. Those works of art are historically significant as the country's first body of public American art.

The 1960's ushered in an era of renewed interest in government support of the arts. At the request of President Kennedy, the President's Ad Hoc Committee on Federal Office Space issued a report entitled, 'Guiding Principles for Federal Architecture.' The report contained a

strong message and a catalytic charge:

'Where appropriate, fine arts should be incorporated in the designs of new Federal Buildings with emphasis on the work by living American artists.'

In 1963, the Administrator of the General Services Administration responded with a direct policy order establishing an allowance for the fine arts of one-half of one percent of the estimated cost of construction of each new federal building. This order initiated a new program, Art-in-Architecture, to carry out the policy and to develop the procedures for its implementation.

From 1963 to 1966, the Art-in-Architecture program commissioned 44 works of art, including sculpture, murals and stained glass panels designed as an integral part of federal buildings. In 1966, an unprecedented and unanticipated increase in inflation in the construction industry—sometimes as much as one percent per month—temporarily suspended the commissioning of artworks, which were funded from the construction budget.

The Art-in-Architecture program was reactivated in 1972, with a revised procedure for selecting artists. Whereas formerly the choice had been based on the design architect's recommendations, the new procedure included the active participation of the National Endowment for the Arts (NEA) as well as the project architect.

The nomination and selection process is as follows:

- When the architect-engineer contract negotiations take place, the architect is informed that one-half of one percent of the estimated construction costs will be allocated for fine arts. He is encouraged to submit an Art-in-Architecture proposal as part of his overall design concept. This proposal must include a description of the location and nature of the artwork(s) to be commissioned.

- Shortly after the award of the construction contract, GSA requests NEA to appoint a panel of qualified art professionals to meet with the project for the purpose of nominating three to five artists for each proposed artwork. At least one of the panelists is to be from the area of the project.
- The artist-nomination panelists, who are appointed on an ad hoc basis for specific projects, and the architect, meet at the project site with representatives of GSA and NEA to review visual materials of artists whose work would be appropriate for the proposed commission(s).
- The nominations are forwarded to GSA by the NEA. After evaluation of the nominated artists' works by a design review panel in GSA's Public Buildings Service (PBS), the GSA Administrator selects the artist(s) for the particular project. GSA and the artist(s) then negotiate a fixed price contract for the design, execution, and installation of the artwork. Artists' concepts are reviewed and approved by PBS's design review panel.

Today GSA's emphasis on the Art-in-Architecture program reflects the philosophy of the (former) Administrator, Jay Solomon, who . . . (wanted) to 'humanize' federal buildings.

Plans for the future of the Art-in-Architecture program move beyond the accomplishments of the past. The program is expanding its activities to provide artworks for existing buildings for which fine arts had been planned but never implemented, as well as those buildings undergoing significant repair and alteration, and it is embracing a greater variety of artworks, such as earthworks, crafts, the building arts and photography.

The Administrator (Solomon) announced that the program 'will accelerate efforts to start art projects at an earlier point in building design;' and that 'initial building concepts will include provisions for works of art . . . bringing art and architecture together at the very beginning.'

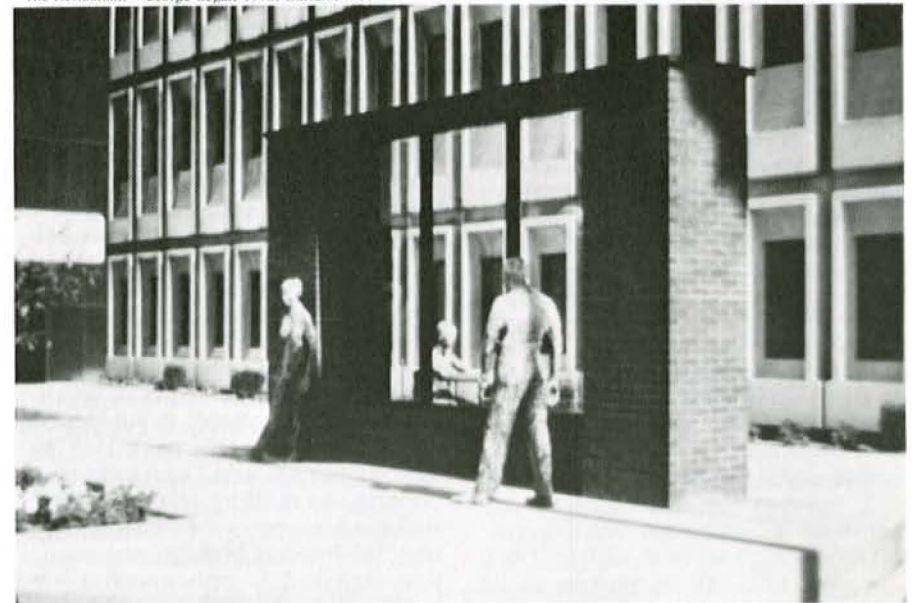
Artists wishing to receive GSA consideration for Art-in-Architecture projects should send a resume and 35mm slides of their work to:

Art-in-Architecture Program
General Services Administration
Washington, D.C. 20405''

Lessons

- The GSA's longstanding record and numerous high quality art projects illustrate that a formula funding approach can achieve good results.
- The use of an art agency—in this case the National Endowment for the Arts—to help conduct the artist selection (a shift from selection by the architect alone) has led to the introduction of more exciting and exploratory works of art. The switch to an outside professional selection panel has also helped to shift controversy about the artworks away from the GSA.
- In recent years, GSA-sponsored art has broadened from static monumental objects to include more dynamic works, which use light, neon, prisms, multiple pieces, participatory sculpture and a variety of imagery. In response to the dramatic site opportunities provided by transportation facilities (see Section 1.2), such a range of artworks could be broadened even further by the responsible agencies.

"The Restaurant," George Segal, 1976, Buffalo, NY.



CASE STUDY 1.6b

“Town Meetings”

**A Democratic Art Selection Process
The State of California**

The Office of the State Architect (OSA) of California administers the Program for Art in Public Buildings. The budget for the program is set in an annual appropriation by the Legislature (\$700,000 for the state in 1977-78). This Case Study focuses on the state's uniquely democratic art selection process referred to as 'The Town Meeting.' The process is described in the following excerpt from the July 1978 OSA report (*ref. 37*):

“The Art in Public Buildings Town Meetings were designed to ensure that artwork selected for the Program be of the highest possible quality; that the community in which the artwork is to be located not feel that the artwork selected was imposed on it from outside; and to engage artists and members of the general public in a practical dialogue about the nature of art, its function in a community and more specifically, ‘what art would be good in *our* community,’ for the purpose of ‘expanding public experience with art,’ as required by the enabling legislation.

All Town Meetings followed that same general format, which is described below.

Program staff first arranged with local contact or contacts to sponsor the Town Meeting in each city. Given the number of meetings to be held (46 in two months) and the staff limitations of the program (one and a half full time positions, one half-time student intern), it was necessary to enlist as much local cooperation as possible; this necessity was also a virtue in that it ensured local participation. The local contact, with assistance from program staff, arranged for a site for the meeting, generally at the building chosen to receive artwork; publicized the meetings through personal contact, letters of invitation, phone chains, and the media; and co-hosted the meeting with OSA staff. Local contacts included legislators' field representatives, arts and cultural organizations, recreation and park departments, community groups, museums, etc. Each local contact was provided with a kit containing sample press releases, letters of invitation, and other materials to minimize the amount of extra work it had to do. The local contact was asked to coordinate planning and publicity efforts with the Building Manager at the local project site. The Building Manager was responsible for talking to applicant artists who had questions about the site and for gen-

erating Town Meeting participation from among the building employee and user population.

The Town Meetings were staffed by professional facilitators under contract to OSA, whose job was to make sure that the discussion among those present kept to the agenda and arrived at some conclusions. Facilitators did not attempt to influence the content of discussions. They were assisted by OSA Program Staff and staff from other state agencies who had attended an OSA Training Workshop on facilitation techniques.

Each Town Meeting was two sessions long. The first session was devoted to achieving three goals:

1. Explaining the program, describing the ‘take part’ process of Town Meetings, answering questions, and helping participants become familiar with the potentials and problems of the site for artwork. (This last was done by showing a 10-minute long, two projector slide-show produced by the Program and designed to familiarize those who were not art professionals with possible media and ways of treating different spaces in public art; and by having the Building Manager take the group on a tour of the building.)
2. Having participants—usually in small groups—develop their own perceptions and ideas about public art at the site into a set of criteria to guide a decision-making Task Force in selecting artists who could create art for the site.
3. Having participants decide the appropriate composition for a decision-making Task Force to review artists and proposals in accord with the guidelines established earlier in the evening; and then selecting the members of that Task Force from those present.

At the second session of the Town Meeting, the Task Force met, to review artist applications for their building. The meeting was open to observers who were

often invited to make comments during the Task Force deliberations. Artist applicants were invited to observe but not allowed to speak in behalf of their own application.

For projects under \$20,000, the Task Force reviewed slides, photos, other supporting visual materials, vitae, and actual proposals—drawings, models, or statements describing the artwork proposed for the building. For commissions of \$60,000 and \$100,000, the Task Force reviewed slides, photos, vitae, and other supporting materials that were submitted as evidence of past work; after the field was narrowed to three finalists approved by the State Panel, those three artists were asked to produce detailed visual proposals which were displayed in the community. The local Task Force was asked to consider the detailed proposals and send any comments, questions, or recommendations to the State Panel to assist them in making the final decision. Support material submitted by the 714 applicant artists included over 130 carousel trays of 35mm slides.

The size of Task Forces chosen ranged from five to twenty-nine; the composition specified by the Town Meeting participants usually included a combination of artists and arts professionals, employees of the building, and members of the general public.

Applicant artists, their relatives, agents or employees were forbidden to serve on the Task Force. Each Task Force was also asked to select one of its members to serve on the Regional Panel and as a liaison to the OSA Program Staff.”

Lessons

- Results of the program available at this writing are insufficient for judging the artistic merits of the works produced. It is likely that some artists would be turned off by the participatory nature of the process, while others may find it stimulating. Thus, the process will fa-

vor artists comfortable with a great deal of public communication.

- A heavily democratic process of this type might be most appropriate for transportation facilities that are oriented to a clearly defined community group (e.g., neighborhood bus stops and local streets).



"The Power of the Sun," Stellar Arts Collective, 1979, San Francisco.

CASE STUDY 1.6c

Seattle 1% for Art A Successfully Innovative Art Program Seattle, Washington

The program managed by the Seattle Arts Commission is one of the most successful and innovative public art programs in the country. It deals with transportation facilities to the extent that they come under city jurisdiction, i.e., street improvements and special projects such as Hillclimb (see p. 168). Beyond specific transportation applications, this program contains many elements that have become models for art programs around the country. Model elements include the Municipal Art Plan, the Registry of Northwest Artists, the selection process and a contract between the city and an artist.

The edited excerpts that follow are from the publication *1% for Art* published by the Seattle Arts Commission. The publication also contains brief descriptions of all of the Arts Commission's projects and a list of the artworks executed under the program. Case Studies 1.3b and 1.5a describe two of these projects in detail.

"Profile of the Seattle Arts Commission

'to promote and encourage public programs to further the development and public awareness of and interest in the fine and performing arts in Seattle . . .'

—from Establishing Ordinance, 1971

This objective and \$35,000 in city funds started the Seattle Arts Commission on its way in 1971. From that time, with a single program supporting a handful of independent cultural projects, the Commission has grown into a city agency with an array of programs (funded from local and national sources at more than \$1,500,000 in 1978) which in some way touch almost every person in Seattle.

The Seattle Arts Commission is a group of fifteen citizens appointed by the Mayor, subject to City Council approval, who serve two-year terms as volunteers. They come from many walks of life. Meetings are open to the public.

The Art in Public Places Program (1% for Art), however, is a full-fledged program which the Commission plans and administers. Each year the Commission prepares and oversees the implementation of a Municipal Art Plan for selecting, purchasing and placing works of art in public places through the 1% for Art funds. The 1% for Art ordinance was passed in 1973 with the express purposes of expanding the City's experience of the visual arts and encouraging artists capable of creating works of art for public places.

A City Becomes an Art Collector

Interest in a publicly funded arts program in Seattle was stimulated by the World's Fair in 1962, and a major conference on public art held here in 1971. Through the efforts of a number of individuals and groups including Mayor Wes Uhlman, the City Council, Allied Arts of Seattle, The Artists' Group, the American Institute of Architects and others, the concept of '1% for Art' was developed and expanded to fit the needs and personality of the City of Seattle. It is based on the assumption that the development of the visual and aesthetic environment is a fundamental responsibility of civic government.

Seattle's ordinance provides that one percent of funds appropriated for municipal construction projects in the City's Capital Improvement Program be set aside for the selection, acquisition and installation of artworks in public places. The law does not attempt to define 'works of art,' but establishes the Seattle Arts Commission as the agency responsible for carrying out the intent of the ordinance.

Municipal Art Plan

Funds for artwork are generated by construction projects undertaken by City departments, and come from a variety of sources: city taxes and fees, bond issues, state and federal revenues. The eligibility of projects must be determined case by case.

Yearly, a memorandum of understanding between the Arts Commission and each department identifies eligible projects. Once the eligibility of a project is determined, the department and the Arts Commission have two options: the art funds may be spent on artwork for that project, or set aside for artworks at another site at some later time. The Art in Public Places Committee must recommend where and how the funds will be spent in the annual Municipal Art Plan.

Through public meetings each year, suggestions from artists and interested citizens are heard, and priorities identified. The Committee then develops a plan to allocate each department's 1% funds for works of art at specific sites. Once the Arts Commission has reviewed the plan, it is presented to the Mayor for approval.

Projects undertaken in the program's first years were evaluated, and procedures for artist selection, jury selection, artists' participation and administration were revised. Long-range goals to guide the planning process were adopted, relating the Municipal Art Plan to the City's overall planning effort. Increasingly, the Municipal Art Plan is becoming a long-range art plan for the City which identifies needs and priorities for the future, and considers gifts and donations as well as publicly-funded works of art.

Artists' Registry

Discussion with artists and arts groups has led to the creation of the Registry of Northwest Artists located at the Henry

Gallery of the University of Washington. This Registry maintains current files of artists' biographies and photographs or slides of their work for use in selecting artwork. It is required that juries making selections for 1% purchases and most commissions consult the Registry. This allows for fair representation of any artist who wishes to be considered for a commission or purchase through the program.

The purchase of artworks by the City has also led to the development of the Arts Commission's artist contract. This contract is considered a landmark step in protecting artists' rights in the sale of their work. It calls for the City to maintain the works in a professional manner, to share the appreciated value of the works with the artist in the event of their being resold, and to protect the artist's rights related to reproduction and display of the work.

Selection Process

The selection process and jury composition for each 1% for Art project in the annual Municipal Art Plan is related to the scope and complexity of the project, the construction timetable matching grant guidelines, and whether it involves a commission or purchase.

The three methods used for selection are described below:

- A prospectus describing the site, budget and nature of the artwork to be commissioned is published, calling for proposals from artists. Artists are not paid for proposals, which are returned following jury review. The jury recommends the artist for the commission.
- An announcement of the project and commission is published; artists are requested to place slides on file at the Registry of Northwest Artists and return a letter of interest in the project to the Seattle Arts Commission. The jury reviews slides and material at the Registry, although they are not limited to

artists registered in their consideration. Three to five artists are selected by the jury to prepare proposals. Artists are paid for submission of proposals, which are retained by the City. The jury then reviews the proposals and recommends an artist to be commissioned.

- This is handled in the same way as a limited entry, except that the jury chooses only one artist, who then submits a proposal prior to final award of the Commission.

The Art in Public Places Committee names an ad hoc jury, usually of from three to five people, for each project. Over the years more than 50 people of diverse backgrounds, including artists, architects, community representatives, city employees, collectors and art historians have participated in the selection process. Because of the unique character of each project, jury selection is a key to a successful result. Jurors are chosen for the special skills, knowledge or concerns which they can bring to the complex decision making.

Each jury receives background information on the project, including site plans or a site visit, and a review of the sponsoring department's special concerns. Serving as a juror requires patience and dedication, and the level of professionalism required is recognized with compensation to jurors not employed by the City.

A Contract Between the City and an Artist

This contract, developed by Anne Focke, former Arts Commission staff member, and the Commission, has been adopted by other commissions throughout the United States as a model.

AN AGREEMENT BETWEEN THE CITY AND

'WHEREAS, the City is now implementing a public art program allocating certain funds for the establishment of artworks in public places and authorizing the Seattle Arts Commission to make payments for design, execution and placement of works; and WHEREAS, the Artist has created the following work of art.

Title?

Dimensions?

Medium?

Hereinafter the above described work of art shall be referred to as the 'Work' and WHEREAS, the Work was selected for purchase by the City through procedures duly adopted by the City, and the Artist is willing to sell the Work, and both parties with the integrity and clarity of the Artist's ideas and statements in the Work to be maintained:

NOW THEREAFTER, the parties mutually agree as follows:

1. The Artist shall sell the Work to the City, subject to the conditions herein, for the price of dollars, receipt of which is hereby acknowledged.
2. A public notice including the Artist's name and mention of the City's ownership shall be publicly displayed and identified with the Work, and shall be paid for by the City.
3. The Work shall be installed and displayed by the City at which is a facility frequented by and open to the general public.

4. The City agrees that it will not intentionally destroy or alter the Work in any way whatsoever, without the artist's written consent. If any alteration of any kind occurs to the Work after it has been finally completed and installed, whether such change is intentional or accidental and whether done by the City or others, then the Work will no longer be represented to be the Work of the Artist without his written consent. The City agrees to see that the work is properly maintained and protected.

5. To the extent feasible, all repairs and restorations which are made during the lifetime of the Artist shall have his approval. To the extent practical, the Artist shall be given the opportunity to accomplish said repairs and restoration at a reasonable fee.

6. While recognizing that the City does not currently have the legal mechanism permitting the sale of works of art, the City agrees that if in the future the City does sell the Work, the City shall pay the Artist a sum equal to Fifteen Percent (15%) of the increase in the value of the Work.

7. The Artist agrees to notify the City of changes in his address and failure to do so shall be deemed a waiver to the Artist's rights in Paragraphs five and six above.

8. The City agrees to maintain on permanent file a record of this Agreement and of the location, condition and disposition of the Work.

9. The Artist hereby reserves all rights to copy or reproduce the Work, but shall not unreasonably refuse the City permission to reproduce the Work for non-commercial purposes. The Artist also reserves all rights under any copyright laws to which the Work may be subject.

10. All Changes in this agreement shall require written agreement signed by both parties.'

Lessons

- With energy and information a local arts agency can create a public art program and could assist a transportation agency in establishing an art program (see following Case Study).
- Seattle's procedures for overall planning and artist selection have been very effective in encouraging lively art activity and public participation, as well as in obtaining high quality art work. These procedures have already been used as models in many other cases.
- The artist contract remedies many of the problems that have occurred with public art works in the past, and provides a useful checklist. There are other technical, legal and contractual issues that often have to be considered. A more complete example is the contract used by the King County Art Commission (*ref.* 30).

"Black Sun," Isamu Noguchi. 1972. Seattle.



CASE STUDY 1.6d
**Massachusetts Bay
Transportation Authority
(MBTA) Art
Successful Procedures
Boston, Massachusetts**

Initial Art Programs (1969–1978)

The MBTA has been acquiring artworks in a variety of ways since 1969 when two local metal sculptors donated works which were installed in two stations. In 1971, the Institute of Contemporary Art sponsored an open competition with funds from the Rockefeller Foundation to create an environmental piece for a 400-foot pedestrian tunnel at the State Street station.

The director of the MBTA's station modernization program was very interested in public art and felt that if added to subway design, it would create stations with strong individual identities. At that time, art had not appeared as a legitimate, separate item for MBTA budgets, so it was listed as "wall graphics" and "special features." Six different artists (three painters, a sculptor, a photographer and a ceramicist) were contracted to create work for four stations.

All of the works are installed and, with one exception, have experienced no vandalism and have generally been well received by the public.

In this initial stage, the MBTA took precedent-setting steps in bringing art into transit stations. However, because there was no formal "art program" or administrative structure, several problems arose:

- in several cases the artwork was sited in dark and little used sections of the station platform;
- local artists were resentful of the program because no public announcement or solicitation of work was made;
- the artists who were commissioned often ran into severe difficulties in getting paid, and had problems with contractors and contracts.

Arts on the Line

Arts on the Line is presently conducting the art program for the Red Line Extension Northwest, which will include 3.2 miles of new subway line and four stations: Harvard Square, Porter Square and Alewife in Cambridge and Davis Square in Somerville (*ref.* 38).

The Cambridge Arts Council, the official arts agency for the City of Cambridge, has as its mandate "to enhance the quality of life in Cambridge." Having been involved with several public art projects, it was natural that their sights turned to the subways. The Arts Council applied for and was given a \$45,000 demonstration grant from the Urban Mass Transportation Administration, administered through the MBTA, to establish and implement guidelines for incorporating artwork into the Red Line Extension. On September 18, 1978, Arts On The Line, an official program of the Cambridge Arts Council, also became a consultant to the MBTA for the Red Line Art Program. A full-time administrator with a half-time assistant were hired for a one-year period. Program decisions were researched and developed by this staff and then approved by the MBTA.

An art allowance of one percent of the bricks and mortar budget (or one half percent of the station's entire construction budget) for each subway station was established. This resulted in a total art budget of \$680,000 allocated among four stations:

Harvard Square	\$230,000
Porter Square	\$125,000
Davis Square	\$125,000
Alewife	\$200,000

Artist Selection

In order to ensure that a broad range of artwork was considered for selection, an Artbank was established. Four thousand flyers were distributed nationwide, announcing the program and the Artbank. Within three months, slides and resumé's from almost 400 artists were collected and filed. This slide registry was to be used as a resource for the selection panels. The art panel may also recommend artists who are not in the Artbank, but those artists must be reviewed by the entire panel.

Before the selection process was devised, a brief survey of other public art programs around the country was made. Arts On The Line tried to combine the best elements of several processes:

- early community involvement to ensure that the art reflected a sense of place and also to help with the public's ultimate reception of the art;
- assurance that all artists (local, non-local, known and unknown) have an equal chance before a panel;
- decisions made by art experts to ensure highest quality of art.

Since the art allowance for each station was fairly substantial and since each station was located in dramatically differing neighborhoods, it was decided that there be a separate art committee for each station. The process moves as described by the chart.

The panels were instructed to select artists and their pieces based on the following criteria:

- artistic excellence;
- appropriateness for site;
- durability of design and materials (50–75 years);
- lack of need for maintenance.

Artist Selection Procedure

ART COMMITTEE (selected by Arts On The Line administrator for each subway station.)

ADVISORY GROUP

- business community representative
- residential community representative
- MBTA representative
- station's architect
- City's Community Development Office
- Historical Commission representative

PANEL

- 3 arts professionals representing differing artistic viewpoints; all qualifications listed below must be covered:
- artist
 - resident of station's community
 - non-resident of station's community

Advisory Group

- 1** Describes station and its social and physical context.

Panel

- 2** Adjourns separately to review Artbank and to add artists to Artbank (MBTA and architect advise as non-voting members).

- 3** Selects artists by one of the following methods:
1. Open Competition (no proposal fee paid).
 2. Limited Competition.
 3. Invitation.
 4. Direct Purchase.

- 4** Develops proposal working with panel, administrator, architect and in some cases, the community.

- 6** Makes suggestions to Panel.

- 7** Convenes separately to make final decisions.

- 9** MBTA approves decision.

- 9** MBTA approves decision.

- 10** Assists with public presentation of commissioned artists.

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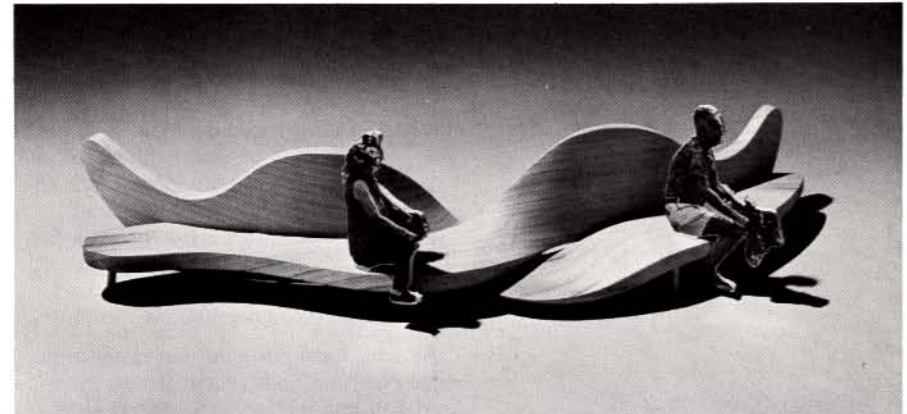
Artist

- 5** Makes presentation to entire committee.

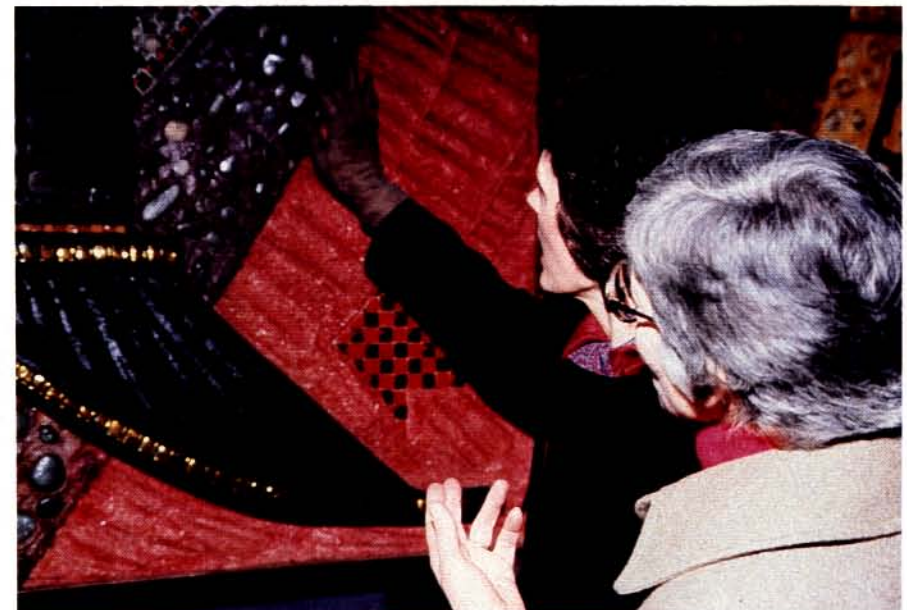
- 8** Confers with contractor and MBTA to confirm budget and schedule.

- 9** MBTA approves decision.

- 11** Receives assistance from Arts On The Line administrator in design, fabrication, and installation of artwork.



a. Model for proposed Alewife Station bench. William Keyser.



b. Joan Mondale admiring Park Street Station mural with artist Lilli Anne Rosenberg.

Harvard Square

Two meetings with the advisory group and a walking tour of the future sites initiated the art panel for Harvard Square. Several meetings followed to review the Artbank. A list of three sites and six artists resulted. A \$35,000 budget was set aside for each site; the artists were paid \$831 to develop proposals for either site. Before the Art Committee had been selected, the architects asked Gyorgy Kepes, a Cambridge artist, to work in the station's central mezzanine. His work was also reviewed by the panel who made recommendations.

An additional \$30,000 was raised from the National Endowment for the Arts (Art in Public Places) for the Gyorgy Kepes piece. A fund of \$20,000 was kept in reserve for funding any cost overruns by the four artists.

Porter Square

Before Arts On The Line was started, the architects hired seven artists as design consultants to develop proposals for the station. The architects wanted to work in close collaboration with the artists. Some artists were asked to work in particular sites, others were given carte blanche. No budgets were suggested, to see what each artist might do if the "sky was the limit." Each artist was paid \$2,500 for a four-month period. They developed proposals which if funded in full would have cost \$200,000. The artists and architects negotiated the location and extent of each piece until the final budget of \$125,000 was reached.

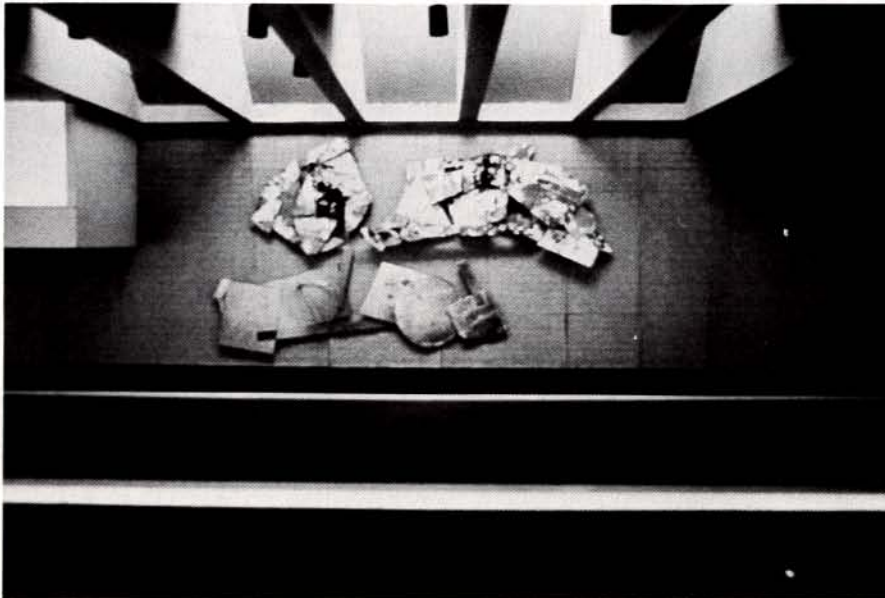
A committee of arts professionals and community residents was convened by Arts On The Line to review the proposals and to make recommendations for the final negotiations. For the most part, those recommendations were followed.

Davis Square

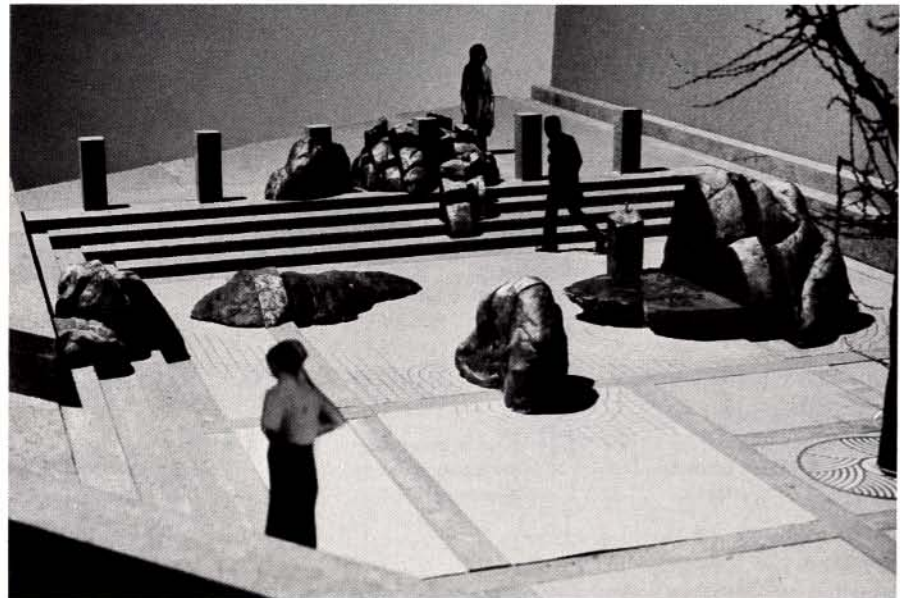
The City of Somerville requested that Arts On The Line coordinate the artist selection process for the Davis Square station. The selection process was completed in January, 1980. The community representatives felt that more connection between artist and the community was necessary within the Art Committee. Two additional steps were then added to the process:

1. Photographs of the artists' proposals will be displayed in a store front. People will be asked to submit their comments to the community representative who will make them known to the art panel before final decisions are reached.
2. The selected artist(s) will be asked to make presentations to Davis Square community groups.

a. Proposed wall sculpture for Davis Square Station, Sam Gilliam.



b. Model of granite and bronze installation for Porter Square Station, David Phillips.



Alewife

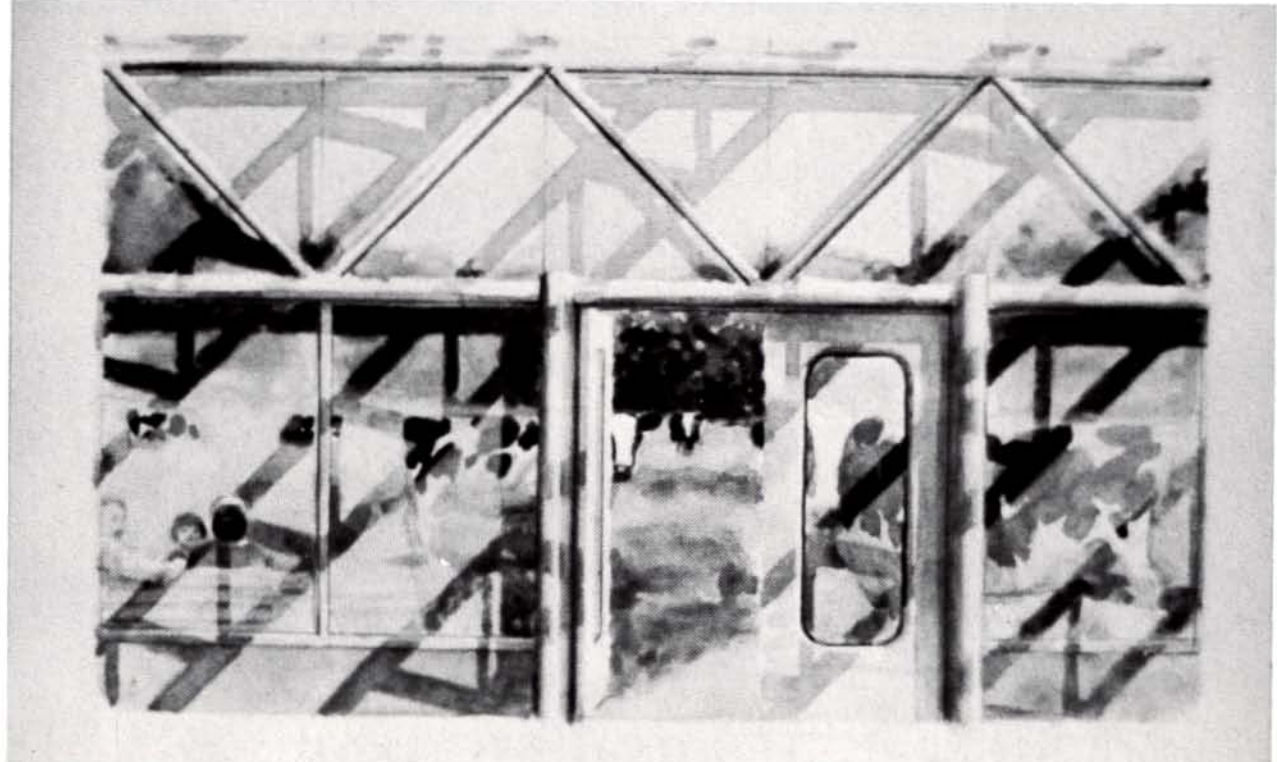
All seven artists were selected by "invitation." Each artist was asked to develop a proposal for a different site in this large station. This station's art will represent the most "environmental" approach, and also strongly reflects the station's setting which is a wildlife resource area. Two artists have been asked to make comprehensive statements: Richard Fleischner will not only create a piece in the landscape, but will design placement of trees, gravel, paths, lights, etc. Stephen Antonakos, who works in neon, has been asked to work in the trainroom on a 200-foot long wall as well as up a stairway, into the large mezzanine and up the escalator.

An unusual element in this station is the involvement of William Keyser, a woodworker. Part of the funds for his project come from the station's bench budget. This is supplemented with funds from the art allowance. The result will be a series of beautiful handcrafted benches supplying the required amount of seating and made of the same material usually employed by the MBTA.

Lessons

- The complicated artist selection procedure was necessary for both political and aesthetic reasons. The resulting proposals show a great deal of promise for enhancing the new subway environment. To repeat the process, other projects would have to have available comparable resources of administrative and professional talent and community interest.
- The process resulted in the selection of a broad range of artists and did not seem to favor any particular type of art.
- Integration with the architectural design could have been improved if the program had started earlier in the design process.

Proposed painting for Alewife Station, Joel Janowitz.



Contents Chapter Two

- 2.1: Streets, Pedestrians and Traffic
- 2.2: Off Street Parking
- 2.3: Highways
- 2.4: Buses and Streetcars
- 2.5: Rapid Transit
- 2.6: Railroads
- 2.7: Airports
- 2.8: Harbors and Water Transportation
- 2.9: Bicycles

2

Facility Design

Introduction Chapter Two

This chapter examines the aesthetic issues and design opportunities for a wide range of travel modes—from the bicycle to the jet plane. It focuses on the experience of the traveler: what he or she sees, hears, smells and feels during the trip and how this shapes his or her overall reaction to the experience.

The aesthetic conditions of a transportation facility will either attract people to a mode of travel or repel them from it. This is particularly important for public transportation agencies that are investing large sums of public funds in efforts to attract people away from their automobiles. This chapter discusses the relationship between the aesthetic attractiveness of facilities and the attraction of clientele. Important concepts relating to aesthetics are discussed not as abstract qualities but as concrete elements which affect the quality of the traveler's experience.

Some transportation modes are accommodated in elaborate, special-purpose facilities, such as airports and subway stations. When these are constructed, complex design teams are retained which usually represent several design professions and a host of technical experts. The designers on such teams address the relationship between technical requirements and aesthetic design in great detail.

This book is too generalized to act as a complete guiding document for facility designers. However, for those embarking on major facility design, this chapter points out the important aesthetic issues involved, and illustrates good design examples. Specific lessons from these projects are provided in lieu of guidelines.

Facilities such as streets, off street parking, and bus stops rarely receive lavish attention from design teams. They are often not even recognized as problems for aesthetic design, thus diminishing their attraction to the public. These types of structures are less distinct from the surrounding community than the more elaborate facilities. They are embedded within the urban fabric and lack clear boundaries. For this reason, their decline strongly affects the city as a whole and poses a serious problem, not only for the traveler, but for the whole community. Thus the design issues and case studies consider "facility design" and "integration with the built environment".

Streets, Pedestrians and Traffic



This section focuses on the problems and opportunities for pedestrians on urban streets. Since automobile use in dense urban areas causes basic aesthetic problems for other uses in the city, the aesthetic qualities of driving on city streets are only considered here in a limited way.

Contents:

Decline of Streets

- Aesthetic Problems
- Fragmented Responsibilities
- Public Values and Political Decisions

Streets for People

- Diverting Traffic
- Pedestrian Malls
- Transit Malls
- Improvements Within Existing Traffic Patterns
- Incentives for Improving Building Frontage
- Maintenance and Space Management

Design Elements

Implementation

Case Studies

- Downtown Crossing, Boston, Massachusetts: 2.1a
- Chelsea City Center, Chelsea, Massachusetts: 2.1b
- Old City, Munich, Germany: 2.1c

Decline of Streets

If you go into the city, regardless of how you travel, at some point you end up walking on the streets. While going to work or out to lunch, the sidewalks are crowded, people are jostling, squeezing together at the crosswalks. But if you are ever around downtown after six in the evening you will see the streets deserted. The traffic and the crowds are gone. It is an eerie, desolate feeling. Looking around, you will notice the cracked sidewalks spotted with chewing gum, litter slowly drifting as the wind sweeps around corners. You may also notice how much the asphalt has come to dominate the streetscape: the narrow sidewalks and buildings are like islands in the continuous sea of asphalt.



Aesthetic Problems

City streets have traditionally been the vital focus of urban activity. The quality of their environment strongly affects the functions of the city and defines its public image. In the United States most city streets have serious aesthetic problems:

- Noise, fumes and visual intrusion of traffic on major pedestrian activities such as shopping or lunchtime recreation.
- Conflict and confusion between auto and pedestrian movement.
- Pedestrian flow congestion during peak hours, physical obstacles such as signs and traffic signals, and lack of sufficient sidewalk space.
- Lack of activity and a desolate, unsafe feeling during evenings and weekends.
- Lack of space for pedestrian related street activities: such as vendors and places for sitting and conversation.
- Poor upkeep and maintenance of streets and sidewalks.
- Unsympathetic frontages of adjacent buildings: blank walls, inactive lobbies or parking lots.
- Lack of protection from extremes of climate (wind, rain, excessive cold or hot sun).
- Overscaled streets: excessive overall width and lack of physical articulation which discourage pedestrian use, especially in cities with low levels of street activity.

Fragmented Responsibilities

In most cities no single agency takes responsibility for the quality of street environments. Departments of Public Works are in charge of day-to-day reconstruction and maintenance, but their mandate, budget and style of operation tend to deal only with limited technical issues, not with design or activity management. Traffic Departments tend to have a similarly narrow scope. Redevelopment and Community Development Agencies can sometimes coordinate the various operations within a limited area but cannot extend these concerns city-wide. State and regional authorities can provide resources but cannot effectively coordinate the local bodies. Zoning and other regulations governing the design of private buildings adjacent to the street are rarely written or administered in a way to insure lively and attractive streets. No one agency can effectively design or manage the street environment or can insure sufficient funding for these tasks.

Public Values and Political Decisions

The underlying causes of such neglect are found in the way people value the urban public environment and in the way political decision-makers respond to these values. In most U.S. cities, people have had so little experience with an attractive street environment that they do not regard it as either an essential need or a realistic possibility. By contrast, in European cities strongly-held traditions force public bodies to care for public places. The few successful examples of revived street environment in this country have had strong impacts on the attitude to public places in those cities. This points to the critical importance of establishing working prototypes of attractive streets in every city as an environmental teaching device.

Successful scale for pedestrian and bicycle traffic.





a. Pedestrians and vehicles compete for use of the street.



b. Weekend view of downtown street.



c. Vacant lots used for parking erode the urban streetscape.

Streets for People

Walking on a street is very different from driving to work. While walking, you are exposed to possibilities, to contact, meeting, seeing something unexpected. You may also be exposed to dangers or challenges. You have to decide whether to approach or avoid situations moment-by-moment. You receive a great deal of stimulation, and make a lot of judgments and observations in a few minutes. You are on the edge between relaxed pleasure and anxious discomfort. The aesthetics and the ambience of the street will help decide if the walk is an anxious or a relaxed one.



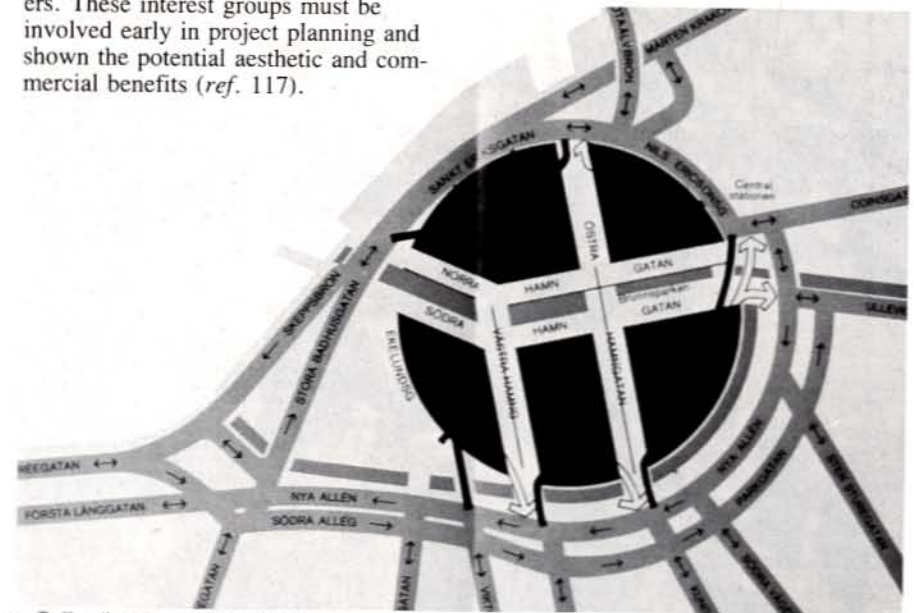
Diverting Traffic

Many cities have re-routed auto traffic away from streets with the greatest pedestrian activity. This has been accomplished as part of overall traffic management schemes that rationalize circulation patterns and still provide auto access to all essential parking, dropoff and delivery points. Aesthetic benefits can be immediate even without any physical improvement by simply eliminating conflicts, noise and fumes, and allowing pedestrians to relax and reclaim the street.

Many European city centers have established major Auto Restricted Zones (ARZ). These include planned "traffic cell" systems eliminating through traffic in Bremen, Gothenberg and Nottingham, and more incremental approaches to pedestrianization of streets such as was done in Copenhagen and Munich. U.S. examples include: the diversions created for pedestrian and transit malls; central area traffic management (Case Study 2.1a); the classification by official policy of downtown streets for distinct uses in Portland, Oregon; traffic diversions from residential areas in San Francisco, Berkeley and Seattle (ref. 122); and temporary street closings such as Nassau St. in New York City.

Traffic diversion schemes can cause some extra congestion at the periphery of the pedestrianized zone, although in most cases this can be relieved through improvements in signal timing, intersection geometry and channelization. Traffic diversion is most appropriate for areas of already existing pedestrian activity but can also be used in setting up the framework for future development and in creating new "intense activity zones." Implementation is likely to be complex, involving protracted negotiations with merchants and property own-

ers. These interest groups must be involved early in project planning and shown the potential aesthetic and commercial benefits (ref. 117).



b. Traffic cell system, Gothenberg, Sweden.



c. Market Street, Italy.

Pedestrian Malls

Some American cities have turned their main shopping streets into exclusive pedestrian areas. These streets are closed to all but emergency traffic (sometimes deliveries are exempted), and are landscaped and furnished for walking. The experience of shoppers walking along the street clearly improved in most cases. The most successful malls are those with high levels of varied activity. These have become both very attractive social centers and highly profitable business areas.

Some examples of these are Quincy Market and Downtown Crossing, Boston; Powell Street at Market, San Francisco; and Yonge Street, Toronto (in addition to the many successful European examples).

Malls with lower levels of intrinsic activity have succeeded through programming events: Mid-America Mall,

Memphis and River City Mall, Louisville, and others. Those where physical street improvements were not combined with strong related private development and activity management have been generally less successful.

Mall planning must involve all affected merchants and property owners and can take as long as two to five years. Construction budgets must account for sub-grade utilities and vaults. Simple, flexible surface designs with a rich blend of activities are generally the most successful. If the street is wide and activity level relatively low, some public space can be turned over to activity-generating private uses.

Transit Malls

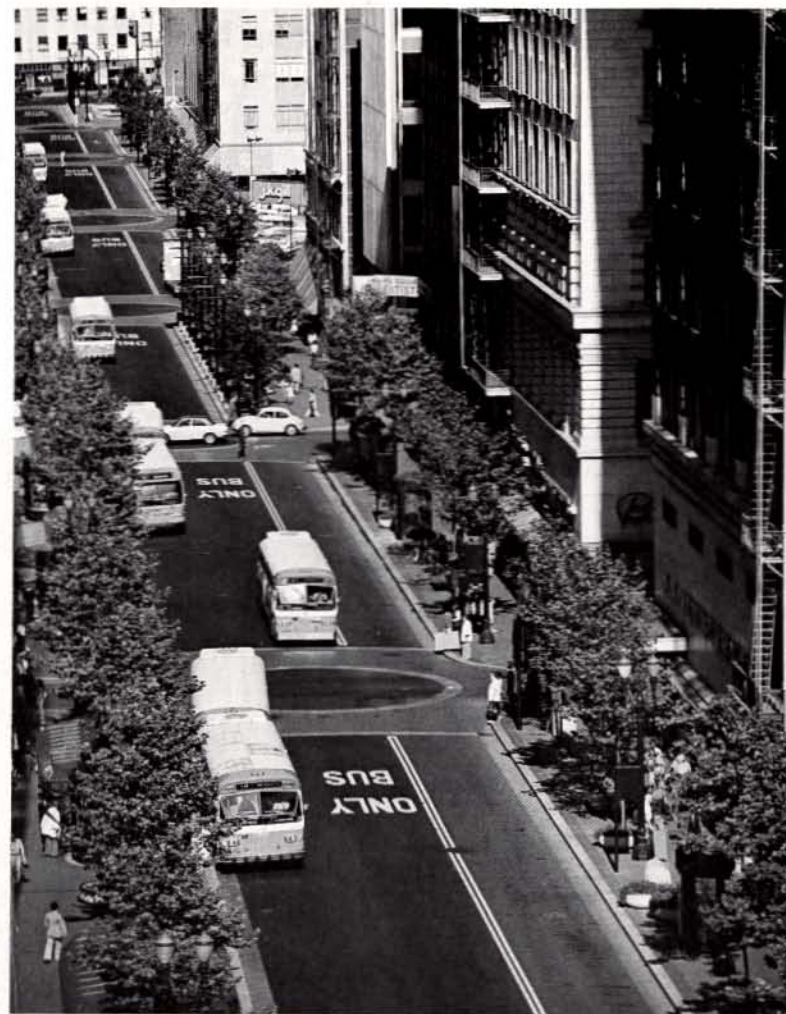
Pedestrian improvements can be successfully combined with improvements for downtown bus movement and bus passengers. This works well on streets with

medium levels of pedestrian activity that are too wide for successful pedestrian malls. The aesthetic benefits, in addition to those of pedestrian malls, include improving the experience of bus riders and the image of the transit system. The latter can lead to ridership increases and better marketability of bus systems (see also Section 2.4). Examples include Nicollet Mall, Minneapolis; Chestnut Street, Philadelphia; Fifth and Sixth Avenues, Portland; State Street in Madison;

and Granville Mall in Vancouver. Many others are in the planning stage. Excessive bus volumes (over 60 or 80 per hour) can cause conflicts with the pedestrian environment due to noise, smell of diesel and the bulk of the buses. Electric vehicles such as the trackless trolleys in Vancouver or light rail trams can avoid this problem. Other implementation issues are similar to those for pedestrian malls (*refs.* 109, 112, 117).



a. Pedestrian mall, Madison, WI.



b. Transit mall, Portland, OR.

Improvements Within Existing Traffic Patterns

When traffic diversion and street closing are either not feasible or not appropriate, many environmental improvements can be made while maintaining the existing traffic patterns. These include minor sidewalk widening and repaving, new planting, lights, street furniture, coordinated signing and signals, accentuating crosswalks and the introduction of art works. Such improvements by themselves are unlikely to cause major changes in the area, but in concert with improvements in the adjacent buildings (see below) can help bring about commercial revival.

Examples include Market St., San Francisco; Fifth Avenue, Seattle; and City Center projects in Chelsea and Newburyport, Massachusetts. Such improvements have often been successfully applied area-wide in historic town centers and districts. Caution may be required, how-

ever, to avoid monotony of a "preservation style" resulting from uniformly applying historically derived design standards to diverse commercial areas.

Implementation is relatively simple and can be done incrementally as funds become available. Many such projects were sponsored by the Economic Development Administration (EDA) to assist local job creation.

Incentives for Improving Building Frontages

Attractive, lively streets cannot exist without active and attractive buildings fronting on them. Programs for streets should therefore include incentives for adjacent building owners to improve the way their buildings relate to the street. The type of use is important: shops and community facilities can contribute activity while blank walls, empty lobbies or parking lots deaden the street. Physical improvements might include set-

backs, treatment of entrances, displays and signs, as well as the massing and architectural treatment of new construction in relation to existing buildings. Cities can influence the design of new buildings through redevelopment regulations and zoning and tax laws, and can provide incentives for rehabilitation through grant, loan and tax abatement programs.

Examples include incentive zoning in downtown Manhattan, redevelopment project controls in Boston that are usually linked with tax agreements, the zon-

ing program for housing in San Francisco and the use of tax rebates for storefront improvement in Newton, Massachusetts.

a. Paving detail, Market Street, San Francisco.



b. Varied storefront architecture, Boston.



Maintenance and Space Management

Many costly street improvements become run-down, underused and thus unattractive due to inadequate maintenance and management. Trash collection, replacement and repair of broken or worn items, painting, and maintenance of landscaping are as essential as the initial design. Programmed community events and entertainment are often required to draw new people to the city center. It is essential to maintain a mutually reinforcing mix of uses and market the whole urban area with a skill equal to that now used for the better suburban shopping centers.

There are only a few exceptional examples of public space management in the United States. These include downtown Minneapolis and the Mid-America Mall office, Memphis. The Providence Kennedy Plaza earmarked \$1 million of Urban Mass Transportation Administration demonstration funds for operation and management to complement a \$5 million capital investment during the first three years. A similar ratio of management-to-capital budget would be necessary for most urban street improvement projects in order to insure lasting environmental quality.



Pedestrianized street, Quincy Market, Boston.

Design Elements

A Stage for Activities

The successful pedestrian-oriented street is a theater of daily activity. People perform while walking, meeting, talking, shopping, greeting, watching each other, eating lunch or making business deals. A successful street design is analogous to a successful stage set: it supports the action and sets the atmosphere, but does not constantly remind one of the props. European pedestrian streets have generally achieved this with simple treatments, often using movable seats and planters, allowing vendors to bring their colorful carts and umbrellas and encouraging cafes to extend their seating into the public space. By contrast, many U.S. pedestrian malls appear overdressed with heavy, permanent architectural elements while they are

underpopulated by people. This imbalance is a result of inexperience with urban pedestrian environments and undue emphasis in budgets on capital improvements over ongoing management.

Pedestrian Pavement

Pedestrian pavement should provide continuity for people walking around the city. It can mark major paths and provide texture and visual interest. It can continue through sidewalks, crosswalks and plazas. The surface should be safe and comfortable to walk on and present no barriers to the elderly and handicapped.

Many of the successful examples copy historic precedents of stone or brick paving in European or older U.S. cities. The Munich example (Case Study 2.1c) successfully combines the traditional cobblestones with the less expensive contemporary precast pavers.

Weathering Materials

Street environments are subject to a great deal of wear and abuse and generally receive only minimal maintenance. Materials should not only survive this but continue to look well. Since the problems vary with local climate, cultural styles and maintenance practices, material selection should be based on the careful observation of what has worked in the past in the particular type of environment.

Signs, Lights and Information

On most streets these elements have been added indiscriminately over time to produce near-illegible confusion. Signs and information (including advertising) should be arranged in a hierarchical scale to allow the viewer to read the most important messages first. In pedestrian areas the lighting should be scaled

down and differentiated from standard road lighting. Some special commercial environments, such as Las Vegas or Times Square, can gain their unique character from the proliferating overscaled signs, but in most cases information and lighting structures should be blended with the architectural character of the street (*ref.* 56).

Plant Materials

Plants can provide a major softening or contrast to areas that may otherwise have inadequate variations of color, scale or texture. Planting can also add considerably to the physical comfort of the pedestrians by providing shade, reducing surface temperatures, and buffering windy areas. Visually, planting may be used to focus attention or to screen views or activities.

a. Programmed activities take place along the Mid-America Mall, Memphis.



b. Planters provide spatial definition along Munich pedestrian street.



The materials chosen must be appropriate for the conditions of light, water, soil and temperature available in the area. Just as important in choosing plants is the amount of maintenance that can be expected, because poor or unhealthy plants will be regarded as more of a nuisance than an amenity.

Planting for seasonal accent and the placement of seasonal flowers has long been an effective means of reinforcing other marketing tools for retail activities. Plants used in this manner may be valuable for only a period of three to six weeks, but require little care or attention. Members of the community, local merchants, or garden clubs may be willing to take responsibility for seasonal planting. Private funds can also be raised for this purpose.

Good examples are the removable planter inserts with changing seasonal plants supplied by a greenhouse in Munich (Case Study 2.1c) and the

flower gardens of Freeway Park (Case Study 3.2a).

Arcades and Shelters

The arcades throughout cities like Bern and Bologna give these cities a fine, unified quality and provide a protected walking environment. American cities have pieces of interesting arcades and shelters such as historic Pioneer Square, Seattle (see photo below); the recent Washington Street canopies in Boston; and arcades in Eugene, Oregon. None of these have yet been developed far enough to tie together a whole district. Arcades and shelters can be of particular value in cities with excessive sun or rain and where the existing architecture is not strong enough to provide continuity.

Unique Local Features

Traditional elements such as statues and fountains, activities like street fairs or

festivals, or special features of local industry and commerce can be emphasized to insure that a special place is created. Refurbishing an old fountain and a clock in Chelsea, Massachusetts, the sculpted centerpiece of Fountain Square in Cincinnati, and the continuing pushcart vendors in Boston's Haymarket serve this essential function.

Implementation

Resources for street improvements usually come from a combination of federal and local programs. On occasion, the U.S. Departments of Transportation, Housing and Urban Development, and Commerce have been able to provide major resources for aspects of such projects. See Chapter 5 for a full listing of such funding programs.

Critical actions for implementation include:

- Integrating street and pedestrian plans with transportation policies, traffic management, and transit improvement programs.
- Setting up participatory mechanisms for continuous review with merchants, property owners and other community groups.
- Selecting the first phase of improvements at a critical location which has a high probability of success and can gain further public support.
- Coordinating with private development plans and schedules to insure that projects can reinforce each other.
- Setting up management, organization and funding for operations prior to completion of capital improvements.

a. b. Historic shelter and bench design. Pioneer Square, Seattle.



CASE STUDY 2.1a

Downtown Crossing Restoring Busy Streets to People Boston, Massachusetts

Shopping in Boston's downtown retail district used to be a frustrating chore: congested, nearly impassable sidewalks and streets often forced pedestrians and drivers into a contest for the little free space left in the area.

Today the district has almost a leisurely air of elegance. You can stroll down Washington Street, the heart of the district, turning your attention to the ornate, historic facades of the buildings. You can sit on a convenient bench to watch the slowly passing parade of city life.

The change has been made by Downtown Crossing, a "Streets for People" project in the center of Boston's Downtown Retail District. The project consists of the closing of streets to traffic within a six-block area, rationalizing auto and service delivery circulation throughout the district, extending bus routes into the area, and a phased improving of the streets with brick paving and pedestrian amenities.

This project was initiated in response to the congestion, conflict and confusion that had made the heart of the retail district lose its attraction. Other parts of downtown Boston have either retained their historic attractiveness or created new attractions such as the Faneuil Hall Markets and the Waterfront. The growing competition made the merchants realize the need for aesthetic improvements. The restoration of the Markets proved that an attractive environment would draw new clientele and convinced the retailers of the benefits of this project.

The closing of Washington Street has been debated by the city for the last 15 years. Traffic engineers argued that it could not be done without the building of a major relief road at considerable

cost and disruption. Finally, a comprehensive study was conducted on re-balancing the circulation elements within the existing street pattern. The analysis concluded that the impacts would be acceptable and the project could proceed. At present, Winter Street and portions of Washington, Summer and Franklin Streets have been closed to traffic and turned over to pedestrians.

The new framework would actually permit the development of a complete pedestrian system from Government Center to the Theater District and from Boston Common to South Station. However, it was decided to phase the plan and limit the initial two phases to a six block section in the heart of the shopping district. This was more practical with funds immediately available and allowed the downtown community to sample the benefits.

The aesthetic effects are striking. On a summer afternoon crowds of shoppers stroll, where pushing and crowding had been the rule. The traffic impacts are lighter than predicted; people seem happy to avoid these previously congested streets. Delivery vehicles are still allowed at limited hours. Shops on Winter and Washington Streets are doing better. Repaving and other street improvements are proceeding gradually. The construction creates a few problems but people are able to work around them. Buses were originally routed down Washington Street but have now been moved to the next parallel street to leave Washington Street free for the large number of pedestrians. The project has had a good press and no serious critics.

Element plans for traffic management.





a. Washington Street, returned to pedestrians.



b. Washington Street, before.



c. Vendors add life to the street scene.

Costs

Funds committed to the project through 1979 include:

Phase I (completed):	
Construction	
—UMTA Section 3 with 20% local match	.8 million
—FHWA Urban Systems	\$1 million
Operation including transit subsidy, traffic enforcement, mounted police, promotion and project administration for 1 year	
—UMTA Section 6, 100% demonstration funds	\$1.5 million
Total Phase I	\$3.3 million
Phase II (under construction)	
City funds for construction	\$1.2 million
Amendment to demonstration grant for operation	.7 million
Total Phase II	\$1.9 million

Credits

Downtown Crossing was planned and sponsored under the U.S. DOT-UMTA Service and Methods Demonstration Program. The local lead agency was the Mayor's Office of Transportation with staff from the Boston Redevelopment Authority. The Massachusetts Bay Transportation Authority and the State Department of Public Works acted as implementing agencies for parts of the project. UMTA's consultants for the original planning were A.M. Voorhees, Cambridge Systematics Inc., and Moore-Héder Urban Designers (*ref.* 117).

Lessons

- If a street has strong pedestrian activities and architectural character, removal of traffic alone can be a major improvement. This has been proven in many European cities but would not apply to all U.S. downtowns.
- Conventional assumptions about traffic and business needs can be challenged by careful study.
- Leadership from the office of a long-time mayor was critical in insuring the implementation of a project that could have bogged down among the many agencies and interests.
- If the activity base of the city is relatively healthy, an incremental approach to improvements seems workable.
- Examples were required to convince merchants and building owners. The success of Boston's Fanueil Hall Markets and the Chestnut Street Transit Mall in Philadelphia were major factors.
- The unusually high ratio of operational to capital funds (about two to three) is a result of major operational changes with only a modest construction program. The demonstration funds for non-capital improvements were very much instrumental in the success of the project.

CASE STUDY 2.1b

Chelsea City Center Aiding Economic Development Chelsea, Massachusetts

A three-quarter mile section of Broadway (Chelsea's main street) and two of its main squares were re-landscaped as part of this program, which was completed in 1979. The project included new brick sidewalks and cross-walks, tree planting, street furniture, improvement to parking lots and store fronts, a group of shelter structures in Bellingham Square and several public art projects. It involved no major change of traffic patterns or street right-of-way use.

Chelsea is an old town near Boston with a largely working class population. Its town center has some handsome buildings but has experienced severe economic decline. This project was sponsored by the U.S. Department of Commerce, Economic Development Administration (EDA) in order to aid economic development both by providing construction jobs to locals and by attracting business into a more pleasing environment.

The interesting aspect of this area, especially of Bellingham Square, is that people use it a great deal. There are many older people as well as unemployed younger ones who seem to spend their lives in those streets.

The construction process itself (lasting two years) was a major event in these people's lives. Using the completed structures quickly became part of people's daily activity. The structures are generally liked. Vandalism has so far been modest considering some of the problems facing the city. The more attractive image of this previously forgotten area is beginning to receive attention from the media and from housing developers. So far the shops have not been appreciably helped by the change.

The use of brick pavement with granite curbs and accent strips, shade trees, cast iron and wood benches, and black-painted steel structures for tree guards, trash receptacles and the shelter structures created an elegant, traditional New England town center image. This might be somewhat incongruous with the local culture but was desired by the city.

Credits

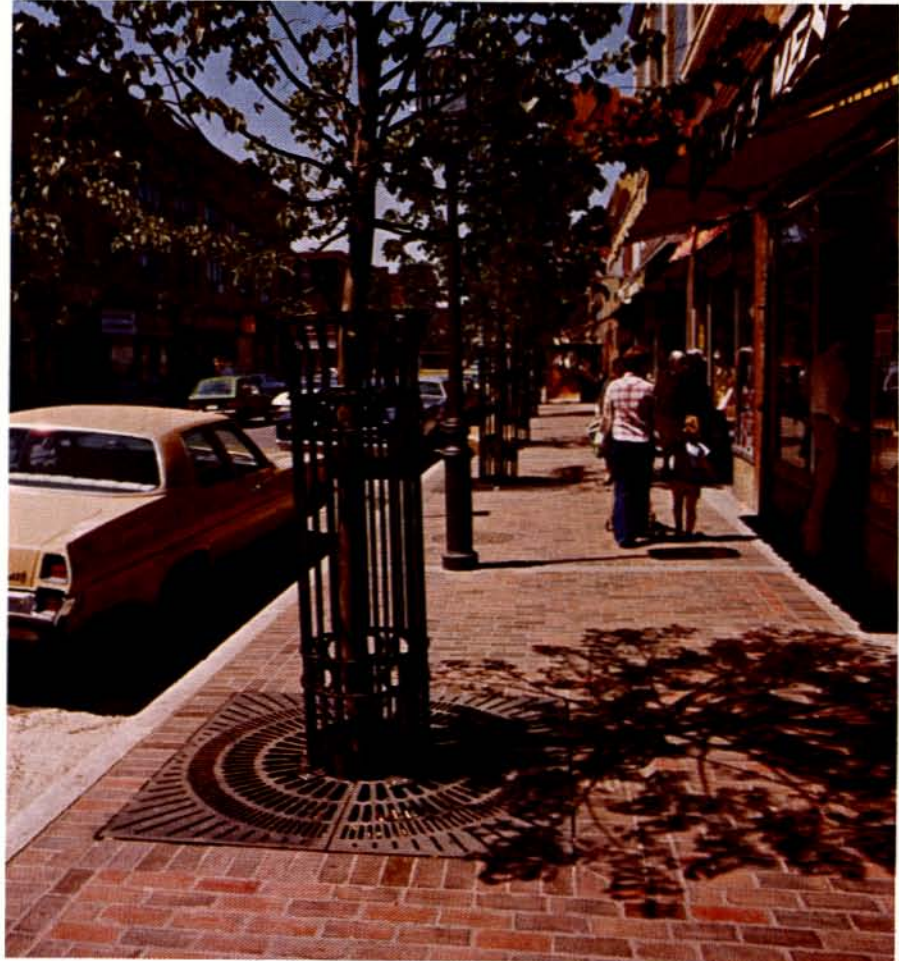
Client: City of Chelsea
Landscape Architects: Carol R. Johnson and Associates
Architects: Moore-Heder
Storefronts: Vision, Inc.

Costs

Total project cost was just over \$3 million funded 100% by EDA.

Lessons

- Improvements carried out within the existing rights-of-way and traffic patterns can have an impact on the image of the city center.
- Using local labor for such construction projects can aid in the economic revival of the city.
- Without complementary development efforts and a strong maintenance program, physical improvements can have only marginal economic benefits.



Improved shopping street.

CASE STUDY 2.1c

Munich—Old City Pedestrianization With a New Subway Munich, Germany

The Old City of Munich is one of the most attractive and comprehensive "Streets for People" programs anywhere. There is a total experience of freedom, visual charm and varied street life throughout the district, an area three-fourths of a mile across.

The major portion of this project was completed just before the 1972 Olympic Games. The overall framework was set by three decisions:

- In the post-war reconstruction, Munich, unlike most German cities, opted to rebuild its Old City according to the historic, narrow and irregular building and street pattern.
- The improvements to the Ring Road around the Old City were designed so it could carry all through traffic.
- The new subway lines crossing the Old City both North-South and East-West, already under construction on the main streets, were completely integrated with the pedestrian streets above them.

Besides this framework, the quality of the experience is provided by the street life and the careful detail throughout: the cafes and vendors occupying the space, the granite and concrete pavers, the planters with fresh flowers, the movable chairs, the arcades and fountains, and the practical public services on the subway mezzanines. The place is considered by citizens as the "parlour of the city"—for staying, playing and walking through.

a. Street life is varied.



b. Subways were integrated with pedestrian streets.



Credits

Client: The City Government of Munich
Architects: B. Winkler and S. Meschedern

Costs

Total cost for the pedestrian improvements was 13.46 million DM, the equivalent of about \$4 million at the time (1969–72).

Lessons

The conditions in Munich were considerably different from U.S. cities, and major plan elements could not be transferred directly. However, there are useful lessons in three areas:

- The overall attitude of treating major downtown streets as the "parlour of the city" and the resulting commercial and civic benefits (pedestrian volumes nearly doubled after the project to 120,000 people per day on the street).
- Integration of pedestrianized streets with transit stations, shops and other public services.
- Details of street construction and street life: encouraging the use of the street by cafes and vendors, careful treatment of paving, planters, lights, etc., and intensive on-going management, including provision of movable chairs and fresh flowers.

c. Public spaces are the city's "parlour."



Section 2.2

Off Street Parking



Memphis.

This section concentrates on the aesthetic issues of parking lots and parking garages in central city areas. Many of these facilities are not publicly constructed. They do, however, have a major impact on the public environment and can be influenced by public regulations and incentives. These impacts and public measures are the main subjects of this section.

Contents:

Parking Lots

- Opportunities: High Density
- Opportunities: Lower Density

Parking Garages

- Planning and Implementation
- Integrated Garage Examples
- Smaller Cars

Parking Lots

*... Don't it always seem to go
That you don't know what you got
Till it's gone—
They paved Paradise
And put up a parking lot.
"Big Yellow Taxi", Joni Mitchell*

One of the most pervasive changes in the centers of many U.S. cities has been the increase in surface parking lots which have replaced demolished older buildings. This creates some of the most serious aesthetic problems for these places:

- Interrupting the active street frontage discourages pedestrian activity and hurts the remaining functions that are dependent on foot traffic.
- Disintegrating the compact, continuous texture of buildings and activities that is essential for providing a kind of critical mass of attraction for the city center.
- Destroying the collective form, rhythms, scale and continuity of the visual streetscape.
- Displacing older buildings that had irreplaceable architectural qualities and had provided visual richness and memorable detail.

This phenomenon is of course not accidental. It is triggered by the combination of increasing demand for auto access and decreasing demand by the traditional users of some of the older buildings. It is greatly aggravated by the lack of effective parking policies and alternative access plans, by overly permissive attitudes toward parking operations, and by local real estate tax structures penalizing the owners of older commercial buildings. While some improvement in the appearance of parking lots can be brought about by design treatment, the root of the problem needs to be addressed through basic planning decisions.

Opportunities: High Density

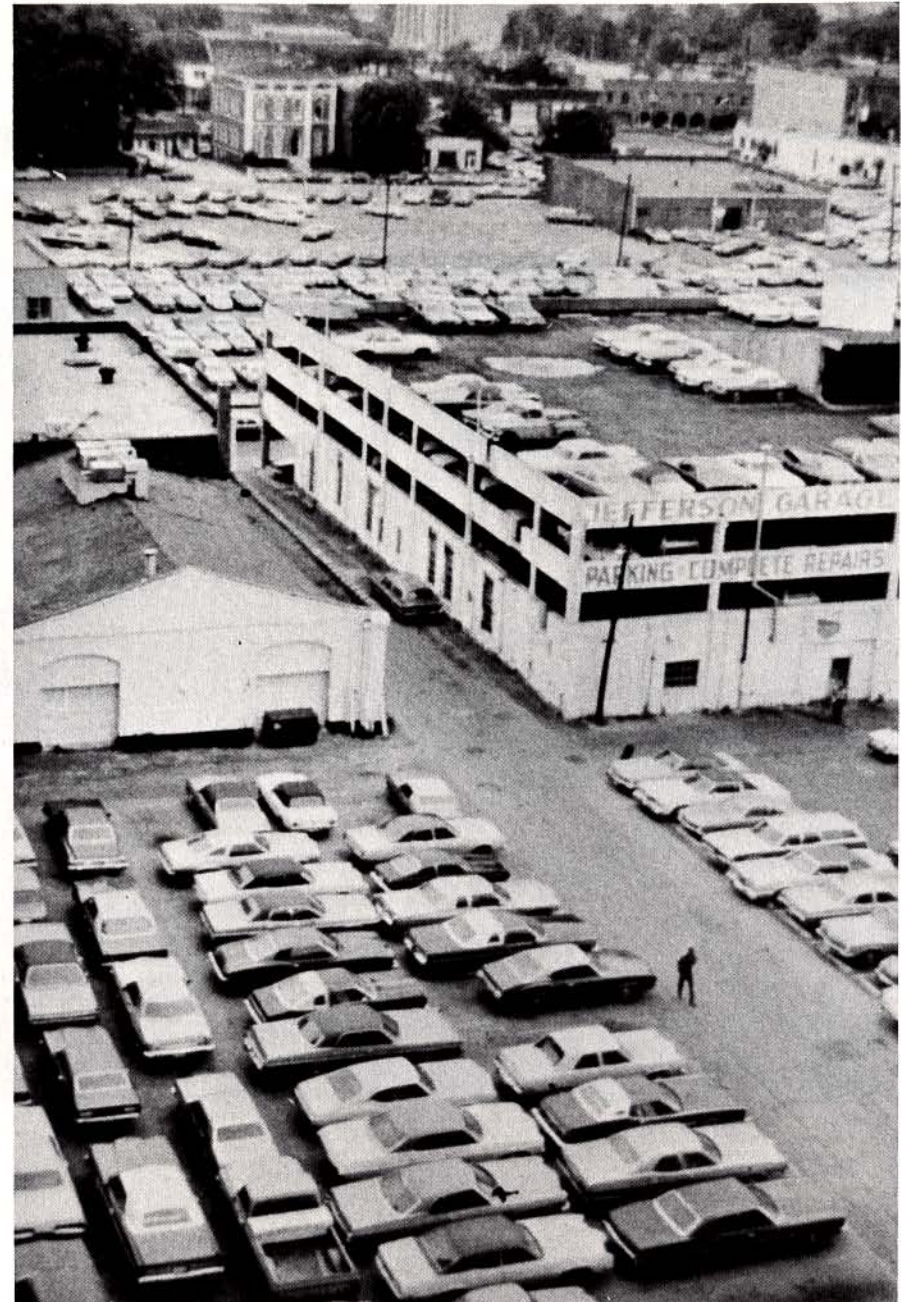
Parking lots are a basically inefficient and aesthetically inappropriate use of land in the dense centers of large cities. Aesthetic improvement can be obtained by limiting this type of use.

Possible techniques for restricting parking developments include:

- A freeze on new permits for surface parking lots imposed by the city. This is easier politically for the local government when mandated as a compulsory parking freeze responding to the Clean Air Act, as occurred in Boston.
- Providing alternative patterns of access to reduce overall demand: intercept parking at transit terminals for commuters, and local shuttle circulators from garages at the periphery of the district for shopping and other trips. Examples include the parking garage at the MBTA Quincy terminal (Case Study 3.3b) and the shuttle bus operated by the Boston Common Parking Garage. If parking is added in the downtown, it should be geared to short term trips rather than commuting and should be in multi-level structures and combined with other uses. (See discussion of parking garages below.)

Implementation mechanisms:

- The establishment of Downtown Parking Authorities that have enough control over the parking supply to set rates and control the amount and location of new parking.
- Negotiated joint development agreements that include public provisions for parking and circulation in exchange for contributions by building owners and developers.
- Reducing demand with employer-sponsored programs for substituting transit passes for parking, and using intensive publicity to promote alternate modes of access.



Parking lots displace other downtown activities.

- Tax and other incentives for the reuse of older buildings that will discourage their demolition and will indirectly limit the spread of parking lots.

Opportunities: Lower Density

The lesser densities in smaller cities and towns make them heavily reliant on automobiles and discourage shifts to alternate modes of access. Those town center areas that can generate rich urban type activity tend to be small enough to be easily walkable. Opportunities for limiting parking lots can be created by restricting parking to the periphery of high activity zones:

- Parking areas should be provided just off the main street with clear signage and attractive pedestrian connections leading to them. Sometimes the rear entrance of stores can open directly onto these lots and provide for package pick-up.
- If parking is provided as part of a large new commercial development, it is important that easy pedestrian access from it to the whole commercial area is provided. Otherwise, as has happened in many towns, the new development may function in a self-contained pattern and actually ruin the existing street-oriented shops.
- Keeping the scale of parking lots relatively small and integrating them with the street by landscaping can make them into a pleasant part of the environment of smaller towns.

Implementation mechanisms:

- Public parking construction has at times been funded as part of federal highway safety (TOPICS) programs when parking was removed from arterial streets.
- Federal Community Development Block Grants have been used to fund combined storefront improvement, signage and parking programs

Landscaping improves the appearance of parking lots.



Parking Garages

The outside of parking garages can present problems for city streets because:

- Parking and ramps adjacent to the sidewalk create dead frontage for pedestrians.
- The overall bulk and design of garage facades is often out of scale and character with the architecture of the street.

The internal environment of most large multi-story garages can discourage users due to:

- Confusing access patterns for cars and difficulty in identifying where to find a convenient vacant space.
- Lack of pedestrian accommodations including clearly designated walkways, identifiable views or landmarks for orientation, weather protection, lighting and an overall sense of a safe, well tended environment.

The internal problems may be resolved by:

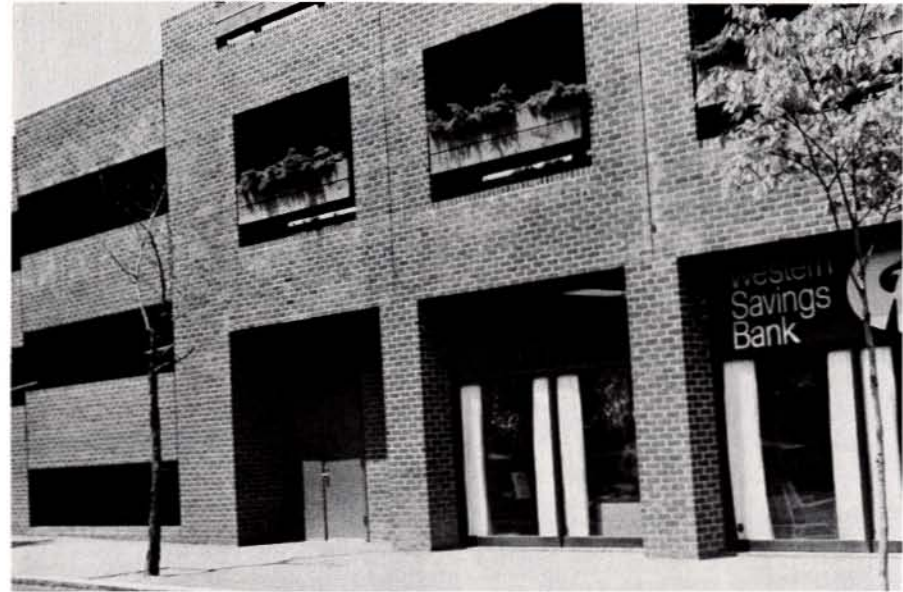
- Creating a direct, well signed access ramp from major auto circulator streets and a simple traffic pattern to each garage floor (see ramps on right hand side, model photo).
- Using a clearly identified pedestrian circulation system consistently throughout the garage. The mechanisms for leading pedestrians in and out of the garage should be addressed as carefully as the traffic engineering requirements for cars.

Integration with the city fabric can be accomplished by mixed use development such as zoning street frontage and other prominent parts of the site for non-garage use. This can range from the inclusion of a few shops to the incorporation of garages in major mixed use developments such as Ostra Nordstan in Gothenberg, Sweden.

Planning and Implementation

An overall urban design plan must identify those street frontages and elements of each city block that should be pedestrian-oriented and those faces that are appropriate for auto access. The best circulation pattern, such as the one used for Ostra Nordstan, will get the cars in from the periphery of the downtown and bring the pedestrians out through the lively parts of the complex directly into the downtown pedestrian network. Besides being aesthetically preferable, this type of arrangement creates the greatest potential for retail business.

To provide appropriately designed pedestrian facilities within a garage may increase the cost of the garage by 10% to 20%. If this cannot be financed from revenues it might be justified as a public subsidy contributing to the overall attraction of downtown. U.S. Department of Housing and Urban Development (HUD), Urban Development Action Grants (UDAG) and Community Development funds have been used for this purpose.



a. Mixed use garage, Philadelphia.



b. Garage under park, Boston Common.

Integrated Garage Examples

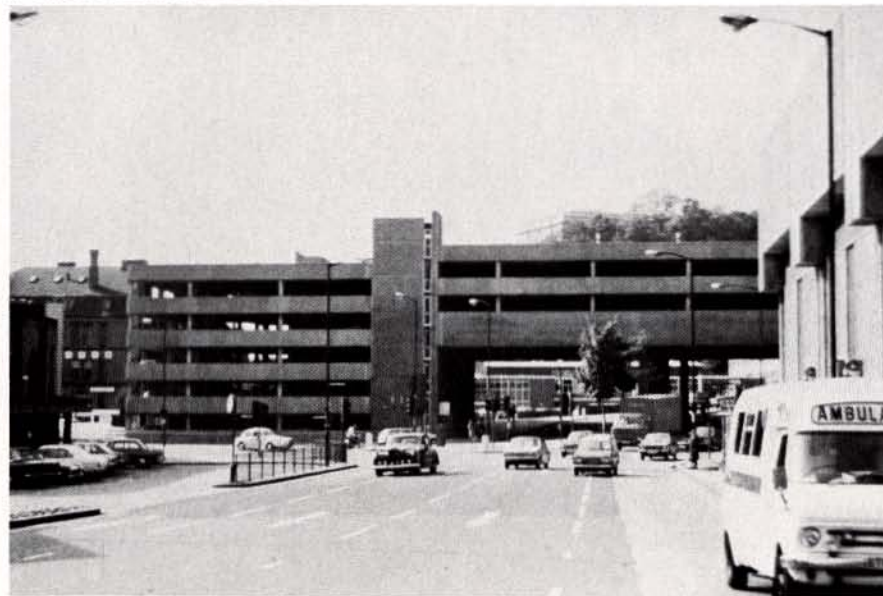
Few major urban parking garages in the U.S. have successfully integrated activities and solved architectural relationships to the urban fabric. The model shown below is a proposal for Providence, R.I. This scheme uses the ground level for retail, creates a network of pedestrian paths which extends an existing pedestrian system, puts 1,000 easily accessible parking spaces on the upper floors, and fits in office and recreational developments at key street frontages and above the parking.

a. Weybosset Gateway model, Providence.



The photo of Nottingham, in the United Kingdom, illustrates the extensive system of peripheral garages around the core of that city. These garages are arranged along the major trafficways ringing the core. Cars enter directly from these. Bus and railroad terminals are integrated with these garages. Pedestrian bridges and shops span over the core and tie into its extensive system of pedestrianized shopping streets.

b. Garage as connector, Nottingham, England.



c. Small cars are easy to integrate with street design.



Smaller Cars

The continuing shortage of energy and high cost of gasoline, along with government regulation, will increasingly promote the use of smaller cars. As the percentage of compact and sub-compact cars increases, significant portions of on and off street parking spaces and garages could be specifically designed for these.

For example, designing 7.5 by 15 foot spaces and 18 foot aisles instead of the current full size spaces would reduce space requirements by 35%. Simple market studies could reveal the percentage of compacts that can be expected in a given situation. Price reduction for parking could favor smaller cars. Besides the economic advantages, aesthetic benefits would result from reduced parking lot areas and garage bulk.



U.S. Rt. 95. Utah.

Section 2.3

Highways

“The view from the road” and roadside development are two aspects of highway design discussed in this section. These two elements are not always compatible: often the conditions which create exceptional driving experiences (i.e. elevated perspective) scar the surrounding environment or create barriers within neighborhoods. (The problems of fitting roads into developed areas are discussed in section 3.2.) The integration of the highway with its rural environment is considered here among other criteria for aesthetic design.

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Highways: A Love-Hate Relationship

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- Road Alignment
- Visual Edge
- Road Surface
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Highways—A Love-Hate Relationship

"I'd been poring over maps of the United States in Paterson for months, even reading books about the pioneers and savoring names like Platte and Cimarron and so on, and on the road-map was one long red line Route 6 that led from the tip of Cape Cod clear to Ely, Nevada, and then dropped down to Los Angeles. I'll just stay on 6 all the way to Ely, I said to myself and confidently started."

Jack Kerouac
On The Road

One of the freedoms felt by many Americans is mobility; the ability to move from where you are to where you want to be, or just moving on for its own sake. The pioneers felt it, and formalized the great cross-country routes. Workers and families and poets and hoboes and truckers and romantics of all ages have been taking to our roads ever since. The need to build roads has been so pressing that little concern has been given to what they are like to drive on, or the effects they have on the land we so much want to see.

The first highway builders gained their experience from the building of railroads. The land was seen by these men as an obstacle to be moved and conquered. Engineering criteria determined the form and appearance of the roadway. To some degree, we have inherited these attitudes and this style of roadbuilding.

Viewing roads as traffic carriers alone resulted in the neglect of their potential as form givers and for revealing the landscape by providing a unique, moving perspective. Too often the driver's view is filled with the chaos of uncontrolled roadside signs and developments, and haphazardly designed and placed structures. Too often the roads we build have no relation to the surrounding land or buildings, and ultimately contribute to their destruction.

Our love affair with the automobile and the excitement of movement it provides on our highways persists, despite these and other problems. More than simply a means of transportation, highway driving can be an intense and sensual adventure, epitomizing the state of mobility valued so highly by our culture. Color, form, and shape in rapid motion reveal our world in a way not seen at slower speeds.

Highways, often triumphs of engineering, are among the most graceful and awe-inspiring structures this age has produced. These vast roads mold the struc-



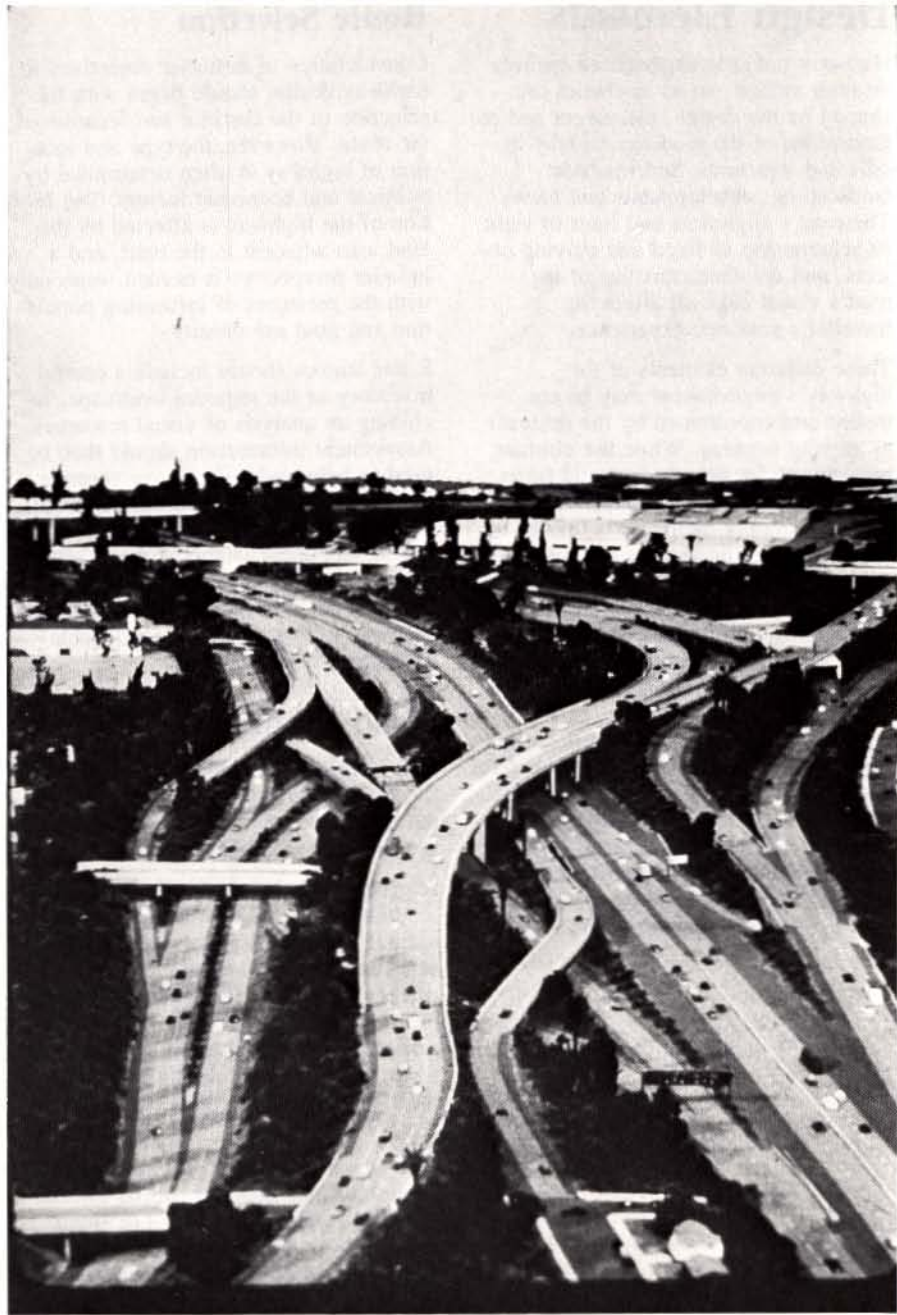
Americans value the freedom of the road.

ture of the communities through which they pass, as well as link them.

An increasing number of highway planners and engineers have recognized the aesthetic potentials of highway projects to help preserve the landscape, aid in rebuilding the cities, and become "sculptures for motion." Aesthetic design of highways and roadside beautification have economic benefits as well, including stabilization of real estate values, increased tourism, and a reduction in certain maintenance costs. This new emphasis on the aesthetic potentials of highways has been made possible by the development of new study techniques, and by a shift of Federal Highway Administration priorities away from simply the construction of new roads, and more towards safety, maintenance, beautification, and environmental integration. We now have the time and the expertise to produce designs which benefit highway users and neighboring communities alike.



a.b. Traffic jams and spaghetti roadways create nightmarish driving experiences.



Design Elements

Highway travel is experienced entirely through motion, so its aesthetics are shaped by the design, placement and relationships of the roadway, nearby details and structures, and roadside landscaping, developments and views. The road's alignment and lines of sight, its relationship to fixed and moving objects, and the characteristics of the road's visual edge all affect the traveller's aesthetic experience.

These different elements of the highway's environment may be controlled and coordinated by the designer to varying degrees. While the ultimate opportunity for designers would be to choreograph the driving experience, more commonly their role is limited to designing specific aspects or sequences of the road. Even without affecting basic route and alignment decisions, however, many visual and architectural elements may be influenced through design. In order to accomplish this, the spatial characteristics of routes and the environments created by abutting structures need to be approached with careful consideration for their aesthetic as well as engineering aspects. This means designing roads and structures as one would a building, by studying plans, sections, elevations and perspectives, as well as by using scale models.

Route Selection

Consideration of aesthetic objectives in highway design should begin with the selection of the corridor and location of the route. However, the type and location of highway is often determined by political and economic factors. The function of the highway is affected by the land uses adjacent to the road, and a broader perspective is needed, especially with the pressures of increasing population and land use density.

Route studies should include a careful inventory of the regional landscape, including an analysis of visual resources. Assessment information should then be used to help make alternative route selections and to develop design concepts, along with other environmental, economic and functional factors. Even when the route has been predetermined, the designer has many resources within the roadway itself to create a pleasurable and safe driving experience.

Road Alignment

Road alignment establishes the view of the road in perspective, a dominant visual element in the driver's landscape, and projects his future movement.

A general rule for designers is to achieve a "flowing" line, with a smooth and natural appearance in the land, and a sensuous, rhythmic continuity for the driver. This effect results from following the natural contours of the land, using graceful and gradual horizontal and vertical transitions, and relating the alignment to permanent features such as rivers or mountains.

Occasional exceptions from a smooth continuity may produce special effects. A long straight run, a series of small hills, or a long dipping curve will be remembered as dramatic departures from the norm, and can even heighten a sense of the continuity through contrast.



Road improvements preserved scenic drive through central Oregon.

In addition to affecting the traveler's sense of motion, alignment characteristics affect the traveler's perceptions of the motion of objects. By tilting and pointing the road, the focus of attention is aimed, and views can be presented as deliberately planned sequences. An example is how a city's skyline first seen in the distance at the end of a long, straight descent seems to rise on the horizon with forward motion. Another example is the apparent rotation of landmarks or other details in relation to each other.



Roadway elements underscore drama of canyon route.

Visual Edge

Landscaping and roadside detail largely determine the content of the traveler's view, by establishing the characteristics of the visual edge. Components of the edge may include plantings, earth forms, walls, rails, overhead structures, signs, lights and the road surface itself. By controlling lines of sight, the basic focus established by the alignment is refined. Coordination of the ensemble of elements within the right-of-way will result not only in a visual harmony and consistency, but should also reinforce the visual and spatial compositions established by the geometry of the roadbed.

Speed, and therefore time, are sensed indirectly through the apparent motion of fixed objects and the passage of roadside detail. These sensations are expanded by a closer proximity and greater frequency of such details. The absence of visual references in such wide open spaces as superhighways and featureless land-

scapes produces boredom, excessive speed and sometimes sleep. Designers may deliberately place objects along the roadside to add interest, provide a reassuring reference for speed, and supply some way of marking forward progress.

Road Surface

Although the highway driver sees mostly sky and pavement, little or no aesthetic consideration is given to the appearance of the road surface. Color is a function of materials and tints.

Selection of materials depends on cost, accessibility, and the experience of local industry. Tinted concrete may help fit a road into its surroundings and so justify an added expense. For example, two-toned asphalt was an attractive way to identify an improved section of road through an historic district in Middlebury, Vermont as a two-lane highway with two parking lanes.

Landscaping

Selective planting and thinning directs views by framing, emphasizing, or filtering the visual field. Plants can serve functional requirements as well, such as diminishing the effects of on-coming headlights when used in medians and at interchanges, or providing optical guidance to direct forward motion or clarify changes in speed or direction. At exit ramps or unexpected curves, for instance, the road's turning can be defined by a clump of trees or a grouping of colorful shrubs. In rural areas, wide median strips planted with native vegetation can help maintain the natural features of the route.

A wide and well landscaped right-of-way will likewise preserve the quality of the countryside and prevent the encroachment of objectionable land uses. Green belts of this sort also act as buffer zones protecting the community from the impact of the automobile. Planting in rural areas has often been done to maintain or encourage diversity in wildlife environments, and to naturalize areas where construction has left massive, unnatural scars. The planting of steep slopes helps avoid erosion and sedimentation of local water bodies. Grading can fit the road to the land with both aesthetic and functional benefits. Gradual slopes on cuts and banks, and rounded instead of angular tops of cuts, appear more natural and graceful, and prevent landslides and erosion.



a. Landscaping ties the Garden State Parkway into its rural surroundings.



b. Wildflowers add color along I-64 near Charlottesville, VA.

Walls

Retaining walls and noise barriers can be significant elements in the highway environment. Standardized designs are often used haphazardly without regard for their visual impact. These walls appear as intrusions relating neither to other elements in the roadway, nor to those in the neighborhood.

Two dominant features of walls are line and form. Long straight lines accentuate length, are monotonous, and create an enclosed, tunnel-like effect. High walls close to the road can make motorists feel anxious, and form a prison-like enclosure on the community's side. The following examples illustrate some successful techniques for reducing these visual impacts.

San Francisco's Potrero Wall reduces its apparent height through sculptured, setback tiers. When the top of a high wall recedes from view, the constricting sense of enclosure is minimized. This wall's sculptured form adds visual interest with the constant play of light and shadow on its surface, the resulting patterns balancing the wall's otherwise overwhelming horizontal and vertical qualities.

In Seattle, plant materials were used to soften the hard, straight lines of the continuous retaining walls shown here. Natural color, texture, and variety are added by the use of evergreen and deciduous trees, flowering shrubs, and vines. The region's moist climate makes a luxuriant growth possible, suggesting easy maintenance.

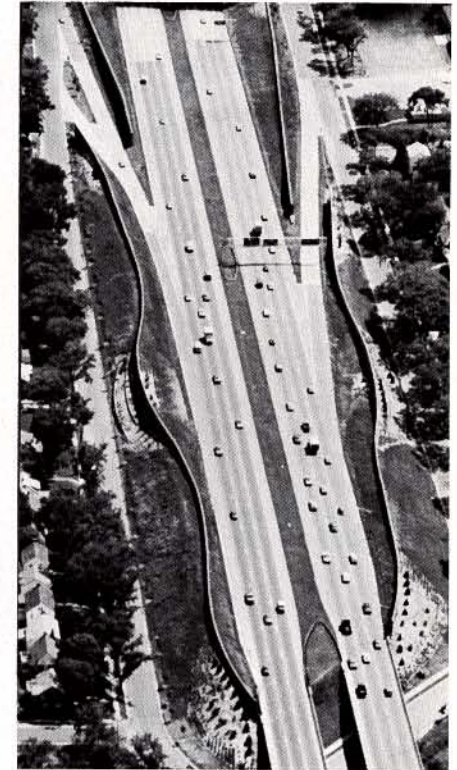
Castellated or serpentine walls such as the one shown here in Minneapolis reduce the visual impact of seemingly unending straight lines characteristic of noise barriers. By varying the line in plan, a sense of space and movement is created. Areas for planting are provided. Earth berms and the use of wood further minimize the impact on the surrounding residential community as well as on the motorist.



a. Sculptural setbacks provide visual interest and ledges for planting. San Francisco.



c. Greenery enhances retaining walls. Seattle.



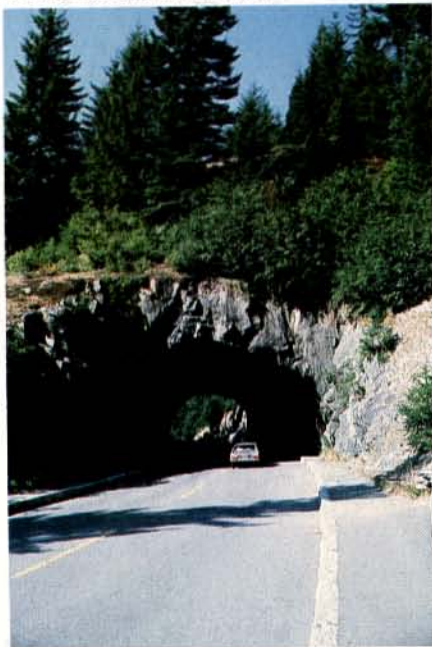
b. Castellated sound barrier fits into residential neighborhood setting, Minneapolis.

Textures on walls function differently for motorists and for pedestrians. Effective textures for high speed viewing are bold and visible at a glance. Pedestrians will prefer detail and subtlety. Public acceptance of barriers may be improved by adding visual interest through texture. Opportunities include using plant materials; building materials with inherent textures, i.e. wood, stone; and building methods which add texture to the surface of structures, i.e. form liners for poured concrete (*ref. 69*).

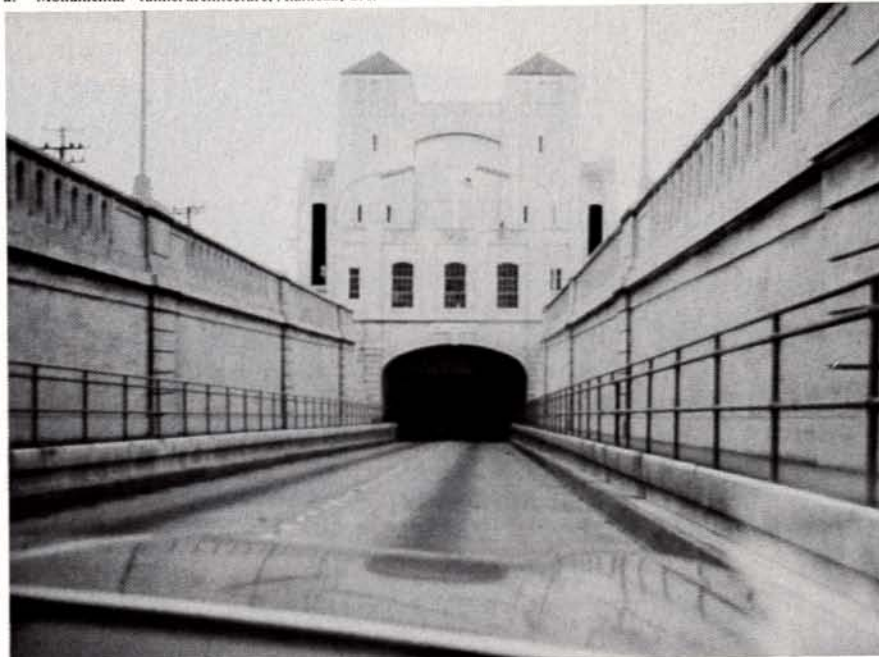
Tunnels

Often long and boring architecturally, tunnels share many of the spatial characteristics of high walls close to the roadway. Tunnels are valuable for urban use nevertheless, since they prevent visual and physical conflicts between the highway and the city's streetlife, open space and other features. To counteract their negative qualities, many of the techniques learned from the design of subways and other underground facilities can be applied (*ref. 59*). These include varying spatial quality, bringing in natural light, and incorporating artworks meant to be viewed in motion. Portals are also dominant elements in the urban context and can benefit from aesthetic consideration. Sculptural, architectural and decorative treatments help to celebrate both their form and function.

b. Mt. Rainier National Park, Seattle.



a. "Monumental" tunnel architecture, Alameda, CA.



c. Autobahn, Wassen, Switzerland.



Bridges and Elevated Structures

Among the highway traveler's most memorable experiences are those formed by bridges. They create singular or repeated enclosures, open up wide vistas and frame views through their structures. They may appear as monumental landmarks, the identifying image of the city, like the Golden Gate, or may be simple, understated and elegant testimonials to good design and engineering.

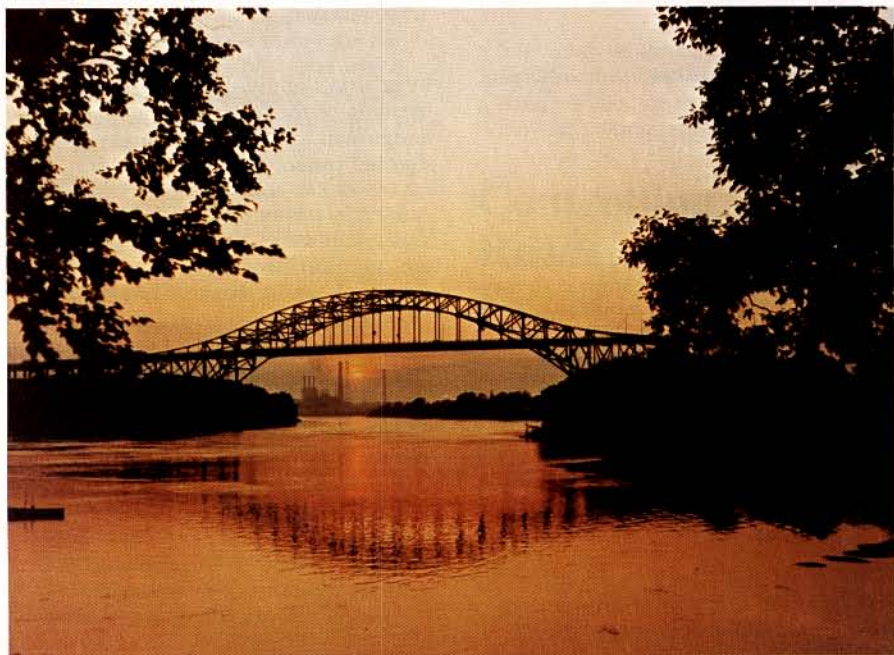
Some visual problems caused by highway bridges are the distractions caused by random and disorderly placement patterns, dominance of massive forms out of scale with the surrounding environment, and the inappropriate use of standard materials and designs. To some extent, standardization has been encouraged by strict state and federal safety criteria. The rigidity of regulations and the complexity of review procedures can lead to a reliance on tried and true functional solutions, which do not relate to particular conditions.

Bridge engineers in California have developed exceptionally beautiful systems for the design of overhead structures and elevated interchanges. Flowing concrete forms cantilever and perch on narrow columns as if "floating." They appear to be both graceful and strong.

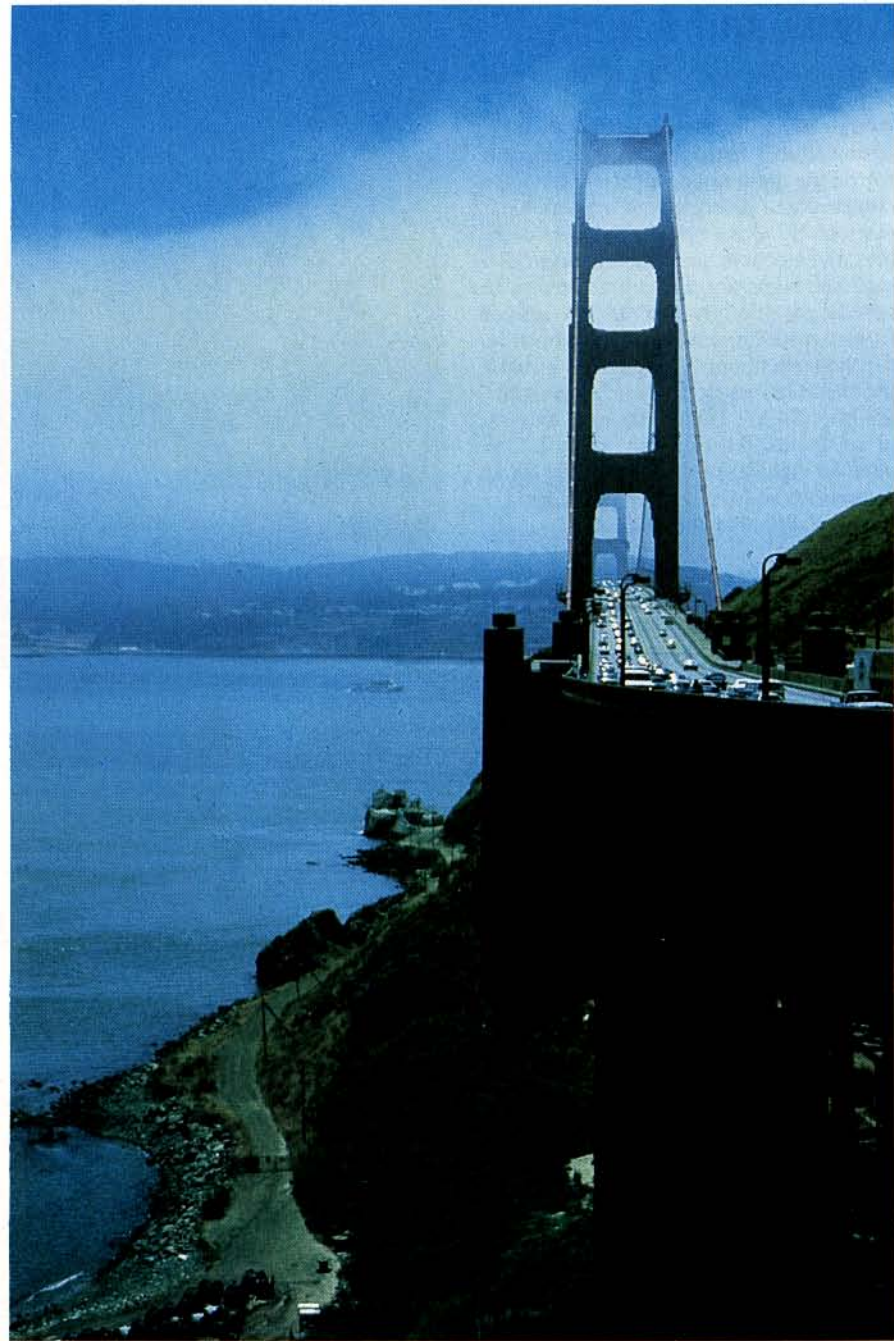
Highway funds may be used to repair and restore bridges of historic and cultural significance. The designs of the past often reveal an exceptional sensitivity to human scale and to their natural settings. Today they are also rich in symbolic and educational meaning. In order to take advantage of historic preservation funds, bridges may need to be officially registered as historic structures or to be within historic districts. In other cases, rehabilitation may take place as part of Federal-aid highway programs.



a. Elevated interchange, near Santa Monica, CA.



b. Understated engineering, Piscataqua River Bridge, NH and ME.



c. The Golden Gate Bridge is a landmark of the San Francisco area.

Signs and Lights

Highway signs and lights function as environmental information systems, although in reality they are not systematized. Uncoordinated equipment for public signing and lighting creates a cluttered and disorganized appearance, particularly along urban roads. At complex intersections and interchanges, directional signs are difficult to read at fast speeds, especially where drivers are confronted with large billboards competing for their attention. At night this visual problem is worsened when these signs are brightly lit. This is not only an issue of aesthetics, but of safety as well. The public's right to privacy and need for information, and the quality of the environment, are also at stake.

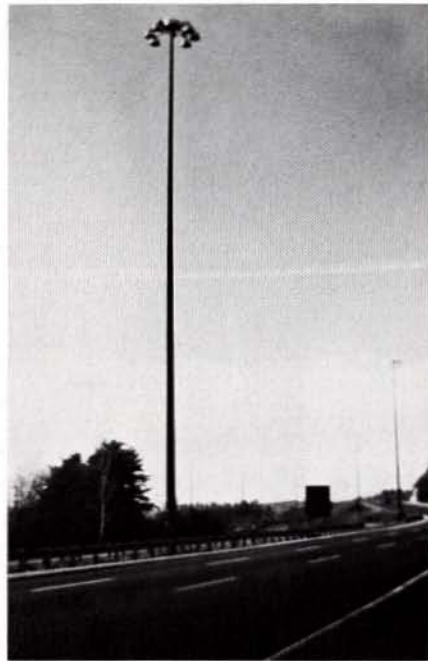
Sign Control

Actions to correct this state of affairs are of two basic types: controls for private signs, and coordination of public sign systems.

Coordinating public programs—

Achieving visual order would not require new hardware, but better planning and cooperation among the many agencies who share responsibility for road signs and lights. This is especially needed in urban areas where procedures for planning, design, construction and maintenance are fragmentary and agencies operate on city, metropolitan and state-wide levels. The need also applies to state highways and counties outside of metropolitan areas where authority is split among different agencies and departments.

Control of private signs—One goal of the Highway Beautification Act of 1965 was to protect the public's investment in the Interstate System and the natural environment by controlling outdoor advertising. Techniques for controlling roadside development can be found later in this section.



a. Light fixtures can have their own sculptural beauty.



b. Illuminated signs command attention.

The Vermont State Legislature has authorized and enforced a statewide ban on billboards along the Interstate System. This law was based on findings that the proliferation of billboards was dangerous for highway users, detrimental to the preservation of scenic values and therefore the economic base of the state, and an ineffective means of providing tourist information.

The law is administered by the Vermont Travel Information Council, which has the authority to regulate size, shape, color, lighting, and location of business and directional signs.

Maine recently passed a similar law, which survived a challenge in the courts by the Outdoor Advertisers' Association. Oregon has an information plaza program similar to one in Vermont where all signs are collected in one area, out of view from the roadway. Hawaii also

prohibits billboards but has no alternate system.

Lighting Design

Aesthetic factors in the selection and placement of highway lighting systems include maintaining an overall consistency with the design of other elements; proportions, scale and form of the fixtures; color of the lights; and the patterns created by the pole spacings. Fixtures can be graceful sculptural objects which add up to a strong rhythmical structure along the roadside. Color can be used to reduce glare, to emphasize changes in the flow of traffic, or to highlight segments of the road, such as the approach to downtown. Controls of private signs and lights could enable special effects for enlivening portions of urban roads.

In general, lighting reveals the form and meaning of the road at night. Lighting design will reinforce good highway design but cannot replace it (*ref. 56*).

Rest Areas

The Highway Beautification Program encourages states to provide more rest areas for the "safety, convenience, relaxation and recreation" of highway travelers. Federal-aid programs may be used to help provide these facilities along interstate, primary and urban systems. Land may be acquired as part of the right-of-way, for the specific purpose of roadside rests, under the general authority to acquire land for highway purposes. Land for roadside parks and other more elaborate facilities may be acquired by many states. In Oregon, for example, acquisition is authorized by purchase, agreement, donation, the right of eminent domain, or whatever means necessary for the:

Development and maintenance of public parking places, auto camps, camp sites, roadside development, recreational grounds or resorts, forest or timber areas or other places of attraction or scenic value which in the judgment of the commission are necessary for the convenience of the public, and which will contribute to the general welfare and pleasure of the motoring public or road user (ref. 62).

Development of rest areas can become a focal point for projects aimed at enhancing the highway user's experience. By offering a quiet oasis apart from the constant rush and demands of the road, these areas improve safety as well.

- As target areas for landscaping programs, special attention can be given to pedestrian oriented details such as plantings, walls, walks and benches.
- Installation of sculptures in rest stops has been successful in Vermont, Massachusetts and Nebraska (Case Study 1.4a).
- Information regarding scenic, historic, cultural, recreational or religious sites enhances the usefulness of the road.



Pedestrian scale and views mark Alexandria MN. rest area.

- Sites may be developed as recreation facilities, i.e. for overnight camping, nature walks, or as staging grounds for bicycle, biking, riding or skiing trails.

Controlling Roadside Development

Techniques for controlling roadside development may include the acquisition of scenic easements, development and enlargement of the right-of-way to provide rest areas and overlooks, regulation of billboards and junkyards, and subdivision and zoning regulations to define land uses. Such management of the roadside can help to integrate the highway with its environment more effectively.

Implementation of roadside development, beautification, and aesthetic design programs for federally assisted highways raises some pertinent issues:

- Although federal law requires the states to maintain effective control over the erection and maintenance of outdoor advertising signs and junkyards along our interstate and federal aid primary highways, implementation is necessarily at the state and local level. Legislative powers and authority must be present to enforce control over billboards and junkyards, and to acquire the necessary easements in the scenic enhancement program.
- At the local level, a means of establishing regional priorities is needed. In order to protect the public interest along the roadside, legislators and the courts must include a consideration of the need for beauty in their definition

of the public welfare.

- Federal funds authorized for junkyard and outdoor advertising control are out of the general treasury and thus earmarked for that purpose. Federal funds are no longer authorized separately for scenic enhancement and landscaping under Section 319 of Title 23 so this program must compete with construction projects for funds out of the highway trust fund. In recent years, federal allocations for highway beautification programs have been minimal.

CASE STUDY 2.3a

Vermont Interstate 89 Aesthetic Design of a Major Highway

Interstate 89 runs from the Connecticut River at an eastern point of the state, to the Canadian border near Lake Champlain on the western side. Construction was completed in 1973. It passes through the state capitol of Montpelier as well as the largest city, Burlington, and links these cities with Boston, Montreal, and via Interstate 91, New York City.

Whether next to whitewashed New England towns nestled in steep valleys, along ancient rock bottomed rivers, or clinging to ridges as they traverse the mountain ranges, the highway sits comfortably, as if a part of the natural order.

I-89 satisfies the aesthetic criteria of both travelers and surrounding communities. The road appears in perspective like a part of the natural landscape, gently following contours and leaving rural areas relatively undisturbed. All along the way, views reflect the changing topography, land uses, and vegetation. A strong sense of the region, its history and meaning, is conveyed through these views and the sequences they form. The driving experience is pleasurable, all elements contributing to a feeling of continuity and harmony. Although all highways create barriers to some extent, I-89 manages to take its place in the overall structure of its surroundings with a minimum of adverse effects. The roadway seems to blend into its setting, and even add to it, by its graceful appearance and landscaped roadside.

Design elements and examples include:

- Alignments followed natural contours and provided smooth transitions. Medians were allowed to vary, horizontally and vertically, and plants were preserved in them where possible. In some sections the separate roadways were treated independently during design. The result was less disturbance

of the surrounding environments, lower construction costs, and a more natural appearance of and from the road.

- Occasional contrasts add interest to the generally flowing lines. An example is a pass through a rock cut heading west from Montpelier. The road winds up towards the cut which frames the crest of the hill like a gateway. A sense of expectation is increased as the rock wall encloses the previously wide open space of the roadway. On the other side, the wide vista of the Winooski River Valley opens up below, with Camelback Mountain distinctively marking the distance. Such cuts are more expensive and alternative alignments were possible. With Federal Highway Administration (FHWA) encouragement this exceptional sequence was constructed primarily for its aesthetic impact.
- Views of distinctive and characteristic scenery were considered during alignment studies and incorporated into design. Portions of the trip from White River Junction to Canada may be remembered because of their distinct visual quality. The leg between Burlington and the border is through agrarian plains. Between Burlington and Montpelier the image is expressive of Vermont life: farms, railroads, the river and distant mountains. From Montpelier to Royalton the road is through undisturbed mountains, alignments and views underscoring the isolated beauty of this setting.
- Safety rest areas are exceptionally well maintained, and provide travel information as well as amenities such as public telephones and toilets. Site selection was based on opportunities for viewing and for introducing the traveler to the local environment, as well as for traveler convenience and safety. Picnic areas and foot-paths provide access to the right-of-way and adjacent public lands. Landscaping buffers the



I-89 fits into the rural landscape.

pedestrian areas from the road. Sculptures have been installed away from the roadway, to further encourage pedestrian enjoyment of the rest areas. (Case Study 1.4a). As one Vermont highway engineer put it, "It's hard to go wrong with this scenery!" Starting out with a spectacular site and relying on natural instincts and common sense seems to have been a part of the reason for the Vermont Agency of Transportation's success. Rural interstate highways have been designed which combine functionalism with natural beauty and blend with the environment.



Rock cut accents panoramic view of Winooski River Valley.

Formalized procedures for evaluating aesthetic effects in design and planning considerations did not exist until 1974, after completion of I-89. During the 1960's when this road was being built, it was nevertheless the policy of the (then) Department of Highways to encourage and promote good design and aesthetics. This was the policy of the funding agency and the FHWA as well. Construction funds were available through the Federal-aid highway program to finance the extra costs of scenic road-

ways, expand rest area facilities, and control roadside developments. Vermont took advantage of all of these bonuses. Efforts to incorporate scenic design were encouraged and supported by FHWA advisors.

All work was done in-house by the state. Aesthetic factors were considered at every stage of the project development process, beginning with identification of alignment alternatives and carried through to engineering design. Alterna-

tives were based on inventories of scenic features and were made to take advantage of natural opportunities for highlights. Passage of the state anti-billboard law further enabled control of the roadside and protected the investment in design.

Credits

State of Vermont, Agency of Transportation, Division of Engineering and Construction.

Costs

The estimated cost for the construction of Interstate 89 was approximately \$181,000,000.00, in 1971.

Lessons

- This project was a success largely because of the state's exceptional scenery. Not every highway project benefits from such raw material. Nevertheless, in-house engineers and designers were sensitive to this beauty, and did not need guidelines to lead them towards a distinguished product.
- The FHWA Awards program was a real stimulus for quality. Competition for recognition of their work and their state was a healthy motivational factor in the Highway Department's work.

CASE STUDY 2.3b

Bridge Preservation Changing Federal Criteria Woodstock, Vermont

Approaching Woodstock, Vermont from the north, the state highway passes around the base of Mt. Tom and takes a 90° turn onto the Elm Street Bridge, crossing the Ottauquechee River. This wrought iron bridge, 109 years old, is only 18 feet wide, and during peak tourist seasons as many as 20 cars may be backed up on either side waiting to cross.

Deteriorating now due to age and neglect, the bridge, although not beautiful, still clearly fits into the scale and setting of this picturesque place. It remains a symbol of the spread of iron bridge technology from railroads to highways, and still expresses a sense of what life may have been like a century ago, when Woodstock was in the midst of the

sweeping changes of the Industrial Revolution.

This case study illustrates how one small town succeeded in changing federal highway design standards to respond to their historic preservation concerns, despite the reluctance of state and federal highway departments to be flexible in applying their own rules.

The Elm Street Bridge, constructed in 1869, is a wrought iron "Parker-Patent" pony truss—"an iron bowstring truss bridge with brace framework above the roadway for lateral support resting on stone abutments" (*ref. 76*) (see photo below). It is one of the few surviving bridges of its type in New England, the only one in Vermont, and is listed in the Historic American Engineering Record. Woodstock Village itself is an historic district.

The bridge serves as a gateway from the north to the village center and slows

traffic to a speed compatible with the pedestrian-oriented scale and feeling of a nineteenth century New England village.

By 1977 structural deterioration had become so severe that the bridge was a serious hazard. Unable to afford the costs of repairs, the town declared the bridge unsafe and appealed to the state for aid. The state agreed that the Elm Street Bridge was one of the most critical bridges in the state, and drew up proposals for replacing it. Funds were available under the Special Bridge Replacement Program in which the federal government pays 75%, the state 20%, and the local government 5% of the cost. The condition was that the bridge be torn down and replaced with a modern, wider bridge, which met FHWA safety specifications and geometric standards.

The town reacted strongly against this restriction. Their interpretation of the design standards was that they could be used as guidelines, made to conform to local needs. They felt that using Special Bridge Replacement Program funds for restoration of the bridge should have been allowed.

Both the State Historic Preservation Officer and the Ottauquechee Regional Planning and Development Commission became involved through the typical "A-95" review (for projects using federal funds), and worked to assure that the necessary procedures under the National Historic Preservation Act of 1966 would be used "to resolve matters involving federal funds being spent in a way that could have adverse effects on an historic site" (*ref. 73*).

The citizen's movement became even more organized in the face of the State Agency of Transportation's refusal to adjust its standards. A year was spent in gathering information and having discussions and public meetings. The case for flexibility in applying the federal regulations was ultimately brought before the Secretary of Transportation. His re-

sponse was that Special Bridge Replacement Program funds could not be used for maintenance or restoration, but only for replacement.

The town and its supporters, however, firmly believed that their position was correct, and that other bridges were also at stake. Provisions in the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, and the Department of Transportation Act of 1966 provide support for redirection of specific programs when special circumstances are involved. All of these statutes contained policies and provisions to protect and enhance the environment, including preservation of unique settings and structures. The Town of Woodstock undertook to review the town manager's application for Bridge Replacement Funds, under Section 106 of the Historic Preservation Act. The Advisory Council on Historic Preservation was called in to review the dispute. A compromise was finally reached. The restored bridge would be 24 feet wide, a minimum for traffic safety and a maximum for preserving the aesthetic character and setting.

Elm Street bridge, May 1979.





Elm Street bridge, ca. 1900.

Design details were specified to mitigate the negative impacts of dismantling and restoring the bridge. The trusses will be restored and incorporated into the new bridge. Abutments will be reused if structurally sound, or reconstructed to have an appearance similar to the original. Timber sidewalks will be rebuilt on the outside of the trusses, and the existing decorative wrought iron railing will be restored. Guardrails will be simple box beams and all railings, guardrails and steel superstructures will be painted black.

Costs

The cost of this bridge was estimated in January 1979 to be \$663,000.

Lessons

- Federal regulations need to be applied with reasonable flexibility regarding standards and allowable operations, as this case study shows. Broad, nationwide programs often cannot respond to exceptional cases individually. When the initiative for flexibility must come from the local level, however, the tendency will be to reinforce the status quo.
- Persistent advocacy by concerned groups in Woodstock was an essential element in changing normally rigid procedures. Local resources and expertise perhaps were exceptional in this case, but nevertheless provide a model for other communities.

CASE STUDY 2.3c

Vail Pass Fitting a Highway to the Land I-70, Colorado

Information for this case study is based on the booklet, *I-70 in a Mountain Environment, Vail Pass, CO.* (ref. 71).

Interstate Highway 70 crosses the Rocky Mountains over the Vail Pass (el. 10,603'), one of the highest elevations for an interstate highway in the United States. The main objective of the Vail Pass Project was to construct an interstate highway compatible with this delicate mountain environment, where the soils are highly erodable and spectacular scenery attracts thousands of visitors annually. The highway was successfully fitted to the land, protecting fragile ecosystems, preserving visual and natural resources, and improving the public's enjoyment of the area by increased access and sensitive design. These problems were resolved effectively as a result of interagency cooperation throughout the project.

Following the decision to extend I-70 across the Rockies, heated controversies developed over the selection of the corridor. In 1959, after a thorough study of alternative routes, it was recommended to follow the existing U.S. 6 over the Vail Pass.

The Vail Pass route was controversial, however. Subsequent to the National Environment Policy Act (NEPA) in 1969, a series of environmental impact statements, studies, reports and clearances on the full project began, and continued through 1975. Construction began in 1973, involved 22 individual projects, and was not completed by 1979.

From the beginning, every effort was made to minimize or eliminate adverse environmental impacts. Scenic quality was considered a key value as well. Design criteria for highway alignment and structures were prepared. Federal, state,



Disturbances of the fragile mountain environment were minimized.

and local agencies provided data for the design studies. The U.S. Forest Service was active in the development of the road through the White River National Forest. Memoranda of understanding were prepared between the local Ranger Districts of the Forest Service and the Colorado Highway Department, specifying construction techniques and contractor requirements. The Colorado Division of Wildlife consulted on game crossings, habitat criteria and channel changes. Local agencies aided with information on water quality and revegetation techniques.

Alignment and design concept stages were used to fit the highway to the land with the least ecological and visual disturbance. It became clear, as studies progressed, that unforeseen circumstances would arise during construction, requiring adjustments to standard contract documents. As a result, special accounts

were set up to finance unforeseen environmental protection expenses. During construction, personnel were assigned to help solve erosion control, landscape and revegetation problems. New techniques proved to be so successful that they were incorporated into standard contract documents, improving cost effectiveness and design.

Special structures were required to satisfy environmental, engineering and aesthetic constraints. The complex problems presented by the mountainous terrain required special procedures and materials not often used on interstate projects. Architectural and engineering consultants developed design concepts once criteria were set.

Stepped walls were preferred to vertical walls. Walls had to be modular and prefabricated to facilitate construction. A parabolic panel was chosen for its strength and appearance. Iron oxide was

added to the cement to produce a reddish-tan tint, which matched the natural colors of the area. The spaces between the panels were filled with topsoil and planted to minimize the massive appearance.

Precast construction methods minimized disturbance of vegetation. Disturbed land was regraded and replanted. Landforms were blended with bridge abutments to maintain visual continuity for motorists. Structures were designed to complement the color of the natural landscape.



a. Tiered, reinforced earth retaining walls before planting with grass.

Landscape techniques were used to stabilize highway slopes and to blend with the surrounding forested mountain-sides. Methods of erosion control, slope stabilization and revegetation resulted in treatments which were successful in terms of scenic quality as well. In areas of heavy traffic, landscape treatments reflected and extended existing landforms, vegetative patterns and features. In pedestrian areas or areas of slower traffic, more attention was given to details.

Rock cuts were sculptured by blasting techniques, to match existing features. Where possible, water features were accented and designed into the rock cut. Pockets were left for future replanting of shrubs and trees, which help reduce the scale of the rock cuts. Top soil was spread on rock benches to encourage grass growth and minimize the visual scar.

Selective thinning of vegetation left a natural forest edge. Where possible, existing vegetation was cleared to frame scenic overlooks. Vegetation was reestablished on slopes for stabilization, appearance, and as cover and food for wildlife. Plant groupings were located in areas most visible to the motorist, and designed to visually extend to the vegetation above the up-slope.

Selective placement of boulders, stumps and old logs was designed to reflect the existing conditions of the area. Trees were arranged within the groupings, adding to the natural appearance.

A full service rest area is being planned to serve motorists and to serve as a focal point for outdoor enthusiasts. The site is in a sub-alpine meadow which is a favorite area for hikers, cross-country skiers, and snowmobiles, and the origin of a dirt road into the mountains.

Costs

Total cost of building the Interstate over Vail Pass, including 22 separate projects, has been estimated at approximately \$67 million, spread over several years. However, special environmental treatments may have added 20–60% to the cost of the highway. Ninety percent of the funding was provided by the Federal Highway Administration.

Credits

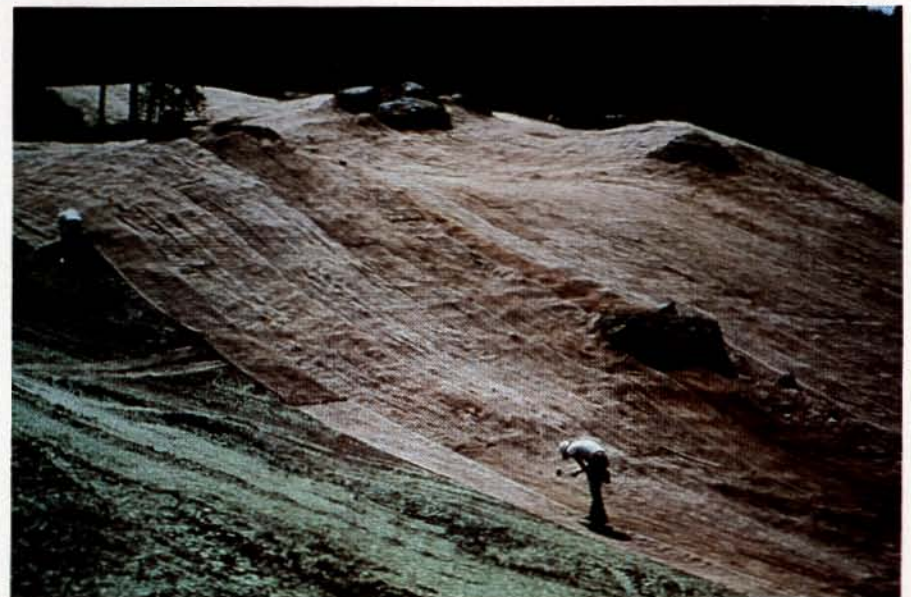
Client: State of Colorado,
Department of Highways.

Land Management Agency: U.S. Department of Agriculture, Forest Service.

Planning & Design: Project team from the agencies involved with many specialized consultants.

Lessons

- Both the expertise and the methods used to integrate the Interstate with the sensitive environment at Vail Pass are transferable to other highway projects. They would be most useful, however, when applied in similar settings.
- Collaborative approaches to identifying the issues and the spirit of cooperation among the various agencies and professionals resulted from the collective awareness of the area's irreplaceable value, and the initiation of the effort during early project development stages.



b. New slopes were landscaped to blend with the setting.

Buses and Streetcars



Painted bus promoted the King Tut exhibit in Los Angeles.

This section addresses the need to increase the attraction of bus systems by increasing their attractiveness. The current problems, opportunities, and some successful examples are discussed. Since there are relatively few successful existing examples responding to the major aesthetic problems of bus systems, some planning and urban design proposals are included to illustrate important concepts. Streetcars and trolleys are discussed briefly as alternatives to buses.

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 - Aesthetic Issues
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- Streetcars and Electric Trolleys**
 - Bustop Shelters, New York, New York: Case Study 2.4a

The Neglected Bus Rider

On a weekday afternoon in the center of almost any city in the United States you will see groups of people from 8 or 10 up to 60 or 70, standing on the sidewalk. The groups tend to consist of the poorer people in town. Many are elderly or high school age. A high proportion are women. They are often mostly black or Spanish speaking.

These groups may occupy a narrow sidewalk in front of a store or bank. Sometimes there is a small shelter with a bench or two that could only hold a fraction of the group only. People lean against the buildings and sometimes sit on the curbstones. The older people generally move away from the teenagers, who sometimes get a little rowdy from boredom. Young children may have to go to the bathroom and at worst have no other choice but to use the nearest doorway (which doesn't please local merchants). Passersby have some difficulty using the sidewalk comfortably. It may become very hot, very cold, windy or rainy, depending on the city. Sometimes there are signs in the adjacent shop window such as, "Please do not ask us for change."

These people on the sidewalk are waiting for the bus.

In 1976, 4.2 of the 5.7 billion transit rides made in the United States were on buses (ref. 87). For the vast majority of American cities, buses are the only form of public transportation, and this is unlikely to change in the near future. But bus service has a generally less than attractive image, and few people who have other transportation options will take the bus. This situation has evolved over a thirty-year period during which dropping ridership led to cuts in service and investment. Major federal subsidies for new equipment and operations have recently begun to reverse these trends in some cities. But much of the image of badly deteriorated systems lingers on and can keep riders away even after costly improvements have been made. This persistent image problem is related, in significant part, to the aesthetic qualities of the rider's experience.

Aesthetic Issues

Observing the experience of typical bus riders will reveal the more specific aspects of the problem:

Waiting for the bus is often mentioned as the worst part of the trip. Travel demand analyses account for it by multiplying the waiting time by two or more. What makes this time so particularly aggravating to people are the uncertainties caused by lack of arrival information and usually poor physical conditions of the waiting area.

Lack of information affects the quality of the passenger's experience because it makes him feel out of control of his time, anxious or angry. If he knew the bus would not arrive for 15 minutes he could choose to walk, go shopping, or have a cup of coffee. Without this information, he must stay at the stop or risk missing the next bus.

Poor physical conditions at the bus stops make waiting unpleasant. Inadequate space, seating and shelter from the



Waiting passengers often block the sidewalk.

elements are basic functional failings that create aesthetic problems as well. Prefabricated, mass-produced shelters are often located at stops without regard to the number of people waiting, the local climate, or the design of the sidewalk and other buildings. Shelters are often exposed to a great deal of vandalism and are inadequately maintained. The result can be more of a new aesthetic problem than an asset to waiting passengers.

Vehicle design and maintenance have contributed to aesthetic problems for both the passengers and people on the street. For the passenger, parts of this problem are crowding while getting on and off, crowding in the aisles, seating configurations, windows cutting off views, overall bleakness of vehicle interiors and the rough rides of aging buses. Many transit authorities are now replacing their fleets with new buses which solve most of these problems. The diesel fumes, noise and bulk of buses that can hurt the street environment have also been somewhat improved with new equipment. However, as long as full-

sized diesel buses are used, they will continue to be somewhat incompatible with pedestrian activity.

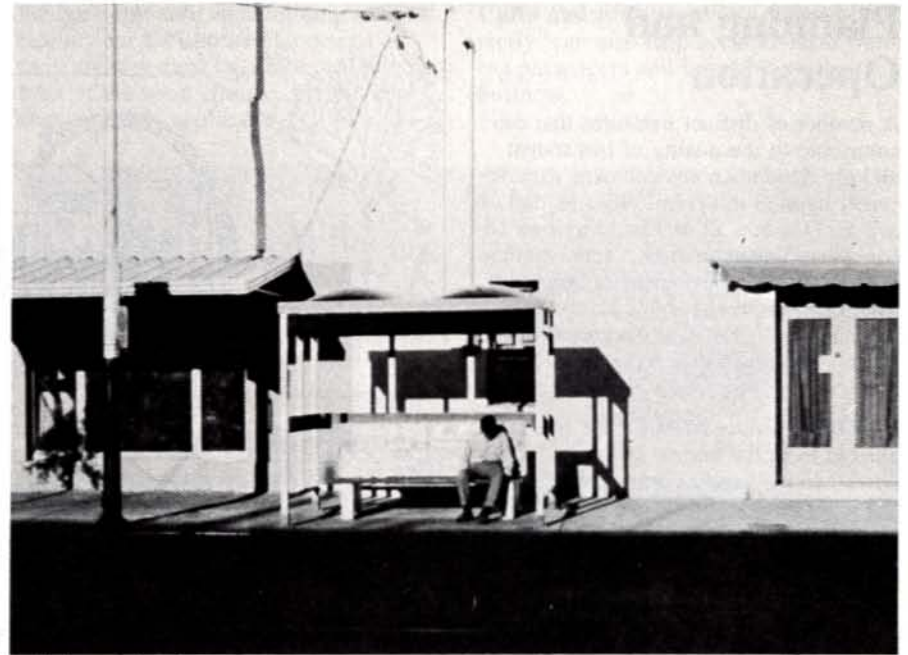
Impacts on Transit

The aesthetic unattractiveness of bus transit translates into lack of attraction for riders. Many bus systems are effectively being relegated to serving only those without access to a car. Yet it is essential, in view of the continuing energy shortage and for other reasons, to attract more people away from their cars and also to generate more off-peak ridership, both of which depend on people *choosing* to take the bus. Obviously, to do this, they generally have to be *attracted*.

Impacts on the City

The environmental effects of conventional buses on the city streets were described above. The consequence is that often those concerned with downtown revitalization, such as merchants and building owners, do not see the bus system as an asset. Walls of buses emitting noise and fumes, and crowds of passengers blocking sidewalks and stores contribute to this feeling. However, bringing increased numbers of cars downtown can create even more serious problems, and since other means of public transportation are too expensive for most cities to build, there is no reasonable alternative to developing more attractive surface transportation, i.e. buses, trolleys, or streetcars.

The opportunities for this exist in the planning and operation of the system, in urban design integration with the city streets and buildings, and in the design of shelters, information systems and vehicles.



a. Shelter unsuited to a hot climate.



b. Waiting for the bus can be aggravating.

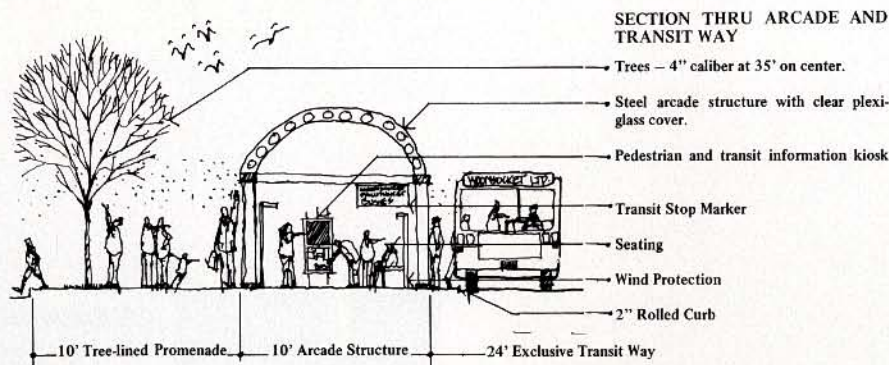
Planning and Operation

A number of distinct measures that can contribute to the quality of bus transit and the downtown environment were recently applied in several cities as part of a U.S. Department of Transportation Urban Mass Transportation Administration demonstration program (refs. 117, 120). The plan now being implemented in Providence is typical of these and can serve as an illustrative example. The plan contains the following elements:

Through routing of bus lines is a major change from the current pattern which has all routes heading into downtown. By linking routes from one side of the city to the other, the need for many transfers is eliminated. This saves the passengers the inconvenience of shuffling from one bus stop to the other (sometimes several blocks away) and waiting an extra time. Additional benefits include providing previously non-existent transit service across the downtown, and reducing the number of buses parked on the downtown streets at any one time. The latter in turn reduces the aesthetic impact of the buses on the downtown streets.

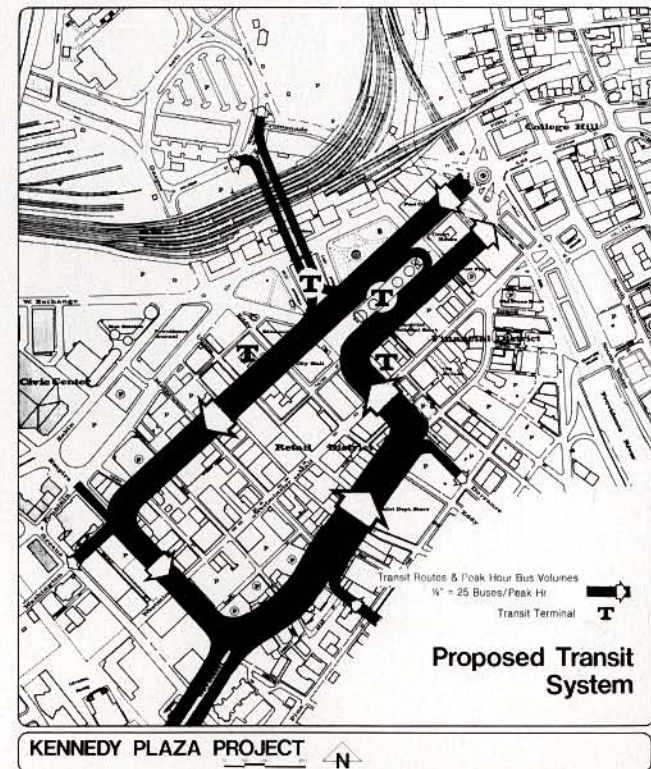
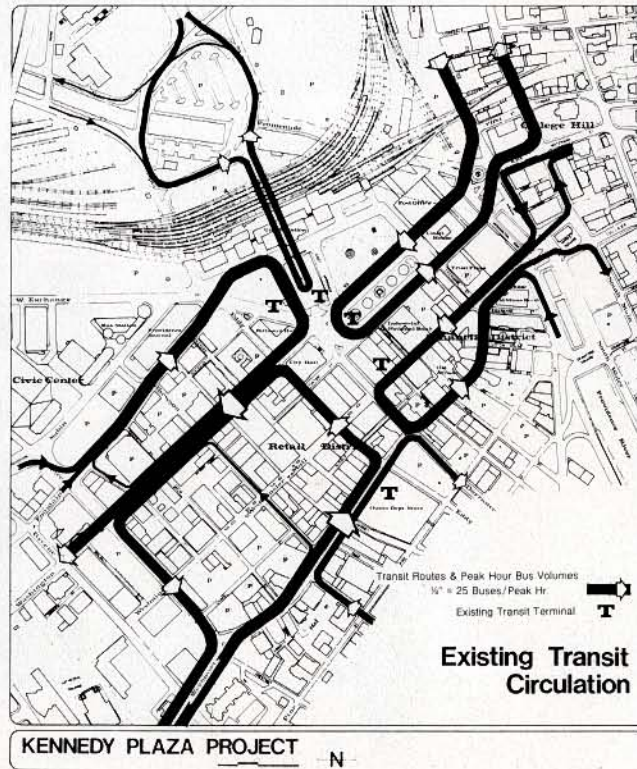
A **mid-day free fare zone** will be established covering the whole downtown and operated from 10 a.m. to 3 p.m. on weekdays. In combination with the through routing this will provide an easy way to get around downtown during the day, encourage an extended range of lunchtime activities, including eating out and shopping, and discourage some auto use. The aesthetic benefit is increased street life, a richer ambience for downtown, and the ability of previously isolated employees to partake in downtown activity.

Transit preference streets or lanes have been designated throughout the downtown area (see plan). These will in-



Proposed arcade and transitway, Providence.

sure that buses are using streets that are appropriate to them and avoid environmental problems such as fumes getting trapped and noise reverberating in streets that are very narrow. They will provide easy flow for the buses and avoid conflict with other traffic. These transit lanes also include sidewalk widening, streetscape improvements and extensive arcades and shelters for the pedestrians and waiting passengers.



Urban Design

The following examples of some proposals for Tucson illustrate the types of opportunities for integrating buses and bus passengers into the downtown street environment through urban design:

Studying the arrival and departure patterns of the buses and passengers can lead to a design concept which solves both aesthetic and functional problems. In the proposed concept, outgoing buses would load along a transit mall on a wide, now declining shopping street. Here sufficient space and amenities could be provided for waiting passengers. They could animate the now inactive streets and bring some business to

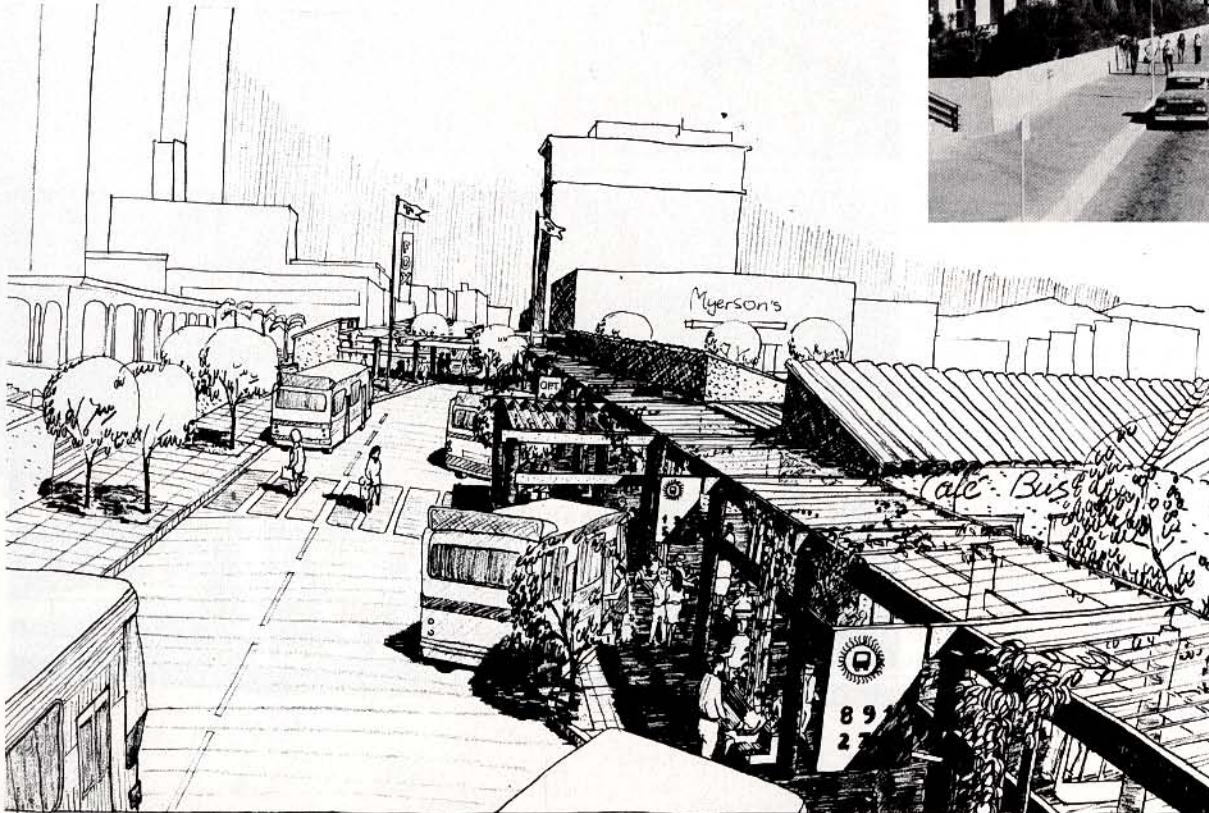
the stores. Incoming buses would unload along the next street which is closer to most work destinations, but would be inappropriate for waiting, and then loop around to the loading street.

Using left-over street space as the major bus terminal could turn this barrier into a connector among three critical components of downtown: the Government Center, the older downtown area and the new Civic Center redevelopment. This link would be particularly important since all three parts now have serious problems caused by the separation.

Bus shelters developed as shopping arcades would insure a pleasant environment for the passengers and could turn

the bus route into an asset rather than a liability for the shops. The design of such arcades must be adapted to the dictates of the local climate, but the concept is widely applicable.

Cafes and restaurants, if planned correctly, can also help accommodate waiting passengers and benefit from their business.



a. Proposed bus terminal, Tucson.



b. Existing Congress Street, Tucson.

Shelter Design

Most of the criteria for designing good bus shelters are ones that should be applied to any architectural problem. But they are so universally neglected that they bear repeating here:

Design capacity should be geared to the number of people who accumulate at a stop. Some downtown stops serve as many as 70 or 80 passengers at peak times and they are best accommodated in arcade type structures that help to integrate them with other pedestrian activities on the street.

Integration with the sidewalk may mean covering the whole sidewalk, as in Chelsea (photo a) or creating special widened areas for shelters.

Appropriate shelter for the climate. In northern climates, roofs should shed rain and snow away from pedestrians. In extremely cold cities (Burlington, Vt., Minneapolis, etc.) wind baffles and radiant heating are necessary. In hot desert climates (such as Tucson) open lattice shading, maximum air movement and evaporative cooling are appropriate.

Seating should be geared to the design capacity of the shelter and the amount of time people spend waiting there. Seating is especially important at stops used by predominantly elderly passengers. Where other seating is provided on the street, passenger seating should be integrated with it to allow waiting passengers to partake in the general social life of the street.

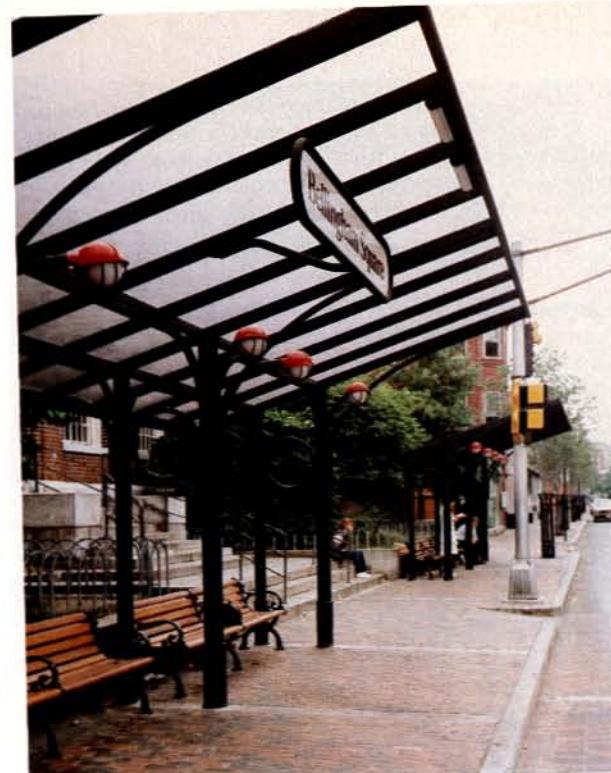
Visibility and security surveillance can be provided by leaving a transparent side of the shelter facing the approaching buses.

Response to vandalism problems must not be made simply by fortifying and stripping down the shelters. Structures can be designed that are relatively vandal-resistant and still look good, such as

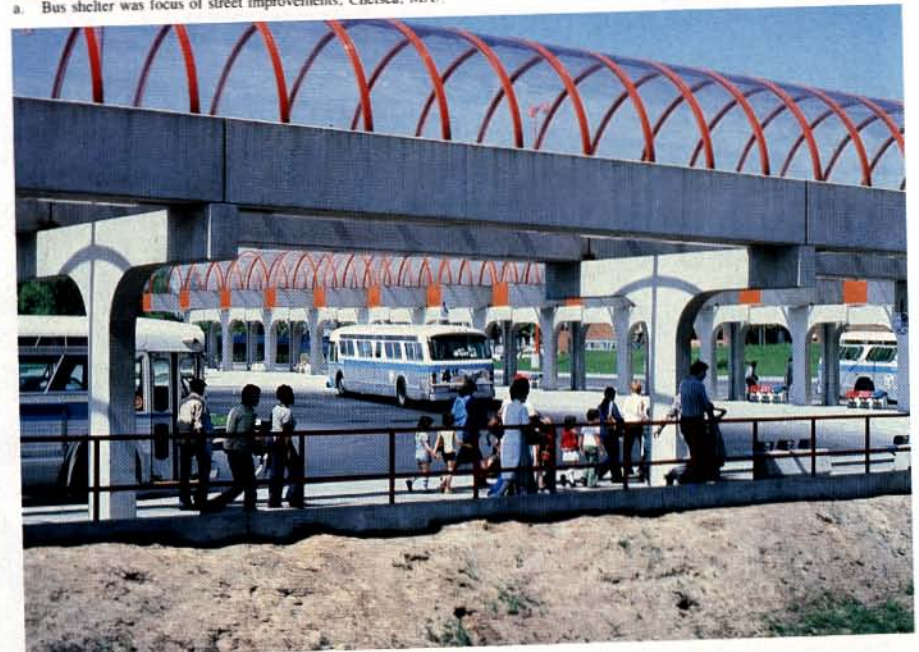
the steel structure in the photo at right. However, only continued surveillance and immediate repair can fully counteract these problems.

Existing buildings can provide shelter opportunities under overhangs or arcades or by the use of vacant storefronts. The availability of these should be used as one of the criteria for determining bus stop locations.

Privately constructed shelters that sell advertising space provide the opportunity to obtain attractive, well maintained shelters at no public cost. For many cities this is the only way to accomplish this. Pioneered in Paris, the concept was adapted for New York City by Bustop Shelters, Inc. (Case Study 2.4a).



a. Bus shelter was focus of street improvements, Chelsea, MA.



b. Arcade structures can serve many buses and passengers.



a. Shelters along transit mall, Portland, OR.

Information Systems

Supplying bus-related information, discussed earlier, does not replace service improvements, but it does provide people with an option to plan their time and avoid the unpleasantness due to uncertainty while waiting. The information system can have aesthetic benefits both by making the overall experience more pleasant and by providing visually attractive elements. Several components make up an effective information system:

System logo and bus stop signing—the former establishes the presence of the bus systems; the latter, by signing the name of the stop on a shelter, can reinforce the sense of place in the city.

Route and district maps are used only in a few systems and then only at major transfer points. These are particularly useful in orienting the occasional rider and make his/her experience less confusing. For example, the downtown stops in Burlington, Vt. (photo b) give very complete information of this type in an attractive format.

Passive schedule information is displayed in many bus systems. The effectiveness is dependent on an ability to meet schedules and update the display cards. These factors vary greatly among systems.

Live information giving predicted time of arrival for the next bus is a major benefit to the passenger especially on systems that have difficulties in running on schedule. An experimental system of this type was installed in downtown Portland, Oregon (see photo, left). Several related ideas are currently in the experimental phase and will probably become feasible with a simpler technology at a lower cost.

Community information boards provided as part of a bus stop are particularly appropriate in neighborhood centers and can turn into a more positive feature of the streetscape.

b. Burlington, VT.





a.-c. Designs for new buses emphasize aesthetics and accessibility.

Bus Design

As was discussed earlier, the noise, fumes and bulk of the conventional transit buses create many aesthetic problems. These are compounded by the history of negative associations that many people have with buses. Thus, attracting new ridership often requires not only solving the problems but creating a fresh image that can be somewhat free of these associations.

Some successful examples demonstrate that new equipment and specialized service can create a new image. Downtown circulator buses have been attracting a great deal of lunch time ridership in Denver, Madison, Los Angeles and Rochester, New York. Suburban express buses have reached the more affluent commuters by offering more attractive vehicles and greater comfort. Providence, Rhode Island, has always used shorter (34 ft.) buses and it recently began operating a new fleet of advanced design buses of this size which are more compatible with the street environment than full-sized (40 ft.) buses. Double-decked London-type buses which give a panoramic view of the street to passengers on the upper level proved to be very popular on New York's Fifth Avenue.

There is some resistance among transit authorities to introducing such specialized buses. Some of the minibuses on the market have had more breakdowns and maintenance problems than standard buses. A smaller bus cannot haul as much of the peak-hour loads and thus more buses are needed, resulting in higher labor costs. Stocking parts and conducting maintenance on a more diverse fleet of buses is administratively somewhat more difficult. Yet the widespread use of a variety of bus types in most other countries, and the successful U.S. examples cited above, suggest that these problems can be solved.

Streetcars and Electric Trolleys

These systems were once widespread throughout U.S. cities but were generally eliminated as ridership dropped and planners concentrated on turning streets over to auto traffic. The major aesthetic advantage of these vehicles is their quiet, non-polluting operation. Their disadvantages are the required overhead wires and traffic conflicts with automobiles.

Streetcars have survived in the Boston area as well as in several of the other older cities. Newly designed, high technology Light Rail Vehicles (LRV) have been put into operation in Boston. These vehicles are attractive both inside and outside, but so far technical difficulties have prevented their full operation as well as their planned introduction in San Francisco.

Once considered unattractive, streetcars are now enjoying a definite revival in many communities for nostalgic reasons and because of their service advantages. In addition, people may be reacting against the ephemeral quality of bus routes that can disappear overnight at the shake of a pen and prefer to see the rails as more solid evidence of a commitment to continued transit service.

Electric trolley buses still operate in Cambridge, Massachusetts and San Francisco and these lines recently received some new equipment. These are much more like buses than streetcars and the aesthetic trade-off with buses is clear cut: overhead wires vs. the noise and fumes of diesel engines. The advantages of this trade vary with the character of the streets and adjacent uses and the amount of other traffic. The Cambridge community likes the trolleys and fought hard to retain them.

d. Trolley in Amsterdam does not disturb the street environment.



CASE STUDY 2.4a

Bustop Shelters, Inc. Private Venture Meets a Public Need New York, New York

In 1970, Bustop Shelters, Inc. imported an idea to New York City: to provide a large number of bus shelters around the city and support them through the sale of advertising. The shelters are built and maintained by the company at no cost to the city or the transit authority. The company, in fact, pays a modest rent to the city for the right to the sidewalk space. The shelters are of a standard design and include a two-sided back-lit advertising panel which is leased out to clients on a monthly basis. A large number of shelters have been erected throughout Manhattan on sites ranging from midtown to Harlem, where no shelters existed before.

Aesthetic impacts include:

- The design of the shelters is light and elegant. They fit well into any environment with a minimum of visual or physical obstruction of the sidewalk, yet provide adequate shelter.
- The shelters are very well maintained. On many of the sidewalks they look like the only spot that is cared for.
- No seats are provided. This makes waiting uncomfortable at off-hours, although in New York, headways, and thus waiting time, are generally short.

The striking feature of this arrangement is that everyone involved reaps major benefits at no public cost, a truly unusual condition in public transportation and urban design. The advertising brings in enough revenue to make the operation highly profitable for Bustop Shelters, Inc. The advertisers receive the captive attention of waiting passengers and the large number of passengers on the sidewalk. The waiting passengers receive an attractive, well lit, well kept shelter, where the colorful advertising adds further color and light to often drab side-

walks. The public agencies receive a small revenue and pay nothing.

Unfortunately, Bustop Shelters is falling victim to its own success. The operation is so profitable that many other entrepreneurs are now scrambling to get into the act and a political controversy developed around the renewal of their franchise.

Design elements are:

- The shelters are about 5 by 16 feet.
- The roof is a prefabricated, lightweight, sandwich panel, supported on four columns.
- Tempered glass panels at the back of the shelter serve as wind screens.
- Lighting is provided by a fluorescent fixture in the roof panel and by the lit advertising sign.
- The advertising panel is two-sided with internal lighting, about 4 by 6 feet, and uses bold, strikingly designed posters.

The structure is painted dark brown. The underside of the roof is white fiberglass.

Costs

The manufacturing and erection of a shelter was priced at just under \$5,000 in 1978. The gross revenue from the advertising was reported to exceed this at each shelter in one year in most New York locations.

Credits

The original concept in Paris was developed by the DeCaux Company. Bustop Shelters, Inc. adapted, built, and managed the New York shelters.



Lessons

- The combination of a clear and unmet public need and a profitable private venture provide a very promising prototype. Besides a wider application to bus shelters, it is easy to envision pedestrian arcades, benches and other amenities provided the same way.
- The planning and design of advertising on public facilities must keep this element in careful balance with the rest of the environment. The shelters look appropriate on a Manhattan sidewalk, but the large, bold graphics may be offensive on a suburban residential street.
- The regular maintenance of the shelters is probably the most critical aspect of their aesthetic success.
- The lack of seats and local place signs is a disadvantage in some locations. These could be easily added if the city required them as part of the contract.
- Unfortunately, this successful program became bogged down in a political controversy. Many other cities have

been considering similar programs but have spent several years trying to resolve political concerns and/or administrative procedures. It is essential for both cities and transportation agencies to develop the managerial flexibility to easily take advantage of such opportunities for joint public/private action.

Rapid Transit



BART train.

This section considers rapid transit and commuter rail systems from the rider's perspective. Commuter rail and subway stations serve symbolic and functional roles in the life of the city. Good design, as this section will show, can accentuate both roles. The process of changing from suburban to urban environments, from above to below ground or from walking to rapid mechanized travel can be stimulating or taxing. This section examines ways in which aesthetics can be used to make these transitions stimulating ones. To the extent that commuter rail is integrated with other railroad operations, its aesthetic design will also be addressed in Section 2.6.

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Unified Design

Circulation and Orientation

Entries

Vertical Circulation

Formal Elements

Signage

Waiting Areas

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MBTA Modernization,

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A Slighted Priority

As the subway from Cambridge emerges from the tunnel and rises up onto the Longfellow Bridge, the beauty of the Charles River and the Boston skyline unfold to the rider. Morning commuters are treated to a panoramic view of sky, water, boats, and a long line of frustrated drivers stuck in the daily traffic bottleneck on the bridge into the city.

Rapid transit is an efficient way of moving people into and around a large city, with a minimum disruption of street life. Without vertical separation of traffic, cities would eventually be choked with surface vehicles competing for limited street space. However, emphasis on the functional role of rapid transit systems, neglecting aesthetic considerations, has led to a deterioration of the quality of their environments. Ridership is discouraged also by a general lack of maintenance and security.

A series of aesthetic problems are common to the older rapid transit systems in the U.S. Entrances often are inconspicuous, lack identity, and are crowded into narrow slots in the sidewalk. The underground subway is sealed off visually and physically from street life, natural light and fresh air. Confusing, underlit pas-

sages impede movement and orientation. Crime is more likely in some of these mazelike places when underpopulated, particularly in the off-peak hours. Riders are often deprived of waiting amenities, including pleasant sensory stimulation, telephones or toilets. Dirt, noise and stale air will often be characteristic of the environment. Aerial stations have often been built as platforms exposed to the weather. Disassociated from other activities, they can be lonely and unsafe places during off-peak hours.

By contrast, turn of the century French and German architects designed subway stations in the grand, symbolic manner of traditional train stations. The buildings were carefully styled and detailed, and conceived of coherently as architecture. These facilities celebrated their role as gateways to the city while enabling efficient movement.

Today, architects face more complex challenges, yet subways fulfill essentially the same purpose as their predecessors. Reliance on efficiency alone as the main design criterion produces barren places. Simply constructing stations, and keeping them clean, is not a solution to the aesthetic problems. Decision makers must take advantage of the fact that, rapid transit stations, as gateways and points of transition, offer many opportunities to create aesthetic experiences which may add meaning to, and enrich, otherwise routine trips. The following discussion of aesthetic design opportunities includes commuter rail stations as well as rapid transit facilities, since both modes share many formal and functional characteristics. For simplicity, the term "transit" will be used for all types of stations.

Aesthetic opportunities in general include:

- Embodying the expressive function of a symbolic gateway, where the transition from "solid earth" to an aerial or subterranean condition occurs.

- Sensory stimulation during waits.
- Celebration of daily activities.
- Heightened awareness of movement.

Station entrance, New York ca. 1910.





a. b. Typical train and sidewalk entrance, New York.



c. Rush hour, Tokyo.

Overall System Design

The overall design concept used in a transit system should reflect the physical, cultural and political environment of the city it serves. This expression of civic aims through system design may take a variety of forms with correspondingly different aesthetic impacts on system users. These impacts are the effect of design decisions, and should be deliberate, not unplanned.

Two major choices are available to designers in their overall approach to system design. Each station may have a unique architectural treatment, within functional constraints, or every station may be designed as part of a unified whole. Montreal's METRO illustrates the former, and Washington D.C.'s Metro the latter. The two approaches have been applied to varying degrees in most other systems, such as in San Francisco's or Boston's transit systems.

Individualized Stations

With this approach, after the establishment of systemwide operational criteria and functional standards, each station receives its own architectural treatment.

Typically, platform area plans and sections remain constant, while spatial concepts, circulation above ground, structure, and finish materials are designed individually for each station.

Aesthetic Impacts

- Visual identity of stations enables orientation without signs and provides system landmarks.
- Systemwide variety enhances public awareness of architectural diversity and style.
- Trips are highlighted by series of discoveries, not routine impressions. Underground travelers often crave such visual stimulation.
- Designs are responsive to changing conditions, sites, designer's philosophies and cumulative experience in construction.
- Architects' creative freedom can produce exceptionally beautiful and innovative results.

There are certain drawbacks associated with this approach. A considerable administrative and creative role must be played by the transit authority in the selection, administration and supervision of multiple design teams. This requires the identification of system goals and objectives for design, and clear-cut design review procedures. Guidelines for community input must be defined as well. Authority for deciding what is acceptable should be established and asserted in a manner which does not diminish the creative contribution and expertise of the design professionals involved. To some extent an uneven level of quality must be expected, from station to station, as every team cannot be equally talented. Performance criteria for materials and detailing can insure basic standards for design.



a. Design of BAKI Glen Park Station employs standard system elements in a distinctive way.



b. Moscow's Kosomolskaya Station is artistic as well as functional.



a. Typical station. Washington METRO.



b. Typical station. Vienna U-Bahn.

Unified Design

With this choice, all stations are designed to have a uniform appearance by means of shape, use of materials, and color. Basic configurations and a standardized architectural vocabulary are established for the entire system.

Variations are only to meet specific local conditions, i.e. side or central platforms, route crossings, site geology. One design team is responsible for working out the essential features of the system, and for overseeing the production of specific construction documents by other subsidiary firms. This greatly simplifies planning procedures and may reduce administrative costs.

Aesthetic Impacts

- The system is perceived as a comprehensive architectural unity, leaving riders with a dramatic overall impression.
- Continuity of design elements clarifies how to use the facility even in unfamiliar settings.
- Consistent and predictable environments can be psychologically reassuring.
- People provide the "color"; the architecture is merely background.

An architecturally consistent environment is unsatisfactory to some users, who may find it to be impersonal; and to designers, who may feel constrained by the uniform standard required. Orientation within the system and to nearby locations depends on reading signs, since stations lack other distinguishing features. Additional visual diversity may be needed to provide landmarks. Above ground structures may be difficult to reconcile with particular neighborhood settings, and a mass-produced or bland appearance should be avoided. These "costs" might not justify the advantage of simplified planning procedures and quality control.

Circulation and Orientation

Aesthetic concerns in the design of circulation sequences include whether entering or leaving is exciting or threatening; and whether the sequences are easy to move through or are crowded and confusing. It is also important that these patterns are integrated with the streetscape, reinforcing neighborhood focal points and patterns of activity.

Entries

Locating entries in the open, sheltering them with covers, or placing them in buildings are design choices with significant aesthetic impacts. People's images of the system are partially associated with their impression of the entry—often the actual interface between the “normal” world and the underground or aerial world.

Open air entries may express direct public accessibility, unimpeded by physical or visual barriers, in the form of doors, walls, or gates. (However, they are inconvenient to passengers in climates with frequent rain or snow.) When sufficiently wide, these openings can allow fresh air and natural light into underground and street level stations. Orientation and security are enhanced through the visual connections provided with streetlife and other activities. Often such entries can easily blend with the existing character of the site, needing minimal articulation. When incorporated into already developed open spaces, the entry itself can become a focus for activity.

Covers and enclosures protect users against extreme weather, and in some climates are essential features. Beyond being simply functional items, these structures can enhance the visibility of the entry (and the system) by signalling its presence in a substantial, concrete way. When well designed, kiosks and shelters make a significant contribution to the architectural character of the community, as in Montreal (Case Study 2.5a). An entry zone may be defined which is not just a doorway, but a place where a range of social interactions may take place. Opportunities include rendezvous, performances and commercial activities.

The design of subway entrances raises the following additional issues:

- Unobtrusive sidewalk entrances may be too inconspicuous. Adequate dimensions and signage can resolve this problem and also help to avoid congestion and conflicts among pedestrians.
- Entrance structures must fit into the architecture of existing neighborhoods.
- Accessibility for the handicapped must be considered in any design scheme.
- Particular issues of access to mixed use subway developments are discussed in Section 3.4.



a. Flea market converges around open air entrance, New York.



b. Entrance to Paris Metro by Hector Guimard is outstanding public sculpture.



a. Small artworks on the wall along escalators in Piccadilly Station, London.



b. Landscaping along escalator, Du Pont Station, Washington.

Vertical Circulation

The experience of changing levels can be controlled by the design of the volume and levels through which stairs or escalators pass.

Multi-level Public Plazas—Widened vertical circulation spaces, such as sunken plazas and open-air concourses, can act as connecting and integrative elements when shallow stations are involved. Levels change gradually and are meshed with the surrounding outdoor activities. Examples of this approach are the entry plaza at New York City's Citicorp Center, which uses private property, and San Francisco's Hallidie Plaza (Case Study 2.5b).

This idea could be applied to aerial systems as well, especially in densely developed downtown areas. Plazas could step up, bringing people and public activity to both the transit station and upper floors of office buildings, which might then be tied into an elevated pedestrian network, linking other buildings, (and safe from vehicular traffic). This type of integration has been considered as part of several "Downtown People Mover" plans.

Dramatic Spatial Experiences—When stations are deep, access through steep escalators can be designed to be especially dramatic. Whether the escalator sits within a larger excavated portion, or is enclosed in a narrow tube, obviously has different effects on riders.

BART's Glen Park Station escalator supplies a means of revealing monumental aspects of the design. From the open well in which it sits, the full height (60 feet) of the structure is visible. Daylight comes streaming in over both the escalator and platform, and through a skylight, making the steep ride memorable and breathtaking.

In Washington D.C., the escalators are housed in relatively narrow concrete shafts with tight spatial qualities. Open

to the outdoors at the top, the contrast between bright daylight and the station's dark, vaulted interior is heightened by the long steep passage in between these worlds. Views are aimed forward, and emphasized by the rising motion (Case Study 2.5c).

Subduing the qualities of long escalator rides may be preferred to dramatizing them. A series of smaller scale elements may serve this purpose.

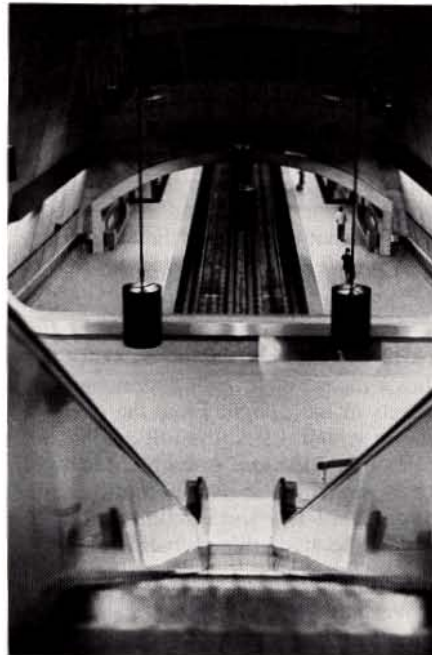
Decorative treatments or artworks can provide visual interest along the way and help relieve the boredom or apprehension associated with long, inclined trips. An example is the display of advertising and small artworks on the wall along escalators in Piccadilly Station, London Underground. Landscaping along escalators is another innovative technique, used in Washington D.C.'s Metro.

Formal Elements

Well designed stations for any transport mode can provide implicit directional information which can be "read" by users. Special opportunities in rapid transit stations arise as a result of their usually compact size. Aesthetic and functional meanings can be easily perceived as integrated in the overall form. Design elements may identify pedestrian flow while serving their own purposes (i.e. seating, planters) and adding to the users' aesthetic experience.

The exposed concrete structure in Montreal's Raddisson Station is a good example of a sculptural form with an intuitive directional quality. A dramatic escalator core commands the control position in the 50-foot high, vaulted space. While descending, the view is impressive. One feels a sense of grandeur, as both a viewer and a participant.

A bridge over the tracks at the foot of the escalator provides a pause in the sweeping movement and allows riders to choose their direction while viewing the platform level as a whole. Smooth and shiny stainless handrails guide movement tactilely and visually. Suspended overhead lighting and indirect lighting in coves along the walls are used to identify pedestrian movement, highlight the form, and provide illumination. The ceramic tile floor finish defines the station platform area, and delineates direction to the platforms.

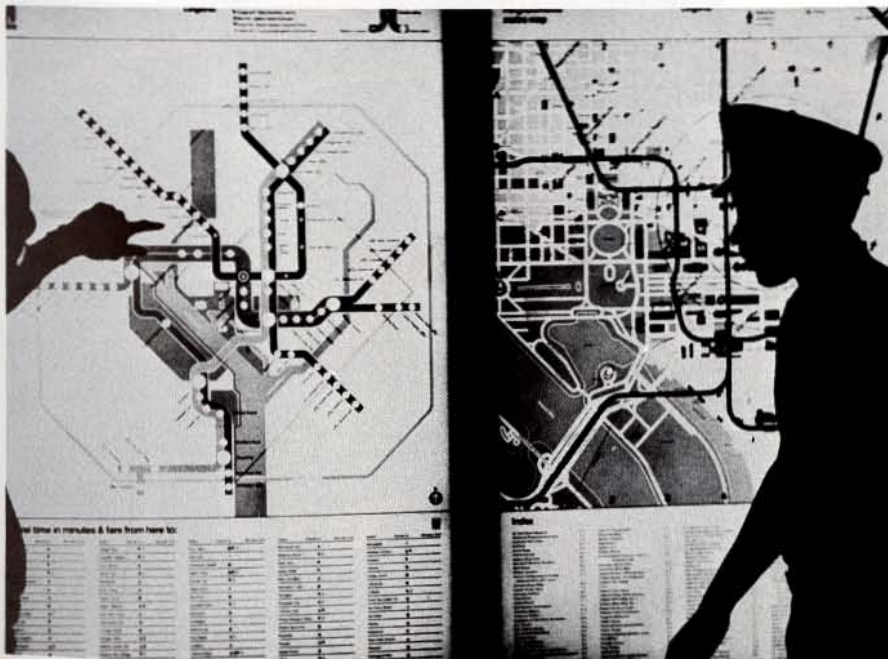


a, b, c. Sculptural form of Raddisson Station, Montreal, has an intuitive directional quality.





a. Signage can have its own aesthetic appeal, as in Stockholm.



b. Washington Metro graphics provide light as well as information.

Signage

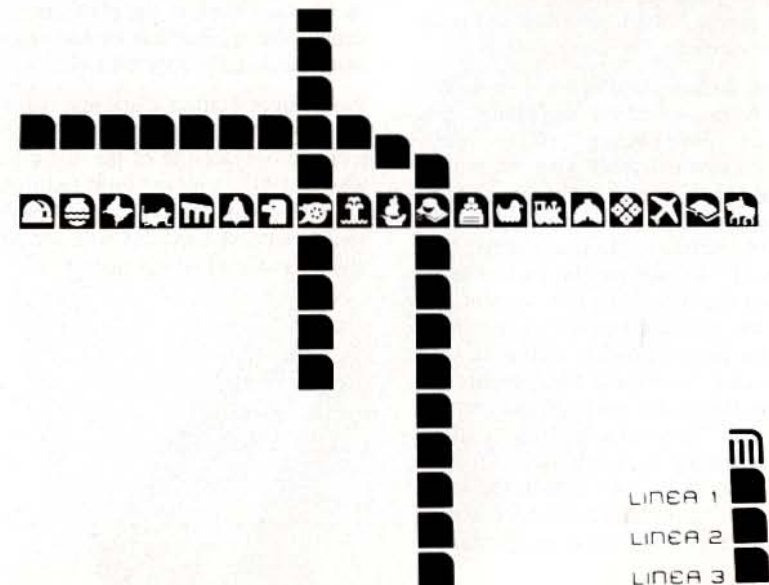
The aesthetics of subway signs can create a distinctive visual appearance and bestow order on the system for the riders. Entrance signs can act as neighborhood markers and decorative elements. Visibility and clarity of the image are the important criteria, and are a function of size, color and illumination.

Pictorial symbols add a strong visual presence, connoting direction or associations with station names of the neighborhood. Station names in Mexico City, for example, are reinforced with symbols and used on signs and route maps (photos c, d). They show the meaning of the station's name or refer to a significant neighborhood item. Personalized versions of these symbols have even been observed on the signs of nearby shops.

Color coding is a proven method of clarifying route maps, and identifying the corresponding stations and paths to reach them. This has been especially well done in London and Boston (Case Study 2.5a). Striking graphic designs, the maps

have become strong visual components of the system's identity in Boston.

Where and how advertising is located must be controlled as well. Competition from commercial graphics, especially when lit, can detract from the effectiveness of system signage. When well done, commercial artwork can add to the overall visual interest.



c, d. Symbols are effective on signs and route maps.

LINEA 1
LINEA 2
LINEA 3

Waiting Areas

Waiting for the train is often boring and uncomfortable. Many American rapid transit and commuter rail stations are stark places without adequate seating.

Design can enhance what people do while waiting and how they feel about it. Visual interest, the social environment and seating play a part.

Travelers underground may feel deprived of stimulation, and unsettled by rapid changes of environment and the mechanization of movement. Designs sensitive to these stresses will provide a welcome pause from the disturbing aspects of travelling underground.

Visual interest may be provided by designs which use variety, texture, and patterns. People become more lively when they are comfortable in their surroundings. Featureless settings cause us to withdraw. Bright, warm colors, adequate light and seating, and attention to detail make people feel good. The following examples illustrate how these elements have been used to create fine public places, which are often the pride of their cities.

Striking underground waiting environments were created for Stockholm, Sweden's 11 "cave stations" (Case Study 1.2b). Teams of artists were invited to decorate each station, to compensate to some extent for the loss of direct contact with the landscape. In one station, light was used "to enhance the feeling of space in the rock," and to introduce dramatic and poetic elements. At another, the artist inserted rocks, picture boxes, poems and "splinters of human life" into the floors and walls of the grotto. These are "fairy tales from daily life . . . something to stop beside. To make association with." At a third, the artist organized the architecture of the station to evoke a memory of an imagined, an-

cient forest, "something for everybody's fantasy to develop further" (ref. 29).

Toronto's Spadina Line uses lighting design to enliven station interiors. At Yorkdale, the platform is covered with a 700-foot long skylight. Within the skylight is an electronic neon sculpture, "Arc en Ciel," by Michael Hayden. Colored lights pulsate when a train is in the station. This one splash of magic transforms an otherwise ordinary place.

New York's stations are rich in historic details, now being preserved as part of station modernization through the Adopt-a-Station Program. Decorative tiles and mosaics dating from 1900 provide a tie to the past and small-scale delights for pedestrians. Pictures often characterize the neighborhood or relate in some way to how the station was named. At Fulton Street there is a steamship, for instance, and at Astor Place a beaver, representing John Astor's furrier business.

Rehabilitation of Brooklyn's once glamorous St. George Hotel includes the revitalization of the Clark St. subway station located within it. A unique element is the mosaic work at the platform which depicts the spectacular harbor view seen from the hotel's upper floors.

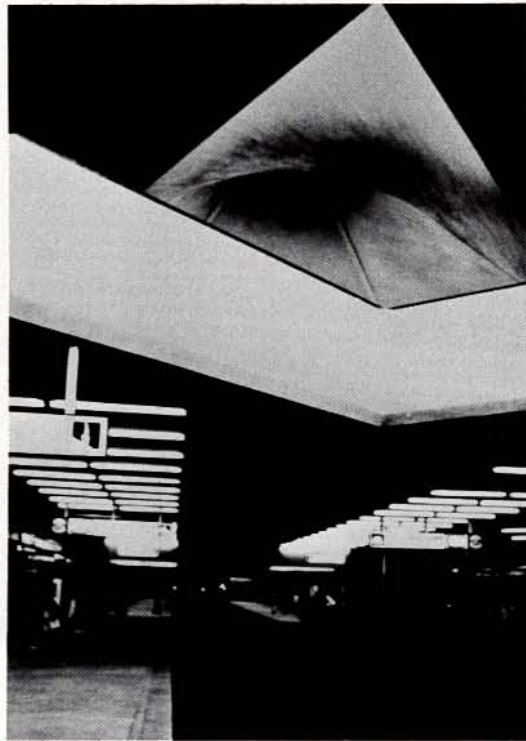
Wall Street Station's original token booth and mosaics are being restored to recreate one section of the station as it was in 1907. Vintage light fixtures and turnstiles will also be restored in the preserved area. An exhibit will add to this unique piece of living history.



a. Kungsträdgården Station, Stockholm.



b. Yorkdale Station, Toronto.



a. Mexico City.

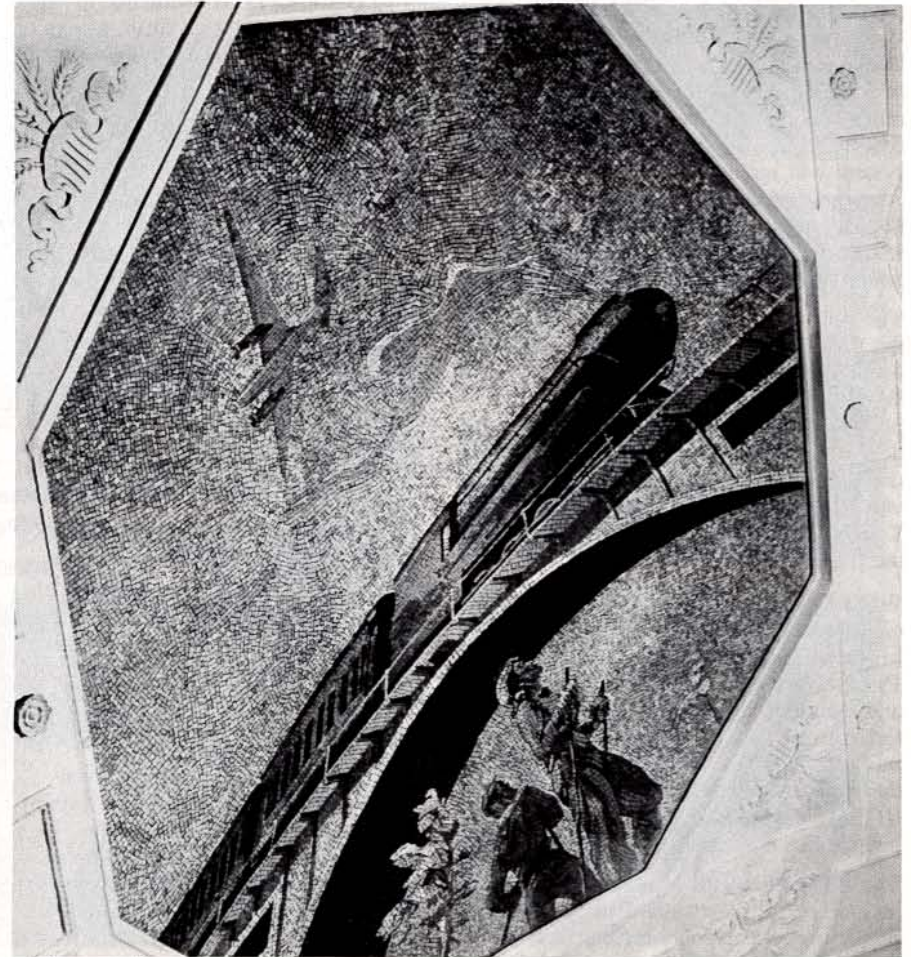


b. Display of art objects, Louvre Station, Paris.

Mexico City's stations have been compared to Aztec temples, with their carvings, fine finishes, and traditionally styled architecture. Artistic treatments did not add significantly to the cost, according to the builders, Ingenieros Civiles Asociados. Historic and symbolic motifs are the primary decorative sources, along with archeological treasures unearthed during tunnel excavation. Such designs celebrate the aesthetic values of Mexico's living past, while filling a critical need in this city choked with vehicles and smog. Making them beauti-

ful was not an afterthought, but an intentional gift to the public, providing endless opportunities for viewing.

Qualities of the social environment are implied through the comfort and beauty of stations as well as through the availability of activities in which to participate, i.e. shopping, eating, watching performances, even watching people. How station design qualities have converged to create relaxed and pleasant social situations is discussed in greater detail in the following case studies.



c. Ceiling mosaic, Moscow.

CASE STUDY 2.5a

Montreal's Metro Innovative Subway Design Montreal, Canada

Montreal's Metro stations have been described by planner Vincent Ponti as "some of the city's most stunning interior spaces." They reflect their significance as parts of an overall circulation and communication system, enabling the integration of a variety of urban activities. As with many successful projects, the Metro can be credited to the long-standing commitment of one powerful public figure—Mayor Jean Drapeau. Work was begun on the first 10 miles of the system in 1962, at an estimated cost of \$132 million. An extension to 15.5 miles was planned in 1963, bringing the cost up to \$213.7 million. Eventually the system will include 44 miles of track, contain 82 stations, and cost \$1.6 billion. Currently 19 miles are completed and 15 miles are under construction. Final completion is set for the 1980's.

The subway was originally a project of the City of Montreal, managed by the Metro Bureau, Department of Public Works. In-house architects developed plans for 11 stations and private firms designed 15 others. The Metro was coordinated with the bus system from the very start. La Regie Autonome des Transports Parisiens was a consultant at the request of the Mayor.

When the 29 municipalities of the Island of Montreal were incorporated as the Montreal Urban Community (MUC) in 1970, responsibility for administration and maintenance of the Metro was transferred to the MUC Transportation Commission (MUCTC). A new department, the Bureau de Transport Metropolitain (BTM), was created to oversee designs and studies concerning the Metro.

The BTM established guidelines which include performance standards and the basic structural layouts for the three

types of stations used in the system. Special equipment and some fixtures were also specified. Each station architect develops his own design philosophy and spatial concept, but uses these standard guidelines.

Part of Mayor Drapeau's vision for the Metro was that it should contribute aesthetically to the urban environment. Stations were conceived of as important public places, graced with artworks, and contributing to the rejuvenation of the city. Each station has a unique identity, and can be easily recognized from the train. For travelers' convenience in this harsh climate, all entries are in kiosks or adjacent buildings. These entries often are prominent pieces of architecture and design in their own right. The Metro stimulated the development of Montreal's "underground city". This aspect of the system is discussed in Case Study 3.4a.

The traveler experiences this totally underground system as a series of discoveries, a visual potpourri. The ride is swift, smooth and quiet. Trains are comfortable and uncrowded. Not all stations are equally beautiful, but most express a warm cheerfulness and sensitivity to human scale. Some stand out as masterful creations, dignifying function with an elegant simplicity.

The rubber tired Metro rolling stock and its concrete tracks are key elements in the success of the system, providing one of the most comfortable rides anywhere. The trains were designed to be simple and lasting, in both functional and aesthetic terms. The only stylistic decoration is a horizontal white stripe, part of the system identification. The ride is smoother and quieter than on conventional steel wheels and rails, and trains are able to negotiate steeper grades. As a result, a humped line profile has been adopted, putting stations closer to the surface and saving energy by naturally regulating speeds.



Warm colors, spaciousness and natural light are key design elements.

Large windows in the cars relieve a sense of claustrophobia and open the rich views of the station to the riders. For many, the front view of the car with its extra wide window has become the symbol of the Metro. Interiors were designed with warm, bright colors and cushioned fiberglass seats.

All stations are standardized into three types. They may be built in open cuts, in large constructed interior volumes, or in tunnels using concrete vaults. Mezzanine entries are standard and provide travelers with an initial sense of the whole station. Station gear, lighting fixtures, exterior decors, graphics and advertising are part of the standards imposed by the BTM.

One outstanding characteristic of the system is the apparent evolution of stages of aesthetic feeling and philosophy. Station designs now reflect several distinct

approaches. The first stations were generally designed around a large open space with a mezzanine on each side overlooking the track. The surfaces are ceramic tiles and glazed brick.

The next phase produced strong sculptural forms. Concrete, granite, stone, brick and steel were used to create tactile effects.

These stations proved to be visually too cold. Recent designs have returned to the use of warm colors and emphasize spaciousness and natural light. Concrete and other durable materials are still used, but in a softer manner, set against colorful industrial forms.

Completed stations become the property of the MUCTC. The BTM continues to participate in certain decisions, in order to prevent maintenance services from damaging the original architectural ideas.



a-h. The system provides travellers with a potpourri of colors, textures and sights.



Angrignon

Angrignon is the terminal of the recently completed western extension. Located on the edge of beautiful Parc Angrignon, it serves both a residential and an industrial area. The complex is an intermodal center serving buses, taxis, automobiles, pedestrians and bicycles. A large (342 meters long) service garage for Metro rolling stock is also included. The cost of the entire development in 1976 was \$21 million.

The design takes full advantage of the park location by providing views of the landscape from all parts of the building. The building's skin is mostly glass, making the place seem transparent. Ground on either side of the station has been excavated and regraded to reveal the platform level which is lined with nearly floor to ceiling windows. Large fishbowl windows are used at the platform level as well, bringing refreshing views of earth and sky to the otherwise underground Metro system.

Daylight floods the platform level from above. The roof of the entire complex consists of a series of long, plexiglass arches which form a transparent indoor/outdoor canopy.

The structure is elegantly simple and straightforward, uses prefabricated parts, and is designed to be an aesthetic element. T-shaped concrete columns support concrete channels which act as beams and conduits. The plexiglass arches are attached to these channels, creating a strong linearity suggestive of the movement of people and trains.

The frames for the plexiglass, the ends of the channels, rails, and the poured concrete service rooms are all painted bright orange. Ventilation stacks are integrated with the design as sculptural elements and painted bold red and orange. Bright colored, formed fiberglass seats add to the visual gaiety. Platform-level vents are also transformed into design elements through color.

The strength and clarity of the physical forms, a visual closeness to nature, and the play of light and shadows make this station an exhilarating environment to move through. Arrival by train is almost startling—like coming outdoors from a dark interior. The sky-filled view from the platform inspires a mood of anticipation and excitement. Bright colors, natural materials and views of nature make this a place for people as well as machines.

The most striking effects are the patterns produced by the structure and canopy. Sunlight shining through the ribbed arches casts delicate scalloped patterns across the ground. At times these resemble the shadows made by waves on the sand in shallow water. New imagery is continually revealed as shadows shift or the viewer proceeds through the space. Standing among the branching columns and web of shadows is almost like being under the trees of Parc Angrignon.

The station's self-identifying image is a distinctive element in the landscape, yet not a dominating one. The transparency and lightness of the structure minimize the impact of the overall volume and mass. The additive nature of this large form always refers the user back to the smaller dimensions of the structural bay. The irony of this design is that the station's presence is appreciated through openness and light.

The surrounding community is linked to the station by provisions for vehicular and pedestrian access. The terminal itself has become a sort of gateway to Parc Angrignon.

Buffer elements were designed to mitigate the impact of the service garage on the park. A corrugated metal fence was painted in bright yellows and oranges in a pattern designed to suggest movement. The garage is further screened from sight by a naturally landscaped earth berm. Excavation of the tunnel from the terminal to the garage produced the necessary

earth material. The tunnel cut was only partially restored, and a small pond was created in the parkland between the terminal and the garage.

Credits for Angrignon Station

Station Design: Staff Architects from BTM

Lessons from Montreal Metro

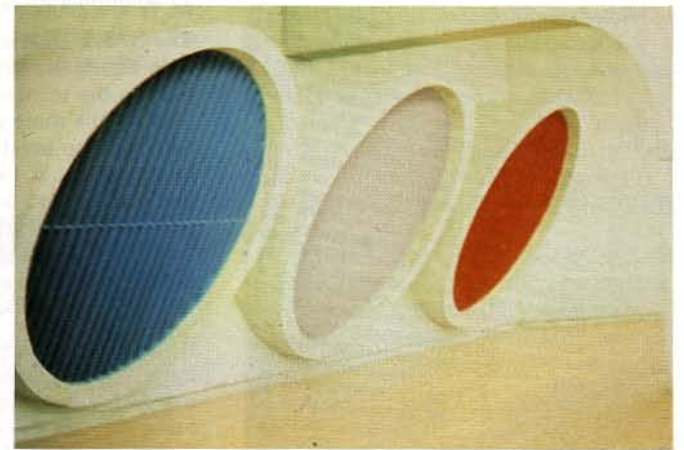
Although the culture and government of Montreal are unlike that of United States cities, there are some lessons which apply to our systems:

- Continuity over a long period of time of the personnel responsible for the design of the Metro, from the Mayor (in office since 1954), to the architectural staff of the BTM, has helped ensure the preservation of the original goals and directives for quality. Under these circumstances, the staff has had the luxury of being able to learn from experience.
- Guidelines can be developed which specify basic functional requirements, standard equipment, and minimum standards, while still leaving the architect with significant creative freedom. The success of the system lay in the ability of the BTM architectural staff to coordinate and monitor the efforts of many individuals and firms.
- An effective commitment to design quality and maintenance are the most important factors. This commitment is continually being renewed by the client. The results lead to frequent and respectful use of the facilities and political support of the system.





a. Low profile design minimizes the impact of the station complex on its park setting.



b. Daylight is a key element.



c. Excavation allows for windows at the platform level.

CASE STUDY 2.5b

BART
A High Technology System
San Francisco Bay Area, California

a. San Francisco above ground.



b. Riding on BART has almost a dreamlike quality.



The Bay Area Rapid Transit (BART) System serves three counties in the San Francisco area. Its primary function is to bring commuters to downtown San Francisco and Oakland. The 75 mile system has 37 stations. Seventeen of these are below grade, 20 are at grade or aerial. The concept of BART is closer to a commuter railroad than of a traditional urban subway. Most of the distribution within San Francisco is handled by the city's own transit system that operates a streetcar and bus network. The four main downtown BART stations include an additional level for streetcars.

The BART District was formed by the state legislature in 1957 to create alternatives to the increasing auto traffic. The plan for the three-county system and the \$792 million bond issue was approved by the voters in 1962. Construction began in 1964 and was completed in phases. Most construction was complete by 1974. The opening of Embarcadero Station and the addition of evening service occurred in 1976.

BART was the first new U.S. rapid transit system in many decades, and many of its elements were prototypes. Some of the more elaborate innovations such as the central train control and the automated ticketing system have led to persistent operating difficulties. The lack of previous experience, coupled with inflation, also caused many budget overruns which necessitated the reduction of some amenities such as landscaping in the later phases.

BART stated its goals in the early 1960's: "... to provide a means of transporting people more swiftly, more conveniently, and more economically than any other existing means of short-haul transportation." Faith was placed in technology to perform this feat. The history of BART spans the crucial era, from the early '60's to the mid-'70's which led many Americans to recognize that technological progress had its limits.

BART has been remarkably successful in meeting its objectives and has, to some extent, also been a victim of the changed attitudes.

Despite this, riding on BART has almost a dreamlike quality. There are smooth, soundless trains and stations with clean, polished surfaces. You feel as if you have just walked into an architectural rendering for the city of the future. Images of automated technology dominate.

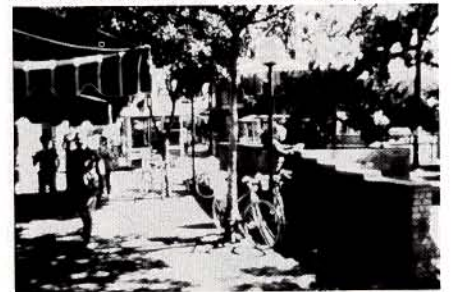
Besides the pervasive images of high technology, there are individual architectural design styles, made possible by the freedom given to the 15 station architects. There are also some ambitious improvements at the entrances, such as plazas and the whole surface treatment of Market Street, but these affect the subway environment only at a few places, such as at Berkeley (photos c, d).

There is no significant integration with commercial activity in the stations as there is in Montreal and Tokyo. Such integration was considered in the design of the extensive concourse areas under Market Street for the four downtown stations, but has not occurred. The opening of the streetcar line, delayed by equipment trouble, will more than double passenger volumes through those concourses, and may encourage some new activity. The rather sterile design of these spaces would not serve to encourage ad-hoc, expanded use.

Generally, the BART stations are aesthetically most comfortable in the suburban landscape where the simple, open designs are complemented by the views, the light, and the pleasant California climate. The underground stations produced mixed results: successful architectural drama with open wells and skylights in Berkeley, Glen Park and Balboa Park, weak attempts at color and decorative treatment at the Mission stations, simple but striking color at two

Oakland stations, and impersonal abstract environments at the four stations downtown. These latter conform to the rather bland office building developments which have proliferated around Embarcadero and Montgomery stations, but bear little relationship to the rich complexity of the older parts of downtown San Francisco (photo a).

c, d. Berkeley's dramatic skylight wells and entry plaza.



Design elements include:

- The trains are memorable for their quiet and smooth ride, spacious interiors with large windows for viewing the countryside, carpeting, and comfortable seats.
- The handling of natural light stands out in the dramatic skylight-wells of Glen Park and Berkeley and in the subtle dappled effect of screens at Walnut Creek, Daly City and many other suburban stations.
- Sunken plazas providing an on-grade exit from the mezzanine are delightfully surprising at Powell Street and Oakland City Center (Case Study 1.2a) and less successful at Lake Merritt.
- The standard station elements consist of industrialized-looking glass and/or stainless steel and include ticket machines, turnstiles, attendant's booths, phones, trash receptacles and toilets.

- Lighting is generally high-intensity fluorescent (35 footcandles) which eliminates the subterranean feeling but also lacks variety.
- The platforms have insufficient seating and do not provide enough visual interest for waiting patrons, who now may wait 15 or 20 minutes at off-peak hours instead of the originally projected five-minute maximum.
- System information graphics are simple but attractive, clear and efficient. Station plans are generally simple and clear enough to require only the minimum of directional graphics. The electronic train destination signs on the platform are particularly successful. They can provide static displays of train destination and arrival time as well as moving light-bulb-type public service announcements and advertising. Commercial advertising is allowed

in a standard format on the train wall of subway stations and on screens between the tracks at aerial stations. Oversized backlit displays are placed at Powell and Montgomery stations. The overall effect of the graphics is restrained and subordinate to the aesthetics of the stations.

Credits

Engineering and Design Coordination: Parsons-Brinckerhoff-Tudor-Bechtel, who retained a coordinating architect and landscape architect on their staff.

Station Design: Fifteen architectural and 8 landscape architectural firms from the Bay Area with a variety of specialized consultants.

Costs

Total cost through 1976: \$1.6 billion
Federal share: \$315 million

Lessons of the BART System

- The reliance on high technology and the earnest devotion to it in much of the design aesthetics produced an overall smooth and comfortable system. But it also created both functional problems (such as a lack of seating) for the station environment and an overall level of humorless expectation of efficiency. This has caused patrons to respond with extraordinary intolerance to any even small technical failures. This is in striking contrast to the affection lavished on the slow but charming cable car. The issue of public response to inevitable technical failures is much better handled by the Golden Gate Ferry System (Case Study 2.8a).
- Specialists represented all aesthetic and design issues but their inputs were not coordinated sufficiently and translated into practical trade-offs. This may explain why, when the budget crunch occurred, these elements were often cut in a seemingly arbitrary way.
- These problems must be seen against the extraordinary achievement of constructing such a system with 80% local resources during a relatively turbulent 12 years.



a. Dappled effect of screens, Walnut Creek.



b. Stations require a minimum of directional graphics.

Powell Street Station/Hallidie Plaza

Leaving the train at this stop, you find yourself in a rectilinear box of a space. The only way it differs from the previous stop at Montgomery is that the stripe on the wall is red instead of blue. The escalator ride is long—it takes you through the still unoccupied streetcar level to the large, mostly empty concourse. There is a great deal of stainless steel and glass, and a white, eggshell-textured tile everywhere that is glossy and smooth to the touch. After passing through the turnstiles and past a vacant vendor's booth, you can see large lit-up panels of advertising, and beyond them a wide opening to daylight.

Attracted to the light, you emerge at Hallidie Plaza, a sunken courtyard filled with trees and surrounded by hanging gardens of vines. The courtyard is an irregularly shaped space served by two sets of escalators and stairs. It is bordered by terraced planting and sitting

areas on one side, with Market Street above, and by the subway entrance below on the other. As you leave the courtyard and ride up the escalator to Powell and Market Streets, the whole wonderfully jumbled panorama of San Francisco street life unfolds: tourists and street vendors, cable cars and office buildings, hippies, winos and business men. It is messy but exciting.

The Powell Street Station is located along Market Street. The station consists of three levels: BART platforms at the bottom, streetcar platforms at the middle and the concourse on top, some three feet below the adjoining sunken plaza. The concourse is a vast horizontal space—approximately 800 feet long by 65 to 100 feet wide. It has slick surfaces and very little activity. The large advertising panels provide the main visual embellishments. Two department stores, Woolworth's and the Emporium, open directly onto the concourse with entry doors but no display windows or cases. Hallidie Plaza adjoins the main down-

town terminus of the cable car lines, a very popular tourist attraction. There is a major visitor's information office within the plaza. All of the city's largest department stores are within two blocks. On the other side of Market Street is an area of fringe commercial uses and low-rent residential hotels.

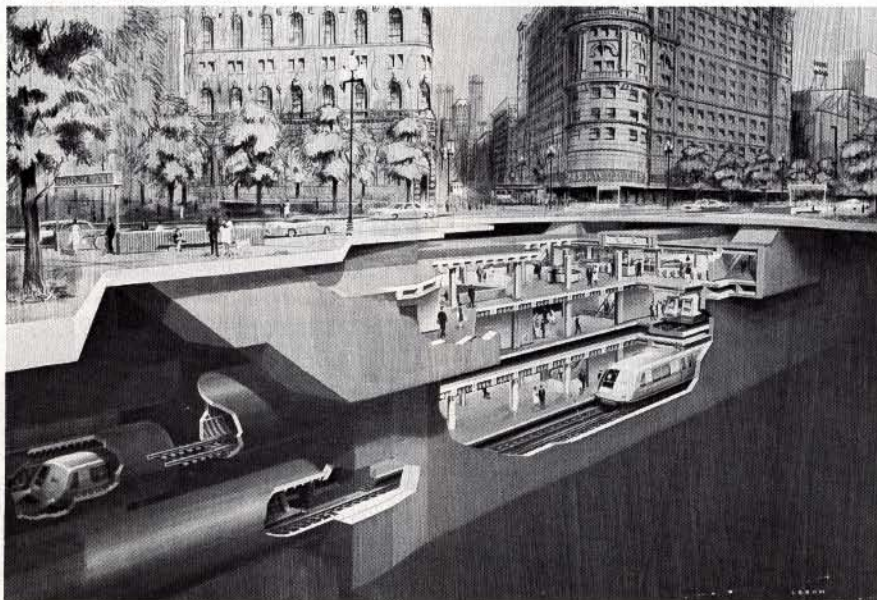
This area is very active. Older locals sit and watch the plaza from the lower terrace area, along with an army of pigeons. A younger, more active crowd of regulars gathers around the rails on the street level. The tourists line up for the cable car at the Powell Street turntable, which is on a short pedestrian mall. There are programmed concerts and informal performances as well as vendors everywhere. There is still sufficient space for the passage of busy subway riders.

This station and plaza complex creates a very strong aesthetic impact by its contrasts. The technologically oriented BART environment opens directly onto

the visual and social complexity of the San Francisco street scene. This was not necessarily an intended effect and is perceived by some as a serious problem. Yet it has a genuine aesthetic value that transcends that of many more harmoniously integrated situations. It is a piece of powerful urban theater, by virtue of the impressions and lessons imparted by its contrasts.

Most of the elements that create the effect are the standard parts of BART stations and the particulars of the Powell Street location. But the design of the interface between the courtyard and the BART concourse contributes to the dramatic contrasts. The wall at the boundary of these two worlds is wide open, marked only by a slight level change. Looking from the concourse, one can see a part of the rough granite terrace walls and hanging vines in bright sunlight. From the courtyard side, the giant eight foot square back-lit map panels of the system attract the subway patron.

a. The station consists of three levels



b. Standard BART elements prevail underground.





Hallidie Plaza's visual and social complexity contrasts with BART's businesslike aesthetic.



Credits

Client: BART was client for the stations and administered the federal grant that financed the plaza. The city's Market Street Task Force administered the plaza contract, along with the rest of the surface improvements on Market Street.

Architects for Powell Street BART Station: Skidmore, Owings and Merrill

Design Team for the Plaza: The Market Street Joint Venture consisting of Lawrence Halprin and Associates, Mario Ciampi and John Carl Warnecke and Associates.

Lessons of Hallidie Plaza

- The types of contrasts and conflicts between street life and transportation facilities that occur at this station are common conditions of urban life in the U.S. They can be considered as opportunities for aesthetic expression and experience, and can be incorporated into the design, rather than avoided.
- When situations of such complexity exist, designs must anticipate potential difficulties, and management plans may have to provide extra resources for maintenance and security.

CASE STUDY 2.5c

Washington D.C. Metro Unified System Design

From the street, Metro station entries are discrete and inconspicuous. A simple bronze pylon, emblazoned with a straightforward M, marks the escalator which carries you underground. The descent is a long one. At the beginning there is no cover overhead. By the time you enter the tube which encloses the lower portion, you have already reached the depth at which many other subway systems run. Still you descend. Anticipation builds as the brown-colored tile first appears at the tube's end, and expands into a landing and the mezzanine of an immense and elegant coffer-vaulted station.

Fifty-three such underground stations, all within the denser portions of the city, are planned for the Washington Metro. As the system's six lines radiate into outlying residential areas, the guideways and stations emerge above grade, their

platforms covered by large concrete roofs with the shape of a gull's wings in flight.

The system is designed as a comprehensive architectural entity—a "system-system". Those underground stations look more or less similar. The above ground look alike as well. A consistent system of signs and graphics is used throughout.

The design of the Metro was strongly influenced by the Commission on Fine Arts and its then Chairman, Gordon Bunshaft. Harry Weese and Associates, the architects for the whole system, originally intended to vary stations in response to the location but the Commission's preference for a strongly unified vocabulary prevailed.

The general aesthetic intent of Metro is very clear and consistently executed: to create a unified, monumental complement underground to Washington's architecture above. The following are particulars of the aesthetic effect:

- The spaces are successful in establishing simple grandeur.
- The floating platforms and indirect lighting focus on the grand vault and away from the people. This makes the environments very dramatic, but somewhat impersonal.
- The mezzanine entrances enhance the spatial drama by providing an uninterrupted view of the whole station and making orientation easy.
- The colors are very subdued, and signs and advertising are not permitted a major visual role.

Since standard elements were used throughout, each component plays a particularly important part.

Coffered concrete vaults are the unifying elements of the Metro. They go through subtle variations. They also contain acoustically absorbent panels. **Floating platforms** and mezzanines are designed in such a way that they never visually connect to the vault. This also discourages graffiti which is virtually non-existent.

Lighting is indirect, reflected onto the vault both at the edges from behind platform rails and from the sign pylons. The fixtures are difficult to keep clean and this has caused considerable (and unfortunate) dimming of lighting levels. Lights set in the pavement along the platform's edge flash to signal the arrival of a train.

Signing is provided by wall-mounted signs and free standing pylons and has generally proved inadequate. Wall signs are hard to see from the train and the pylons may seem to give ambiguous direction.

Floors are of a dark brown tile, increasing the feeling of being underground. **Benches** are too few and not comfortable. **Color** is provided only by a few backlit advertising signs. The dominant effect is monochrome.

Entrances make a minimal presence above ground. They can be fitted into any surface situation using standard elements, but are hard to find and add little to the streetscape.

Costs

Through 1978, construction costs have totalled just over \$3 billion. Funding has been a combination of federal-aid interstate highway transfer funds, other direct congressional appropriations, and contributions from the regions served.

Credits

Client: Washington Metropolitan Area Transit Authority (WMATA)
Architects: Harry Weese and Associates
Engineers: DeLeuw, Cather and Associates. The two firms were retained directly by the client and given equal status on the design team.

Lessons

- The client and the powerful Commission on Fine Arts specifically wanted the monumental, unified image and successfully directed the designers to obtain it. The overall effect is well matched to the environment of monumental Washington, although it might be inappropriate elsewhere.
- Some opportunities are lost by this type of approach: the type of colorful activity that animates the stations in Montreal and the type of streetscape improvements and integration of entrances that has occurred in BART.
- Giving the architects a status equivalent to the engineering team was critical to attaining the high degree of aesthetic design control.

Open air exits can have strong visual ties to the site.





Architectural drama is heightened where lines cross.

CASE STUDY 2.5D

**MBTA Modernization
Design for Efficiency and Aesthetics
Boston, Massachusetts**

Boston's subway system is one of the nation's oldest. It began operations in 1897 as a subterranean trolley line. Today, the combined subway and streetcar system is 73 miles long, has 44 stations, and carries 146 million passengers annually.

The Massachusetts Bay Transportation Agency's multi-million dollar Program for Mass Transportation, begun in 1964, includes the construction of new stations and modernization of the existing system. The purpose of the modernization project was to improve the functional efficiency and visual impact of the stations through good design. Facilities were to reflect the rising standard of urban living, make transit riding more convenient and comfortable, and be comparable to the new suburban stations. A description of the Program says:

"Dismal depressing austerity that drives prospective customers—and revenues—away will be avoided. Lavish ornateness which serves no basic purpose, but wastes funds as well as confuses the rider, and adds to maintenance, will be avoided, on the other hand." (ref. 95)

The architectural firm, Cambridge Seven Associates, was hired to redesign the system. They approached the problem from the standpoint of urban design—how to help make downtown Boston function better. Their work, as described by Peter Blake in *Subways* (ref. 88) is summarized here.

Four techniques were used: identifying the four lines with color, standardized typography for essential information, pictorial images to relate subway platforms to above-ground scenes or landmarks, and improved vehicle design.

Lines are known as the Red, Blue, Green and Orange. Station color schemes often reflect this identity as well. A color-keyed horizontal band with the station name facilitates recognition from the train. End walls are often keyed to the color of the line.

Helvetica medium is the type face used throughout the system. A logo was developed (a T in the circle), and used to signify the location of a station. An arrow in the circle points to station entries. Easily legible diagrammatic subway maps were designed, and coded by color and typography.

Photographic or painted wall images portray above ground scenes or representative themes. At the Aquarium stop, for instance, the graphic has a fish theme, while at the Airport stop there are birds in flight. These images are the only "posters" seen from the train. All other advertising is restricted to the wall behind the tracks, and cannot be readily seen from inside the train.

Typically, stations modernized during the first phase of work share an understated aesthetic. Brick floors and walls, wooden benches, fluorescent lighting, and clear signage create an uncluttered and efficient, yet warm appearance. These stations provide underground travelers with a relaxed reassuringly "normal" setting. Recent renovations introduced new design elements.



a. Typical modernized Green Line Station.



b.-d. Exposed trusses and graphics are decorative elements at State Street.



a, b. Park Street's design emphasizes color and detail.



State Street, Orange and Blue Lines

An all-white color scheme and straightforward detailing give this station an austere, direct aesthetic. The only decoration is a striking supergraphic star, in the system colors, in a two story chamber leading to the platform. The design also serves to direct passengers to either the Orange or Blue Line.

The interior volume has been opened up to its two-story height in the platform room, too. In the renovation process, two old trusses were revealed and painted white, heightening a sense of the volume (photo b, to left). Above the tracks and visible from the platform, a window opens onto an upper level corridor. This unusual feature adds to the station's spatial complexity, and gives pedestrians a sense of their destination, the platform below.

Architects for the station were Wallace, Floyd, Ellenzweig and Moore.

Park Street Station, Green and Red Lines

Park Street Station is the centerpiece of the system, the intersection of the Green and Red Lines. It is the busiest and largest station and the most complex in terms of function. It is also the oldest subway station in the country. The fairly controversial renovation was the subject of an extensive user involvement process, funded by the Urban Mass Transportation Administration.

Colored ceramic tiles are used in a lavish way, creating a gaudy yet whimsical environment. Patterns, colors and forms add up to a richness which imbues otherwise ordinary spaces with visual and tactile interest. A non-conventional color scheme of reds, greens, yellows and blue is vivid, although not pleasing to everyone.

Closely spaced suspended lighting fixtures form a composite overhead fabric,

reinforcing a distinct interior quality. Shades glow and sparkle, adding to the dramatic quality of the setting. Green and red lamps reinforce the system's color identification and provide orientation. The lights dominate the station's image and are its most controversial design element.

Kiosks which incorporate benches are permanent furniture, designed to house flower and fruit stands. Carving sheltered spaces out of the path of circulation, the kiosks provide a natural focus for activity. Although these spaces are not yet used for concessions, Park Street's famous "underground" musicians find them to be excellent sites for performing.

Many small events attract the eye—lights, colors, textures, forms—and this can be beguiling or confusing. The effect is festive, but may cause a tension if there is too much going on. A warm sense of humor has enchanted a previously drab place. But so many different

design elements seem to compound the existing visual clutter.

The architect was Arrowstreet, Inc.

System Costs and Credits

The Massachusetts Bay Transportation Authority (MBTA) owns the system, and is responsible for its coordination, expansion, improvement and operation (including funding). Over \$15 million will be spent on major work on 18 stations and minor work on 22 others. The design department, under the direction of John Williams, coordinates the work of consultant architects, which is subject to rigorous community reviews.

Lessons

- Graphics, colors and materials supply an underlying visual uniformity which enables station design to vary. Riders receive an overall impression that the MBTA is willing to explore new design ideas and encourage diversity, as well as provide a consistent, easy to use service.
- Upgrading the stations of an old system can be an effective means of improving the public's image of rapid transit. There is no substitute for service, however, which remains the primary factor in consumers' choices. Modernization will be perceived as a mere face lift, and even resented by some, if service improvements do not follow.

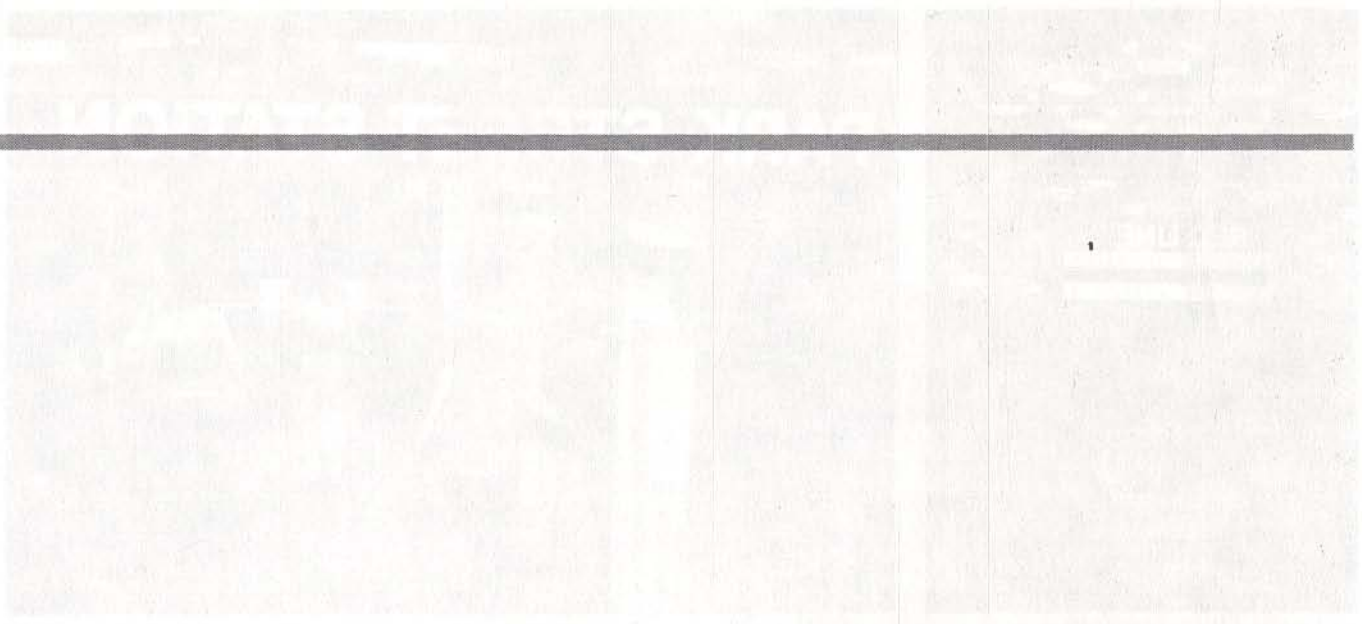
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Grand Central Station, New York.

Section 2.6

Railroads

This section discusses the use of aesthetic design to further a railroad revitalization. Aesthetic design opportunities include enhancing the travelling environment (the interior of the train), and developing the aesthetic potential of stations as public buildings with significant impacts on the traveler and on the surrounding community. Railroad freight service will not be considered here.

Portions of this section were taken from research reports on this subject, in particular *Recycling Historic Railroad Stations* (ref. 100); and *Reusing Railroad Stations* (ref. 104).

Contents

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- Decline of Rail Passenger Service
- Potentials for Revival
- Obstacles to Revival

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- New Stations with Mixed Uses

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Vehicle Design

Recycling Stations for New Uses

Development Procedures

Aesthetics and Railroad Revival

"The railroad station is the gateway of the town, but a gateway through which people are brought from the uttermost parts or through which they set out on unlimitable journeys. What structure in the whole of our civilization should make a finer appeal to the imagination?"

Toronto World, Nov. 4, 1919

Union Station, Washington D.C.



The history of the railroad in America is the story of much of this country's economic, social and technological heritage. The railroads helped to transform the United States from an agricultural nation to an industrial one. The mobility, comfort, and relative economy of the railroad made this land accessible to industrialization and stimulated its urbanization. Cities were built and enriched by the economic power of the railroad. Innovative urban forms—tall buildings, vertical transport, and multi-layered activities, were all dependent on the population densities made possible by the railroad. Railroad-sponsored industrialization also made dreary factory towns, and encouraged the idea of separating work places from living places. Rail transport made commuting from suburbia possible.

During the Victorian era, traveling by rail reached unparalleled heights of luxury and style. The railroad catered to public taste, providing parlors, dining cars, day coaches and sleeping cars. Railroad structures were designed in a mood of self-confidence. Many were technological triumphs, expressing the spirit of innovation which was so strong in the middle of the nineteenth century. New techniques for construction, engineering and manufacturing enabled the spanning of the rivers, the climbing of high mountains, and the building of stations which enclosed huge open spaces.

In fact, stations were the culmination of this mood, symbols of the railroad's role in history and in the life of the community. Many are among our finest examples of 19th and early 20th century architecture and are handsome civic monuments. An estimated 20,000 passenger stations remain out of the 40,000 which were probably built. About 500 continue to be used by intercity rail transportation, although an additional number are in use for commuter service.

Decline of Rail Passenger Service

Passenger service has declined rapidly over the past 50 years due to many factors. Railroads could not compete with airplanes and cars in providing Americans with the speed and convenience they were taught to value by the railroads themselves.

Rail passenger service is still strong in major corridors such as the Northeast corridor from Boston to Washington, D.C. and the Los Angeles-San Diego corridor; there is potential for increased strength in other corridors. Rail passenger service has declined substantially or disappeared completely, however, in many parts of the country, e.g., the states of Maine, New Hampshire, Oklahoma and South Dakota. Columbus and Dayton, Ohio; Louisville, Kentucky; and Nashville, Tennessee are among those that have lost their long distance passenger service.

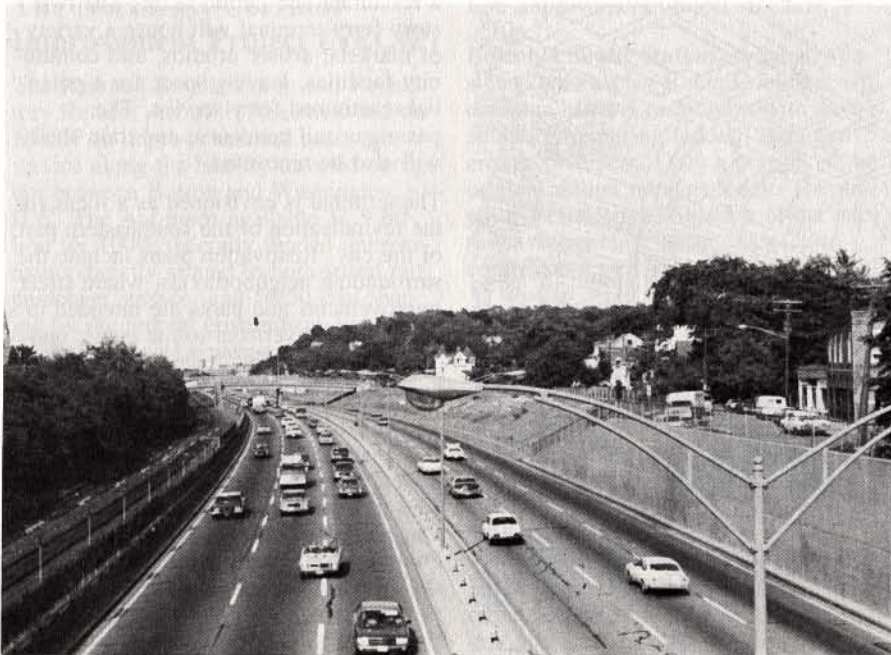
During the decline of intercity passenger service in the 1950's and 1960's, railroads lost money on passenger service and, accordingly, did not invest in stations or rolling stock. As a result, these facilities and equipment were deteriorating when Amtrak, a federally subsidized corporation, was created in 1971 to assume responsibility for passenger service. Except in the Northeast Corridor, Amtrak contracts with private railroad companies to use stations and tracks. In many cases these companies have deferred track maintenance, with adverse effects on the speed and on-time performance of passenger trains.

Although Amtrak has made substantial improvements to railroad passenger equipment and has improved ridership, further improvements in present conditions are needed to encourage increased use. Although a number of old stations

are still in use, many of these see only a few trains a day, and their once grand interiors are vacant and uninviting. The neighborhoods surrounding these stations have often declined, although some are part of current downtown revitalization efforts. In other places replacement stations have been built, but these tend to be unimaginative, lacking in aesthetic amenities, and not centrally located.



a. Newtonville, MA before.



b. Newtonville, MA after.

Potentials for Revival

Service improvements may lead to important increases in rail passenger traffic, with sufficient activity in station areas to make their redevelopment feasible and attractive. If energy shortages persist, the railroad could become important again as a vital force in the life of large cities.

- Railroad created city centers, and can participate in their revitalization. Commuter and long distance passenger railroad service can affect the aesthetic environment of the city by reducing traffic congestion, encouraging the layering of multiple activities at stations, and serving as a catalyst for new downtown developments. This has occurred at the Place Bonaventure, in Montreal, and is being planned for Boston's South Station. (Joint use developments and air rights techniques are discussed in Section 3.4.)
- Historic stations are frequently significant architectural and cultural resources, adding character to their settings and providing interior spaces which could not be duplicated today. These buildings are "national resources" and can be preserved by rehabilitation for the old use or adaption for a new one (which could involve a different transportation mode).

Obstacles to Revival

Until very recently, federal support for the passenger railroads has been limited, compared with steadily increasing support given to highway and aviation systems.

At present, improvement in passenger service is inhibited by legal obstacles to public investment in private facilities (i.e. privately owned railroads) and by conflicts between publicly funded passenger trains and privately operated freight trains that share the track.

Large old stations are costly to maintain, and the rehabilitation process can be complex and difficult to finance, whether the stations are to remain as part of the rail system or not. Obstacles to station rehabilitation include:

- Legal problems of multiple ownership of stations.
- The difficulty of finding appropriate tenants for the grand historic spaces, which may no longer be able to support a reduced rail function.
- A banking community which may be reluctant to finance "high risk" reuse projects, or to reduce high interest rates on available funds.
- Legal and financial complications when stations are the assets of bankrupt companies.
- Real estate market forces encouraging speculation in urban land. Railroad companies find it more profitable to demolish old stations on prime land, in order to replace them with higher density developments, thus increasing the land value.
- An absence of community or local government support or recognition.

Station Design Concepts

Two approaches to station design are considered here:

- Renovating existing historic stations to enhance current, or serve proposed, transportation needs by combining them with compatible new uses, if necessary.
- Design of new facilities which combine transportation and other functions, or which are integrated with adjacent activities.

Small commuter rail stations would be similar in form and function to rapid transit stations (see Section 2.5), and are not discussed here separately.

Renovation of Stations

Historic stations in cities where passenger rail service is in operation should be considered for adaptation to current and proposed transportation needs. Space that is no longer needed for passenger service may be shared with a variety of compatible commercial, cultural or educational uses. The resulting mix enhances and enlivens the passenger's experience, while supporting the new activities.

Having been commercial ventures, the larger stations were designed to attract customers beyond those who used the trains, and so can potentially be revived for that purpose. The design approach may be strictly preservationist or it may involve remodelling with contemporary elements.

Despite changes in the physical fabric of the city, these stations continue to affect

their surroundings with their commanding presence. Among the most prominent and handsome buildings in a community, railroad stations came to be regarded as gateways to the city. Often centrally located and perceived as civic monuments, they provided a focal point in the growing, changing metropolis. Railroad stations are also distinguished by the diversity and vitality of their architectural styles. Some were masterpieces by well-known architects. Others were standard designs adapted to local conditions by skilled craftsmen, using a rich architectural vocabulary. As a result, each station has a unique community identity.

In addition to the general problems of renovation, the success of a rehabilitated station may depend, in part, on efforts to revitalize the surrounding community, and should take place in the context of broad revitalization plans, wherever pos-

sible. In this way, stations have a greater potential for recapturing their former role as a focus for civic pride. Ideally, some form of community ownership of the building would be part of the reuse scheme.

Hoboken-Erie Lackawanna Terminal

Renovation of the historic Hoboken-Erie Lackawanna Terminal will be the centerpiece of this city's waterfront revitalization plan. This rail-ferry terminal, designed in 1907 by Kenneth Murchison, is one of the few of its kind still having limited operations, and is listed in the National Register of Historic Places. The Hoboken Community Development Agency is the project sponsor.

In addition to preserving the building, rehabilitation is aimed at creating a lively, intensely-used urban center. The exterior will be restored, and the ornate main waiting room will be converted to a restaurant and public space. The two story ferry terminal will house a variety of markets, artists' studios, and community facilities, leaving space for a potential reactivated ferry service. The passenger rail concourse and train sheds will also be renovated.

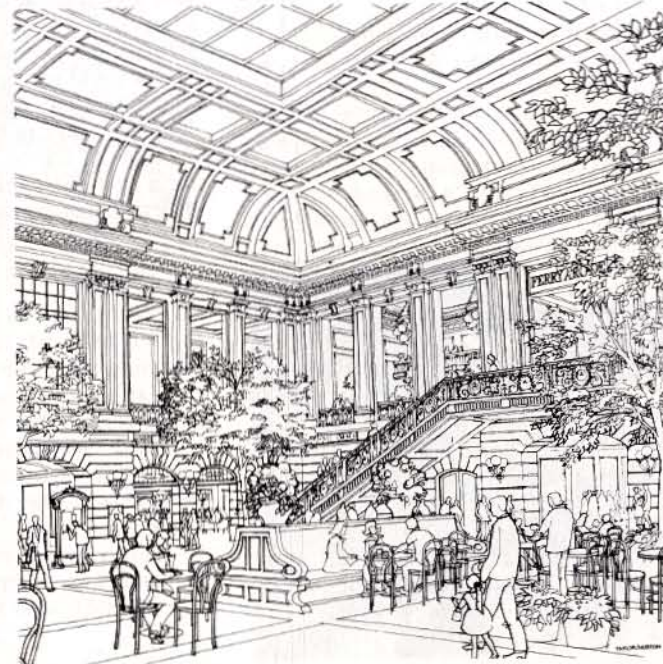
The terminal is envisioned as a focus for the revitalization of the southeastern part of the city. Renovation plans include the surrounding neighborhoods, where street improvements and parks are intended to open up the riverfront to the public and provide open space. Access to the terminal and the area will also be improved.

The cost of the total project is estimated at \$9 to \$10 million. Both public and private funds will be used, including \$3.8 million from the Economic Development Administration's Public Works Program, for rehabilitating the roof and skylights of the waiting room.

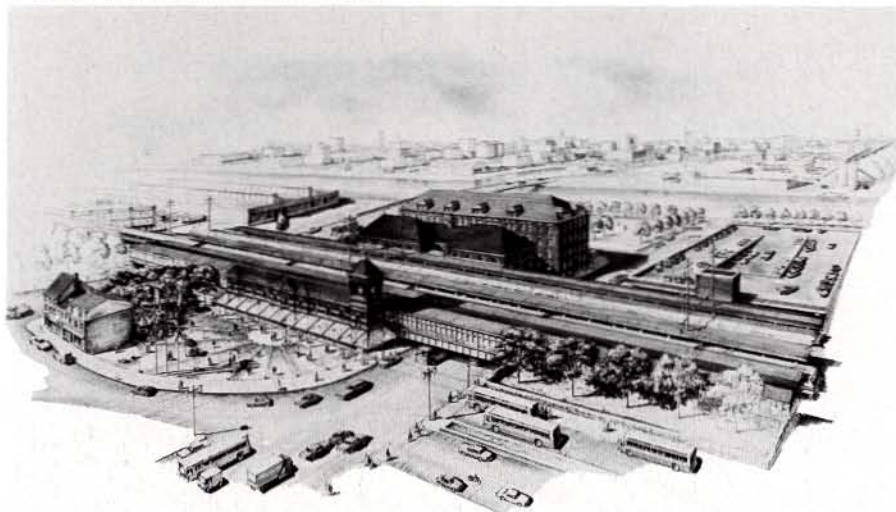
a. Hoboken, NJ before.



b. Hoboken, NJ after remodelling.



a. Proposed renovation, Wilmington Station, Baltimore.



The Northeast Corridor Improvement Project (NECIP)

The Railroad Revitalization and Regulatory Reform Act of 1976 established the NECIP to improve railroad passenger service along the heavily traveled corridor between Boston and Washington, D.C. The Act made available \$1.9 billion for 100% federally funded improvements directly related to high-speed rail passenger service, and 50/50 cost sharing by the federal government and state, regional or local government for related projects. Three quarters of one percent of station costs are being used to purchase art work. Of the 15 or so stations being improved, 9 are listed on the National Register of Historic Places. These stations will be renovated, where the requirements of the corridor can be reconciled with the structure's historic significance. Non-transportation related uses are included in some designs, and will be funded separately. Some of the sta-

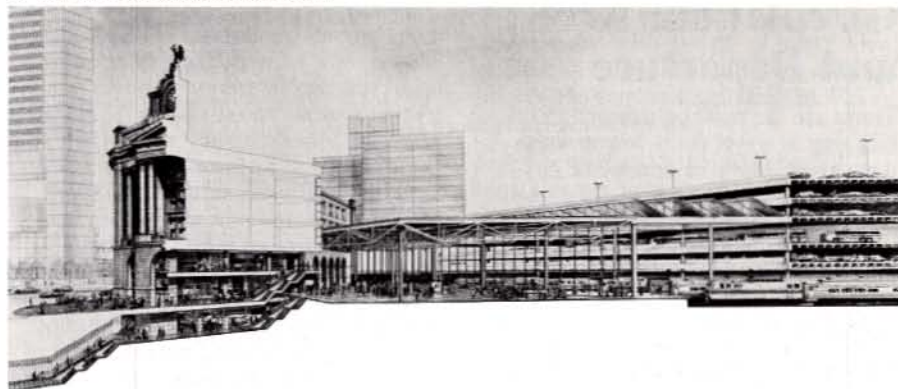
tion improvement projects include:

Boston's South Station, originally designed by Shepley Rutan Coolidge, will combine historic restoration with new structure, requiring federal, state and city involvement. Only a portion of the original station remains today. The proposal includes rehabilitation of the interiors, realignment of the tracks, and construction of a new passenger center.

New Haven's Union Station was designed by Cass Gilbert and completed in 1920. By 1972, it had become so run down it had to be closed. The improvements will include restoring the facade and great interior hall, reorganizing station functions, and installing new graphics.

Wilmington Station was designed by Frank Furness and is the last remaining large railroad station of his design. Its iron and glass canopy will be recon-

b. Proposed renovation, South Station, Boston.



structed, and the facade with its terra cotta trim will be restored as part of the overall program.

New Stations with Mixed Uses

Where new stations are to be located in an area with established commercial or service uses, the benefits of having a mixed-use station would be the same as those described for renovated, mixed-use stations. Integrating the new facilities into the community is more valuable than if the facilities were to be isolated and surrounded by parking lots. Intermodal connections suggest other formal and functional requirements as well. New railroad stations of this sort should perhaps resemble meeting halls or markets, instead of using the temple symbolism of the Victorian era.

While no major mixed-use stations have

been built in the U.S. recently, the new Central Station in Montreal is a good example. It has been integrated with a hotel, as well as the downtown, by means of the underground pedestrian network that has made this a multi-level city (Case Study 3.4a). In the complex leading up to the station are a variety of stylish bars, cafes and shops, as well as an entry to the massive Place Ville Marie. This forty-two story complex was built on a seven-acre air rights site over the railroad tracks, and includes 2.9 million square feet of office space, 160,000 square feet of retail space, and 350,000 square feet of parking space. Also connected to the station via the retail mall are the six-acre Place Bonaventure, with its hotel, rooftop swimming pool and exhibition hall.

Circulation: Arrival and Departure

Trains are the most convenient and direct way to travel from downtown to downtown. Being central to the city makes the station a potentially dramatic place to arrive. Strengthening the linkages between the station and employment and activity centers further integrates the railroad into the circulation patterns of the city.

Arrival and departure sequences can be structured and highlighted with sights, sounds, tastes and even smells. In the ideal case, passengers may arrive into a Grand Hall, buzzing with life from boutiques and cafes, or they may be oriented outward by dramatic views of the city streetscape, heightening the sense of arrival. Pedestrian malls leading up to stations can provide elegant approaches, comparable in some situations to the original boulevards, allowing viewers to appreciate historic stations' architectural beauty and detailing. Washington, D.C.'s Union Station is an example of how a park-like setting can make an imposing building seem even more impressive.

The railroad station as a form developed sophisticated ways of handling separations and interrelationships between passengers, functions and ground transport. Grand Central Station represents the culmination of this form, anticipating contemporary multi-use planning by using multiple levels to handle complex circulation problems.

Included in the complex are two levels of railroad trains, three subway lines, shops, restaurants, offices and a theater. Underground passages provide access to adjoining buildings. Even without the Grand Hotel called for in the original plans, the terminal is really a city within a city.

New London, Connecticut's Union Station, originally designed by H.H. Richardson, is a good example of retained and expanded transportation uses in a recycled station. As part of the Northeast Corridor Improvement Project, (NECIP) Amtrak agreed to lease space to a developer who put together the renovation package. Amtrak now shares the first floor waiting room with a restaurant. The basement was opened up to provide additional waiting space, and a mezzanine adds room in the restaurant section. A sense of the original openness and grand scale has been retained.

Intercity and local bus service are to be located in the building, thanks to NECIP planning funds. There is a taxi waiting area directly in front of the station, and a 1,500-car garage, built with urban renewal funds, across the street.

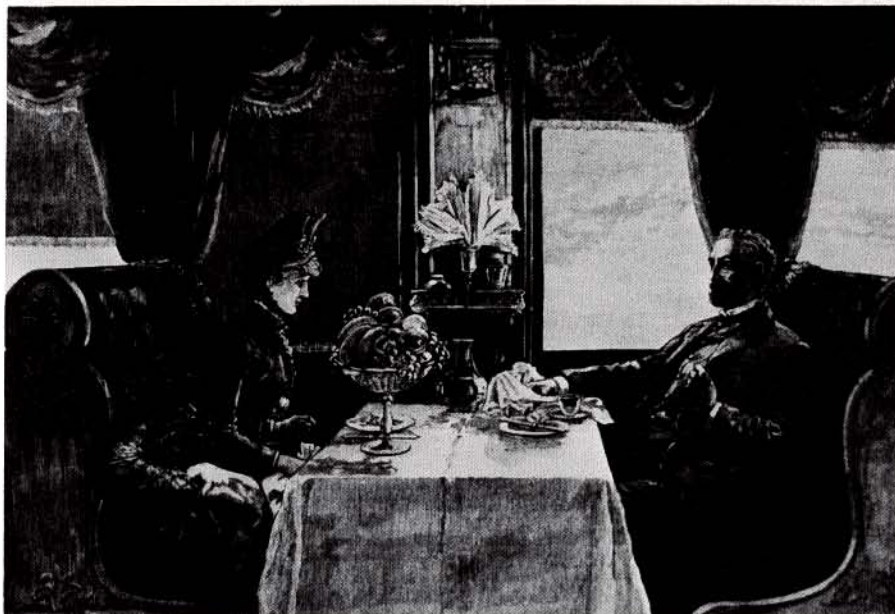
Boats to Southern New England islands depart from adjacent docks. The station's downtown location makes this connection convenient to the restaurant and the city as a whole.



a. Boulevard approach to Union Station, Washington, D.C. complements the monumental design.



b. Union Station, CT, provides links to commuter buses and a ferry.



a. Views of travel by train, ca. 1890.



b. AMTRAK's new superliner.

Vehicle Design

An important aspect of improving the popularity of train travel is the design of the train itself. The decline of passenger service resulted in less money being spent on the purchase and upkeep of trains. As a result, much of the existing rolling stock is over 20 years old. Recently, public and private efforts have been aimed at upgrading existing trains, and designing more comfortable, attractive and efficient trains for the future.

The first new long-distance passenger rail cars built in America in 20 years, luxury bi-level superliners, were introduced in October, 1979. These cars cost nearly \$1 million each. Among the features offered are deluxe bedrooms, family rooms, private baths, and full-size kitchens which permit expanded meal service.

In marketing rail service, comfort for passengers should be emphasized. This concept was important in new design features selected by the Canadian government (now being implemented) as a result of a limited competition for the design of improved trains. Features of the new interiors include warm brown-toned decor, encased overhead luggage racks, five-foot long tinted windows, reading lights, food service at each seat, and modern washrooms with provisions for the handicapped. These designs will be incorporated in new trains, and will be adapted to existing trains as well. Layouts can be modified to meet changing passenger requirements, i.e., turning coaches into club cars, which have always been welcomed by passengers.

European rail cars have long been famous for the quality of their dining cars, day coaches and variety of sleeping arrangements. The recently retired Orient Express, for instance, provided an ex-

ceptional travel experience and rich material for the imaginations of many who rode on it. It was the setting for daily dramas and romantic emotions in real life as well as fiction.

A self-contained "hotel on wheels," known as the Tour Train, offers a variation on this experience for Amtrak and Canadian passengers, carrying travelers on weekend excursions to selected resort areas. Operated by the Otter Valley Rail Road in Procter, Vermont, the train provides 30 passengers with transportation, sleeping accommodations and meals, as well as ground transportation to local attractions. Stopovers are planned near sites of interest to tourists.



a. Oberlin, OH.



b. Duluth, MN.

Recycling Stations for New Uses

In small communities outside metropolitan areas, or in cities where rail passenger service has been discontinued, the old station can continue to serve public and private interests by being adapted for new uses. As described above, these historic buildings are usually worthy of preservation. They often are sturdy structures. Rehabilitation may be economically feasible, and will stimulate the local economy through the creation of jobs.

Every city has potential uses for recycled stations. In many communities, multi-use spaces are needed by educational and cultural institutions and by commercial ventures. Government functions requiring public access are also potential users. Mass transit is a logical component of reuse.

Oberlin Station

This station, in Oberlin, Ohio, was purchased by the Nordson Foundation because it could be converted easily for a variety of civic activities. The Foundation decided to use the previously vacant building as a Head Start School. The exterior was restored and the interior remodeled to include classrooms, offices, a toilet and modern kitchen.

The school leases the station from the Foundation for one dollar per year. The success of this effort has convinced the Nordson Foundation to convert a station in Amherst, Ohio, into a cultural center, which will include the performing arts.

Duluth, Minnesota

This 80-year old station has been converted into the St. Louis County Heritage and Arts Center. This center is a joint effort by eight city and regional cultural groups. The facility includes museum and exhibition space in the original depot, a transportation museum in a new trainshed, and a new theater for the Duluth Playhouse in an addition to the depot. The building was purchased by a non-profit organization for \$137,500. This group now administers the facility. The cost of the completed project was \$3 million, 30% from government grants, 35% from foundations and 35% from private fund-raising. The station reuse has had significant impact on revitalizing the area and has helped expand the city's tourist industry. Amtrak had ended service to Duluth, but starting in March 1977, added one round trip daily to Minneapolis-St. Paul. The new passenger facilities were located di-

rectly behind the historic depot, making the Arts Center an attraction for the passengers as well.

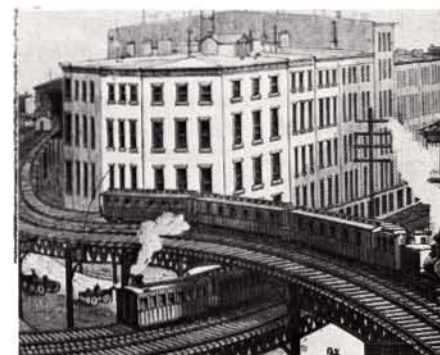


a. Pennsylvania Station, New York.

Development Procedures

The initiative to renovate railroad stations may come from a transportation agency, a city government or private parties. In all cases a complex set of factors must be considered:

- **Legal issues.** The titles of railroad property are often tied up in complex bankruptcy procedures. These must be cleared before any new entity can initiate development.
- **Transportation planning.** This must include assessing the needs of continuing rail use and potential intermodal adaptations prior to commitments of space to non-transportation uses. Federal technical assistance grants are sometimes available for these studies.
- **Architectural survey.** The historic and architectural value of the building, its physical condition, and feasibility of alternative reuse schemes should be evaluated by professionals. Transportation planning grants may cover some of this work if continuing transportation use is involved.
- **Market studies.** These must establish the viability of commercial uses if such are proposed in order to make the case for financial backing. Both public granting agencies and private financiers are likely to require a demonstration of demand for the rehabilitated space. The larger stations are likely to be developed by public/private joint development teams where transportation agencies may play a part as either owners and co-developers or as prime tenants leasing from the developer. In either case, they can play a major role in reviving the important resource represented by railroad stations.



b. Elevated tracks, New York, 1880.



Dallas-Fort Worth

Section 2.7

Airports

Airports often serve as symbolic gateways to cities, much as railroad stations once did. Aesthetic problems inherent in airport terminals are posed by their large size and scale and their complexity. The solutions addressed in this section are aimed at creating human scale, adding drama and personality to these environments, and providing a sense of orientation for the passenger.

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The Growth of Airports

"For me, aviation has value only to the extent that it contributes to the quality of the human life it serves."

Charles A. Lindbergh, July 1972

Airports were once symbols of glamor and excitement, places where vacations to exotic places began, celebrities might arrive, and adventure was in the air. Flight provided the main ingredient of this excitement; the airport only needed to supply a backdrop to such an exhilarating event. Although airport terminals were significantly large, they had not yet become so massive as to require the invention of new architectural forms. They were directly modeled on those earlier public buildings for mass circulation, the great railroad stations. Railroad concourses directly influenced the planning and design of early airport terminals, as a comparison of Union Terminal in Cincinnati and the Greater Pittsburgh Airport shows.

Aesthetic Problems

As air travel became more popular, it eventually came to be regarded more as a means of mass transit than a holiday

outing. Larger planes were designed to handle growing traffic demands and terminals became congested, leading to larger and more complex facilities.

Standardization of terminal space was seen as a solution. Aesthetics and passenger's needs would often take second place to efficiency-oriented solutions to logistic problems. In 1973 William B. Foxhall described the consequences of this growth:

"... bleak and confusing terminals: exhausting delays in ticket lines, more exhausting hikes on foot with luggage, traveling unconscionable distances mandated by the convenience and configuration of machines; demands upon the traveler's time and person, serving no purpose but the proprietary image of the airlines, shrinkage and withering of the quality of life, subservient to the economics of machines and to the monstrous conditions they create. . . . But the airlines, not the travelers are the essential client of the architect in this arena. So the airports are for the airlines, not for travelers." (ref. 9)

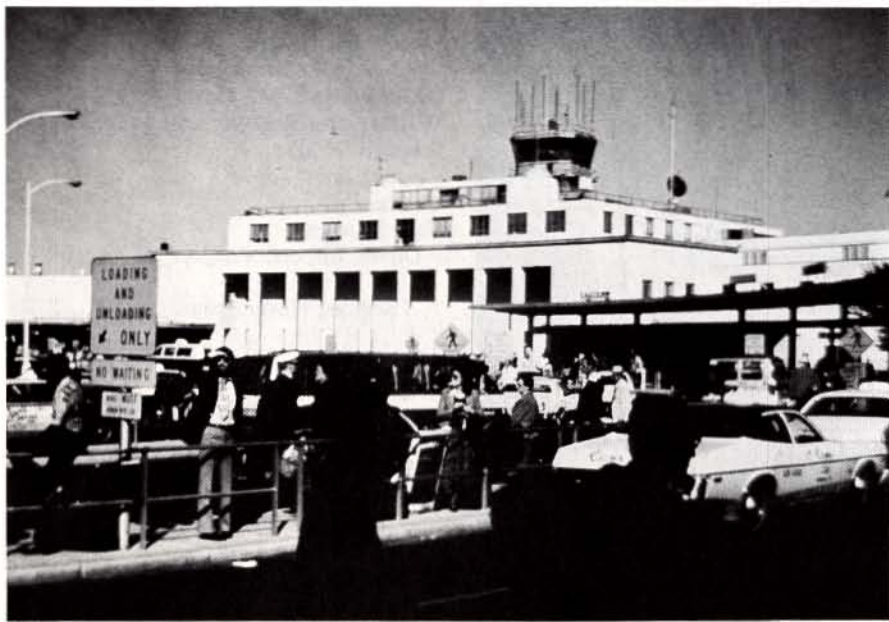
Terminal designs appear to encourage people to spend time and money in the concourse shops and bars, by making the free public areas cold and unattractive. Competition among concessions at least ensures some personal attention to the passenger and a pleasant atmosphere. Even these enterprises, however, can have a mass-produced look, and many express their identity through gimmicky designs.

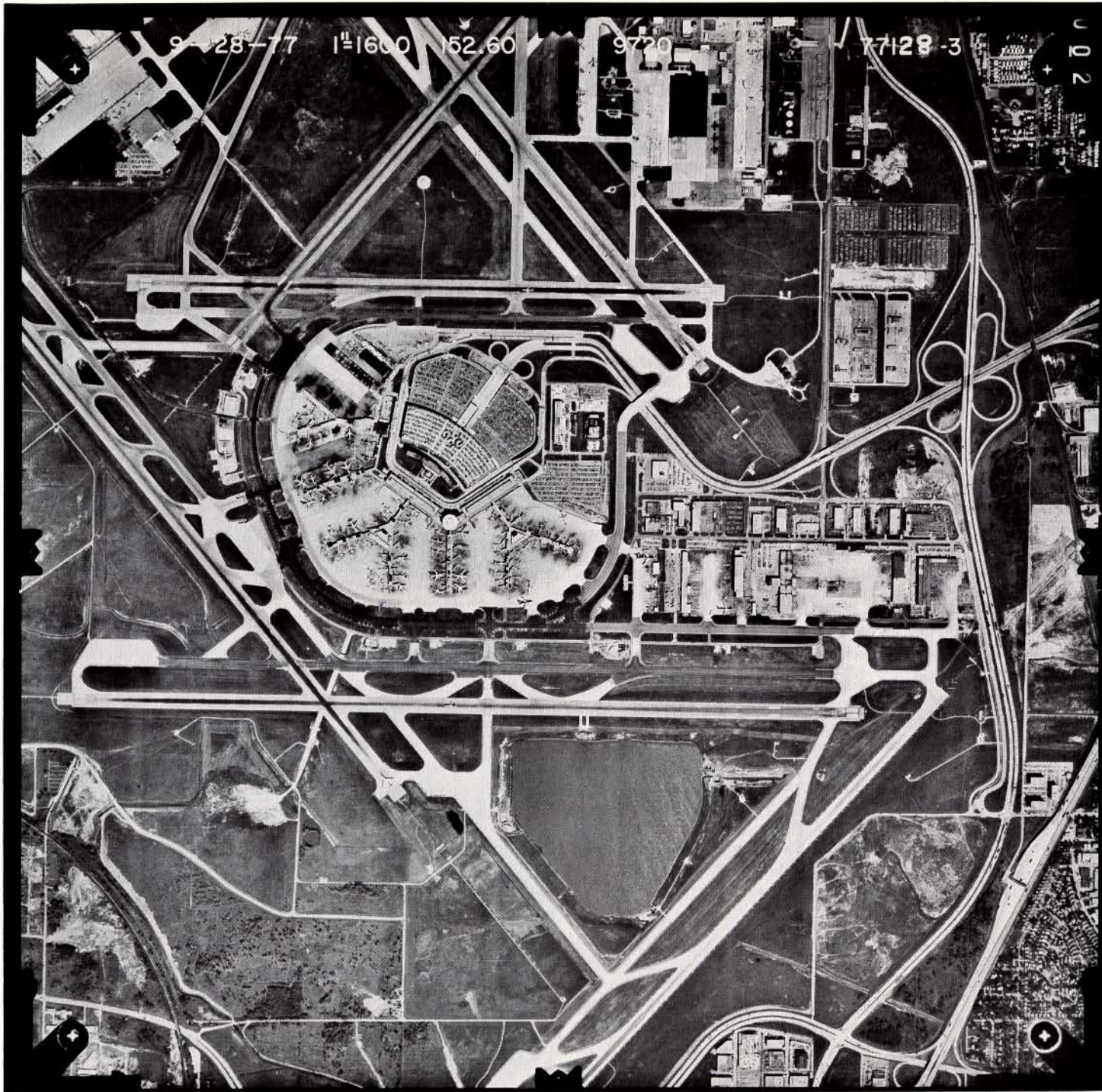
Another cause for neglect in the design of some terminals' public areas was the optimistic assumption that passengers would not need to use them for any length of time. This has proven not to be the case, particularly for travelers on long-distance or connecting flights and charters. Some people spend days in terminals due to their standby status or because of unforeseen circumstances such as weather or technical difficulties. De-

lays in landing caused by increasingly frequent air traffic jams also create long and often anxious waits for family and friends on the ground. Bleak waiting areas may aggravate the physical and psychological discomforts experienced by many travelers in these circumstances.

Opportunities

In recent years, a need for new facilities, expansion and remodeling provided a chance to correct these problems and create a better image. The human element has been given appropriate attention in many of these projects. Perhaps passenger resistance in the face of rising costs and shrinking amenities will be a factor in making more airport terminals a source of community pride again, by encouraging well designed terminals with exceptional environments for passengers. Some specific design approaches are described in the following section.





Rapid expansion of O'Hare Airport, Chicago, caused problems for both air travelers and the surrounding community.

Design Concepts

Passengers retain long-lasting impressions of terminal design. These impressions may influence whether a person will travel to a city by air, and how they relate to others while in the terminal. Two types of design concepts described here—called “grand gateways” and “the terminal as machine”—are useful in looking at general aesthetic issues involved with contemporary terminal design problems.

Grand Gateways

Terminal design can provide a coherent visual image, a “gateway” which expresses the large-scale civic commitment to the airport. This sort of approach often produces architectural forms which are quite sculptural and unified. In some cases, such as the Dulles and Newark terminals and Kennedy’s TWA terminal, these forms are intended as dynamic expressions of the movement and energy of flight.

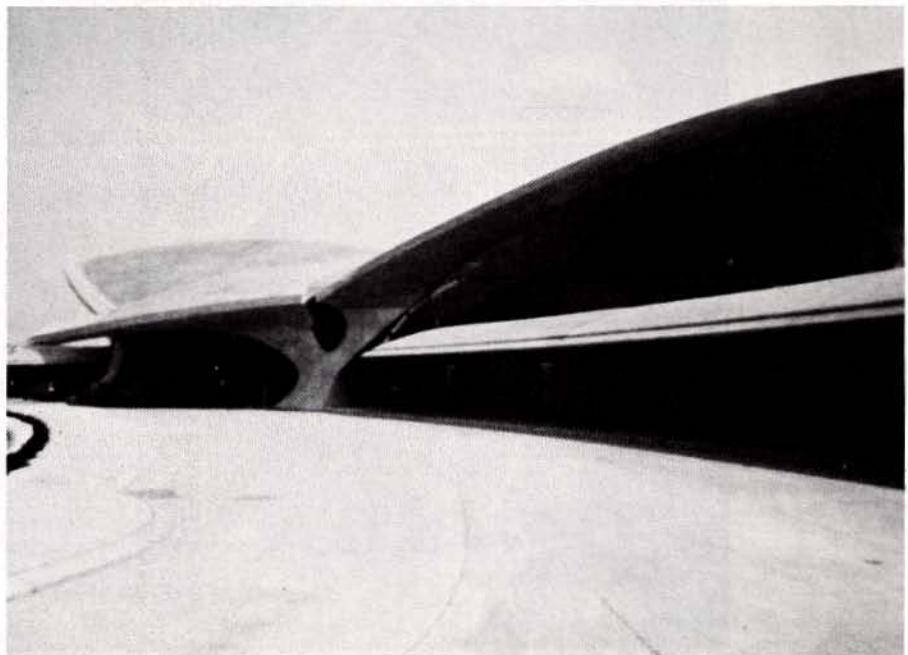
Terminals designed in this grand manner are closest in form to their predecessors, the sumptuous railroad concourses. These kinds of terminals strive to embody symbolic power, ennobling the transport companies and their passengers, as well as the host community.

Commanding the scene with their dominating presence, strong large-scale forms are often well suited for the vast landscapes of huge airfields. Meant to be perceived from afar, however, modern monumental designs are often ineffective up close, if they lack the detailing which characterized railroad terminals.

Monumental forms also tend to be difficult to modify for changing needs. Expansions can dilute or destroy the original intended effect. Programmatic changes, such as retro-fitting for security, may detract from the monumental scale by creating inefficient uses of space as a result of partitioning and closing off circulation areas. This issue more fully illustrated in Case Study 2.7a, Dulles Airport.



a. Terminal design expresses Newark's civic commitment to the airport.



b. Design of Kennedy's TWA Terminal is symbolic of flight.



a. Logan Airport, South Terminal, courtyard.



b. Logan Airport, Volpe Terminal, "no-nonsense" design.

The Terminal as Machine

The rapid growth of airports during the 1950's and 1960's led to a need to reorganize circulation and to integrate terminals with ground transportation. Older facilities were systematized during expansion. New construction emphasized a rational, linear approach. As an airport consultant stated in 1969: "an airport terminal is a location where aircraft discharge passengers and cargo and refuel. It should function as a well-oiled machine . . ." (ref. 12)

The functional aesthetic of this approach (and of course most airports represent neither one type or another but a mix of ideas) differs from the "monumental" mainly in the absence of conscious symbolism and in its additive nature. Beyond these characteristics, either type of structure may assume a variety of forms and circulation patterns, i.e., centralized entries with concourses or piers, satellites, horseshoe arrangements, etc.

A product of expansion, these linear buildings are often quite extensive and designed with growth in mind. Articulation of functional separations, terminal units and circulation elements helps to reduce the impact of such sprawling forms. Structural and mechanical systems, when left exposed as part of the terminal building's interior and exterior finish, are natural elements of these aesthetics. Standardized components provide flexibility for programmatic changes. These designs are business-like and efficient, aimed at the frequent user who has little interest in drama or ceremony.

With standardized superstructures, the design of the interior spaces and sequences becomes critical. When successful, such buildings can both well serve and celebrate the daily activities of the terminal. When purely utilitarian in design they can be very impersonal and lack identity to the point of disorienting passengers.

Logan Airport, Boston. Two terminals at Boston's Logan International Airport which differ in size and style, illustrate this functional aesthetic.

South Terminal was the first to utilize the linear concept. The most important aesthetic quality of this terminal is its handling of scale, carefully fitting functional components into economical layered vertical relationships and horizontal sequences.

The precast concrete structure is linked to the central garage and access drive by pedestrian bridges that define comfortably-sized outdoor courtyards. As a result, the passenger's overall impression is gained by moving through the building, not perceiving it as an overall object. The rhythm of repeating signs along the access drive is appropriate to the speed of driving, while the passenger spaces are scaled to access on foot. Design of the interior is carried out in low-keyed, neutral tones and smooth finishes which reinforce the image of the well-ordered, functional, passenger-oriented airport.

The John A. Volpe International Terminal is a subtle, understated building with long, unbroken lines. These lines perfectly express the function of the terminal as "an elongated transfer mechanism" with both a layered and a linear plan. The austere design gives the terminal a distinctive, refined identity to greet international travelers.

Circulation

Procedures for ticketing, holding, screening and otherwise processing passengers have strongly affected the design of airport terminals. Circulation planning is generally aimed at providing smooth, continuous and efficient motion, and separating the flow of incoming and arriving passengers, their families and friends. However, long walking distances, and confusing passages and roadways can impose indignities and discomfort on many users. Especially vulnerable groups include the physically handicapped, the elderly, families with young children, travelers with heavy baggage, and those preoccupied or distracted by their business or unfamiliar surroundings—just about everybody at one time or another. Design solutions need to limit passenger walking distance, avoid barriers, and improve the scale and clarity of the pattern through signage, architectural details, and landscaping techniques.

Designs to Limit Walking Distance

“Drive to your gate”, concepts are associated with the linear style of terminal design described above. These are aimed at the close coupling of land transportation and the airplanes by enabling curbside check-in or departure pick-up on the same or separate levels. Parking is located near the terminal, but cannot be convenient for all; some long walks from the lot are inevitable. Vertical layering of component parts separates traffic and minimizes walking distances within the terminal. Decentralization of ticketing and baggage claim is essential to the system. Coordination of the operating methods of the participating airlines is also required; individual procedures must fit within system guidelines. The need to have elaborate approach roads, and secu-

rity checkpoints compatible with open plans, are other issues which may interfere with the intended direct access to the planes.

Dallas-Fort Worth Airport. Described as the biggest and most automated airport with the shortest walking distances, the Dallas-Fort Worth Airport (D/FW) has elevated the linear, drive-to-your-gate style of airport architecture to an art form. The plan is a series of semi-circular terminals arranged on either side of a high-speed expressway. Parking is in the center of each terminal and plane gates are on the outside. An AIRTRANS people-mover system is part of the road spine, tying whole airport together. D/FW is distinguished not just by its size and its integration of multiple terminal buildings, but by the different kinds of perceptions it gives to arriving and departing passengers.

Passengers arriving by ground transportation walk only 120 feet from the curb, through the building to the departure lounge. The connection is direct and unrelated to the total ensemble of identical terminal buildings, which can not be viewed clearly from the expressway.

From the air, however, the monumental dimensions of D/FW become apparent. The late sculptor, Robert Smithson, was a consultant during design to enhance this effect. During aerial arrival and departure the traveler becomes aware of the airport as a large scale earth form, quite different from its closely knit appearance when seen from the ground.

The “satellite concept” limits walking distance by the functional separation of airside/landside activities. A central building provides passenger processing, concessions, and access to ground transportation. Satellite airside structures provide waiting facilities, and space for servicing, loading and unloading of aircraft. Various means of connection to the main terminal include pedestrian



a. Dallas-Fort Worth, decentralized terminals.



b. Elevated shuttle over approach road, Tampa.



bridges, automated guideways, shuttle buses and mobile lounges similar to those at Dulles Airport. These shuttle systems are critical elements of the system and can represent a major investment. They can also form prominent visual elements for passengers whose main impression of the airport is experienced while being transported from one place to another. One important advantage of this approach is that circulation becomes clarified and direct, and congestion is minimized.

Tampa International is an example of the satellite concept in a new terminal using an electric shuttle system on elevated tracks. In Case Study 2.7b, Seattle's SEA-TAC Airport illustrates how satellite facilities were used to expand a traditionally styled terminal, with the linkage provided by an underground transit system.

Airport Charles de Gaulle, Paris
Based on the satellite concept, de Gaulle Airport in Paris provides sim-

ple, clear, and visually dramatic circulation sequences. The terminal building is shaped like a doughnut, with a glass-enclosed atrium at its center. Separate arrival and departure ramps lead vehicles around the perimeter of the building until the correct airline is found. These ramps and the columns provide the terminal with a highly textured image. Parking is directly on top of the terminal.

Movement proceeds through an automated check-in area towards the building's center, where a two-story lobby surrounds the atrium and departure information is displayed. Passengers move on escalators and moving walkways up through clear plastic tubes across the atrium to the gate level, which overlooks the lobby. Orientation is always towards the atrium, so that movement is easy, clear and visible.

Coming off the ramps, movement toward the gate is again circumferential, and relatively short, since the gate is



a,b. Sculptural forms and a dramatic atrium create an exciting spatial environment, de Gaulle Airport.

near the center. At the desired gate, another moving walkway brings passengers radially outward through a concrete tube

over the roadway, under the taxiways, and finally up into glass boarding islands.



c. Moving sidewalks feature overhead visual displays.

Landscape Design

Landscape development of airport sites and approach roads improves their appearance while solving functional problems of circulation, orientation and environmental impact. Designs can direct traffic, screen views, accent decision points and signage, and add changing color, shade and texture. Plantings and earth berms buffer noise and heat produced by planes and cars. Photosynthetic processes help filter and cleanse the air. Coordination of landscape treatments, lighting, furniture, roadways and structures can clarify the functional elements of the terminal. The following examples illustrate some successful landscaping techniques.

Controlling Views—D/FW: Here landscaping helps direct people to their destinations and orient them within the various areas of this massive airport (larger than Manhattan island). Native plant materials, extensively used, give travelers their first impression of this gateway to the Southwest. Large masses of vegetation, several mile-long earth berms, and wide areas of grasses give form to this large, flat site, often viewed from cars at high speeds. Broad swaths of colorful wildflowers are planted along the access road and between the runways. Plant materials create a network of screens, backgrounds, and focal points. Berms are unifying aesthetic elements, used to integrate the buildings with the site. Smaller groups of flowers and flowering shrubs mark pedestrian areas.

Emphasizing Function—Miami Airport: Landscape development of the terminal parkway was intended to provide a "tunnel of green" for travelers in this congested environment. Designed to give many visitors their first glimpse of Florida, the lush tropical foliage is also functional. Plantings relieve the heat and air pollution associated with dense develop-

ment and automobile use. Beautiful and durable native species visually direct traffic flow and form backdrops for signage. Large palm trees mark intersections and decision points. Within the terminal area, different tree varieties distinguish different circulation paths.

Details contribute a great deal to the design's success. Illumination and sprinkler systems were installed as part of the project. Plantings in pedestrian areas are in separate pots, each with an automatically monitored hose for easy maintenance. Trellises, benches, flowers, shrubs and walls create an enjoyable scale and park-like setting, available for outdoor waiting or simply resting.

Special Opportunities

Norfolk, VA International Airport Terminal has a unique setting in the Norfolk Botanical Gardens. Visitors may go to the gardens from the airport through a special pedestrian walkway. Landscaping was designed to blend with the adjacent pines, philodendrons, camellias and azaleas.

The Portland, OR Airport has also replaced much of its asphalt and concrete with greenery. It features English Ivy ground cover, 744 trees, 2,653 shrubs and 350,000 square feet of grass.

At Fresno LA Airport a sense of the region's agricultural character can be seen by passengers while still in the plane. The areas between the runways have been cultivated for over 30 years with cotton, peanuts and grain. There has been no apparent conflict between farming and airport operations.



a. Greenery replaces asphalt at Portland OR.



b. Native species are both beautiful and useful at Miami.

Graphics and Orientation

Some of the confusion and inconvenience experienced in airport terminals can be avoided through clear and unified signage. Systematized forms, colors and installations can eliminate clutter and even give otherwise undistinguished buildings a sense of visual organization. Signs can be lit to enhance their aesthetic effect and their legibility. Signage should, of course, be coordinated with all other details, including street lighting, landscaping, architecture and interior design.

The color coded graphics program for Newark Airport, which is designed to encompass the total airport environment beginning with the roadways and extending into the terminal's interiors, provides a continuous "thread" of visual communication leading to the departure gate. The key components for such a system are consistency and continuity of the elements.

In order to reduce travelers' confusion at Fresno Airport, strict controls have been established for all concessions and lease spaces. Letter styles and sizes have been standardized, and carriers' logos must be placed only behind ticket counters and check-in desks. These guidelines are part of an overall design treatment aimed at enhancing the visual unity of the interior spaces.

Graphics can provide decoration and information about the region and can indicate directions and locations. Qualities of the Pacific Northwest are the theme of Portland International Airport's graphic displays. Four 55-foot long full color photos depict Oregon outdoor scenes. Hanging banners portraying major industries and silkscreened prints of Oregon wildflowers are informative, decorative, and useful as space dividers. The interior finish materials continue to welcome and orient passengers to the region. A warm

setting is created with Western red cedar paneling and rich colors and materials.

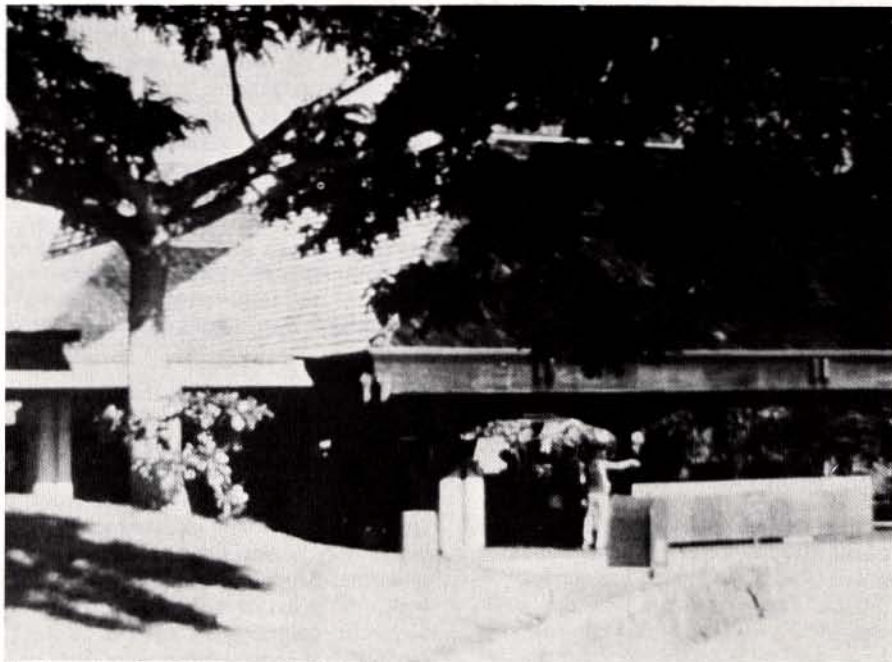
Orientation within the airport can be provided through design of materials and illumination. A common technique is the use of patterns or colors on the floor to guide pedestrian traffic and mark changes in use, such as at queuing areas. The color and intensity of lighting, and the design of fixtures, may be used to define pedestrian and vehicular routes and highlight destinations.

Thematic local design elements can provide passengers with an important means of orienting themselves. The inter-island terminal of Ke-Ahole Airport has been designed in the vernacular Hawaiian style of hut-like clusters. Arriving passengers at McCarran Terminal in Las Vegas are greeted by huge billboards with flashing neon lights. Moving sidewalks approximately 750 feet long are accompanied by taped recordings by celebrities instructing riders in their use.

The unique Las Vegas style permeates the terminal's environment.



a. Banners are both informative and decorative, Portland, OR.



b. Vernacular design orients passengers, Ke-Ahole, HA.

Waiting and Related Amenities

Design can influence people's experiences in air terminals perhaps most significantly in the public waiting area. In the past, the quality of these environments has been neglected, to the advantage of private concessions to which passengers and others flee for refuge. The character of waiting areas is determined in part by the overall space design, the ambience created by seating arrangements, decor, views, opportunities for social interaction, and the proximity of amenities and concessions.

Space Design

Whether passengers wait in large central holding rooms or in separate lounges at the gate greatly affects the quality of the experience. Central waiting rooms offer spaciousness and the liveliness of a crowd, heightened by the proximity of concessions and the freedom to wander and congregate. As crowds grow, however, and circulation and the display of necessary information becomes more complex, the advantages of central areas decrease. During the 1950's, gate lounges were favored. These provide smaller scale rooms, which may be more reassuring than crowded, open spaces. The opportunities for amenities and diversion are necessarily limited, however, by such decentralization. Security needs and economics are now favoring a return to a shared lounge approach, located between gate areas or at satellites, and perhaps in conjunction with a central hold room as well, as at SEA-TAC (Case Study 2.7b).

Miami's satellite facility for international travel illustrates the variety of conditions possible with the shared lounge approach. Passengers with time may choose to avoid the wide open main area, with its comfortable yet formally

arranged seating. Alternatives are niches in which the furniture is arranged in groupings convenient for conversation and couches for quiet relaxation. Large windows, plants, natural materials and tables add the thoughtful touches which create a more intimate setting within the larger room.

Ambience

The comfort of seating and the decor of waiting areas can play an important role in determining how passengers perceive air travel and their fellow passengers. The comfort and privacy of seats, and even the visual and tactile qualities of materials used, often affect people's states of mind and responses.

As mentioned above, Portland Airport illustrates how a careful interior design creates an atmosphere of unhurried hospitality. Silk-screened banners create private, quiet sitting areas in the midst of a larger, busy space. There are also oak furniture upholstered in warm-colored woven plaids, writing tables and lamps convenient for reading. These thoughtful touches are refreshing to find in a public facility, and they generate an ambience which is more personal than institutional. Other touches include patterned carpeting which is coordinated with the other textiles, and carts laden with flowers. Lush plants in oak containers define the more intimate scale of the sitting areas and add to the aesthetic affects with their textures, variety of forms, and colors.

It has already been noted that Logan's South Terminal expresses a more button-down aesthetic, perhaps aimed more at the tastes of the jet-age commuter. Subdued colors and smooth surfaces create a streamlined, low-key environment, which may be described as either elegant or sterile, depending on the eye of the beholder. Window walls fill the space with soft, natural light, and extend the comfortably narrow dimensions with op-



a,b. Shared lounges offer a choice of seating arrangements. Miami International satellite.





a. An atmosphere of unhurried hospitality, Portland, OR.



b. Cleveland-Hopkins' "Cleveland Space" provides a quiet repose.

opportunities for viewing, avoiding a sense of crowding.

Amenities

Accommodations for rendezvous and well-wishing at airports are often sorely inadequate, being limited to already crowded corridors in front of security checkpoints and arrival gates. For international arrivals, being met can become a trying experience, if sandwiched clumsily between customs and baggage claim. Public gathering areas are now being provided at some terminals to make these social activities easier for passengers, their families and friends. Baltimore-Washington International (BWI) has a centrally located meeting place near the baggage claim, identified by means of super-graphics and a red tiled floor pattern. In the Cleveland-Hopkins airport terminal a quiet area known as the "Cleveland Space" serves a similar function.

Entertainment centers where TV or movies may be viewed, or that provide various games such as checkers, chess, pool or pinball, offer passengers something more than eating and drinking as pastimes. These facilities require additional maintenance expenses, but also enliven the general atmosphere and bring strangers together.

A unique variation on this opportunity is available at McCarran Terminal in Las Vegas, where clusters of slot machines are available for passengers.

Airports can also make space available for displays of public interest. (For a discussion of the possibilities offered by public art, see Chapter 1). These can provide a forum for social interaction as well as heighten the traveler's sense of the larger community. Dallas-Fort Worth's display of a prehistoric dinosaur found during preliminary excavations for the airport reveals, for instance, the history of the site, and dramatizes the tremendous changes which have taken place in the area.

CASE STUDY 2.7a

Dulles Airport
A Grand Symbolic Entrance
Virginia

Dulles Airport, located in Northern Virginia, 26 miles from the White House, is a ceremonial gateway to the Capital. Highway access is restricted to a 13-mile limited-access expressway through the rolling countryside. Completed in 1962, the airport currently handles about three million passengers per year, a figure considerably lower than most other large commercial airports.

A unique feature of Dulles is that all of its functions are contained in a single compact terminal building 600 by 150 feet. This was made possible by the introduction of mobile lounges, a new concept for transporting passengers from

the terminal to the aircraft, which park on the jet ramp a half-mile away. The terminal building was recently placed on the National Register of Historic Places. It is currently undergoing some expansion to provide additional space for passengers and baggage handling.

The architect was very conscious of the need to marry the static, classical traditions of federal architecture with a recognition of the movement, lightness and excitement of jet travel. The overall form of the building is a clear and very successful response to this need.

An outstanding aesthetic quality of the terminal is the unusually careful and consistent consideration of each aspect of the traveler's experience. This masterfully designed sequence is illustrated by the photos on this and the next page:

- After driving through the unspoiled countryside, the passenger sees the building's shifting silhouette from the sweep of the access road.
- The vertically separated ramps—one designed for arrivals and one for departures—draw up alongside the grand colonnade at the front of the terminal building.
- Inside, all of the airline functions and concessions are arranged within one large and dramatic light-filled space.
- One can walk across the width of the relatively narrow building to the restaurant or observation deck in one minute and get a broad view of the airfield and the movements of the planes.
- Without walking much further, boarding passengers can enter the gates and find seats in the mobile lounges parked along the rear of the terminal.

The compression of all these activities into a distance of less than 200 feet has a wonderful effect not experienced at any other major airport: all of the functions are easily visible and comprehensible to the passenger, thus creating an intimate, personal sense of the relationship of the parts to the whole. Another, very practical effect is, of course, the almost complete elimination of the tedious, "endless" walking so characteristic of many airports.

In addition to its conceptual elegance, the terminal building provides one of the most beautiful spaces created by modern architecture. The sweep of the columns and the roof, the proportions, the views, the quality of light and the bustling but uncrowded activity all have an immediate, total effect on passengers and visitors.

a. View from approach road.



b. Colonnade at terminal entry.





a. One dramatic terminal space houses all functions.



b. Restaurant offers view of the airfield.



c. Mobile lounges park behind the terminal.



d. Terminal expansion under construction.



e. The building is relatively narrow.



f. Mobile lounges offer comfortable seating.

In addition to its overall concept and unique exterior and interior beauty, the Dulles Airport terminal introduced a series of other notable design features that are illustrated by the photos on this page:

- A public observation deck is easily accessible, providing a full view of the terminal, mobile lounges and airfield.
- Even though most seating is set in straight rows, there are some interesting variations, including writing desks with chairs and lounge chairs around tables with a view.
- The mobile lounges were designed with the space and comfort of a real lounge, not with the usually confining dimensions of a passenger vehicle. The second generation of lounges are somewhat less satisfactory in this regard, since the hydraulic jacks occupy the center of the space.

Responses to Change

Since the Terminal opened, major changes have occurred in air travel: the need for security controls and the introduction of wide-bodied jets carrying three or four times as many passengers as in the past. The latter situation has created a need for a second generation of mobile lounges capable of being hydraulically raised to the higher airplane doors.

The expansion (now in construction, see photo d) was carefully conceived to minimize any adverse effect on the building's profile. The new departure area will permit moving the security gates to the back gate edge of the concourse area. Additional baggage space will be located below. The aesthetic values of the building appear to be well protected.

Costs

The original terminal cost \$108.3 million in 1962, including the 13-mile access road. The addition is budgeted at \$7 million.

Credits

Dulles Airport is owned and administered by the Federal Aviation Administration (FAA) of the U.S. Department of Transportation.

Architect: Eero Saarinen and Associates

Architect for the expansion: Helmuth, Obata and Kassenbaum

Lessons:

- Many of the elements of Dulles including its "ceremonial" function, its semi-rural site, its federal ownership, and relatively low air and auto traffic volumes are atypical. This cautions against direct adaptation of all the design features employed at Dulles to other locales.
- The beauty of the building is the result of outstanding work by one of the great modern architects, and cannot be transferred by a simple formula. A building at Boston's Logan Airport appears to borrow from it, but, as might be expected, has fallen short of the elegance achieved at Dulles.
- The degree of concern for the experience of air travelers and the way their needs were studied and addressed by inventive design are relevant to every airport. Such a perspective should be carefully introduced into airport planning and design programs.

CASE STUDY 2.7b

SEA-TAC Airport
Blending Efficiency and Aesthetics
Seattle, Washington

The Seattle-Tacoma International Airport (SEA-TAC) completed a major phase of its expansion and reorganization program in 1973. The resulting terminal complex has a capacity of 13 million passengers per year, which is expected to be reached by 1981. The complex consists of a main terminal building, two satellite terminals and a 4,300 car, eight-level parking garage.

SEA-TAC derives its growing importance from its role as a gateway to the Orient and Alaska. It has a "traditional" plan (i.e., central terminal instead of drive-to-your-gate) but many innovative features: an automatic "people mover" connecting the central building and the satellites, and a completely automated baggage handling system. Arrival by car

occurs on the upper level with baggage checking, ticketing and departure gates located on the same level in the adjacent building. Baggage handling, pick-up and departure by car are on the lower level. The garage is centrally located and connects by bridges to the terminal on a mezzanine between the two main roads. The maximum distance from parking to gate is 600 feet.

The aesthetic of SEA-TAC is a blend of functional and monumental. The approach side of the garage is deliberately designed for a monumental effect. The space of the arrival and departure decks begins to scale down, articulated by bridges and entrances. The main concourse is functional and spacious, but a bit barren, while the waiting areas are sociably arranged, and comfortably furnished. Anthropological displays related to the Northwest Indians and works of art (Case Study 1.4b) are used to accent the waiting areas. The architectural

scheme as well as graphic signing make orientation very easy.

The basic aesthetic was developed in response to some social research by the architects at the start of the project. The research indicated that there are two basic types of air traveler. The great majority are on routine trips and want to travel as quickly as possible. The other type is the occasional traveler or tourist who is more interested in "getting into" the air travel experience. In response to these findings, the aesthetic of the main spaces was deliberately kept smooth flowing and functional. More design detail and stimulation were provided in the slightly out-of-the-way waiting areas and lounges.

Design elements include:

- Moulded, poured-in-place concrete structural elements were used throughout the roadways and garage to provide consistency of form.

- The interior of the concourse has a terrazzo floor, and plastic laminate and steel surfaces in neutral tones that are ideal for maintenance, though somewhat impersonal.
- To save energy, the intensity of lighting in the concourse and waiting areas has been cut in half from the original plan, thereby making these spaces dimmer than intended.
- The waiting lounges have carpeting, comfortable chairs, some tables, display cases and art works. The color schemes are subdued.
- The information system includes large maps and clear signs.

a. Garage is designed for monumental effect.



b. Arrival space is scaled down for pedestrians.





a. Simply designed concourse is ample for crowds.



b. Waiting areas are more intimate and comfortably furnished.

Costs

Construction of all new facilities, including garage, roads and terminal buildings, cost \$175 million in 1973.

Credits

Client: Port of Seattle

Architects: The Richardson Associates

Lessons

- The carefully considered functional and aesthetic design elements make SEA-TAC airport popular with passengers and well-liked by the airport management.
- The interior architecture of the terminal building does not quite fulfill the promise of architectural excitement created by the outdoor approach sequence.
- The conditions at this airport are sufficiently typical that most of its parking/roadway/terminal layout and terminal design concepts could be applied to major expansions at other large, conventionally planned airports.

Harbors and Water Transportation



Lower Manhattan, 1887.

Urban waterfronts in the U.S. are in the midst of a revival after a long period of decline. Actions by transportation agencies can play a part in waterfront revival in two major ways: by creating or reinforcing still viable water transportation, such as commuter ferry services, and by providing the necessary transportation actions for multi-purpose waterfront redevelopment. This section focuses on these two areas of opportunity.

Contents:

Waterfront Decline and Revival
The Potential for Water Transport

Actions for Waterfront Redevelopment
Removing Transportation Barriers
Developing New Access to Waterfronts

Disposition of Waterfront Land
Planning and Design Issues

The Golden Gate Ferry System,
San Francisco Bay,

California: Case Study 2.8a

Waterfront Decline and Revival

A few years ago you could work in downtown Boston and except for the occasional sea breeze flowing up State Street, never know that the harbor was there. That has changed now. Much of the downtown's daily life and special events such as the July 4th fireworks have moved back to the renovated water's edge. You can now take your brown bag lunch, follow the sea breeze, work your way under the Central Artery and have your vista expand over the Harbor from Waterfront Park. You can even have your noon meal out in the Harbor, aboard special luncheon cruise boats.

Most major American cities started by the water and developed their earliest centers in close contact with ocean or riverports. In recent years the traditional roles of water transportation have greatly declined and waterfronts have become underused.

This decline deprived the public of two types of amenities: the excitement of travelling by water and the aesthetic value of having an active, accessible waterfront next to the city center. The potential for waterfront revival includes a limited but important potential for renewed transportation uses and a great many opportunities for waterfront redevelopment for a variety of uses in which transportation actions play a major part.

The Potential for Water Transport

A certain amount of passenger and freight traffic by water continues to be functionally and economically viable. In several cities such as Seattle, New York (Staten Island) and to a lesser extent Boston, commuter ferries continue their historic role of bringing workers into the central city. In San Francisco, a new high-technology ferry system was established to serve Marin County and relieve traffic congestion (Case Study 2.8a). Special services such as boats to National Park Service historic sites in Boston also serve to relieve traffic congestion by inducing visitors to leave their cars behind. In addition, there is a growing amount of excursion cruising and private pleasure boating in most urban harbors. Cargo service is also being revived with container ports and other technical innovations.

Commuter and other functional boat services have a great deal of aesthetic potential. Boats are generally slower than other modes, but by travelling more directly and without traffic, do not necessarily take longer. In any case, they have the potential for making the time spent in commuting a great deal more pleasant for their passengers than the experience of congested driving or transit-riding. Combining the pleasure of boats with the business of commuting attracts riders, as illustrated by Case Study 2.8a.

Ongoing boat transportation along with cargo terminals, boat yards, fishing piers and other marine activity are important in maintaining the authenticity of waterfronts. The types of redevelopment discussed below that are now occurring on many every urban waterfronts could, without the existence of these activities, create an unreal, "theme park" atmosphere. Heavy industrial uses must, to some extent, be separated to avoid functional conflict. But the aesthetics of a waterfront environment should be true to its lively, robust history and allow a variety of functions to exist side by side.

Copenhagen Harbor.



Actions for Waterfront Redevelopment

In the last decade, the popular and commercial success of waterfront redevelopment projects in San Francisco and Boston has prompted many cities and developers to focus with interest on waterfronts. Specialty shops, entertainment, housing, hotels, marinas, aquariums and museums are the most common uses. The "character" of waterfronts is generally emphasized as a theme. These developments have been among the most successful in bringing people back to the cities and creating a "fun" image, in contrast to some of the remaining city environments. Because of these successes, public incentives to waterfront redevelopment are being provided in many cities, including Baltimore; Seattle; Portland, OR; Portland, ME; Minneapolis; Philadelphia; and many others.

The aesthetic benefits of waterfront redevelopment include: spatially opening up the city center to and from the water, recapturing the love of the city's water-oriented history, developing new people-oriented uses on the waterfront, and the opportunity for recreation and a change of pace for downtown employees.

Many of the steps needed to open up waterfronts for redevelopment require actions by transportation agencies. By participating, transportation agencies can help provide the public with the aesthetic benefits of revived waterfronts. These actions, which are discussed more fully below, include:

- Removal of transportation structures that now act as barriers (railroad tracks, roads, highway ramps).
- Provision of new access to the new uses (including feeder service for commuter boats).

- Disposition of waterfront land now in the jurisdiction of transportation agencies but no longer required for transportation facilities.

Removing Transportation Barriers

Railroads, highways and wide arterial roads often meet along the waterfront to form an almost impenetrable barrier to pedestrians (see photo below). Opening up the waterfront requires that new barriers be prohibited and that old ones be selectively removed, consolidated, or redesigned to insure better access and visual contact.

Such actions took place in the stopping of the Embarcadero Freeway construction in San Francisco, the removal of Central Artery ramps and relocation of Atlantic Avenue in Boston the removal of Harbor Drive in Portland, OR, and the decking of a highway in Philadelphia.

In the past, many years of public pressure and negotiations between the cities and transportation agencies have been required to accomplish such changes. The transportation agencies (including private railroads) have often resisted due to the expense and transportation compromises involved. However, now that the value of waterfronts has been firmly re-established, the removal of these barriers where necessary should be included among high-priority policy objectives and incorporated into city and transportation agency plans and budgets.

a. Memphis riverfront is cut-off from the city by road and rail.



b. Exit ramp was removed to provide Boston's Walk-to-the-Sea.



Developing New Access to Waterfronts

One of the major attractions of urban waterfronts is their proximity to downtown areas. The development of walkways with pedestrian amenities is the most common transportation improvement. Examples of this are Boston's Walk-to-the-Sea and Baltimore's walkway system from downtown to the Inner Harbor.

Seattle's "Hillclimb" project (see photo, opposite) incorporates an inclined elevator, steps and special walkways to remove the barrier of a steep grade and to connect the waterfront to the popular Public Market at the upper end. This project counteracts the physical and psychological barriers created by the Alaskan Freeway between Seattle's downtown and its waterfront.

In addition to walkways, special rides are being introduced in a number of cities. San Francisco's historic cable cars take masses of tourists to Fisherman's Wharf. Memphis is building a monorail to Volunteer Park on the Mississippi River, and Seattle and Portland are both considering antique electric trolleys to run along their waterfronts. In New York, a special aerial tramway was introduced to aid in the redevelopment of Roosevelt Island. These rides have in common their combination of practical transportation service and a "fun" quality that appeals to tourists but is also appreciated by everyday users.

The implementation of special rides can be complicated by their mixed purpose. Transit agencies are often reluctant to be involved in this type of "non-serious" operation. Private entrepreneurs will run harbor cruises and water taxis in peak season, but usually cannot make more regular and comprehensive service profitable. In some cases, special nonprofit operating entities that can combine public funds and private contributions might

need to be established. Many cities have already established downtown development corporations which can take on this role. Private beneficiaries of the improvements are sometimes then assessed for that portion of the operating expenses that corresponds, in full or in part, to their share of the benefits.

Disposition of Waterfront Land

The piers, rail yards, roads and streets on the waterfront are usually owned by transportation agencies. Due to the growing demand for waterfront land for private development, these public and private agencies have considerable leverage. They can attach provisions requiring specified public aesthetic benefits to the land disposition agreements. Examples of such benefits include leaving open "view corridors", insuring continuous public access to the water's edge, and standards requiring space and amenities for the public. These types of provisions are usually worked out in cooperation with a city's planning or redevelopment agency, which can frequently provide the necessary coordination and design staff support.

Harbor areas are likely to pose complex legal and regulatory issues. Property ownership or easements may be held by the U.S. Coast Guard, local port authorities, railroads, and state and city agencies as well as by private industries and businesses. Controls may be applied by state agencies responsible for environmental and/or coastal zone management. The shaping of water channels, piers and jetties may be under the jurisdiction of the Army Corps of Engineers. Older laws conferring special restrictions, rights, or privileges for the use of the waterfront may still be in effect. Thorough legal research and coordination with all parties having possible legal involvement is a prerequisite to effective waterfront planning.

Planning and Design Issues

- Maintaining full public access to the water's edge is essential to make the aesthetic experience of coming from the city to the water complete. The development of piers for private luxury housing, as is occurring in Boston, can inhibit this. Baltimore's Inner Harbor development proceeded under an explicit policy of keeping the whole waterfront clearly accessible to the public.
- The balance between water-oriented transportation and industrial functions, and the displacement and exploitation of these by tourist-oriented ventures, must be understood and translated into planning controls. The Seattle Waterfront, as an example (photo, opposite right) has so far maintained this balance.
- Designs should recognize the special qualities which affect the particular body of water such as tides, seasonal variations in the level of rivers and patterns of wind, fog or temperature. Traditional designs of piers, quays, steps, anchoring devices and many other details were developed in response to these factors, and can be re-emphasized.
- Exaggerated and non-functional versions of waterfront clichés, such as anchors, chains and bollards, should be avoided.

Roosevelt Island Tramway, New York.





a. Hillclimb, Seattle.



b. Seattle waterfront.



c. Battery Park, New York.

CASE STUDY 2.8a

The Golden Gate Ferry System Making Commuting Pleasurable San Francisco Bay Area, California

The Golden Gate Bridge, Highway and Transportation District provides commuter ferry service between Marin County and downtown San Francisco. Marin County terminals are located in Sausalito and Larkspur, with a separate line serving each. The Sausalito line is more of a local service to the town while the Larkspur Line serves as a collection point further upcounty where people arrive by car or feeder bus. The latter line is the subject of this case study.

The Larkspur service is provided by three new vessels and a new terminal structure at each end. The design capacity of the system is 750 passengers per boat and it is projected that 3200 commuters per day can be carried on the three vessels now operating. The ride takes 40 minutes at peak hours and 50 minutes at off-peak when slightly slower speeds are used. The boats spend 10 minutes at the terminals unloading and loading.



This system accomplishes a very unusual feat: commuter transportation becomes an enjoyable experience, one that people can look forward to as a pleasant and/or productive part of the day rather than as the unpleasant price paid for their choices of living and work locations. This point bears emphasis, for it rarely is given sufficient consideration, let alone accomplished, in the design of public transportation. Yet this kind of enjoyable travel could be a key factor in convincing people to switch from their cars.

The planners of the Golden Gate Ferry System explicitly set out to accomplish such a switch. The District had a direct mandate to relieve the congestion on the bridge which it also controls.

The exceptionally appealing travel experience created by the Larkspur Ferry is attributable to three components, in order of importance:

- The design of the boat and the quality of the ride.
- Well-planned and developed access to and from the terminals at both ends.
- The design of the terminals.

The design of the boat and the quality of the ride are the most important factors, since commuters spend 80 minutes per day on the ride. The Larkspur Terminal is well served by feeder buses and a convenient parking lot close to the freeway. The Downtown Terminal behind the historic Ferry building is at the foot of Market Street, within easy walking distance of much downtown employment and the subway station. The design of

both terminals is exceptionally light, airy, colorful and festive. As a result, the terminals are significant assets to the system, even though the punctual service means most passengers spend very little time waiting.

There is an interesting aesthetic contrast between Bay Area Rapid Transit (BART) and the ferry system. Both introduce impressive technology and the latest machinery. But BART's methods are somewhat more humorless and earnest, boasting only of performance and efficiency, and therefore obtaining little affection from the population. The ferry system laces technology with whimsy and delight, providing memorable trips without any loss of efficiency. (Some of these differences occur because the two systems address different sets of problems on different scales.)

The gas turbine vessels are of a highly sophisticated design, and can cruise at speeds up to 25 knots. There are now some regrets about the technology. The engines have proven to be inefficient in their use of fuel and too specialized to allow easy maintenance and replacement of parts. The high speeds have caused some wave erosion, requiring lower speeds along portions of the course.

From the point of view of the traveler's experience, the boats are completely successful. The major aesthetic feature of the trip is the changing view of San Francisco Bay. But the physical design and facilities provided on board greatly contribute to this success. Special features include the following:

- Snack bar, bar and several indoor and outdoor lounges (commuters can regularly have their breakfast and afternoon cocktails on board).
- Comfortable, colorful seating next to large picture windows for views or around tables for work, conversation or games.
- Photo and narrative displays of the history of Marin County throughout the boat.
- Special facilities for bicycle storage.
- A profusion of color and light animating the spaces throughout the boat.
- An overall atmosphere (created by people as well as spaces and furnishings) that promotes a choice between privacy or socializing.



Commuting by ferry is an enjoyable experience.



a. San Francisco Terminal.



b. Boat design satisfies both functional and aesthetic criteria.



Terminal Planning and Design

The Larkspur Terminal includes an elaborate feeder bus service connecting to pickup points in the suburban communities and coordinated with the ferry schedule. Access to the terminal is a simple, efficient operation. The Downtown Terminal, located within a few minutes walk of Embarcadero subway station, is very convenient for most commuters. Visual connections and paths to this terminal are not, however, well developed and seem more remote than they should. The main aesthetic virtues of the terminal layouts are that they do not cause uncertainties, delays or other barriers on the trip.

The two terminals have a similar architectural vocabulary, despite very different site conditions. The Downtown Terminal is a small addition to the extensive older Ferry Building complex and is somewhat dominated by the environment that was already there. Larkspur, the more ambitious of the two structures, was built on a previously undeveloped site. It was a catalyst to other developments now beginning to grow up around it.

The Larkspur Terminal is dominated by a dramatic, white space frame structure that is prominently visible from the approaching boat. It has a strong presence in its otherwise nondescript surroundings. The waiting areas inside are richly landscaped with orange trees, flowers and shrubs and provide small, intimate seating groups along the major pathways. The overall effect resembles a light, spacious greenhouse. Dozens of songbirds have taken up residence among the space frame struts and provide continuous sound effects. The space frame extends to form a canopy over the bus drop-off points and an entrance to the parking lot. The parking lot is clearly organized with islands and dividers, which are planted with trees and

Terminal building visually commands its site.





a. Space frame structure is easily seen from the boat.



b. A greenhouse like landscaped interior.

flowering groundcover plants. The building and site are spotlessly maintained.

In spite of its attractiveness, this building provoked some controversy. Its \$13.6 million cost was greatly above estimated budget. On rainy, windy days the open space frame does not provide enough protection, and the addition of screen walls now being considered is made somewhat difficult by the architectural design. Generally, however, the terminal is a wonderful place at which to arrive or wait.

Costs and Resources

3 Vessels	\$13.0 million
Downtown and Larkspur Terminals	<u>\$23.8 million</u>
Total System	\$36.8 million
	(in 1974)
US-DOT-Transit funding:	\$26.9 million

Clients

The ferry system was developed and is operated by the Golden Gate Bridge, Highway and Transportation District. This agency is also responsible for the operation of the bridge and for providing commuter bus service from Marin County. As a result it is in a good position to balance the three modes of commuting from the county to downtown San Francisco.

Credits

Larkspur Terminal Architects: Braccia/DeBier/Heglund
 Downtown Terminal Architects: Environmental Planning and Design Associates

Lessons

- The Golden Gate Ferry is unique because it shows that a boat system with the latest technology can be very attractive for commuter service.
- The responsible agency's control over several modes of transportation gave it some flexibility in developing, operating and marketing the new system.
- The diversity of on-board facilities is one of the primary reasons why the ride is such a pleasant experience.
- Some of the design features would be attractive only under the right climatic conditions. In Northern cities, both boats and terminals would need more protection from inclement weather.
- The items that caused problems—inefficient engines, excessive terminal costs, and inadequate weather protection—could have been avoided without reducing aesthetic benefits.

Bicycles



Meet of the League of American Wheelmen, Washington D.C. 1884.

The use of bicycles as an alternative to most other modes of urban transportation has inherent aesthetic benefits for both the rider and the rest of the community. These are as (or more) important as the aesthetic benefits of the specific physical design of bikeways. Since relatively little planning or implementation of bicycle systems has occurred in this country so far, this section discusses how this record can be improved and how the overall aesthetic benefits of increased bicycle use have been realized. Specific physical design issues are discussed secondarily.

Contents

Bicycles as Urban Transportation

- Aesthetic Impacts

- Problems Blocking Public Acceptance

Actions to Expand Bicycle Use

- Planning Solutions

- Construction of Bikeways

- Parking, Storage and Transit Links

Funding Sources

- The Paul Dudley White Bike Path, Cambridge and Boston, Massachusetts:

- Case Study 2.9a

Bicycles as Urban Transportation

With a sense of satisfaction, the morning commuter guides her bike across the intersection, choked with cars, trucks and buses. Inside their vehicles drivers look intent and harried. Peddling quickly past the creeping traffic, the cyclist reaches the bike path along the river. Smiling, she breathes in the fresh morning air. The surface of the river is calm. This is her favorite time to be here and she is aware of thoroughly enjoying this ride to work as a needed moment of solitude and physical exercise. Crossing the river towards the downtown district where she works is the best part of the ride. Here the sky stretches widely overhead and every day the color and mood is slightly different. The rest of the trip is more hazardous; she must compete with cars for limited street space. She confidently navigates her way to the office, past the rich architectural facades of nineteenth-century townhouses and commercial buildings, preferring the risk of riding in traffic to a long and passive subway ride.

Bicycles run on the muscular efforts of their riders, the most energy efficient transportation device ever invented. They were the first machine to be mass-produced for transportation, and continue to play a major transportation role in many countries. Bicycle use is widespread in Great Britain, China, India, North Vietnam and Europe. In Amsterdam, during rush hour, 60% of all journeys to and from the city center are made by bicyclists, only 10% are by car. Bicyclists move faster in Bangkok and Hong Kong than cars and buses move in New York or Boston. European bicyclists outnumber motorists two to one, and are ensured a place on the roads by means of facilities and laws.

Although bicycles were popular in the United States at the end of the nineteenth century (four million Americans owned bikes then), there has been little or no planning or implementation of bicycle facilities for urban transportation in this country since the advent of the automobile. During the past decade, however, this trend has begun to shift. In 1972, for the first time since the introduction of Ford's Model T, more bikes (12,000,000) were purchased by Americans than cars. By 1975 there were over 100,000,000 American bicyclists. This renewal of interest in bicycling has been encouraged to some extent by an increase in Americans' leisure time and by the ongoing energy crisis. For too long considered by many as only a toy, the bicycle must now be integrated into the total transportation system.

Aesthetic Impacts

The appeal of the bicycle is based in part on environmental and health considerations. Bicycling is philosophically attractive as well. Aesthetic impacts (considering aesthetics in its wider sense) can include:

- Improved physical fitness and health.
- Pleasures of bicycling as a sport or recreation.
- No addition to air or noise pollution; reduction of existing pollution levels when bicycles substitute for vehicles.
- Reduction of traffic congestion and parking problems. (Eighteen bicycles can be parked in the space for one car. Thirty bicycles can travel in space required by one moving car).
- Quick, flexible, and personalized transportation.
- Spiritual self-discovery. As William Saroyan wrote, "I was not yet sixteen when I understood a great deal, from having ridden bicycles for so long, about style, speed, grace, purpose, value, form, integrity, health, humor, music, breathing, and finally and perhaps best of all the relationship between the beginning and the end."

Roadblocks to Public Acceptance

Public acceptance of the bicycle as a transportation mode has been restrained, due to the problems associated with their use, which include:

- Safety, primarily due to the inadequate design of streets and highways and the lack of both driver and bicyclist education, e.g., how to share the roadway. Other common hazards are debris on the street, storm grates and broken pavement.
- Inconvenience of bicycles in inclement weather.
- Theft of bicycles (mostly in urban areas).
- Limited carrying capacity.
- Lack of parking facilities in some areas.
- Other legal or institutional restrictions to their use (e.g. building regulations prohibiting bicycles).



Actions to Expand Bicycle Use

Actions taken to improve safety conditions and the viability of bicycling as a transportation mode enhance the aesthetic benefits as well. These actions fall into two categories: "no build" planning solutions, and the design and construction of bicycle facilities.

Planning Solutions

The bicycle problem is caused primarily by a lack of planning for integrating bicycles and cars in their common roadways. The solution often lies not in the construction of new facilities, but in providing driver and bicyclist education, and in planning for more effective use of existing resources, such as local streets.

Motorists' and bicyclists' education can make drivers aware of the safety needs of bicyclists, and bicyclists more aware of the hazards of riding on city streets. Drivers in turn must learn to watch out for bicyclists, avoid cutting them off with sudden turns or by opening the doors of parked cars, and generally respect bicyclists' rights to road space. Such educational programs have long been established in European cities, where cars and bikes freely intermingle in the street. English drivers must pass a bicycle handling test.

Local streets provide the most direct and inexpensive bike route systems. They are best suited for the experienced bicycle commuter who is confident in traffic and feels impeded by off-street bike paths shared with pedestrians, joggers and inexperienced bicyclists. Selection of routes is based on the most common destinations, the volume of automobile traffic, speed limits, intersections and parking. Where traffic volume is low, only a sign marking the route is

necessary. Designated bike lanes may be created by removing parking, or, if the street is wide enough, by realigning traffic lanes. When bicycle volume is high and traffic volume low, an existing traffic lane can become an exclusive bike lane. Bike lanes can be accommodated alongside roadways in parks, and adjacent to bus lanes within transit malls. One problem in using less travelled local streets, however, is that they often do not provide the most direct route.

Among the problems of on-street bike lanes is that cars frequently use these lanes for turning, and as an access for parking in driveways. Physical barriers or guard rails would prevent this use but would also be a hazard to bicyclists.

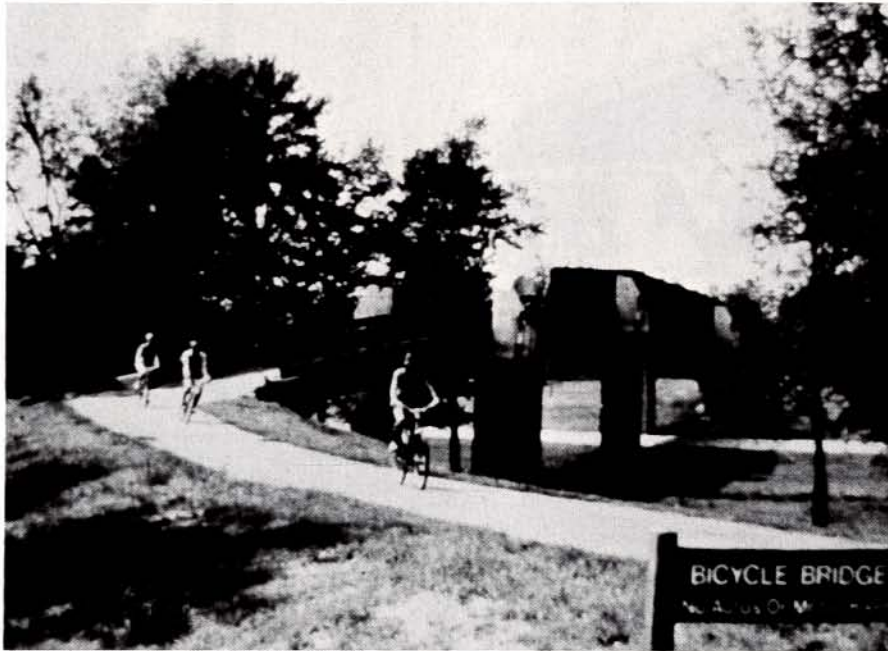
The authority for establishing bike lanes on public streets or highways is often not explicit in local municipal codes. Traffic engineers may be able to establish bike lanes as traffic control devices, but enforcement of street traffic regulations usually rests with the police. Urban bicycling maps enhance these systems by indicating the safest routes, unique features along the way, and intermodal links. The maps also encourage a sense of adventure and discovery of new routes.



a. Bike lane created by realigning traffic lanes.



b. Pavement markings delineate bicycle crossing.



Bicycle bridge arches over Rt. 54, Peachtree City, GA.

Construction of Bikeways

Limited funding for bicycle systems has been available primarily for the construction of off street bicycle facilities. It was once considered always more desirable to provide separate facilities than to share the road. Bike paths also provide excellent access to recreational facilities, often following scenic routes. These paths can be used more readily by inexperienced bicyclists, and shared with pedestrians and joggers.

This solution creates problems of its own, however. Intersections cannot be eliminated, particularly if the bike path serves an urban access function. Moreover, opportunities to build off street bike paths in developed areas are limited. Bike paths are often built where there is room for them, not necessarily where the demand is highest. The cost of construction is high (although not

compared to streets), since paths have often been built with heavy highway maintenance equipment in mind, and many use petroleum-based surface materials i.e., asphalt. Using lighter equipment specifically for maintenance of bikeways and using new materials (i.e. fuel ash or lime fly ash) would substantially lower these costs. In some cases, special lighting, guard rails, signage, and painting may add significantly to the total cost (ref. 43).

Off street bike paths may be built in the medians of parkways or wide city streets such as upper Broadway in New York. Sidewalks have been used, but are not recommended due to the cost of widening and curb cuts, and conflicts with pedestrians. Utility and abandoned railroad rights-of-way can offer good routes with few street crossings, but the purchase of these easements may be expensive. River banks, drainage gulches and canals

are potentially excellent routes, sometimes combining recreational and commuter paths with open space improvements and flood control projects.

Cranford, New Jersey. Cranford, New Jersey's community bikeway system was an outgrowth of the increased awareness of bicycling which resulted from the city's successful bicycle safety program. The 11.5-mile route was completed in 1978 at a cost of \$158,000. It was designed locally, from the point of view of the community bicyclist and police traffic safety officer. Construction was by the New Jersey Department of Transportation with 70% of the cost borne by the Federal Highway Administration and 30% by the state.

Cranford's bikeway consists mostly of low-traffic streets, designated as "Bike Routes" to form a continuous system leading to schools, public transportation, shopping and recreational areas. Paths are eight feet wide, and provide access over a river, under a railroad and through parkland.

Use of the bikeway system is not mandatory. The system is popular, however, and many bicyclists choose to avoid high traffic streets by following the bike route signs.

Existing roads were used whenever possible to provide greater security at night. Separate bicycle paths were built only where necessary to avoid obstacles, and were made as visible from the road as possible, to facilitate observation by both police and citizens. Safety is also enhanced by the frequent use by joggers and pedestrians as well as by bicyclists.

In order to avoid traffic conflicts, bike lane markings were not painted on the streets. It was determined that lanes would require a ban on street parking, a disadvantage for homeowners and merchants and not a clear safety advantage. This community felt that the solution to safety problems was in "teaching bicy-

clists and motorists how to share the roads, not in trying to separate bikes from other vehicles on the road" (ref. 40).

A five-member Bicycle Board, funded from the police budget, plans the city-wide program of education and media coverage, and directs police enforcement actions. The enforcement effort is supported by an education and public information campaign, involving as many as fifty officers and citizens at a time. According to one reviewer of the program, Cranford's police/citizen team has succeeded without outside funding "because of the involvement of the entire community and the tenacious dedication of its organizers" (ref. 40).

Parking, Storage and Transit Links

In order to encourage bicycling, safe parking, storage facilities, and intermodal connections with public transportation are often needed. These facilities help address the problem of theft, and commuter needs. Long-distance bicycle travel to recreational areas can be encouraged by the same means.

Parking and storage facilities can be located at major employment centers, shopping malls, parks, garages, parking lots, near building entries on sidewalks, and at mass transit locations. When located at transportation terminals or stations, bicyclists may park and ride to destinations otherwise hard to reach due to distance or physical barriers. The bike racks currently available are inadequate, because they generally do not protect the entire bicycle. In response to this, Denver residents, in cooperation with the Denver planning office, designed more secure racks, which are attractive urban furniture as well. Similar actions are being taken in many other cities. Bike racks and locks can be financed by public agencies, service clubs, businesses, or franchise with a manufacturer. Fees can be charged for supervised parking, (or for storage in more expensive lockers) but should be low enough to encourage bicycle use.

Denver's urban bikeway plan includes a bicycle-bus transfer system. Along the six express routes which serve the city's outlying areas, public use facilities (i.e. gas stations, libraries) will serve as locations for bicycle parking. Bike racks will be provided at no cost to the adjacent facility, and bicycles will, in effect, be under observation all day. The "pedal-hopper", where the bicycle is carried onto the bus and parked in a rack, is also under consideration. Conventional buses could carry sixteen bicyclists. This dual system is currently in use in San

Francisco on buses and BART. In San Diego and Seattle, bike racks are provided on the outside of buses.

Several transit systems (San Francisco's BART, Washington D.C.'s Metro, New York-New Jersey Path, Atlanta's MARTA) provide bike parking facilities at their stations. In the BART system, 1,200 bike racks have been placed where there is high station activity, and if possible, in sight of station agents. For safe storage, 650 weatherproof bicycle lockers have also been installed both in suburban and downtown structures. These lockers rent for five dollars a month. The Bikes-on-BART policy allows bicyclists to bring their vehicles on board trains, with some restrictions. Bicycle commuter and recreational trails have been developed in coordination with BART stations to provide better linkages between bicycles and transit, and core cities and recreation areas in the Bay Area.



a. Well designed racks protect the entire bicycle.



b. CALTRANS shuttle service.



c. Bicycles may be brought onto BART trains.



Highway funds were used to construct this bikeway in West Salem, OR.

Funding Sources

Each state has various funding sources which can be used for bicycle-related projects. Often existing budgets would allow expenditures for such projects, and efforts can thus be aimed at redirecting current expenditures rather than seeking additional funds or legislative authority. Some federal funding sources include:

- **Safety.** The Highway Safety Act of 1966 created the National Highway Traffic Safety Administration (NHTSA) to address highway safety problems. Section 402 of this act provides funds to the states for highway safety programs, including bicycle safety projects.
- **Planning.** The Federal Highway Administration makes available planning funds from the Highway Trust Fund, intended for the development and implementation of highway projects, which include bicycle facilities. These funds are only for projects in urbanized areas.
- **Construction.** The federal-aid highway program provides monies to states which can be used to support construction of bicycle facilities and walkways. Some states have earmarked highway funds (gas/sales tax revenues) for bicycle-related projects. Oregon has legislation that requires one percent of its highway funds to be spent on bikeways and footpaths.
- **Other programs** include the Department of Interior's Heritage Conservation and Recreation Service, for recreational bike path construction; General Revenue Sharing; funds from the Development of Housing and Urban Development (HUD) for urban bikeways; HUD's Open Space Land Program; and the Economic Development Administration's Public Works Program for construction in areas with high unemployment or low family income levels.

Bicycle-related improvements can often be included in general, high expenditure programs, such as park beautification, waterfront development, urban renewal, and bridge construction projects.

CASE STUDY 2.9a

The Paul Dudley White Bike Path

**Building a Bike Path in an Urban Area
Boston and Cambridge, Massachusetts**

Construction of this 25-mile route along the Charles River is now nearing completion. The bike path has been named after the dedicated advocate of biking for better health, Dr. Paul Dudley White. It follows a panoramic route along both sides of the river from Watertown Square to the Charles River Dam and locks, which lead eventually to Boston Harbor. Parallel to, but separate from, the roadway, it is used for recreation and commuting, and provides splendid views. Bicyclists of all skills share the path with pedestrians, joggers, and recently, roller skaters, as well.

Land along the river is part of the Metropolitan Parks System, which was established in the 1890's for the joint operation of park services for the surrounding Boston communities. The Metropolitan District Commission (MDC) maintains and governs these lands, and over 170 miles of roadway. In addition to the Paul Dudley White Bike Path, the MDC has two other completed bike circuits, and long-range plans for extensive paths along the Neponset and Mystic Rivers nearby.

This route illustrates a number of typical situations encountered when building a bike path within older urban areas.

- One common problem is how to get around physical barriers, i.e. bridges and viaducts. Previously, when bicyclists reached the viaduct under the Longfellow Bridge, for instance, it

was unclear where to go next. Only one and one-half feet remained on the side of the road for the bike path at this point. The design solution was to increase the sidewalk width by reducing the roadway, and installing two foot high, smooth granite edge stones as barriers. This resulted in a seven-foot wide path, protected from traffic. Similar solutions can be applied to other highway viaduct bridges at very little cost.

- At the Boston University (BU) Bridge, a dangerous intersection was avoided by constructing a wood platform underneath the bridge (see photo). The new platform has the aesthetic benefit of revealing the Boston skyline, framed by the river and the bridge overhead, to bicyclists and pedestrians.
- Recently, renovations were completed on the section of the route through

Boston's famed Esplanade, a riverside park. Paths were made using a dense mix of small stones, creating a smooth new surface. Many thoughtful amenities were provided along the way, including seven drinking fountains, benches, picnic tables and 25 police phones. This is a high crime area at night, but is still frequently used by joggers and bicyclists. Previously, the closest phone was located several blocks away.

- Plans to extend the bikeway include recycling an unused railroad bridge connecting that links Boston and Cambridge into a bicycle and pedestrian way, and developing the land at the foot of the bridge into a park.

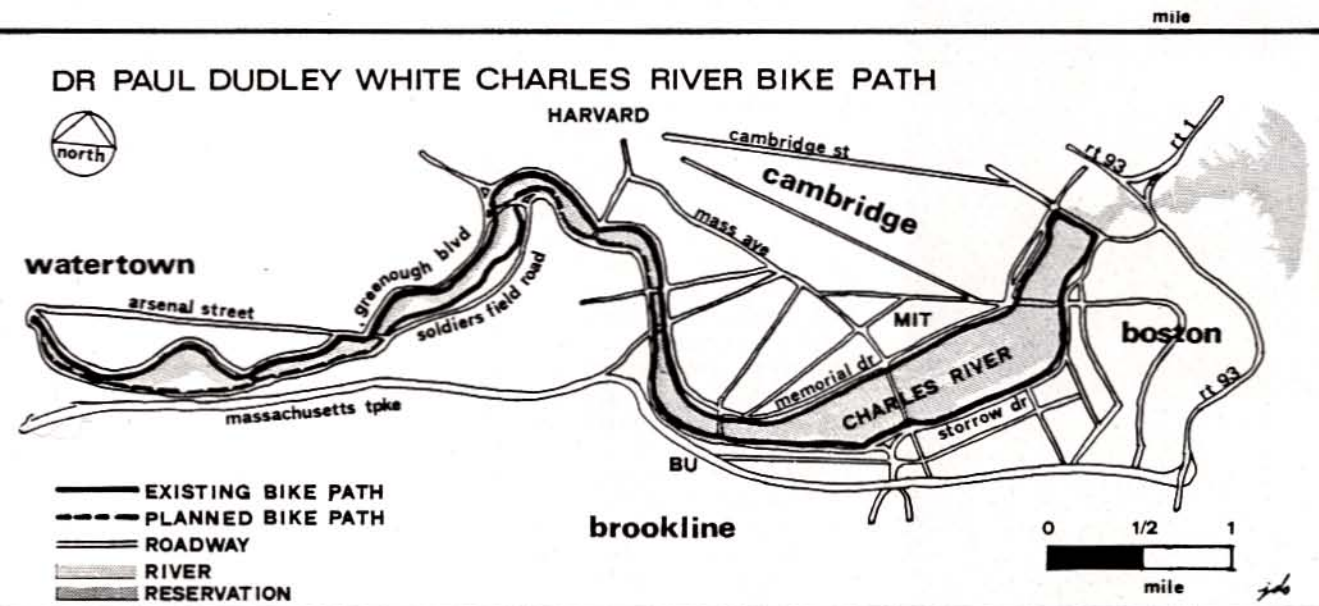
The first phases of this bikeway system were funded from regular MDC recreation budgets. These were limited and much in demand, thereby insuring that the bikeway could be constructed only in small increments. A recent ruling by the State Administration and Finance Commission, however, made highway funds available for bike paths that parallel highways. This has permitted the planning and execution of more ambitious phases.

Costs

Construction took place in four phases, with a fifth and final phase pending. It is difficult to translate costs into a per-mile figure or to compare them to other localities. Some work was incorporated into other MDC contracts, and work of later phases was applied towards upgrading earlier projects which had been inadequately completed.

Phase 1	1971-2	\$30,000
Phase 2-4	1974-8	\$1,142,000
Phase 5	proposed	\$500,000

Recreation funds were used prior to 1975. For phases 3 and 4, highway monies were used for projects parallel to the road.



Bikeway follows the river on both sides.



a. Bikeway under Boston University Bridge.



b. Water fountain is scaled for bicyclists' convenience.



c. Traffic lanes were realigned for widened bike path under the viaduct.

Credits

The Metropolitan District Commission has owned, designed and supervised construction for the bike path. Engineer Richard Ward has been in charge of the project, overseeing planning, design, and construction.

Lessons

- The development of an ambitious urban bikeway can require a clear overall plan and a patient, phased execution.
- Local conflicts between bikes and autos, or a lack of space for the bikeway, can be handled by some ingenious technical solutions. These can differ dramatically from highway and road design techniques, due to the lighter loads of bicyclists and pedestrians.

- The presence of a strong bicycle advocate in a responsible position within an agency in charge of local transportation is essential for obtaining adequate attention to this mode of travel.

Contents Chapter 3

- 3.1 Assessing Potential Impacts
- 3.2 Urban Highways and
Guideways
- 3.3 Station Parking and Feeder
Service
- 3.4 Joint Development
- 3.5 Common but Neglected
Elements

3

Integration With the Built Environment

Introduction

This chapter addresses the aesthetic issues involved in integrating transportation facilities with their surrounding communities. A successful integration can accomplish two purposes: it can avoid destroying existing aesthetic values in the community, and it can create new opportunities for a lively environment.

The assessment of such aesthetic impacts is now required for transportation projects using federal funds. Methods for these assessments are discussed in Section 3.1. Sections 3.2 through 3.5 cover aspects of design which can insure that transportation facilities add to, rather than subtract from, the aesthetics of their surrounding communities.

Three types of facilities have the most important and frequent aesthetic impacts on the surrounding communities: highways and guideways in center cities (Section 3.2), parking and feeder service at rapid transit stations (Section 3.3) and multi-use joint developments (3.4). In these three cases, integration with surroundings is a problem separate from basic facility design.

It is not only entire facilities that have impacts on the surrounding community. Standard components such as paving, fencing and signs are routinely deployed in the environment without regard for their aesthetic impacts. Section 3.5 discusses these often overlooked elements.

Some elements of transportation facilities (such as streets, parking, buses and harbors) form a continuous environment and need to be discussed together. These elements/facilities have already been covered in Sections 2.1, 2.2, 2.4 and 2.8—sections which included discussions of

interactions with the adjacent built environment so need not be repeated here.

Providing more explicit guidelines for integrating facilities with different community types (according to density, topography, climate, social factors, etc.) was considered and rejected. There are too many variables for such a classified set of design guidelines to be really useful. Moreover, in all the case studies, it was found that the best designs were very specific, inventive responses to the local conditions that could not have been anticipated by any sort of generalized design guidelines. These projects happened because committed and forceful administrators in the city or transportation agency were willing to work with advocates for the community environment. Top quality designers were generally retained and given the freedom they needed to create a good piece of work.

Assessing Potential Impacts

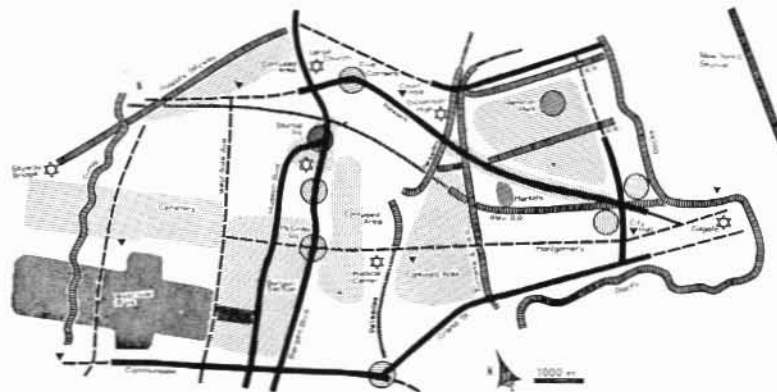


The assessment of aesthetic impacts is required as part of federal environmental impact review procedures. The current practice of such assessments for transportation projects contain some unsatisfactory aspects, to the detriment of aesthetics. This section discusses some techniques to improve these assessments.

Contents:

Legal Requirements for Aesthetic Impact Assessment

- Problems with Present Procedures
- Inventory and Analysis of Existing Aesthetic Resources and Values
- Urban Ecological Analysis
- Anticipating Aesthetic Impacts



	PATH	EDGE	NODE	DISTRICT	LANDMARK
major element	thick solid line	thick dashed line	large solid circle	large irregular shape	large star symbol
minor element	thin solid line	thin dashed line	small solid circle	small irregular shape	small star symbol

The visual form of Jersey City as seen from the field, and the aerial view (ref. 128).

Legal Requirements for Aesthetic Impact Assessment

Appropriate consideration of aesthetic qualities and impacts of transportation projects vis à vis the built environment is not only a desirable objective but also a legal requirement. All projects utilizing federal funds are subject to Section 102(2)A of the National Environmental Policy Act of 1969 (NEPA), which requires agencies to:

“ . . . utilize a systematic interdisciplinary approach which will insure the integrated use of the natural and social sciences and the *environmental design arts* in planning and in decisionmaking which may have an impact on man's environment.” (*emphasis added*)

NEPA also establishes the need to:

“Identify and develop methods and procedures . . . which will insure that presently unquantified *environmental amenities and values* may be given appropriate consideration in decisionmaking along with economic and technical considerations.” (*emphasis added*)

The spirit of this and other aspects of NEPA is to encourage productive and enjoyable harmony between people and their environment. More specific references to aesthetics are contained in several statutes applicable to federally assisted transportation projects including Sections 2 and 4(f) of the Department of Transportation Act, Section 109(h) of Title 23, U.S.C., and Section 106 of the National Historic Preservation Act.

The strongest and most specific requirements are related to publicly owned park and recreation lands (under Section 4(f)) and to historic places (under the National Historic Preservation Act of 1966). Aesthetic impact concerns are central in both of these areas, and sensitive design re-

sponses are usually required to mitigate the impacts involved.

However, in order to insure thorough consideration of “unquantified environmental amenities and values” (in this case aesthetics), environmental reviews must not rely on these special statutes alone but need to continually reinforce the spirit of NEPA. This is essential, for aesthetics play a major part not only in open space and historic places but in all aspects of transportation and community design.

Problems with Present Procedures

The operative portion of NEPA has become Section 102(2) (C) which requires that all Federal agencies include in every proposal for an action “significantly affecting the quality of the human environment” a detailed statement on the impact of the action.

Many of the current aesthetic assessment procedures, however, suffer from the following:

- Aesthetic impact is often treated in a cursory or mechanical manner resulting in a data base that is either too general or too complex to be of real value in the decision-making process.
- Sporadic attempts are made at quantifying some elements, but few holistic approaches are used with appropriate involvement of design professionals.
- Most impact studies treat aesthetics separately from other impacts and do not adequately recognize the tradeoffs that exist between aesthetics and other project considerations or the relative value placed by the affected community on aesthetic qualities.
- Aesthetic impacts are often examined after the location has been completely worked out, leaving room for only cosmetic treatment.
- Few satisfactory techniques are used to

determine the impact of changes on people's experiences and the value to be accorded to these factors. Such techniques can be important since personal responses to the environment tend to be subconscious, not well understood by the people themselves, and elusive if reliance is placed on interviews alone.

- Frequently aesthetic concerns get thorough consideration within the Environmental Impact Statement process only when communities or concerned organizations lobby for them. Such is arguably the case with the Red Line Extension, Harvard Square (*ref.* 127); and the West Side Highway reconstruction proposal (*ref.* 63).

The remainder of this section focuses on some assessment techniques which attempt to address these difficulties.

Inventory and Analysis of Existing Aesthetic Resources and Values

Many of the currently used visual assessment techniques have been derived from the work of Kevin Lynch and his seminal *Image of the City* (ref. 128). This book identifies five generic elements—path, edge, node, district and landmark—which form a person's perceptual map of the city. The conceptual framework was developed and tested with residents of three U.S. cities. It proved to be an excellent descriptive tool for specifying the distinctive and memorable aspects of urban form. What it did not provide is a clear-cut standardized evaluation process or "automatic" design criteria for the five elements.

Another often overlooked, yet important, component of the aesthetic experience is the type and character of activities which occur in a given place. Activities and their settings interact in complex, but by no means random ways. The rules of interaction are sometimes known and measurable, sometimes known but not measurable, and sometimes unknown or subject to disagreement. Sophisticated quantitative techniques for measuring these relationships have been researched but are not sufficiently advanced to be applicable. The most useful approach is careful, detailed observation by design professionals and detailed recording of these observations on maps, photographs and other illustrations.

Before one can estimate what effects change will have on a particular environment, the environment must be appraised. Among appraisal and valuation techniques which have evolved to address this issue is Lynch's *Looking at the Vineyard* (ref. 129). It includes val-

uation techniques in a description of eight distinct landscapes on Martha's Vineyard Island, Massachusetts. Prescriptive regulations for road, path and parking character in each landscape were developed with extensive community input about which areas and elements people liked, which they disliked and why, and the changes which would enhance their life on the island. This subjective valuation was combined with technical terrain and ecological analysis to aid in arriving at final recommendations. Lawrence Halprin, designer of Freeway Park (Case Study 3.2a), has also developed and tested participatory valuation techniques with successful results in a number of cities, including Cleveland and Omaha (ref. 126).

Urban Ecological Analysis

The Urban Ecological Analysis technique (ref. 134) displays aesthetic resources and issues to the community and client in terms which facilitate decision-making on street management and improvement alternatives. The central element of this technique is a detailed base map of existing physical conditions upon which use patterns, issues, user perceptions and recommendations can be recorded. Inventory maps are then overlaid on one another to display activity complexes or "settings".

This is similar to the method pioneered by Ian McHarg for analyzing natural settings by land features such as soils, slope, vegetation, views and vistas, etc. (ref. 130). Maps of interrelated phenomena can then be overlaid to determine environmental "suitability" (i.e. minimum constraints) and "capabilities" (i.e. positive contributions) for regional transportation or other alternatives.

The Urban Ecological Analysis can similarly facilitate judgments about the following types of transportation actions:

District-Wide Traffic Management in downtown or dense residential neighborhoods must respond to the often conflicting claims to the public streets by vehicles and pedestrians. Improvements may include traffic diversion and auto restricted zones, exclusive busways, parking restrictions, etc. The new networks created by these elements should not only work as transportation systems but also be compatible with and complement the surrounding urban fabric.

Street Classification based on urban ecological factors insures the appropriate use of streets. The factors considered include street width, adjacent building masses and frontages, pedestrian and vehicular entrances opening on to the street, present pedestrian and vehicle volumes, and symbolic roles of the street in the city fabric.

The summary classification of a street may be: primary pedestrian/shopping street, secondary pedestrian/shopping street, auto distributor street, auto and service access street, transit/pedestrian way. The resulting street classification should be the best possible fit between the street's natural role in the fabric and requirements of the various transportation networks.

Fixed Guideway Transit location and design can involve both generation and displacement of activities. It may greatly affect the streetscape, especially if on or above ground level. Fixed guideway systems can create the incentive for new growth or revival but can also become barriers between districts and activities. "Suitability" and "capability" maps of a district can be useful during the conceptualization of alternative routes, technologies, vertical alignment and station location. Impacts on streetscape and architectural character, including light, shade, noise, views and microclimate can be specified and examined in the context of each location.

Station Location and Configuration can be designed and evaluated in relation to the surrounding architecture, pedestrian/vehicular conflicts, and activity patterns. The Harvard Square study, described in ref. 127, suggested a series of criteria for the redesign of the subway station which was planned for reconstruction. Some relationships were revealed through the analysis which were not obvious initially, such as the station configuration that was most attractive for different types of shopping.

Neighborhood priorities defined through directed discussion.



Anticipating Aesthetic Impacts

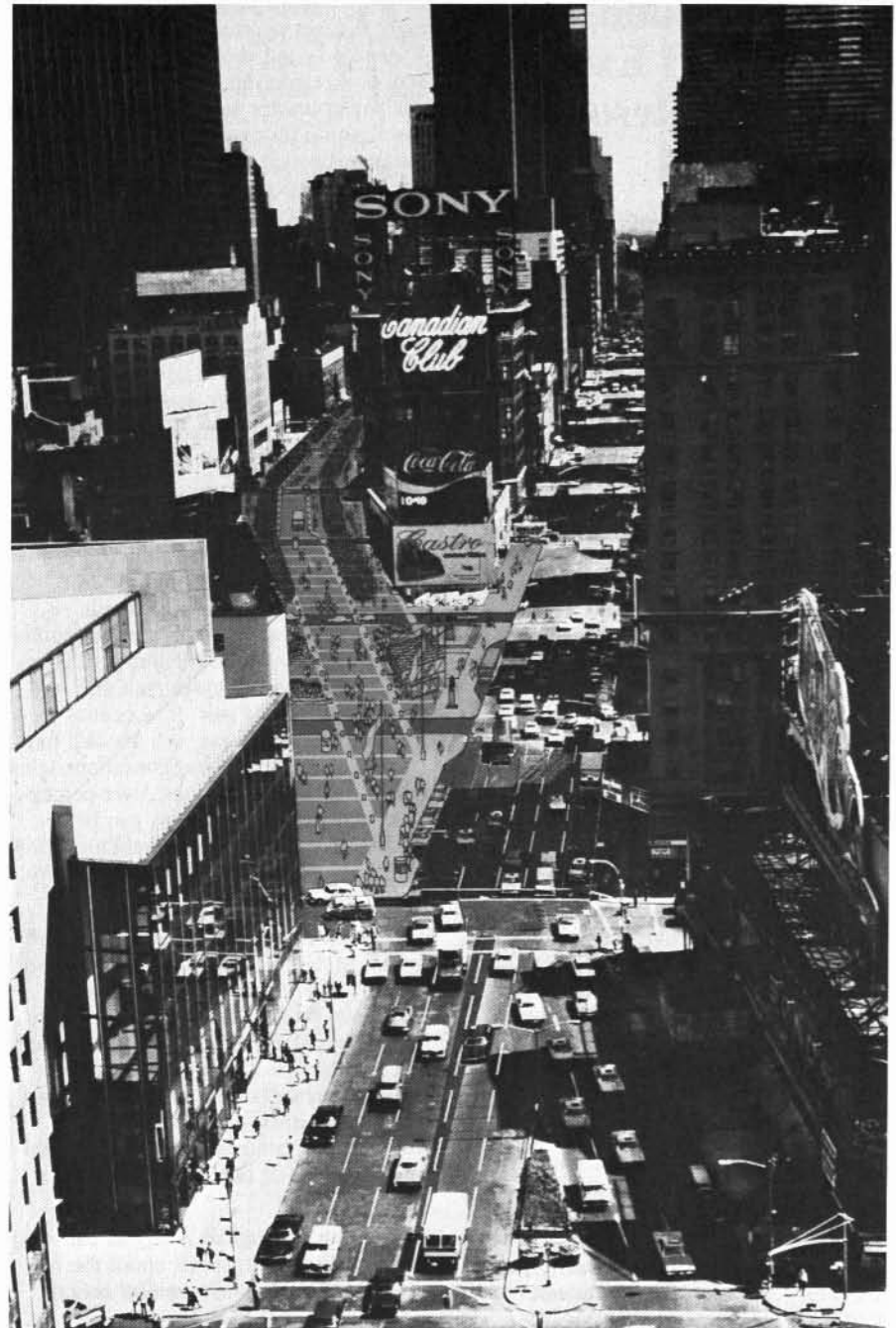
The most commonly used techniques for simulating aesthetic impacts are architectural drawings and models, montages over photographs of the existing environment, and analogies to similar facilities already built in similar environments. Presentation, however, can be deceptive. Renderings illustrate distinctly selected, usually flattering viewpoints. Surroundings are often abstracted and difficult to perceive. Montages and "before and after" studies partially address this issue. The most complete physical simulation is afforded by a three-dimensional model. However, what looks good from the bird's eye view may not from street level. Thus, when models are used to illustrate anticipated impacts, it is important that they be viewed from simulated eye level. Various optical instruments are available for simulating the effect of moving within the physical setting.

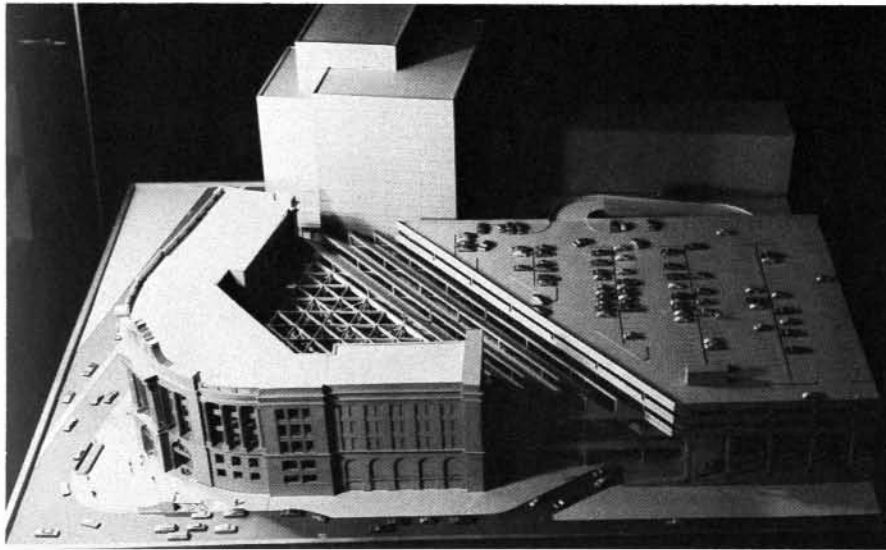
Secondary impacts such as induced development and changes in the social environment are the most difficult to assess, yet these too, have important aesthetic implications. An added complication is that aesthetic impacts interact closely with the social environment and economic attractiveness. Sometimes these factors are perceived together as the "image" of the community. Analogy to similar built facilities can be effective in simulating the combined impacts. This technique must be used judiciously with a clear understanding of the major differences and similarities between the projects being compared.

Simulation of other non-physical impacts that will affect the quality of the environment (i.e. auto traffic generated, changes in pedestrian activity, security and maintenance) can also be evaluated and displayed using the Urban Ecological Analysis. Often some of those effects

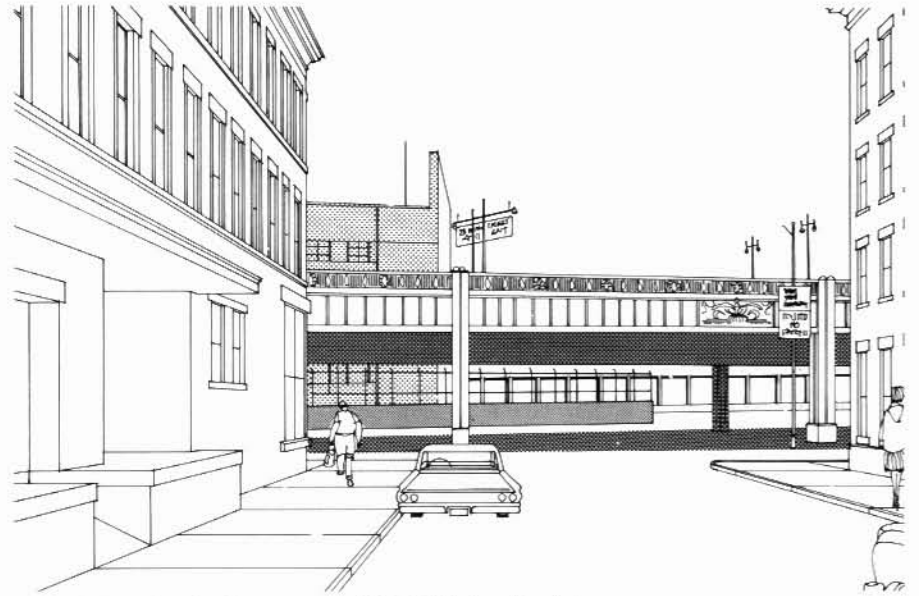
will be presented within large computer-generated tables of projected traffic, travel demand and use patterns. In this form, they are difficult for decision-makers and community groups to decipher. Mapping these patterns and juxtaposing them with the existing situation is more illustrative and readily understandable.

Most critical in anticipating aesthetic impacts is that the appropriate techniques be used at an early enough stage in the process to truly inform it. The techniques themselves must facilitate review, necessary value judgments, and negotiation of alternatives within an open, participatory process. This requires close coordination between aesthetic simulation techniques and the decision making process.





a. Model of proposed renovation of South Station, Boston.



b,c. Renderings to show visual impacts at eye level, West Side Highway, New York.





Urban Highways and Guideways



Brooklyn-Queens Connecting Highway at Brooklyn Heights, New York.

This section focuses on the aesthetic problems associated with transportation facilities that cut across dense urban areas, and on the opportunities for aesthetic solutions. The focus here is on ameliorating pre-existing situations, although the design of new or rebuilt structures for integration is also discussed.

Contents

Fragmenting the City

Designing for Integration

Removing or Rebuilding

Adding Platforms

Transforming Viaducts

Developing Air-Rights Projects

Planning, Design and Implementation

Case Studies

Freeway Park,

Seattle, Washington:

3.2a

BART, Albany and

El Cerrito, California:

3.2b

Fragmenting the City

What used to be a city street now has buildings on only one side. Open space the width of a city block is on the other side. You can't quite see across the space because a ramp and guardrail partially block the view. A ten-lane highway is in a trench in the open space. There are service roads on both of its sides and heavy traffic. The street that crosses the highway has no pedestrian crossing lights. It rises to a crown at the middle of a bridge about six feet higher than the sides of the road and this makes the crossing seem longer. At the middle of the crossing you can see the traffic and feel cold wind blowing along the trench. Finally, on the other side of the open space that seems very far away, there is another crippled half-street and the city starts up again.

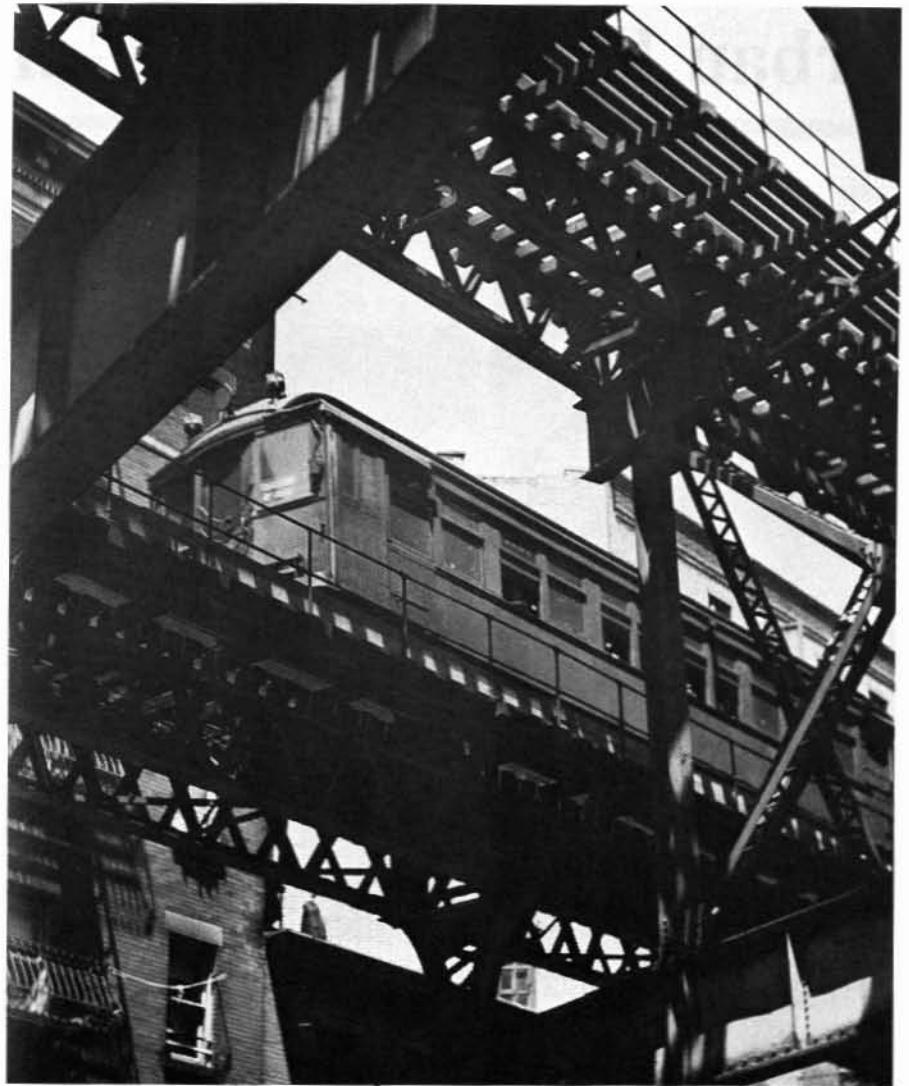
Railroads started splitting cities in the 19th century and gave rise to the concept of the "wrong side of the tracks." Transit systems introduced elevated viaducts in New York, Chicago, and Boston and brought blight to the streets they ran on. Highway cuts, viaducts, ramps and interchanges achieved similar results on a larger scale.

Transportation facilities that cut across cities have the following impacts:

- Splitting districts and neighborhoods in the city from one another.
- Discouraging pedestrian movement.
- Disrupting the fabric and visual scale of the city.
- In the case of elevated structures, blocking views and creating dark, sometimes dangerous places under the structures.
- Wasting land and disrupting the geometry of city streets and blocks.
- Severing valuable aesthetic resources, such as waterfronts, from the rest of the city (see Section 2.8).

Since these aesthetic problems, and many additional functional ones, have now been recognized by most cities and transportation agencies, no new projects in large cities are likely to be built with a blatant disregard for the city fabric. If transportation lines go through central areas at all, it will be necessary to provide funds to put them below grade or provide covering structures that permit reintegration of the urban fabric. Subway construction projects have in fact been treated as opportunities to improve the surface environment, helping to compensate for the years of disruption during construction.

Smaller cities with declining activity and depressed real estate values are still in some danger of being cut up by poorly planned highway construction. The impacts of poorly integrated transportation structures on the city are so wide-ranging and long-lasting that they should not be allowed in urban areas.



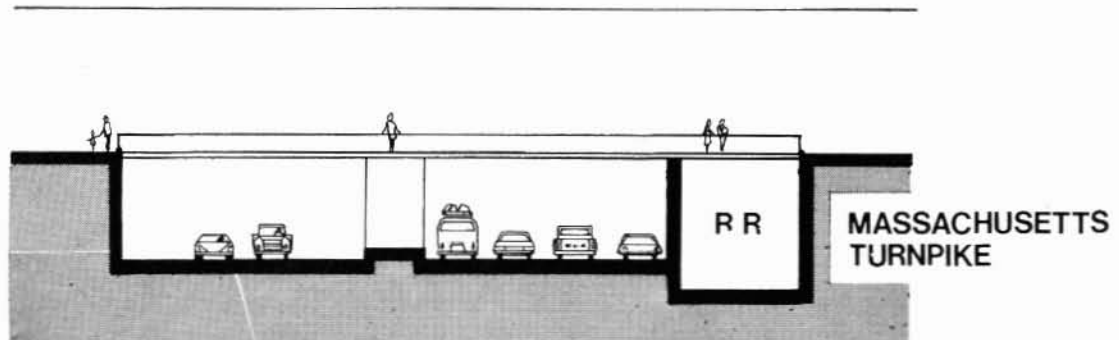
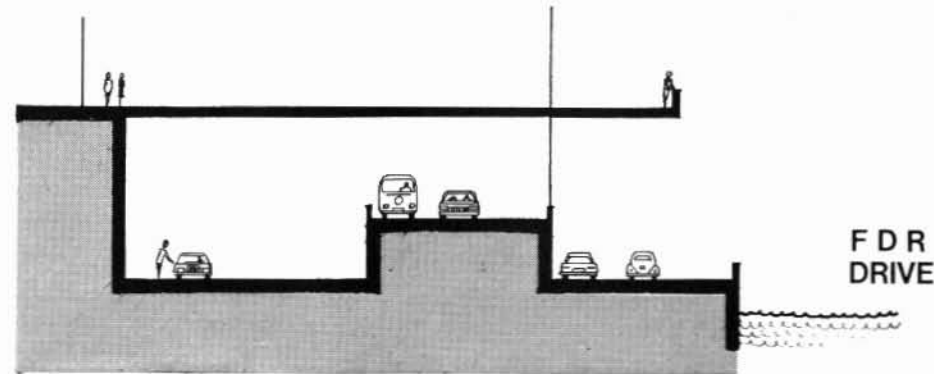
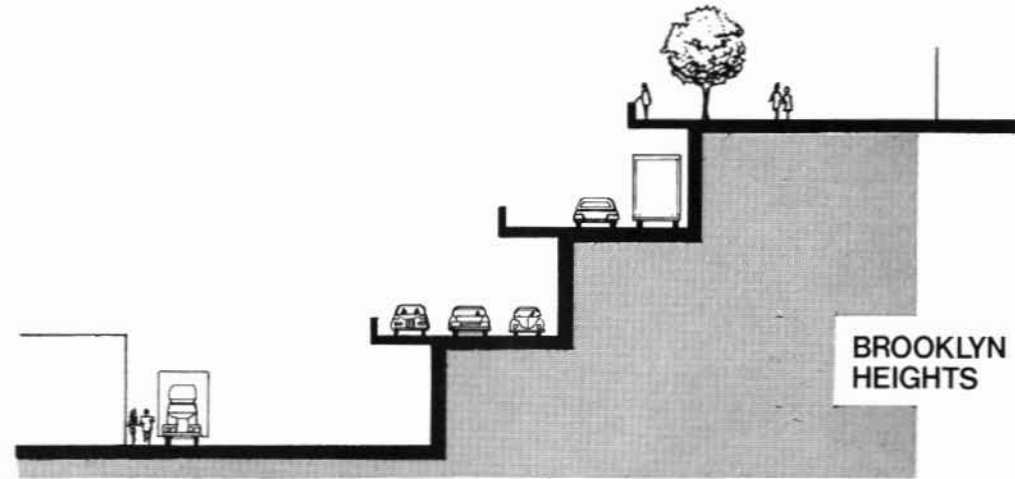
Some new urban highways are still being constructed; the following section discusses briefly some opportunities for designing those for integration. Most U.S. cities have already been disrupted by cuts, viaducts and interchanges, so the remainder of the section focuses on opportunities for remedial action.

Designing for Integration

For new urban expressways, it is essential to "design in" maximum opportunities for integration. The criteria for these have been analysed in other studies (refs. 58, 59, 64, 84).

The following are a few outstanding points:

- Select routes where the urban fabric is already discontinuous, such as along railroad trenches and edges of industrial zones. This occurs at most waterfronts, but waterfront siting of highways can cause serious problems for cities (see Section 2.8). There are exceptions where integration has been handled successfully. For example, the Massachusetts Turnpike followed a railroad trench to minimize disruption.
- Use natural topography to minimize the highway's impact. The Brooklyn/Queens Expressway is still the best example of this where both drivers and the community above have spectacular views of the East River, yet the Promenade and the residential community are totally shielded from the traffic. Other cities with high bluffs along the water such as Memphis and Seattle may have missed similar opportunities.
- Set road elevations to insure level clearance of the existing city streets over the highway or under bridge structures. There are many unfortunate examples of not depressing highways deeply enough to save a few feet of excavation, thereby forcing all cross streets to rise sharply to clear the road.
- Design and engineering of medians, retaining walls, and ramps should anticipate the potential for air-rights construction. An urban design analysis of the route through the city can set priorities for the likely demand for air-rights construction along the route. Highway structures in the city should generally allow for this possibility.





a. Penn's Landing, Philadelphia.



b. Capital Reflecting Pool.

Removing or Rebuilding

Disruptive transportation structures have been removed most frequently when, besides being aesthetically undesirable, they become technologically obsolete. Numerous older elevated rapid transit lines have been removed for this reason. In Boston, a major reconstruction of the Central Artery was used to justify plans for complete reconstruction below grade. The collapse of a section of the West Side Highway in New York opened the door to considering less obtrusive alternative configurations. There are some examples, such as the removal of Harbor Drive on the Portland, Oregon riverfront, where a road was removed simply to restore access to the river.

It is likely that there will be many proposals from cities in the next decade for the removal or rebuilding of disruptive highways. These can be enormous, long-term and costly projects. However, they

may offer the only remedy for serious mistakes made in earlier highway building. If rebuilding takes place, the techniques discussed earlier in this chapter should be applied. Other techniques, described below, might provide appropriate (and less expensive) solutions.

Adding Platforms

Platforms can be built over depressed urban expressways to re-establish the ground plane of the city. While such provisions have sometimes been incorporated into the original road structure, platforms can usually be added after projects are in place. The platforms have been used for both public open space and the development of extensive building complexes. Examples of open space development include the Capitol Reflecting Pool in Washington, D.C., Penn's Landing in Philadelphia (see photos above), and Seattle's Freeway Park

(Case Study 3.2a). Examples of mixed use joint developments are discussed below under "Air Rights" and in Section 3.4.

The aesthetic benefits of platforms can range from visually eliminating the road and restoring the continuity of the city "as if nothing had happened," to creating a new special event. In the case of the Capitol, the monumental and historic values demanded eliminating the road. Freeway Park covers the road but also creates an event for the driver.

The cost of platforms may run \$50 per square foot or more depending on engineering complexities. However, in many cases the construction of platforms can make accessible additional vacant land on medians, between ramps or at the edges of the road and thus possibly lower the actual cost per square foot of reclaimed land. In many downtowns the value of land is \$50 per square foot or

higher, making platforms a good investment. The subsidy required in areas of lesser land value is often justified in terms of relieving the harsh negative impacts of an open trench on the community.

The platforms pose a design challenge from the points of view of both the pedestrian's crossing above and the vehicles passing below. The exceptional way that Freeway Park responds to both of these issues will be discussed in Case Study 3.2a.



a. Shops under treeway, Tokyo.

Transforming Viaducts

Elevated highways and tracks have become major disruptions and symbols of decay in many cities. Applied treatments cannot overcome all of these problems, and removal may be the only aesthetic answer. But there are treatments that can bring a measure of improvement. These range from planting decorative vines, such as shown below for the Embarcadero, to completely transforming the environment, as in the Hillclimb Project in Seattle (described in Section 2.8).

Many modest uses such as parking, temporary markets, or recreational facilities, have been introduced under structures (Case Study 3.2b). Most of these only partially mitigate the disruptive ef-

fects of the viaduct. Shops under a highway in Japan give a glimpse of the more exciting opportunities for transforming the structures into shelters for vital activities. Covered arcades could cross under the highway. Waterproof roofing, noise dampening, lighting and other climate protection appropriate for the region could be added. Offices or apartments could be erected along the highway, (facing toward the city and buffered against the noise and fumes by walls), to reduce the visual impact of the highway. The costs would be relatively moderate, since basic structural modification of the viaduct could be avoided. New commercial developments are another possible use that would increase tax revenue for the city.



b. Embarcadero, San Francisco.

Developing Air-Rights Projects

The construction of major multi-use complexes over transportation structures was initiated with Grand Central Station. A great variety of more recent projects, from L'Enfant Plaza in Washington, D.C. to Place Bonaventure in Montreal, have followed suit. These projects provide a range of opportunities for re-connecting the fractured city fabric.

The potential aesthetic benefits are increased activity and new pedestrian connections animated by shops or made attractive by public open spaces. One common defect of many past projects has been the isolation of a new air-rights development from the adjacent streets by wide access roads and an inward-focused design. Examples include Boston's Prudential Center and the Gateway Plaza in Newton, Massachusetts. In order to maximize the benefits of connection across the highway, the projects would best be designed to tie closely into the surrounding urban fabric and pedestrian patterns.

Such commercial ventures are most likely to be initiated by developers in dense downtown areas where demand is high and new sites are difficult to find. However, cities in collaboration with transportation agencies can encourage air-rights development where in their view it is in the public interest by subsidizing the cost of the air-rights and providing the foundations and platform structures with public funds.

Mixed-use joint development also provides opportunities that range beyond connecting across a highway. These are discussed further in section 3.4, specifically with regard to development at stations and terminals.

Planning, Design and Implementation

Healing scars caused by transportation facilities requires considerable resources, skills and coordination. The success of such a program depends on the correct analysis of critical conditions, imaginative urban design ideas, tenacious local leadership and the availability of federal funding.

Critical conditions to be taken into account include:

- Physical configurations of highway and topography.
- Activity levels and attractions of both sides of the highway.
- The physical scale, density and architectural character of the surrounding city fabric.
- Availability of redevelopment sites or adaptable buildings and functions adjacent to the highway.
- Land values, market demand and development interest related to these adjacent sites.

The role of urban design is amplified because:

- The concept of turning an existing problem into an attractive redevelopment must be convincingly formulated and sold to a range of naturally skeptical parties.
- Complex functional elements involving highway and traffic engineering and economic, architectural and landscaping concerns must be integrated into a single coherent project.
- The initial ideas on how to accomplish such projects have almost always been developed by designers.

Local leadership has played a critical role in the successful projects. An acute problem arises because some projects

may take as long as 5 to 10 years to implement. Elected officials generally have shorter terms than that and may tend to commit themselves to projects that can be realized in a shorter time. Worse, if a project is championed by one official, a political rival might deliberately kill it when he comes into office. Many projects, however, have been effectively championed by unelected civic or business leaders who have strong local influence among supportive private citizens (Freeway Park, Case Study 3.2a).

Funding of projects intended to correct past flaws requires a combination of public subsidies to defray the considerable costs involved. The following discussion of Freeway Park illustrates the type of funding program that may be needed.

Hotel in Newton, MA., built on air rights over the Massachusetts Turnpike.



CASE STUDY 3.2a

Freeway Park
Cooperation Leads to a Major Park
Seattle, Washington

Freeway Park is a 5-acre open space completed in downtown Seattle in 1976. It bridges the 10-lane Interstate 5 (completed in 1966) and incorporates the roofs of a 630-car public and a smaller private garage. It has a strongly sculpted ground plane filled with a surprising variety of places: fountains and waterfalls, quiet sitting areas and dramatic terraces, and a "canyon" descending to the freeway median and providing a window to the traffic amidst the roar of falling water. The park is profusely planted with shrubs and colorful seasonal flowers. It is busiest at lunchtime when heavily used by downtown office workers, but it has constant use by nearby residents as well. Outdoor concerts, celebrations and many other special events for downtown Seattle are held there.

To the east of the park is the residential area of First Hill which includes several hospitals and many elderly people. The Park extends into this area over the roof of the public parking garage. To the west is the Central Business District descending to the harbor. The land falls fairly steeply from east to west, allowing the Park to make its connection through a series of intricate level changes.

The pedestrian in the park encounters a series of surprises and delights. One is lured in from the sidewalk of ordinary downtown streets by the glimpse of flowers and roughly sculpted concrete forms. Inside, the space leads to the dramatic central cascade and canyon, masking the city streets and the freeway. The sense of a magically protected environment is purposefully accomplished by sophisticated design techniques, yet one is not conscious of the props.



a. Before Freeway Park—December 1973.



b. Freeway Park, Seattle.



The park is a landmark to drivers for the downtown exit.

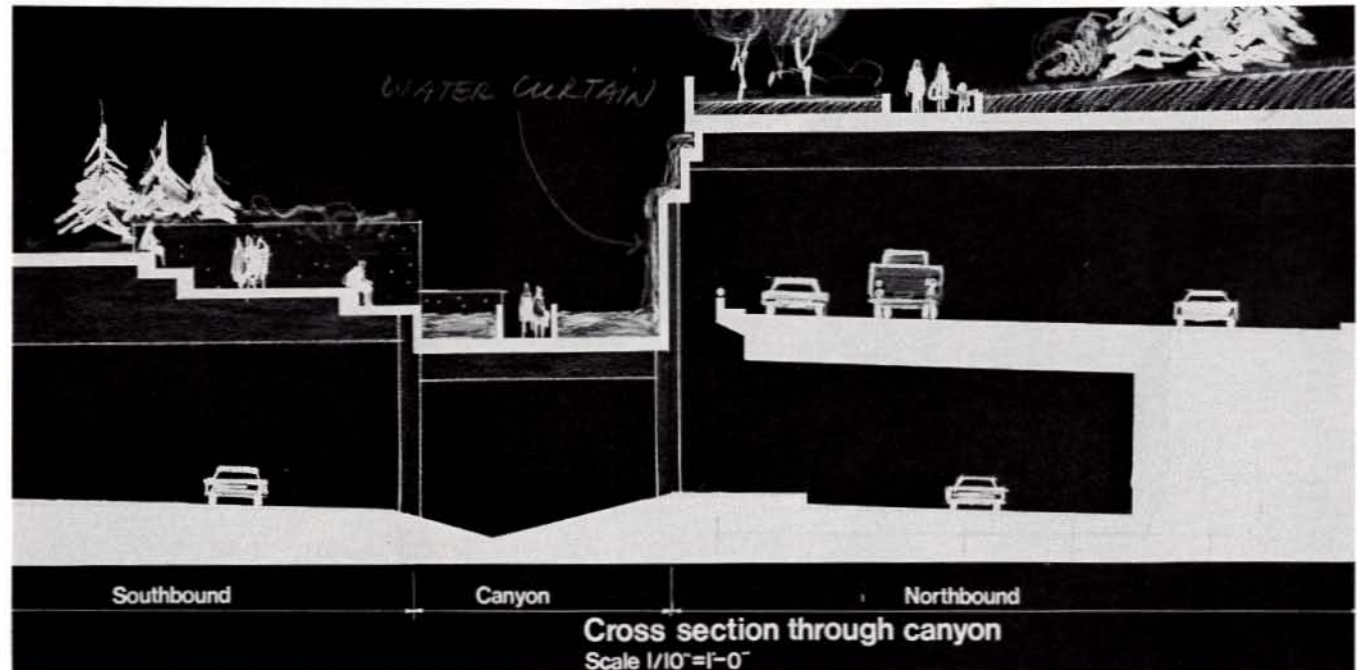
The park is unusual among highway platform projects in that it also greatly adds to the aesthetic experience of the driver. From the I-5 freeway, the park first appears as a striking series of terraced forms of rough concrete. The exit ramp rises amidst the exuberance of hanging gardens. The effect is one of intrigue and delight.

The park is located at the major auto entrance to downtown and its presence signals arrival into the heart of the city. A dramatic sequence of views accompanies the change in speed and direction as the ramp turns off the freeway. As attorney James R. Ellis, a prominent local citizen, said, this park was "not a casualty of the war between freeway fighters and freeway lovers", but a very intelligent solution to recognizing the needs of both.

The aesthetic impacts range beyond the immediate experience. The park has become a proud symbol for the city of the willingness of public and private powers to care for the environment. It has helped consolidate the very positive attitudes that are being brought to bear on the improvement of most major downtown streets, the waterfront and the historic Pioneer Square area.

Freeway Park is perhaps the most successful example to date of mitigating the impacts of a highway in the city through ingenious design. The park not only connects previously severed areas, but provides a new place of great community value.

The park cost about \$45 per square foot, including the structure and landscaping. Equivalent land in the downtown, if



available, would have cost \$50 or more per square foot for purchase alone, without demolition or improvements. Before the park was constructed, the site was yielding less than \$50,000 per year in taxes. The Freeway Park joint development program included a private office building which raised the tax yield to \$175,000 per year. The program also included 630-car parking garage with direct access to the freeway and excellent pedestrian links to downtown.

The development process:

- Several architects and prominent citizens had the idea for the park even before the freeway was completed in 1966. James R. Ellis is credited with leading the complex, long-term effort that resulted in completing the project in 1976.
- The "Forward Thrust" bond issue passed by the citizens of King County made the park possible by providing \$334 million for civic improvement projects.
- A developer who was planning a major office building on an adjacent site was induced to incorporate the building and its garage into an intricately structured joint development program.
- Federal and state highway funds were secured for the construction of the "lid", largely through the efforts of the Director of the State Highway Department.
- A complex, three-party legal agreement was executed between the City, the State and the developer (Case Study 4.2b) to define the roles and responsibilities of each.
- The joint parties deliberately set out to retain a strong designer and resolved to give her an unusually free hand to create a unique project.

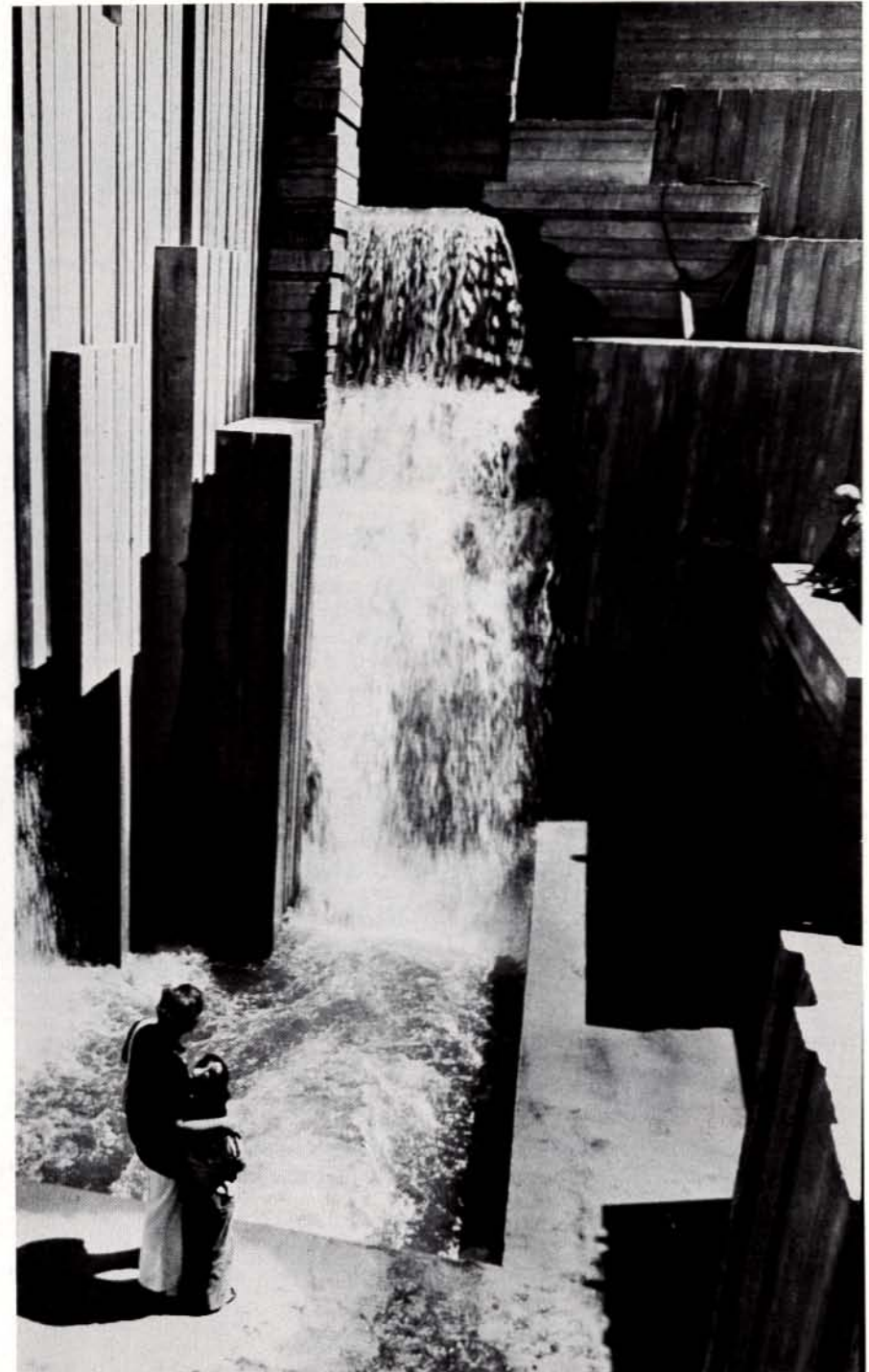
Notes written at the beginning of the project by the park's designer, Angela Danadjieva, indicate that the aesthetic impacts were achieved through deliberate techniques. She described the overall concept as "a green embroidery forming

a cover at different levels over the freeway" a cover which could eventually be extended to reach the Waterfront. The elements that make the park work so well include:

- Controlling the viewing distance and providing a great variety of close-to-middle distance elements.
- Creating a strong central focus with the cascade and canyon aspects to draw attention away from the edges.
- Including a variety of paths, sitting areas, nooks and niches in the landscaping to provide for choice of privacy or socializing and to add interest in walking and discovery.
- Using the varied but rectilinear and strongly-related concrete forms to create a metaphor for the Northwest mountain landscape where rocks and cascading water are dominant elements.
- Employing visual buffers designed to block views but provide a soft, sensuous edge.
- Masking the loud traffic noises with the sound of the waterfall.
- Improving the air quality by providing a buffer to the highway and an opening to the west to allow sea breezes.
- Using a rich and varied planting program to create the sense of a luxurious garden. The technical design of the planters (to maximum soil depth) and the selection of soils, plant materials and irrigation systems were tailored to the local climate and preferred maintenance practices. The designer worked very closely with Seattle's unusually innovative Parks and Recreation Department.

The increasing attractiveness of Freeway Park as its vegetation matures is attributable to exceptional maintenance practices.

- The city allocates a budget of \$80,000–\$90,000 per year and has the service of two full-time gardeners for the park.
- A group of major adjacent businesses formed an organization called "Friends



The freeway median became a waterfall and grotto.

of Freeway Park" which provides a yearly fund of \$20,000–\$30,000 to supply and maintain the flowers and shrubs which enhance the fresh beauty of the Park.

Costs

Park

Forward Thrust Park Bonds	2,800,000
Community Development Block Grants	340,000
Federal-Aid Municipal (FAM) Highway Funds	60,000
Metro	19,000
Federal-Aid Interstate (FAI-Highway Funds)	180,000
Housing and Urban Development Open Space Funds	209,000
Interagency Committee for Outdoor Recreation	424,000
American Legion	35,000

Bridges (lids)

Federal and state highway funds	\$5,527,000
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Garage

Councilmanic Bonds and Bond Interest	\$4,200,000
	<u>\$4,067,000</u>

TOTAL, 1976 \$13,794,000

(Quoted from a flier by Seattle's Parks and Recreation Department)

Clients

The client for this project was a combination of three entities:

1. The City of Seattle represented by its Parks and Recreation Department.
2. The State of Washington Department of Highways.
3. The Developers of the Park Place office building, R.C. Hedreen.

Credits

Designers included:

Park—Lawrence Halprin & Associates; Angela Danadjieva, Project Designer; Edward McLeod & Associates, Landscaping

Freeway Lid—State Highway Department

Garage—Naramore, Bain, Brady & Johanson, Architects

Lessons

- The most influential factor was the imaginative and energetic initiative shown by the community concerned with downtown Seattle. Credit goes to the leadership of Ellis and others, the willingness of the voters to support the "Forward Thrust" bond issue, the enthusiastic cooperation and continued technical support from the State Highway and City Parks Departments, and the willingness of the private developer to join the team.
- The three party contract was a critical instrument for negotiating, resolving and continually managing the relationship among the participants.
- Retaining a strong and imaginative designer and giving her the freedom she needed was an essential factor in producing such a consistently successful environment.
- A commitment to funding continued upkeep and improvement proved to be essential to sustain the aesthetic effects.
- The particular vocabulary of planters, planting and water elements is appropriate to the Northwestern climate. Different climatic conditions would require different elements.



a. Views of the park from the street attract pedestrians.



b. The park feels like a magically protected garden.



CASE STUDY 3.2b

BART Linear Parkway Park Improves a Transit Right of Way Albany and El Cerrito, California

The linear park runs through the townships of Albany and El Cerrito and consists of 2.7 miles of landscaped recreation area. The park was planned for the narrow (30 to 45 foot) right-of-way after land acquisition and basic design for the Bay Area Rapid Transit (BART) guideway were already completed.

The park section of the guideway runs through a suburban residential area of older houses, relatively densely packed but well kept. A single track belonging to the Santa Fe Railroad runs on grade along the whole length of the park, separating it from the back yards of houses to the east. On the west edge the park is bounded by Masonic Avenue with houses on the other side of the street. The park connects to larger landscaped parking areas at two stations (see Case Study 3.3a for El Cerrito del Norte) and is integrated with neighborhood parks and schools along the way.

The park does not alter the primary visual impact of the guideway. This structure is considerably better designed than most guideways, with simple, clean lines and softened concrete shapes, although still intrusive among the small houses and back yards. The park, a narrow strip of land packed with paths, mounds and flowering bushes and used by bikers, joggers and rollerskaters, doesn't change the visual personality of the guideway, but it does make the structure seem more approachable.

Fortunately, the BART trains are very quiet and cause a minimum of additional disruption. As an attractive and well used community facility, the park has made the right-of-way a focus of posi-

tive aesthetic experiences and compensated for the impact of the structure.

The BART Impact Program (*refs.* 90, 94) reported that about 90% of abutting households on both sides believe that the park has a "good" or "very good" effect, and that they use it extensively. It also reported that the favorable response to the park did not significantly offset the generally negative reaction to the presence of the elevated BART line in the neighborhood. Nevertheless, it has been reported that the park contributed to the maintenance, attractiveness and stability of the adjacent neighborhoods.

The park was a demonstration project sponsored by the U.S. Department of Housing and Urban Development (HUD) to illustrate the potential benefits of multiple use and beautification of the rights-of-way of aerial structures.

The success of the park is partly due to the following factors:

- The simple design of the structure with minimum obstruction of light and ground area.
- The very quiet trains.
- The moderate climate which sustains vegetation and activity outdoors year-round.
- Good maintenance by the localities.

The design elements inside the park focus on active recreation and include periodically placed special exercise and play facilities along the path which weaves back and forth between the columns. Many of these facilities are specially designed for joggers to stretch or limber up at intervals. These areas punctuate the monotony of the structure with a rhythmic variety of special environments and experiences.

The townships have been gradually adding more small facilities. The vegetation is maturing, the vines are climbing the structure and the park is continuing to improve.

The Albany and El Cerrito neighborhoods greeted the plans for the aerial structure in the 1960's with considerable resistance. Since the BART District had not set aside sufficient funds to provide extensive landscaping, it applied for and received the HUD demonstration grant in 1966. A first half-mile phase of the project was built by 1968, shortly after that portion of the system was completed. Planning for the linear park was carried out in close cooperation with the local city agencies. These agencies subsequently took over management of the park and continue to maintain and improve it.

Costs

U.S. HUD grant	\$457,000
BART	44,700
Total	\$501,700

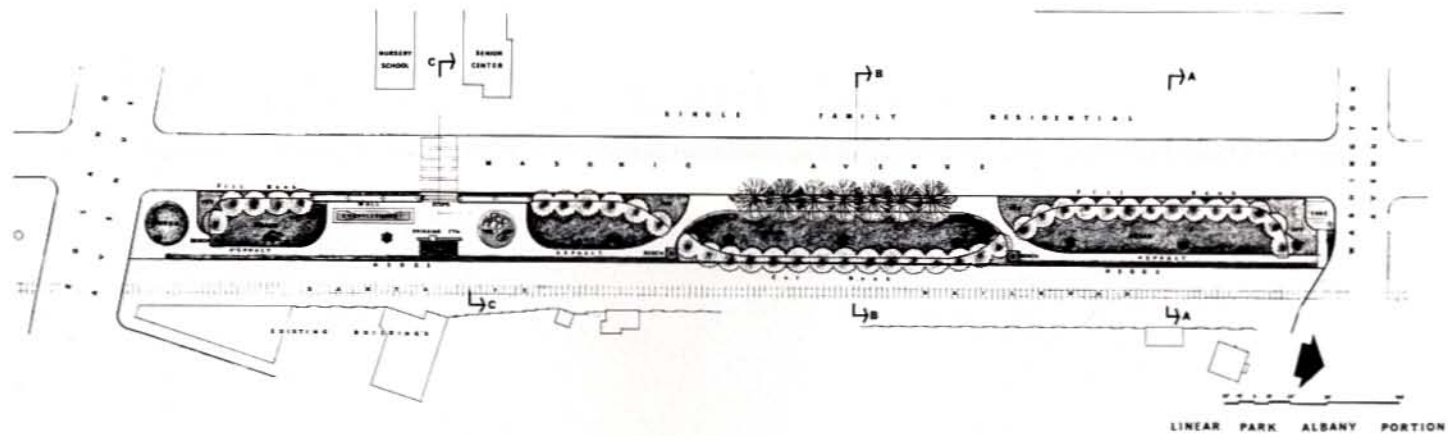
Credits

Landscape Architects—Sasaki, Walker Associates, Inc.

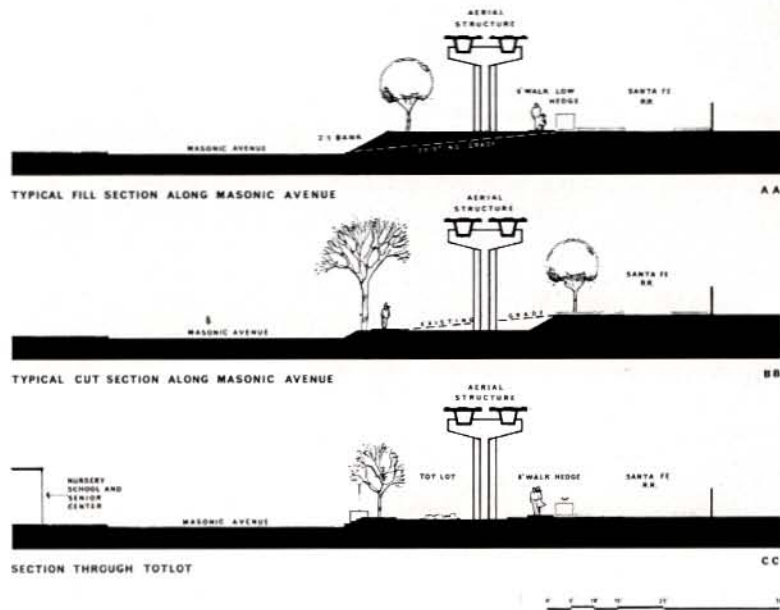
Lessons

- A linear park added after-the-fact cannot significantly reduce negative impacts but can provide compensating amenities as a trade-off.
- If the linear park had been considered in the original planning, a more varied configuration of land could have been achieved, along with a more thorough integration with community facilities and a more successful visual relief from the relentlessly linear quality of the guideway.
- Both the site conditions and the active, user-oriented design elements listed above were essential to the park's success. This contrasts with the many other left-over spaces around transportation lines where minimal planting and no programmed active use result in far less aesthetic benefit to the com-

munity. The planned activities automatically generate advocates for continued maintenance and improvement.



a. Plan



b. Typical sections.



c. A landscaped recreational path.



Station Parking and Feeder Service



San Leandro BART station.

This section focuses on the aesthetic problems caused by the interface between regional rapid transit stations in outlying areas and the surrounding community.

Contents:

Transit Stations and Community Scale	
Resolving Harmful Effects	
Case Studies	
El Cerrito Del Norte, BART Station, California:	3.3a
Quincy Center, MBTA Station, Quincy, Massachusetts:	3.3b

Transit Stations and Community Scale

On mornings when you're running late, wondering whether you'll make the train, the garage at the station is like a welcome beacon. You're glad it's so big; it's good to know you'll find a space quickly and might not miss the train after all. But there are also the less hurried times, when you remember the streetscape before the rapid transit line. During those times the massive parking structure looms large, dominating the area. It makes the houses and streets seem smaller and unprotected.

In order to make rapid transit service cost-effective in outlying residential areas, guideways frequently emerge, at or above grade (and sometimes in an open cut), as the line proceeds outside the dense downtown core. Large parking and feeder bus facilities are generally required at these stations. Such facilities are often out of scale with the surrounding community's land use patterns, architectural style and overall visual image. The basic aesthetic issue is thus one of minimizing and ameliorating potentially harmful effects of a large regional transportation line upon the local physical and activity patterns through which it runs.

The least expensive manner of providing parking in such locations is at grade. Large open air lots, however, can tear huge gaps out of the surroundings, and disrupt the streetscape's coherence. Above-grade parking garages minimize the spread of asphalt, but can be just as disruptive visually if out of scale with adjacent buildings. Moreover, garage structures which provide no animation or activity at ground level can cast large areas into shadow and deaden the liveliest of areas.

Resolving Harmful Effects

- The re-use of abandoned railway facilities provides an excellent opportunity for minimizing guideway impact. Many of these rights-of-way are no longer as disruptive as when they were first cut, having been in place long enough so that surrounding use patterns have adapted to their presence. The existing railroad station buildings at these locations already contain waiting facilities and often provide some drop-off and parking areas.
- Stations can help re-knit portions of a community cut by the guideway. Decatur station in Atlanta's new transit system has been built with a park above which connects and revives

parts of a neighborhood shopping center. In Boston, segments of the new Orange Line's guideway around stations are to be decked over and used for recreation and other community activities, greatly enhancing the facility's integration with its surroundings.

- Sensitive design of bus layover berths can mitigate visual intrusion of buses. Angrignon station of the Montreal Metro (Case Study 2.5a) is an excellent example of integrating feeder bus facilities with their surroundings. The station is depressed, yet visible from the public park in which it is located. The layout of bus berths does not physically interfere with pedestrian circulation between station and park, and limits the visual intrusion of large buses. In addition, brightly painted overhead canopy structures in the bus waiting areas further suppress the visual impact of buses.

- Layout and landscaping of at-grade lots can significantly ameliorate aesthetic impacts. If parking requirements are to be met in at-grade lots, generous landscape screening as at El Cerrito del Norte (Case Study 3.3a) can reduce visual intrusion and enhance integration with the surroundings.
- Active spaces should be planned into the ground level of garages to reduce the deadening influence of a garage on the surrounding streetscape. Garages, though more expensive than on-grade lots, can accommodate more cars without as much clearance and destruction of adjacent building fabric. Quincy Center in the vicinity of Boston, (Case Study 3.3b) is one example of a garage which is integrated reasonably well with its environs.



Angrignon Station, Montreal.

CASE STUDY 3.3a

El Cerrito del Norte BART Station

Successful Design of a Suburban Transit Facility El Cerrito, California

El Cerrito del Norte is an elevated on-line rapid transit station serving commuters and residents of a suburban area 15 miles from San Francisco. It is located adjacent to medium density residential, retail and office developments and is at the northern terminus of the BART Linear Park (Case Study 3.2b). The station provides feeder bus berths, auto drop-off and 1,054 on-grade parking spaces.

The asphalt desert usually resulting from large-scale parking lots is nowhere to be seen. The presence of parked cars is disguised from surrounding streets by a rich growth of bushes and trees thriving atop an earthen bank. A path cuts across the lot, tying the sidewalk to the station entrance, and is flanked on either side by a colonnade of trees which create a canopy of leaves. The path also splits the lot into smaller portions. Other islands break up the asphalt expanse even further. Ground ivy blankets most unpaved surfaces and reaches into paved surfaces, softening the hard curb edge that marks the car's domain.

This lot not only looks better—but is more comfortable to the user. Missing is the oppressively hot micro-climate created by large surfaces of sun-softened asphalt. The numerous stands of trees provide welcome shade.

Specific design elements that create these aesthetic effects include:

- Parking layout which is divided into six major clusters and then further broken up with landscaped islands.
- Landscaped pedestrian access ways to the station from all four sides.
- The mature trees on the site were preserved through adjustments to parking

layout and careful attention to finish grading and drainage patterns.

- Use of landscaped earth mounds to screen the edges of the parking lot.

Costs:

While cost figures for the parking area were not available, the designers confirmed the relative cost per parking space was only very slightly more than the cost of standard parking lots with no aesthetic treatment.

Credits

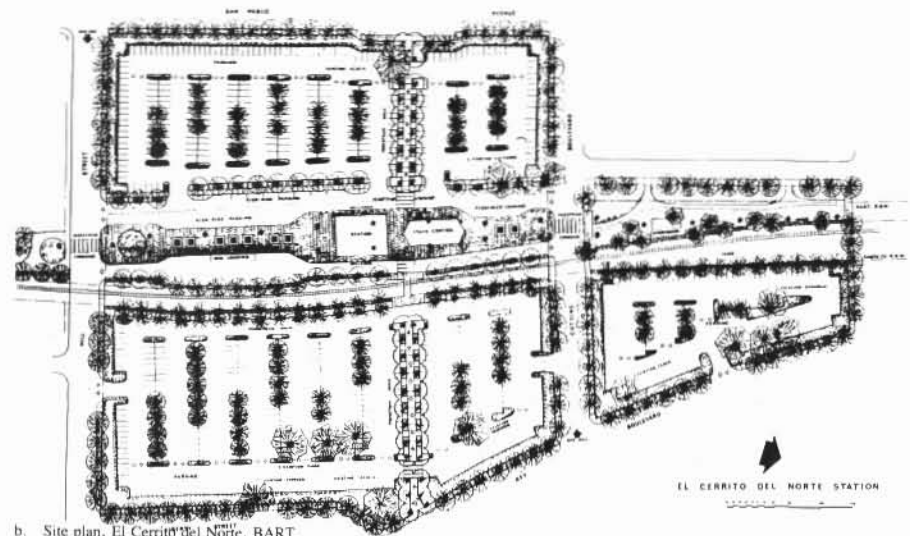
Landscape Architects: Sasaki, Walker Associates, Inc.

Lessons

- The design elements described here are appropriate for any large suburban parking lot.
- The specific design configurations and plant materials must be adapted to the local climate and site conditions and should be determined by a landscape architect who is fully aware of these factors.



a. Tree-lined path through the parking lot.



b. Site plan, El Cerrito del Norte, BART

CASE STUDY 3.3b

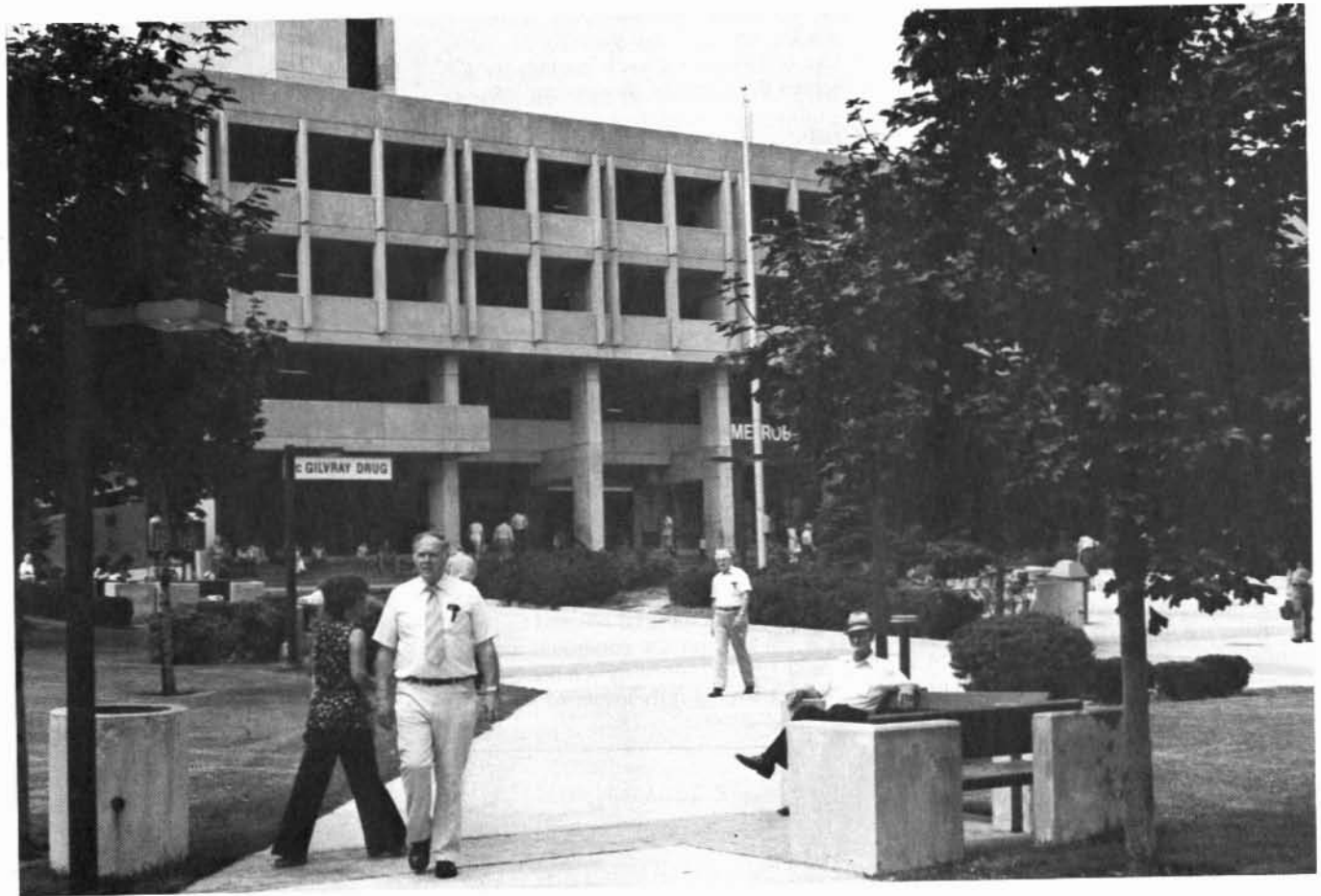
**Quincy Center Station, MBTA
Garage Design Helps to Integrate
Transit Station with Commercial
Center
Quincy, Massachusetts**

Quincy Center station is the terminus of the Massachusetts Bay Transportation Authority rapid transit Red Line. It is located on the edge of the central business district of an older suburb, (Quincy) nine miles outside of downtown Boston. The station opened as part of the line's extension in 1971. At this time yet another extension, four miles past Quincy Center, is under construction.

The Red Line's guideway through this portion of Quincy is depressed in an open trench that separates a quiet residential neighborhood from the busy commercial district. The station and a parking garage straddle the cut. A pedestrian passageway through the facility bridges the trench and provides access to the station platform below. Sixteen bus routes terminate at Quincy Center. An 800-car parking garage rises above the station platform. Walkways lead directly to the garage from surrounding city side walks.

The facility is well integrated, and all modes are closely juxtaposed. The access and circulation patterns are designed to minimize potential conflicts. Cars enter and exit the garage at one end; people arrive and exit on foot at the other. Buses arrive with cars, but are diverted to berths alongside the structure.

The Quincy Center station is much more successfully integrated with the business district than with the surrounding residential area. It is set back from a major shopping street paralleling the guideway, behind a landscaped open space and an older building with commercial and office uses.



Park helps to fit the station into its setting.

This open space provides a park for all downtown users as well as transit patrons. Enclosed on three sides by the city hall, the transit facility and older block of stores, the area is a quiet inlet off the busy downtown street. This park accommodates a multiplicity of uses and enhances the walk to the station. People use it to eat lunch, to relax on the grass, to sit on a bench with trees overhead, to talk with friends, and to watch others go by. Children come to run through the sprinklers on hot days. This interweaving of activity ties the station to its surroundings.

The pedestrian passageway through the facility achieves similar results. This linkage over the trench improves the community's overall pattern of pedestrian circulation. A bank, coffee shop and drug store animate the entire length of the passageway, providing convenience for both transit riders and people using it to get to the other side of the guideway barrier.

Viewed from the business area, the bulk of the station is scaled down by the intervening presence of the older building. The building screens the station, so that the pedestrian view constantly changes as you pass by. The shops at the ground floor of the older building turn the corner and continue along the landscaped square, extending the city streetscape toward the station entry. All these elements combine to mediate the actual size and bulk of the station in relation to its surroundings.

Such is not the case, however, on the other side of the tracks where the parking garage is a wall greatly out of scale with adjacent dwellings. Entry is through a tiny notch in the sweep of concrete. The concrete surfaces, acceptable on the commercial side, accentuate the harsh contrast between station and environs on the residential side.

Another apparent shortcoming is the bus waiting area. This wide, arcade-like

walkway, with seats along one side, is carved out of the first level of the parking structure. There is a good view of the green square and downtown street—until the buses arrive. When there are more than two in the area, the open walkway becomes a tunnel filled with engine noise, heat and fumes. In the summer, numerous people wait for buses in the landscaped, open space. In winter, users prefer the heat and protection of the enclosure.

Costs

The estimated total construction cost, exclusive of rapid transit system equipment, is \$5,400,000.

Credit

Architect: Glaser/De Castro/Vitols Partnership, V. Vectors Vitols, Partner-in-Charge.

Lessons

- A garage integrated with a station structure provides a superior opportunity for integration with a local commercial center. This is due to the potential compactness of circulation, and connections with pedestrian patterns and mixed uses. Quincy Center provides a good model.
- The bulk of a garage can make its integration with a suburban residential area more difficult in some ways than would be the case for an open lot. The reduction of horizontal expanse is an asset; while the visual impacts and activities generated by station and garage are not. Interposed uses such as the extension of neighborhood commercial activities combined with apartments could make a more successful transition.



a. Station is in scale with the business area.



b. Parking garage forms a wall on residential side.

Joint Development



Place Bonaventure, Montreal.

This section discusses the opportunities for integrating transportation facilities with new, private real estate developments for mutual benefits. Transportation can deliver a concentration of potential clientele while private development can create added attractions and an animated environment. This section focuses on new mixed use developments in the urban locations which present the greatest opportunities.

Contents

Transportation with Other Activities

Public Pedestrian Ways on Private Land

Streetscape and Parking Improvements
Mixed Use Developments
Special Transportation

Balancing Incentives and Controls

The Role of Urban Design
Legal and Administrative Issues
Environmental Review and Public Participation

Case Studies

Underground Montreal,
Montreal, Canada: 3.4a
The Gallery at Market East,
Philadelphia, Pennsylvania: 3.4b

Transportation with Other Activities

One of the most exciting parts of travel is arriving dramatically in the middle of a festive urban space. Many great European railroad terminals drop their passengers in vast skylit halls which open into one of the great squares of the city. You can check your bags, step through the doors, and observe cafes, shops, parks and a rich variety of streetlife.

Joint Development generally covers two related concepts:

- Physically combining transportation facilities with other public or private land uses so that the physical buildings, interior circulation and spatial arrangements form a single complex.
- Implementation programs that include combined actions, administrative and financial coordination, and closely meshed development schedules between transportation and other projects.

The **aesthetic benefits** of joint development vary a great deal. They may range from the modest gain of uncrowded subway stairs to the spectacular addition of dramatic, multi-level "City Rooms" that can become focal points of vibrant urban activity. The most successful developments completely animate and transform the experience of the patrons of transit stations and parking garages. The less successful may only provide proximity without an active relationship. The distinguishing features of the successful projects include:

- The concentration of lively activities such as shopping and dining along sidewalks and public paths.
- Direct visual connection from stations and parking facilities to active spaces.
- Quiet, non-polluting transportation hardware that facilitates integration.
- Balanced activities, including evening and weekend use.
- Pedestrian amenities, including climate protection, seating, plants and flowers, information, toilets, and other services (see Chapter 1 for the role of art works).
- Ongoing, high quality management, maintenance, security, and activity programming.

A primary **economic impact** is the attraction of business back to the central city. The direct measures of success, increased employment, tax revenues, and business and real estate development, are



The Atrium at Citicorp Center, New York.

not likely to be achieved unless people are strongly attracted to the new project. This in turn is closely linked to design quality and the pleasurable aspects of the experience.

Boston's Quincy Market and New York's Citicorp Galleria illustrate that attractive environments in major mixed use projects can contribute to spectacular business success.

Public Pedestrian Ways on Private Land

Complementing facilities with public pedestrian ways on adjacent private land can benefit both the public and the property owner. Subway access, for example, can be provided through private lobbies; sidewalks widened by arcades on private land; public pedestrian ways constructed through the blocks, and bus shelters set behind property lines. Projects such as these add to limited sidewalk space, provide climate protection, or improve circulation and access. The aesthetic benefits can include: more generous spaces with natural light or controlled climate for subways, climate protection and engagement with adjacent activities for waiting bus passengers, and more comfortable or stimulating walking environments for pedestrians. Property owners will benefit from the increased numbers of people brought into the area, because of the increased potential for retail business.

The techniques for implementation include negotiated leases or easements, zoning requirement changes (either *a priori* or as a trade-off for bonuses), or the taking of rights-of-way by eminent domain. Subway entrances in Washington, D.C. and Montreal (see Section 2.5) and incentive zoning programs in New York are examples.

This type of joint development is particularly appropriate in downtown areas where narrow sidewalks are overcrowded and bus stops or subway entrances conflict with pedestrian flows. It is also appropriate at other major concentrations of activity such as at medical or government centers.

Where climate or security problems are severe or passengers may often wait 20 or 30 minutes at off hours, the experience can be greatly improved if the waiting areas are combined with 24-hour cafeterias or similar facilities.

Streetscape and Parking Improvements

These are the most common public contributions in a city's efforts to attract private development. Streetscape improvements have obvious aesthetic benefits as discussed in Section 2.1. Public parking garages can provide opportunities to control circulation patterns of vehicles and pedestrians and create an appropriate environment for both, as discussed in Section 2.2.

In addition to their individual design potential, streetscape and parking measures can greatly improve the aesthetic effect of an urban district when organized into a coherent plan. Streetscape improvements on a specific project should fit into an overall pedestrian network joining activity centers with the shopping streets of the district. Public parking facilities located at the periphery of intense activity zones can be designed as logical transition structures. Auto-oriented streets can feed cars to the periphery of the zone, while pedestrian access can be focused toward its active interior.

Examples of very successful integration of this type include the central areas of Nottingham, U.K. and Gothenberg, Sweden. Developments in the U.S. have often failed to make this kind of successful connection between new developments and the surrounding city fabric and often isolate the two. The streetscape improvements at the Faneuil Hall Markets in Boston are one notable exception. The Urban Development Action Grants provided by the U.S. Department of Housing and Urban Development have helped to provide parking garages as development incentives and have encouraged more integrated designs in Cambridge, MA and Providence, RI among other locations.



Quincy Market, Boston.

Mixed Use Developments

Transportation facilities can provide a significant portion of the clientele for the shops, offices or hotels in mixed use developments. These major developments may combine several modes: railroads, rapid transit, regional bus lines, intown air terminals and parking. When several transportation functions are architecturally integrated with the public spaces of the development, the aesthetic results can be very exciting.

The Oakland City Center Development (still under construction) is organized around a BART station and an attractive plaza (Case Study 1.2a).

The great mass of the Place Bonaventure in Montreal includes most of the elements described above and generates a striking new form for urban buildings (see photo p. 212). "Underground Montreal," along with its connections to several downtown subway stations and major new developments (Case Study 3.4a), is probably the most extensive and successful example of mixed-use development.

Philadelphia's Gallery (Case Study 3.4b) illustrates a common problem in integrating public transportation with commercial development. The project relies to a great extent on transit riders as customers. Yet the physical and social environment of the transit system (SEPTA) was considered potentially detrimental to the new commercial venture and connected to it only by a separate concourse. And indeed, the confined, noisy, less well-maintained subway environment contrasts sharply with the bright new Gallery.

A similar antipathy by developers towards direct links to the subway was also evident in downtown San Francisco. In that case, however, the system was obviously going to be new, very quiet and unusually well maintained. Yet very

few developers took advantage of the bonus provided for tying directly into BART stations (*ref. 90*).

The outlook in that case and others may be partly attributable to the stereotype held by many Americans that public transportation serves only the economically and socially disadvantaged—a false image often reinforced by the aesthetic poverty of the facilities. The success of Montreal's development has proven that mixed-use joint developments can change this perception. To insure success, however, transit facilities and related developments should be designed jointly.

Special Transportation

Some "experimental" transit systems have been planned to stimulate urban activity and development. These range from minibuses and electric trolleys to monorails, aerial trams and automated "people movers." The aesthetic benefits can result not only from the exciting activities and dramatic spaces at the terminals, but also from the interesting quality of the ride.

Examples include the monorail built in conjunction with the World's Fair in Seattle, the Aerial Tram from Manhattan to Roosevelt Island and the jitneys at Disneyland. The Downtown People Mover (DPM) Projects currently being designed for Los Angeles, Miami and Detroit also fall into this category. Such specialized transportation is particularly appropriate to connect several compact activity centers across a relatively discontinuous urban fabric.

Caution should be exercised to avoid aesthetically undesirable impacts of these systems on the existing city environment. A monorail or DPM can create visual and noise problems similar to other elevated roads or transit guideways, as shown by the unattractive pres-



a. Oakland City Center, site plan.



b. Trolley, Sacramento, CA.

ence of the Seattle monorail guideway on certain of the downtown streets. The best opportunities for aesthetic integration occur when the new transportation

can be designed and built jointly with adjacent development as in the Seattle Center terminus of the monorail.

Balancing Incentives and Controls

Public agencies must consider both incentives to, and controls on, joint development projects. Incentives such as street improvements, public parking, added transit service, tax breaks or streamlined review and approval procedures are often required to interest a private developer in the project. The controls must insure that both the physical design and the operation of the project adequately serve the public. The controls must also address issues of aesthetic integration with the surrounding community, including architectural relationships and secondary environmental impacts such as traffic congestion, noise or other changes in community characteristics.

The practical balance of controls and incentives is a function of the site's economic attractiveness. If the location is highly attractive, such as the Boston

Waterfront or downtown Manhattan, developers will compete for the opportunity, and controls to serve the public benefit can be emphasized over incentives. If, however, the present attraction is marginal, as in the downtowns of many medium-sized and smaller U.S. cities, the incentives must be stronger; controls will only be effective if outweighed by incentives and the attractions of the site. An emphasis on incentives requires the investment of considerable public funds. Once the renewal effort begins to "take," the balance can sometimes be shifted towards public controls with less public investment.

The Role of Urban Design

A trade-off of incentives against controls should not be intended to benefit the public at the expense of the developer, or vice versa. It is the role of imaginative designers to create solutions that benefit each. For instance, the improvements provided by the developer in the

Faneuil Hall Markets serve the general public well while also serving to maximize business. Urban designers and other design professionals both in public service and in the developer's employ play a key role in putting together, illustrating and realizing such complex projects. Issues related to the selection and use of design professionals are discussed further in Section 4.5.

Legal and Administrative Issues

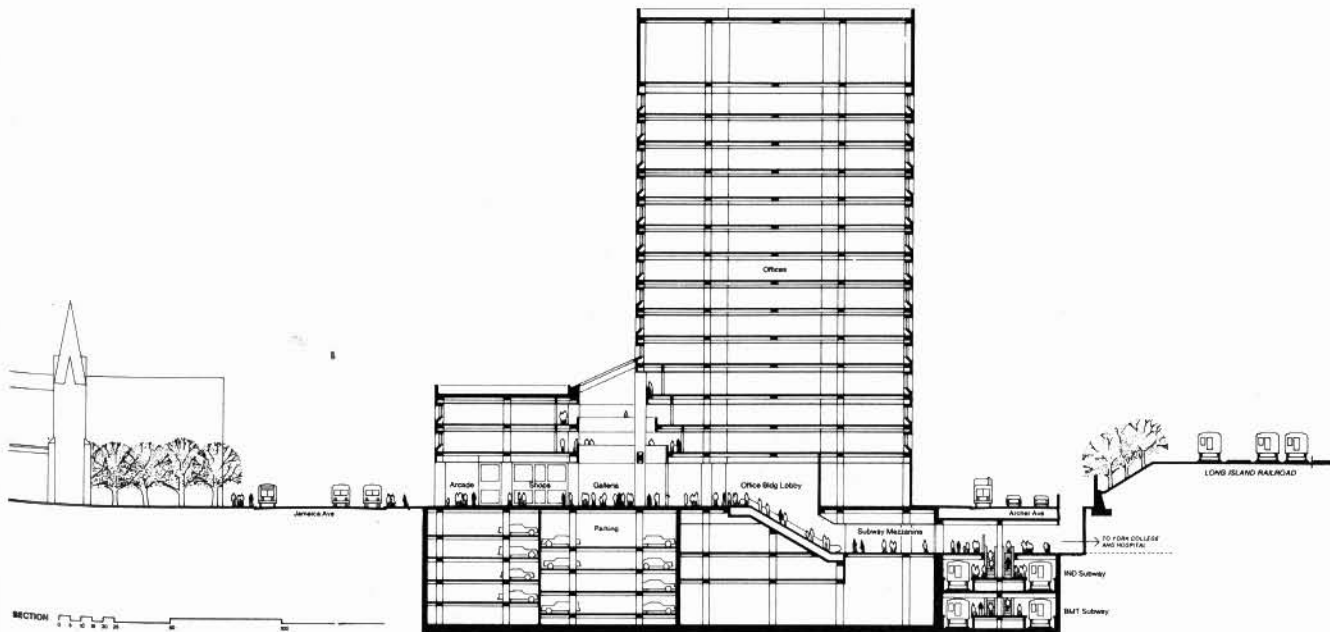
Successful joint development projects have been executed by use of procedures ranging from ad hoc agreements to fully constituted public/private development corporations. An example of a legal agreement for joint development is found in Case Study 4.2b.

Legal and administrative issues are usually quite complex for major joint development programs. For example:

- Land held by transportation agencies (particularly by railroads) is often subject to complicated legal constraints.
- Private and public developers are often under different schedule pressures.
- Private developers want to minimize their financial commitment (which includes designers' fees) until the project is assured and want to see public improvements in place before completing their projects.
- While public agencies often have in-house staffs or access to technical assistance funds to carry out initial studies and project organization, local political credibility and some federal funding programs still require that firm commitments are obtained from the private sector before proceeding with a project.
- A special coordinator, responsible to both private and public parties, is often required to lead the project. Since the projects can easily take four to six years to implement, a long-term commitment to funding the coordinator's position is essential.

Environmental Review and Public Participation

Because federal funds are used in most joint development projects, environmental impact requirements must be satisfied, and extensive community review and participation may be necessary. Relatively small segments of the public can sometimes raise issues that cause delay of a project. It is therefore to the advantage of both the developer and the sponsoring agency to elicit and fully understand public sentiment early in the development process. This can be accomplished through an extensive and aggressive participation program, through which necessary compromises may be possible before design and other commitments are firm. Community involvement can also ensure that advocates in the community will help carry projects to implementation.



Proposal for tying transit mezzanine to adjacent uses through open air spaces, New York.

CASE STUDY 3.4a

Underground Montreal Mixed Use Developments Integrate Pedestrian and Transit Networks Montreal, Canada

Underground Montreal (“Montreal Souterrain”) has made the subway system the focus of downtown pedestrian circulation and retail activity. This integration, developed through public and private initiatives, has created a thriving urban complex separated from the surface streets. It made public transportation the proud centerpiece of redevelopment and challenged prevailing negative stereotypes about public transit in North America.

“Montreal Souterrain” is an extensive network of underground public pedestrian ways which provides direct climate-controlled connections to 20,000,000 square feet of private and public construction within the downtown core. The network, composed of Metro lines, stations and approximately seven miles of pedestrian passageways, presently links nearly 1,000 boutiques, three major department stores, 100 restaurants and bars, dozens of office buildings, movie houses, art galleries, a large concert hall and two theaters.

Two downtown railway stations, Gare Windsor and Gare Centrale, and the main bus terminal are accessible from this “underground city.” Gare Centrale’s waiting room functions as an integral link in the network.

There is wide diversity among the downtown Metro stations integrated with the network. Some stations, such as Place-des-Arts and Bonaventure, are linked to other activities by simply designed underground passages which dramatically open up to major interior retail malls. At McGill, however, department stores and specialty shopping arcades are contiguous with the actual station mezzanine.

The aesthetic quality of the system is typified by arrival at the Place-des-Arts station. The rider is greeted by a stained glass mural illustrating the story of music in Montreal. Beyond the mural is a tile-walled, brightly illuminated, spotless underground passage which bends left, then right (eventually emerging at grade level). The tile walls dissolve into glass as the passageway widens into an elegantly appointed entry foyer for the Place-des-Arts cultural center. Light streams through a completely glazed wall which affords a refreshing view of an exterior landscaped forecourt.

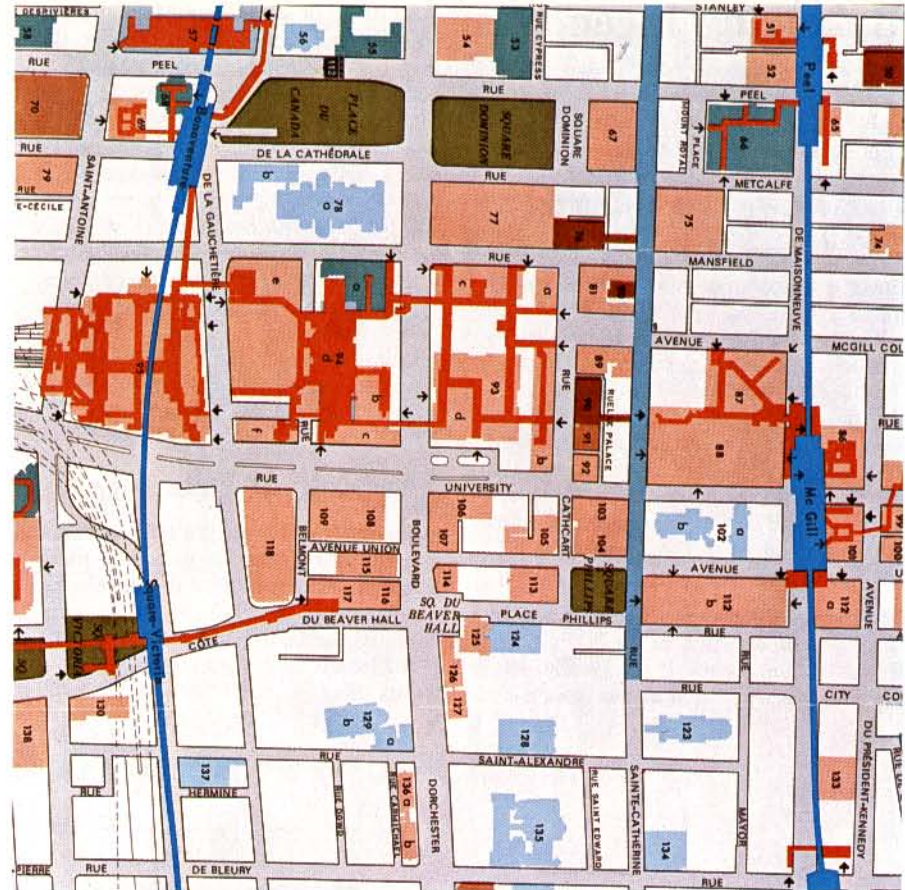
Continuing further, the passage narrows and tunnels underground. Small shops now line it, animating the space with their activity. Suddenly the area opens to a huge multi-storied, covered atrium of the Complexe Desjardins with dozens of restaurants, bars, cinemas and boutiques.

Succeeding passageways quite often abruptly change in materials, textures, scale, size, and presence or absence of retail uses. In most instances, the changes do not jar the senses or confuse one. Rather they create an unfolding kaleidoscope of pathways, spaces and activities.

Aesthetically, these environments are very different from city streets. Within the passageways there is no noise, pollution, congestion, or conflict caused by automobiles. There is no litter, dirt, graffiti or broken pavement.

Outdoor vistas, such as found at Place-des-Arts, are infrequent. On the other hand, the snow, sleet, icy winds and low temperatures typical of Montreal winters don’t occur underground.

The pedestrian passageways of “Montreal Souterrain” are funded and built by private developers desiring connections to the underground network. There is no overall master plan designating passageways at specific locations. The process is



a. Map of the underground network.



b. Activities are dense and interconnected.



a,b,c. A variety of materials and spaces add up to a cohesive aesthetic environment.

instead one of incremental growth and change. It relies heavily on the private sector to initiate proposals for new links. The city then reviews such proposals and may choose to negotiate modifications with the developers prior to issuing necessary approvals and building permits. To facilitate design review and to insure a high quality of construction, the city has promulgated standards governing materials, minimum dimensions, layout, lighting, ventilation and fire protection.

Once built, ownership of those portions of the passageway on private property remains with the property owner. The city is now proposing legislation that would transfer the ownership of all passageways from private to public, to better control encroachments by retail uses which interfere with pedestrian circulation.

Currently, maintenance, cleaning and security of all private underground structures are the responsibility of the owners. If these duties are not carried out to the satisfaction of the city, the city does the work at the owner's expense.

The first portion of Montreal Souterrain was built in the early 1960's as part of the Place Ville Marie redevelopment, which included a 42-story office tower and several smaller buildings linked by a network of sheltered, shop-lined pedestrian ways. This development, built over publicly-owned right-of-way and connected to the Gare Centrale, required extensive private and public collaboration. Such close cooperation has since become a hallmark of Montreal's urban design process and has been extremely important in developing the excitingly urbane "underground city."

Though Place Ville Marie was an immediate success—aesthetically as well as financially—it was not until the public sector expanded its role with construction of the Metro system that the underground pedestrian network became so extensive.

The leasing of air rights was judged by a recent U.S. DOT study (*ref. 94*) to be an important inducement to large scale private development at the Metro's McGill Station. This study also concluded that the Metro was the key to the rapid development of the retail-lined pedestrian ways of Montreal's "underground city." The benefits of linkage to the subway station can be gauged by the \$500,000 price recently set by one developer at McGill station to allow another developer the right of access to an existing passageway. To prevent such fees from acting as a disincentive, the city is considering a change in regulations to permit unlimited rights of access.

Initially, the Metro management actively promoted the linkage of private developments to subway stations. Since the advantages have now been widely demonstrated, the initiative for integration has increasingly come from the private sector.

Metro physically demonstrated the City's ongoing commitment to downtown revitalization and aesthetic quality. It also provided an extensive connective infrastructure which concentrated downtown users at Metro station locations. The private sector was not slow in realizing the benefits of cooperation with Montreal's enlightened public sector.

McGill Station

One of the first Metro stations to open (1966) in the heart of the retail district was McGill Station. It is still one of the best examples of the merging of transit and retail functions.

The station has two levels, one at the subway platform, and a mezzanine carved into a side wall which spans the lower platform level at both ends. Thus, much of the lower platform level has a spacious, 25 foot ceiling. Physical connections to retail uses ring the space and to the "underground city" occur from the mezzanine, which also provides for unimpeded pedestrian circulation through the subway station. The high ceiling of the lower level and visual connection between the two levels gives the traveler a sense of open space. In this environment the comings and goings of Metro trains, although seen and heard, are not a sensory jolt or imposition.

When initially opened, only two major department stores—Eaton's and La Baie—had direct access to the station. In the 12 years since, two new office towers and three specialty shopping complexes containing approximately 250 boutiques and restaurants have been tied visually and physically to McGill Station.

At McGill, the interweaving of retail and transit activities is so complete that the station is the center of an exciting in-town retail complex. The physical image, though utilitarian, is handsome, providing a simply articulated, functional linkage between the Metro and adjacent retail and office uses. Its daily use by thousands of people for shopping, getting to or from the train, work, lunch or dinner, or simply strolling through to window shop and watch other people gives the station enduring vitality.

Specific physical elements which reinforce the sense of openness and integration of activities at McGill include:

- A structural system of columns and beams which permits spans of up to 40 to 45 feet in width.
- Minimal barriers separating fare and non-fare areas within the station space. Dividers are either three foot high walls or full height plexiglas partitions.
- Retail facades in station mezzanine which contain substantial glazing and display windows as well as store entries.
- The use of retail advertising within the station space, and the display of metro directional signs within the shops.

In addition, the following operational and management elements contribute significantly to the overall aesthetic experience:

- A number of station entrances from retail complexes are open during all hours Metro is in service and not just when the stores are open.
- Metro cars are exceptionally quiet and clean.
- The station environment is very well maintained.
- Metro stations have their own cleanup crews. The station platform is washed daily.

Close coordination with the two major department stores at McGill resulted in a station which was bounded on one side by Eaton's basement foundation. (Eaton's paid for the construction of a new store entry at this point.) La Baie, at the other end of the station, leased space under a city street and also opened an entrance to its basement.

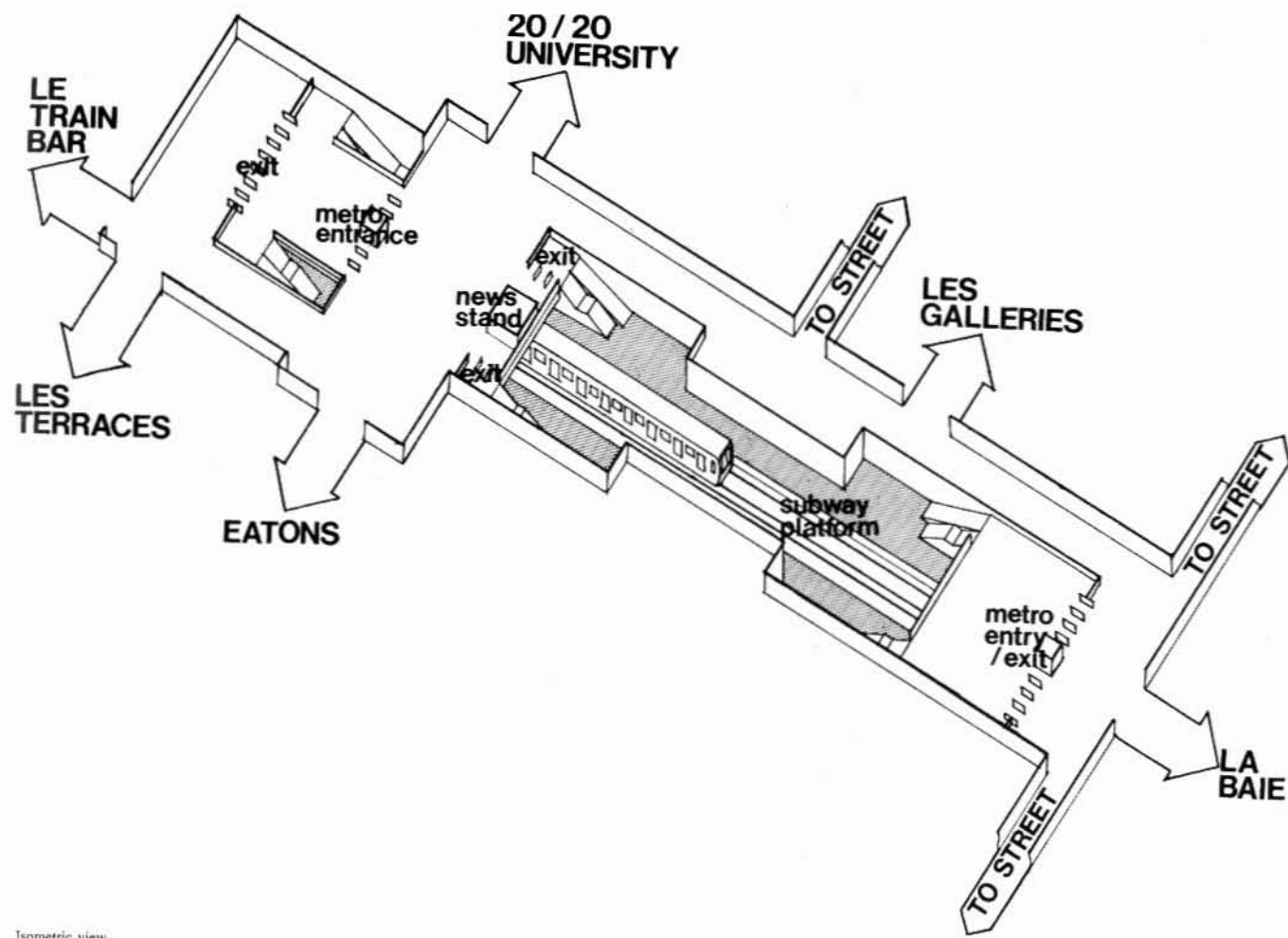
All individual shopkeepers and management personnel encountered at Les Terraces (the newest retail complex at McGill) felt that direct connection to the station had a positive effect on retail sales. This is also the case for Eaton's and La Baie. When the station was first opened, both stores had bargain basements accessible from the Metro level. Since 1976, one store has remodelled

and now offers its better quality merchandise on a main shopping floor at the station's mezzanine level.



View of the mezzanine.





Credits

Architects: Crevier, Lemieux, Mercier and Caron

Lessons

The successful integration of transit and the pedestrian shopping environment of downtown Montreal points to a great, yet unrealized, potential for many U.S. cities. The factors critical for achieving this potential appear to be:

- Administration, planning and design and a continuity of policies. The city of Montreal was always intensely involved with land acquisition and planning for the station areas and maintained a continuous commitment to joint development for two decades.
- Designing transit hardware and stations as good neighbors to pedestrians and commercial development. This required a quiet, non-polluting system, open circulation patterns and a visual image compatible with glamorous downtown shopping malls.
- A strong initial push by the public agencies to make attractive examples of the early stations such as McGill. Once profitability was proven, the private sector took the initiative.
- Pedestrian design appropriate to the climate. In the cold of Montreal a fully protected environment was needed. In contrast, in a milder climate like San Francisco, fully enclosed downtown concourses would be less successful than the more open and attractively landscaped but still well integrated Oakland City Center Complex.

Isometric view.

CASE STUDY 3.4b

**The Gallery at Market East
Mixed Use Tied to Transit
Philadelphia, Pennsylvania**

Gallery—Phase I

The Gallery at Market East is the first completed phase of a planning and urban design program dating to 1958, when the first concept plan was published. This plan, encompassing 129 acres of downtown land, is Philadelphia's largest and most ambitious urban renewal project. It envisions the revitalization of a mile-long stretch of Market St. between Independence Mall and the City Hall to its former stature as a vital in-town retail center.

The Gallery—Phase I contains 125 shops and restaurants with a total retail area of 200,000 square feet and an additional 200,000 square feet devoted to public circulation and activity space. Retail uses starting one level below-grade are organized on four levels around a large sky-lit atrium. Major pedestrian access is directly from Market St. via a sunken courtyard. The Gallery is also accessible from the 8th St. subway station by way of an underground concourse and from an aboveground parking structure via a pedestrian bridge.

In addition to the smaller shops and restaurants are two 500,000 square foot department stores: a new Gimbel's and a completely remodeled Strawbridge & Clothier's. The Gallery somewhat resembles an enclosed suburban shopping mall. There are, however, important distinctions, including the Gallery's downtown context, its scale and more intensive use of land, and its integration with rapid transit and pedestrian circulation.

Gallery—Phase II

A little over one year after the Gallery's opening, the city's Redevelopment Authority announced a similar joint venture development for the next two blocks of Market St. When completed in the early 1980's, this development will extend the Gallery to the existing Reading Railroad Terminal and will be more closely integrated with a new commuter rail station than the present Gallery is with the 8th St. subway station.

The aesthetic impacts of the Gallery are greatly intensified by the paucity of its surroundings. When contrasted to the drabness of marginal retail uses and vacant, deteriorating structures of surrounding streets, or the drabness of the 8th St. subway station, the atrium sparkles with energy. The severity of this contrast poses a number of difficulties for integration with the surrounding environment.

Although approximately 70% of the Gallery's shoppers arrive by public transit, and only 500 feet separates the atrium from the 8th St. station, the physical design de-emphasizes the connecting underground concourse. The Gallery contributes little to the enhancement of the aesthetic quality of the station space. And the station, in its present state, can do nothing save harm the overall image of the Gallery.

From the pedestrian environment of Market Street, entry into the Gallery is also made more vivid by sharp contrasts. The entry court of the Gallery is an oasis in the midst of urban decay of adjacent buildings. An ample terraced courtyard provides direct access to the atrium one level below Market St. The entire facade of the atrium is glazed, integrating the street more closely with the Gallery en-



Interior atrium.

vironment. A fountain and sitting niches are on the periphery of the exterior courtyard space. The exterior fountain, however, is often silent, its water stagnant, quite unlike the fountains inside. The difficulty again is maintenance in the areas not controlled by the developer.

By all accounts the Gallery is a tremendous financial success. Its shops and restaurants are recording sales of nearly \$250 per square foot per year, or double that of an average suburban mall, aptly demonstrating the commercial viability of joint development within declining downtown areas.

One specific transportation-oriented decision appears to have had a localized neg-

ative impact on retail sales. The decision to retain auto traffic on 9th St. broke the continuity of pedestrian improvements at street level. The retail spaces thus separated from the atrium are largely vacant. Vacancies are not a problem at similar locations on other levels where the interior public space is continuous above and below 9th St.

To overcome initial reluctance by private developers, the Redevelopment Authority decided to share the risks in a public/private joint development venture. The authority paid for two-thirds of the costs of constructing the basic building shell. The developer paid one third in exchange for a 99-year lease and also paid for the completion of retail spaces.

The joint development agreement gave the developer less control but reduced his risk to an acceptable level.

The concourse linking the Gallery to the 8th St. station was adapted from a portion of Strawbridge's basement space, which was acquired by the Redevelopment Authority. (Strawbridge's also undertook extensive remodeling of its store at that time.) It appears that an opportunity may have existed to then enhance the pedestrian concourse by opening up light wells to the exterior. This opportunity was not pursued apparently because of the poor maintenance of the station itself and its image as an unsafe place.

Costs and Resources

Gallery Improvements and Construction:	
Redevelopment Authority	\$18.0 million
Rouse Company	20.0 million
Gallery Tenants	5.0 million
	<hr/>
	\$43.0 million
	(\$90.53 per square foot of building)

Related Improvements:	
Gimbels	\$35.0 million
Strawbridge & Clothier	10.0 million
Parking Authority Garage	8.0 million
Southeast Pennsylvania Transportation Authority	5.0 million
Utilities	9.0 million
	<hr/>
	\$67.0 million

Total Cost (1976) \$110.0 million

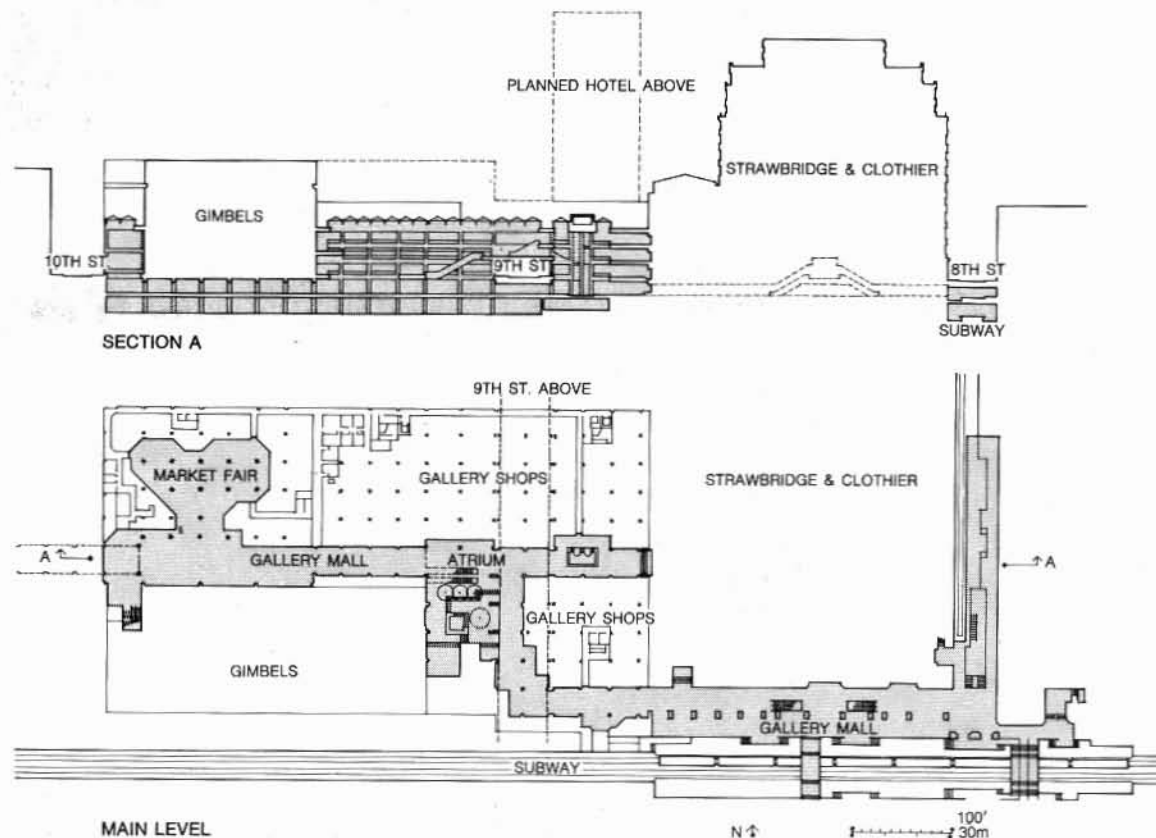
Credits

Client/Developer:
Redevelopment Authority of the City of Philadelphia and the Rouse Company

Architects: Bower and Fradley

Lessons

- The Gallery I demonstrates that an in-town shopping area heavily dependent on public transit can be an aesthetic and financial success. Such a project can succeed by relying on lower income clientele and cheaper merchandise than most glamorous downtown malls. Such a project, however, depends heavily on public funding for implementation.
- An older transit system, by contrast to Montreal in the previous case study, makes integration much more difficult. Its physical characteristics and prevailing image do not make it desirable for developers striving to create a new attractive image. A major commitment to physical renewal and operational improvement of the transit station would have been necessary to bring about close physical integration.



MAIN LEVEL
Plan at main level and section.



Common But Neglected Elements



Typical treatment of everyday elements.

Some of the most pervasive aesthetic impacts are caused by common components and materials of a transportation facility that are seldom considered from the point of view of aesthetic design or integration with the surroundings. This section calls attention to such elements and the opportunities for improvement.

Contents

Engineering Out of Context

- Undefined Horizontal Space
- Left-over Land
- Asphalt Pavement
- Wire Fencing
- Signs, Lights and Signals
- Concrete Walls and Abutments

Potentials for Action

- The Designer's Role
- Standards
- Costs and Budgets

Engineering Out of Context

Stepping off a crowded sidewalk in downtown Manhattan your foot touches asphalt pavement. It is astonishing to think that this pavement is connected to a huge network of asphalt rivers and oceans linked uninterrupted to every road, parking lot and suburban driveway from here to Los Angeles. It is a giant feat of man-made technology: nothing interrupts the flow of asphalt, while it interrupts everything else on the ground.

There are many standard physical elements related to transportation that are widely used because they are functionally appropriate, inexpensive and durable. Most of these elements are designed and deployed by practical minded engineers and administrators who focus on meeting the functional needs of the transportation facility. When introduced into complex environments such as city, town, neighborhood center, residential area or sensitive landscape, such elements often have unintended destructive effects.

The following discusses some of the most common of these standard physical elements. Examples of better than ordinary treatment are shown not as models but simply to illustrate the possibilities. There are usually many design options. Designers should be retained who are sensitive to the aesthetic qualities involved and the need for integration with the environment.

Undefined Horizontal Space

The requirements of increasing auto traffic have created a great deal of undefined horizontal space in cities. Roadways blend into the parking lots, driveways and service stations. Buildings are torn down to create more parking and maneuvering space. New buildings are sometimes isolated in a sea of parking lots. In many cities, 60% or more of the downtown area is space devoted exclusively to the automobile. This environment is not pleasant for the driver, and creates a hostile setting for any activity outside the car.

Where sidewalks, building entrances or open space for recreation occur in such environments, they should be defined and screened from this amorphous "machine space". Much can be accomplished through the siting of buildings and the overall shaping of the pedestrian paths. Planting, screening, changes of level, and pavement texture are key design elements. Details such as flowers and stone walls can also provide a counterpoint to the bleakness of the rest of the environment.



Landscaping is an effective buffer treatment.

Left-Over Land

The geometrical requirements of road and rail design often result in odd-shaped, often inaccessible pieces of land. These can range from the hundreds of acres imprisoned in a highway clover leaf to small triangles or circles trapped in urban intersections. The engineering designs consider the land only from the point of view of accommodating the turning radii, required elevations, etc. Even when the left-over pieces are landscaped, their odd shapes, and sizes and isolation can make them impossible to use.

The "useless" quality of such land also gives it a low priority for maintenance. Thus, such places tend to be desolate and unattractive.

Adjustments of the road or guideway to provide better access and more developable or useable shapes is the more important step toward realizing some design

opportunities. Sometimes ingenious design can turn what may have seemed a hopeless situation into a successful place as was done with the Albany Linear Park under the BART guideway (Case Study 3.2b.).

Asphalt Pavement

Bituminous asphalt is the most appropriate and economical road surface for automobiles. Its success has made it into the most ubiquitous element in the landscape of urban America. The uniqueness of city and town centers and older residential neighborhoods disappears with the spread of asphalt, which functionally and symbolically reserves the space for vehicles. In areas where space is to be reclaimed for pedestrians, the asphalt should be removed or altered.

Sidewalks, crosswalks, pedestrian streets, squares and footpaths can be defined by the use of different materials

and textures. The most common are brick or stone pavers, tiles and specially textured concrete. These are more expensive per square foot than asphalt but are needed in smaller quantities. The cost of space per pedestrian is still likely to be much lower than the cost of asphalt per driver. When special pavement is used for aesthetic effects, overly rough or slippery surfaces should be avoided to insure safety and comfort of walking.

a. Highway interchanges leave behind hard to use land



b. Brick paving offers a wide choice of patterns.



Wire Fencing

Chain link wire fencing is a sort of vertical equivalent of asphalt: nothing else can keep people in or out at such low cost and last so long with no maintenance. Little else is so ugly and pervasive in the American environment.

Fences are used for safety and/or security along tracks, limited access highways, airport runways, and storage and maintenance facilities. Large expanses of wire fencing with "machine space" beyond can seriously impair the visual character of a residential neighborhood or a public street. In highly visible areas, fencing should be designed to conform with the character of such areas, even at higher costs. Some attractive, traditional alternatives are wood or iron fencing and masonry walls. Chain link fencing can be made somewhat more attractive through coating with colored vinyl, combining with opaque materials or sculptured shaping as illustrated by Case Study 1.5a.

Signs, Lights and Signals

Signs, lights and signals are often deployed in routine procedures that do not respond to aesthetic conditions. For example, standard lights used on highways keep marching heavily across the delicate tracery of a suspension bridge in Maine. And in the Boston area, new standard cantilevered traffic signals for major arterial roads are placed at small residential street corners as well, their bases blocking half of the narrow sidewalk and their massive aluminum poles and yellow signal-heads rudely contradicting the character of the environment.

The uniform application of standard equipment should be tempered to allow adjustment to the locale. For example, the integrated sign/signal units on San Francisco's Market Street sit well on this large, formal avenue, although they wisely were not used on more intimate streets. The large sodium vapor lights of cor-ten and stainless steel are as impres-

sive as giant trees on the Massachusetts Turnpike and are quite appropriate in those open spaces. In contrast, traditional lighting recently installed in Boston's Downtown Crossing (Case Study 2.1a) fits well into that environment.

a. Painting of Montreal Metro garage fence suggests movement of trains.



b. Traffic signal system, Market Street, San Francisco.

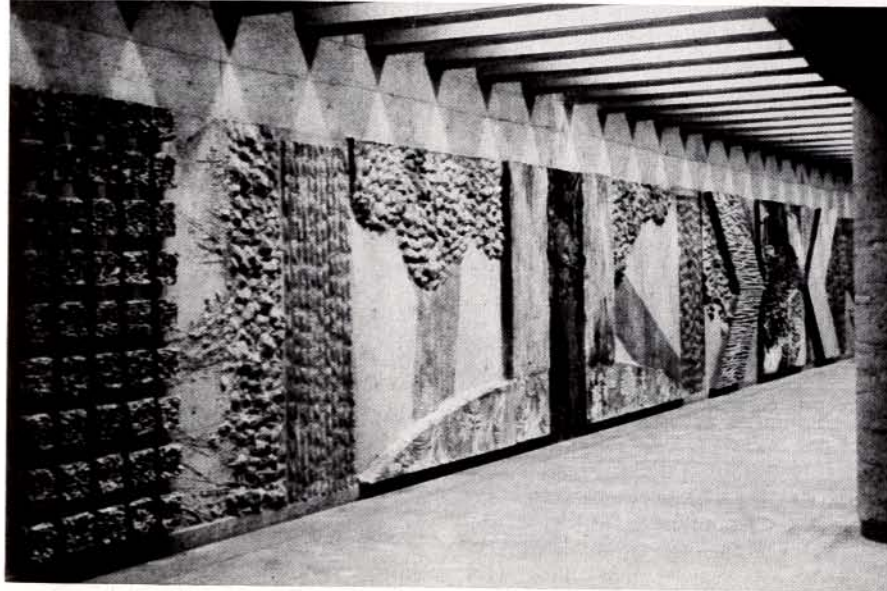


Concrete Walls and Abutments

While concrete has enjoyed quite a vogue among architects it never endeared itself to the general public. Most of its manifestations as highway ramps, abutments, barrier walls and columns even lack the graceful plasticity or strong form that has intrigued architects. (See Case Study 2.7b for a notable exception.)

The color of concrete can be controlled by the choice of cement and aggregate to create less drab visual effects. The shapes of columns, beams, and rails can be made at once structurally more efficient and visually more interesting. Texture created by form work can give concrete the look of a more natural material and reduce its attraction for graffiti. Vines and other planting, can soften the effect.

a. Aesthetic designs can be included in formwork for concrete.



Potentials for Action

The deployment of all the elements described above is controlled by local transportation agencies: city and state departments of public works, state transportation, highway departments, and regional transportation agencies. The first, and probably most important action, is for someone in a responsible administrative position to take a careful look at the system-wide effect of these standard physical elements and introduce a design concern into the relevant operations.

The Designer's Role

Designers working for the transportation agencies (either in-house or as consultants) can study the specific aspects of these elements and procedures. A slide show of the aggregate visual effect of these elements throughout the city or state can be a useful eye-opener and can easily be prepared by designers. Through such means, designers can define opportunities, suggest priorities from the environmental point of view, develop alternative techniques, and estimate costs. They must collaborate closely with the engineers and administrators to insure that safety, operating cost and other requirements are met, and that the design proposals can realistically be implemented.

Standards

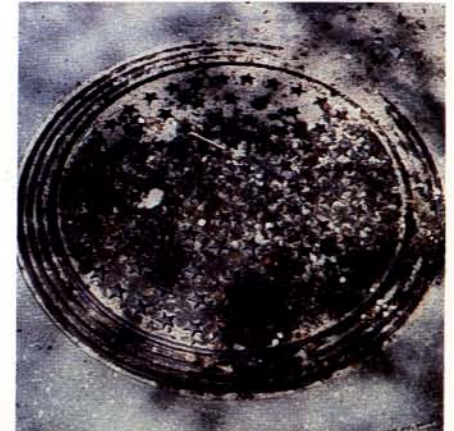
Material and equipment standards should be defined in terms of both functional and aesthetic performance. They should be flexible enough to allow integration with the surroundings. For instance, the actual traffic signal or sign and its location may be standardized for driver recognition, but the mounting system may be allowed to vary, as appropriate for the street. Some federal standards linked with eligibility for funding are partly re-

sponsible for the rigid uniformity, and they need to be relaxed somewhat to allow a more adequate response to this design concern.

Costs and Budgets

Some design improvement can occur in the everyday elements described here without extra cost, and by more careful placement and consideration. However in many cases, particularly pavement and fencing, the better solutions will cost more. The need for the more costly solutions should be determined by urban designers for the transportation agency, based on the intensity of use and aesthetic character of different areas. Extra costs can then be justified on the basis of environmental needs and benefits over and above strict functional performance.

b. Manhole cover, New York.



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- 4.2 High Priorities
- 4.3 Facility Owners' Needs
- 4.4 Funding Agencies' Procedures
- 4.5 Designer Selection
- 4.6 Planning and Preliminary Design
- 4.7 Final Design and Construction
- 4.8 Maintenance and Management

Introduction

As has been pointed out throughout the previous chapters, aesthetic qualities are an integral part of the way a design is conceived. Thus, aesthetic concerns must be represented throughout the design process from early conception to detailed execution.

Ideally, if we were a nation like the Balinese, all of our activities would be suffused with an aesthetic concern. Transportation planners would plan, administrators manage, and engineers compute with an eye toward the beauty of the product of their work. There are, in fact, many who do this. Yet the majority of the transportation facilities visible in our environments testify to our failure to integrate the solution of our "practical" problems with making our environment beautiful.

The recurring theme of this report is that this situation can be improved. The case studies in the first three chapters show many outstanding examples of art and design. The key questions for this chapter are: Can the lessons of such good examples be generalized? Can they become the norm rather than the exception? These questions lead to an examination of procedures that produce transportation facilities, to see whether significant improvements can be made.

A review of the case studies reveals that some of the pioneering projects were motivated not by policies or procedures, but by very specific local energies and individual initiatives. Not surprisingly, projects such as Freeway Park are the invention of creative individuals without the support of an established procedure. The procedure, in fact, is often invented as part of the project. Other very suc-

cessful projects, however, were based on the adaptation of existing procedures and prototypes. The Downtown Crossing project in Boston, for example, was catalyzed by Urban Mass Transportation Administration support for demonstrating the U.S. adaptation of Auto Restricted Zone concepts widely used in Europe.

While improved procedures usually do not, by themselves, create the impetus for aesthetic design, they can assist in opening doors for it. There is considerable art and design talent in most communities. Procedural changes could help focus this talent on transportation facility planning and design. Improvements in procedures can be made—starting with early planning phases and ending with construction and maintenance programs—that would increase the opportunities for creating attractive projects.

This chapter examines current procedures, provides recommendations for their improvement, and includes examples of procedures which are supportive of art and aesthetic design.

4

Improved Procedures

Increasing Aesthetic Concern

If transportation planning procedures are to incorporate a greater concern for aesthetics, energies must be introduced that can counteract the inertia of the status quo. This section is an overview of the instruments that can help change current procedures which ignore or downplay aesthetic concerns.

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High Level Policy Statements	
Incorporating Design Advocates	
Special Purpose Funding	
Demonstration Programs	
Publicity for Successful Prototypes	
Guidelines and Directives	
Policy Statement by the U.S. Secretary of Transportation:	
Case Study	4.1a

High Level Policy Statements

In order to make any significant change of direction in a government agency, it is essential that the top policy makers clearly declare their support of such a change. The policy statement by Brock Adams, former Secretary of the U.S. Department of Transportation (DOT) launched the efforts of the DOT Task Force on Design, Art and Architecture in Transportation. Michael Dukakis, when governor of Massachusetts, made it very clear that he wanted transportation projects throughout the state to serve the environmental and revitalization goals of established communities. Current Secretary of Transportation Neil Goldschmidt made concerns for the environment and public transportation major issues in his successful campaigns for mayor of Portland, Oregon. Their clear policies were followed by productive actions by their more specialized agencies, departments and staffs.

High level initiatives may be the result, in part, of careful groundwork by legitimate advocates on the agency staff or in the outside community. The initiatives also must be followed up with detailed administrative procedures and project-oriented technical work. It is particularly important to back up these policy initiatives with specific funding commitments, wherever possible. Nevertheless, a strong policy statement alone can be a catalyst for coordinated action. Heads of appropriate agencies should be encouraged to make such policy statements in support of art and aesthetic design in transportation facilities.

Incorporating Design Advocates

Much of the everyday decision-making of government agencies is accomplished through resolving the competing pressures of the moment. Ideas lacking strong on-the-spot advocates can often be pushed aside by more current, pressing demands. This has, in all too many cases, been the fate of art and aesthetic design. While there may be agreement that these are important issues, other concerns (such as quantity of production, technical performance, etc.) usually achieve higher priority, leaving no resources for aesthetics.

While the now dominant priorities are demonstrably important, they should not categorically take precedence over aesthetic design. The priorities that have prevailed have traditionally been the concerns of transportation planners, traffic and civil engineers and administrators. As was pointed out before, many people in these professions will not, on their own, have a sensitivity to aesthetic concerns. Thus, it is desirable to have people with a professional orientation to aesthetic design and art to act as advocates at various stages of decision making.

The role of aesthetic design advocates is further discussed in relation to specific procedures in the following sections. The point that bears emphasizing here is that it would be best to build advocates into the system with roles made effective by budgeting, staffing and statutory authority. The presence of advocates may be seen as a disruptive complication to

some budget conscious engineers or busy administrators (as environmental review procedures have sometimes been perceived). However, there is no way to emphasize such a major area of previously neglected values without some departure from "business as usual" Advocates (and any related required reviews) are necessary in order to insure exposure and attention to the aesthetic impacts and opportunities at all phases of transportation projects. Once such values are established, (through a series of projects), it is likely that the viewpoints of the disciplines will blur and that more engineers and administrators will strive on their own to create attractive as well as useful projects. This was one of the several gratifying products of the Auto Restricted Zone Demonstration Program (Case Studies 2.1a and 4.2a).

Special Purpose Funding

Ideally, the local agency-clients for transportation projects would allocate their own budgets to incorporate the appropriate levels of design and art. In practice, however, aesthetics often are seen as the "soft" part of a project, where budgets can be most easily cut. Thus, funding categorically allocated by the granting agency is often a necessity for obtaining art or improving aesthetic design.

Allocating a percentage of construction costs to works of art has been adopted as a policy by many agencies. Cities and states around the country have legislated the use of a set percentage (often one percent) of the cost of public construction for the purchase or commissioning of art. The General Services Administration mandates one-half of one percent of Federal building costs be used for the purchase or commissioning of art. Most of the administrations within the U.S. DOT do not prescribe a percentage allocation, but many of the local transportation agencies have chosen to do so (*ref.*

3 and Case Study 1.6d). The formulas can be somewhat arbitrary but seem necessary to insure continuing attention to the arts. Transportation projects where the arts budgets were discretionary have consistently had less funding devoted to art work than those where a percentage formula has been used.

The aesthetic aspects of facility design are so integrated with other design aspects that a percentage funding formula is not possible. But experience shows that special funding allocations for aesthetic design aspects have acted as important incentives. For instance, the Section 319(b) of Title 23 (part of the Highway Beautification Act of 1965, as amended) programs that provided 100% funds for highway beautification produced a large number of projects. When the 1976 Highway Act absorbed this funding into the general construction budgets, and made beautification programs discretionary, activity in this area declined.

If localities do not choose to place a high priority on aesthetic issues, should the federal government pressure them to do so by providing special funding or mandating percentage set asides? The current tendency is to back away from this type of intervention. There are some conditions, however, that warrant such specialized support. In some situations, there are substantial local constituencies for aesthetic improvement—notably pedestrians and bicycle riders—whose interests are not adequately represented by the local transportation agencies.

Demonstration Programs

Significant opportunities for aesthetic design may not be recognized or viewed as acceptable for funding, given local priorities. Demonstration programs can provide one-time special purpose funding to enable officials of the public to better judge the benefits of a design concept. A

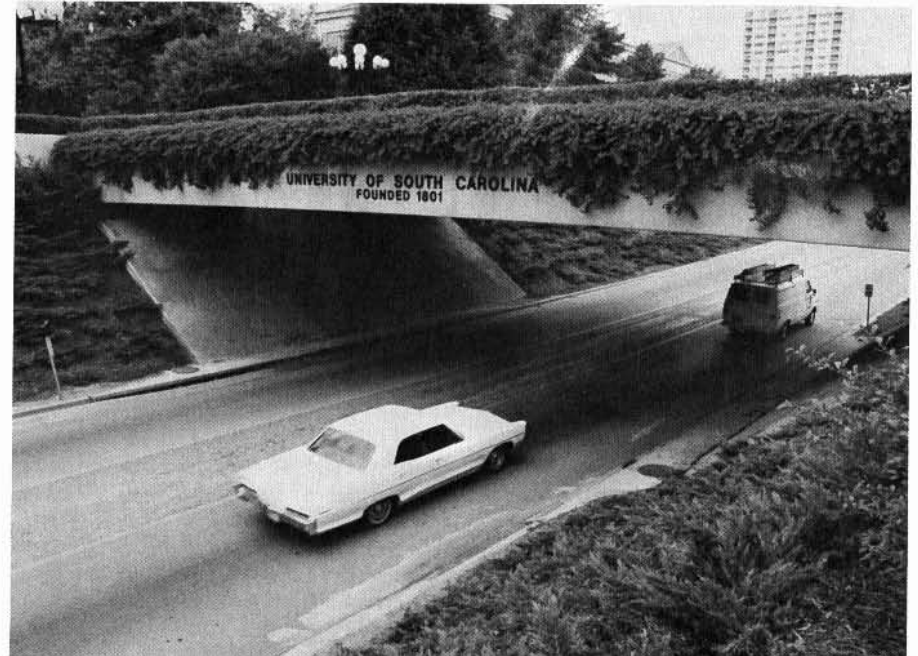
useful example of this is the Auto Restricted Zone (ARZ) Demonstration Program (Case Study 4.2a).

The Urban Mass Transportation Administration (UMTA) Service and Methods Demonstration Program was established to conduct demonstrations, including efforts such as ARZ. Authorized under Section 6 of the Urban Mass Transportation Act of 1964, as amended, the program provides 100% funding and conducts extensive evaluations of projects to identify possible applications for other localities. The ARZ effort was the first of the Section 6 demonstrations to be directly involved with major aesthetic issues. The availability of funding was a major factor in persuading local officials to sponsor these often controversial projects. Evaluation of other (mostly European) ARZ projects has indicated that merchants and officials were usually ap-

prehensive before the project began, but were pleased with the results afterwards. Thus, demonstration funding seemed a particularly appropriate mechanism for introducing this concept into the U.S.

Working prototypes—whether they were special demonstrations or not—were found to be the most effective means of convincing people of the benefits of spending money on aesthetic design and art. Personal experience of the quality of such environments and the sense of competitive local pride ("Why couldn't we do as well at home?") work together to persuade local officials to greater efforts in this area. Continued funding of demonstrations of innovative aesthetic design and art programs for the various transportation modes would certainly give further impetus to improved design quality in transportation.

Public and private efforts produced this unique facility.



Publicity for Successful Prototypes

Successful prototypes are the main vehicles for translating new ideas in art and design into common usage. However, exposure to already successful prototypes is often sporadic and should be systematically increased. Once people have seen the Montreal Subway system, a European ARZ, or Freeway Park, they can envision how such projects can greatly benefit their own places. But the majority of local officials who make decisions about similar projects, or about other projects which could offer special opportunities for design quality every day, are not familiar with these prototypes.

One obstacle to increasing this exposure is that in the areas of art and design quality there is no substitute for direct experience. Pictures and written descriptions (such as provided in this report) can call attention to the projects, but strong skeptics will not always be convinced by those. Slide tapes and sound films can come a step closer to simulating the actual experience. For some major projects, however, it will be essential to take officials, community members and influential business people on tours of appropriate prototype projects.

Visits by Portland merchants to successful transit malls, and by the mayor of Boston to European ARZ projects, helped generate the support to carry these projects to completion. During the last year, the U.S. DOT, working with the Organization for Economic Cooperation and Development (OECD), sponsored a conference in Europe for U.S. mayors and other officials. A tour of outstanding urban transportation improvements was included and enthusiastically received. Site visits require expense and effort, but they are generally cost effective, particularly when they can be linked to projects under consideration at home.

Design awards can also be an effective vehicle for encouraging good aesthetic design. The Federal Highway Administration design awards was the first such program within the U.S. Department of Transportation, and has had good results. For example, the State of Vermont, following recognition of its outstanding design work on Interstate Highway 89/91, has adopted elements of this project as statewide standards. The Federal Railroad Administration has just initiated a similar program for railroad-related design achievements.

Much more could be accomplished with such awards at relatively little cost, creating a major incentive toward good design. Some state DOT's might wish to evaluate possible awards programs, which could emphasize the recognition of the types of design and art concerns described in Chapters 1, 2, and 3. Possible modal categories are fairly self-evident, but a significant number of cross-modal categories and special transportation categories could also be considered. For example, awards could be given for:

- The best collaborative project between artists and transportation designers;
- The best administered art in transportation program;
- Incorporation of works of art;
- Design of passenger terminal and station facilities;
- Multimodal structures and transfer points;
- Sympathetic treatment of historic, cultural, or natural environments;
- Landscaping treatment;
- Use of graphics and signs;
- Bridge design;
- Urban transportation rights-of-way; and
- Rural transportation rights-of-way.

Whether focusing on a specific transportation mode, or all modes, a modest budgetary commitment to administration, personnel and expenses could expedite a range of awards programs. Eminent practitioners of the art and design profes-

sions should be invited (with expenses and honorarium paid if possible) to participate on the juries. The staff assembled for the awards should be provided with the capability to publish the results shortly after the judging. Generally, the jury's comments regarding both the entries and the design issues should be solicited and published. The publications generated by the awards programs could provide new case studies concerning the use of art and design in transportation.

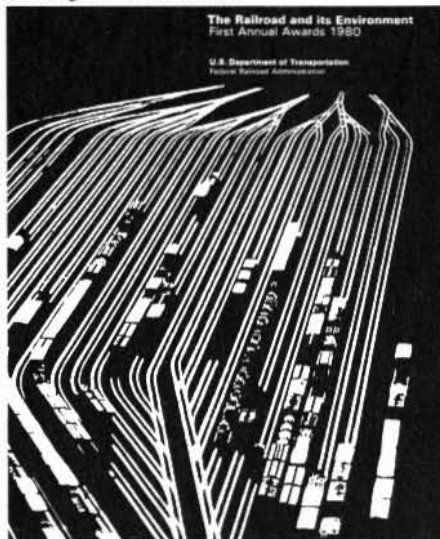
Design awards programs for art and aesthetic design in transportation facilities can also be initiated by the design and arts community. National and local chapters of professional organizations and art agencies could conduct these. The results of such awards programs should be published not only within the design community, but in journals and other publications read by the transportation community.

Guidelines and Directives

Guidelines or directives on design, art and architecture in transportation should be approached with caution. Any attempt to define the concrete elements of "good" art and design was found, in the course of this research, to be generally unproductive. A creative designer can invent many different "good" solutions to any design problem. Obviously, language can not be devised to anticipate all possible solutions, and the operating documents should be sufficiently flexible to accommodate the unforeseen possibilities.

Prescriptive directions on design by public agencies are as likely to inhibit as to encourage creative art and design. General performance criteria for economy of means, cost effectiveness and public acceptability can be established. Functional requirements must be respected. Special design issues and opportunities, such as those discussed in Chapters 1, 2 and 3, can be identified for each type of project

FRA design awards announcement.



and site, and will vary considerably among these.

One potential use of design quality guidelines and directives may lie in opening up the transportation planning process to contributions by talented artists and designers. In this area, explicit instructions can be used to:

- Translate general policy initiatives into operating procedures in the local arena, where many of the project-oriented decisions are made.
- Provide specific points of entry and resources for art and design practitioners, and their professional contributions.
- Legitimize and encourage initiatives by local officials to create attractive transportation environments.
- Reflect or institute desired procedures for determining funding eligibility, defining project scope, selecting designers, administering transportation planning and design programs and managing completed facilities in order to introduce a more comprehensive concern for aesthetics.

CASE STUDY 4.1a

Policy Statement by the U.S. Secretary of Transportation

On September 1, 1977, former Secretary of Transportation Brock Adams issued a policy statement on design quality and approved a number of specific initiatives to carry out that policy by encouraging improved aesthetic design, art and architecture in transportation projects and facilities. Implementation of the policy and program on Design, Art and Architecture in Transportation is continuing under current Secretary Neil Goldschmidt. The original policy statement is quoted in its entirety, immediately below.

The Secretary's Statement on Design Quality

"In America, our transportation systems are among our proudest accomplishments. They provide us with great mobility, while shaping the man-made environment, our daily routines, and our visual surroundings. An investment in the design of transportation systems can produce humane and pleasant places and improve the quality of our environment.

It shall be the consistent policy of the Department of Transportation to encourage good design, art, and architecture in transportation facilities and services. The environmental design arts shall be combined with other technical skills in an interdisciplinary approach to planning, constructing, and operating transportation systems. Funding for appropriate works of art in public spaces shall be provided for Departmental facilities and encouraged in transportation systems receiving grants under our programs.

Attention to design quality can yield substantial economic benefits. Attractive and efficient design can increase ridership and support for public transit, as well as promote safety and economy in operations. While the aesthetic benefits of design quality often elude quantifica-



Observation deck, Miami International Airport.

tion, we recognize that transportation is not an end in itself, and that its design and operation must support efforts to improve the human environment and enhance the social, commercial, and cultural resources of our communities.

The goal of this Department is the development of a unified transportation policy that coordinates improvements in transportation systems with increments in the quality of life. To this end, we shall encourage the highest design achievements in all our programs."

The policy statement has had a catalytic effect. Several transportation projects now include major art programs. The policy statement, the Department's Task Force report which led to the policy and program, and two annual reports on the progress of the program are being used to generate local interest in better design, art and architecture in transportation. If periodically reinforced and bolstered (as is now the case) with funds

from some of the regular grant programs, this clearly stated DOT policy will continue to have a wide-ranging, beneficial effect on design quality in transportation projects and facilities.

High Priorities

Certain elements of transportation facilities merit special attention for aesthetic design because of their intensity of use and needs, and the very high potential impact of such treatment. This section describes the criteria for special aesthetic design attention and highlights areas where aesthetic considerations are particularly important.

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**Conditions Meriting Special Attention
Pedestrian-oriented Design
Joint Development Procedures
Compensation to Communities for the
Impact of Transportation Corridors
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The Auto Restricted Zone Demonstration Programs:	4.2a
Freeway Park Three-Party Agreement, Seattle, Washington:	4.2b

Conditions Meriting Special Attention

There are several types of transportation sites where aesthetic impacts assume substantial importance:

- Areas with exceptionally dense or frequent passenger use (rail station platforms, bus stops in commercial centers, airport ticket lobbies and gates, etc.);
- Communities with aesthetic qualities that are highly sensitive to disruption (historic districts, cohesive residential neighborhoods, etc.);
- Permanent, highly visible transportation structures (bridges, towers, viaducts, etc.);
- Facilities where the prevailing aesthetic environment may actually deter use (subway platforms, buses, parking garages, etc.);
- Locations (downtown shopping streets, waterfronts, etc.) where the improvement of transportation facilities has a strong potential for stimulating revitalization.

In the course of setting priorities for aesthetic emphasis, for these and other sites, particular consideration should be given to three areas of concern: (1) pedestrian-oriented design, (2) integration of transportation facilities with joint development, and (3) compensation to communities for the impact of previously constructed transportation corridors. These areas are highlighted because history suggests that they entail substantial problems and exceptional but neglected opportunities. These issues may also justify urban design analysis and treatment, not always considered a routine part of

transportation facility design. Proposals for pedestrian-oriented design, joint development and physical elements to compensate bisected communities should reach beyond the confines of the transportation project to add vitality to the urban fabric. Such projects require the creative work of urban designers and special combinations of resources. Through these means, the potential exists for turning a difficult problem into a special attraction.

Several case studies in Chapters 2 and 3 demonstrate success in these areas (Case Studies 2.1a, 3.2a, 3.2b, 3.4a, and 3.4b). They are, however, still the exception rather than the rule.

Pedestrian-oriented Design

All travelers, regardless of mode of transportation, are pedestrians at parts of every trip. The functions of entering, departing on foot, and other walking activities (discussed in detail in Chapter 2), represent important transitions. The public will often perceive the quality of the transportation environment in terms of these experiences. Yet in the traditional design process, pedestrian concerns are often viewed as secondary to the safe and rapid movement of vehicles. Neglect of the pedestrian's perspective can be particularly striking at bus stops, and pedestrian paths through parking lots and garages, and in the treatment of most urban streets and sidewalks. But even facilities more explicitly designed for pedestrian use, such as subway stations and airline terminals, often fail as pedestrian environments.

Whether transportation activities and facilities short-change their own needs or not, they frequently exert a blighting influence on the pedestrian life of surrounding communities. This blighting takes the form of imposing traffic on urban shopping streets, turning town commons into traffic rotaries, dividing residential areas with major arterial streets, and constructing massive highway or guideway structures which disrupt or prohibit pedestrian movement.

The loss of pedestrian activity is the loss of the life blood of a community. To avoid this loss, and to generate projects that encourage walking, a special emphasis on the pedestrian impacts of most transportation projects is warranted.

An effective procedural improvement in this area might be to require more extensive analysis of pedestrian opportunities and impacts of any proposed project than now required as part of the environmental reviews. Of course, the recent Urban Mass Transportation Administration (UMTA) Auto Restricted Zone Program (Case Study 4.2a) has served pedestrian concerns well. UMTA has also led the way in providing substantial capital grants to build transit malls and other surface transit-related pedestrian improvements. The Federal Highway Administration (FHWA) has also moved toward supporting some pedestrian oriented improvements through the Federal-aid to Urban Systems (FAUS) program. The availability of further federal support, combined with the requirement to carefully address pedestrian issues, could add significantly to the limited success in this area to date.

Joint Development Procedures

The opportunities for joint development of transportation with other public and private projects are discussed in Section 3.4. This is a promising method for both improving transportation and revitalizing urban areas. Such projects have synergistic benefits making the combined whole more attractive and profitable than the sum of its parts, with integrated design as the key. Joint development requires molding different clients into a coordinated entity and adopting a coherent administrative procedure to accomplish the project.

The parties in a joint development venture are likely to include local or regional transportation agencies, city government, and private developers. Additional parties, such as federal and state funding agencies, may also be involved. Once all participants have agreed to a joint development approach, the agreement must be defined in careful contractual terms. The three-party agreement executed by the City of Seattle, the State of Washington Highway Department and a private developer was effective in ensuring the development of Freeway Park (Case Study 4.2b). The important aesthetic consequence of this agreement was to permit a strong designer to work in relative freedom from conflicting client pressures in order to create a coherent design.



Penn's Landing, Philadelphia.

Compensation to Communities for the Impact of Transportation Corridors

The rapid expansion of transportation facilities (particularly highways) in the 1950's and 1960's left many communities with severe aesthetic, as well as functional, problems. Cities were sometimes walled off from their waterfronts, and town centers were split by highway trenches. Present planning procedures are more sensitive to such problems. Nevertheless, communities are still suffering the consequences of some past actions.

The problems and solutions are more than aesthetic and include issues of community functions and land use. People's

anger at blighting structures or facilities is often expressed in aesthetic terms (they are "ugly", "dark", "bleak", "out of scale with neighborhood"), but minor cosmetic treatments will not suffice. Freeway Park (Case Study 3.2a) and the BART linear park (Case Study 3.2b) are suggestive of the range of compensatory actions that may be required. These include decking over highway trenches; new construction to visually shield the structure; and putting pedestrian paths under elevated viaducts; building neighborhood parks as buffers; replacing surface parking lots with carefully planned garages; and re-routing traffic that divides communities. So far such actions are rare; they occur where local leaders devote unusual energies to obtaining support and funds for them. Specially earmarked funding programs and other incentives from state and federal governments could lead to more such measures.

CASE STUDY 4.2a

The Auto Restricted Zone Demonstration Program Pedestrian-oriented Street Design Procedures

The Urban Mass Transportation Administration (UMTA) Service and Methods Demonstration Program sponsored Auto Restricted Zone (ARZ) projects in four cities: Boston, Memphis, New York and Providence. The projects involve closing some streets in the downtowns to auto traffic and rearranging traffic patterns to improve conditions for pedestrians and surface public transit. The plans are clearly intended to serve aesthetic and economic renewal objectives as well as transportation goals.

The projects are now being implemented. As of fall, 1979, Boston's Downtown Crossing was essentially complete (Case Study 2.1a), the Memphis project was under construction, and the New York and Providence efforts were in project design. Three of the four current ARZ demonstration projects come from an initial selection of five cities made at the program's inception in 1975.

The program and these projects have a complex history, too lengthy for discussion here. However, aspects common to several of the projects provide some significant lessons for the future of aesthetics in transportation.

The concepts applied in the ARZ plans were not only familiar in Europe but had already been studied locally for each of the demonstration sites. However, the idea of actually reducing or excluding traffic in selected areas had not been accepted. The planning phase of the demonstration, carried out by the consultant team, helped to focus the local debates on ARZ's merits, and provided technical information (such as traffic and parking and goods delivery studies) and illustrations of the opportunities (urban design

studies). The prospect of a 100% demonstration grant to assist with actual implementation of the plans created a greater willingness to find solutions. This process could be useful for many other cities.

ARZ was a further step in promoting UMTA's objectives to improve the quality of the urban environment. The program emphasized that pedestrian improvements and overall downtown vitality can be constructively linked with improved transit service. In addition to the demonstration grants, the four cities also applied and received commitments for 80% capital grants. The demonstration's emphasis on the "software" of maintenance, activity programming, security and traffic enforcement was also innovative. Attention to these kinds of concern will clearly benefit future projects of this nature.

Within the consultant team, the hard lines between engineers and designers often disappeared, promoting some re-examination of values. Administrators both at UMTA and in local government visited European ARZ's and came back with first hand experience and enthusiastic support. Each of the projects fostered cooperation between the local city governments and transit agencies.

Cost Effectiveness

The commitment of under five million dollars of demonstration grants to the four projects has been a catalyst for change at and around the chosen sites. The demonstration's effects have also gone beyond the four projects, as considerable interest has been generated around the country. The ARZ effort appears to have been a highly cost-effective investment involving substantial aesthetic benefits, and could be used as a model for further activities of this nature.



Mid-America Mall, Memphis.

Lessons

- The ARZ Demonstration Program was an effective catalyst for the aesthetic improvement of city centers. More such projects should be pursued.
- Successful demonstrations have to be allied with appropriate local advocates who will work to carry out the projects. Support by the mayors and major business groups was essential in the four cases. Planning staffs of the cities also played a critical role in sustaining the projects. Commitments for this type of support should be secured before designating a demonstration site.
- UMTA allowed a reasonably broad though fully supportable interpretation of transit-related pedestrian improvements in making capital grants. Such improvements are major determinants of the aesthetic quality of projects.

CASE STUDY 4.2b

Freeway Park Three-Party Agreement A Model Joint Development Contract Seattle, Washington

In 1970, the State of Washington Department of Highways, the City of Seattle and developer Richard C. Hedreen entered into a three-party contractual agreement for the development of the Freeway Park Project. The project is discussed in detail in Case Study 3.2a. The additional case study here focuses exclusively on the agreement as an instrument for the joint development of a very attractive project.

The 16-page agreement is a straight-forward, readable document. Parties contemplating a similar joint venture would benefit from reviewing the full text. Here, however, only key points and procedural aspects with a direct bearing on the aesthetic outcome are discussed.

Aesthetic objectives were clearly set out in the Introductory Section, alongside other general requirements: "... (IV) develop a substantial connected public open space available for pedestrian passage, for the preservation of light and air and for public rest and recreation and for enjoyment as a place of beauty in a dense urban environment;"

A commitment to the total project was clearly stated. The section "Ultimate Development" identified major project elements and summarized schedule commitments to their completion. Emphasis on the total project was essential because it assured all parties that having made their share of the effort, they would reap the benefits of the combined results.

The conditions for the private development were particularly carefully defined. This was necessary to insure that the expenditures of public funds would be matched by a sufficient private effort. Technical controls such as the load bear-

ing capacity of the garage roof for planting and open space use, and the alignments and minimum dimensions (including height) of public pedestrian ways through the private section of the property were stated.

The design team was defined in the agreement. The developer retained his own building architect, the state hired architects and engineers to design the freeway bridges and the public garage, and the city selected a coordinating landscape architect to design all of the public space on the surface. Since the public space overlaps all three jurisdictions, the other parties were obligated to make contributions to the landscape architect's fee according to a specified formula. The designers were required to work as a team. The coordinating role assigned to the city as client, and thus to the landscape architects retained by the city, empowered this design firm to be, in practice, the most influential member of the team.

Detailed definition of components occurred on pages seven through twelve of the agreement. The particular responsibilities related to each component were clearly defined. For instance, it was stated that the "West Plaza" (part of the continuous public space occurring over the private garage and office development) shall be designed by the total design team (which was coordinated by the landscape architect). Priority was also placed on completing this design early so that the developer could proceed with his project. Responsibility fell to the developer for paying both design fees and construction costs for certain parts of this component while the city would cover other costs. The division of responsibilities was similarly described for the remaining project components as well.

Maintenance responsibilities and costs for the completed project were also



clearly assigned. General costs were divided between the city, the state, and Hedreen according to a formula. Hedreen was obligated by the contract to a \$10,000 per year contribution toward the provision and maintenance of seasonal flowers. The city was obligated to provide police protection throughout.

Public liability was assigned to each party during the construction of portions of the work they were responsible for. After completion, the city obligated itself to assume full liability for all of the public spaces.

Lessons

- A complete definition of physical project elements and related intentions had to be developed prior to this agreement. The instrument was useful at the point of embarking on specific project design.
- In its coverage of the range of obligations and responsibilities, this agreement is a good example for other projects. However, the actual categories and terms of such a contractual agreement must be custom-tailored to the project.

Facility Owners' Needs

At present, many of the aesthetic needs related to transportation facilities have not been met. Once basic policies to improve this situation are established, the owners must take concrete steps to specifically assess aesthetic needs, determine their priorities and budget the necessary resources. In doing this, the owners will probably require some professional assistance. This section focuses on methods of incorporating aesthetic values into the operation of a transportation agency. The "owners" are here distinguished from "funding agencies" described in the next section. "Owners" are responsible for building, operating and managing the facilities, and therefore initiate most of the action. Their priorities however are influenced by funding sources.

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- Owners and Their Concerns**
- Aesthetic Opportunity Review**
- In-house Design Staffs**
- Other Government Agencies**
- Outside Consultants**
- Design Advisory Boards**
- Community Participation**
- Scope of Work**

Owners and Their Concerns

The owners of transportation facilities are the federal, state and local governments, special purpose agencies and private corporations. Due to this diversity, they are likely to have different priorities and concerns in aesthetic design and art.

If the owner is a relatively independent, single-purpose transportation agency (such as a regional transit authority), it may want to undertake aesthetic improvements to attract ridership, improve the level of service, and increase the safety and efficiency of operations. A city government may consider economic revitalization a major goal and view a street improvement program as a way of attracting new developments. A private airline or bus service is likely to look at aesthetic improvements as a means of helping it compete in the market place.

In spite of this diversity of concerns, the ways aesthetic design and the use of artworks affect the facilities are similar. If travelers are satisfied or excited by their surroundings during the trip, and if the neighbors of transportation facilities consider them attractive additions to their communities, all of the above objectives will be well served. Thus, in spite of diversity, owners can approach their aesthetic needs in a very similar manner. The assessment of these needs must in all cases include a study of the quality of the experience of the individuals using the facility and of those otherwise exposed to its impacts.

Aesthetic Opportunity Review

The previous chapters have illustrated numerous opportunities for aesthetic design and the use of artworks in all modes of transportation. While a few outstanding projects have capitalized on these opportunities, in the majority of cases they are still fully or partially missed. The opportunities occur during routine operations and during the planning and design of new projects. Opportunities are frequently missed however, either because they are never recognized at all, or they are recognized, but passed over in favor of competing priorities that demand funding and administrative attention.

In order to upgrade the aesthetic quality of transportation facilities, improved procedures could address both problems. An aesthetic opportunity review could be incorporated in the formal review procedures, such as for annual operating plans and budgets, and for key stages of new project development.

A thorough analysis of aesthetic opportunities can be performed by systematically examining the potential impacts of each element of the transportation facility (circulation areas, waiting places, the ride, views of guideways and vehicles, sounds and fumes, etc.) in relation to each major segment of the riding public and the surrounding community. Each element of such an analysis assesses subjective aesthetic experiences (such as excitement, interest, boredom, etc.). These can be reasonably predicted by trained professionals and then aggregated on spatial maps and charts, or described through other techniques. The relative importance of aesthetic treatments can be weighted by the number of users, their frequency of use, and time spent in a particular environment.

To be effective, an aesthetic opportunity review must be conducted by professionals with the expertise and authority to become effective advocates for allocating a fair share of resources to aesthetic concerns. Reviews may be conducted by in-house staff, other government agencies, consultants, or outside Design Advisory Boards. As part of the aesthetic opportunity review, alternative functional arrangements may also need to be considered. For example, in a recent study by S.G. Associates in Cleveland, the relocation of a proposed parking garage site and feeder road created opportunities for open space and residential developments, an auto restricted zone, a better transit station design, and other aesthetically beneficial developments without any loss of functional efficiency.

In-House Design Staffs

Most major transportation agencies have some architects, landscape architects or other design and art professionals on their staffs. The size of design staffs varies from those with the full capability to design finished facilities (such as found at Montreal Metro) to those with a few professionals who act only as advisors.

Many transportation agencies do not at present have sufficient aesthetic design professionals on their staffs to conduct the aesthetic opportunity reviews recommended above, turn those opportunities into design initiatives and oversee their implementation. This problem may be resolved either by expanding the staff or by making arrangements with other agencies or private consultants to regularly assist the transportation agency with aesthetic issues.

It is important that the aesthetic design staff be given a clear mandate for aesthetic opportunity review and related policy initiatives. This means that design staff members must be involved in the early formulation of operating policies and new project concepts. The staff should also be charged to maintain an up-to-date inventory of aesthetic problems and opportunities throughout the system.

If the agency relies heavily on its in-house design staffs, it is important that this staff is continually supplied with fresh ideas. Design and art professionals must practice their skills on actual projects, and grow and change in order to remain vital. Agencies may tend to create administrative positions for designers and remove them from actual project design. If this happens, the designer may get into the rut of playing only the critic's role and becoming rigid and bureaucratic. To counteract this, either the personnel should periodically change, or enough projects should be fully designed in-house to keep the designers in practice.

The effectiveness of a design staff is dependent on support from the agency administrator. If the executives consider the design staff a resource and rely on its recommendations, the designers will be stimulated and inspired. If they are not taken seriously, the most talented designers will leave, and the others will become ineffective.

Other Government Agencies

Other governmental agencies may have the interest and capabilities to deal with aesthetic issues of transportation. In city government, these frequently include planning, urban design, community development or parks departments. On the regional or state level there is more variation but many planning or environmental agencies include design staffs. These agencies are sometimes in position to help when the transportation agencies do not have adequate in-house staffs to deal with aesthetic issues.

Such cooperation is mandated in most cities where the different departments must review highway, street improvement, parking or transit projects. Regional transportation agencies and special authorities are more independently constituted, and such interlocking review procedures often have to be specially arranged. However, interdepartmental cooperation is never easy in government and requires clear support from the chief executive, and good working relationships on the staff level.

The role of art agencies in assisting with art programs is explored in Section 1.4. Transportation agencies can receive such assistance from local, county or state art agencies as well as from the National Endowment for the Arts.

Outside Consultants

Commonly, transportation agencies do not retain consultants concerned with aesthetic design until after initial technical studies indicate specific project elements. However, as indicated above, the full range of aesthetic opportunities is only likely to be uncovered if sympathetic professionals are involved in early reviews. If sufficient qualified in-house staff is not available it would be reasonable to retain urban designers, architects, landscape architects or artists as outside consultants to conduct aesthetic opportunity reviews of the system as a whole and of major project initiatives. The consultants can conduct the assessment as a one-time professional overview or as a kind of sensitivity training program involving technical designers, administrators and users of the facilities. An example of the latter approach is the workshop series conducted by the Seattle design firm of Jones and Jones for the Federal Highway Administration (*ref.* 61).

Design Advisory Boards

Boards consisting of recognized and qualified design and arts professionals have been constituted in many areas and charged with a variety of aesthetics-related policy decisions. They may also be called Design Review Boards, Design Commissions or Fine Arts Commissions. They may be responsible to the general governmental unit as are the Seattle Arts Commission (municipal) (Case Study 1.6c) and the Washington (D.C.) Commission on Fine Arts (federal) or they may work for a separate transportation entity as in the case of the Bay Area Rapid Transit Arts Council (Case Study 1.2a). The roles of these bodies vary from relatively perfunctory reviews to active participation in all aesthetics-related public developments.

An active Design Advisory Board can help a transportation agency in dealing

with many of its aesthetics-related issues. It can supervise aesthetic opportunity reviews, project scope definitions and funding priorities (see below). It can also conduct the selection of artists and designers, and design reviews for projects in progress.

Using such a board can accomplish two purposes for the transportation agency: providing expert advice and policy recommendations in the areas mentioned above and helping to insulate the transportation agency from political pressure and criticism resulting from potentially controversial aesthetic judgements.

The powers given to the board, the selection of its members and their terms of service will determine its effectiveness. To be effective, a board should be appointed by the highest level executive or policy-making body of the jurisdiction and must have consistent administrative support for its recommendations. To champion high quality art and design and be credible, the board must include respected designers and artists. To promote a balanced point of view and avoid excessive dominance by particular personalities, the terms of service can be made relatively short (possibly two years). To insure a professional rather than political focus, members should be recommended by local professional organizations and art agencies.

If the board is to address the full range of aesthetic design and art issues, its membership should represent a cross-section of all the relevant disciplines. The board can rely on local professional and arts organizations, community groups, or special task forces as advisors on particular issues. If concrete programs such as designer or artist selection come under its jurisdiction, the board may need to constitute ad-hoc panels or juries of professionals from outside its membership who are best qualified on the issues. This is particularly true for art programs where a board dominated

by design professionals may not be sufficiently versed in the issues and opportunities presented by public art (Section 1.4).

The board must work closely with the in-house design staffs or consultants of the transportation agency. The staff would generally conduct the technical reviews and analyses under the board's direction and make presentations to the board and the public.

Community Participation

The owners' assessment of aesthetic issues can greatly benefit from communication with the traveling public and the local communities. People often have strong and explicit reactions to the quality of their environment and one of the most direct ways to assess these is to ask them. Obvious as this may seem, this type of assessment is often neglected. Attitudinal surveys, sample interviews and participatory workshops are among the most common techniques for assessment. A further description of some of these techniques is provided in Section 3.1.

It must be remembered that people can only make judgements on qualities they have already experienced. If the designer or artist is considering proposals that are unknown to a particular section of the public, a considerable educational effort must accompany the participatory opinion-gathering, otherwise people may reject an idea simply because it looks strange to them (Case Study 1.3c).

Scope of Work

The implementation of aesthetic concepts will depend on specific resources earmarked for them and on continued creative work and advocacy throughout the often lengthy project design and construction procedures. This means that aesthetic needs and opportunities, once established, must be translated into specific budgets and supportive arguments into funding applications. It also means that requests for proposals (RFP's) and selection procedures for consulting services must be formulated to insure the participation of strong and effective professional advocates for the specific aesthetic issues involved.

Consulting firms responding to an RFP search for a competitive advantage and will carefully scrutinize the requirements and directions of the client. For instance, the way the RFP is written for a traffic management and street improvement project may encourage either an engineering or an urban design firm to take the lead role in the proposal. The lead firm will also seek out its subcontractors and consultants in a way designed to match the client's intent. The proposed level of effort by each specialty will also be determined in this way.

Thus, the allocation of authority and resources within the competing consultant teams is already largely predetermined by the RFP. In current practice, this leads to dominance by large engineering firms not highly qualified in aesthetic areas who retain aesthetic design professionals only for limited roles. If a more serious commitment to aesthetic design is desired, the RFP must be explicit about this. For example:

- A major transportation corridor study may consider many alternative modes and routes and only look at physical configurations on a very conceptual level. Yet aesthetic consequences result from decisions at this level: the

ability to preserve or alter the existing landscape, the character of urban development or renewal that may be stimulated, etc. The aesthetic design expertise that can anticipate and shape these consequences includes that of regionally oriented landscape architects and urban designers. The role of these disciplines needs to be defined in the RFP.

- The design of a subway extension project along an already predetermined route may focus its aesthetic concerns on joint development, integration with community activities and art programs at the stations. The RFP should therefore define architectural and urban design services required and the needs for art professionals. If the station designs are of primary importance, it should be suggested that architects rather than engineers take the lead role as was the case with the Massachusetts Bay Transportation Authority's Red Line Extension.
- The in-house design staff and Design Advisory Board should review the RFP's to insure that the appropriate resources and professional assistance have been requested. Further details regarding designer selection are provided in Section 4.5.



Residents feel ownership of the sidewalk. Philadelphia.

Funding Agencies' Procedures

The availability of outside funding is an influential factor in encouraging transportation facility owners to emphasize aesthetic design and artworks. Having generally encouraged aesthetic concerns, funding agencies must make specific decisions on the eligibility and priority for funding of such project proposals. This section reviews existing policies and recommends appropriate criteria and techniques for project evaluation. Techniques reviewed in Section 4.1 and priorities described in Section 4.2 need to be considered by funding agencies also.

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Influence of Funding Programs

- Federal Transportation Agencies
- Other Agencies

Evaluation Criteria and Techniques

- Newburyport, MA, Town Center, Case Study 4.4a

Influence of Funding Programs

Most transportation agencies depend very heavily on federal and state funding programs to finance their capital improvements and operations. For this reason, the emphasis placed on a particular project element is usually defined not only by the perceived need but also by the eligibility of this project element for outside funding. Thus, funding agencies can greatly influence the amount of aesthetic design and art committed to transportation projects by including these elements as eligible for funding. Owners cannot follow through on their aesthetic design objectives unless they can obtain funding for them.

Federal Transportation Agencies

High quality aesthetic design is already generally encouraged for basic transportation facilities (i.e. transit and railroad stations, air terminals, highways, etc.), subject only to overall cost limits and reasonableness. The Federal Railroad Administration (FRA) and the Urban Mass Transportation Administration (UMTA) may allow artworks as eligible project costs under some circumstances. The Federal Highway Administration (FHWA) permits the installation of artworks within the rights-of-way and safety rest areas and will participate in the cost of site preparation for the artwork but not in the cost of purchasing or commissioning the art itself.

The question of eligibility becomes more complicated in the case of local government projects that overlap with transpor-

tation facilities, but do not always fall clearly into one of the established grant program categories. These include: auto restricted zones and other streetscape improvement projects relating to traffic management and surface mass transit, public parking facilities as incentives for redevelopment, the reuse of older railroad stations and other structures, and special projects such as decking over highway trenches.

There is considerable demand from cities and towns for the above types of projects with aesthetic requirements. Downtown revitalization efforts are intimately linked with the aesthetic improvements of streets, parking and transit; city governments are aggressively seeking funding for these types of projects. High level policy statements (Case Study 4.1a) have established the principle of supporting projects that contribute to urban revitalization. However, offices administering the federal grants may still face some complex determinations as to what is eligible and what is not.

Other Agencies

State highway or public works departments act as conduits for federal highway funds. State and local governments must supply matching shares for federally funded projects and the whole cost of some items not eligible for federal funding. These agencies must also devise ways to choose among projects competing for aesthetic design and art funding.

Some agencies such as the Massachusetts Department of Public Works have developed their own operational criteria (Case Study 4.4a) which include:

Reasonableness—usually defined as a relationship to average or standard costs—i.e. a special street design may cost half again as much as the standard approach, if supported by clear arguments, but it may not cost three times as much.

Other local efforts—gauged by commitments made by the locality to raise the standards of its public environment outside the proposed project, such as local financing of parking lot and alley improvements and the rehabilitation of buildings, to match the proposed non-standard street designs.

These criteria seem appropriate in protecting the transportation funding agency from carrying a disproportionate burden of any revitalization effort. They may disadvantage depressed urban areas where the need may be great but where other commitments are difficult to obtain. However, other public programs such as the Economic Development Administration's Public Works program, and the U.S. Department of Housing and Urban Development's Urban Development Action Grants and Community Development Block Grants might sometimes be used to provide the necessary financial commitment.

Evaluation Criteria and Techniques

Detailed evaluation criteria are constantly updated by funding agencies as they gain experience with the aesthetic design of transportation facilities. These will vary with the type of facility, locality and resources currently available. However, the general criteria for high priority areas for aesthetic design listed in Section 4.2 can be applied in all cases. During the evaluation, the project proposal can be measured against these criteria in two ways:

- How great is the need for aesthetic considerations in this project? Is the project among the high priority categories identified?
- How successful and economical is the proposed design solution in responding to the need?

When a funding agency conducts the review of a project application, it has to carry on an aesthetic assessment similar to that recommended for the facility owner in the previous section. Aesthetic design professionals (either as in-house staff or as consultants) should be involved in the technical review, and the points raised in the previous section can apply here as well. Design Advisory Boards similar to those discussed in Section 4.3 could also be effective in working with the funding agencies and could provide technical expertise and general advocacy for aesthetic issues. (Although no precedent was found during the course of this research for the use of outside professional panels as advisors on funding eligibility and priority.) One advantage of using an outside Design Advisory Board would be (as in the case of facility owners) to insulate the funding agency from the political consequences of controversial aesthetic decisions.

The following case study (4.4a) shows that determination of funding eligibility of aesthetic project elements can evolve in response to proposals initiated by the owners (in this case the town of Newburyport, MA). This kind of flexibility is essential. The value of aesthetically oriented designs often becomes clear when

they are fully developed and illustrated. If the funding agency has staff and advisors who can recognize these values and has the flexibility to respond to them, then it can truly participate in encouraging aesthetic design for transportation facilities.

Shade trees are an important street amenity, Washington, D.C.



CASE STUDY 4.4a

Newburyport Town Center Re-interpreting Design Standards Newburyport, MA

The Massachusetts Department of Public Works (MDPW), which is the state highway agency, made considerable changes in its standard practices for a street improvement project in Newburyport. Following the success of this locally initiated program, it became an accepted model for subsequent projects.

The City of Newburyport, Mass. had initiated a major project to revitalize its downtown district. Newburyport is an old, small city on the Merrimac River and was, during the colonial period, a major ocean shipping port and ship building center. Over the years, Newburyport lost out to larger port cities (Boston, Salem, etc.) and experienced economic decline.

Newburyport developed its revitalization program around restoration and adaptive use rather than the more typical renewal/new construction effort. This approach had significant implications for the planned use and physical design of transportation facilities in the revitalization area, including streets, parking areas and sidewalks. The objectives were to produce a level and type of traffic activity compatible with the goals guiding the urban design, and to carry the architectural treatment through to the physical design of the streets, making the transportation facilities an integral part of the area design.

The entire design/implementation process involved a large number of federal, state and city agencies. The City of Newburyport, having initiated the revitalization, set out to maximize federal and state participation and to accomplish design goals within existing federal and state financial programs. This effort was significant because such programs are normally directed more toward new construction than toward rehabilitation and adaptive use. Similarly, design standards, design treatments and use of materials explicitly or implicitly part of the federal and state programs are geared more to contemporary concepts and functional specifications than to older urban form, scale and architectural design.

A majority of the urban streets/sidewalks and on-street parking facilities within the Newburyport project area were facilities which were eligible for use of federal

highway program funding. The primary funding program in effect at that time was the TOPICS program which had as its purpose safety and capacity improvements to existing streets.

The TOPICS program in Massachusetts at that time was approached primarily as traffic and highway engineering design, with little attention to special aesthetic/urban design treatments. Emphasis was on functional solutions following acceptable engineering design practice.

Newburyport presented the Massachusetts Department of Public Works (MDPW) with the first request to expand the TOPICS design approach to incorporate aesthetic design enhancements. This was a departure from previous projects in that:

- traffic planning considerations went beyond usual TOPICS type solutions to include the area urban design objectives;
- the physical design aspects, in addition to meeting traffic operations and safety functions, were also to be compatible, and in fact, made part of the overall architectural/urban design for the area;
- design of surface treatments and use of materials were dictated primarily by the architectural and urban design treatments of buildings, open spaces, etc. in the project area and for the most part were substantially different from those used on previous typical TOPICS projects.

First, MDPW determined that the TOPICS program could be used for Newburyport. This study showed traffic operational and safety deficiencies were present and the improvement actions were eligible for Federal-aid funding (TOPICS).

Planning and design efforts were begun and were carried out differently than on the majority of past TOPICS Projects. The City of Newburyport selected and retained the design firm for the work. On

previous projects, MDPW selected and contracted for the design services. MDPW accepted this approach, even though they were responsible for channeling the federal aid and providing a portion of the local share for construction. Although the city selected and paid for the consultant, the consultant had to be acceptable to MDPW (a means of controlling the quality of the engineering design).

Since the street design had to meet state and federal requirements to maintain funding eligibility, MDPW controlled the design review process. The design review process standard for projects initiated by the MDPW was followed, the only difference being that the city (through its consultants), rather than the state, made the submission.

The designer retained by the city was a member of the overall design team selected by the city for the entire area revitalization project. Consequently, the transportation facilities design which emerged was an integral part of the entire plan in every aspect, including circulation patterns, parking geometrics, urban design, surface treatments, materials and street furniture. Many of these elements were substantially different from typical TOPICS designs:

- brickwork-sidewalks and street;
- granite paving;
- special lighting fixtures (period design);
- special street furniture.

The unconventional features caused the MDPW concern regarding federal participation. Moreover, the non-standard treatment involved added cost. The state's policy did not allow funding for projects without assurance of federal participation. Thus, acceptance of the design by the Federal Highway Administration (FHWA) and subsequent financial assistance was essential to project implementation.

As no clear-cut federal guidelines existed on the design standards, treatments, and costs which deviated from common design practice, approval of the design and costs required a favorable interpretation as to statutory authority, and a willingness on the part of the FHWA to fund more costly elements.

The MDPW and the city of Newburyport together presented the case to the appropriate Federal Highway Administration division office. This process involved negotiations resulting in a decision to accept most of the design elements as eligible for Federal-aid funding.

Among the factors which influenced MDPW and FHWA to participate in the Newburyport project was the commitment by the city to carry the roadway design through to city streets and alleys not eligible for Federal-aid or state funding. The city committed its own resources to implement the non-eligible projects. In addition, the costs, though above the standard, were judged reasonable for the amenity-based design treatment.

The Newburyport project was very successful, and won several awards. The MDPW was so pleased with the outcome that it now encourages the "Newburyport Model" as standard procedure for local improvement programs. The key features of these procedures are:

- Localities are to initiate and define their own improvement projects.
- The city is to select, retain and pay the design consultant subject to MDPW review and approval.
- Aesthetic enhancements are accepted for funding if they meet criteria for reasonable cost effectiveness, are integrated with an overall program for improvements, and are matched by local commitments.

The subsequent results have been mixed. Some projects have had difficulty in obtaining adequate local leadership and internal political support. Cities with

strong local initiative and resources have taken good advantage of the new flexibility. The more open policy has stimulated street improvement projects in other communities such as Lowell, Lawrence and Newton, Massachusetts.

Lessons

- A commitment by the city to consistently pursue aesthetic objectives is probably the most important ingredient for a successful project. In addition, while many different physical elements and funding programs can be fitted into a coherent program, a successful outcome depends on the desire and ability to treat all aspects (from concept to detail) with aesthetic care.
- Aesthetic treatment of transportation facilities is easiest to achieve if standards for such treatment are established throughout the public environment of the city and the aesthetic improvements can be justified as part of a broader program.
- A single design team, under the city's (or other owner's) control, and responsible for all environmental design decisions, is likely to achieve the strongest results.
- The owner, which pays the design fees, has a clear means of control. But this payment, which is not reimbursed under current practice, can become a difficult "front end" burden for poorer communities. Technical assistance funds could be channeled to the consultants through the owner, relieving some of the burden and still maintaining local control.
- Reasonable flexibility on the part of the funding agency played a major role, as did the persuasiveness of the local advocates.
- This process (like most models) is only as good as the agencies administering it. Since it relies on local initiatives, the quality of local leadership becomes the critical factor.



Newburyport, MA.

Designer Selection

This section discusses the selection procedures for design consultants and specific improvements which can be made in them to encourage greater aesthetic concern. Artist selection procedures are discussed separately in Section 1.4. "Designers" referred to in this section are professionals concerned with aesthetic design: architects, urban designers, landscape architects and graphic designers.

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Selection Methods Issues Affecting Aesthetic Design and Alternatives

Selection Methods

The most common method of architect-engineer selection for major transportation facility designs follows a two-step process:

1. Interested consultants submit brief, standardized qualification statements (no proposals required at this stage) which are reviewed by the Evaluation Board and reduced to a "short list" of about four to six finalists.
2. Final selection is based on proposals solicited from the finalists that detail technical approach, special expertise, manpower allocation, project management and other pre-established criteria.

Methods of solicitation vary from the federal government's formal publication in the Commerce Business Daily to notices in the local press and other less formal means. The Architect/Engineer Evaluation Boards or equivalent selection committees are generally constituted from in-house staff of the transportation agency. Qualifications are often requested using the Federal Standard Forms 254 and 255 to describe the firm's experience. Proposals are usually requested from "packaged" consultant teams that contain all the required expertise under the management of a designated prime contractor. The finalists are generally interviewed by the Evaluation Board prior to selection.

A common alternative is a one-stage process in which a notice is published and RFP's are sent to firms recommended by agency staff, or to those firms requesting them. In this case an unlimited number of proposals may be received and evaluated, and a smaller

number of finalists interviewed prior to selection.

In this case all interested firms write full proposals. This is a major effort with a relatively smaller chance of selection, and is burdensome to the consultant. But it may open the door to firms that are not established enough to be selected on the basis of standard qualifications.

Issues Affecting Aesthetic Design and Alternatives

Described below are certain aspects of selection procedures that may work against obtaining high quality design, and alternatives to them:

Large consultant teams can lead to not choosing the best qualified design professionals and artists. A major transportation project requires a great constellation of technical expertise, of which designers and artists are a small part. If packaged teams are selected, the merit of these designers may have little influence on the selection, and the best talent may not be chosen. Some agencies solicit separate consultants and then assemble the team after selection. Such a process was followed by the St. Paul Downtown People Mover Project and to some extent by the Massachusetts Bay Transportation Authority (MBTA) on the Orange Line Extension. It allows the retention of a particularly appropriate designer regardless of what engineering firm he/she originally teamed up with. The arrangements of consultant teams for proposals are often sufficiently ad-hoc that such changes may not cause problems, but in fairness to the consultants the agency's option to re-arrange teams must be indicated in the RFP.

Solicitations may not reach the best qualified designers and artists. They may not regularly peruse the Commerce Business Daily or be known to the staffs of transportation agencies. Notification of specific projects or general solicitation should be published through local professional societies, arts agencies, professional journals and the daily press.

Qualification statements do not reflect design quality. Instruments frequently used are the Federal Standard Forms 254 and 255. The first is filled out by each participating firm. The second is for the project team. These rely solely on quantity, describing the size of the firm and the dollar value of the work it has performed. Brochures and illustrations are often explicitly discouraged. A firm that has done a hundred mediocre projects looks much stronger on these forms than the one that has done two brilliant ones. Visual illustrations of key projects should be requested. References to user/clients who can testify about the aesthetic quality and general performance of the designs should be followed up prior to deciding on the qualifications of designers.

Open competitions make it easier for new design firms to show the strength of their aesthetic design ideas in a full proposal. On the other hand, these put some additional burdens on the other competitors (since the likelihood of landing a contract with the same amount of effort put into a proposal decreases) and on the client agency (since more proposals have to be evaluated). However, in order to insure entry for new firms and a supply of fresh blood to the design process, such open competitions should be held periodically. They could either be used for very important design projects to attract the established firms as well as the newcomers, or for relatively minor ones where only the more eager, smaller firms would be likely to compete.

Proposal formats don't usually show design ideas or intent. In the case of a strong aesthetic emphasis in the project, some illustration of a design approach should be requested. In a two-stage competition, the second stage could involve the preparation and illustration of conceptual designs. Since this is a major commitment of time and expense, consideration should be given to an expense budget for the finalists requested to prepare such designs. This process is commonly followed in architectural competitions.

Evaluation Boards need to include design and art expertise. This is essential in order to judge the relative merit of competitive design professionals or proposals. Ways of introducing this expertise were already discussed in Section 4.3.

Design fees should reflect the scope of work, not a straight percentage of construction cost. The importance of a design element or the work required to develop it is often independent of capital costs. Straight percentage fees often actually provide incentives for wasteful design. The federal Department of Transportation procedures provide a good model in selecting designers solely on technical merit, and only then negotiating the fee. Percentage guidelines are still used, however, to set upper limits of fees, and these are not always realistic. Fees may justifiably reach a much higher than usual percentage of construction costs when dealing with low cost, but complex, design elements. For instance, a downtown auto restricted zone may only cost \$1 million in construction to implement, but may require years of planning, adjustments, negotiations and reviews and the continuing contributions of transportation planners, urban designers, traffic and civic engineers and landscape architects. A small project such as a group of bus shelters at a transfer point

may cost only \$100,000, but to respond to complex community needs and site requirements, it might easily cost \$18,000 or \$20,000 to design. By contrast, a \$20 million subway station following pre-established design standards may be a simple project and demand less than a six percent design fee. As a general matter, however, a little more spent on design tends to pay for itself in the cost-effectiveness of the actual construction.

Community representation will lead to the expression of a community's aesthetic values. Some transportation projects will affect the environment of a specific community. In such cases, it may be appropriate for representatives of that community to be on the Evaluation Board and review potential design consultants from the point of view of suitability to the aesthetic values of the community. The MBTA has successfully introduced this practice on the Orange Line Extension and several other projects.

Designers working for local communities provide an even more direct way of insuring responsiveness to local needs. The Massachusetts Department of Public Works has introduced a policy to encourage cities and towns to hire their own designers to develop plans for local street improvements (Case Study 4.4a).

The procedures suggested here are likely to be useful in finding the most creative designers to improve the aesthetic quality of transportation facilities. Further details should be worked out in relation to local conditions and resources. Ongoing communications between the leaders of the transportation agency and the local art and design community should be used to constantly test and review designer and artist selection procedures.

Planning and Preliminary Design

It is not commonly perceived by transportation planners or their clients that decisions reached at the early stages of project planning and preliminary design may have important aesthetic consequences. Yet when routing and service decisions are made, many aesthetic impacts are often implicit as well. This argues for the early inclusion of design professionals who can anticipate and help to control these consequences. The section describes the potential roles of these professionals and the way these early decisions may be made to serve aesthetic design objectives.

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Examples of Aesthetic Issues The Role of Design Professionals Environmental and Community Review

Examples of Aesthetic Issues

1. In a number of the proposals for Downtown People Movers, the routes and stations were located in dense, built-up areas of the downtowns. From the planning point of view this made sense, since these areas had dense activity and often needed the new vitality that may come with added access. The planning studies often did not, however, sufficiently explore or illustrate the aesthetic impact of elevated guideway structures on older city streets. Only when these relationships were more fully visualized did the problems created by the original alignment decisions become clear.
2. The Golden Gate Ferry System (Case Study 2.8a) derives much of its exceptional aesthetic quality from the most general planning decision: to run a commuter ferry boat across San Francisco Bay. The designs of the boats and terminals greatly enhance the experience, but much of its excitement comes from simply crossing this wonderful landscape under a variety of conditions, day after day. In its unique role of controlling auto, bus and boat commuting from Marin County, the client agency could take advantage of the inherent beauty of the water route to attract commuters away from driving across the overcrowded bridge.
3. Initial schemes for the Harvard Square subway station reconstruction considered moving the main access point to the station into adjacent Brattle Square, the center of the shopping area. On its face, the move seemed logical. However, a more careful study of the

Brattle Square environment (by the Harvard Square Urban Ecology Study, see *ref.* 127) revealed that its attraction was contingent on a moderate density and carefully balanced mix of activities. Adding the higher volumes of transit patrons to this environment would have hurt the shops. The result was a recommendation to keep the main entrance at its present location. Such analyses, however, are not routinely conducted when locating a new activity-generating transportation facility in a complex urban area.

The Role of Design Professionals

The above examples argue for the inclusion of design professionals, concerned with aesthetics, in the early stages of transportation projects. Landscape architects with a regional orientation and urban designers are the key professionals at this stage. They are trained to analyze the opportunities and constraints presented by the existing environment from an ecological and aesthetic point of view. These features of a region or an urban district (sometimes described as "capabilities" and "suitabilities") can be represented by overlay mapping (Section 3.1). The maps can juxtapose potential views, outstanding natural and man-made features, areas particularly vulnerable to intrusion, etc. The transportation planners can then consider these issues alongside their other requirements in laying out alternative schemes.

Once alternative transportation modes and route alignments are proposed, the designers can analyze them for aesthetically critical areas. By overlaying the

transportation schemes on the base maps described above, potential problem and opportunity sites can be identified.

At this stage, more detailed prototype design studies for resolving the problems (such as fitting a guideway into an existing street) and of enhancing the opportunities (such as designs to enhance view) are also necessary. These will assist in evaluating alternative schemes by illustrating the severity of potential problems or the value of potential opportunities.

Techniques for studies of this kind for the natural environment have been developed by McHarg (*ref.* 130) and Halprin (*ref.* 126). An approach to city context is presented in *Urban Ecological Analysis* (*ref.* 134).

Environmental and Community Review

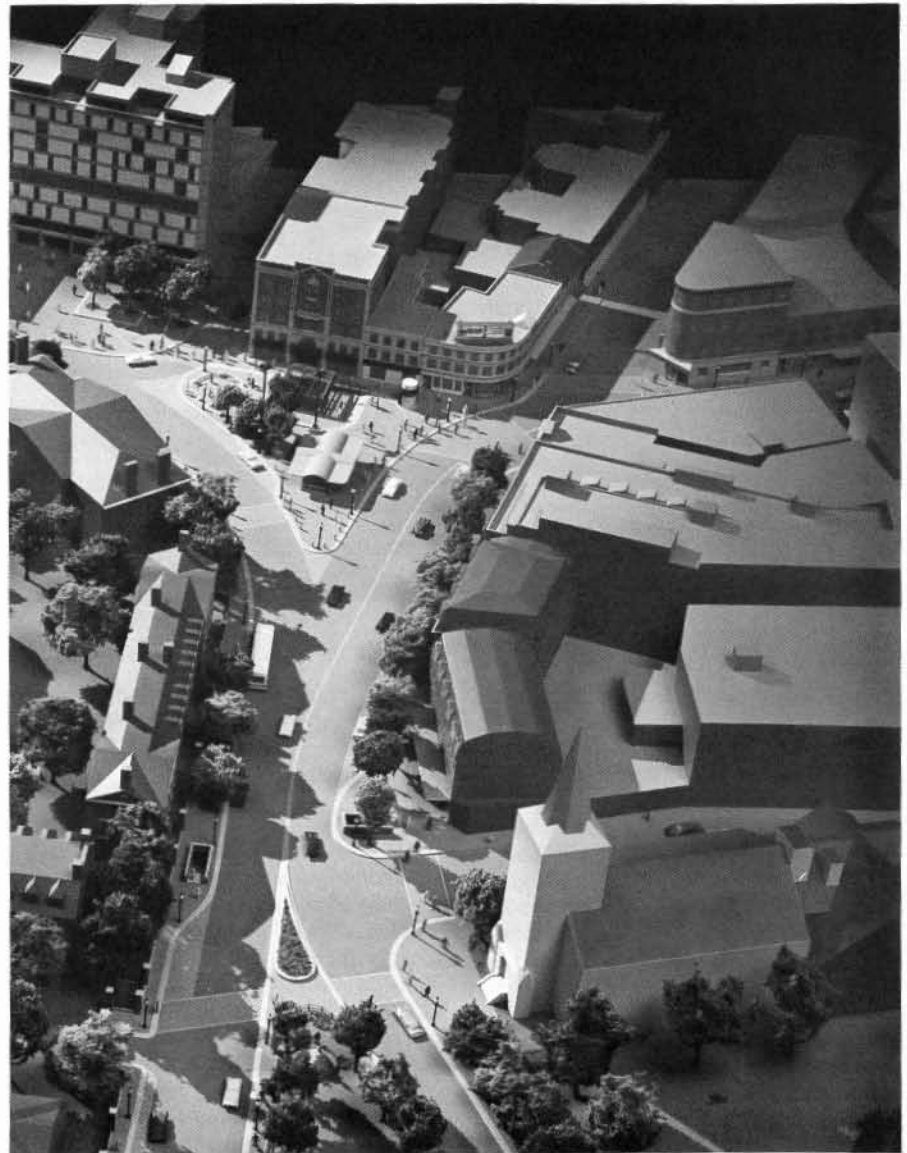
An important component of assessing aesthetic problems and opportunities is determining the value placed on them by members of the communities they most directly affect. Therefore, it is desirable to have the aesthetic assessments described above subjected to evaluation through community participation. It is essential that the community is first provided with the well illustrated results of the initial analyses and design studies, so that people can visualize the problems and opportunities, and make judgements about them.

Community participation usually occurs during the environmental impact reviews and during major planning programs. In the past, such reviews have occurred after conceptual design, usually during basic location or siting decisions. Since by that time much effort had been invested in developing the design, the environmental review sometimes is used merely to justify the concept. If there were any dissent in the community, the

environmental review process might then take on an adversary character, with positions hardening on both sides.

A much more constructive procedure is now evolving, which makes environmental reviews and related community participation a continuous part of conceptual design, as well as subsequent stages of project planning and project development. This can insure that the design team can absorb environmental concerns and the community's values and incorporate them into the conceptual alternatives. This process was followed for the design of the extension route and revised subway station in Harvard Square. The result was that this otherwise highly critical community (that has stopped many other major projects) rapidly approved the preferred alternative and is still quite cooperative during a difficult and disruptive construction program.

The preliminary design for a project should specifically identify the aesthetic issues and priorities for final design and engineering. It should define the types of art programs, the scope of work, and the responsibility of different design professionals in the further project stages. It should propose budgets and other resources required for these tasks.



Model of proposed Harvard Square MBTA Station, Cambridge, MA.

Final Design and Construction

During this stage the shapes, materials, colors, textures and lighting that make up the transportation environment are given physical definition. The results will depend on the quality of the designers, the attitudes of the client, and the resources available. However, the procedures used during final design, engineering and construction can also influence the aesthetic quality of the results, as discussed in this section.

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Types of Design Procedures

- Major Project Design
- Routine Installations

Types of Design Procedures

Major new projects arrive at the design stage through conceptual planning and preliminary design, described in the previous section. These projects go through many years and cycles of planning and designs and involve complex, multi-disciplinary consultant teams. It is important that aesthetic concerns are not lost through these complex procedures.

But a large number of smaller, routine projects are designed every day by the staffs of transportation agencies. The routine projects are often not considered as problems for aesthetic design. Yet they result in a world of asphalt, signs, lights, fencing, etc., that very much affects people's aesthetic experience (see Section 3.5 for discussion of these elements). The procedural recommendations for these two scales of projects—major and routine—are quite different, as listed below:

Major Project Design

Scope of work and designer selection are critical in determining the aesthetic results. Procedural improvements for these are discussed in Sections 4.3 and 4.5.

Client support for the aesthetic objectives must be expressed both in terms of top level policy and day-to-day support of the in-house project management staff. It is important that the staff assigned to the project be qualified to deal with the aesthetic design problems. As project designs evolve, the staff needs to fully understand and be able to advocate

the aesthetic design concepts just as strongly as other aspects of the design.

Visual presentations should be prepared as the design progresses. Drawings, models and photo or film techniques give an immediate sense of the qualities of the proposed design. These act not only to illustrate the project to the public but to elicit the support of the technical and administrative members of the client agency and the consulting team. Models that can simulate the user's experience (as opposed to a "bird's eye view" of the project) are particularly useful and illustrate how aesthetic improvements really make a difference.

Photography of models from the passenger's point of view was used very successfully for the design of stations on the MBTA "Red Line" extension. The Federal Highway Administration is currently experimenting with the use of models to simulate the driver's reaction to different tunnel portal designs. Models and other visualization aids are especially important for complex, long-term projects, to ensure that aesthetic concerns are kept in view during all other design deliberations. A special budget outside the normal design fee may need to be set aside for presentation expenses.

Design review is usually conducted on a number of levels. The project management staff of the agency continuously reviews the work. In a project with many components by different designers, there is often a coordinating urban designer or architect responsible for insuring compatibility. In the case of the Washington, D.C. Metro, the coordinating designer controlled all of the design while at the

Bay Area Rapid Transit only the design of certain functional elements were standardized. In addition, the Design Review Boards and Arts Commissions, as well as interested community groups, may review the designs. This can be a healthy process as long as it is understood that the architect or other designer is clearly in charge of resolving the design problems, and in creating a strong, coherent design. If the selection process is careful to obtain an excellent designer, he or she will produce the best results with freedom to be creative.

Art programs should be activated during the early part of the design phase. If artists are to integrally collaborate in the design (Case Study 1.5a) they must be paid members of the team from the beginning of design. If they are in the more usual role of siting and integrating a piece of commissioned work within the established architectural scheme, their role more realistically begins during the design development (or after 25% design completion) phase. See Sections 1.4 and 1.5 for more extensive discussion of these issues.

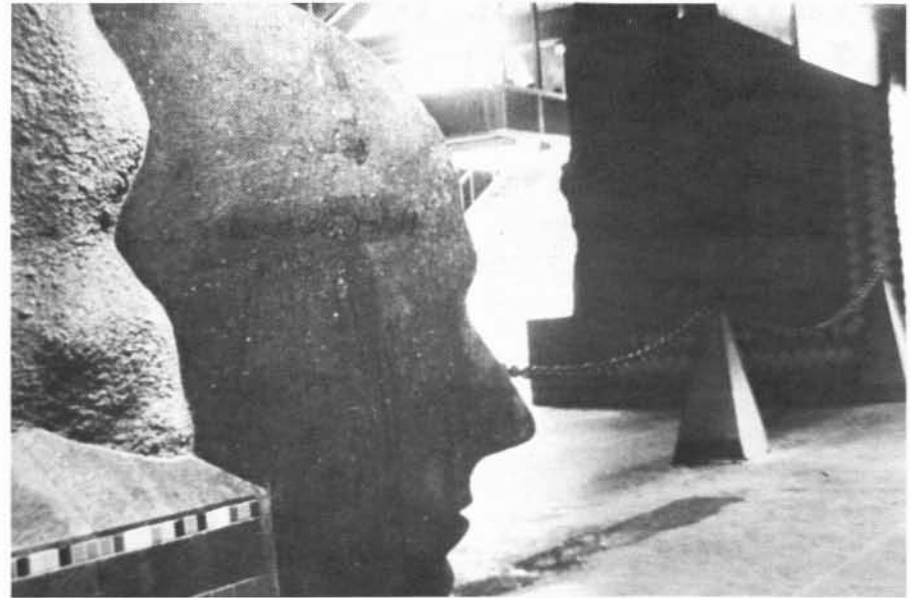
A great pitfall for aesthetic design elements has been their treatment as the "soft" items in a project. Administrators often allow them in the early stage of a design, but consider them expendable if technical or budget problems arise. This is probably the most common reason for the aesthetic poverty in many finished projects. The early designs for these often had contained superior schemes that had been cut back along the way.

To counter this tendency, aesthetic elements should be more carefully studied and justified in the early stages. They should certainly **not** be frills, but designs based on clear needs and executed with economical means, thus creating maximum effect. It is essential to be tough about this early and require clear illustrations and justifications to support the de-

sign. However, once design solutions and art programs have passed these tests, the client agency should commit itself to their support as strongly as to the technical components of the project. After that, if compromises must be made, they can involve all elements, not just aesthetics. If budget cutting must occur, it may generally be preferable to reduce the project's overall scope and defer some part of it to a later date, rather than cut the aesthetic quality of the project and create a permanently inferior place.

Non-standard components are often proposed for aesthetic reasons and it is often discovered rather late in the detail design phase that such elements require elaborate approvals. The design of highways, roads and related equipment is governed by stringent standards, but standards exist for all other modes of transportation as well. The purpose of the standards is usually functional (safety, recognizability, replacement, etc.) though sometimes aesthetic reasons (consistency, unity) may have been considered. It is often possible to meet the same purposes better with an ingenious non-standard design, but the procedure for waiving the standards must be understood and initiated early in the design process to avoid rejection or major delays.

Leaving certain aesthetic decisions to the end of construction can allow a more direct response to the place and a less formal design process. The choice of colors, finishes, some furnishing items and graphics is often best made after the spaces are basically defined and physical scale and light quality can be directly experienced. Some artists can only work effectively in response to a real space. The opportunity for working this way can be created by setting aside budget allowances in the construction contract without actually defining the details of the work. The regulations of the funding



Aesthetics and structure were integrated at all stages in Stockholm's subway system.

agencies and competitive bidding laws can create some obstacles which must be reviewed ahead of time.

Routine Installations

The most widely visible routine construction elements such as pavement, fences, signs and lights. (see Section 3.5) are those deployed by local public works and state highway departments. It is important that the work of these agencies proceed efficiently, and this requires fairly standardized operations. Custom designing each repaving or traffic signal and sign project is not realistic. However, a review of the standard elements and techniques could be carried out on a periodic basis. When annual project lists and budgets are prepared, for example, in-house or consulting designers could identify design opportunities in terms of:

- Revision of standard elements to be replaced by more attractive materials.
- Review of procedures for aesthetic im-

pacts (such as placing new signs, selecting and marking crosswalks, resurfacing streets, periodic repainting of facilities, etc.).

- Identifying special opportunities (using criteria for high priority aesthetic treatment listed in Section 4.2) and removing these from the "routine" category for more careful aesthetic design treatment.
- Juxtaposition of illustrative materials (such as a slide show) on the aesthetic results of current standard practice with illustrations of the aesthetic opportunities. The illustrations should be reviewed with the top administration of the agency, and the political leaders of the city or state, to obtain the mandate and resources necessary to make improvements.

Maintenance and Management

The aesthetic impact of a transportation facility is greatly influenced by the way it is maintained. Environmental management can, in addition to avoiding problems of deterioration, greatly enhance public spaces by programming into them regular lively uses and special events. Resources for maintenance and management are presently scarce but must be considerably increased if other efforts for aesthetic design and public art are to succeed. These issues and related recommendations are discussed in this section.

Contents

- Problems and Opportunities**
- Funding Environmental Management Programs**
- Lessons from the Case Studies**

Problems and Opportunities

Inadequate maintenance causes serious aesthetic problems. Places with trash, dirt, broken glass, damaged furniture or dead plants cannot be aesthetically satisfying, regardless of their design. The more care and money spent on the design, the more distressing it is to see it abused and neglected. A serious indirect impact of maintenance problems is that many client agencies, having experienced the depressing phenomena described above, respond by eliminating aesthetic elements altogether.

The lack of environmental management results in missed opportunities for aesthetic enhancement. Programmed events and performances can turn a street or subway station into an exciting and friendly place. Examples are the multiple entertainment and promotional programs at Memphis' downtown pedestrian mall and entertainment at subway platforms by the "Music under Boston" program. The Cincinnati program (Case Study 1.4c) to put entertainment on the buses and bus stops is a particularly imaginative illustration of the possibilities. All of these programs were remarkably inexpensive, costing a small fraction of other capital and operating costs, but they enhanced the quality of the public's experience. The most important ingredient for these programs was creative and energetic management.

Even greater opportunities can be opened up by managing the daily activities of streets and transit stations in conjunction with adjacent commercial facilities. The most successful example of a far-reach-

ing joint activity management occurs at "Underground Montreal" (Case Study 3.4a). The potential was established through basic planning. But the success is really due to intelligent, on-going management and a willingness to tackle the complexity of joint responsibility. A good management group can continually invent ways of enriching the environment and the activities.

Avoiding additional amenities, for fear of maintenance problems, is unfortunately the most common practice. This practice is often based on the bitter experience of transportation agencies' having tried and failed to reach an acceptable level of maintenance. The result is often a directive to the design team to create a "maintenance free" or "vandal proof" environment. There is certainly good reason to avoid especially vulnerable or tempting materials, but the result is often a total lack of interest, stimulation or comfort for the public.

The real answer to "maintenance problems" is more and better maintenance. However, funds for maintenance are hard to obtain. They usually come from the regular operating budgets of the agencies which are always under severe pressure. Federal programs provide a great variety of capital funding with 80% federal contributions, while the operational subsidies are fewer, harder to obtain and usually only provide a 50% match. The common local response is "deferred maintenance", which gradually results in decay.

Funding Environmental Management Programs

Since the local funding situation is unlikely to improve, an effort will have to be made to find other funding sources. For projects where aesthetics are a high priority (see Section 4.2), and where maintenance is currently a significant problem (particularly urban street projects, transit stations and railroad stations) the balance of capital and maintenance expenditures may have to be shifted.

It is difficult to prescribe the correct ratio of maintenance to capital expenditures since these vary with the type of project and local context. But a review of successful projects such as Freeway Park (Case Study 3.2a) and the Memphis pedestrian mall suggest that for urban streetscape projects, a fund of around two percent/year of the capital costs should be earmarked for physical maintenance, and another one to three percent required to provide management and activity programming.

Under the relevant federal programs, maintenance and management are generally considered a local responsibility. The reasons include avoiding an open ended financial obligation and not wanting to interfere in local affairs. It is possible to avoid these pitfalls and still provide funds for maintenance in the following ways:

- Projected maintenance costs could be counted towards the local match for a capital grant. For example, a contractual commitment (defined in terms of staffing, budgets and specific operations) to a high level of maintenance could be required of the locals prior to the award of capital grants. The current maintenance practices of the owner might then be reviewed by the funding agency and an appropriate level of remedial action incorporated into the contract. The financial burden

on the local agency could then be lightened by allowing the first ten years of maintenance costs to count as part of the required local funding share. Future capital grants could be made contingent on compliance with the maintenance commitments.

- The local agencies might also make use of other federal and local programs, special taxing districts or other public or private contributions to fund their management/maintenance plan. In the case of the Providence Rhode Island Kennedy Plaza Project, the Urban Mass Transportation Administration agreed to fund an unusually intensive management/maintenance operation through a Section 6 demonstration grant for three years, with the requirement that the city and the business community assume the responsibility thereafter.
- Federal programs outside the Department of Transportation might be susceptible to similar changes. For example, federal aid to local public works programs administered by the Economic Development Administration (EDA) for areas of high unemployment has so far only covered capital expenditures. The statutory purpose of this program is to generate local employment. Yet construction programs are short term, and can use only a limited number of the unemployed for short periods. By contrast, maintenance programs are on-going, can more easily train currently unemployed personnel and provide steady employment in the community. Grants to localities for public facility maintenance might well suit the EDA program objectives although this would require a change in the legislation.



Physical solutions are not enough to prevent vandalism.

Lessons from the Case Studies

Vandalism is a persistent problem for public facilities in all of the large and some smaller U.S. cities. While no general remedies were found, a few observations related to maintenance are helpful:

- There is usually a particularly rough initial testing period just after the facility is completed. If the effects of vandalism are immediately corrected during this period, it will sometimes subside.
- Vandals are usually not random strangers but groups that "hang around" the facility who are often known in the community. The use of maintenance or security personnel from the community who actually know most of the people in the area can reduce vandalism.

Storefront management offices are used in several major auto-restricted zones and pedestrian projects. These have proved successful in responding quickly to problems and in keeping close contact with business people and other interested parties. The Memphis Mall office is a good example; its staff oversees routine maintenance, plans entertainment and promotion programs for the Mall, and raises funds. They also promote the downtown as a whole and help locate appropriate new tenants for vacant spaces. Coordination is accomplished with other city agencies to insure that the Mall receives all necessary services. The office is a visible presence; its director can often be seen walking the Mall, talking to people, even picking up bits of trash missed by the maintenance crew.

The care of special elements, materials and artworks—Some elements such as fountains, plant materials or the finish of art work may require special technical

care. A number of expensive new projects have suffered from incorrect maintenance procedures. The designers or artists should be required to provide clear instructions for the care of these elements, and should initially supervise the training of maintenance personnel. The agency and staff assigned to the maintenance should be established at the beginning, particularly for projects related to public streets, where overlapping jurisdictions are likely. If repair of such special elements is required, the artist or designer should be consulted, prior to proceeding if possible, to insure that the proposed repair techniques are appropriate.

Private contributions can enhance the attractiveness of aesthetic improvements. For example, in Seattle the "Friends of Freeway Park" organization consists of major businesses in the area who contribute \$20,000 to \$30,000 per year for installation and upkeep of seasonal flowers. (Case Study 3.2a). New York's "Adopt-a-Station" program relies primarily on such private businesses, institutions or community groups to improve and personalize the stations they adopt (see Section 1.3).

The public management can be improved by catalysing such private programs, pursuing sponsors for them and coordinating their activities. This type of involvement not only contributes additional material resources, but also creates a more positive sense of identification with, and pride in, public places. This feeling contributes to the aesthetic impact of a place.



Maintenance crew at work.

Contents Chapter 5

- 5.1 Funding Sources
- 5.2 Annotated Bibliography
- 5.3 Case Study Contacts
Picture Credits

Introduction

Chapter Five, devoted solely to reference material, will direct those interested in further research to the proper sources. The Chapter is organized as follows:

Section 5.1 Funding Sources covers a variety of DOT programs and other funding sources, including federal, state and local government assistance and private contributions. Legislation and regulations affecting aesthetic design or the purchase of art are described, to assist users of this report in determining the administrative and statutory constraints.

Section 5.2 Annotated Bibliography is a selection of reference literature used in the report or useful for further study.

Section 5.3 Case Study Contacts is a listing of key personnel or agencies which can provide, on request, more specific information on each project. Detailed documentation which could not be included in the bibliography or main text, such as copies of contracts, architectural plans, or descriptive brochures, will usually be available from the listed personnel and agencies.

References

Funding Source Inventory

In this section, funding sources and resource agencies for design, art and architecture in transportation are described. Included are programs of the Department of Transportation, as well as those of other federal agencies, state and local government, and private organizations. Relevant legislation and regulations are described.

This is a selective listing; the status of many of these programs is dependent on continued legislative support and funding. Each agency can supply more specific information on eligibility requirements and funding levels, and most can provide brochures of program categories and opportunities for assistance. Many of the programs require matching funds, and an imaginative use of available resources is often necessary to put together a funding package which will ensure a project's success.

Contents

- Federal Environmental Protection Legislation**
- Key Department of Transportation Programs**
- Resources Outside the Department of Transportation**

Federal Environmental Protection Legislation

The following federal legislation has been important in the protection of aesthetic resources in the natural and man-made environment, and for the consideration of aesthetic factors in the development of federally-assisted projects.

Department of Transportation Act of 1966, Section 4(f) (49 U.S.C. 1653(f))

Section 4(f) of the DOT Act requires "that special effort should be made to preserve the natural beauty of the countryside and public parks and recreational lands, wildlife and waterfowl refuges, and historic sites." Section 4(f) prohibits DOT approval of any project that uses or endangers such designated lands unless there are no "feasible and prudent" alternatives and all possible planning has been done to minimize harm to the area.

A special review of all projects that might affect such properties is required for all relevant DOT program areas, highways, airports, urban mass transit, railroads, and other activities (*ref. 63*).

National Environmental Policy Act of 1969 or "NEPA" (42 U.S.C. 4321-4347)

NEPA establishes a broad national policy to promote efforts to improve the relationship between man and his environment, and provides for the creation of a Council on Environmental Quality (CEQ) to oversee implementation of the law. NEPA sets out certain policies and goals concerning the environment, and requires that, to the fullest extent possible, the policies, regulations

and public laws of the nation shall be interpreted and administered in accordance with these policies and goals. The Act also sets forth the requirement for the preparation of environmental impact statements on 'major federal actions' (including many federally assisted transportation projects) and calls for an interdisciplinary approach to their formulation (*ref. 63*).

DOT NOTICE N 5610.4—Implementation of Decision to Address Environmental Design Considerations in Environmental Impact Statements

This notice requires that, "where relevant, draft EISs . . . shall be circulated to the officially designated state and local arts councils and as appropriate to other organizations with interests in design, art, and architecture in transportation projects."

Draft EISs shall also "document the consideration given (or to be given) to design, art and architecture in project planning and development." The final EISs (where relevant) filed with the Environmental Protection Agency "shall similarly reflect consideration of design, art and architecture" (*ref. 3*). (Although this notice officially expired in February, 1979, its provisions reflected more recent DOT procedures and guidance for implementing the National Environmental Policy Act.)

Section 106, National Historic Preservation Act of 1966 (16 U.S.C. 470(f))

Prior to approval of federal funding or licensing, agencies shall "take into account the effect of undertaking on any district, site, building, structure or object that is included in the National Register

of Historic Places," and give the Advisory Council on Historic Preservation "a reasonable opportunity to comment with regard to such undertaking" (ref. 63).

Historic Sites, Buildings and Antiquities Act of 1974

This statute provides for the preservation of historical and archeological data which might otherwise be lost or damaged as a result of a federal project or program.

Tax Reform Act of 1976 (P.L. 94-455)

Section 2124 establishes important tax incentives for the preservation and rehabilitation of historic commercial and income-producing structures. Provisions are designed to stimulate rehabilitation and discourage destruction of historic buildings, and to encourage the charitable donation of partial interests, such as facade easements, in significant properties. The act allows an owner of a "certified historic structure" to deduct for federal income tax purposes over a 60-month period the costs of "certified rehabilitation," in lieu of otherwise allowable depreciation deductions (ref. 51).

Some other relevant environmental statutes are: the **Federal Water Pollution Control Act, Fish and Wildlife Coordination Act, Endangered Species Act, Coastal Zone Management Act, Wild and Scenic Rivers Act, Wilderness Act, and Clean Air Act.**

Executive Orders of the President include: *Executive Order 11514—Protection and Enhancement of Environmental Quality*, which "orders all Federal agencies to initiate procedures needed to direct their policies, plans and programs so as to meet national environmental goals";

Executive Order 11593—Protection and Enhancement of the Cultural Environment, which "requires that Federal plans and programs contribute to the preservation and enhancement of sites, struc-

tures, and objects of historical, architectural, or archeological significance";

Key Department of Transportation (DOT) Programs

In 1977, the Task Force on Design, Art and Architecture in Transportation recommended that the Department:

"make more explicitly and widely known the availability of planning and project funds for the incorporation of design arts principles in transportation systems, including funding for original works of art in public spaces in such systems" (excerpted from ref. 2).

In response to the Task Force recommendation, operating administrations within DOT have issued policy statements and directives concerning funding of improved design quality. Original works of art can sometimes be funded under certain programs and several project grants have included artworks. (excerpted from ref. 3).

Each of the relevant DOT administrations offer a wide variety of programs, often with complex regulations governing funding. The following listing should be used only as general resource. Specifics on program criteria, funding eligibility and levels, etc. are available from each administration.

Federal Aviation Administration (FAA)

The FAA administers grants for airport development projects, as well as regulates air traffic and ensures aviation safety.

Airport and Airway Development Act of 1970

The Act requires "that airport development projects authorized pursuant to this

part shall provide for the protection and enhancement of the natural resources and quality of environment of the Nation . . . including but not limited to fish and wildlife, scenic and recreational assets, water and air quality and other factors affecting the environment . . ." (ref. 13).

FAA Order 5100.35 "Design, Art and Architecture in Airport Development"

This order prescribes guidelines for treating and promoting design, art and architecture in the Airport Development Aid Program (ADAP). It encourages the "consideration of design concerns early in the planning process" for airport facilities and permits reasonable costs for improved design in connection with eligible airport work. "The federal percentage of cost under ADAP for design, and architecture will be governed by the limitations and amount authorized for the item of airport development to which it is applicable" (ref. 2).

Elements which might be funded in this manner include: lighting effects; space to display objects or works of art; architectural treatments which reflect specific customs, style, or cultural attitudes; and landscaping. (Art works for airports are no longer eligible for funding, but it is still federal policy to foster art in terminal development.)

Federal Railroad Administration (FRA)

Among other activities, the FRA oversees Conrail and Amtrak budgets, and manages the DOT-owned Alaska Railroad. Several programs are designed to help private railroads upgrade their facilities and equipment.

Railroad Revitalization and Regulatory Reform Act of 1976 (4R Act)

Section 703 authorizes funding of track and station improvements in the North-

east Corridor. \$1.9 billion was approved for 100% federally funded improvements directly related to high-speed intercity rail passenger service, with appropriations 50% of the cost of the improvements to non-operational portions of the affected stations.

Under this program, three-quarters of one percent of each station renovation budget has been set aside for original works of art. Eligible works of art include murals, bas reliefs, free-standing sculpture, fountains and paintings.

Local Rail Service Assistance Program Under Section 5 of the Department of Transportation Act

This law provides assistance to states for rail planning, and expands the possibilities for construction of rail or rail related freight facilities, including substitute service.

Federal Highway Administration (FHWA)

Title 23, U.S.C. (federal-aid highway statutes)

The authorized program provides guidance and funds to the state highway agencies in developing their highway facilities. States initiate the projects, but FHWA is responsible for review and approval at key stages whenever Federal-aid funds are to be used in planning or developing a project (excerpted from *ref.* 75).

The Highway Beautification Act and the Federal-Aid Highway Act authorize the inclusion of aesthetic and environmental considerations in Federal-aid highway projects.

Highway Beautification Act of 1965

The Act established as national policy the preservation of natural and manmade beauty along the federally assisted interstate and primary highway system through control of outdoor advertising signs and junkyards, and landscaping and scenic enhancement of such highways.

Although a lack of separate funding has essentially deactivated the sign and junkyard programs, the Act does establish legal precedent for protection and funding of aesthetic elements along highways.

Federal-Aid Highway Act of 1970

The Act requires that possible adverse economic, social, and environmental effects relating to any proposed project on any Federal-aid system be fully considered in developing such projects (*ref.* 63).

Highway Trust Fund

Highway Trust Fund monies are distributed among the states. Interstate funding is 90% federal aid and 10% state matching funds. Funding for Primary, Secondary and Urban System projects is 75% federal and 25% state matching. States with large holdings of public lands may increase the federal share under Section 120, Title 23, U.S.C.

Since the passage of Federal-Aid Highway Act of 1973, the Trust Fund has been opened to certain non-highway mass transportation uses depending on planning decisions from various local officials and groups.

Interstate, Primary, and Secondary Systems

Consideration of aesthetic factors is advocated throughout the development process for these highways which connect the principal metropolitan areas by direct routes. An FHWA regulation, "Landscape and Roadside Development" imposes the requirement that highways "must not only blend with our natural, social, and cultural environment, but also provide pleasure and satisfaction in their use" (*ref.* 3).

The inclusion of landscaping and safety rest areas and the preservation of scenic land is considered a necessary component of highway development. Federal-aid funds may also be used to prepare a site for the placement of appropriate original works of art within the highway right-of-way.

Federal Aid to Urban Systems (FAUS)

This program improves service to the major centers of activity within urbanized areas. Together with the Federal-aid Interstate, Primary and Secondary programs, these funds can be used to finance Transportation Systems Management (TSM) improvements, depending on the type and location of the TSM project.

- *Section 135, Title 23, U.S.C., Traffic Operations Improvement Programs (TOPICS)* includes improvements on any Federal-aid system or those which are off the system but will benefit traffic on the system. Eligible activities include channelization, traffic control signalization, bus loading facilities, preferential bus and high occupancy vehicle (HOV) lanes, pedestrian and bicycle projects, and grade separations for pedestrians, highways and railroads.
- *Section 142, Title 23, U.S.C.,* as amended by the Federal-Aid Highway Act of 1973, provides for the use of Urban Systems funds for the purchase of rail rolling stock, bus shelters and fixed rail facilities, as well as the construction of publicly owned parking facilities. These transit improvements need not be located on the Urban System.

Miscellaneous Programs

Parking Facilities—to encourage the use of public transportation or high occupancy vehicles (HOVs).

Bikeways and Pedestrian Walkways—as incidental features of highway construction, and in conjunction with auto restricted zones.

Special Bridge Replacement—when important bridges on the Federal-aid highway system are determined to be deficient.

Operation Wildflower—a cooperative effort with Garden Clubs and State Highway Agencies to promote the propagation and growth of wildflowers along Federal-aid highways.

Urban Mass Transportation Administration (UMTA)

UMTA assists the planning and operation of public transportation facilities in urban areas. It funds local public transportation agencies for development projects and service expansion and oversees the technical and environmental aspects of planning and project development.

Funding programs include:

Discretionary Capital Grant

Program—Section 3 of the Urban Mass Transportation (UMT) Act of 1964, as amended, provides for grants for construction of new fixed guideways and extensions, modernization of mass transit facilities and equipment, construction of new facilities and equipment, introduction of new technology, joint development and urban initiatives projects, and commuter rail projects that will mitigate adverse effects of the Northeast Corridor rail service project.

Art and graphics aspects of projects developed in accordance with overall plans for transit improvement may be eligible as well. Although emphasis has been placed on functional art, projects may also include fine art.

Federal grants are for not more than 80% of the project cost.

Urban Mass Transit Program—Section 5 of the UMT Act provides funds for the purchase of buses, and bus-related equipment and for the construction of bus-related facilities. The money may also be used for either capital projects or operating assistance on commuter rail or fixed guideway system in urbanized areas.

The federal matching share is generally 50% for operating expenses and 80% for capital costs.

Demonstration Projects—Section 6 of the UMT Act sets aside funding on a one-time basis for demonstration proj-

ects, which may include elements involving improved aesthetic design, art and architecture. For example, the Cambridge Arts Council received (through Massachusetts Bay Transportation Authority) a grant under this section to plan and implement the Arts on the Line project (see Case Study 1.6d).

Intercity Bus Assistance—Section 21 of the Act authorizes facilities to be acquired, constructed, altered and coordinated with other modes of transportation.

Transportation Improvement Program (TIP)

Under joint FHWA/UMTA regulations, each designated Metropolitan Planning Organization (MPO) in urbanized areas is required to develop a Unified Planning Work Program describing anticipated planning needs, and Transportation Improvement Programs (TIP), which identify projects expected to be constructed in the following year. Federal funds allocated to MPOs may also be used for a variety of planning and research activities, including those necessary to the subsequent development and implementation of bicycle, pedestrian, traffic management and parking projects.



Highway funds were used to construct this bikeway in Salem, OR.

Resources Outside of the Department of Transportation

Following is a selected listing of some programs available through federal agencies, state and local governments, and private organizations, which may be useful to individuals and groups interested in the incorporation of design arts principles and works of art in transportation projects.

Advisory Council on Historic Preservation

This independent federal agency advises the President and Congress on national preservation policy, and implements the Section 106 procedures of the Historic Preservation Act of 1966, for federally funded projects. It also serves to create preservation sensitivity among government agencies and develops programs to integrate preservation concerns with other government policy decisions.

AMTRAK

This federally sponsored, private corporation was organized for the purpose of improving intercity passenger rail service nationally, generally using existing passenger stations. Where the existing facilities are inadequate or inefficient, Amtrak is authorized to lease other facilities. In some cases, Amtrak has constructed new terminals.

State and Local Station Rehabilitation Program

This Program:

- Provides up to \$50,000 on a matching basis to improve rail passenger facilities;
- Pays up to 60% of project costs for rehabilitation, reconstruction or improvement of AMTRAK stations; and
- Provides advice and guidance on re-use projects.

Department of Agriculture

Cooperative Extension Service and Farmer's Home Administration

This program may be used to help finance arts-related programs and cultural activities, including historic preservation in rural areas.

Soil Conservation Service

Various programs are available to fund water-related conservation projects, which have included bike trails and other recreational facilities along beaches or marshland and in watershed areas. 50% matching grants are available through the Watershed Protection Program. The Resource Conservation and Development Grant Program is broader in scope, aimed at developing economic opportunities and improving the quality of the environment through the conservation of natural resources.

Department of Commerce Economic Development Administration (EDA)

Public Works and Economic Development Act of 1965

Planning Assistance Grants

These grants may be used to assist in developing long-term strategies to deal with a variety of economic development problems experienced locally across the nation. Planning may include assessment of factors in tourism development such as the restoration of historic preservation sites, the expansion of cultural facilities and transportation improvements.

A minimum of 25% must be obtained by the grantee from non-federal sources and may be in the form of cash and in-kind contributions.

Public Works Grants

Grants for the construction of public facilities are provided to stimulate long-term economic growth in designated redevelopment areas. Facilities funded under this program may be used for a combination of commercial, tourism-oriented and transportation uses. Non-profit corporations may participate in the program, receiving grants ranging from 50-80% of total project costs.

Public Works Impact Program

This program provides grants for the construction of public facilities which will provide immediate jobs in redevelopment areas. Funds can cover 80% of costs of purchasing, constructing or renovating facilities; or 100% if the grantee has exhausted its taxing or borrowing capacity. Recent projects have included the conversion of Union Depot in Duluth, Minnesota into a cultural center.

Department of Defense

Office of the Assistant Secretary (Manpower, Reserve Affairs and Logistics) Economic Adjustment Assistance

Communities suffering adverse economic impact resulting from changes in defense programs are eligible for assistance including the coordinated application of appropriate federal programs involving grants and loans; mobilization of the resources of federal, state and local agencies and the private sector; and arts-related technical assistance. In 1974 the President's Economic Adjustment Committee (EAC) helped Rhode Island's Newport County Arts Council obtain funding for "Monumenta," an annual outdoor exhibit of contemporary sculpture.

Department of Energy

Appropriate Technology Small Grants Program

Grants (up to \$50,000 each) are available to support small-scale technologies that: 1) are appropriate to local needs, resources and labor skills, 2) involve the use of renewables, 3) are easy to install, operate and maintain, 4) are environmentally compatible, and 5) are decentralized and non-capital intensive. Innovative transportation-related proposals, such as bicycle or pedestrian mall projects, could conceivably be eligible for funding.

Department of Housing and Urban Development (HUD)

HUD was established in 1965 as a response to the rapid urbanization and increasing importance of housing and community development. It has helped shape the national policy to promote revitalization of existing urban centers, and provides aid in the form of grants, guarantees, loans, mortgages and loan

insurance, home ownership and rental subsidies, and technical assistance.

Community Development Block Grants (CDBG)

These grants may be awarded to local governments for a wide range of community development activities which were previously eligible under separate categorical grant programs, i.e., Urban Renewal, Public Facilities Loans, Urban Beautification and Preservation Grants.

Urban Development Action Grants (UDAG)

The UDAG program was developed to assist severely distressed cities and urban counties, to revitalize local economies, and to reclaim deteriorated neighborhoods, through a combination of public and private investments in projects of maximum benefit to low- and moderate-income persons and members of minority groups.

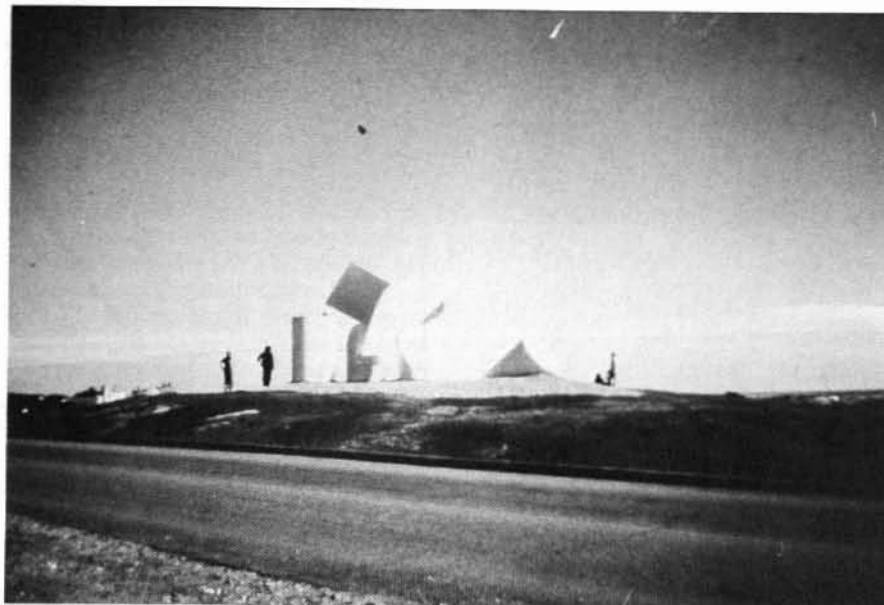
Urban Reinvestment Task Force

A public-private coalition to stimulate and aid investment in inner city revitalization, the Task Force (initiated in 1974) is a joint effort of HUD and the Federal Home Loan Bank Board to demonstrate how declining but still viable neighborhoods can be revitalized through a partnership of residents, financial institutions and local government.

Comprehensive Planning Assistance ("701")

The "701" program makes grants to fund a broad range of planning and management activities including feasibility studies for cultural and recreational facilities; studies of the economic, social and cultural impact of proposed facilities on the surrounding environment; urban design activities within planning agencies; and historic preservation planning. Plans must be concerned primarily with problems of growth and consider factors such as the preservation of architecturally or

archeologically significant sites. In 1974, Hoboken, NJ received a grant to assist with the preservation of the Lackawanna Railroad-Ferry Terminal.



Sculpture by Richard Lieberman was partially funded by the US Department of Defense.

Department of the Interior

Heritage Conservation and Recreation Service (HCRS)

The HCRS administers a variety of programs designed to conserve the nation's cultural and natural resources and assure adequate opportunities for recreation.

Principal responsibilities of the agency are historic preservation, natural resource conservation and recreation. In addition, the agency reviews the environmental impacts of proposed transportation projects that receive federal financial assistance, to seek to avoid harm to open space, historic and archeological sites, recreation areas and the natural environment.

Historic Preservation—In addition to its policy making role, HCRS administers the National Register of Historic Places program, the historic provisions of the Tax Reform Act, the Historic Preservation Fund, and archeology and rehabilitation programs. It also provides technical assistance concerning cultural resources and historic preservation.

Natural Resources Conservation—HCRS administers the National Registry of Natural Landmarks, and assists federal agencies, states, municipalities and private groups in establishing recreational trails. Unused or abandoned transportation corridors such as railroad rights-of-way are excellent potential trails.

Recreation—The Land and Water Conservation Fund supports the acquisition and development of public outdoor recreational areas and facilities, including bike paths and roadside rest areas. Assistance is also available for programs which affect the delivery of recreational services (including community revitalization and tourism) or involve the cultural and recreational aspects of water resources and development, including urban waterfronts.

The Urban Park and Recreation Recovery program provides financial assistance to urban communities for the rehabilitation of existing recreational systems and demonstration projects for neighborhood park and recreational enhancement.

Department of Labor

Comprehensive Employment and Training Act of 1973 (CETA)

This program promotes job training and employment opportunities for economically disadvantaged, unemployed, or underemployed persons. Program and funding decisions are made at the state and local levels. Public agencies or private non-profit organizations may administer specific programs (usually as contractors or subgrantees to governmental units).

CETA funds can be used to pay the salaries of artists, performers, instructors and employees performing arts-related services. Work can be performed in public service fields such as beautification, conservation, neighborhood improvements, public facility maintenance, and community improvement.

Department of the Treasury

State and Local Fiscal Assistance Act, 1972: General Revenue Sharing Program

States and local governments may spend U.S. Treasury funds according to their own priorities and laws. Arts-related uses have included the construction of museum facilities, establishment of neighborhood cultural and performance centers, establishment of revolving funds for historic preservation, and program support for community arts councils.

Environmental Protection Agency

Wastewater Treatment Grants Program

This program enables communities to obtain important recreational benefits at relatively little cost. Communities planning sewage treatment improvements with federal assistance are required to evaluate the potential for multipurpose recreational development in the sewer right-of-way. The provision has been used to fund bikeway planning between population centers, water bodies and recreation areas. The corridor does not need to be a part of a formal recreation plan.

General Services Administration (GSA)

The Public Buildings Service (PBS) of the GSA supervises the design, construction, operation, maintenance and protection of federally owned and leased buildings throughout the country.

Public Buildings Cooperative Use Act of 1976

- The Act provides that GSA acquire and utilize space in buildings of historical, architectural, or cultural significance, when feasible; and
- Permits mixed use of public buildings, encouraging the inclusion of commercial, cultural, educational or recreational facilities.

Surplus Properties Act

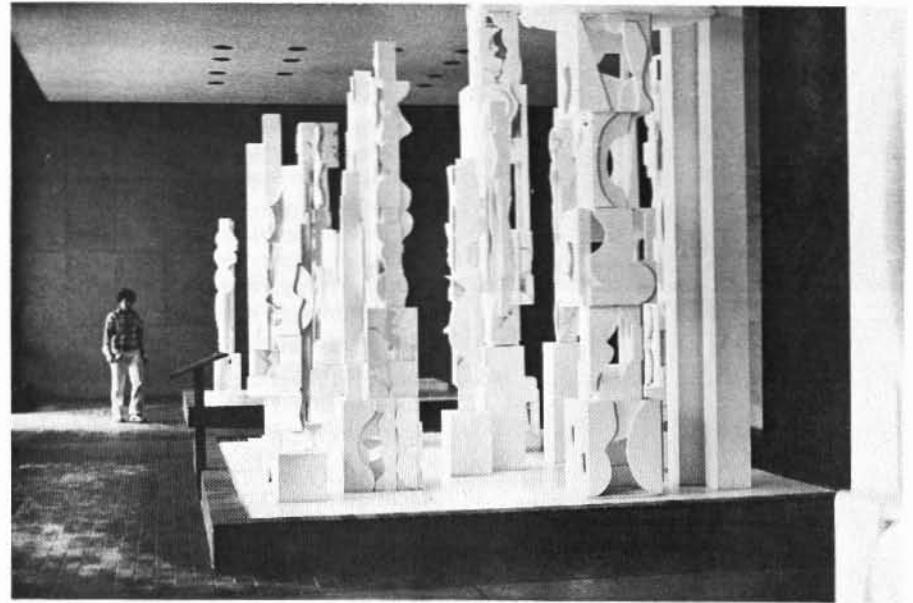
- Provides for the disposal of federally-owned properties determined to be surplus, which may be acquired by state, county and municipal governments for public purposes.
- Permits historic properties to be conveyed to public entities without monetary consideration, subject to perpetual use restrictions.

Living Buildings Program

Public and private non-profit organizations are encouraged to use government buildings for cultural, educational and recreational activities.

Art-in-Architecture Program

One-half of one percent of the estimated construction costs of federal buildings is allocated for fine arts. Existing buildings where art has been planned but not implemented, as well as those buildings undergoing significant repair and alteration, are also included in this program (ref. 39).



"Bicentennial Dawn," by Louise Nevelson, 1976. US Courthouse, Philadelphia.



Detail of subway passageway sculpture, Samuel Lebowitz, 1971, New York.

National Endowment for the Arts

This independent federal agency was created to encourage and support American arts and artists. The Endowment provides three major types of financial assistance:

- Artists' fellowships
- Matching grants to non-profit, tax-exempt arts organizations
- Grants to state arts agencies and regional arts groups.

Numerous programs are available and are listed in the Endowment's annual Guide to Programs. Some key programs are:

Architecture, Planning and Design Program

Promotes excellence in design by funding activities in architecture, landscape architecture, urban design, city and regional planning, and other professional design fields.

In addition to awarding grants, the program serves as an advocate of good design. Through the Federal Design Improvement Program, the Endowment encourages federal agencies to recognize the role of design in buildings and in communications materials.

Grants are available for individuals and organizations. Categories include "Livable Cities" (to encourage communities to use design as an integral part of their planning processes); "Design: Communication and Research" (to increase public awareness of good design); and "Cultural Facilities Research and Design" (which might be used for projects combining transportation and cultural activities).

Expansion Arts Program

Supports neighborhood and community arts organizations. Categories for funding include:

- Instruction and Training
- Arts Exposure Program
- Services to Neighborhood Arts Organizations
- Regional Tour Events
- Comprehensive Technical Assistance Program

Federal-State Partnership

Provides basic support for the arts nationwide as well as grants based on Endowment approval of plans. . . . the program administers federal support for the arts through state and regional arts agencies. Funds are awarded in three ways:

- State Grants—These include Basic State Operating Grants of \$275,000 each awarded to state arts agencies.
- Regional Grants—Basic Regional Operating Grants (\$40,000 each in 1979–80) to states and direct grants (a total of \$638,000 in 1979–80) to multi-state organizations and projects on a competitive basis to address regional priorities.
- Grants for Support Services—3% to 5% of the Federal/State budget is reserved for a variety of governmental support services determined by the program, such as the National Assembly of State Arts Agencies, pilot projects, and training programs.

Visual Arts Programs

Art in Public Places enables municipalities, institutions, agencies and non-profit groups to commission or purchase works of art for such places as plazas, riverfronts, airports, subways and highways. Non-matching planning grants are also available. These are to encourage artists to develop new ideas and methods for art in public places.

Other key NEA programs are museum grants and special projects which cut across several art disciplines and have potential national or regional impact.

National Endowment for the Humanities

Division of Public Programs

Funds are available for projects involving value-choices and decisions of the general adult public. Projects in the arts that emphasize theory, history or criticism or relate art appreciation to other fields in the humanities might be supported, such as:

The Museum and Historical Societies Program, which supports projects that are aimed at developing an interpretive cultural and historic overview, that use cultural and historic objects, and draw upon the past for insight and perspective. (ref. 1).

Program Development which supports experimental projects that examine unique subject areas, involve interdisciplinary cooperation, and reach new public constituencies in order to foster public understanding and appreciation of the humanities.

National Science Foundation (NSF)

Office of Government and Public Programs, Public Understanding of Science Program

Grants ranging from \$5,000-\$500,000 are available "for projects that inform the general public about the potential uses and limitations of science and technology in society" (ref. 1). The emphasis is on large scale communication projects, such as broadcasting, science museums and journalism.

Projects have included a half-million dollar grant to the Exploratorium Science Museum, which specializes in exhibits that combine art and museum education. Other arts-related proposals concerned with informing the public about the impact of science and technology on culture and ways of life may be eligible.

National Trust for Historic Preservation

A private non-profit organization, chartered and partially funded by Congress, the Trust has responsibility for "encouraging public participation in the preservation of historic districts, sites, buildings, structures and objects of significance in American history and culture (ref. 1). The Trust provides educational and advisory programs, generates and operates revolving funds, and owns and administers many historical properties. Membership in the National Trust is open to individuals, organizations, and businesses. Funding categories include:

Consultant Services Grants, which provide matching funds to assist members in securing consultants' services on preservation-related projects, such as historical research and feasibility studies. Projects have included a study on the conservation of bronze outdoor monuments in Missouri and a plan to save a park in Tennessee from an Interstate highway.

Field Services, which provide professional advice on preservation problems, including liaison between federal agencies and local historic preservation groups.

National Historic Preservation Fund (NHPF), which offers matching grants, loans and guarantees, to be used to help set up local revolving funds for improving properties of historic or architectural significance, and to finance adaptive re-use projects.

Per Cent for Art Legislation

The National Assembly of State Arts Agencies reports that 16 states, at least 37 cities and four counties have adopted ordinances which require that a minimum percentage (usually 1 percent) of the cost of public construction projects be allotted to the arts.

The counties and cities which have percent for art ordinances are:

Anchorage, AK	Kansas City, MO
Davis, CA	Albuquerque, NM
Los Angeles, CA	Sante Fe, NM
Palo Alto, CA	New York, NY
Riverside, CA	Toledo, OH
San Francisco, CA	Tulsa, OK
Santa Barbara, CA	Eugene, OR
Santa Rosa, CA	Pittsburgh, PA
Walnut Creek, CA	Wilkes-Barre, PA
Broward Cty., FL	Salt Lake City, UT
Dade Cty., FL	Bellevue, WA
Pierce Cty., FL	Everett, WA
Miami Beach, FL	King Cty., WA
Atlanta, GA	Mountlake Terrace, WA
Chicago, IL	WA
New Orleans, LA	Renton, WA
Boston, MA	Seattle, WA
Cambridge, MA	Tacoma, WA
Baltimore, MD	Madison, WI
Rockville, MD	Milwaukee, WI

Private Foundations

A list of private charitable foundations is usually available in public libraries. These tax-exempt organizations are too numerous to list and include, in addition to the Rockefeller and Ford Foundations, hundreds of others. Such foundations are frequent sponsors of arts-related and community development projects.

Regional Development Commissions

Economic Development Assistance

Seven Regional Development Commissions "develop long-range interstate economic development plans, coordinate federal and state economic development activities and promote increased private investment in economic development regions" (*ref. 1*). Two kinds of assistance are offered.

Supplemental Grants assist state and local governments in meeting the local share of matching requirements for federal grant programs. Funds may be used for the construction or equipping of facilities and acquiring land.

Technical Assistance Grants assist state and local governments in financing planning activities, demonstration projects and training programs related to economic development.

Proposals for using the arts to stimulate a region's economic development, i.e., through tourism or recreation, will be considered.

Smithsonian Institution

Smithsonian Institution Travelling Exhibition Service (SITES)

Travelling exhibits are available for rent on subjects including art, architecture, graphics, design and crafts. Rental fees, which cover most organizational expenses including insurance, range from \$50 to \$5,000 for standard exhibits.

One subject of a past travelling exhibit was "Ride On" (a social history of bicycles). Current subjects include "Subways, an Underground Exhibition," "Exhibition Flight" and "Terminal, Station and Depot."

State Historic Preservation Officers (SHPO)

Appointed for each state by its governor at the request of the Department of Interior following passage of the National Historic Preservation Act of 1966, SHPO's are the key state preservation officials within the national preservation network. Their responsibilities include nomination of properties to the National Register of Historic Places, development of a state preservation plan, administration of the federal preservation grants within their state, and review of federally funded or licensed projects for their effects on the state's historic and cultural resources.

State and Local Funding Resources

Traditional, non-federal methods of financing community redevelopment projects, which may involve transportation-related improvements, include:

- **General Obligation Bonds**, which are issued by a local government with voter approval and which are backed by general tax funds.
- **Special Bonds**, issued by a local government for revenue-generating public improvements, with the new monies being pledged to retire the bonds. This method is frequently used to provide new parking facilities.
- **Special Assessments** imposed by a local government on property owners directly benefitting from a renewal or rehabilitation project. This device has been used for specific improvements such as new lighting or utilities. Currently it is being used to help finance larger projects, such as mall development, which include several of the specific improvements in special districts.
- **Special Improvement Districts** created to focus on limited land areas and act as special purpose governments. Some districts involve local government membership, others only involve area business interests, which make proposals to local government. Districts can conduct planning themselves or hire professionals, and can incur indebtedness beyond the legal ability of the local government to actually deliver a program of redevelopment. They are financed by some form of special assessment on those properties in the area—often by front footage, or assessed value of total land area. Some special purpose districts have condemnation powers and the authority to issue bonds.

Enabling Legislation

State laws may provide alternatives to federal aid to undertake and finance parking, redevelopment projects and other street and public property improvements. Such laws sometimes enable the legislative body of a city to make improvements and charge the cost to owners of the benefited property. Others authorize municipalities and counties to make improvements or to provide public services along public streets.

In California, the Pedestrian Mall Law of 1960 "enables main streets in commercial areas to be restricted and improved for pedestrian use. Costs of the development may be assessed against the benefited lands or may be financed with other available (city) funds" (*ref. 132*).

Community Development Laws enable communities to participate in urban renewal projects, by forming agencies "to prepare and carry out plans for the improvement, rehabilitation and redevelopment of specific areas deemed to be blighted" (*ref. 132*). Both public and private sources may provide financial assistance to these agencies.

Zoning Ordinances can be an effective method of financing, although rarely used for that purpose. "For example, ordinances can provide for in-lieu cash payments to the city as an alternative to meeting parking space requirements . . . a parking district can apply any such payments to parking lot programs which benefit the entire business community" (*ref. 132*). Similar methods could be applied to other requirements mandated for certain types of construction, such as setbacks or floor area ratios.

Tax-Increment Financing

One form of incentive for private development is tax-increment financing. California, Ohio, Minnesota and Oregon are some states which have laws allowing this approach. California's provisions are as follows:

- Once a redevelopment project has been approved, the existing assessed valuation of the area is "frozen," and termed the "base valuation."
- Through the life of the project, any additional assessed valuation is termed the "increment" due to redevelopment.
- All tax revenues flowing from the additional assessed value may be used by the municipality to repay bonds sold on the market to finance the project.

Tax abatement is a standard means of encouraging urban redevelopment by the private sector in Massachusetts. Baystate West in Springfield is a good example. There, the developer pre-negotiated the real estate tax for the project so that the tax for the development would be based on the income, rather than any assessment of physical structure. According to the developer, this provision was extremely effective in making this mixed use project possible (*ref. 85*).

Private Development Corporations

Some states permit the creation of private development corporations with quasi-public powers. They can operate with profit, limited profit or unlimited profit. With local government authority, some of the corporations can make use of eminent domain and condemnation, issue bonds, and incur debt. While not tax exempt, the corporations are frequently offered an incentive of tax abatement.

State, Regional and Local Arts Agencies

Each state and U.S. territory has an official state arts agency that usually is part of the state government and receives state appropriations. These agencies generate and distribute funds, coordinate arts activities, provide technical assistance to arts groups, and supply information about the arts in their areas. They also award grants to assist major cultural institutions and arts organizations and support community arts agencies, festivals, workshops, and, in most cases, individual artists.

A growing number of regional organizations, such as the Southern Arts Federation and the Western States Arts Foundation, perform similar functions for groups of states in a geographic area. These organizations are governed by state arts agencies and receive much of their funding through them (*ref. 1*).

Local arts agencies share the same concerns but have a local orientation, generating community oriented programs and funding. These organizations may sponsor public transportation-related projects such as subway art programs, performances in transit waiting facilities, or streetscape enhancements.



Street minstrels, New York City, 1871.

Annotated Bibliography

This selective listing includes material referenced in the text and sources of specific interest to various users. It is generally organized alphabetically by major topics. The first category refers to federal policy and program guides.

The reference numbers in the text correspond to the items listed in this section.

Most public agencies will provide their current program guides and/or further information upon request from their Office of Public Information or an equivalent contact person.

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- Streets for People**
 - Pedestrianization
 - Traffic Management
- Urban Design Techniques**
- Waterfronts**

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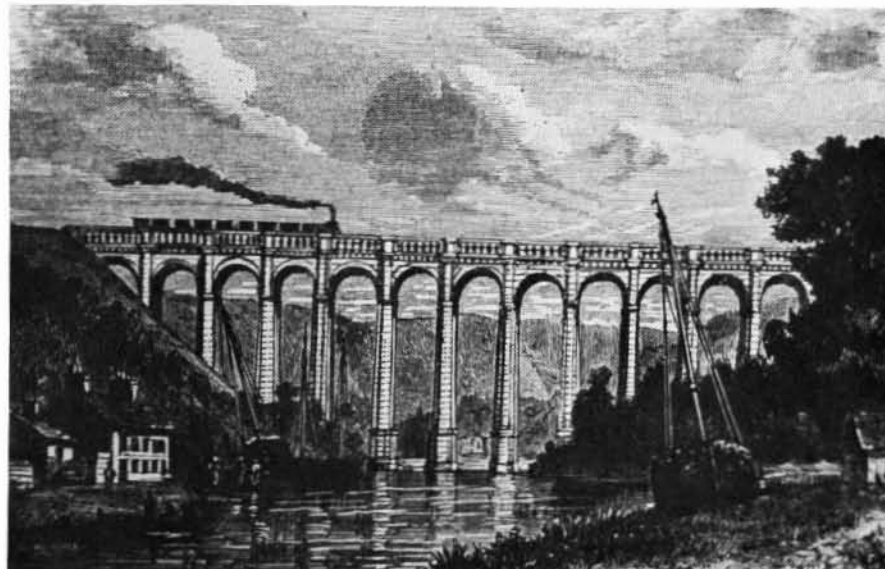
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Boston, MA.

Case Study Contacts

Chapter One Art In Transportation

- 1.1a **"The Calder" in Grand Rapids**
A Piece of Art Becomes a City's Symbol
Alexander Calder, Sculptor
City Manager's Office
Grand Rapids, Michigan 49502
- 1.2a **"Grey Portal in an Afternoon Garden"**
Enhancing a Subway Entrance with Art
Harold Paris, Sculptor
Dale O'Dell
Oakland Redevelopment Authority
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Oakland, CA 94612
- 1.2b **Stockholm Subway Art**
Providing Memorable Waiting Places
Ami Sandstedt, Information Officer
Swedish Information Service
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- 1.2c **Chelsea Square**
Art for the Community
Penelope Jencks, Sculptor
Carol R. Johnson Assoc., Landscape Architects
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- 1.2d **"Dedicated to Mechanics"**
Renovating a Piece of Historic Sculpture
Douglas Tilden, Sculptor
Mr. Myron Tatarian
Department of Public Works
City Hall
San Francisco, CA 94612
- 1.2e **Gasworks Park,**
Recycling Giant Machinery into a Park
Chuck Greening, Artwork
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- 1.2f **Earthworks**
Land Reclamation as Sculpture
Jerry Allen, Project Manager
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- 1.3a **"Landscape of Time"**
Integrating Sculpture with Architecture
Isamu Noguchi, Sculptor
Building Manager's Office
Federal Building
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Seattle, WA 98102
- 1.3b **Fountain**
Sculpture as Image and Logo
Ted Jonsson, Sculptor
Richard Andrews, Project Manager
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- 1.3c **Asaroton '76**
Innovative Art in a Complex Site
Mags Harries, Sculptor
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- 1.3d **Mission Murals**
Expressing Community
Sentiment
Mujeres Muralistas and M. Rioz,
T. Machado and R. Montez, Painters
Galeria de la Raza
San Francisco, CA 94612
- 1.4a **Vermont Sculpture Symposia**
Finding the Unexpected Along the Highway
Paul Aschenbach, Coordinator
Charlotte, VT 05445
- 1.4b **SEA-TAC Airport Art**
Integrating Art with Terminal Expansion
Gerald Williams, Partner
TRA-The Richardson Associates
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Seattle, WA 98104
- 1.4c **Queen City Metro**
Temporary Art Works for the System
Southwest Ohio Regional Transit Authority
Edward Harvey, General Manager
Queen City Metro, Operating Division
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- 1.4d **Emeryville Flats Sculpture**
Spontaneous Art by the Highway
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- 1.5a **Viewland-Hoffman Receiving Substation**
Artists and Designers Collaborate
Andrew Keating, Sherry Markowitz and
Lewis Simpson, Artists
Hobbs/Fukui Associates, Architects
Seattle Arts Commission
305 Harrison Street
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- 1.6a **Art-in-Architecture Program—GSA**
Sponsoring Art in Federal Buildings
General Services Administration
Washington, D.C. 20405
Donald Thalaker, Director
(or through regional offices)
- 1.6b **State of California "Town Meetings"**
A Democratic Art Selection Process
Sym Van der Ryn, State Architect
Office of the State Architect (OSA)
Department of General Services
Sacramento, CA 95814
- 1.6c **Seattle 1% for Art**
A Successfully Innovative Art Program
Richard Andrews, Project Manager
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Art in Public Places
305 Harrison Street
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- 1.6d **MBTA Art Program**
Successful Procedures
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Carol R. Johnson & Associates
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Gerhardt Meighorner
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Baureferat-Stadtplanung
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- 2.3a **Vermont Highway I-89**
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Arthur Aldrich
Location and Environmental Engineer
Vermont Agency of Transportation
State Administration Building
Montpelier, VT 05602
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Robert G. Horne, Municipal Manager
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- 2.3c **Vail Pass**
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Duard L. Vernon, Staff Design Engineer
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- 2.4a **Bustop Shelters, New York**
Private Venture Meets a Public Need
Bustop Shelters, Inc.
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- 2.5a **Montreal's Metro**
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M. Jean Dumontier, Chief Architect
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- 2.5b **BART—A High-Technology System**
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- 2.5c **Washington, D. C. Metro**
Unified System Design
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- 2.5d **MBTA Modernization**
Design for Efficiency and Aesthetics
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- 2.7a **Dulles Airport**
A Grand Symbolic Entrance
Dexter P. Davis, Airport Manager
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- 2.7b **SEA-TAC Airport**
Efficiency and Aesthetics
Gerald Williams, Partner
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- 2.8a **The Golden Gate Ferry System**
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Gene P. Rexrode, Project Engineer
Golden Gate Bridge, Highway and
Transportation District
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San Francisco, CA 94129
- 2.9a **The Paul Dudley White Bike Path**
Building a Bike Path in an Urban Area
Richard J. Ward, Engineer
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Lou Anne Kirby
Seattle Parks Department
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Sasaki, Walker Associates, Inc.
Landscape Architects
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- 3.3a **El Cerrito del Norte BART Station**
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Sausalito, CA 94965
- 3.3b **Quincy Center, MBTA**
Garage Design Helps to Integrate Transit Sta-
tion with Commercial Center
John Williams, Coordinating Architect
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50 High Street
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- 3.4a **Underground Montreal**
Mixed Use Developments Integrate Pedes-
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M. Roland Garand
Planning Department
Montreal Urban Community
507 Place d'Arts, Room 300
Montreal, Quebec, Canada
- 3.4b **The Gallery at Market East**
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Market East Development Corporation
Avrum Cantor
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Philadelphia, PA 19107

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Robert P. Thurber
Office of Environment and Safety, (P-20)
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400 Seventh Street S.W.
Washington, D.C. 20590
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Joseph Goodman
Office of Service and Methods Demonstration
U.S. Department of Transportation
Washington, D.C. 20590
- 4.2b **Freeway Park Three-Party Agreement**
A Model Joint Development Contract
Lou Anne Kirby
Seattle Parks Department
Seattle, WA 98104
- 4.4a **Newburyport Town Center**
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Massachusetts Department of Public Works
District Five Office
485 Maple Street
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