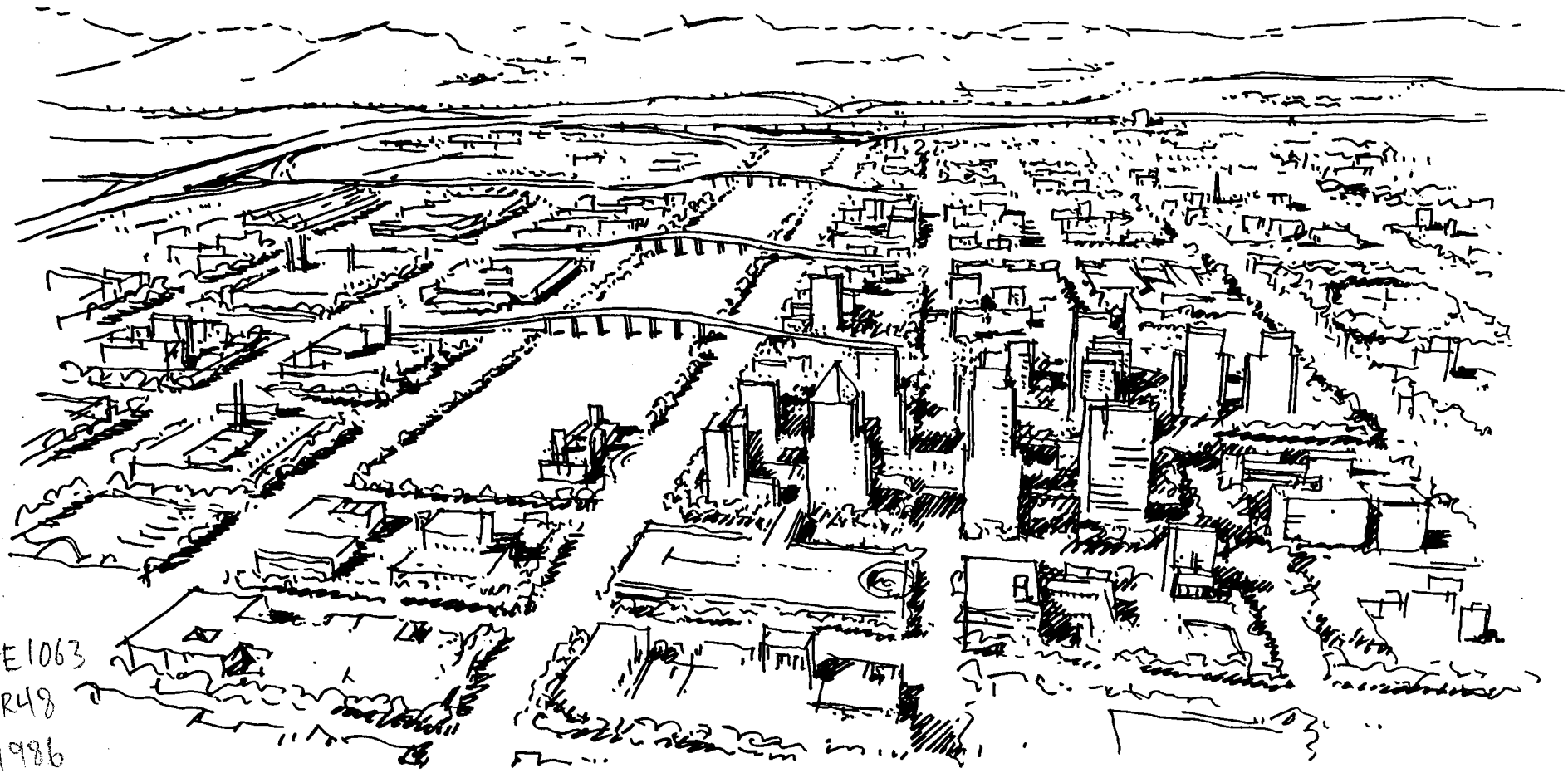
REUSE OF CENTER CITY RAILROAD LANDS

An Opportunity for Energy Efficient Urban Design



REGIONAL/URBAN DESIGN ASSISTANCE TEAM (R/UDAT) REPORT--October 1985
A Program of the American Institute of Architects

The preparation of this report was funded in part by a grant from the U.S. Department of Energy and was drafted by a team organized by the American Institute of Architect's Regional/Urban Design Assistance Teams (R/UDAT) program. The team--made up of design, planning, development, and energy specialists from throughout the country--met from October 18-20, 1985, in the offices of the San Francisco Chapter/AIA during which time this report was written and illustrated.

Team members donate their time and are reimbursed only for travel and living expenses while in the field. Since the R/UDAT program's inception in 1967, nearly 400 men and women have served as members of 89 teams.

Published in the United States of America by the AIA,
1735 New York Avenue, NW, Washington, DC 20006

ISBN: 0-913962-79-1
AIA Catalog Number: R343

THE AMERICAN INSTITUTE OF ARCHITECTS
1735 New York Avenue, NW
Washington, DC 20006

REUSE OF CENTER CITY RAILROAD LANDS

An Opportunity for Energy Efficient Urban Design

TABLE OF CONTENTS

GENERIC CASE STUDY LOCATIONS

INTRODUCTION

The Urban Design and Planning Committee of the American Institute of Architects has sent interdisciplinary Regional/Urban Design Assistance Teams to 89 American cities since 1967.

The purpose of the R/UDAT program is to assist these cities in dealing with specific local problems and issues through the participation of citizens, agencies and local interest groups with an interdisciplinary resource team. The objectives of the program are to improve physical design, to stimulate public and private action, and to provide an opportunity for consensus among diverse community groups and individuals.

The reports written during these visits reveal that, although the problems and solutions are local in context and emphasis, some are also national. The AIA has, therefore, decided to begin a new series of R/UDATs--called "Generic" R/UDATS--to occur parallel to the existing program. The new series will examine those components of local contexts that are national in scope. Through examining local case studies, the new series hopes to offer some transferability and awareness of common national issues.

THE R/UDAT ON RAILROAD LANDS AND URBAN ENERGY ISSUES

This is the first of this new series. It examines the reuse of railroad lands in the cores of cities. It is a joint effort of the American Institute of Architects and the U.S. Department of Energy to investigate through an interdisciplinary process the opportunities for comprehensive urban design and efficient energy use in the context of the redevelopment of under-utilized railroad land resources.

Following the decline of railroad usage and the clearance or consolidation of trackage, huge acreages exist adjacent to the existing downtowns of cities of every size, large and small. These tracts are in some cases so extensive that they present a unique opportunity to many cities to reconsider the basic form and future of their downtown areas.

It is almost impossible to exaggerate the importance and magnitude of the opportunity. For most cities, these tracts of under-utilized land represent their last major chance to radically redesign and reinforce their downtown cores and bring to their cities an inventory of their most sought after and cherished goals.

On the other hand, they offer an opportunity to rethink the way in which the downtown as a whole is to be used and marketed for coming generations. Thus every resource of wisdom and input that the city can marshall --from the private sector, neighborhood groups, citizens, and institutions to agencies and city government--needs to be brought to bear on the task.

For the railroads and the city alike emerges the chance to create comprehensive redevelopment plans that include transportation, conservation, downtown housing needs, public open space and the reclaiming of natural features and resources, as well as new developments in a compatible interrelationship with the existing city.

One of the compelling conclusions of this report is that the planning of these land resources is of such magnitude that their interrelationship to the metro-region as a whole is critical, not only in terms of economic growth but in terms of physical form.

Railroads are essentially lineal systems, penetrating cities to core destinations. Passenger terminal buildings at the turn of the century were often grand and ornate celebrations of arrival and departure. In some cities the architecture of these buildings has a grandiloquence equal to city halls, courthouses, and even cathedrals.

But, railroad real estate has other characteristics. Trackage often expanded to huge marshalling yards, or to freight houses and warehousing. Some tracks served large industries. Dependent on relatively flat terrain, railroads tended to follow river-banks and to expand in alluvial flats.

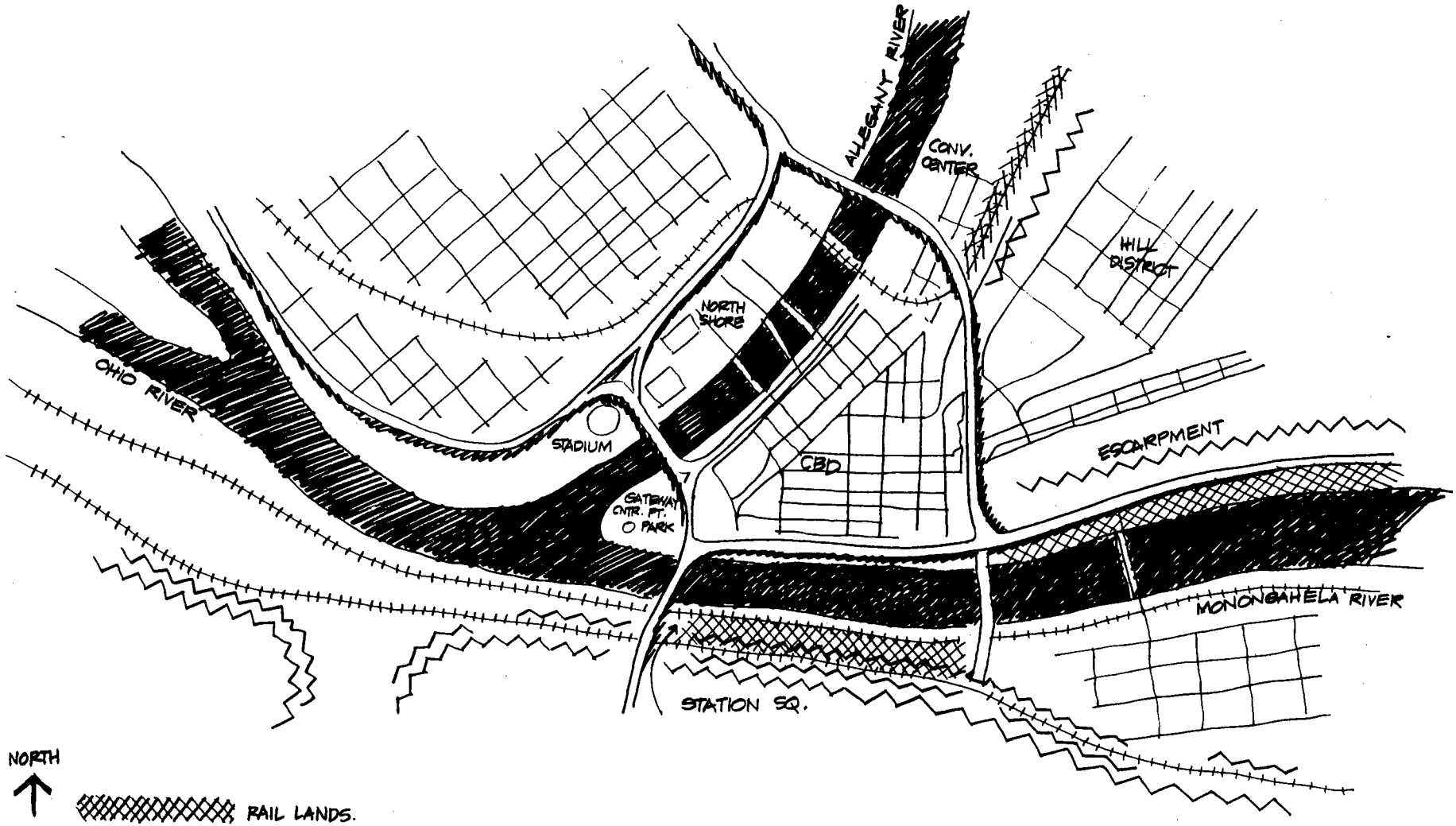
In recent years, profound economic changes have been taking place. The decline of heavy industries, the growth of the trucking industry, the decline of passenger services, and mergers of competing railroad companies have led to a consolidation of trackage and to a streamlining of services including containerization. Several railroad companies, recognizing the value of their land holdings, have formed development divisions.

The AIA has assembled an interdisciplinary team--architects, planners, engineers, economists, real estate specialists, neighborhood activists--to examine this situation and recommend some ways in which cities, railroad companies, developers and citizens can develop planning processes together to arrive at concensual goals and plans that benefit all concerned.

THREE CASE STUDIES:

Three case studies of projects at various stages of completion--located in Pittsburg, Denver, and San Francisco--have been used to demonstrate what has been done to date, and what the future opportunities and planning processes might be from the lessons learned. For example, one critical element of focus in this report is energy efficiency. Another focus is the impact of alternative planning goals and procedures.

The report looks at who the main actors are--in the private sector, in government, among the citizens and in special-interest groups--and it addresses the questions of process and leadership. It also looks at other factors such as ecology and conservation, tax generation and employment, and the reinforcement of traditional established downtowns.


ALLEGANY RIVER
CONV. CENTER
HILL DISTRICT
NORTH SHORE
OHIO RIVER
STADIUM
CBD
ESCARPMENT
GATEWAY CNTR. PT. PARK
MONONGAHELA RIVER
STATION SQ.
NORTH
RAIL LANDS.
0
1/4
1/2
1 MILE

1 CASE STUDIES

PITTSBURGH, PENNSYLVANIA

Two rivers, the Allegheny and the Monongahela flowing together to form a third, the Ohio, are the historic keys to this city.

In the eighteenth century, the French and British recognized the strategic importance of this natural "gateway" to the west and fought over it. The discovery of the vast Pittsburgh coal seam lead to the city's rapid growth as an industrial powerhouse and the rivers became transportation arteries--boats on their waterways and railroads along their river banks.

Pittsburgh is also a city of hills and valleys. As the city grew, the valleys were filled with steel mills, other industries, and railroads as well as highways. The hilltops became residential communities.

Each of these communities had its own physical identity and its own cultural flavor. Indeed, because of the extreme geography of the city, some were separate jurisdictions. The rivers in the nineteenth century created Pittsburgh's city boundaries.

Also in the nineteenth century, the pall of sulfurous smoke that hung over the city, glowing orange at night from its reflection of the open hearth furnances, symbolized economic growth and blue collar employment. By the mid-twentieth century, the same pollution symbolized a city that was ugly and increasingly unlivable.

In the immediate post-war years, a series of public/private initiatives were taken to change the image of the city on a large and dramatic scale. Flood control measures, the nation's first clean air act, and the nation's first urban renewal legislation were passed in the 1940s.

As a result, the city was able to clear out large and obsolete railroad holdings from the heart of the city and turn the land over to new uses. Modern corporate skyscrapers rose from the rubble of old railroad warehouses to greet the newly-discovered blue sky and clear sunlight above with shining metal and glass. And, at the confluence of the rivers, the city created a great state park in the form of a huge front lawn and gateway to the city.

Pittsburgh thus became the first city to consciously and dramatically change its image--a deliberate choice to present to the world--not as city of heavy industry, but as a city dedicated to a bright new future based on technological change.

Today, Pittsburgh's downtown, The "Golden Triangle," is home for the nation's third largest concentration of Fortune 500 corporations. And the Triangle itself is a dense mini-Manhattan, hemmed into a small spit of land bounded on two sides by rivers, and on the third by the hills and escarpments to the east.

In the 1970s and 80s, the downtown leapt the rivers for the first time. The development of Station Square and of the Stadium in the seventies, and North Shore in the early eighties, have led to a new conception of the rivers. Now instead of being edges or barriers, the rivers form two majestic waterways within a downtown that has begun to occupy the alluvial flats on their farther banks.

The importance of this to Pittsburgh is obvious. Less obvious, but no less important, is its relevance for other cities. The development sites in question were railroad lands. In the case of the sites north of the Allegheny, the railroads were demolished and ceased to exist, leaving cleared land for redevelopment. In the case of Station Square site south of the Monongahela, the railroad not only remained active but the Pittsburgh and Lake Erie Railroad became a development partner in the project.

Railroad lands are, of course, linear in form--in Pittsburgh, a strip of railroad land on the low ground between the river's edge and the adjacent hills. Their phased redevelopment, therefore, occurs like beads strung together. Station Square is adding to itself incrementally east and west. The area known as The North Shore is also planned as a series of increments which will form a continuous redevelopment when they are completed.

Railroad lands offer the best opportunity to cities for revising urban form on a macrocosmic basis and for evolving a new image and character for future generations.

In the planning effort that cities will undergo in seizing this opportunity, it might be well to remember that railroad lands are corridors. New rapid transit systems or new busways tying city neighborhoods and suburban nodes to the downtown should be considered, as well as the opportunities and controls for new development along these corridors that the new transit systems will generate.

ECONOMICS

Pittsburgh, in the context of the "rust belt," has seen its population drop from almost 700,000 in 1950 to just over 400,000 in 1985. In contrast, a visitor today to its Golden Triangle would view over nine million square feet of new office space constructed in less than ten years (on a base of less than twenty million). Coupled with new hotels as well as retail and reuse projects, the 1970's employment of 124,000 will have been increased by 40,000. This services/knowledge economy is creating markets for projects which reuse railroad and industrial sites rendered obsolete by the city and region's changing economy. No longer "Hell with the lid off," Pittsburgh has responded to these changes through a development policy which recognizes that land, labor and capital are required for Pittsburgh's continued economic vitality and that those factors of production must be available in sufficient quantities and at appropriate costs for job producing investment to occur. Land, as the least mobile factor of production, requires that mature cities such as Pittsburgh create "new" urban land resources through conversion of railroad land and adjacent heavy industrial and distribution uses. The expendable railroad and warehouses of the lower Triangle provided the opportunity for the post-war creation of the office, hotel and open space complex of Gateway Center and Point State Park while, additionally, excess railway and warehouse lands provided the opportunities for Three Rivers Stadium and the David Lawrence Convention Center in the 1970s.

Also in the 1970s, market conditions allowed consideration of the reuse of the Pittsburgh and Lake Erie Railroad's station and warehouse facilities across the Monongahela from the Triangle. Blending approximately $7 million in foundation grants with a like amount of public grants and loans, the Pittsburgh History and Landmark Foundation, as master developer, was able to attract private investment for the conversion of the

freight house to a festival retail center, the station and its annex to office and restaurant uses, and the warehouse to office and retail uses, with a related parking structure. A hotel and docking facility for the "Gateway Clipper" cruise fleet completed the first phase of development by 1984. The reuse and mixed use concept--relying on the natural amenities of the site between the Monongahela River and Mt. Washington, the quality of the inherited and restored built environment, and the proximity to the rapidly expanding Golden Triangle, has led to a successful regional center. The hotel consistently maintains the highest average occupancy in the region, while the many chain restaurants in the festival retail center boast the highest sales per square foot in their respective chains.

Early City concerns regarding encouragement of "downtown" uses across the rivers for the first time in Pittsburgh's history have refocused instead on the ways in which the Golden Triangle and North and South Shore developments can be related to one another and as part of a larger downtown to take advantage of the rivers' potential. Consistent with the land use component of the City's Downtown Development Strategy, development of new office space at Station Square is limited. Additionally, the transportation component has led to provision of "fringe" parking at Station Square to serve the Triangle while the new light-rail system serving the South Hills-to-Downtown corridor has a stop at Station Square. Urban Development Action Grant funds were secured both for parking construction and traffic impact mitigation measures required by the new development. Furtherance of the City's open-space policies has been met to a degree by river access to the Clipper Fleet, but efforts to create a waterfront promenade have been stymied by the railroad's insistence that expensive river wall maintenance be given over to the city.

The Three Rivers Stadium project represents changing market conditions over a relatively brief twenty-year period. In the mid-1960s, the City selected the area across the point to replace Forbes Field in the city's University neighborhood. The redevelopment project required clearance of the early 1920s railroads and warehouses which had themselves replaced Exhibition Park, the city's original home for the Pirates. At the time, the intended land use was limited to a municipal stadium, parking, and a one-mile riverfront park. By the 1980s, however, the unanticipated strength of the downtown office market produced rising Golden Triangle land costs leading to interest in the fringe areas such as the stadium--first for daily surface parking and then for development opportunities. At the same time, as part of a renegotiated lease with the Pirates, the City regained the development rights to the stadium land. Rejecting a steady stream of unsolicited proposals for "suburban" office buildings, bargain-rate hotels, and floating dinner clubs, the City established four objectives for the site:

- The development plan should maximize total long-term benefits to the city.

- It should enhance the use of the stadium through expanded parking, improved access and circulation, and added amenities.

- Land uses should relate to stadium activities and be supportive, and not competitive with, downtown and other major development sites.

- Any proposed use should preserve and enhance public access to the riverfront, take into account views from and of the site, and retain the stadium as the dominant architectural feature.

The City's plan seeks to utilize the region's greatest natural resources--its riverfront--to transform the site into a major new complex with over 3,000 new permanent jobs. The stadium project would include a science and technology center, a tech mart, a hotel, recreational retail shopping, a children's theme park, an outdoor festival area, a marina, improved parking facilities, and an enhanced public access to the waterfront.

The focal point of the Stadium Project would be the Center for Science and Technology, symbolizing Pittsburgh's emergence as a leader in the new field of advanced technology. The Center, along with the proposed tech mart, would provide an important link between the Jones and Laughlin (J & L) site and Herr's Island, the City's two other riverfront projects where advanced technology uses are proposed.

Once constructed, the Center would be almost entirely self-supporting because of the exciting new Omnimax Theatre. To make possible total project funding of $284.5 million, the City has requested state assistance of $29 million to supplement $155 million of private investment, $10 million of Federal investment, and $83 million of tax and revenue bond supported local investment.

The project, announced in September of 1984, is likely to be under construction by 1988, when new expressways serving the site will be open and will include a reversible high-occupancy vehicle (HOV) lane to service both stadium events and daily fringe parkers. This will reduce energy usage and vehicle emissions and will complement a downtown development strategy that prices Golden Triangle parking to encourage both transit ridership and fringe parking usage.

The J & L project represents the very real and visible transformation of a portion of the Pittsburgh economy from heavy metals to advanced technology. Conversion of the 51 acres of former steel-producing land along the Monongahela River to the Pittsburgh Technology and Industrial Park will take advantage of the site's proximity to the Golden Triangle with its corporate headquarters as well as to the University of Pittsburgh and Carnegie-Mellon University.

This development will capitalize on the demonstrated leadership of Carnegie-Mellon University and the University of Pittsburgh in fields such as computer software, robotics, and bio-medical engineering. Two of the projects to be located on the J & L site are the National Center for Robotics in Manufacturing, with its integration of robots into the "factory of the future," and the Western Pennsylvania Biotechnology Center, with its linkage between state-of-the-art academic research and commercially profitable industrial applications. These two projects will set a high standard for the remaining research and development, office, and light industrial uses.

Seventy-nine million dollars in private investment will be leveraged by $16 million in state investment, $.5 million in Federal investment, and $3 million in local investments and will produce 1,100 jobs.

The City will continue to monitor the additional 200 acres of railroad and steel mill land stretching along the Monongahela for possible reuse. To aid in this analysis, as well as to maintain jobs in the metals sector, the City and County will undertake a metals retention/reuse study.

The reuse strategy will address the potential new uses of each site, with emphasis on advanced technology applications; estimate the costs of acquisition, clearance, infrastructure, and site improvements for each proposed new use; estimate job creation and tax impact potential of each new private development; develop a human resources strategy for workers displaced by the transition to a new use; and determine the potential for public access to the riverfront on reused sites, including possible sites for public parking.

URBAN DESIGN

STATION SQUARE

In the early 1970s, the Pittsburgh and Lake Erie Railroad (P&LE) owned a series of underused buildings. Its ornate Italianate passenger terminal was vacant except for morning and evening commuter trains. Its freight house, shovel warehouse and two annex office buildings were underused or empty, and there were rumors of possible demolition.

The Pittsburgh History and Landmarks Foundation (PHLF) commissioned a master plan and a market feasibility study showing the recycling of the existing buildings for new uses and the phased development of the total 41 acre site with new buildings.

The master plan was predicated on providing the downtown with something that it did not have--a festival place to serve the metropolitan region and to attract tourists. The freight house and the warehouse would house a festival shopping center with an architectural imagery drawn from the history of Pittsburgh's railroads, rivers, and buildings and the terminal would house a unique restaurant in the old passenger concourse.

Offices, a hotel, a dock for riverboats, a parking structure, and landscape treatment that included historic artifacts of monumental scale were incorporated into the master plan. Later phases, yet to be added, included new condominium housing facing the river and the Golden Triangle.

TECHNOLOGY AND INDUSTRY PARK

Allied to the University of Pittsburgh and Carnegie-Mellon University, this 51 acre site is designed as a campus of new buildings. Landscaped open spaces provide the buildings with riverfront access and vistas to the south while parking areas and structures are located conveniently between the new buildings and the entry-points from the highways along the northern edge.

The site has two entry-points designed not only to make the phasing of the project easier, but also to symbolize the two universities and their research departments.

Southern exposure provides architects and developers with the opportunity of harnessing active and passive solar energy while simultaneously insulating their buildings within tight thermal envelopes. And, landscape treatments provide the opportunity for windbreaks and other climate-mitigating protections against winter storms and summer heat.

The planning provides for incremental growth, each phase being a complete piece in itself. In this way the timing of development can respond both to market forces and to the technological advances promoted by university research and corporate investment.

THREE RIVERS STADIUM

The Three Rivers Stadium project inherited components whose scale rivals that of the earlier railroad lands and warehouses. Three Rivers Stadium itself, flanked by parking lots, stretching along a mile of the Ohio and Allegheny Rivers, and contained by the interstate highways and the Ft. Duquesne Bridge, is a dominant feature of the city's skyline. The urban design scheme accepted this dominance, and developed a continuous wall of structures on each side of the stadium, also stretching along the rivers with Roberto Clemente Park. The open space system also extends around the stadium.

Vehicular entrances to elements of the development occur along roads which are perpendicular to the horizontal scheme of the rivers, open space and structures. The structures, housing a variety of uses, are not a true megastructure, but are reminiscent of the variety of freight houses, warehouses, roundhouses and terminals that comprise typical rail complexes.

URBAN DESIGN AND PLANNING PROCESS

STATION SQUARE

In 1973 Arthur Ziegler, President of the PHLF, asked UDA/Architects of Pittsburgh, to devise a master plan for the 41 acre P&LE site, with an emphasis on recycling all of the existing buildings.

The Allegheny Foundation granted funds in 1974 to enable an independent market feasibility study. Legal mechanisms to enable PHLF as a non-profit entity to joint venture with P&LE as a for-profit entity were studied simultaneously.

In 1975, following a positive market feasibility report and acceptance by the IRS of the joint venture, the Allegheny Foundation granted PHLF a $5 million equity grant to proceed with the development. Approvals of the master plan by the City Planning Commission were then granted, and detailed architectural drawings for the Express House, the Grand Concourse and the Freight House were begun.

The Express House, the smallest of the three elements, opened as an office building in 1977. In 1978, the 550 seat Grand Concourse Restaurant and Gandy Dancer Bar opened in the Terminal, following an investment of $2.5 million by the C. A. Muer Corporation. The Freight House opened in 1978 following $6 million in private sector investment including $2.3 PHLF equity. The Freight House included fifty specialty shops and restaurants.

Meanwhile, construction of the Sheraton Hotel and the recycling of the Shovel Warehouse for shops and offices, to be called Commerce Court, was under way. The Sheraton opened in 1981 and Commerce Court opened in 1983 following $21 million in private investment. Also in 1983, a four-deck 800-space parking garage was built with $3 million private investment to match a $3 million Urban Development Action Grant.

In 1985, 73,000 square feet of recycled offices in the terminal building above the Grand Concourse opened, following $6.5 million in private investment and the Gatehouse building with 50,000 square feet of offices also opened, with $5.2 million in private investment.

Also in 1985, the PHLF extended its 41-acre site westward by 6.5 acres beyond the Fort Duquesne Bridge by the acquisition of the Northern Star Ice Cream and the Lawrence Point buildings.

The project has prototypical importance because of three major factors:

- Old railroad buildings are recycled rather than demolished, thus making history the basis for an urban richness extending into the future.
- The master plan was based on uses that offered to the City a festival market place of a kind the City lacked, thus Station Square was not competing with (and weakening) existing downtown businesses.
- And P&LE used its land and buildings as equity in a joint venture development with the PHLF, thus continuing its ownership position in this successful project.

TECHNOLOGY AND INDUSTRY PARK

In the fall of 1980, Pittsburghers were stunned to learn that Dallas-based LTV would close its J & L Second Avenue hot strip mill, which employed 1,500 people, down from a peak of 5,000. The mill, part of J & L's complex which stretched along both sides of the Monongahela River, was being closed due to deficient demand, not technological obsolescence. The City almost immediately began working with a local developer in an effort to purchase the mill for industrial reuse. However, the mill was sold instead to the Park Corporation, basically for the salvage value of the capital equipment and structures. In 1983, the City, through its Redevelopment Authority (URA), announced that it would purchase the cleared land from Park for development into an industrial park. The site would become the first in-city industrial park of the Regional Industrial Development Corporation (RIDC), a quasi-public creation of Allegheny County charged with industrial site development responsibilities. The project is a major component of "Strategy 21," the cooperative economic development strategy of the City of Pittsburgh, Allegheny County, the University of Pittsburgh, and Carnegie-Mellon University.

In September 1985, the City Planning Commission approved the preliminary land development plan and recommended Council approval of rezoning from a heavy industry category to a "specially-planned district" for the Pittsburgh Technology and Industry Park. Site clearance will be 75% complete by the beginning of 1986, with construction of site infrastructure to begin in the spring of 1986.

The site will be developed by RIDC as master developer under contract to the URA as landowner. Individual sites will be sold or leased for uses relating to the advanced technology specialties of the two universities and Pittsburgh firms.

THREE RIVERS STADIUM

In 1982, the City of Pittsburgh and its professional baseball franchise, the Pittsburgh Pirates, negotiated the Pirates' lease for Three Rivers Stadium. By reassuming the development rights to the surrounding parking lots, the City was faced with its second opportunity in fifteen years to consider the re-use of this former railway and warehouse land on the banks of the Allegheny and Ohio Rivers.

While the redevelopment project of the 1960s had a relatively simple program of stadium, parking and waterfront improvements in an era of federal funding for redevelopment and urban parks, the development project of the 1980s was faced with a scarcity of public profits. With the financial target of $1 million per year to reduce stadium operating deficits and the planning objectives of the creation of a regional business/entertainment/education complex which would not compete with other existing or planned projects, and a requirement to maintain the minimum of 4,200 parking spaces for stadium events (for both practicality and bondholder commitments), the project inherited a site with complexities quite different from those of the railroad and warehouse properties of only a few years earlier. But the fact that the property had been assembled into a single tract under the control of the City and its Stadium Authority allowed the project to proceed with the City contributing land as its equity in proposed development.

The City Planning Department assembled a multidisciplinary team of consultants to supplement City staff in 1983. This team prepared the mixed use plan announced in the fall of 1984. The plan was developed as part of the City's Downtown Development Strategy, which has guided the growth of the Golden Triangle and its environs since the late 1970s. The City is now in the process of negotiating with potential developers while proceeding with further engineering, design and financing of the parking garages necessary to allow development to proceed on portions of the existing stadium parking lots.

LESSONS LEARNED

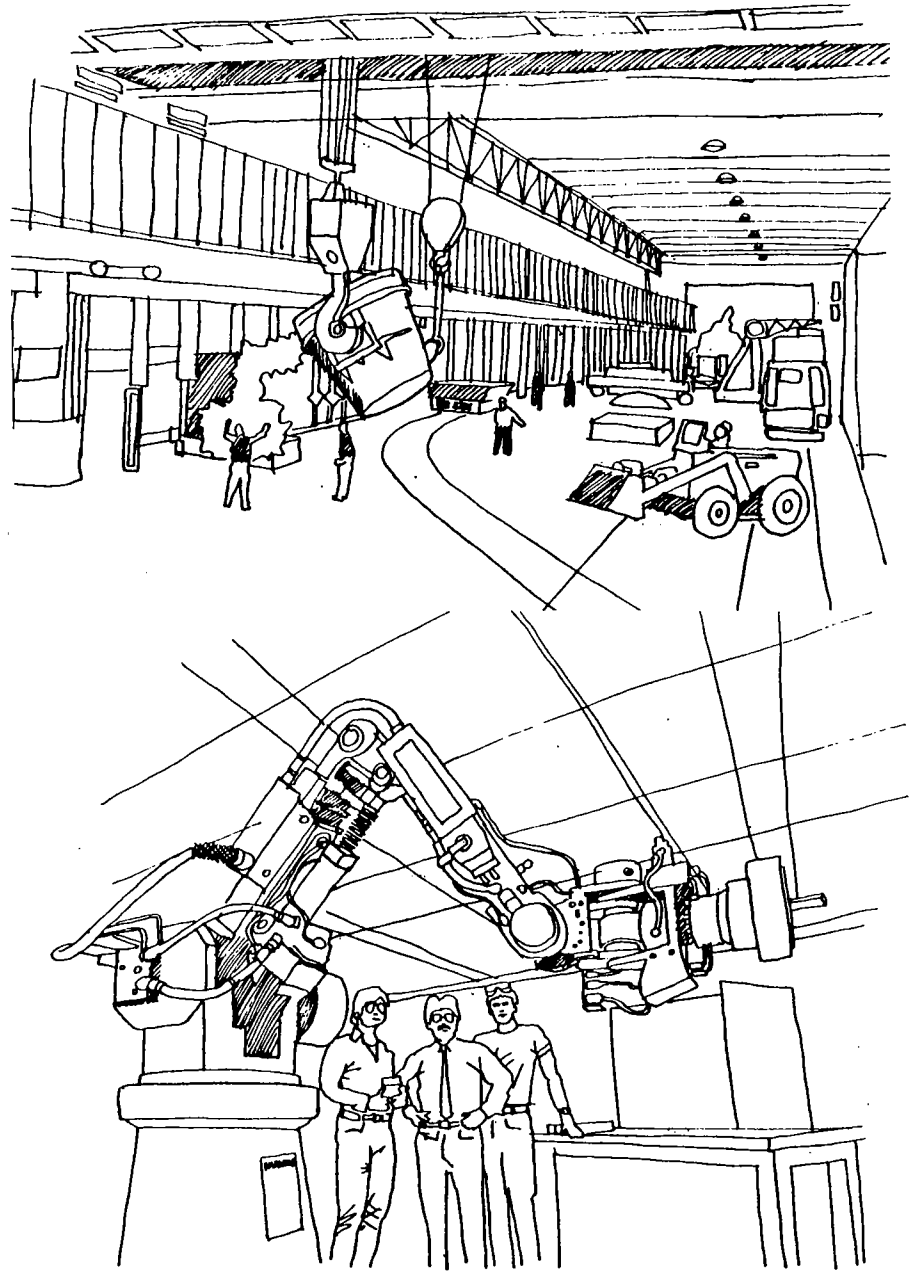
The Station Square project represents the successful reuse of railroad buildings in the context of an operating railroad. The project demonstrates the need for a private/public/foundation financing partnership to achieve the dual objectives of preservation and creation of a mixed-use destination complex. The attraction of the buildings, their history and their setting proved enough to overcome conventional wisdom regarding location. The project was considered risky enough, however, that the financial success of tenants and sub-developers has yet to be realized by the master developer--a situation likely to be overcome as access to the local highway system is improved and future development occurs. The project also indicates problems in dealing with railroads and railroad land. The operating rail continues to be a physical barrier to direct river-front access, due to unresolved issues of liability and riverfront wall maintenance. Railroad corporations are not always structured to respond to development proposals or to operate as a development partner.

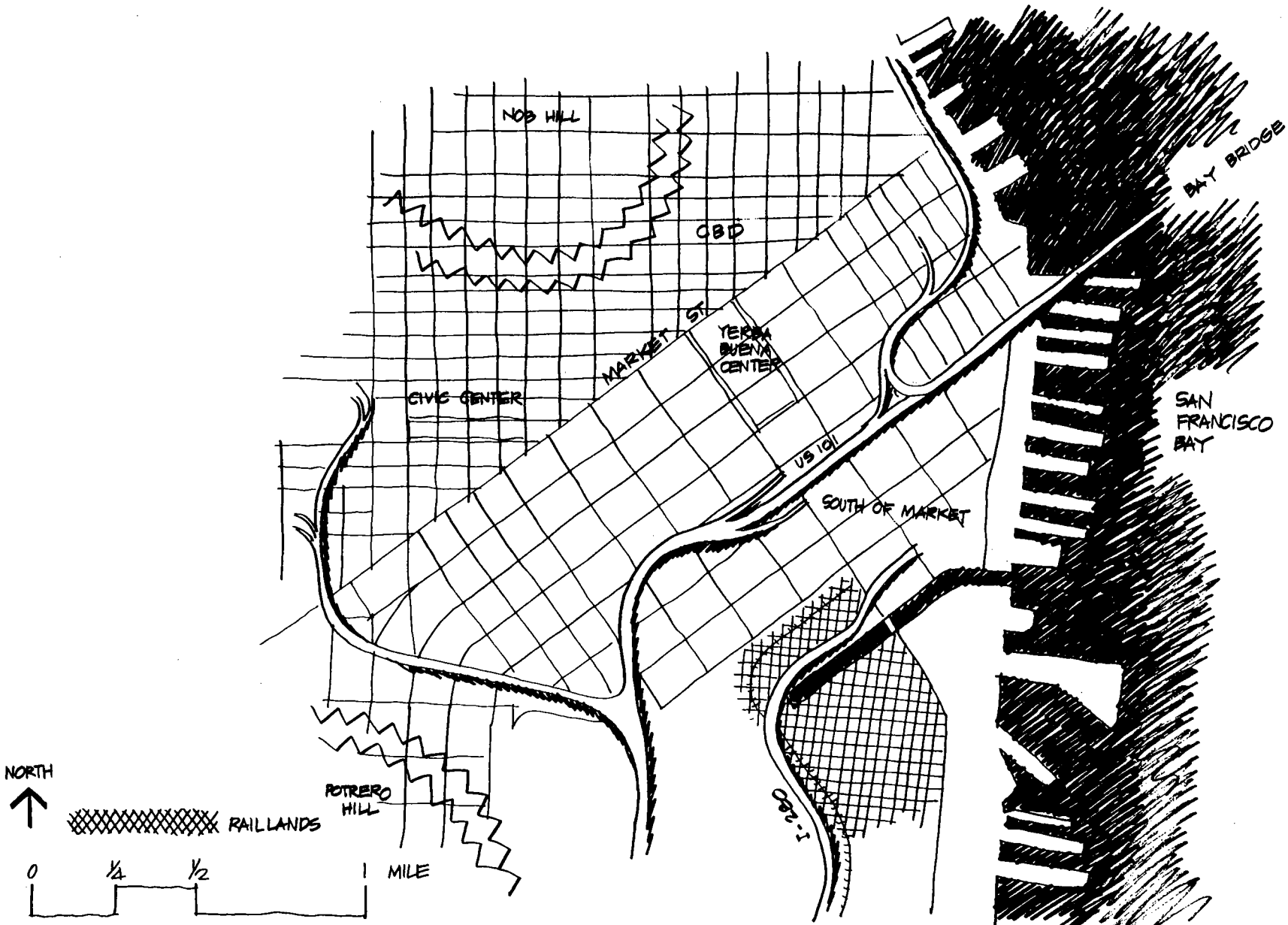
In order to overcome the factors preventing development, the community and developer may be tempted to accept lower quality development, which would have a short-term benefit but a long-term cost. Certainly, the hotel at Station Square, as the first entirely new structure, failed to carry out the architectural vocabulary established by the reuse of the railroad structures. Instead, it is a structure which could be found along any stretch of suburban highway, and represents more of an impediment to high quality future development than did the inherited constraints of railroad land. The public sector, too, in its reluctance to be seen as doing anything but facilitating an uncertain project, failed to insist on compliance with its own planning and urban design standards which could have been effective under the planned development zoning category.

The Three Rivers Stadium project, as well as the City's Strip District project, demonstrates the value of interim use of railroad land. Cities should be prepared to resist the temptation to rush into development of a railroad site just because it has become available after a century or so of active rail use. The scale of such land is frequently large and is added to an existing list of available sites. In densely-developed cities, surface parking may be an appropriate use, since it reduces the demand for public and private investment in parking structures. Fringe parking can be a valuable tool in competition with suburban sites which typically offer a plentiful supply of free parking. Fringe parking can also be part of a larger City strategy to reduce traffic congestion and vehicular pollution within the downtown core by pricing parking to encourage long-term parkers to utilize the fringe parking resource or shift to transit. When market and public policies dictate structured parking, it can frequently be provided on the railroad due to lower land costs and the cost-effective means of construction on the relatively unconstrained sites. Finally, an interim use can provide "breathing room," during which unique needs may be identified as new market ideas emerge. Festival markets may not be the only route to urban salvation forever.

Pittsburgh's J & L site offers a lesson on the differing demands on area infrastructure between a railway/industrial use and emerging uses. The former required roads capable of handling heavy trucks, for example, as well as transit and auto traffic for workers in two or three shifts per day. The latter uses, however, require roads to handle traffic generated by one shift per day in structures with generation characteristics quite similar to those of office uses.

The J & L site, with its waterfront orientation near both downtown Pittsburgh and its universities, demonstrates the qualities of under-utilized railway and industrial land which offer such tremendous potential. Bio-medical engineering and advanced manufacturing techniques, such as robotics, may occur on the very sites which supported the earlier era of industrial production and distribution. Enough such sites may be just what is needed to keep the festival markets booming.




NOB HILL
CBD
MARKET ST
YERBA BUENA CENTER
CIVIC CENTER
BAY BRIDGE
SAN FRANCISCO BAY
US 101
SOUTH OF MARKET
POTRERO HILL
I-280
NORTH
RAILLANDS
0
1/4
1/2
1 MILE

SAN FRANCISCO, CALIFORNIA-- MISSION BAY

HISTORY

Civilization came to Mission Bay in 1769 when Aguirre surveyed the western edge of San Francisco Bay and opened the area to Spanish settlement. The Spanish established Mission Dolores on a creek that fed Mission Bay, a shallow expanse of water and marsh. In 1846, when the United States took California from Mexico, only a few missions, forts and settlements distinguished Yerba Buena, later named San Francisco, from what it had been for thousands of years. But in 1849, the discovery of gold sparked its transformation into a burgeoning industrial and commercial city.

Its need for rail access, just sixteen years later, led to construction of the wood pile supported Long Bridge at the mouth of Mission Bay in 1865, isolating it from San Francisco Bay. Over the next 50 years, Mission Bay was filled for railroad and industial development leaving as its remnant Mission Creek -- first a thriving maritime waterfront, now the lazy host to wildlife and a picturesque boat/houseboat harbor.

Mission Bay, consisting of 230 acres of obsolete and underused railyards and warehouses owned by the Santa Fe Pacific Company, and bisected by Mission Creek, a navigable tidal channel held in trust by the Port of San Francisco, is the target for a major development proposal.

THE PROJECT

The project being planned consists of 230 acres (originally 195 acres but later augmented through the Southern Pacific-Santa Fe merger). The site is largely on a level landfill of what was once a shallow bay within the larger San Francisco Bay.

Its current uses are rail-holding yards, which are to be relocated, and some warehouse and light industrial uses on short-term leases. The site is surrounded by a residential neighborhood (Potrero Hill) on a hill to the west, a large wholesale showroom district (Showplace Square) to the northwest, and industrial and maritime uses in the other directions. It is located about a mile from San Francisco's financial district. It is buffered on the west and north by an elevated interstate freeway which terminates in midair and is not to be completed. The site has an excellent microclimate and good views of the downtown skyline. It has limited direct access to the bay shoreline but contains within it a narrow inlet called Mission Creek, which has a small houseboat community.

The property is owned by the Santa Fe Pacific Development Company (the merged land development companies of the Southern Pacific and Santa Fe railroads), the City (developed and underdeveloped streets), the State of California (which has an air rights easement for the elevated freeway), and by the Port of San Francisco (Mission Creek). The addition of certain other properties controlled by the Port is being discussed.

APPROACHES TOWARD DEVELOPMENT

THE GOVERNMENT INITIATIVE-ONLY MODEL: In the early 1970s the City sought to encourage the Southern Pacific to redevelop its property. Planning staff prepared design sketches and provided rather permissive zoning. The property was held by the Southern Pacific Transportation Company which saw a continuing railroad use and the City's overture was rejected without serious consideration.

City policy developed in the late 1970s, and as expressed in its general plan, encouraged some housing on a portion of the site nearest downtown and industrial use of the balance.

THE "DEVELOPER INITIATIVE-ONLY" MODEL: In the early 1980's Southern Pacific, without prior consultation, presented to City planning officials preliminary plans for development of the entire site (exclusive of the Santa Fe holdings) as a high-density mixed-use project. The plan was not favorably received because of density, use and design objections. Southern Pacific was encouraged to try again with new consultants which, with some initial reluctance, it agreed to do.

THE "DEVELOPER INITIATIVE/GOVERNMENT INTERACTION" MODEL: The City indicated its willingness to consider changes in its land use policies for the area without giving a clear indication of what changes it would support. Rather, Southern Pacific was encouraged to obtain an analysis and recommendations from its new consultants which the City would then consider. Southern Pacific hired I.M. Pei, from New York, and Wallace, Roberts and Todd, from Philadelphia, to work under Southern Pacific's direction. Over the course of a year, a plan was prepared with periodic meetings with City staff and community groups, particularly from nearby Potrero Hill. Both City officials and community groups were in reactive roles, however--reacting to materials pre-screened by Southern Pacific, and presented to them by the Southern Pacific and its consultants.

A well-designed but unresponsive plan was developed which called for some 16 million square feet of office and research and development space in structures ranging from 4 to 42 stories in height, and 7,000 units of housing ranging in heights from 2 to 20 stories, around a re-created lagoon and canal system.

Repeated objections to heights of buildings and the quantity of office space were made by City officials and the community. These went unheeded by Southern Pacific. Principal concerns were that, in effect, the plan created a second downtown core, and that not enough housing units--vis-a-vis projected employment--were being provided. The City wanted the project to produce a surplus of housing over the demand generated by the new employees the project would create. Southern Pacific insisted that it needed the proposed quantity of office space to justify its investment in the infrastructure required to create the environment to support the housing.

For these and other reasons (including uncertainty about the location of a new stadium), an impasse developed. The Mayor of San Francisco and the President of Southern Pacific became directly involved in negotiations in an effort to break the impasse to no avail. Citizen groups working with members of the Board of Supervisors (the local legislative body) were proposing a public referendum on a policy statement that would call for lower heights and less commercial development. There was also talk of the City purchasing the property, voluntarily or unvoluntarily. The impasse continued until the Southern Pacific-Santa Fe merger was suddenly announced, and Santa Fe personnel took charge

of the negotiations. They asked the Mayor to delineate specifically what her administration would support so that Santa Fe could decide whether it was interested in developing under her guidelines, or whether they would simply land-bank the property.

Eventually, a general land use plan and development program was developed which the Mayor and Santa Fe, through a written Memorandum of Understanding (MOU), indicated they would both support. It set a maximum height of 8 stories (compared to 42 under the Pei plan), reduced the maximum office/R&D square footage by over 9 million square feet (eliminating the second downtown core objection), increased the minimum number of housing units, and specified that 3,090 of them were to be for low and moderate income households, and provided for major open spaces.
It was later explained that the corporate objectives had changed--Southern Pacific's being to establish maximum land value, without regard to the duration of buildout, and Santa Fe's being to maximize cash flow.

A NEW BEGINNING: THE "GOVERNMENT LANDOWNER CITIZEN PARITY" MODEL: Using the Mayor-Santa Fe MOU as a point of departure, a detailed plan is being developed by the City's Planning Department (with monies provided by Santa Fe) with the action and direct involvement of Santa Fe and community groups. These range from the directly affected houseboat community to city-wide special interest groups, that had organized into a clearinghouse for consideration of their varying interests. All three parties--government, landowner and citizenry-are now participating in an open planning process which will take another year to complete. If successful, it will result in a project the three groups can support and will culminate in the enactment of public policies, development controls, and the execution of a development agreement that commits the developer and the city to the staged actions needed to carry out the project over a 15- to 20-year buildout period.

PERSPECTIVES ON CITY AND LANDOWNER NEEDS

The City looks to Mission Bay to satisfy its needs for housing (particularly housing affordable by the City's working population), for job-generation (secondary office, blue collar and "new collar" such as office services, printing, computers, etc.), and for open space in the park-deprived eastern half of San Francisco. Santa Fe, of course, is looking to create a quality project that will convert its land to cash.

PERSPECTIVES ON LOCATION

Within Mission Bay is Mission Creek, a sheltered tidal channel that hosts magnificent shorebirds with six-foot wingspreads. This amenity can be expanded and enhanced.

Mission Bay is surrounded by diverse and vital, yet unconnected areas: Potrero Hill's residential neighborhoods, Showplace Square's designer showrooms, Townsend Street's office conversions of historic warehouses, and a transportation depot that is the terminus of the heavy rail peninsula commuter line and its connection with a proposed light rail extension of the City's municipal railway system. The new development, and particularly its central park, can provide a center and focus for a new district that includes all of these areas.

The questions to be resolved in the coming months of formulation of a preferred plan are these:

-Can more than the minimum 7,500 housing units be planned?

-Can the housing affordability goals be achieved or bettered?

-How much of the maximum 6.7 million square feet of commercial/R&D space is needed to finance the project? Can R&D activities be attracted to this central city location? Is back office space needed here to prevent the migration of clerical jobs to the suburbs?

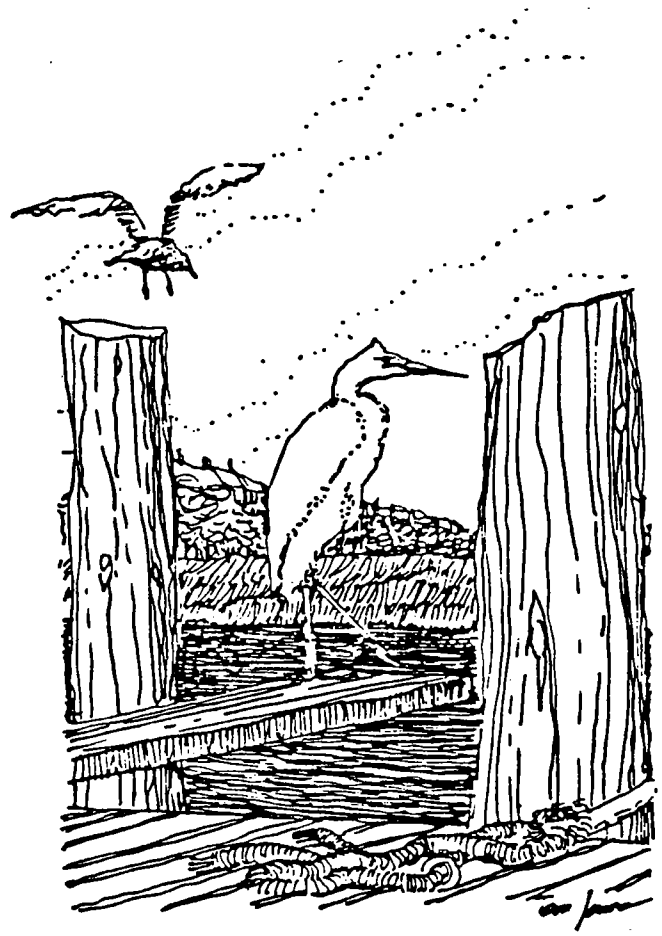
-Can an 18-acre parcel of Port land be released from future maritime use?

-What will be the amount and quality of the open space? Can the tidal waterway be developed as a rich natural resource in its own right, or simply as a decorative amenity for the residential/commercial development?

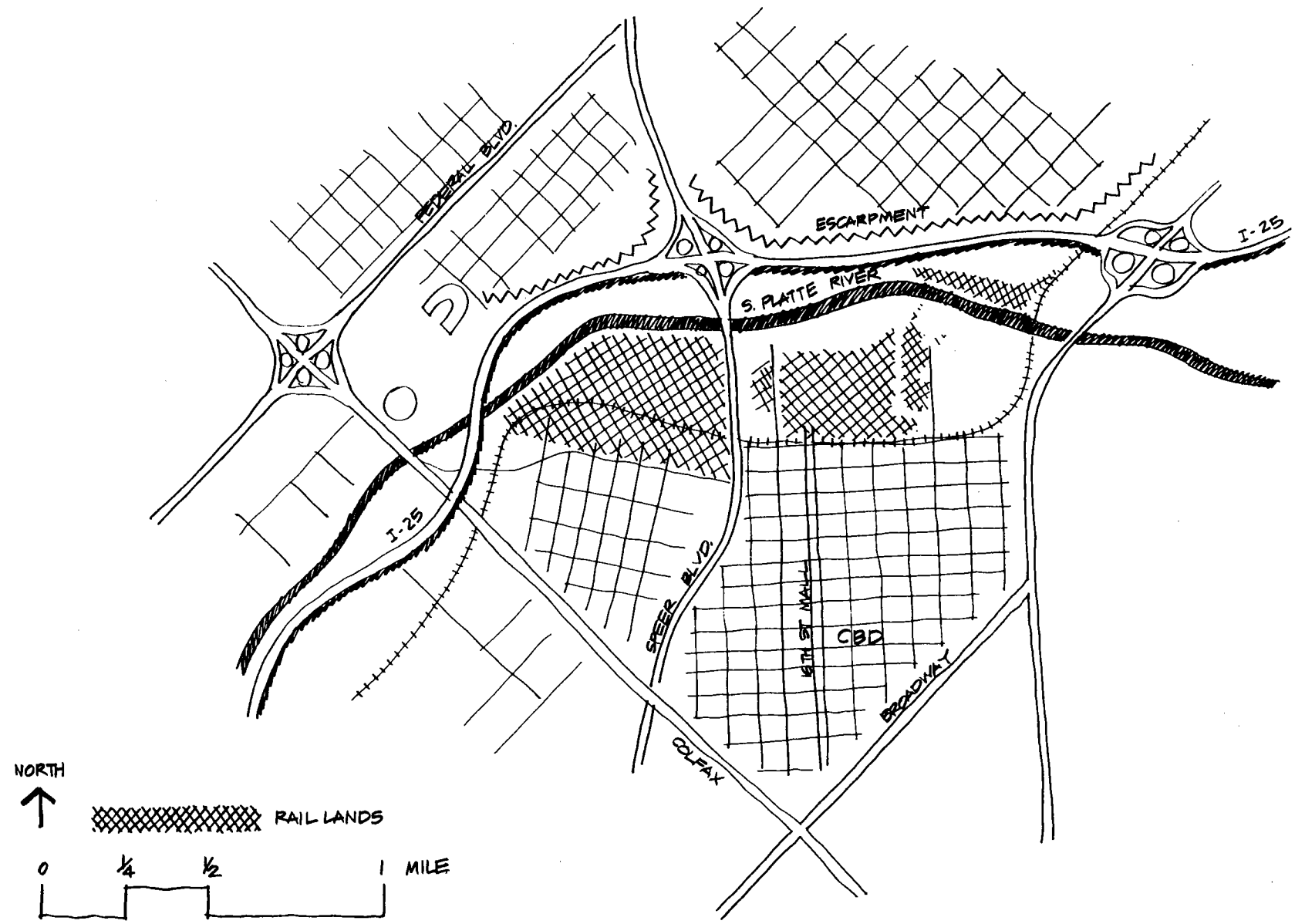
-What will be the design of the street grids and of the general development?

LESSONS LEARNED

Staged projects that are large-scale and long-term can only proceed if there is a general consensus among the landowner-developer, government, and the citizenry. Achieving that consensus requires the development of compatible objectives as early as possible. It is best and most quickly achieved if all three groups participate in the planning process on a relatively equal footing. Failure to achieve that consensus in the first three approaches to development of Mission Bay resulted in years of inaction and the waste of millions of dollars in fruitless planning and lost opportunity costs.



MISSION BAY


FEDERAL BLVD.
ESCARPMENT
I-25
S. PLATTE RIVER
I-25
SPEER BLVD.
16TH ST MALL
CBD
BROADWAY
COLFAX
NORTH
RAIL LANDS
0
1/4
1/2
1 MILE

DENVER, COLORADO

GENERAL DESCRIPTION

Unlike Pittsburgh and San Francisco, Denver reigns over a sparsely populated region. Although its founding was also related to user functions--in this case a river crossing--the water is not a significant factor or barrier. Denver is the gateway to the mountains for millions of skiers and summer tourists it is home to many large military and civilian government installations and defense contractors, and more recently, the service center for regional mineral exploration and extraction. The area is relatively flat before rising to the mountains on the west and to the south would seem, at first glance, to be unconstrained. But, water is not universally available and there are limited areas in which the region can grow. Even more constrained is the City of Denver which can no longer annex undeveloped land due to a state constitutional amendment instigated and supported by suburban jurisdictions.

One of the largest areas of undeveloped land within the city is the Central Platte River Valley, adjacent to and west of the central business district. Interstate I-25, the South Platte River (100' wide channel) and a moderate bluff form the western edge of the Central Platte Valley; the eastern edge of the valley and the historic district of lower downtown are defined by the main line railroad corridor. The area is further defined on the north and south by major access corridors into the downtown area and is bisected by Speer Boulevard and Cherry Creek that forms a diagonal open-space corridor that bisects the valley and the city. This corridor defines the flood plain area to the south from the northern area which is out of the flood plain. For years, that area has been vacant or uninhabited except for an auto crushing facility.

Several years ago, a major flood occurred that prompted Corbusian "Ideal City" proposals. In recent years, successful attempts have been made to clean the valley up, remove abandoned railroad uses and tracks, and reclaim access to the South Platte River as an open space corridor and amenity. In the meantime, a number of development proposals have been proposed for an entertainment/amusement park to a new-town-in-town.

After an unsuccessful attempt in 1974 at redeveloping a portion of the area, Burlington Northern, Inc., through a newly-formed subsidiary, Glacier Park Company, proposed the redevelopment of 155 acres under a joint venture arrangement with Miller-Klutznick-Davis-Gray. As the plan developed momentum, other redevelopment interests surfaced which, collectively, would impact the entire Platte Valley. A public/private task force was appointed by the new mayor to bring together the various public and private interest groups to develop a framework for a study area of approximately 400 acres. This task force--The Platte Valley Development Committee--began their work in January 1984. It is comprised of representatives of the City Council, the Planning Board and other administrative offices, railroads, developers, and neighborhood organizations and landowners in the area. It issued its Policy Document reflecting the agreements reached in the process in June, 1985. The concept plan will be the basis for zoning, development agreements, and other contracts affecting the development of the Central Platte Valley.

ISSUES/CONCERNS/ASSUMPTIONS

Denver is in a "landlocked" situation because the City cannot annex additional land and is in competition with suburban areas that can annex additional land and exceed Denver in area. This severely affects Denver's ability to increase economic development for additional jobs, residents and tax revenue. The need for such development, comes in part, from the fact that Denver has been losing its economic base to surrounding areas.

Given these circumstances, it is important that the remaining undeveloped land in Denver be put to better use whenever possible. The Central Platte Valley is the most prominent example of such underutilized land.

The Central Platte Valley as it currently exists, morever, offers the opportunity for Denver to actively compete with suburban developments. This is because the land values in the Valley are competitive with surrounding projects, there is excellent access to the Valley, and it is a location immediately adjacent to downtown services. Also, the Valley presents unique amenities, such as an improved South Platte River, Cherry Creek, and new open space opportunities.

There were certain guidelines and constraints in the Central Platte Valley:

- Funds for public acquisition of entire redevelopment areas are not available.
- Generally, a local government cannot use eminent domain to acquire land owned by a railroad.
- To the greatest extent possible, the development in the Platte Valley must pay for the infrastructure which directly benefits the Platte Valley.
- The development in the Platte Valley should complement, not duplicate the downtown.
- The development of the Central Platte Valley offers the city a special opportunity to achieve certain high priority goals of developing additional open space and substantial core-area housing.
- Major public funds are not available for development subsidies of non-economic projects.
- The goal was to create a redevelopment plan that is economically viable for the private sector while achieving the primary public sector goals of additional open space, housing, quality design, and urban character.
- The development of the Platte Valley will take over 25 years, and as such, the development of detail expressed in the concept plan must be flexible enough to accommodate changing markets, public objectives, and financing availability.

The transformation of the Central Platte Valley from an area associated only with railyards and warehouses to one in which the waterways and greenways are prominent could trigger a significant change in the image of Denver for many people. The Platte Valley, for many, is currently a transportation crossroads through which they travel. For those people, their image of Denver is, in great part, their image of the Platte Valley. The enhancement of the valley through the improvements outlined in the plan, offers the opportunity to create a dynamic and powerful gateway and image for Denver and to reunite neighborhoods that have been cut off by the highway and railroads.

Through the addition of landscapes open space, people oriented activities (employment, cultural, recreational, and pedestrian/retail), and housing, there would be an opportunity to respond to markets in the core area which have not yet been successfully tapped. In addition, these projects could effect substantial change in how people define Denver. Denver--facing the mountains--will not only be a city of family residences, cultural and recreational opportunities, and myriad parks, but would once again be reconnected to the waterways where the city was founded.

LAND

The 400 acre development study area is located along the Platte River, west of the Central Business District.

The history of the Central Platte Valley has produced its current poor visual image. It is zoned for industrial use and has existed for many years as rail yards, warehousing, and small industrial and processing business--highly dependent on rail usage. The area has a blighted image and had been in the 100-year flood plain since such records were kept. However, recent improvements to Cherry Creek have caused those properties north of Speer boulevard to be removed from the flood plain.

For years the Platte River had no care and it, too, added to the blight of the area. But through the 1970's--due principally to the efforts of the Greenway Foundation and millions of dollars in expenditures--the Platte has taken on new beauty through improvements and the addition of parks along its banks. The Platte River and Cherry Creek offer the major natural amenities on which new development can capitalize.

A major portion of the 400 acre study area is owned by the railroad companies serving the metropolitan district--Burlington Northern, Rio Grande, and Union Pacific, along with the Denver Union Terminal Railroad. The remainder of the land is held by several development interests, the Greenway Foundation, and the public sector. Each of these ownership interests was represented in the Platte Valley development planning process.

ECONOMICS

Denver is one of the most rapidly growing cities in its size class (1.7 million, metropolitan population) in the country. With rapid growth in the 1970s and early 1980s due to its position as a center for mineral exploration and mining, an attractive lifestyle and a financial and service center for a broad region of the Rocky Mountain West, the area attracted unprecedented investment and development interest. Previously committed projects came on line coincident with the downturn in the national economy in 1983-84 and, as a result, Denver now has one of the higher office vacancy rates in the nation--due more to the unusually high construction rate than the absorption (leasing) rate which has actually been at a fairly high level.

This metropolitan growth will impact Denver and its suburban jurisdictions. However, Denver is a "landlocked" city in that it is effectively prevented from annexing new land. This affects the City's ability to expand the job, tax, and residential base white suburban locations--notably the southeast area along Interstate 25--are becoming competitive with downtown for office, hotel, and commercial activity.

Within this context, the Platte Valley project is designed to accommodate the continued long-term growth of Denver and specifically add tax base, jobs and commercial facilities on what is the last large tract of undeveloped land available in the City of Denver.

The costs of roads, open space, and major utilities are estimated to be around $180 million over a 20-year period. This is expected to be financed through tax increment financing and special districts. Ultimately, with these funds will come private development in the Valley, but there are unresolved issues involving the up-front costs and early years' needs while the development gains momentum.

The total development plan anticipates about 13 millon square feet of office. 1.4 million square feet of retail, 4,000 to 5,000 residential units, 1,200 hotel rooms and many public facilities including, the option for a new convention center site.

PLANNING CONCEPTS

Land Use

The objective of development in the Platte Valley is to complement--rather than duplicate or compete with--the downtown. Denver aims to retain and improve its share of metropolitan development, but also to complement, reinforce and enhance the downtown by compatible adjacent development. The Platte Valley presents an opportunity to achieve these goals, specifically for the provision of additional open space and substantial core-area housing.

Although the maximum allowable development is 25 million square feet, it is expected that over a 30-year period, market absorption figures will produce closer to 18-20 million square feet. Of this, roughly 65% will be in office and employment uses; 16% in residential; 7% in retail; 6% in hotel; and the remaining 6% for public activities. The retail is conceived as secondary or supporting commercial uses and not development of regional shopping centers.

Development throughout the Valley will be a variety of mixed use clusters or sub-districts. The Platte Valley offers the greatest opportunity to build a large number of housing units adjacent to the downtown core. Preferred locations for the residential development are indicated within the 11 sub-areas of the land use plan.

One of the major benefits of opening up the Central Platte Valley is the addition of approximately 115 acres of new open space and parks. Added to the existing 37 acres, the Platte Valley development, combined with this greenbelt, seeks to enhance the South Platte River and Cherry Creek waterways, thereby providing the focus and key to a significant metropolitan waterway in an arid landscape. The open space will serve residents and workers in the Platte Valley as well as tourists, downtown, and adjacent Denver neighborhoods.

Major elements of the open space include expansion and completion of the Platte River Greenway a new 40-acre park (the Denver Commons), and Rockmont Park serving the northwest neighborhoods, a new 30-40 acre park between the lower downtown area and the Platte river; and a 1,500-foot promenade along Cherry Creek, and greenway connections to adjacent neighborhoods. This promenade will have a mix of restaurant, entertainment and office with residential development, and biking/walking paths along the south side.

Circulation

Consolidation and realignment of the railroads into a mainline corridor are the single most critical facilitators of Platte Valley development. The existing railyards will be removed and a single rail travel way established in combination with a proposed transit path, minimizing the broad dimension of the resultant corridor and retaining the vacated alignment for future transit and pedestrian use. Extensive landscaping will flank the entire route in some locations, there will be parking garages and/or construction using track air rights. General policies have addressed noise, vibration, and visual impacts as well as a light rail transit corridor that will be located within an easement provided by the main line realignment and will utilize the Union Terminal as a transit hub. The lightrail system will serve the old and new airports, lower downtown, the Platte Valley Sports Complex, and will connect with areas to the south of Denver. Longer term possibilities include an intermodal front range and mountain transit connection.

Other transportation improvements include upgraded interchanges and access off Interstate Route to both the Platte Valley and downtown. Auto access into the development will be provided by a new or upgraded Mile High Spine Road and other regional and local access routes.

Mass transit will utilize primarily the extension of the 16th Street Mall shuttle service to the Platte Valley and provisions for future corridors connecting the various activity centers within the Valley and adjacent areas.

A combination of integrated and free-standing and underground garages will provide parking. The number of spaces will be determined by market demand and construction costs. Also an extensive pedestrian circulation network will be part of the open space network and integrate the various activity centers within the Valley and adjacent areas.

SUB-DISTRICTS

Design guidelines will be utilized to assure character both related to valued downtown urban form and to the new identity emerging in the Valley. With the intentions being to create distinctive neighborhoods within the Platte Valley.

VIADUCTS

Bond financing in 1982 has enabled infrastructure reconstruction. This in turn has made possible the transformation of negative imagery into a positive aesthetic of the Valley built from support elements. Additionally, viaduct reconstruction will speed direct access to the Valley floor.

RETENTION OF VIEWS

The city beautiful movement of the turn of the century, established precedents for the preservation of views. Valley development presents the opportunity to maintain a sense of spaciousness derived from existing views of the mountains and by opening up new views to the river. Height limitations as well as view corridors, viewplanes, framed, and axial views to be retained or extended will be identified for detailed urban design guidelines. Views both to the Platte Valley and back to the downtown will enhance the identity and drama of Denver. Also, panoramas from elevated points of freeways will be sought. And views to significant landmarks such as City and State Buildings, the renovated Tivoli Brewery, and views from the City Hall steps, will be preserved.

HISTORIC PRESERVATION

Designation of landmark structures for listing on the National Register of Historic Places and the establishment of special historic districts will be a by-product of Platte Valley development, particularly the adjacent Warehouse District. Use of the transfer of development rights technique will enable retention and enhancement of the Union Terminal.

DESIGN REVIEW AND DESIGN GUIDELINES

Given the scale of potential development, the City will establish a Design Review Process. This will evolve in conjunction with the ongoing public and private design development. Design guidelines will be the mechanism for implementing the Design Review Process.

At the urban pattern scale, design guidelines and reasonable development standards will shape the character of public rights-of-ways and of public lands abutting private property. Additionally, guidelines and standards will foster day and evening street activities by encouraging mixed uses, requesting transparency at grade, establishing a habitable microclimate, and providing street furniture amenities. Rights-of-way will be extended through parcels and large mixed use buildings.

Development heights will be sculpted to retain views and control the pedestrian scale/microclimate. Higher structures will be clustered at key locations so that a continuous "wall" or random siting of tall buildings will be prevented. A transition will occur between the 3,000-6,000 foot downtown buildings the 40-200 foot lower downtown and the 30-50 foot existing neighborhoods. Building towers will be 18-22 stories, midrise structures 10-12 stories, and lower structures 5-7 stories.

Standards for the bulk and scale of buildings will be derived from design precedents found within the warehouse district. The massing and materials of new facades also will relate to those of the warehouse district, particularly at Valley edges adjacent to the towers downtown. The continuous street line elevation--characteristic of the downtown grid and grain--will predominate while cornice setbacks at the 90-100 foot level will be used to maintain existing or

new views and to provide visual continuity from the pedestrian viewpoint. This is especially appropriate along Wazee Street and the lower downtown.

A program incorporating 1% of the cost for public art into the design of public and private projects will likely be explored in forthcoming planning phases.

POLITICAL/INSTITUTIONAL

It became evident during the Platte Valley Development Committee review process that the huge responsibility of implementing the development of the Platte Valley should be delegated to a separate agency. The committee's report suggests restructuring of the Denver Urban Renewal Authority, once an active force in the community, or creating a new community development agency. Its responsibility would be to negotiate with property owners/developers, manage the public sector capital improvements, and generally supervise the process.

The concept plan has been accepted by the Planning Commission with some modification and will be presented to the Mayor and Council with a recommendation to adopt the document as an amendment to the City's comprehensive plan. It is uncertain as to whether the Council will accept that recommendation or merely acknowledge the document as a guideline for the Valley.

A major commitment must be made in a public/private partnership for funding the infrastructure requirements to protect the economic viability of redeveloping the Valley. The City's general fund is not perceived to be the mechanism for developing that infrastructure whereas public revenue generated by private investment is. The timing of these improvements with private investment decisions will be critical to the City's and developer's ability to maximize the potential the Valley offers. The benefits of the redevelopment extend beyond the Valley and into the central core in terms of ingress and egress improvements which should allow for the application of other sources of capital.

Funding mechanisms under review are a tax increment on special district applications and a philosophy of protecting the general fund from any increase in annual operating costs as a result of the revitalization of the Platte Valley.

The challenge for implementation of the Central Platte Valley development plan will be to arrive at a resolution between the City and the developers to raise the level of specificity on issues of design review, mechanisms for residential requirements and, most importantly, the timing and funding of infrastructure improvements.

LESSONS LEARNED

The major lessons learned from the Denver experience include:

-The city needs to have access to resources (people, talent, money) to work with developers in a timely and efficient manner. (Staff or consultants)

-The amount of time, effort, and commitment that it takes to go through the process.

-The ability of the process to be open and flexible enough to respond to external as well as internal forces and change.

-The need for continuity in the facilitation of the process.

-The need for the City to develop project management capabilities and resources to deal with projects of this scale, scope, and complexity and to effectively negotiate their position.

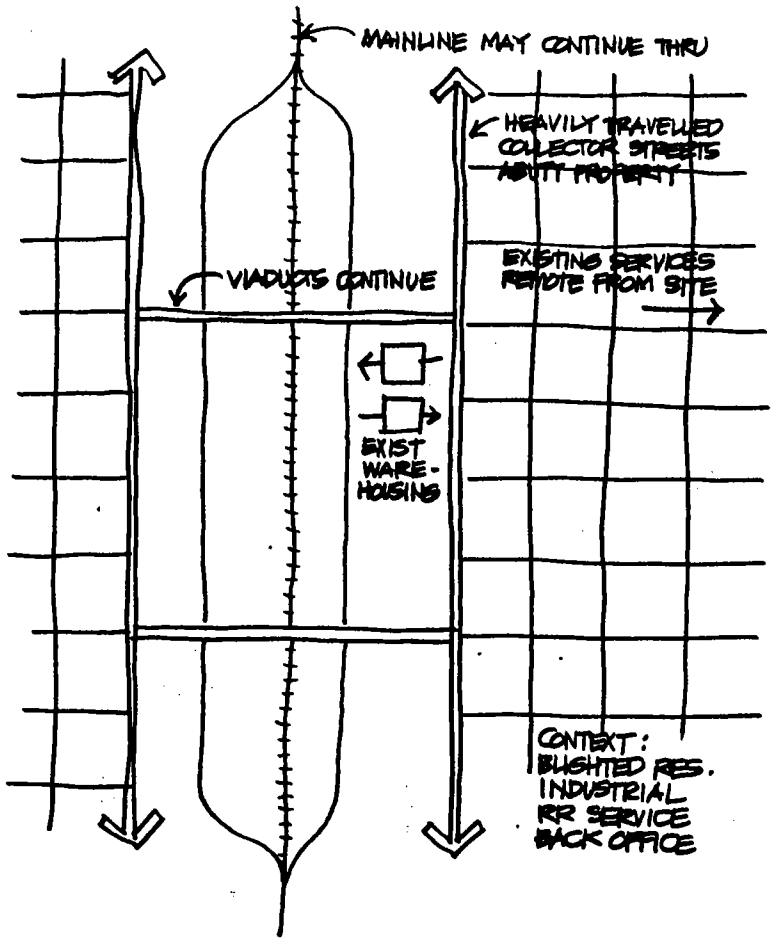
-The City must identify the overall City needs for the project in terms of its needs, goals, desires, direction, and bottom line.

-The timing of proposed public sector actions was not consistent with development schedules.

-The use of an agency for implementation of funding mechanisms and management will be required.

-The need for an interdisciplinary planning approach.

-The cooperation of developer interests is imperative in reconciling conflicts of agenda.



PROTOTYPICAL RAIL YARDS

LAND CHARACTERISTICS: FLAT, NEAR CBD, 20-200± ACRES, NO UTILITIES, NO ROADS, ON FILL AT WATER EDGE, BOUNDARIES DETERMINED BY RAILROAD GEOMETRICS.

2 FACTORS AFFECTING REUSE

LAND

HISTORY

Historically, American cities have grown around or adjacent to the railroad network that was vital to the economic stability of the area. Consequently, former "switching" or "marshalling" yards consuming significant acreage are located in close proximity or contiguous to central business districts. Consolidations and/or technical advances have alleviated the need for rail-related use of these expansive properties and, in many cases, the growth of the city is at their doorstep. Additionally, these "keystone sites" separate the growth from desired amenities or opportunities such as waterfront acreage or ingress/egress connections to the city core.

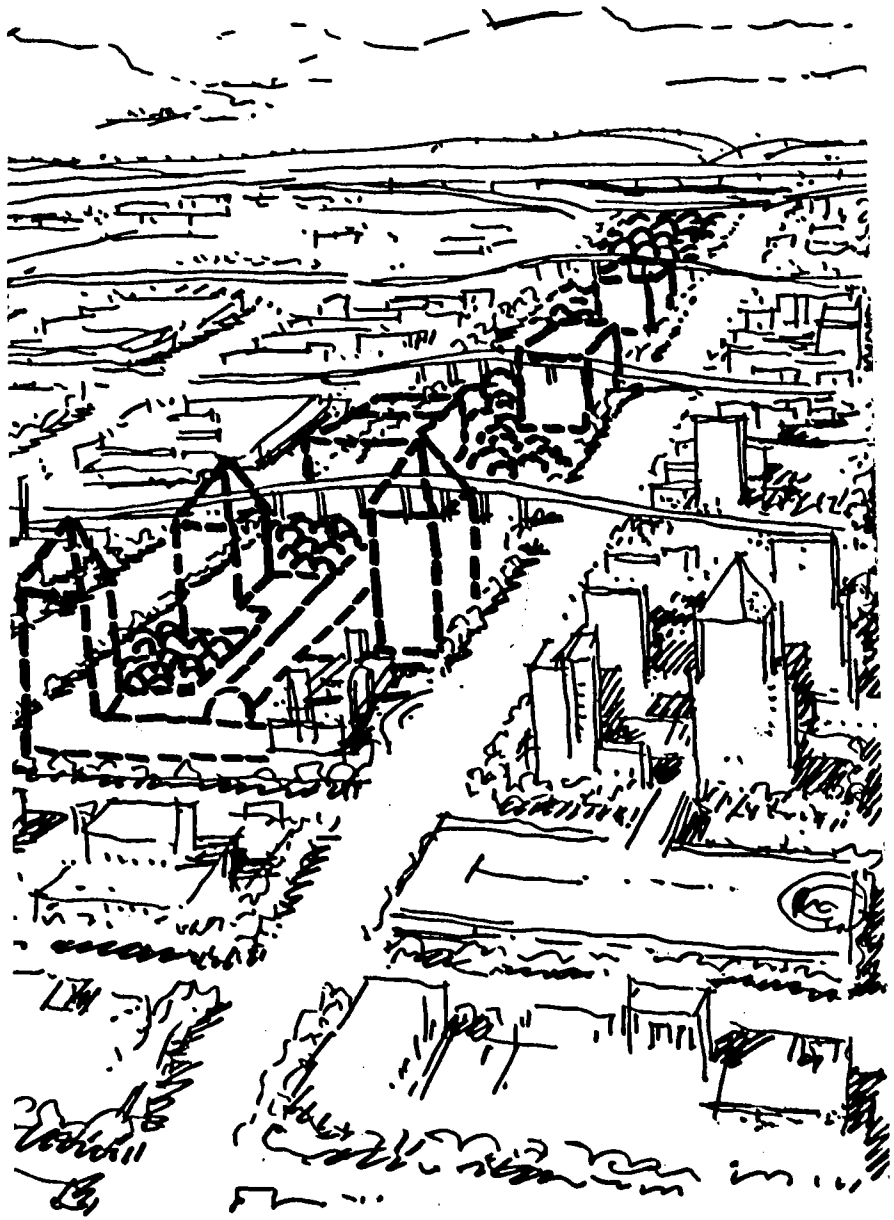
CURRENT CONDITIONS

The nature of past railroad use has left these large tracts virtually without any infrastructure, i.e. roads and utilities, a deficiency that renders them undevelopable in their present condition. Existing railroad-owned infrastructure is minimal under current use and will be totally inadequate if the property is redeveloped to any higher use.

While the extensive switching yards may be available, in many cases there will be a need for continuing the mainline operations through or adjacent to these parcels.

In most instances, each of these properties is under a single railroad ownership but--through the series of mergers, consolidations, and abandonments within the industry--the conveyance of fee title between companies may not have been complete. Complicating the task of resolving title issues is the past practice of railroads not recording the easements, permits, ordinances, and licenses encumbering the property. Extensive research of the railroad's own records may be required to fill this information void.

A current boundary survey would be necessary for the title review. Many such areas either have never been surveyed or the scope of previous survey assignments did not allow the extensive investigation of both public and private railroad records to form a basis of control.



ECONOMIC FACTORS

This opportunity has been brought about through the interaction of two distinct but interrelated factors--central city land economics and market conditions as well as technological innovations affecting the rail industry

The central city once functioned as the focus of both commercial and industrial activity. The advent of production line technology, however, changed the physical configuration of manufacturing plants from a vertical to a horizontal orientation. This required access to large tracts of cheap land which were available in the newly-developing suburbs. Spurred on by federal and state highway systems and FHA mortgage insurance, both residents and industrial jobs left the central city. At the same time, the function of the center city changed to a service-based economy. Land values increased, reflecting the development of higher density commercial uses.

Commercial and passenger rail facilities have historically served the center city. The commercial rail facilities have served the industrial base once concentrated in the center city or its fringe. As base industries have relocated to suburban areas, the need for rail facilities in the center city has diminished.

Technological innovations and structural industry changes have reduced the amount of land required by rail companies. The introduction of containers and trailers is gradually phasing out the use of boxcars which traditionally required large parcels of land for storage and maintenance. The industry has implemented other measures that have resulted in greater

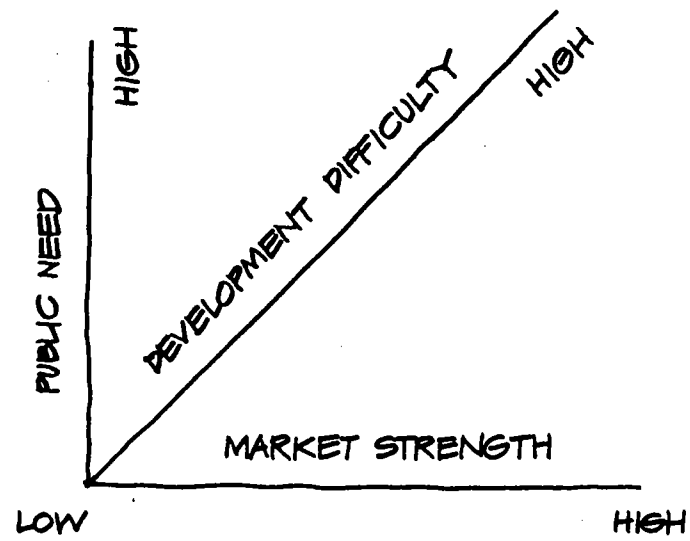
operational efficiencies using less land. Finally, competition within the transportation industry as a whole and a changing regulatory environment have given rise to mergers that have resulted in the discontinuance of certain unprofitable lines and facilities while creating opportunities for achieving greater economies of scale by consolidation.

RATIONALE FOR DEVELOPMENT

There may be many reasons for wanting to develop railroad properties and differing objectives for cities and owners. The initiative for development could come from either side, depending on the circumstances. To define the range of circumstances, three axes of a three-dimensional array may be considered:

MARKET STRENGTH: The development pressures may be great, expansion choices for downtown limited and the railroad land well-located. On the other hand, there may be little growth pressure or the downtown (or even the entire city) is not competitive and the railroad land is seen as a resource for economic development.

DEVELOPMENT DIFFICULTY: The site may be easy or difficult (i.e., costly) to prepare for development. Even if it is well-located, flat, and at the edge of existing development, as it often is, the infrastructure and development costs (in flood plain issues) may be high in relation to competing sites.



RATIONALE FOR DEVELOPMENT

PUBLIC	L	L	L	H	H	H
PRIVATE	L	L	H	H	H	L
PHYSICAL	L	H	H	H	L	L

PUBLIC NEEDS: A city's interest may be spurred by factors such as a need for economic development in general or a specific public or private opportunity that needs a large site and which could be lost to the city or region if the railroad site were not available. Also, a city may need housing, recreation or complementary facilities to support the existing downtown and adjacent neighborhoods or to provide expansion space or public amenities that would encourage and direct certain types of land use (residential) in a more desirable direction for downtown or to direct its growth in a desirable direction.

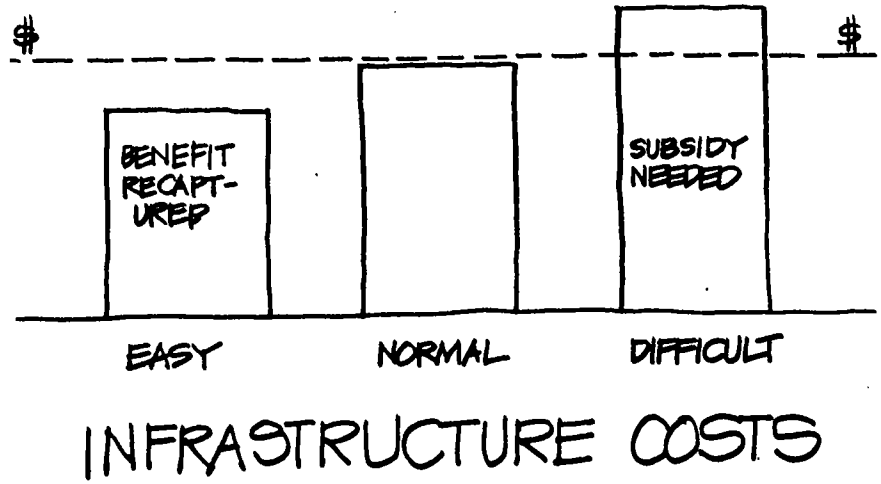
In cities where the public need is great, market pressures high, and costs low, it is likely that the railroad will have taken the initiative. Where market strength is low, the city will probably be the initiator with its degree of involvement depending on the difficulty of development. The point is that each situation is different and will require specialized approaches suited to the particular situation.

PROJECT FEASIBILITY

For development to occur on these lands, the project must ultimately be feasible--that is, it must make sense to all parties who are participating and contributing capital, whether financial or political, and the community in general. The city must achieve its objectives, particularly if it is subsidizing the project or making major concessions in its zoning or development regulations. The railroad, the property developer (if that is a different entity), and the ultimate tenants and owner must have a fair return and a competitively-priced project.

The infrastructure costs are a critical variable here. Most downtown development has evolved slowly over time with an efficient economic system that defined land values and set rents within an infrastructure system generally provided by the public. The lands in question are a very different animal and there is no such historical basis for valuation. But, the final product must compete in the market. In some cases, the infrastructure costs may be so high that public funding is required. Or, development concessions must be made to increase the the scale of the project so that overall costs can be more widely spread or unit costs reduced. In other cases, it may actually be cheaper to develop the sites in the traditional manner and the project can then afford to contribute toward the public objectives in exchange for necessary development approvals.

In any case, both the city and the railroad must know, understand, and appreciate each other's objectives and not have unrealistic expectations or demands.



CHARACTERISTICS OF LARGE-SCALE DEVELOPMENT

Planning for development of large tracts (25-200 plus acres) adjacent to a central business district has much more in common with large tract development elsewhere than with other downtown development. Yet, because of its location, the development is likely to be more urban (i.e., high density, more mixed uses, and less homogenous) than large tracts elsewhere. Some key differences between such large-scale developments and a typical downtown project (say, one-half block) are summarized in the following table:

RAILROAD-OWNED LARGE TRACT	TRADITIONAL ONE-HALF BLOCK
Ownership:	
Long-Term Owner	More Recent Purchaser
Long-Term Commitment	Shorter Term Involvement
Can Build Values Over Time	Return Limited to Current Project
Infrastructure:	
Not Generally Available	Available to Lot Line
New Access/Circulation System Needed	Fits Into Existing System
New System/Thresholds	Marginal Impact
Uses:	
Wide Range, Mix	Single--Limited Mix
Timing:	
5 to 20 Year Plan	Immediate Development
Future Uncertain	Fixed Now
Accommodation of Public Needs:	
Wide Range Possible	Limited Room
Image & Development Concept:	
Evolving Over Time	Static--must fit in with existing pattern of development.

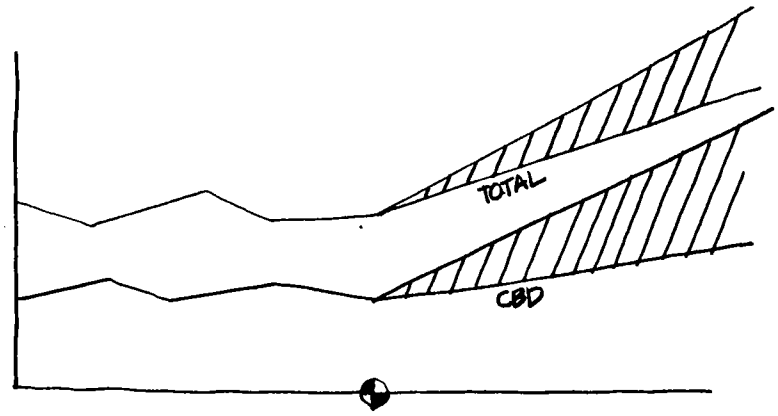
OTHER KEY ISSUES

Because of the quite different characteristics of railroad land (or other large tracts) relative to traditional downtown development sites, they offer both unique advantages and disadvantages. Also special ways of dealing with proposed developments are required. What is appropriate in any community will vary with its own circumstances, but these similar issues should be carefully examined.

DOWNTOWN COMPETITION: Many communities have great investments in their downtown areas. Development of railroad lands can be complementary, competitive, or indifferent to the downtown economy. The mix, density and character will determine which.

ALTERNATIVE SITES: What if the sites were not developed? Would the development be likely to go instead another site within the city or to another jurisdiction? The answers may affect the justification for public involvement in the process. The local tax structure may also affect the rationale.

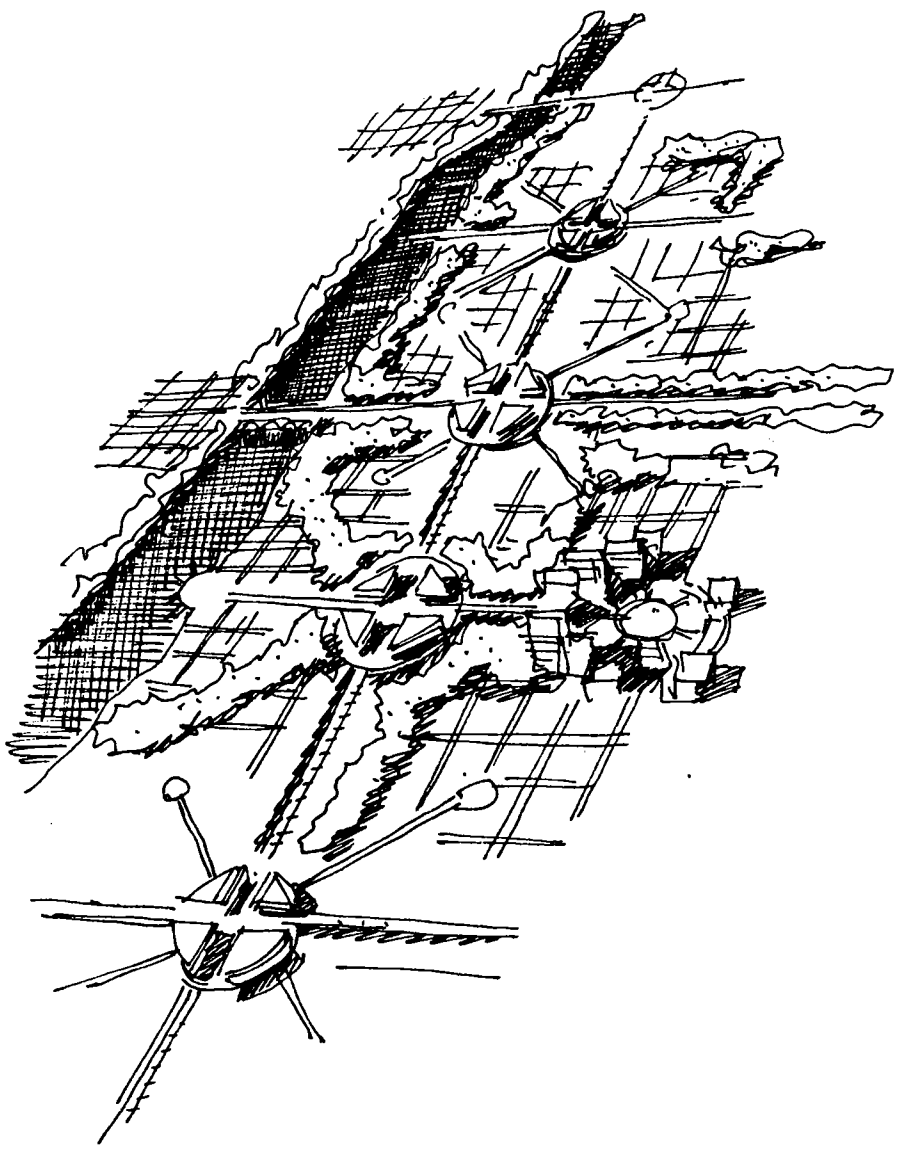
ECONOMIC DEVELOPMENT: Will development at the site bring new economic opportunities to the community to create its own character, image, and pattern of development?



ADDITIONAL DEVELOPMENT DUE TO RR. DEVELOPMENT

PUBLIC RESOURCES: Does the city have available -- and can it afford -- supporting actions necessary to bring about development of the railroad land or to maximize its beneficial impact? Such actions might include:

-Creative financing
-Tax increment financing
-Flexible development regulations
-Speedy and firm commitment for public actions
-Equitable tax policies
-Effective citizen involvement
-Key public amenities
-Supplemental loans, grants, guarantees
-Continuity of public actions and priorities (through potentially different administrations)



URBAN DESIGN

Urban design is an architectural language which describes planning concepts and recommendations in three dimensions. Its purpose is to show how the components of the city-- buildings, heights, uses, traffic, parking, open spaces and landscaping, etc.--can be woven together in such a way as to meet the economic goals and the legislative priorities of the city. Also, The Urban Design process can carry planning recommendtions to the threshold of detailed design and implementation.

In every urban design situation there is the past and the future -- the past offering its inheritance of location, physical infrastructure, and buildings and the future reflecting our hopes, policies, and investment intentions.

Our cities today are perforated into open lots and obsolete buildings awaiting redevelopment. These are the elements of the city's perpetual rebirth. But, there are few opportunities in our cities as large as our inheritance of underused railroad lands. These provide unprecedented opportunities to develop new and complex urban design recommendations, reflecting the goals of our urban futures.

In developing these designs for underused railroad lands, we inherit sites which, because of their past usage, usually have no infrastructure of roads, sewers, or utilities. This enables us a unique freedom. It also challenges us to tie the sites, and the new developments they will carry, meaningfully into the existing frameworks of adjacent city sectors. This challenge to develop a unifying design framework for the new keystone areas will perpetually remind us that, in forging our new designs, we have to capitalize not only on feasibility but on the best aspirations of our citizens, investors, elected officials, and government agencies.

Railroad lands, from Grand Central Terminal in Manhattan to the massive yards of Chicago and the mainlines of numerous small towns, were the form-giving elements of 19th- and 20th-century communities. Frequently following natural corridors of original settlement, they are now part of a regional pattern of movement systems and the distribution of people and economic activities.

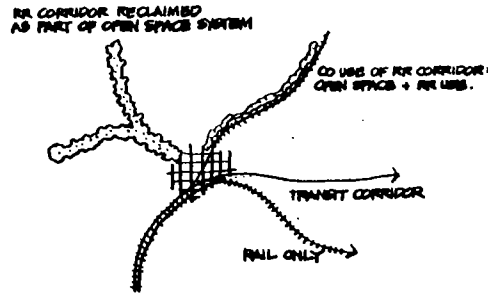
Now as changes occur in technology, transportation and production, the utilization of these corridors is diminishing. Communities are well advised to examine the re-use of these rail corridors as corridors--for busways, mass transit, bikeways or linear open spaces as systems or segments of connecting linkages. The width of these corridors varies and presents a variety of opportunities. The choice of uses for a corridor may influence the evolving form of the community and the metropolitan area.

The rail corridor could continue to represent a barrier, and the barrier condition can be worsened if the corridor is used for multi-laned highway purposes. If, however, the corridor is used for a two-laned parkway, busway or transit way, the barrier effect might be reduced and new activity centers--or common areas of community use to stitch areas and neighborhoods back together or provide access to natural amenities or uses previously cut off--introduced at access points. When rail corridors are used for recreational purposes, barrier effects may be reduced even further, and neighborhoods may be enhanced at the micro-level. Recreational use of these corridors may provide the only opportunity within a community or region to substantially change and improve the recreation opportunities available through public park systems and provide new linkages with the core area. This potential has been realized in numerous rural areas and urban areas alike where railroads, with their trestles and tunnels, now accommodate bikers and hikers.

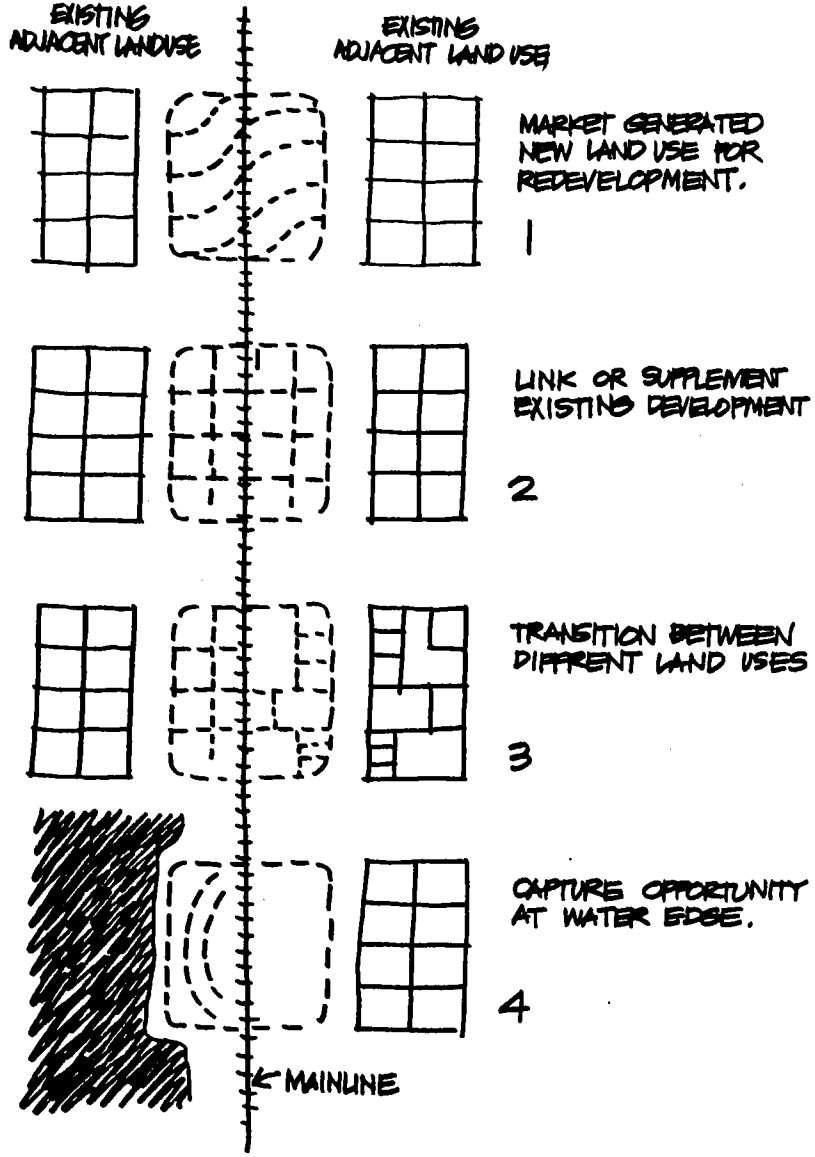
Changes in urban form may be most dramatic when railroads are located adjacent to natural amenities such as water and mountains. It is in these areas that the choice is most profound, and the barrier effect can be reinforced rather than ameliorated. In other situations when mainline railroads are consolidated, realigned, or removed, opportunities exist to gain access to these natural amenities by combining them with other transportation corridors on highways, or by adjusting their alignment either vertically or horizontally.

When communities are not prepared to choose among future uses, corridors should still be retained. Once a corridor is allowed to be partially used, sold or otherwise dismantled, it is usually too expensive to reassemble.

Finally, these options do not necessarily require abandonment of rail uses. It may be possible to introduce new uses such as busways, light rail transit, or bikeways into the active rail corridor. When a busway or transit project can also finance the relocation and reconstruction of new, welded rail along one side of the corridor, the railroad gains while providing the opportunity for a new public resource.



RR CORRIDORS AS URBAN STRUCTURING ELEMENTS WITH OR WITHOUT RR USE



CONCEPTUAL OPTIONS FOR REDEVELOPMENT OF YARDS.

LARGE PARCELS AND REGIONAL IMPACT

Large parcels adjacent to or within a central business district present special opportunities for large scale urban infill development at a regional scale which can influence the urban form of the city and metropolitan area. They can create their own market image and have an impact which is unequaled in modern times. This opportunity can be viewed either as competitive to the downtown (in scale and use) or as complementary and reinforcing. These opportunities take on two basic approaches:

-Creation of a separate, but linked, regional/urban activity center that takes on a special character-image and sense of place that is complimentary to the existing urban core.

-Growth of the existing central business district by extending the infrastructure of the downtown and built up adjacent areas into available vacant lands.

Due to the large scale of the project, it allows for a more flexible development strategy, a greater mixture of land uses and activities, and an opportunity of fulfilling various city-wide needs--such as close-in downtown housing and large scale openspace, as well as assuring the economic vitality of the project.

Because the location of the land is likely to serve as a gateway location to the center city, its presence can have considerable influence on the quality of surrounding development, as well as enriching the image of the area and the downtown.

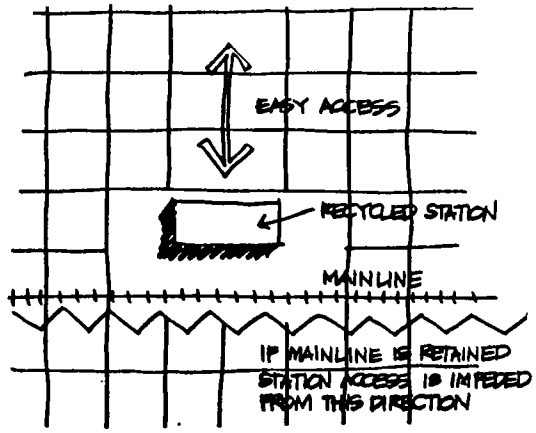
SITE DEVELOPMENT OPPORTUNITIES

Due to size and lack of existing infrastructure, large parcels can be developed in a much more flexible manner, without most of the constraints and development pressures found in a typical urban single land parcel. Also, the project can be phased according to market needs and can develop interim uses that ultimately allow redensification to the desired market potentials.

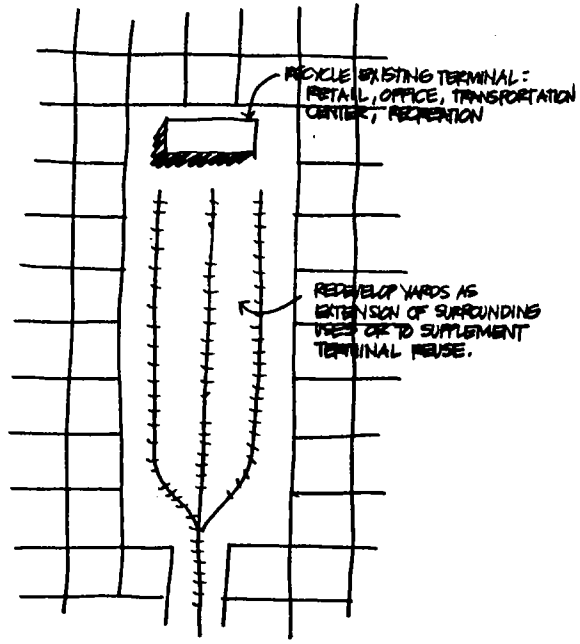
Densities of commercial land use on the project site can be manipulated in a way to provide housing opportunities--important in serving city needs as well as providing a means of transition between office districts and surrounding residential neighborhoods--and energy efficiencies in transportation, heating, and cooling.

COMPATABILITY OF URBAN FORM

Issues of compatability of urban form and character, patterns of development, and uses and activities within adjacent areas are key elements to be considered. These large land parcels are typically surrounded by existing patterns of development which have established certain relationships of views, access, and physical form with their natural surroundings. The issues of physical form relative to acceptance by adjacent development interests and affected neighborhoods has been a central issue in the political and community acceptance of proposals for these large parcels of land.



RECYCLING STATIONS



RECYCLING TERMINALS

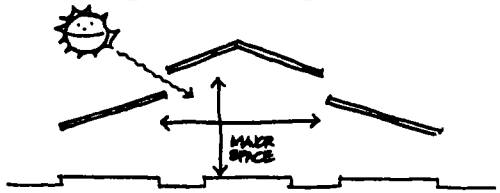
DEVELOPMENT OPPORTUNITIES

A variety of development opportunities exist with the reuse of railroad lands and their corridors. These include but are not limited to:

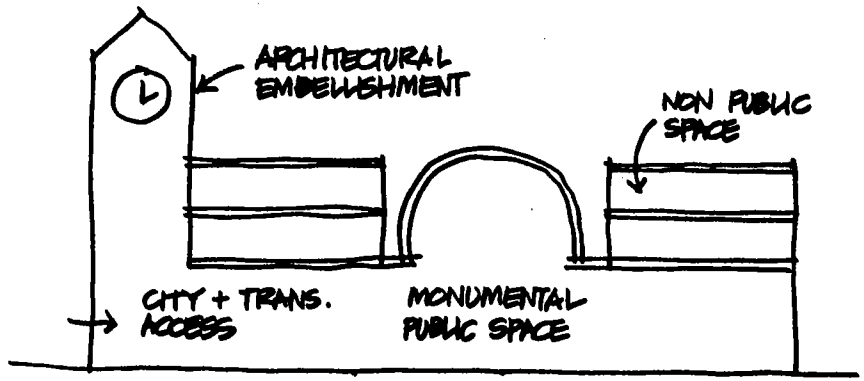
- -Preservation and reuse of historic railroad and ancillary use buildings (i.e., terminals, stations, warehouses, maintenance facilities, roundhouses, etc.).
- -New development opportunities of a variety of scales and mix of uses which are compatible in urban form, pattern, and use.
- -Air rights development over new or existing railroad corridors which integrate the railroad or transit functions within the project and provide for connection opportunities within the development and open space uses over the corridor.

QUALITY OF DEVELOPMENT

With the size and scale of the proposed development, there is an opportunity to set the qualitative standards and guidelines from the start that would influence the overall quality, character, and image of the total project, its key components, and the individual elements in both the public and private sectors.



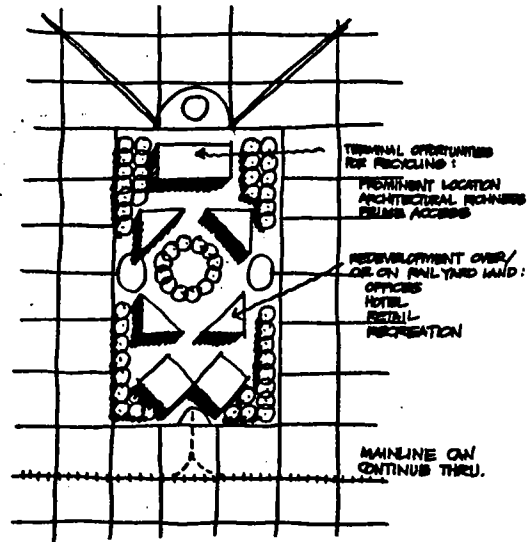
RAILROAD BUILDINGS



STATIONS/ TERMINALS

COMMON FACTORS: BUILT 1915-1940±; LANDMARK BUILDINGS; URBAN DESIGN CENTERPIECE; PROMINENT LOCATION + ACCESS

POTENTIALS: TRANSPORTATION CENTER, RESTAURANT, RETAIL, OFFICE, MIXED, OTHER.



URBAN DESIGN POTENTIAL OF RECYCLED URBAN TERMINALS

NEW PUBLIC INFRASTRUCTURE

Due to the lack of adequate existing infrastructure within and leading to new redevelopment opportunities, there suddenly exists the opportunity to create a new system and aesthetic of public infrastructure--one whose form, location, and function can be determined by either a new urban form or one that evolves from the extension of existing street patterns or grids. The potential to remove antiquated, outdated models, bridges, and infrastructure elements can lead to new building forms by considering new levels of service and delivery of goods, energy, utility, and transit systems.

CONNECTIONS

Within the elimination or the minimization of the railroad as a barrier, the opportunity exists to create physical and visual connections and access to existing and new natural amenities (i.e., waterways, views, and previously unaccessable areas) and to expand the size, use, and activities along existing open space corridors and connections. Also, the chance exists to re-use abandoned portions of consolidated railroads rights-of-way for transit and open space connections to regional amenities and adjacent areas forming a network or a framework of connections. It can also develop new cross-connection opportunities over or under existing highways, rail, or transit corridors.

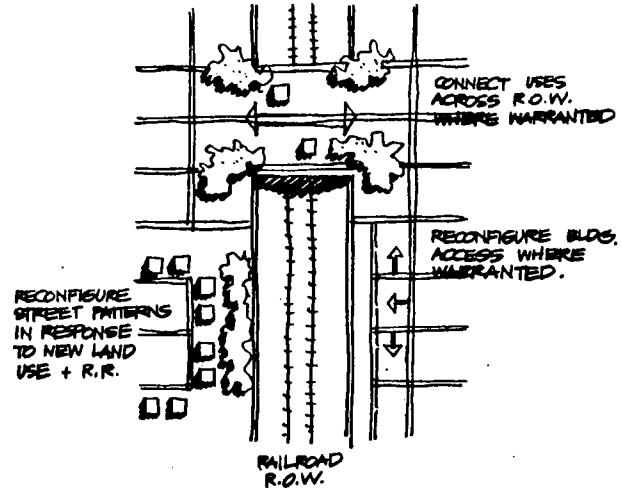
EDGES AND SEAMS

With the development and re-use of large parcels of railroad land within and adjacent to the existing corridors, new edge conditions and opportunities arise between adjacent areas and land uses. These edge conditions can be used as buffers or seams between areas to allow for finishing off adjacent patterns of development or to provide for separations and clear definition of the image and character between adjacent areas.

They can also provide opportunities for connections and bridges between adjacent areas at key intersections with either open space, appropriate common or joint uses and activities, or structures.

PEDESTRIAN ZONES/PLACES

The opportunity exists to create, plan, and provide for--at the outset--a pedestrian oriented environment and network that can offer a continuity, and variety of pedestrian oriented spaces, places, and connections. They could eliminate pedestrian-vehicular conflicts and provide an organizing structure that relates and ties old and new development opportunities together with the natural features of place, environment, and use.



R.O.W. POTENTIAL MODIFICATIONS

GATEWAYS

Due to the historic nature of the location of railroad properties on the "backside edge" of downtown areas, such properties provide opportunities for the establishment of new gateways and entrances to the downtown, new development parcels, and adjacent areas that before were unaccessible physically or visually. They can establish points of orientation, and access, introduce a new character and image, and serve as a point of transition from one area or district to another.

ANCILLARY RAILROAD LANDS

Railroad lines, sidings, and yards frequently were developed to satisfy the specifc needs of adjacent users. Whether these users were warehouses or manufacturers, the decline in fortunes of the railroads and their users mirrors the early period of growth. Thus, the availability of railroad land is accompanied by the availability of ancillary buildings or land. A fundamental difference exists, however, since structures such as warehouses have adaptive reuse possibilities while industrial artifacts such as steel mills do not.

In the first case, the railroad track areas allow for infrastructure changes and infill development to support the transformation of an area with adaptive reuse of the railroad's warehousing, transfer and produce buildings. In the second case, the railroad track areas may not have any development potential unless the industrial behemoths can be removed, usually at great expense. Removal and re-use of these railroad and industrial properties represents a profound change in urban form and image, including the community's shared image of itself. Improperly handled, this change can represent a period of decline. Properly handled, it represents rebirth.

URBAN DESIGN TOOLS

Large-scale development enables the use of more flexible development controls which, in turn, facilitate more creative urban design. Special use districts, planned unit developments and (in California) specific plans, and (in Florida) developments of regional impact, can be used to provide for:

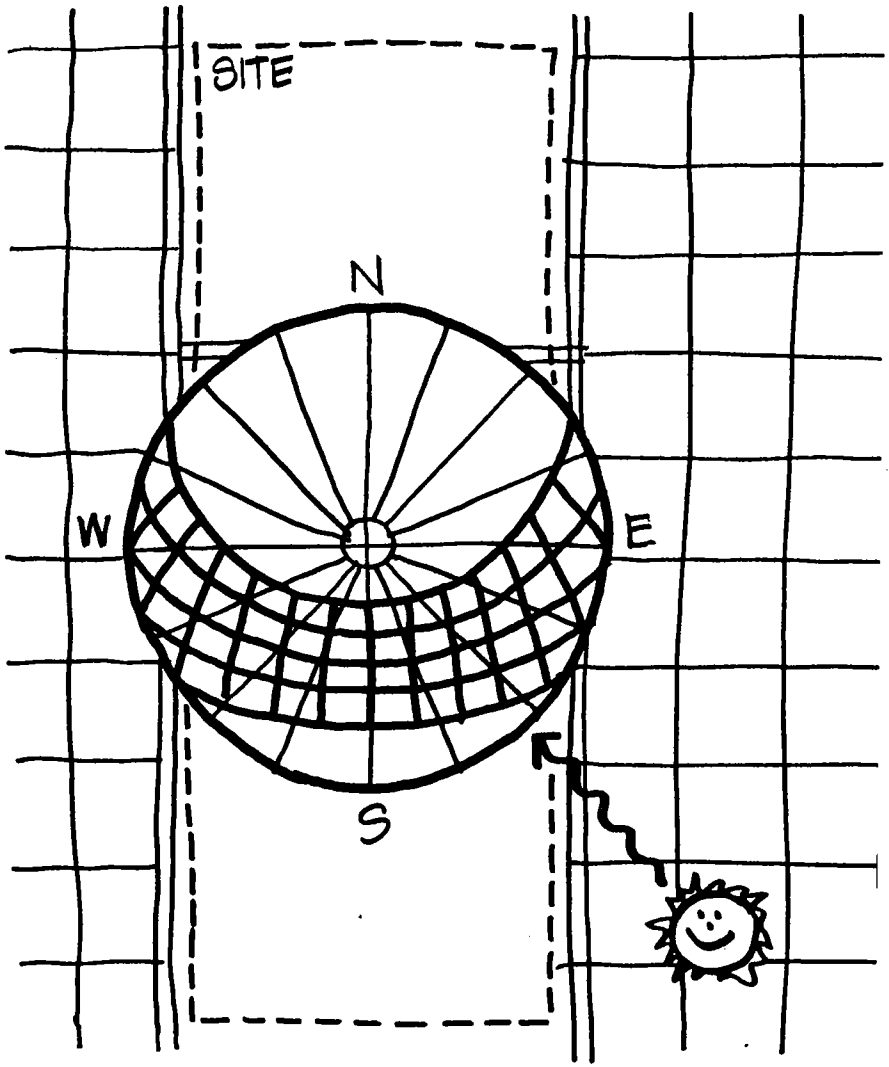
-A mix of uses specified for the whole project area, not small individual parcels.

-A concentration of diversity to achieve larger, more useful openspaces and more interesting built forms.

-A staging of infrastructure and development to relate to area absorption rates and competing projects.

In some jurisdictions (e.g., California), development agreements can be employed to protect both government and the developer by providing certainty that subsequent phases of the project will be carried out. They can lock in the development program and freeze the zoning, thereby justifying major front-end infrastructure investment by the developer. This investment can then create a "quality environment" in which "quality development" can take place over an extended period of time.

The American Law Institute's Model Land Development Code provides a vehicle for the creation of specially planned districts, in which a designated Land Development Agency can provide a zoning mechanism for large scale, planned developments which require major new infrastructure investments for development and which can be realized only over a long time horizon. (Pittsburgh recently adopted a variant of this process for implemening its larger projects which frequently involve recycling railroad land.)



ENERGY

The development of unused or underused railroad land offers unique opportunities for executing energy-conscious design and urban planning. Because of the scale of development, it is possible to control not only end-use conditions (how buildings use energy) but also how that energy is supported and to seek an optimization between supply, delivery, and end-use systems. Further, it is possible to control external conditions which impact on how a building consumes energy. These external conditions include solar access and micro-climate.

In addition, non-building considerations such as transportation access waste disposal and material handling may be manipulated to reduce overall energy resource consumption.

These energy use reductions will result from the optimization of individual systems but, more importantly, from the combined effects of the interaction of multiple systems selected and designed based on their abilities to function integrally with each other. It is this ability to coordinate systems and subsystems--internal and external to individual buildings--that offers unique energy conserving possibilities.

The opportunities for energy-conscious design fall into two general categories. First are those considerations that would apply to any large-scale development, and second are those that result from the particularities of former railroad land.

The first energy considerations, those which deal with any large development, generally pertain to opportunities to use systems that require some minimum size for viability. Related to this is the possibility of establishing special building standards regarding energy performance and end-use demand characteristics.

The second group of energy factors are those which take advantage of the unique nature of former railroad properties. These characteristics include:

- -generally open land adjacent to or within central business districts
- -little or no existing infrastructure; and
- -part of regional corridor.

RESPECT PRESENT USES

PEOPLE

ROLE

Citizens can perform a valuable and legitimate service by articulating one pole of development issues and concerns, the developer formulating the other, and the city moderating toward a balanced and compatible design. Without informed and active citizens, a development can be shaped exclusively by developer interest, market forces, and political expediency. If such a development is not sufficiently responsive to peoples' perceived needs, the development can collapse when it encounters public opposition instead of needed consent--in general, this consent will consist of public support in financing, legislative referenda, or actual marketing.

INTERESTS

ON-SITE: Residents, businesses, property owners, and other users of the site are interested and want to be comfortable with its future development. They can provide valuable information about the virtues of the site that should be recognized in its development.

NEIGHBORS: Neighboring residents, business, industries, and others are concerned with the development's impact on their land values, traffic, parking and other environmental impacts. They are also concerned with other infrastructure elements, views and other amenities, and the continued economic and social health of their own areas. They can provide valuable information as to needs and ways to integrate the development into its surroundings.

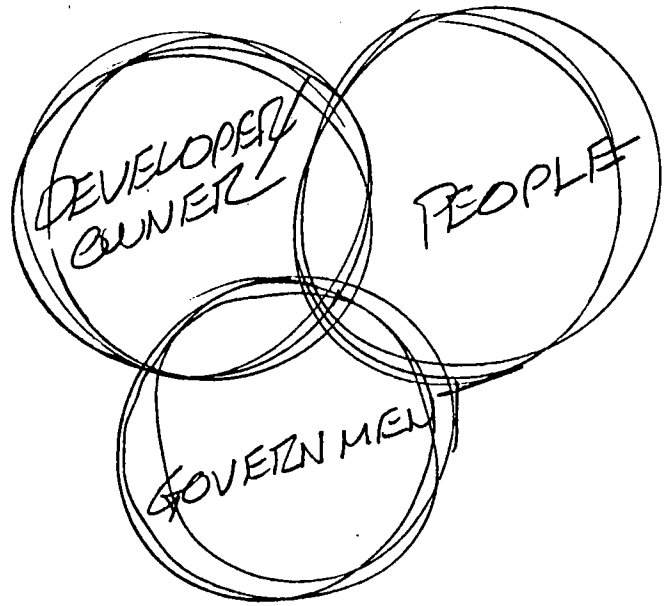
CITY WIDE: Residents, businesses, and industries city wide are concerned with the development's impact on the form and fabric of the city's economic viability, on its infrastructure, on its satisfaction or exacerbation of the city's needs for housing, jobs, open space, industry and commerce. They can provide valuable information as to the general political viability of development proposals.

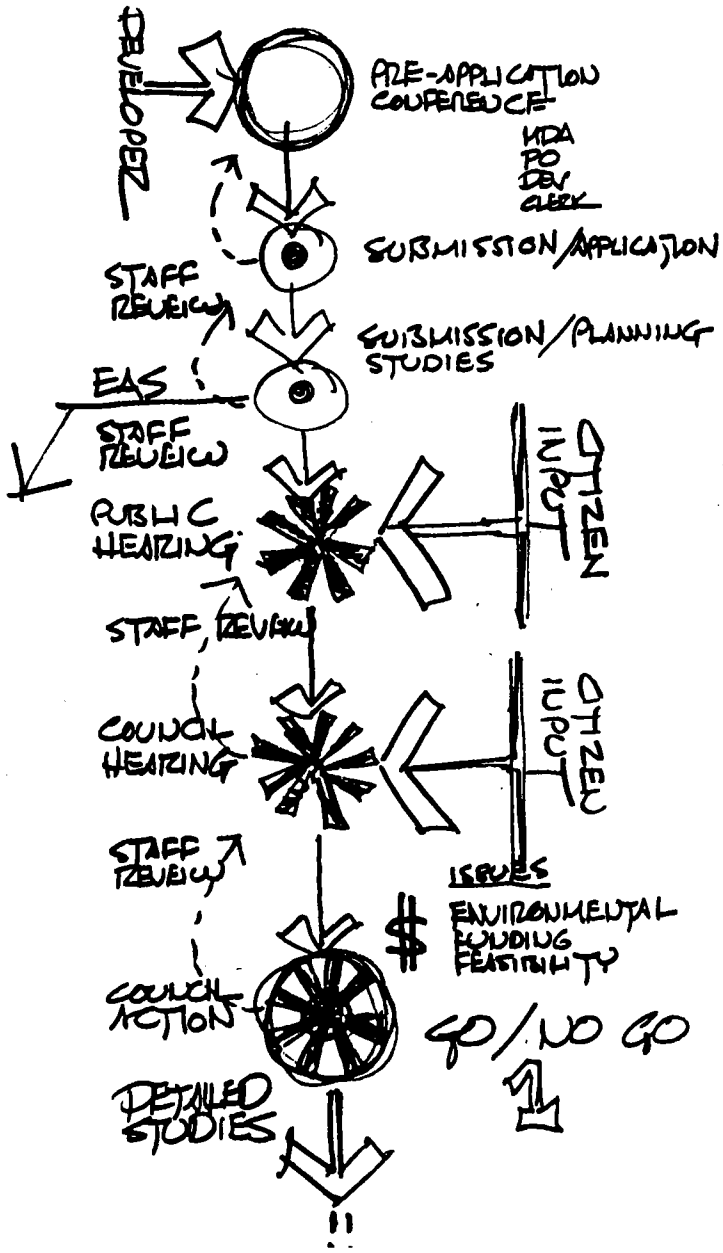
SPECIAL INTEREST GROUPS: Groups who are not directly impacted by the development may, nonetheless, be interested in special potentialities offered by the site such as its natural resources open space potential, or added environmental impacts of noise and air pollution.

TOOLS AND STRATEGIES

The citizens' chief tool in gaining a substantial voice in the development dialog is their power to delay the project through legal or political means. This is a powerful tool for developments of the scale of this study. Delays can cause a developer or project to fail. Citizens should therefore understand that their power is a two-edged sword--negative and positive. Used constructively by developers and by the city, citizens can form a resource pool of pride, wisdom and creative input that can contribute to the formal and market success of the project and can ease the approval process.

Citizens should be advised that the other two parties--the developer and local government--are very interested in the predictability of the process. The way for citizens to acquire and keep a place in the development dialog is to have clear goals that are limited to the developer/government's ability to grant, and to cooperate with those other parties in formulating and expediting the process in direct proportion to the degree to which those goals are achieved or agreed to. If citizens' goals are achievable within a development that could be sponsored by the owner--and that could be permitted by the government--then the ideal place for citizens is at the initial design/negotiating table. To achieve such a place requires citizens to exhibit consistency, responsibility, clear goals, good faith, and a clear and authentic structure for citizen participation. The likely alternative to this approach is failure or replanning of a project because citizen interests were ignored.





PUBLIC DIRECTION/POLICIES

Since the scale of these projects can have such a profound impact on the city, it is imperative that government has a very clear sense of what it wants out of the project. The greater the specificity at the outset, the greater is the assurance that the city will get what it wants and that the project will proceed without misunderstandings and disagreements in the future. At the same time, it should be recognized that all details of a large scale project cannot or should not be worked out in advance and that some flexibility is required on both sides to allow for changing circumstances. Therefore, mechanisms should be developed and agreed to whereby matters can be made more specific over time, with the appropriate governmental agency retaining the right of review and approval over these specifics. For example, the initial agreement should cover such basics as general distribution of land uses and form controls--height, bulk and general design guidelines--and should define, as precisely as possible, the scope of future review over what issues and what the procedure for review should be.

PUBLIC CAPABILITIES/TOOLS

Much of the local government experience with federally supported redevelopment is applicable to the development of large railroad lands through a public-private partnership but, with one major difference. Rather than a public agency acquiring title to the property and disposing of it subject to controls, controls must be imposed through exercise of the police power. Zoning tools, such as special use districts and planned unit developments and, in some jurisdictions, development agreements can be designed to contain the kind of controls generally found in redevelopment plans and land disposition agreements.

Depending on the administrative capabilities of the particular jurisdiction, it may be appropriate to call on the staff expertise of the redevelopment agency to administer these zoning controls.

CITY NEEDS

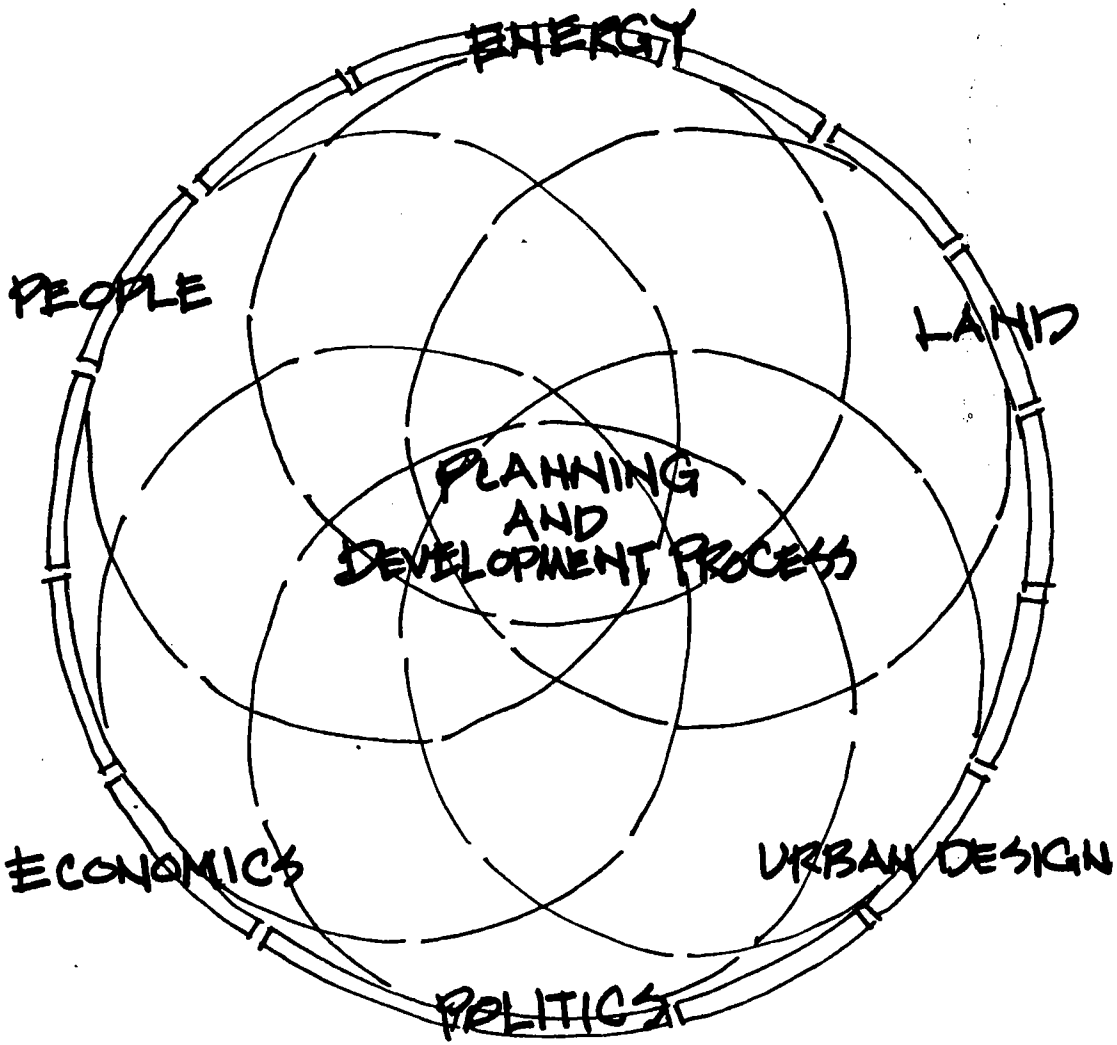
Since they are often large enough that dramatic changes in land use can be achieved without displacement and relocation, vacated railroad properties afford the opportunity to meet city wide needs that are difficult to meet on an infill basis within the existing development fabric. For example, in a developed city it is difficult to add major increments of housing within established neighborhoods whereas it is possible to create whole new residential neighborhoods on large vacated railroad properties. Similarly, the parcel may be large enough and isolated enough to support stadiums or locally undesirable land uses such as refuse disposal facilities, which could not be located elsewhere in the city.

INSTITUTIONAL NEEDS/CAPABILITIES

The approach to land development will be colored by the financial needs and objectives of the railroad. If the financial objective is to enhance the book value of the land asset, the railroad may wish to establish a high density commercial development program that will maximize land value without regard to the marketing period. On the other hand, if the objective is to maximize cash flow, the railroad may opt for a less intensive mixed use project to speed up project build out and payback on investment. Often the land will have been owned for a long time and therefore its carrying constructs will be low, allowing the railroad to take a longer term view of the project. However, the need for major front end and infrastructure investment may eliminate this advantage.

The approach to land development may also be colored by the organizational capabilities of the railroad. In some cases, the railroad will have a development arm that wishes to become the long-term developer. In other cases, it may not and may choose not to add that capability. Here the object may be to get the development potential of the land established and approved in order to market the land at a higher value to entities that would undertake development.

INTEGRATION OF FACTORS



INTEGRATION OF FACTORS

All of the elements discussed offer a unique opportunity in planning the optimum use of the unique resource presented by large-scale railroad lands adjacent to downtown areas. To summarize these issues:

LAND

-Size and shape usually usable
-Topography generally flat
-Few physical constraints
-Title often difficult to clear
-Location near existing city resources

ECONOMICS

-Infrastructure costs high
-Massive undertaking by railroads and city
-Realistic and feasible project needed
-Innovative financing and public/private cooperation needed
-Project can build values over time
-Interim land uses and staged density inverses possible

URBAN DESIGN

-Unique opportunity to improve city's image and eliminate blighted and underutilized land
-Often at water's edge and near city resources and amenities
-Large enough to create internal image and sense of place
-Must caution to stay in city vernacular
-Opportunities for city open space and regional connections

ENERGY

-Efficiencies of scale and patterns of development
-Control for solar access orientation
-Landscaping for microclimatic improvement
-Design for pedestrian environment
-Support and extend mass transit opportunities
-Cogeneration, energy cascading, and infrastructure efficiencies
-Daylighting and buffering commercial buildings

PEOPLE

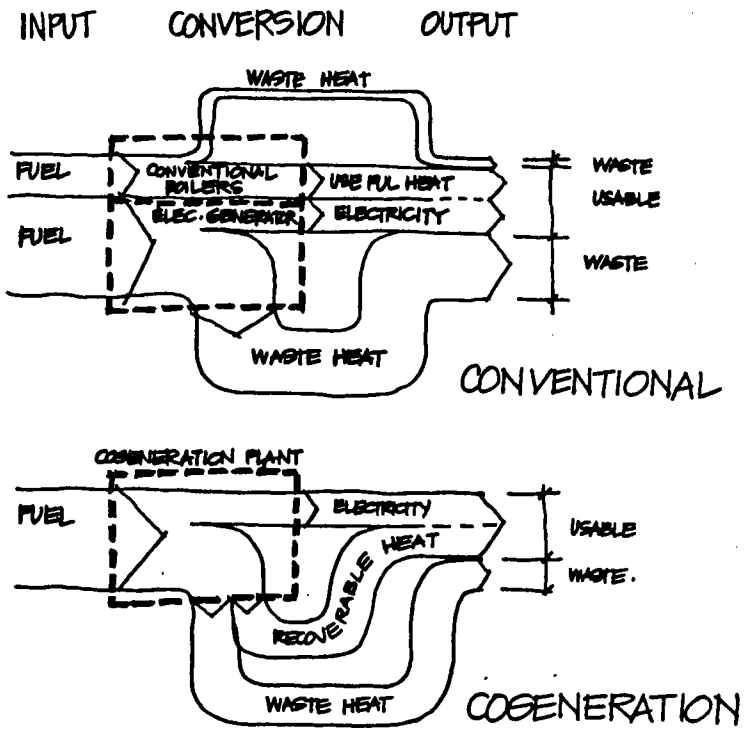
-Need to respond to citizens' interests on site, in adjacent neighborhoods, and city wide.

-Need to communicate with citizens as individuals and as special interest groups.

-Need to respect ability of citizen groups to assist or deter development.

POLITICAL/INSTITUTIONAL

-Need for clarity of city objectives
-Unique opportunity to meet citywide needs--e.g., housing, public facilities, or open space
-Need for development controls that are both specific and flexible
-Need for staff capability to manage project control and delivery in a timely manner



3 ENERGY OPPORTUNITIES

The energy required for building operation and construction represents well over one-third of all energy consumed in the U.S. annually. Slightly less than thirty percent of national energy use goes into building operation (heating, cooling, lighting, etc.). Another five percent of national energy use is committed to building construction. This includes energy required to produce the building materials as well as the energy used on the construction site itself.

In addition, building development and urban planning have a significant impact on a number of non-building construction sectors including electric and gas utilities, roads and highways, water and sewer facilities, and local transportation systems. The construction in these categories adds another three percent of total national energy consumption to that controlled or influenced by architectural and urban planning decisions.

Finally, transportation, which is significantly affected by planning decisions, consumes another twenty-five percent of the energy used in the US

While it is clear that not all of this energy use can be manipulated by architectural and planning decisions, it is equally apparent that any large scale development will have a sizable impact on energy use and that informed decisions can significantly reduce energy use for these developments.

A discussion of specific opportunities for energy-conscious design follows. However, several overriding factors must be borne in mind. First, to most parties involved in a major development program, energy considerations are likely to have a very low priority. Given the vast array of issues that require resolution, there

is a strong tendency to regard any divergence from usual practices as distractions from the major goal of realizing the project.

Second, energy issues tend to be highly site and project specific. The options that are discussed here are intended to raise issues and suggest factor involved in their evaluation and should not be taken as definitive.

Third, based on current technologies and economics, some of the options are likely to prove viable today. Others, because of either technical or economic factors, are theoretically valid but not generally realizable at this time. In these cases, consideration should be given to what must be done during the planning process to avoid precluding these options if and when they become available.

Fourth, and related, given that development is most often staged rather than completed in a single phase, some of the options which require a "critical mass" to achieve viability must wait until a project is well along. The issue of how to accommodate these opportunities during the early phases of a project until this critical mass has been reached will bear serious consideration.

With all of the above in mind, it is also necessary to stress that although energy issues may be perceived as low priority items by the parties involved in a major development project, they have the possibility of incrementally enhancing a project, perhaps contributing to the ultimate success of the effort. Further, the societal benefits of reduction of energy use can frequently be achieved in ways which are, at the same time, beneficial to all interested parties (lower cost, greater access to view, reduced environmental impact, etc.) However, this will only occur through active efforts to this end.

END USE ENERGY CONSIDERATIONS AND CASCADING

The first step in introducing energy-consciousness into the design or planning process is to clarify the uses to which the energy will be put and to ascertain which of these uses are essential and constructive and which are included merely out of habit. These uses may include building, heating and cooling and lighting. They may also include process uses and motor-driven systems such as elevators, fans, pumps, and so forth.

DEFINE ENERGY FORM/BY-PRODUCTS

Once these end uses have been established, it then is necessary to define the form of energy required to meet these demands and the kinds of energy resources that can achieve these forms. For example, light (form) can be supplied by daylight, electricity, and, in some cases, gas flame, candles, etc. (kinds of energy resources).

It is also necessary to identify the by-products or "waste" associated with the supplying of these various energy forms. For example, when light is delivered to a space, heat is an inevitable result. This heat may be a positive or negative factor in the building operation. Similarly, when steam is provided at a laundry, waste hot water, at a temperature too low to be used in the laundry, will usually be dumped into the sewer system. And yet this water contains heat energy which could be used for any operation requiring low temperature thermal energy (such as a source for heat pumps, pre-heating domestic hot water, or snow melting).

END USE DEMANDS

In order to know what end use demands might make waste energy into useful resources, it is necessary to have the whole energy picture available for review. It is generally the case that the greater the diversity in energy demands, the more likely it is that there will be demands for "waste" energy. In recent years, the kind of analysis described above has been applied most often to individual buildings. However, when such it is possible to look at an entire community, chances of finding the kind of match which will permit the use of "waste energy" increases greatly.

ENERGY AT THE LOWEST POSSIBLE LEVEL

The most efficient use of energy resources will occur when energy is provided at the lowest possible level consistent with the final demand. Each time that energy is transformed from one level to another, wastage results. For example, the goal of providing space heating to a building is usually to maintain a temperature of about 70°F. In order to do this, heat energy must be introduced into the space at a temperature sufficiently above 70°F that the heat will flow from the supply medium to the space. This might require a supply medium at 175°F. Ideally, an energy resource to meet this demand should be heat at about this temperature. Heat is the lowest form of energy and therefore, any other form of energy resource represents a more refined source than is necessary and, consequently, means that waste has occurred in order to achieve this more refined form.

Take for example, the use of electric resistance heating. A heat source (low energy form) is used to produce steam which in turn drives a turbine to create mechanical energy (higher energy form).

In this process, as much as two-thirds of the original heat energy may be as rejected as waste heat. The mechanical energy is then converted to electrical energy (still higher form) with an additional loss in the form of heat. The electricity, is then transformed and transmitted to its point of end use where it is passed through a resistance device to be converted back into heat (lowest form). The end result is that less than one-third of the original heat energy is finally delivered to the end user.

Energy is never destroyed. It is simply changed from one form to another and when it performs a task it always drops to a lower level. Therefore, when tasks require high level energy forms it is inevitable that lower level energy forms will be the by-product and if tasks requiring this lower level energy forms can be identified, this by-product becomes a resource rather than a waste.

This pattern of using energy resources at successively lower forms is called "cascading". The impact that this has on saving energy resources is clear. Fuel is consumed to produce a unit of high level energy. This unit does a high level task and, in doing so, it is transformed to a lower level. If this lower level form is then used to do a lower level task, it eliminates the need to consume fuel that would otherwise be required to do this lower level task.

In addition to the energy resources that result as by-products to the transformation which takes place when energy performs tasks, there are other resources that are due to activities that are not primarily energy-related. For example, the burning of waste products results in the production of heat. This heat has, most often been rejected to the atmosphere through stacks. If captured, however, it is a potentially valuable resource provided that a use can be identified for it.

The larger and more diversified the potential using community, the greater the chance for finding an appropriate use.

URBAN FORM

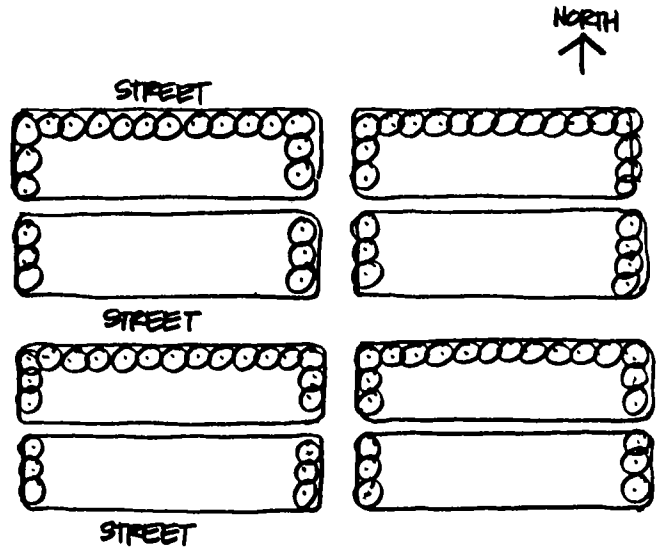
Energy is typically a minor factor in the creation of urban form, partly because energy conservation is understood primarily at the building scale and also because other urban design and economic factors typically take precedent. Seen in the lower form, the energy concerns of urban form are rarely in conflict with those other factors and often augment the viability and livability of a large development. There are several principal ways urban form offers energy consumption dependent on climate, building type and the mix of uses within an area. Regarding energy use in buildings, the orientation and massing of urban blocks can have a significant impact on heating and cooling demands. Differing urban forms and densities can offer opportunities for daylighting commercial buildings by limiting the depth of each floor or providing for skyviews. Urban form and its pattern of mixed use can encourage or undermine a mass transit system. It can shelter and promote a pedestrian environment or it can literally force people into their cars. What is important to acknowledge is that energy strategies at this scale--from daylighting and passive solar access to convivial pedestrian paths--offer the livability and desirability of an area as much as its energy profile.

RESIDENTIAL

Housing as a mixed use component for inner city areas is a high priority. Affordable housing is often a higher priority. The viability of energy-efficient housing is contingent on many factors of which the urban form and building type rank very high. Given a well-insulated building, orientation, solar access and shaping can contribute major energy savings.

Given that climatic conditions vary considerably across the nation, only general concerns and options can be listed. For areas requiring heating, orientation and solar access are primary. Both can easily conflict with other urban design treatments such as street orientation and economic densities. However, the open quality of railroad properties and the indeterminable mix of building types afford opportunities to avoid typical conflicts. For a heating climate, the following guidelines are applicable:

-If a "street wall" urban form is used, the grid should be long in the east-west direction, providing more southern aspects for residential buildings.



TONY GARNIER'S CITIÉ INDUSTRIAL IS A MODEL OF ENERGY EFFICIENT PLANNING: BLOCKS ARE LONGEST IN THE EAST-WEST DIRECTION, WITH TREES ONLY ON THE NORTH, EAST AND WEST SIDES.

-Single loaded corridor "stackers" or town house building types should be utilized to avoid north-facing units.

-Solar access should be preserved by using low-rise, high-density building types that are spaced to allow winter sun to the majority of units.

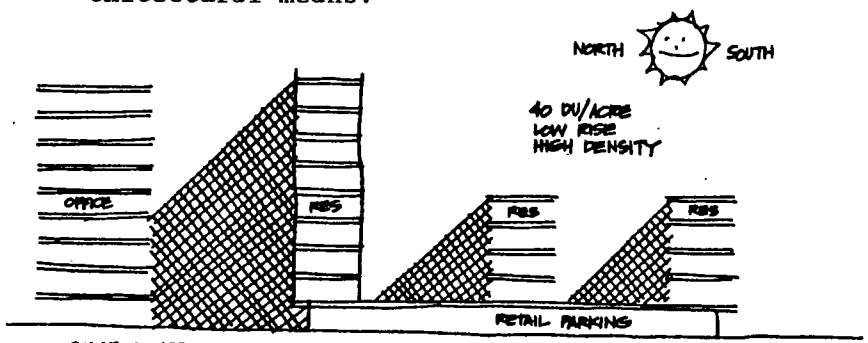
-High-rise slabs should be located to shade industrial or office buildings rather than other residential units, open space, or pedestrian corridors.

For a climate in which cooling is dominant, the following guidelines are possible:

-Westerly aspects are to be avoided and, given that heating may also be a criteria, southern over northern aspects emphasized.

-Single loaded and stacked townhouse building types should be utilized to provide for cross ventilation.

-For cooling-only climates, shading can be provided by neighboring buildings, plant materials, or architectural means.



SOLAR ACCESS IS MORE IMPORTANT FOR RESIDENTIAL USES THAN FOR OFFICE OR RETAIL.

-High-rise towers should be slender with a majority of corner units to provide for cross ventilation.

To summarize, residential buildings should be planned in a grid which emphasizes a southern orientation for solar heating as well as ease of shading.

In climates requiring heating, buildings should be placed to avoid shading and/or mixed with building types that don't require daytime heat. For areas which are strictly residential, 100% solar access allows approximately 40 units/acre. Higher densities are possible at residential edges where shading doesn't impact on other residential buildings.

OFFICES

Energy conservation in office buildings is largely a building systems problem. In any climate, heating is a relatively small load because of large internal heat gains and relatively small surface areas. Cooling and lighting are the controlling energy constraints. Given these concerns, the following guidelines may apply:

-Daylighting can potentially save energy but care should be taken to avoid increasing cooling loads. Where slender buildings are programatically appropriate, side lighting into the first two work stations is possible if the high light transmission glass is well shaded. The heat gain or loss involved with increased glass areas may outweigh the lighting savings.

-Where daylighting is feasible, east and west facades must be carefully considered as they tend to be difficult to shade while admitting light.

-Office structures should be sited and massed to avoid shading residential areas, open space, or high-use pedestrian paths.

INDUSTRIAL, RETAIL AND PUBLIC

These building types are rarely dependent on urban form for energy conservation. For retail and public buildings, the criteria of use and economics far outweigh possible energy conservation strategies (i.e., reduced lighting demands). Industrial buildings have a historic opportunity for daylighting through roof apertures. But, this is possible in any form or orientation.

MICROCLIMATIC EFFECTS

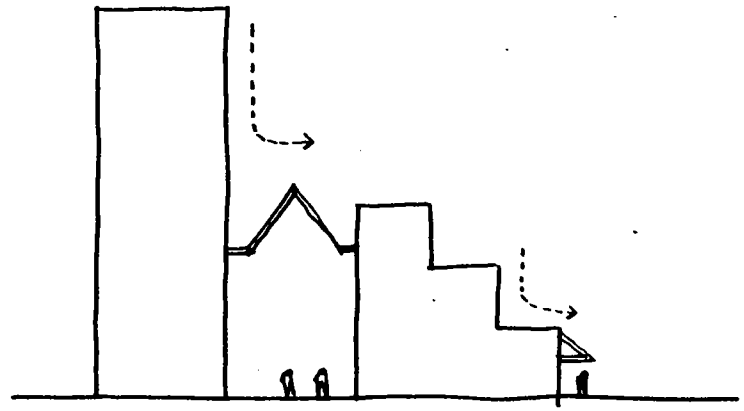
Urban form can affect the microclimate of an area and, therefore, its livability and energy demand profile. Given many climatic conditions, it is difficult to identify generic and universal strategies but a list for various conditions would include:

-Shaded or structured parking areas avoid heat build-up in hot climates (Sacramento, for example, is on average hotter than the surrounding agricultural land because of asphalt areas).

-Mirror glass buildings should be avoided in hot climates as they can increase microclimate temperatures by reflecting heat into streets, parking areas, and other buildings.

-Urban form can, in very complex ways, increase or mitigate strong wind conditions. Increased wind can affect residential heat loss but rarely affects the energy performance of sealed commercial buildings. Wind can, however, create external impacts at entrances and pedestrian areas adjacent to the building.

-Landscaped open space and major water elements can have a considerable cooling effect through transpiration and evaporation.



-Larger atriums or glassed arcades can buffer buildings, thus reducing heat losses and sheltering year-round pedestrian activities in cold climates. Such buffer spaces are best configured to allow winter sunlight and exclude summer sun

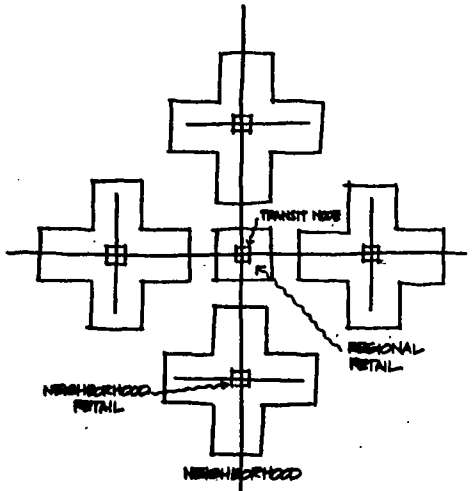
TRANSPORTATION

Mixed-use planning at the scale made possible with large railroad properties can have a major impact on transportation utilization and future energy use. There are three ways the impacts can be manifested: trip length, trip mode, and number of trips generated. Reductions in trip length and number of trips absolutely reduces transit energy demands. A shift in mode, from auto to light rail, say, may reduce energy consumption depending on the passenger efficiency of the system. An efficient auto with three passengers may be more efficient than a low occupancy light rail train or bus.

TRIP LENGTH

Given an urban environment, a downtown location for housing will most certainly reduce trip length to most typical destinations. Therefore, merely including housing in the program for redevelopment of central railroad properties is perhaps the most significant energy-conserving strategy if the housing replaces growth at the suburban fringe. Beyond this macro effect, the mixed use plan can further reduce trip lengths by employing the following program guidelines:

-Providing a balance between the income level of new jobs created or jobs in the immediate area and the cost of housing. Although the opportunities for regulating a correspondence between workplace and dwelling is slight, economic viability is the most positive encouragement for people to live and work in the same neighborhood.



LOCATING NEIGHBORHOOD RETAIL WITHIN WALKING DISTANCES AND REGIONAL RETAIL AND TRANSIT NODES IN SEQUENTIAL PATHS REDUCE THE QUANTITY AND LENGTH OF HOUSEHOLD TRIPS.

-Provide neighborhood retail facilities within walking distances of residential units. This presupposes a sufficient market area and density.

-Investigate the viability of including a regional retail facility resulting from combining the new housing with existing housing in a typical market area.

-Provide passive and active recreational facilities within walking distance.

-Provide public services (libraries, post offices, schools, etc.) within walking distances.

The image of an urban village or urban quarter summarizes the criteria for efficient transportation. The more an area can include a full range of destinations, the less transit will be required. Some railroad properties may be enough to create a semi-large urban village. Others may provide space to balance and complete an existing zone. The goal is to draw together into a human-scaled vicinity the diversity of a city.

TRIP GENERATION

The configuration and quality of an area can encourage walking and the combination of trips, thereby potentially reducing the total number of trips per household. Reducing distances is the first step in providing for a pedestrian environment, but the quality of the paths is of equal importance to encouraging non-auto trips. In addition, locating destinations in sequences can reduce the number of household trips by allowing combinations and on-the-way stops when using the car or mass transit:

-Locate neighborhood or regional retail and public services at transit arrival points or along paths to housing.

-Provide bike paths and pedestrian paths to major recreational areas.

-Combine work places with restaurants, convenience retail, and open spaces to avoid mid-day trips.

-Transit stations or stops should provide opportunities for joint development of employment and shopping facilities to eliminate the need for additional trips.

Above all, make the pedestrian comfortable. Paths need to be shaded in summer and sheltered in winter. They need to be entertaining, exciting, and/or at the center of activities. They also need to feel safe; therefore, residential surveillance, automobile proximity and lighting are key.

TRIP MODE

The railroad's corridors and terminals occupy a central location for mass transit alternatives in mature cities. There property can often provide the access for new mass transit systems at a macro scale and should be seen as a pathway as well as a destination. Beyond this macro scale, their central location can reinforce the existing urban mass transit network by placing housing and jobs within the system. Low parking allotments and convenient connections to existing mass transit systems can significantly reduce automobile use per household. Zoning mechanisms should offer incentives to encourage this.

COGENERATION AND DISTRICT HEATING/COOLING

Cogeneration is a special case of cascading energy resources. As a rule it refers to the recovery of "waste" heat from electrical generation. This recovered heat is usually utilized for industrial process or building heating, cooling and domestic hot water or a combination of these.

The simplest form of cogeneration results when a single user takes the entire thermal output recovered from a generator, using conventional means to make up any deficiencies in the quantities of thermal energy, and where there is an unlimited demand for the electrical output. This is generally the case when a cogeneration facility is electrically connected to the utility grid and delivers its thermal output to a large industrial user. While this arrangement has the advantage of technical and institutional simplicity, it has limited applicability, relying on the existence of large industries with major thermal loads. It also does little to reduce energy costs to residential and commercial energy users.

TOTAL ENERGY SYSTEMS

A second form of cogeneration is the small, self-contained individual building unit which may be "total energy", that is, completely independent of outside electrical connection and may be grid-connected in which case it can obtain peak and emergency power from the utility or sell excess electricity to the utility.

There are several problems with individual building cogeneration:

-The small scale of the demand requires equipment with less than optimal efficiencies.

-The operating and maintenance requirements may be a deterrent to the individual building owner/operator.

-With the "total energy" approach, the cost for back-up capability to provide power during maintenance periods or in the event of equipment failure becomes a major cost penalty.

-With minimal diversity, the individual building is likely to show major peaks and valleys in demand for both electrical and thermal energy. For the "total energy" system, this will result in severe under-utilization of the system which, in turn, will mean a high capital investment relative to the energy saving. If the grid-connected system avoids under-utilization by installing a smaller system and purchasing a significant amount of power from non-cogenerated sources, it will fail to maximize the potential savings from cogeneration.

A DIVERSIFIED COMMUNITY

A third form of cogeneration avoids these drawbacks. This is the cogenerated central plant connected to a diversified community. This connection may be only thermal with all of the electric output being sold to the electric utility. Alternatively, the system may also sell electricity to the community. In this second case, the system may be stand alone or be grid-connected with the grid providing back-up and peaking power and serving as a market for excess electricity.

The thermal connections to the community require that some form of district heating system be installed. This will be some form of steam or hot water system requiring piping. Here, large, open sites, free of existing instructure are ideal. A thermal distribution system installed as an integrated element in a comprehensive infrastructure can have lower costs and greater rationality than one which must work around a maze of existing utilities.

At this time there is general concurrence that hot water is the preferrable medium for thermal distribution in district energy schemes. It is possible to run pressurized water at relatively high temperatures to meet process demands for steam. The new Trenton, NJ, Integrated Community Energy System distributes hot water at 390°F in order to permit connection to existing building systems using medium pressure steam. However, it is desirable to provide heat at substantially lower temperatures if possible. Lower temperatures mean greater heat recovery potential, lower heat loss during transmission, and less expensive piping.

A low temperature distribution system requires that standards for end use equipment (equipment within the buildings) be established. Here, again, the characteristics of large railroad tracts couples well with the development of district heating as there are few, if any, buildings on the site at the outset of the project and any buildings which do exist are most likely going to receive new mechanical systems. This is a specific case of matching end-use demand to an available energy resource.

A gas or combustion turbine functions similarly to the steam turbine, however instead burning fuel to generate steam, the hot gasses from fuel combustion drive the rotor directly. Turbo-prop aircraft engines are, for example, combustion turbines. For cogeneration, the hot exhaust gasses are passed through a heat recovering, boiler and produce either steam or hot water.

Deisel engines are probably the most commonly known of the cogeneration prime movers; although for cogeneration, the scale of the engines may be far larger than normally pictured. With deisel engines, waste heat is not only recoverable from the engine exhaust but also from jacket cooling water (similar to a car's radiator) and from the oil cooler. In each of these technologies, the spinning shaft of the prime mover is connected to an electric generator which produces the electricity.

SYSTEM CHARACTERISTICS

It is not the intention of this section to detail the design considerations of cogeneration alternatives. However, several characteristics of the various systems may provide useful background.

Steam turbines are generally most useful in large size --modules beginning at capacities of 20-50 megawatts (electric) and extending up to the range of large, central station generating facilities.

Combustion turbines have, as a rule, the lowest first cost but also the lowest efficiency in producing electricity. They do, however, release their waste heat at the highest temperature of the three technologies and may therefore have advantages in applications where high temperature heat is required. Combustion turbines are commonly available in modules from about 800 kilowatts (0.8 magawatts) to 25 megawatts electric.

Deisel engines range from moderate to extremely high efficiency in electric production. Their primary disadvantage to use in cogeneration is that a substantial portion of the waste heat is at relatively low temperature. If, however, a low temperature demand can be established, deisels exhibit a high overall efficiency with a large portion of the total energy in electricity. Deisel modules range from very small (less than 100 kilowatts) through 25 megawatts, and large; although for cogeneration purposes, the engines in the range of 2-3 megawatts and larger show substantially higher efficiencies (in electric production).

Cogeneration with district heating seems to require a minimum building community of 1-2 million square feet of building with significant benefits from increases above this level. It also requires a diverse community in order to maximize utilization of the equipment. Since thermal distribution is both material intensive and expensive, a dense community will enhance the attractiveness for a district heating system. All of these characteristics are likely to be present in the redevelopment of former railroad property.

EMBODIED ENERGY

At present, it is unlikely that the energy embodied in building materials will have a significant effect on planning decisions. However, given that energy resources are finite, we will undoubtedly face future crises in which reduction of energy consumption will again become a major national goal. Thoughtful planning now can mitigate these future problems.

The energy required to construct buildings (including that required to manufacture, fabricate and transport building materials) represents about five percent of national energy use or about one-sixth of the energy required to operate buildings. There is, however, another way of looking at the relative importance of embodied energy in buildings. The embodied energy per square foot of new construction ranges from 600,000-700,000 Btu/sf for residential construction to 1,000,000-1,600,000 Btu/sf for commercial buildings. (These figures represent "source" energy, and include losses in generation and transmission.) With current source energy figures for commercial building operation

at 100,000-150,000 Btu/sr, it can be seen that the energy required to construct a building may equal ten or more years of that building's operation energy.

Strategies for reducing embodied energy in new construction are outlined in the HANDBOOK OF ENERGY USE FOR BUILDING CONSTRUCTION, U.S. DOE Document CE/20220-1 available from NTIS, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161.

Consideration should also be given to the energy embodied in existing buildings. The Handbook permits a take-off and summary of the energy content of buildings or portions of buildings already in place. However, without having to analyze this embodied energy in detail, it can be said that whenever a building or portion of a building can be reused, there is a saving of energy. Some examples of the quantities of energy saved are as follows:

1 cubic yard of concrete	2,590,000 Btu (18 gallons of oil)
100 square feet of 8" thick brick wall	28,100,000 Btu (195 gallons of oil)
1 ton structural steel	45,400,000 Btu (315 gallons of oil)

It should be pointed out, however, that the primary reasons for preserving buildings are not energy considerations but are, rather, issues of urban and historic continuity.

4 LESSONS LEARNED

GAUGING VALUE

The three case studies have one commanding feature in common. Each of them demonstrates the extraordinary and unique opportunity that underused railroad lands offer to cities to reconsider their revitalization and to restructure their future form from within.

If the Pittsburgh, Denver and San Francisco examples are in any sense prototypical--and clearly they are--this is the one overriding message they send to cities, large and small, across the nation.

As awareness of the potential of railroad lands within cities grows, several railroad corporations are forming strong real estate divisions within them. In some corporations these divisions are set up as individual profit centers within the company, bringing them to the edge of becoming speculators, entrepreneurs or developers.

In two of the three case studies, the railroad companies had not conducted planning, marketing or urban design studies to investigate the potential of their holdings. Consequently the value of their lands could only be gauged by the going market rate for unused and unimproved sites in relatively depressed locations in cities that have faced years of decline due to obsolescence and the pressures of competing suburbanization.

The case studies demonstrate, however, that truer land values can be gauged only after planning processes have established future directions and reuses, and some determination of phasing, front-end capitalization, market absorbition, and division of responsibility for implementation and management has been made. Planning, economic, and urban design studies to explore future uses and potential are, therefore, an essential tool.

PUBLIC/PRIVATE PLANNING PROCESSES

The three case studies revealed that the gross extent of railroad land available for new development is larger in each case than the acreage of the traditional downtown. This fact alone shows the extent of the opportunity that many cities have for reshaping their future form for generations to come. And, for most of these cities, the opportunity is unique. The opportunity is all the more extraordinary in that these lands are for the most part in single or limited ownerships, and due to their often slighted conditions are relatively low in land value. The fact that a development program might become the basis for adjusting land value means that a balance between all the aspects of a development pro forma can be arrived at.

Another important aspect of the opportunity is that little or no relocation is required. Railroad lands have by tradition not been housing areas. And the forcible relocation of viable industrial uses is unlikely to be necessary or advisable, except in unusual circumstances, since employment in most cities is of vital concern. Relocation is generally not a major issue.

It is therefore deeply in the mutual interest of both the public and the private sector to engage in joint or at least closely interrelated and coordinated planning efforts.

COMPREHENSIVE PLANNING: THE POWER OF IMAGE

In recent decades, city centers have been weakened by suburbanization. Residential, commercial and institutional growth has occurred on the edges of traditional cities, not in their cores. Older neighborhoods have struggled for survival, older industries have become obsolete.

Railroads have suffered parallel declines. The growth of the trucking industry and of the passenger airline industry have whittled away at their traditional markets, and the decline of traditional heavy industries as in the steel mill valleys of Pittsburgh and Cleveland--have further crippled their traditional role.

But, new counter-trends are also in evidence. The excitement and culture of traditional downtowns are beginning to be rediscovered. Cities are learning how to market their richest resources, and how to build on their traditions.

On the public side there exist a series of perceptions and agendas for the city's future which are in turn related to public programs, employment, tax revenue projections, and the perceived wishes of citizens. These are important starting-off points for comprehensive planning processes, since it is the advantage of all concerned to arrive at comprehensive plans that are at once feasible but which also coincide with the best public interest.

Urban design is a critically important tool in this process. Through planning, economic market analyses, and infrastructure studies, directional recommendations can be made. But urban design provides us with the

three-dimensional images that show how everything can fit together and be made to work in harmonious interrelationships. The case studies presents in this report demonstrate how critically important the power of urban design images are in the portrayal of intentions.

In the San Francisco case history, two previous comprehensive planning efforts were rejected once the urban designers revealed what the intentions and recommendations looked like in three-dimensions. The Pittsburgh case history, on the other land, shows how urban design images became the basis for market feasibility projections for Station Square, for rezoning and planning, and for the comprehensive interrelationship of public and private capitalization inputs that became keys to project's success. Similarly, urban design studies for the Stadium project will be a critically important tool as the project moves forward into implementation.

In Denver, the urban design studies helped shape the patterns of development, density, use, and activity while preserving views and creating and reinforcing existing urban features and amenities.

REMOVAL OF BLIGHT

Underused railroad lines in city cores have a blighting image. Weeds growing tall between rusting railroad lines, empty warehouse buildings with broken windows, and derelict pieces of unused machinery are the language of decline. They have a deeply negative influence on city centers struggling to survive the challenges of suburbanization.

Comprehensive planning and urban design processes provide images that show how the elements of blight can become the keys to a new future. The Pittsburgh Station Square case study shows how old and underused railroad buildings can be recycled and have a new and richly imageable future, while also becoming the armature for new developments to follow in further phasing.

This kind of success--the transformation of minus conditions into plus conditions--tells the world at large and the regional market in particular, that the city center is on the march. Station Square now attracts over 3 million visitors annually.

The Denver case study reveals, on the other hand, how a city and a number of railroad companies together can develop alternative futures. The planning, market, and political forces at play on the Platte River Valley site offer alternative themes that are now in the process of exploration. Their comprehensive resolution will have a deep impact on the economic future and balance of the entire core area.

ROLE OF CITIZENS

Public policy issues are within the purview of citizen inquiry and participation. The absence of citizen enfranchisement in San Francisco's early Mission Bay schemes turned out to be an Achilles heel. As the report indicates, citizens wield great power. They can--as we know from both Denver and San Francisco--defeat or delay projects, cutting deeply into their ultimate feasibility.

On the other hand the planning and development processes are so sophisticated that it is difficult to include uniformed citizens in meaningful roles. Information, open lines of communication, and carefully constructed public workshops are tools which, when they are used progressively along a meaningful planning timeline, will ensure an increasingly knowlegeable and involved body of citizens, with the ultimate goal of public/private concensus.

The most recent Mission Bay studies show that citizens are a rich resource to be used in planning. A series of concerns have surfaced there that have enrichened the emerging urban designs--concerns focusing on ecological conservation of water frontage, passive and active recreation, and the proper adjustment of density and usage to liveability and environmental quality.

The political value of concensus is obvious to both the public sector and the private. Citizen backing is also an invaluable marketing tool as the project moves forward into implementation.

PHYSICAL ATTRIBUTES OF RAILROAD LANDS

Railroad lands are linear in form, and generally occupy flat lands. The ideal routes that the nineteenth century railroad builders used were riverbanks. Rivers not only have the same gradients as those required by railroads, but millenia of erosion have resulted in alluvial flatlands that have proven ideal for marshalling yards and heavy industrial uses.

Also, railroads are by nature link-systems. In core areas they celebrate their destination with great terminal buildings and magnificent concourses. They are traditional gateways.

Although long-distance passenger services by rail have been largely superceded by airline travel, the opportunity exists for consolidated railroad corridors to provide fast intercity surface services and to become rapid transit and mass transit corridors within metro-regions.

Planning the latter corridor usage implies new nodes of development at transit stops and points of modal split. This in turn provides the city with a new and compelling metro-form of radial corridors--based on traditional railroads, services, and the terminals--albeit in new forms.

Water frontages have become in the past decade a key element in downtown revitalization. The fact that in the past riverbanks have been occupied by railways and industries but may now be replanned offers the opportunity to regain public access to return to the public one of the most satisfying natural resources that cities can enjoy.

CITY PROCESS

A city that finds itself with major undeveloped land near its central business district--and with pressure for development or a clear public need that can benefit from development--should undertake a careful process of analysis and planning. The three components are:

-Define the situation

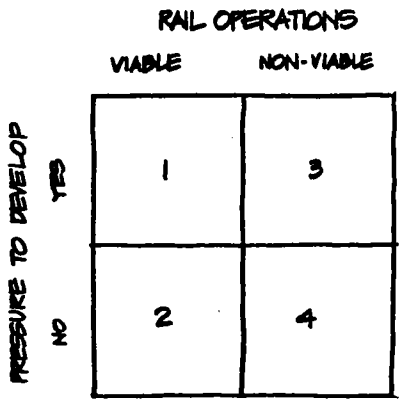
-Decide what the development should be

-Decide how best to get it done

This will be a valid framework whether the railroad has come to the city with a proposal first, or the city has initiated the process.

DEFINE THE SITUATION

Real estate development is highly dependent on local market factors and conditions. Because of this, the redevelopment of railroad-owned land will proceed or not largely in response to unique local conditions. This study has identified four generic redevelopment scenarios that can assist railroad companies and communities in evaluating the potential for redevelopment. These are illustrated below.



RAIL-OWNED LAND DEVELOPMENT SCENARIOS

The four scenarios relate the two key economic factors that will influence the feasibility and timing of redevelopment. These factors are:

-The viability of continued rail operations on the site

-The pressure to redevelop the site to its highest and best use

Scenario One is the most difficult and complex of the four presented. Here, there is a viable rail operation in place that is also experiencing pressure to redevelop. There is the potential for conflict between public and private objectives. Redevelopment under this scenario could entail significant costs with respect to relocating viable rail operations.

Scenario Two involves a viable rail operation that is not currently experiencing pressure to develop. This situation may occur when the rail operation is located in the fringes of the center city or in a highly industrialized area. The implications of Scenario Two is that the current use of the site is the highest and best use. As the center city expands and industrial uses are relocated, this situation may change.

Scenario Three is the optimum redevelopment scenario. In this case, pressure to redevelop coincides with the situation where rail operations are no longer viable or required on the site. The opportunity exists for integrating private redevelopment objectives with public policy objectives.

Scenario Four describes a situation where rail operations are no longer viable and there is little to no real estate demand for alternative uses in the near term. Here, the issue becomes one of land banking. Long-term economic development objectives of the community may warrant purchasing such a site if this is acceptable to the railroad company. However, the railroad company may be willing to do its own land banking because of the inherent long-term value of a large site in the center city. Both parties should promote the site's availability as a component of a comprehensive economic development program.

DECIDE WHERE IT SHOULD BE

Ideally, a joint effort among the railroads, the city and affected citizens and interest groups, the economic planning for the site must determine the most appropriate mix of uses (public and private) and their market orientation, identify infrastructure needs and costs, include negotiation of public and private responsibilities, and prepare pro forma analyses of the project's financial characteristics. Depending on the redevelopment scenario facing the city, this process may be initiated by one party or the other, or one may take the lead in developing the information. In many cases, each party will develop its own scheme and background data, but this can cause mistrust and disagreements later if the information is not shared.

DECIDE HOW TO GET IT DONE

In some case studies the land was acquired by the city for its own development or resale to others. In other cases the railroad maintained ownership and control. In yet others the railroad sold or leased the land to one or more developers or operations. Whatever the ownership structure, the strategy for implementation must include clear roles for both the city and the railroad. And while the exact mechanisms and organization will vary from city to city, the process must be: proactive, flexible, innovative, feasible and committed.

PROACTIVE: Both the railroad company and the local community need to be provactive with respect to each other and the reuse of railroad property. A proactive strategy entails both groups being open, accessible and clear about their goals, objectives and concerns. Both parties need to anticipate changing market conditions and the needs of the community. Expectations and requirements need to be clearly defined and differentiated.

FLEXIBILITY: Flexibility is necessary due to the complex timeframe of developing a large-scale project. The railroad company must be prepared to accommodate uses, restrictions, and conditions on development designed to achieve various public policy objectives. Such objectives attained through "exactions" may reduce the short-terms economic returns to the railroad company. For its part, the local community must permit the railroad company the necessary flexibility to respond to changing market conditions and financial requirements. The community must be willing to make trade-offs and compromises.

INNOVATIVE: The scale of this type of development both invites and necessitates innovative solutions to a wide range of social, physical, environmental and economic issues. The early and meaningful participation of organized interest groups is not only desirable but critical. Citizen participation in today's legal, political, and regulatory environment can make or break projects. Large-scale development provides the opportunity to implement innovative planning and design concepts that are not practical for small scale projects. The opportunity exists to have a major and long-term impact on the form and character of the center city. Large-scale development may have major environmental impacts. Innovative approaches to mitigation are required, while opportunities for enhancing the natural environment can be more readily pursued. Innovative approaches to financing large scale development will be required. Local governments can no longer depend on federal and state grant programs or unrestricted borrowing authority to finance land assembly, relocation, infrastructure, etc. Increasingly, local government must rely on its own financial resources to finance public improvements. Joint public-private financing strategies must be explored.

FEASIBILITY: Public policy objectives must be carefully weighed in light of their impact on project feasibility. Expectations must be realistic as to the nature and scope of development exactions and regulatory restrictions. A high degree of financial sophistication is required of both parties. If the development is to be a true public-private partnership, there needs to be an openness and objectivity with respect to the sharing of financial information. Financial returns to the developer must be competitive and reflective of the level of risk. The incentives and public expenditures must be designed to insure the long-term success of the project, not merely provide a one-time jump in land value.

COMMITMENT: Both the local community and the railroad must be committed to the process and project. Commitment can be measured in terms of the financial, political and corporate resources invested by both groups. Developers undertaking large-scale development are most concerned about:

-Consistency in the application of policies plans and regulations

-Continuity in political decision-making and

-Timeliness in decision-making.

For its part, the local community is most concerned that the development delivers what was promised. The concerns of both parties must be addressed formally through such devices as memoranda of understanding and development agreements. A commitment by both parties to minimize uncertainty is beneficial to all.

CRITICAL LARGE SCALE DEVELOPMENT ISSUES

ISSUE	PROBLEM	REMEDY
-Government Review Process	-Fragmented decision-making -Conflicting/Changing Requirements -Delays -Additional Cost -Duplicate Procedures	-Coordinated Permit Review -Concurrent Processing -Memorandum of Understanding -Development Agreement
-Development and Design Guidelines/Requirements	-Non-Flexible -Conventional -Lack of or premature specificity	-Stage review -Definition of approval and conflict resolution mechanisms -PUD zoning
-Infrastructure and Public Improvements	-High front end cost -Equity (i.e., project needs vs. area-wide needs) -Uncertainty of public sector timing and funding	-Public funding of certain infrastructure elements -Developer financing of "fair-share" -Providing tax-exempt financing to developer -Developer Agreement

R/UDAT TEAM

TEAM CHAIRPERSON

BEN H. CUNNINGHAM JR., AIA
Executive Vice President, Architecture Group
CRSS
Houston, Texas

Ben Cunningham is an architect and urban designer with substantial national and international experience in large scale community design and development. He has served on three previous R/UDAT teams and is a past chairman of the AIA's Urban Design and Planning Committee.

TEAM MEMBERS

PETER CALTHORPE, AIA
Principal
Calthorpe Associates
Sausalito, California

Peter Calthorpe is an architect and urban planner concentrating on the design of affordable housing and master planning for mixed use commerical and development projects. He has specialized in urban energy issues and is serving as a visiting critic of the schools of architecture at the University of California Berkeley and the University of Washington.

W. PAUL FARMER, AICP
Deputy Planning Director
City of Pittsburgh
Pittsburgh, Pennsylvania

Paul Farmer is an urban planner and has served as Deputy Planning Director for the City of Pittsburgh since 1980. He has taught in the Graduate School of Public and International Affairs at the University of Pittsburgh and in the School of Architecture and Urban Planning at the University of Wisconsin-Milwaukee. He is the author of PERSONALITY, POLITICS AND PLANNING: HOW CITY PLANNING WORKS and has served as a Director of the American Planning Association.

PETER M. HASSELMAN, FAIA
Principal
Sandy & Babcock, Architects and Planners
San Francisco, California

Peter Hasselman is an architect and urban designer with nearly twenty-five years of professional experience. He acted as the lead designer of the Northeast Corridor Improvement Project between Boston and Washington, DC. This project focused on the renovation of railroad stations, maintenance facilities, and related urban design implications. Additionally, he is a periodic lecturer, critic, author, and editorial cartoonist. He has served on eight previous R/UDAT teams and is a member of the AIA's Urban Design and Planning Committee.

BOB ISAACSON, PE
Project Engineer
San Francisco Redevelopment Agency
and Secretary,
Mission Creek Conservancy
San Francisco, California

Bob Isaacson is a civil engineer and a founding director of the Mission Creek Conservancy. He lives on a houseboat moored on Mission Creek. He is presently the Project Engineer for the Rincon Point/South Beach Redevelopment Project and has extensive experience with several public agencies in California as a staff engineer. The Mission Creek Conservancy is concerned with fostering appropriate redevelopment of the Mission Bay area of the city.

DAVID N. LEWIS, FAIA/RIBA/AICP
Chairman
Urban Design Associates, Architects
Pittsburgh, Pennsylvania.

David Lewis, founder of UDA/Architects, is an architect and urban designer. He has taught in the architecture and urban design programs at Carnegie-Mellon and Yale Universities and has served as chairman of the AIA's Urban Design and Planning Committee. He has served on five previous R/UDAT teams, chairing two. His firm is responsible for carrying urban design through architecture to construction for a variety of waterfront, railroad, historic, and multi-use developments throughout the US. Additionally, he has authored numerous articles and books on urban design, including co-authorship of the forthcoming book on the AIA's R/UDAT program--URBAN DESIGN IN ACTION.

WILLIAM F. MASTERSON
Senior Manager, Real Estate Consulting Group
Peat, Marwick, Mitchell & Company
Los Angeles, California

Bill Masterson is a real estate market and financial analyst, and has worked as a consultant to public and commercial clients throughout the country for over ten years. Additionally, he has development policy analyses, evaluation programs, and performance audits for federal, state and local governments. He is a member of the American Planning Association.

DAVID A. OLESON
Assistant Vice-President for Denver Operations
Glacier Park Company of Burlington Northern, Inc.
Denver, Colorado

Dave Oleson is a real estate development and management specialist with extension managerial responsibilities in marketing, industrial development, commercial development, property management, and railroad interaction. The Glacier Park Company is part of Burlington Northern, Inc., that offers properties in many parts of the US and Canada for joint development and investment.

BELINDA ORLING
Consultant
San Francisco, California

Belinda Orling is an urban designer and photographer working with architects in the US and Canada. She has development urban design guidelines for downtown waterfronts in Halifax and Toronto and has worked with railroad facilities and conducted feasibility studies for railroad lands in Winnipeg and other Canadian cities. She has taught in the fields of urban and environmental design.

J. LEE SAMMONS, AICP
Senior Vice-President
Hammer Siler George Associates
Denver, Colorado

Lee Sammons is a real estate and economic development consultant who works with both private and public sector clients. He has completed numerous downtown revitalization, recreation development, economic, market and feasibility studies for residential and commerical land development projects throughout the U.S. This is the second R/UDAT on which he has participated.

CARL STEIN, AIA
Principal
The Stein Partnership
New York, New York

Carl Stein is an architect practicing energy planning and design and has been a principal of the Stein Partnership since 1976. He was principal in charge of the Trenton, New Jersey, cogeneration district heating system--the first of its kind in the US--and principal in charge of the largest ornamental brownstone preservation project in the New York region. He has chaired the National AIA's Energy Professional Development Program Task Group that conceived and designed courses that have been delivered to over 5,000 architects.

RONALD A. STRAKA, FAIA
Deputy Director for Urban Design
City/County of Denver
Denver, Colorado

Ron Straka is an architect and urban designer who, in private practice, has participated in developing urban design plans for underutilized railroad lands in large and small communities. Since 1984, he has served as Denver's first Deputy Director for Urban Design and, in that capacity, has led the development of urban design concepts for Denver's Central Platte Valley. He has served on ten previous R/UDAT teams and is a past chairman of the AIA's Urban Design and Planning Committee. He received the AIA's Kemper Award in 1977.

STEPHEN TOWNSEND
Urban Designer
Skidmore, Ownings & Merrill
San Francisco, California

Steve Townsend is an urban designer and trained architect who, during the past five years, has worked as project designer on projects ranging from urban centers to large mixed-use developments.

GEORGE A. WILLIAMS
Assistant Director, Department of City Planning
San Francisco, California

George Williams is a lawyer and urban planner and has been with the City of San Francisco for the past twelve years. He is in charge of long range and project planning and is the principal author of the DOWNTOWN PLAN FOR SAN FRANCISCO. He is also responsible for the planning of the Mission Bay project.

R/UDAT TASK GROUP CO-CHAIRMEN

CHARLES F. REDMON, FAIA, Co-Chairman
Cambridge, Massachusetts

RONALD L. KULL, AIA, Co-Chairman
Cincinnati, Ohio

R/UDAT TASK GROUP MEMBERS

John P. Clarke, AIA/AICP
Trenton, New Jersey

James Christopher, FAIA
Salt Lake City, Utah

David N. Lewis, FAIA/AICP
Pittsburgh, Pennsylvania

Ronald Straka, FAIA
Denver, Colorado

AIA STAFF DIRECTOR

BRUCE M. KRIVISKEY, AICP
Director of Urban Design and R/UDAT Programs
The American Institute of Architects
Washington, DC