

CITY EXTENSIONS: The Revitalization of Denver Colorado's Platte River Valley

by James A. Sobey

B.A., University of New Mexico, 1975

Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Architecture

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June 1982

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Department of Architecture
May 7, 1982

Certified by

Imre Halasz, Professor of Architecture,
Thesis Supervisor

Accepted by

Roten
MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Shun Kanda, Chairman
Department Committee for Graduate Studies

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ABSTRACT

This thesis examines a process for future city growth in Denver, Colorado. Its objective is to develop a model by which future expansion of the city might build qualities of continuity and identity between adjacent sections of the city and the Platte River through the revitalization and extension of network edges.

Present growth trends in Denver have altered traditional city network relationships. The exchange between movement systems, building forms and landscape has deteriorated resulting in the isolation of the pedestrian edges which once made Denver a city of vitality.

This thesis begins with observations of a specific problem of discontinuity within Denver's Platte River Valley. It then outlines goals for future growth. The third section defines the task of seaming together valley districts. The fourth section documents a method for analysis and extension. The last section includes strategies and design projections to illustrate how districts of the city might grow, with examples of extensions from a regional size, to examinations in more detail of landscape network and building relationships.

Thesis Supervisor: Imre Halasz
Title: Professor of Architecture

ACKNOWLEDGEMENTS

I would like to thank the following people who contributed to the direction and content of this thesis;

Imre Halasz for his exceptional assistance with the development of this thesis, his generosity of time and criticism.

Barry Zevin for his help throughout the duration of the study.

Stan Anderson for his invaluable criticism.

The neighbors of Denver's Confluence for their assistance in the development of the design goals for this thesis.

David Cooper for his encouragement.

My parents for their support and understanding.

Bainbridge Bunting for his inspirational work, teaching, and enthusiasm which shall be remembered by his students.

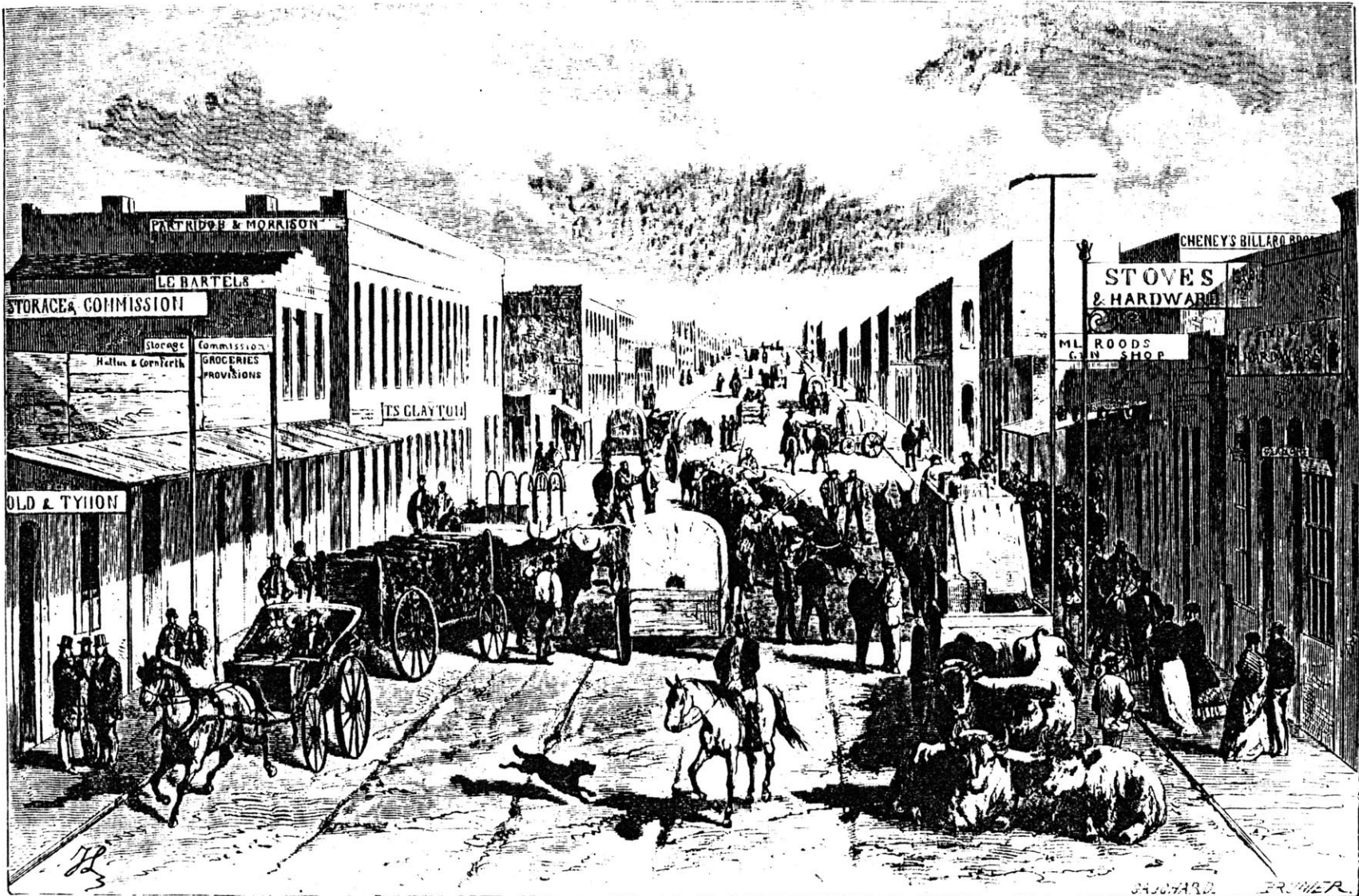


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Section I INTRODUCTION

Represented in this thesis is the continuation of ten years of personal interest in the patterns of growth along the eastern mountain slopes of Colorado. With a population that has nearly doubled in the past twelve years the region is in the thrall of rapid development of prairie land, mountainside and riverfront, into a uniform blanket of sprawl. This new growth lacks sensitivity both to the natural landscape and settlement patterns of previous inhabitants of the region.

For economic viability Denver began as a city of continuous store fronts with easy pedes-

trian access. For future adaptability the buildings of the street were of a nonspecific composition, creating a building type which related directly to the movement systems of the city. The introduction of the automobile and trends toward "compositional" building design which do not relate to the movement systems of the city has resulted in the virtual loss of edge continuity.

The intention of this thesis is not to challenge existing programmatic plans for the Platte River Valley. Based on the concept that city extensions may form seams of revitalization with the existing

city structure, this thesis attempts to develop a system of elements and relationships which may act as supports for new growth in the Platte River Valley.

This method was selected so that expansion might be examined in an incremental and comparative way. The elements come primarily from an identification of existing city and regional forms.



A typical building type which allowed for expedient construction, adaptable reuse over time and easy connection with adjacent buildings.

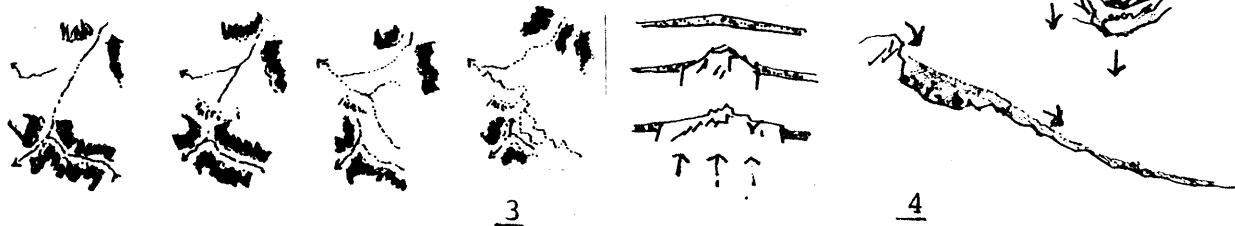
Section II OBSERVATIONS

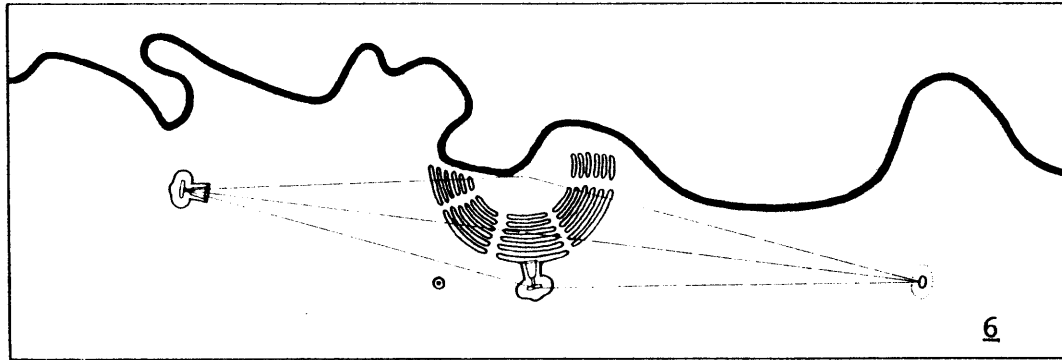
Historical Perspective

Denver grew from the confluence of the Platte River and Cherry Creek, formed by fifty million years of geological development. After centuries of mountainous uplift to the west and peripheral tilting to the east, streams and rivers reaching down the mountains formed alluvial fans, canyons, and river valleys. From the confluence of the two rivers, over valley trees and prairie piedmont, views of the arc made by the ramparts of the

Rocky Mountains may be seen. Summits to the west rise more than 14,000 feet above sea level from the prairies at Denver's present site, 5,200 feet above sea level.

These sketches illustrate the geological growth process which took place at the edge of the Rockies where Denver is now located. They show the process of up lift, formation of alluvial fans, river canyons and ramparts.

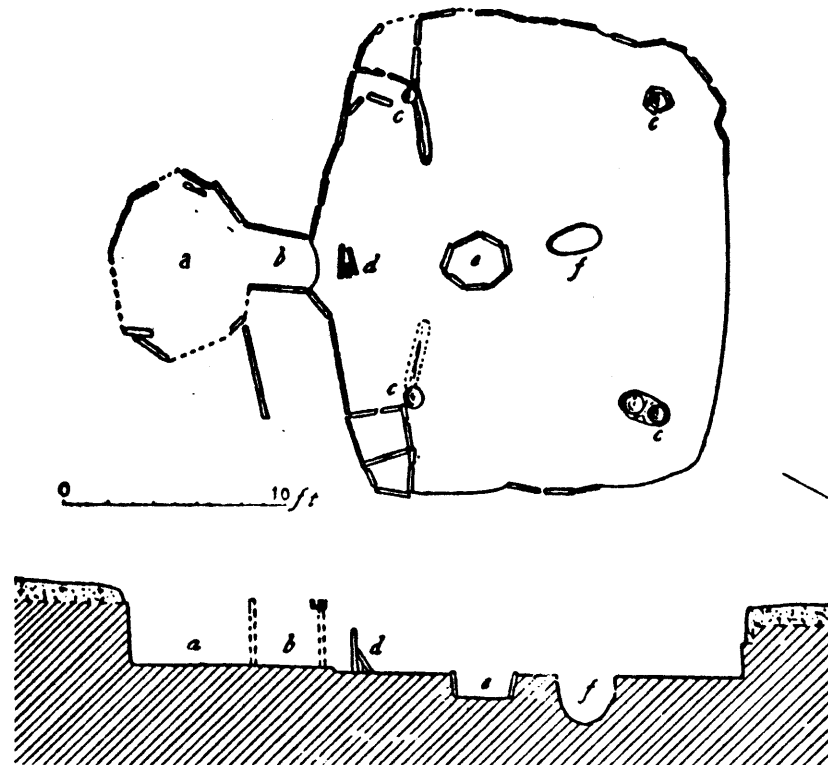




Poverty Point at Floyd, Louisiana, at the river's edge. Constructed about 1,000 B.C. may have supported a population of 2,000 inhabitants. Although neither pit houses nor mound-supported villages have been found at the confluence of Denver, archeological evidence indicates that the trade networks of each may have included the Colorado region.

Archeological records of settlements at the confluence begin 10,000 years ago with discoveries of Folsom period tools. In its natural state Denver's wooded river valley provides a protective area for settlement in contrast with the harshness of the open prairies. Nearby mountain canyons provided a means of access to an added range of microclimates and ecosystems, contributing to the viability of the confluence as a stable settlement region.

Early pit dwelling of "Basket Maker Culture." Similar to those found in southwestern Colorado.



The search for gold carved trails beside canyons just west of Denver.



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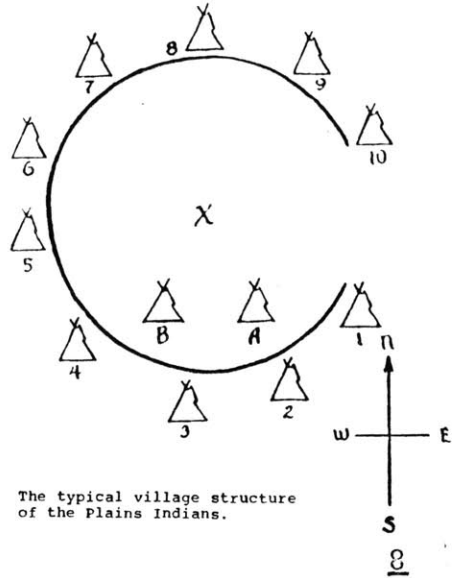
Legends of the "Seven Golden Cities of Cibola" brought many to-be-frustrated French and Spanish fortune seekers to the

Platte River Valley. The Santa Fé Trail crossed the Platte River just south of its confluence with Cherry Creek, bringing many of the gold prospectors up from Mexico. In 1857 gold was found, two miles north of the confluence in the Platte River bed, beginning rapid migration and speculation.

The Arapahoe Village

The land adjacent to Denver's confluence was granted as "Indian Territory" by the Fort Larimie Treaty of 1851. This treaty was overlooked as soon as gold was found in 1857 at the banks of the Platte River. The Arapahoe Indians remained at the confluence until 1870 when pressures from new settlers pushed them into the plains. Arapahoe settlements were structured around a central point, making a large "C"

shape with a gap to the south-east allowing for penetration of the morning sun.



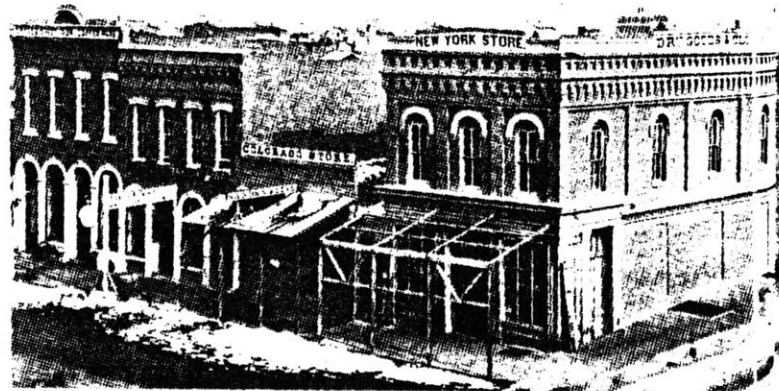
The typical village structure of the Plains Indians.

The Town Company

Three major town companies quickly claimed land around the confluence and established gridded plats for sales. The grid was used for fast and even subdivision of land. Profit was

the first concern of the town company. Although morphological continuity was not a primary concern, town companies' attempts to enhance the quality of the grid to attract settlers came soon after their establishment through the building of pedestrian sidewalks, planting of street trees and the locating of important civic buildings at intersections, giving the towns a vital pedestrian edge.

Street corner in late 1860s showing the addition of a covered sidewalk which was the first step in transforming a building edge to adapt to local climactic conditions and to create a protective edge for pedestrian movement.



Auraria

Auraria was the first town company to survey land at the confluence. It was located just south of Cherry Creek. The land was claimed by speculators through marriage to Indian wives. Auraria's street grid direction was selected to run parallel with the flow of the Platte River, about 30 degrees off an orientation with the cardinal direction. Street grids were established with equal block sizes and then divided into parcels for sale.

St. Charles and Denver City

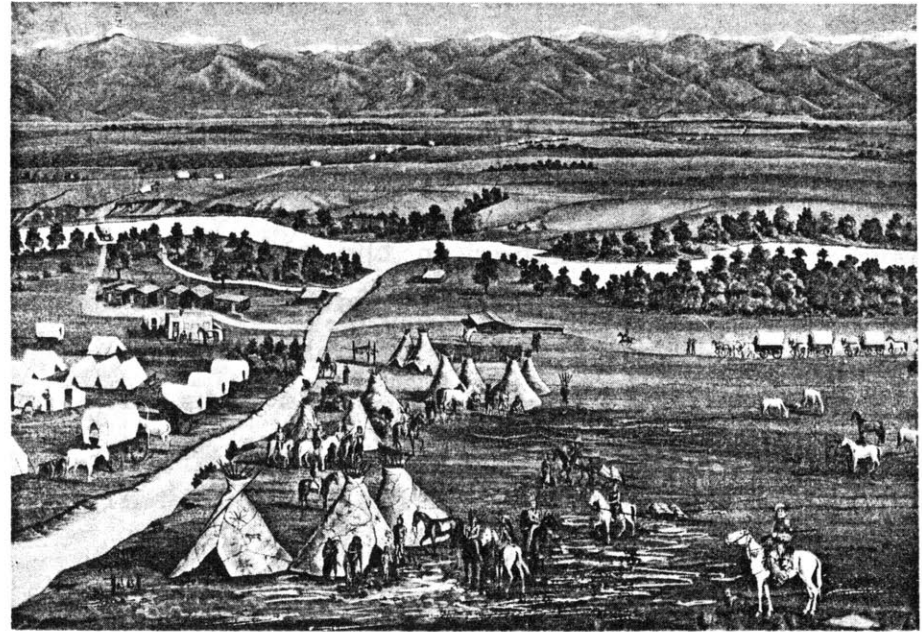
St. Charles was claimed as a town site at the northeast corner of the confluence shortly after Auraria was established. However, it was not settled

before General William Larimer, an experienced town developer, who had helped build towns from Pennsylvania to Kansas, jumped the claim of St. Charles, and renamed the site Denver City after the nearest territorial Governor, James W. Denver, of Kansas. In an attempt to establish town identity, Larimer shifted the street grid 30 degrees from Auraria. Its orientation was 45 degrees off an orientation with the cardinal directions.

Highland

Highland was the third town company to claim land at the confluence. It was located on the north west side of the Platte River, continuing the grid established by Auraria, its directional orientation and block size.

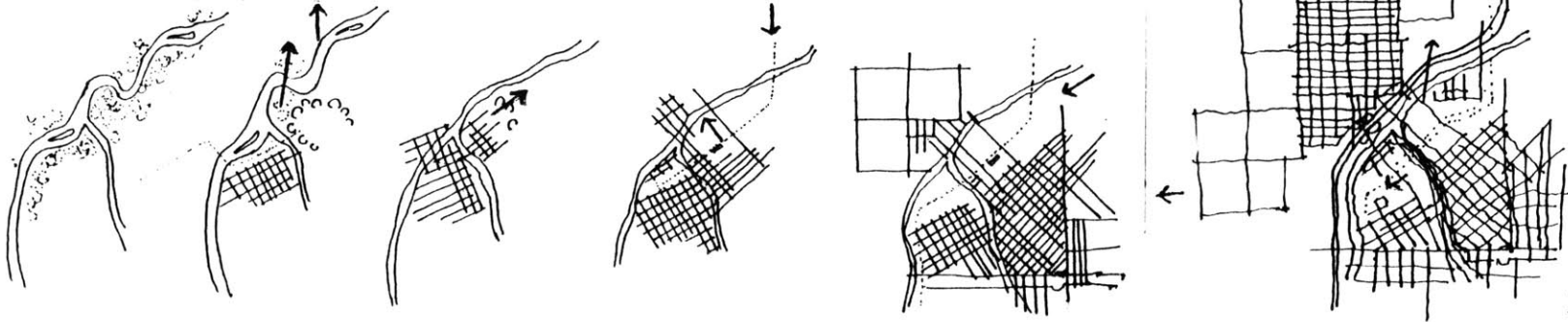
Unification of the three town companies came after a Christmas Day party with local residents and a wagon of whisky which arrived that day from Toas. Together the name Denver was selected. Future grid plats from that time came to follow the cardinal directions of the national land grid. The national land grid which covers the midwest serves as a directional orientation for all subsequent city expansion around Denver; however, due to the ramparts of the Rockies twelve miles from Denver, this pattern does not continue to the west.



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Denver's confluence in the first year of settlement, showing the Indian Camp and newly-arrived settlers.

These sketches show the settlement patterns at Denver's confluence in its first twenty years, beginning with the natural site, the relocating of the Platte River, the unification of the town companies, reorientation with national land grid and the introduction of the railroads.

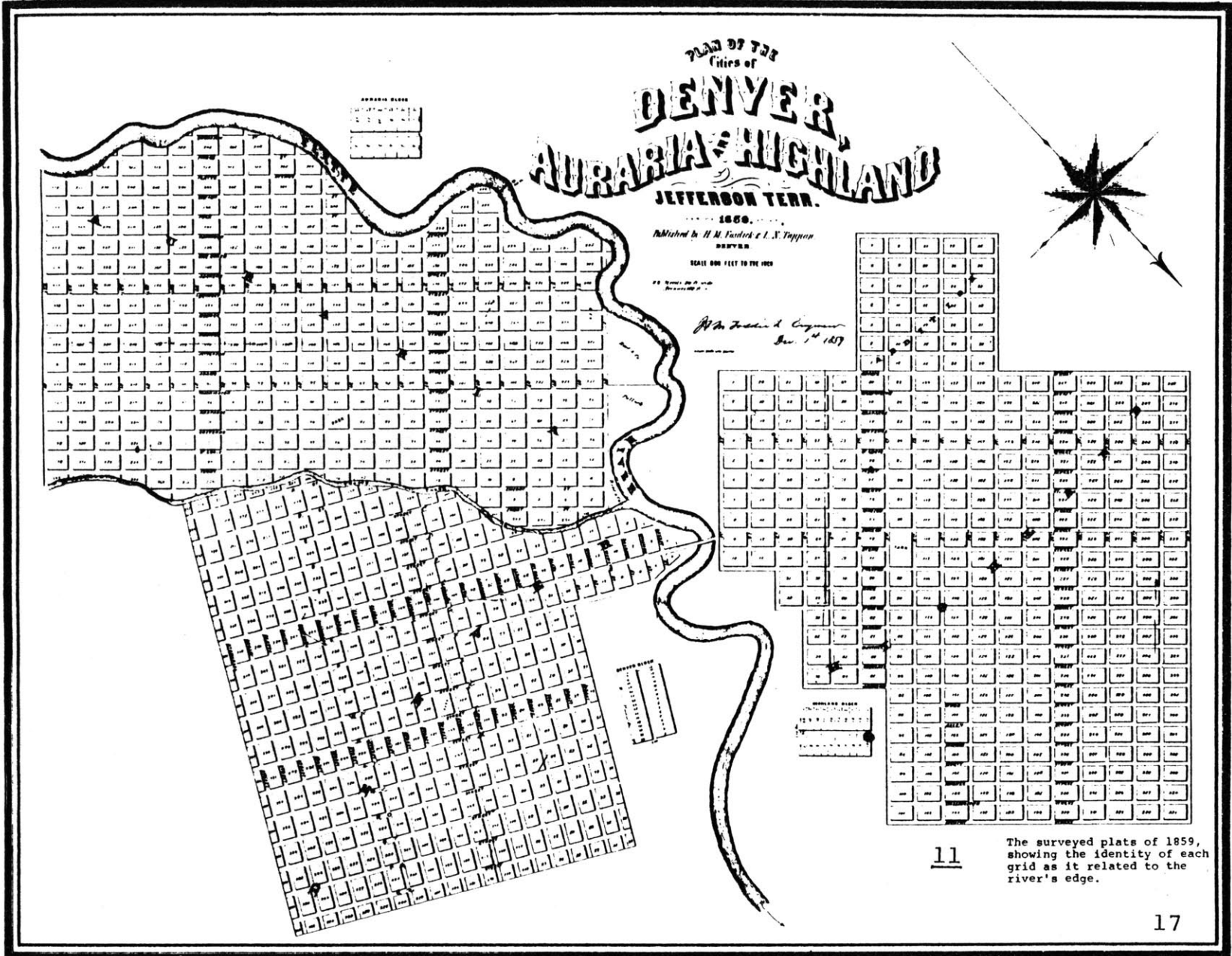


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Although early settlers took Indian land they failed to take Indian advice about the dangers of flooding in the river valley. Several floods have destroyed buildings in the Platte River Valley, the first of which was in 1863. Since that time a series of dikes and dams have been constructed, the most recent of which was built after a flood of the valley in 1974.

As a result both of a city-wide fire in 1864, and from continued fear of Indian attack, Denver enforced an ordinance requiring all buildings within the center city to be of masonry construction. Bricks and stone quickly became a cheaper building material than wood after most of the trees in the river valley had been cut down for Denver's first ten years of construction.

Several feeble attempts to make Denver a river port failed because of the swiftness and unpredictability of the river's water level. By 1870, because of difficult terrain to the west, Denver was in danger of being excluded from the cross continental railroad system. A group of Denver citizens raised the funds to build a railroad north to Wyoming which connected with the cross continental railroad lines. The building of the railroad station and subsequent railyards in 1870 became a barrier between the city and the Platte River.



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The surveyed plats of 1859, showing the identity of each grid as it related to the river's edge.

Urban Renewal and Morphological Decay

"Age-old values and love affairs like the one between man and art have been broken by the machines, while the statues of the generals looking like traffic policemen watch the fleeting man over tops of the car."
C. A. Doxiadis 1

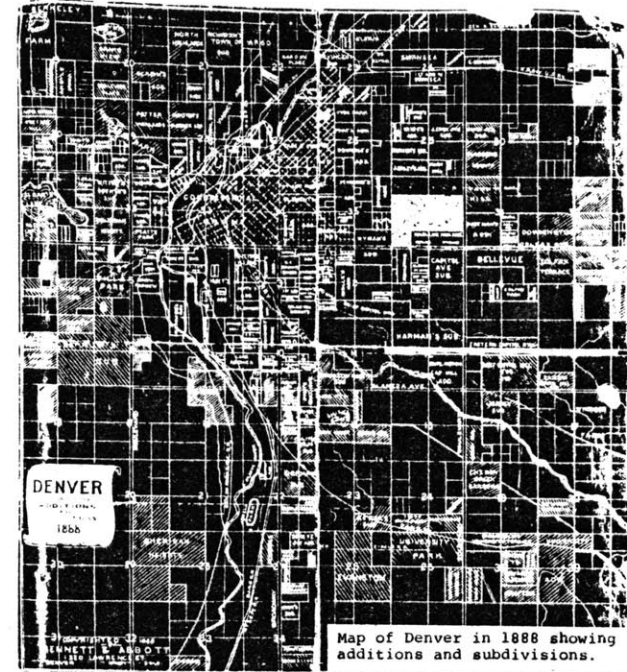
Soon after its establishment, Denver became a lively oasis of activity. It was a safe and welcome place to be, in contrast with the open harshness of the surrounding prairie.

In the 1860s a French mining engineer said of Denver that he was surprised to find:

"many attractive houses, churches and wide streets, quite open and planted with trees, the movement of life is everywhere, one would hardly believe himself at the end of the prairies, 2000 miles from New York."¹

In the 1880s suburbanization began around Denver with the birth of street car lines and increased land sales competi-

tions around the city. The center city remained an active transportation transfer point and business center, however growth moved outward in leaps, a trend which has continued to this day.



The building of interstate and city highways increased the development area around Denver from 59 square miles in 1941 to 118 in 1973. The Platte River Valley from the 1900s has become an industrial and railroad belt and interstate highway right-of-way, leaving large voids in the city fabric and inhibiting recreational uses of the river's edge.

During the first thirty years of Denver's history, public gates, parks and squares were established within the original city framework. Most all of these, however, were lost to increase vehicular circulation.

The federal housing act of 1949 offered funding to many cities through an urban redevelopment program aimed at "cleaning up



The "welcome" gate marked the entrance to Union Station Plaza. It was removed in the 1930s to clear lanes for vehicular traffic.

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A city monument marking the joint at the intersection of two grid directions. Later removed to allow for freer vehicular circulation.

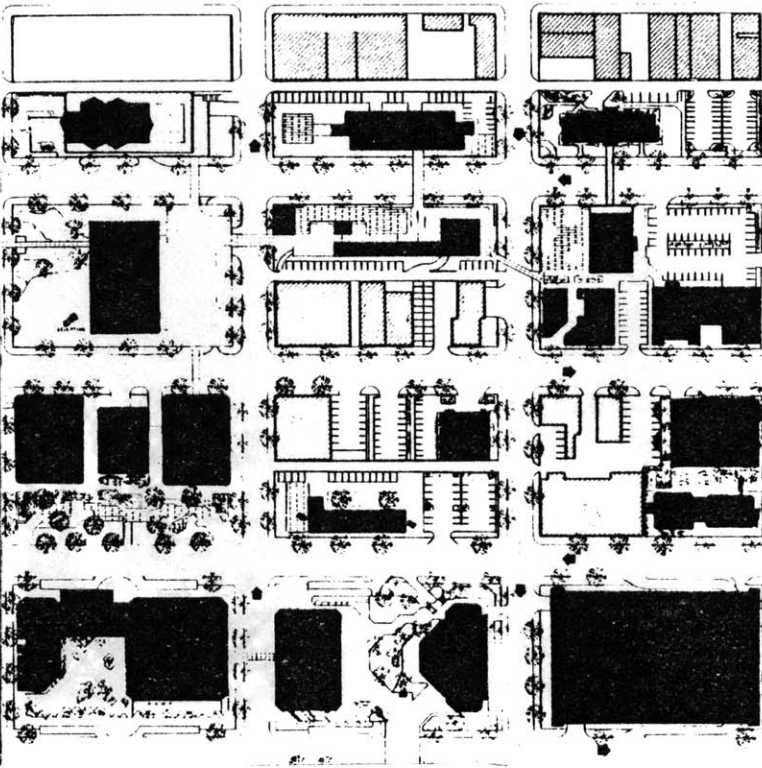
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The master plan for the Urban Renewal "Skyline Project."

Proposed buildings are dark and existing are cross-hatched. The new building emphasizes the separateness from the edge of the street and independence from adjacent structures. From "The Skyline Urban Renewal Project," September 1981.

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deteriorated downtown areas."

In 1959 the State of Colorado established an urban renewal program which made a clean sweep removal of many housing areas around the confluence site, including most of the original structures of Auraria. The plan was to build highrise centers, to provide an educa-

tional complex, highways and parking facilities in their place. Many of the intentions and goals for the river valley region are represented in the Van Schaack project, about which J. Robert Cameron made the following statement:

"Urban renewal planners in cooperation with traffic engineers and public works officials redesigned streets and eliminated the old grid pattern. These changes have made a more attractive development for the high-rise and townhouse units of midwest Van Schaack, and have enhanced the design of the neighborhood shopping center."³

In this attempt to clean up Denver through Urban Renewal it is the feeling of many city residents that traditional regional identity has been lost to highrise office towers and parking lots. The new building edges do not relate directly to pedestrian uses.

Section III DEFINING THE TASK

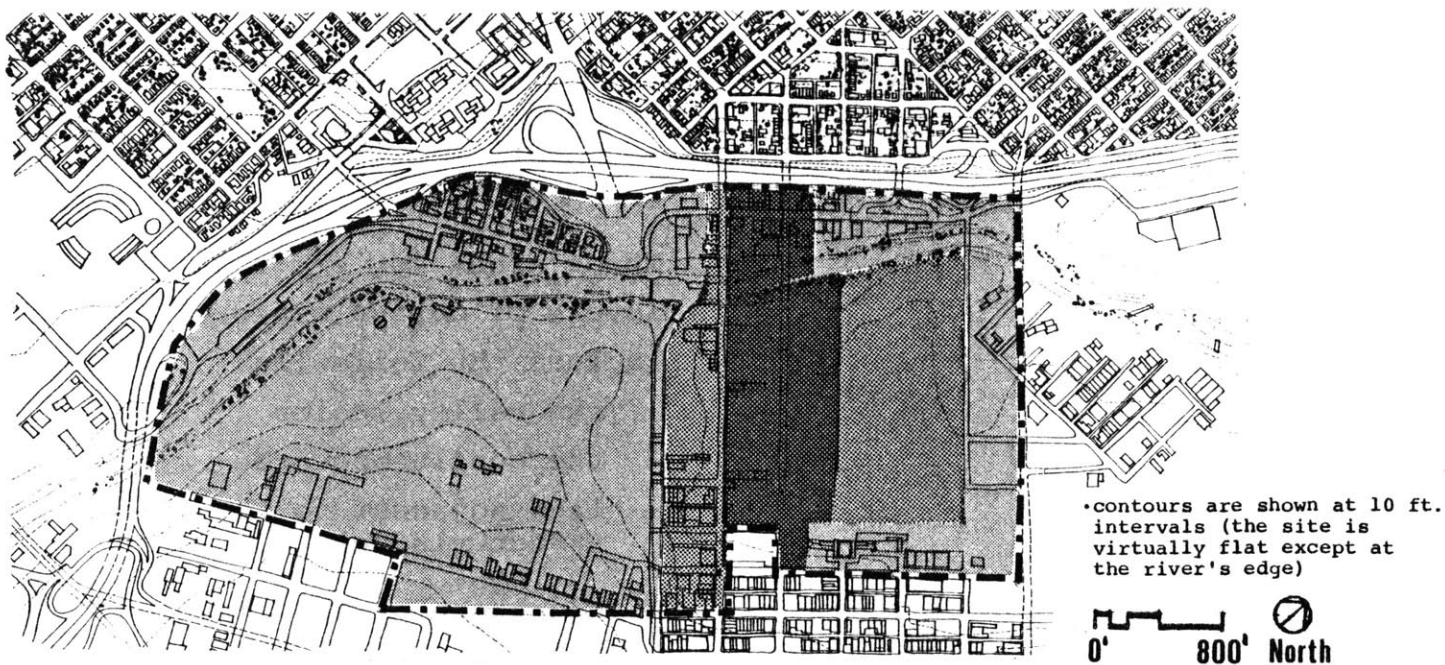
Site Description

The site I have studied for design projections is defined on two sides by existing city districts. A residential neighborhood to the northwest and Denver's "Central Business District" to the southeast. Two more sides, the northeast and south, are continuations of the river valley industrial belt. The site used in this thesis for design projections is presently scheduled for redevelopment by its major landholder, Burlington Northern.

Three areas for progressive levels of design explorations include the following:

- the valley region
- the confluence area
- land adjacent to the 16th Street viaduct

Within these areas a major ^{distinction?} destruction has been made between the northwest and southeast side of the river. Much of the southeast side is within the 100 year flood plain and has been designated as public open space for recreational uses. The northwest side of the river is presently developed to the river's edge. It is on higher ground out of the flood plain. On both sides of the river public right of way for pedestrian-related uses has been established. 21



The Platte River Valley at the confluence. I have identified three areas for different levels of design exploration:

- the valley region, for extension of city framework and movement systems
- the confluence area, bordered by Cherry Creek, the Platte River, Union Station and 19th Street, for extension of parcelling vertical and density
- the 16th Street viaduct for an infill study to show how a network seam might be supported through the building of adjacent uses

Because of strong solar radiation at Denver's altitude it is important to provide some protection at the building edge most of the year.

Denver's semi-arid climate requires irrigation for tree planting with the exception of areas adjacent to the river where trees grow due to river water percolation.

Winter and spring winds, most of which come down the mountain canyons to the northwest, also suggest some form of street level protection for the pedestrian.



View of Platte River from the
16th Street viaduct.

This drawing shows the approximate fault lines, commonly called joints, in the mountain structure near Denver. The axis and the three major peaks around Denver are located here



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Goals for Future Growth

Several plans for expansion of the city into the Platte River Valley have developed over the past fifteen years. To develop design goals in this thesis I have reviewed objectives which have been developed by four groups with interest in the area. These include the following:

1. Residents of Adjacent Neighborhoods;
2. The Platte River Greenway Foundation;
3. The Denver Mayor's Office;
4. Burlington Northern (the major land holder at the confluence).

Residents of Adjacent Neighborhoods

- allow for access to recreational uses at the river's edge;
- develop pedestrian connections with downtown Denver
- redirect through vehicular traffic
- maintain diverse character of existing neighborhoods by providing housing types for all levels of income
- preserve mountain views
- encourage multi-use areas with twenty-four hour activity
- allow for more privacy and identity in residential blocks.

The Boulder Colorado retail mall; a seam of pedestrian activity.

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The Platte River Greenway Foundation

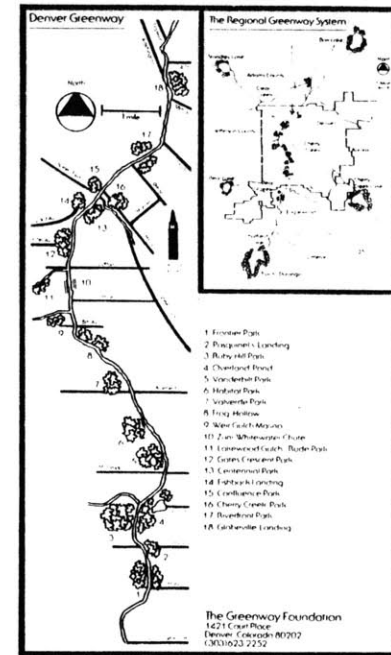
- revitalization of the Platte River as a natural landscape element
- protect the flood plains as open recreational areas
- build pedestrian paths and bike trails for recreational and transportation uses.⁴

The Denver Mayor's Office

- extensive improvement of the Platte River and adjacent areas for park and recreational uses
- intensive commercial development of the area between the river and Interstate 25
- a large park and recreational area south of the 20th Street viaduct
- relocation of existing railroad yards to create a high density residential and commercial "New Town" to span the Platte River in the central Platte Valley.⁵

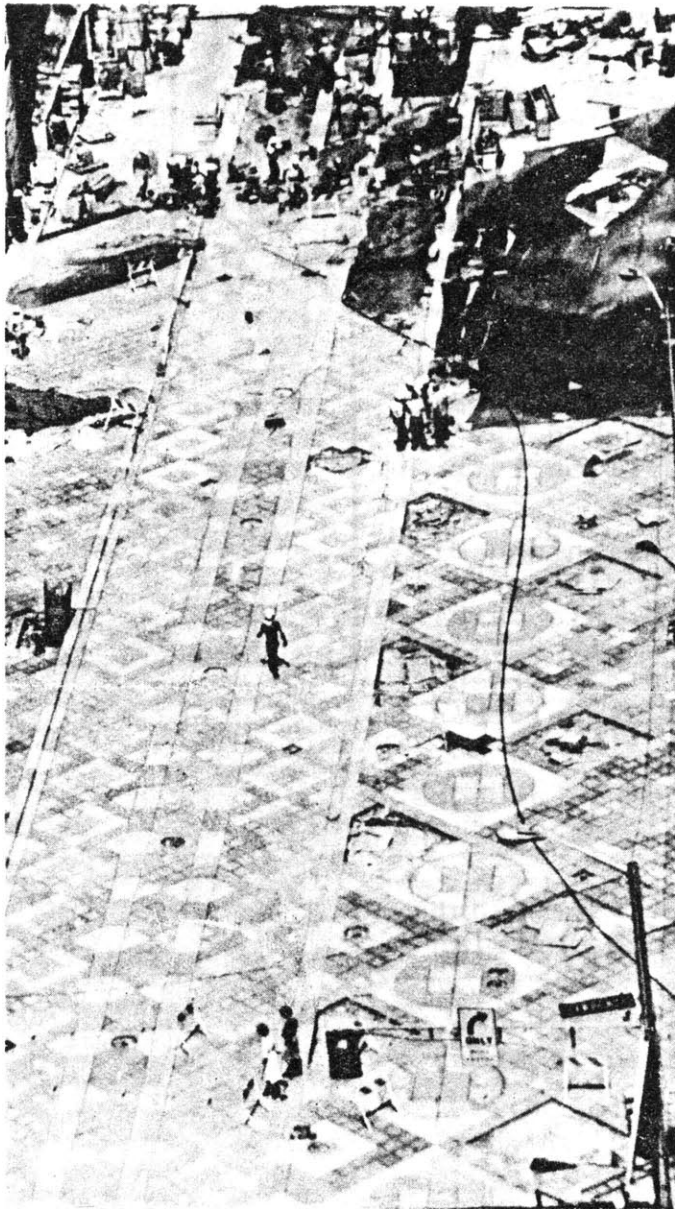
I have added the following goals;

- intensification of access edges to natural landscape areas
- establish a relationship to existing city networks (in this case, making a connection with both city vehicular systems and the 13 block downtown pedestrian mall on 16th Street)
- provide for pedestrian and bicycle movement from cities to neighborhoods (in this case, linking to the systems developed by the Platte River Greenway Foundation at the river's edge)
- provide tree planting, arcades and activity areas adjacent to public paths
- develop a continuity of planting and surface on pedestrian streets
- discourage vehicular through traffic in neighborhood areas
- develop a hierarchy of movement systems which allow for greater through traffic in areas of commercial activity which do not conflict with pedestrian continuity.



Proposed paths and bike trails along the Platte River Valley. Platte River Greenway Foundation.

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Observations made by Burlington Northern

- the study area has poor linkages to the central area of Denver
- the Platte River Development Committee has prepared plans for, and the city is developing, a linear park along both sides of the South Platte River, with special focus on the original pioneer settlement location at the confluence of the South Platte River and Cherry Creek
- high levels of air and noise pollution occur along the viaducts and immediately adjacent to Interstate 25
- a 16th Street mall extending from Arapahoe Street to Broadway is proposed as a catalyst for strengthening the retail core area
- relocation of railroad activities will create opportunities for riverfront development along the South Platte River and Cherry Creek
- excellent mountain and downtown vistas can be provided from the two major development parcels.⁶

Formal Assumptions

Continuity and Identity

From the goals outlined, two perhaps seemingly contradictory objectives for the Platte River Valley were developed. The first dealt with the issue of continuity. There exists a desire to create active links both to provide access to the river's edge and to mend the segregating gap made by the railroad yards.

One source of discontinuity in Denver is the decay of the relationship between traditional movement networks of the city and the spacial structure, either building or landscape, which support their use.

In writing about the spacial structure of streets, William C. Ellis projects a concept of street design which grows out of the positive elements of a region's tradition as well as more recent design concepts;

"The notion of an equivalency between the solid and spacial elements of a city is an important one. The exterior spaces of the city are the rooms of the city and the built structures are the walls of those rooms. The walls owe a responsibility to the formation of those rooms. The interior functional considerations of creating exterior space." ⁷

The second goal observed was to establish identity through individual districts in the city which residents might refer to as their neighborhood. Kevin Lynch noted the importance of the identity of a neighborhood size in the following passage;

"The issue of physical size may indeed be meaningful, and even generalizable, at the scale of the very local unit, within which people are personally acquainted with each other by reason of residential proximity, and where size plus other features such as social homogeneity, street pattern, identity of boundaries and common services play a definite role in promoting control, present fit, and sensibility." 8

Although these may appear to be opposing qualities, interconnecting and balance may be developed, as found in the traditional street model of Denver, through the contrast and reconciliation of opposites.

Section IV DESIGN METHODS

An Incremental Process

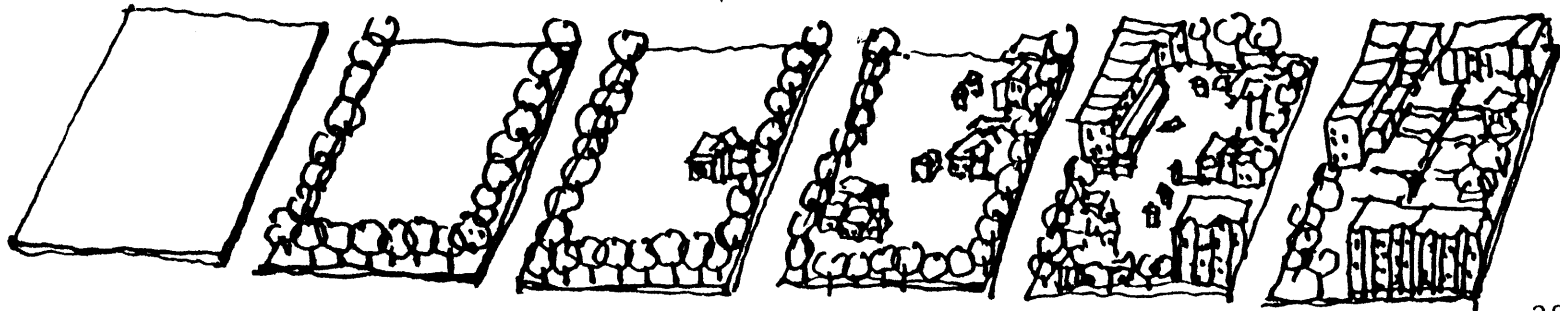
Street grids have a long history of use both in Europe and in the Americas. The ancient Greeks used the grid to achieve a predictable order and egalitarian division. It acted to represent a stable social framework which allowed for a variety of densities and organic growth within it. Its most obvious attribute, as in Denver's case, was that it allowed for expedient development of land. Yet these qualities were quickly overshadowed by its continued packing into open space. "It was less the first grid-iron plans, which, in most cases were too modest in size to be offensively dull, than the later extensions of cities that violated good sense in community planning. Without regard to topography or, more importantly, failing to include in the additions to the city some of the open spaces of the original design, these new areas mechanically repeated almost endlessly the grid street system without any relieving features."⁹

I have used a block-like system of sizes with a hierarchical movement network and a positive landscape form to give the design projection identity.

The following terms define the basis for a method of analysis and extension:

A sketch showing the layering process of Denver's settlements before 1900.

- the establishment of gridded plats
- the planting of street trees
- lower density inhabitation of the block away from busy cross streets
- the building of higher density residential and commercial sections of the block closer to cross streets
- the establishment of semi-public inner block territories



Layering; Kevin Lynch defines the use of layering "as a deliberate device of aesthetic expression ... the visible accumulation of overlapping traces from successive periods, each trace modifying and being modified in time."¹⁰

Incremental Phasing; This allows for the elements of time and size to become part of the design process through the identification of morphological elements and their relative sections; incremental phasing allows for participation and growth at the user level of decision making. The street block has been the traditional element of incremental phasing in Denver. Its simple use lacks the quality of identity and range.

Frameworks, Networks and Infill

"Now it is impossible to conceive of social relations outside a common framework. Space and time are the two frames of reference we use to situate social relations, either alone or together." 11
Claude Levi-Strauss

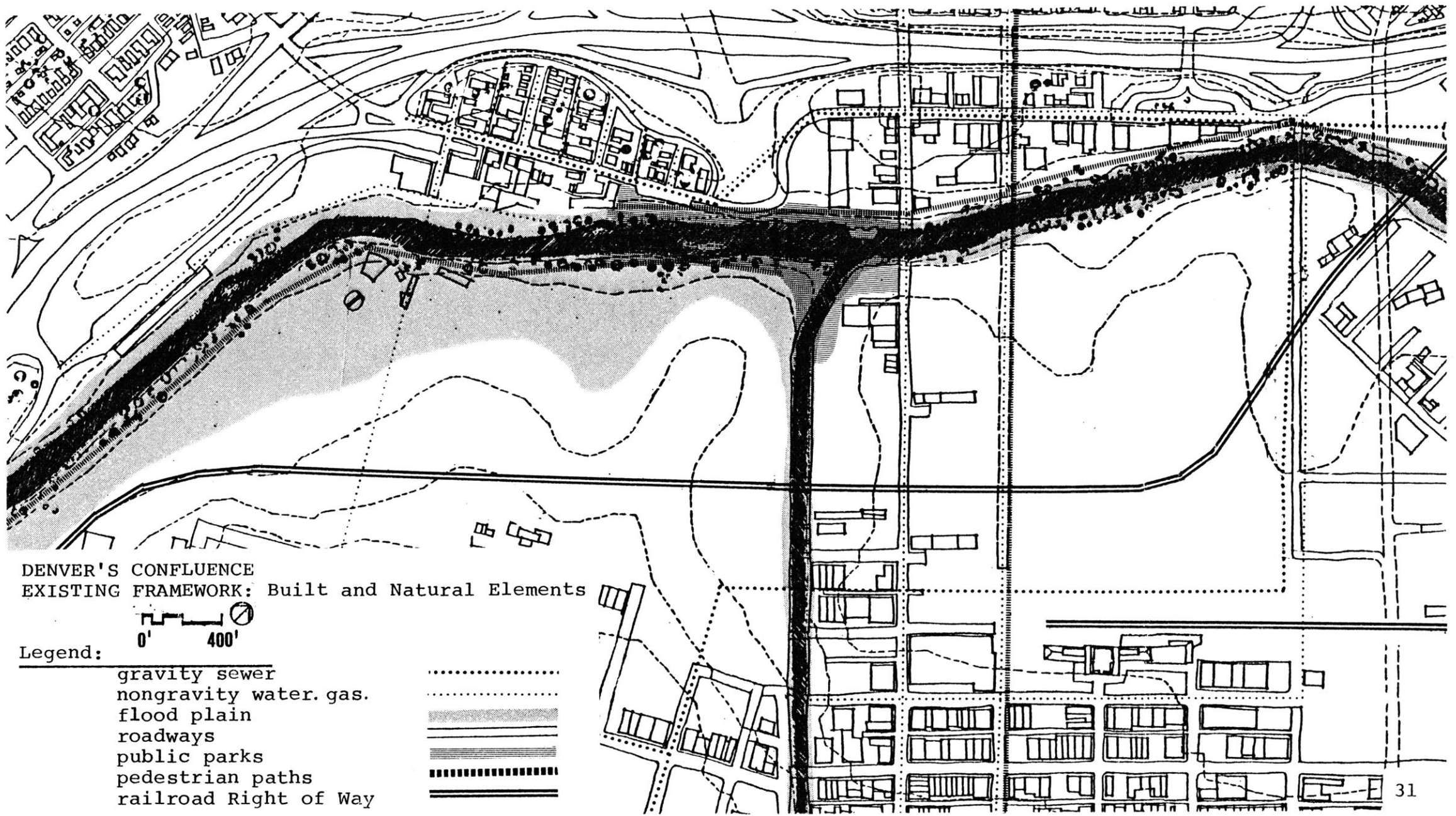
In making projections for extending the city after primary goals and objectives have been developed, a secondary consideration is the formal relationship between a network of movement systems and adjacent buildings or landscape. The spacial structural relationships of the city may be referred to as a morphology created by the interaction of three identifiable systems: framework, network and infill. I have used these systems first to analyze existing conditions and then to project extensions. The objective of this system is to create a continuity with the existing morphology of the surrounding area while still allowing for a range of identities within new growth.

The framework-network-infill system for describing urban morphology was used in a study for the revitalization of downtown Santiago, Chile in 1979. The study "Revitalization y Estructuration el Centro del Santiago" was done by Halasz Underhill and the Catholic University of Chile and gave the following definitions:

Framework: "The framework is the largest, most permanent element of physical organization; it changes least and is therefore the most neutral part of the system." 12

As framework elements, I have included the following:

1. climatic conditions, wind and solar;
2. natural landscape, mountain views, Cherry Creek and the Platte river;
3. street organization, the existing city grid;
4. utility infrastructure, power, water and sewer;
5. passenger and freight rail systems.

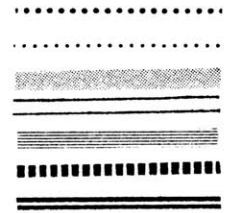


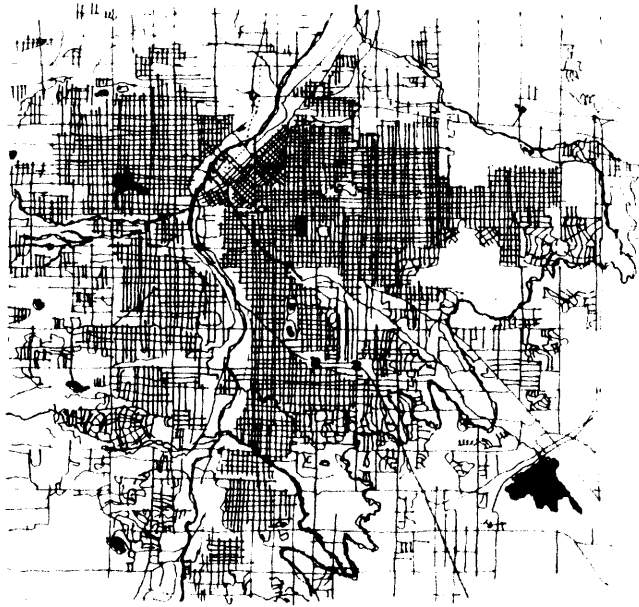
DENVER'S CONFLUENCE
 EXISTING FRAMEWORK: Built and Natural Elements



Legend:

- gravity sewer
- nongravity water. gas.
- flood plain
- roadways
- public parks
- pedestrian paths
- railroad Right of Way



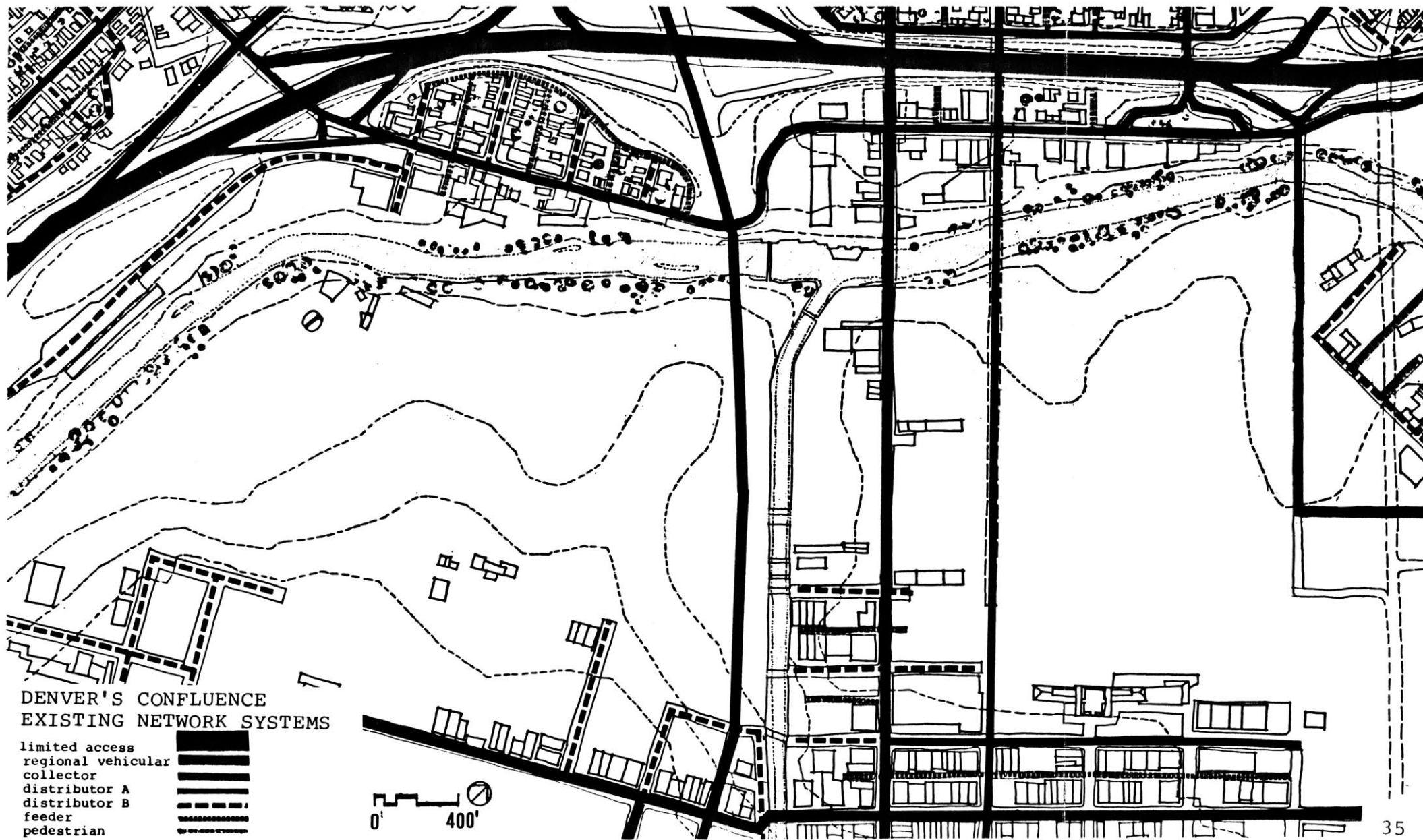


Map of Denver showing major street framework and landscape elements.

Network: "Networks refer to the lines of movement within the framework. The network is three-dimensional and includes movement of people, services and goods. Network components may or may not correspond with the framework." 12

I have included the following as network elements:

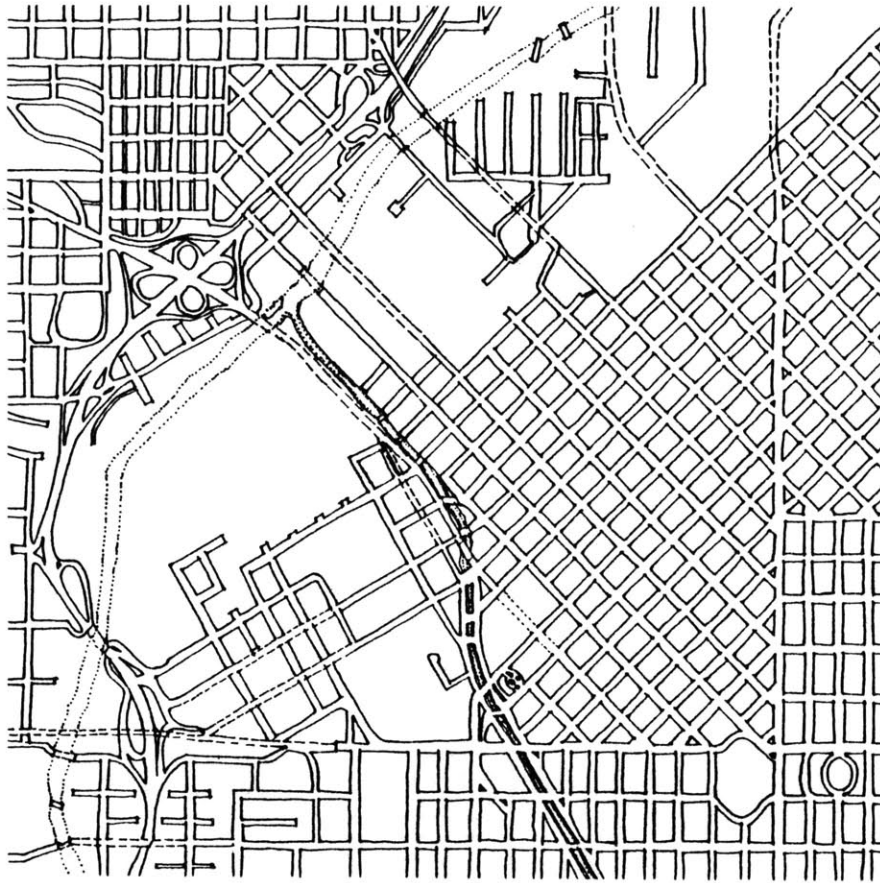
1. regional transportation systems
 - bus routes;
2. regional vehicular movement systems
 - a. arterial highways
 - b. collector avenues;
3. local vehicular access systems
 - a. distributor streets
 - b. feeder streets;
4. pedestrian access systems
 - a. pedestrian paths with regional connections
 - b. pedestrian paths within a vehicular network;



DENVER'S CONFLUENCE
EXISTING NETWORK SYSTEMS

- limited access
- regional vehicular collector
- distributor A
- distributor B
- feeder
- pedestrian





Larimer Street elevation,
showing continuous building
edge at the street.



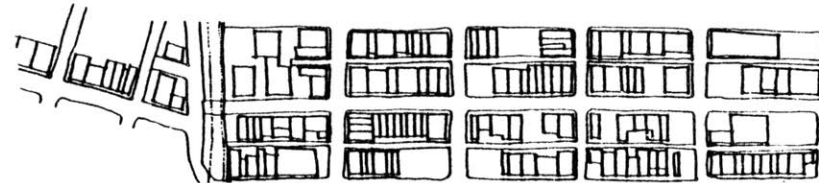
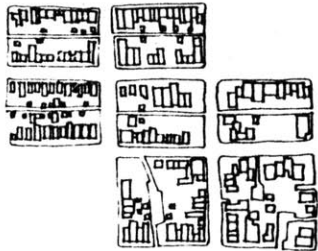
Infill: "Infill is the smallest part of the tripartite system, most susceptible to change and adaptation; therefore it has the shortest lifespan. Building lots, buildings and uses of buildings are examples of infill." 12

I have included the following as elements of infill:

1. Megaform - a large support structure for smaller forms. The megaform has a longer life span than the forms it supports and is less flexible. It may be referred to as a collective form, or infrastructure, less defined than the forms it supports. In Denver the traditional street grid and the continuous building facade, which allow for changes to occur within its structure over time, may be called a type of megaform;

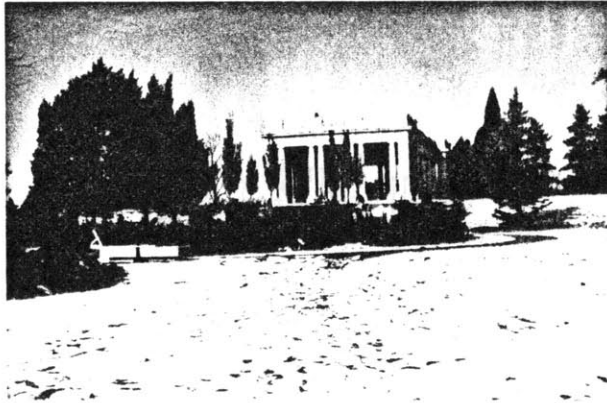
2. Aggregate Form - a building form of a typical size which may be added to incrementally. The size of an aggregate form is based on the area needed to support a residential or independent commercial use. An important characteristic of an aggregate form is its linking component which may allow for a variety of connections, spatial or continuous over time. Many examples of aggregate forms may be found in Denver. Three common types are the residential detached townhouse, the continuously built row houses and the continuously built commercial block.

Typical infill of residential densities from the neighborhood north of the Platte River.

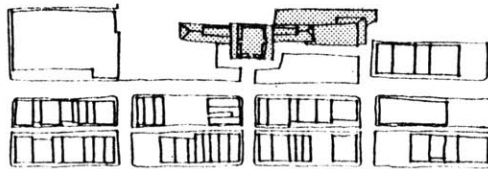


Site map of typical street building in pre-Urban Renewal Denver, showing their continuous relationship. These buildings often shared party walls which made them structurally interdependent.

An example of a typical townhouse of the 1890s in Denver, from the neighborhood north of the Platte River.



A detached pavillion in a Denver park, illustrates the more public nature traditionally given to compositional building types in Denver, Colorado.



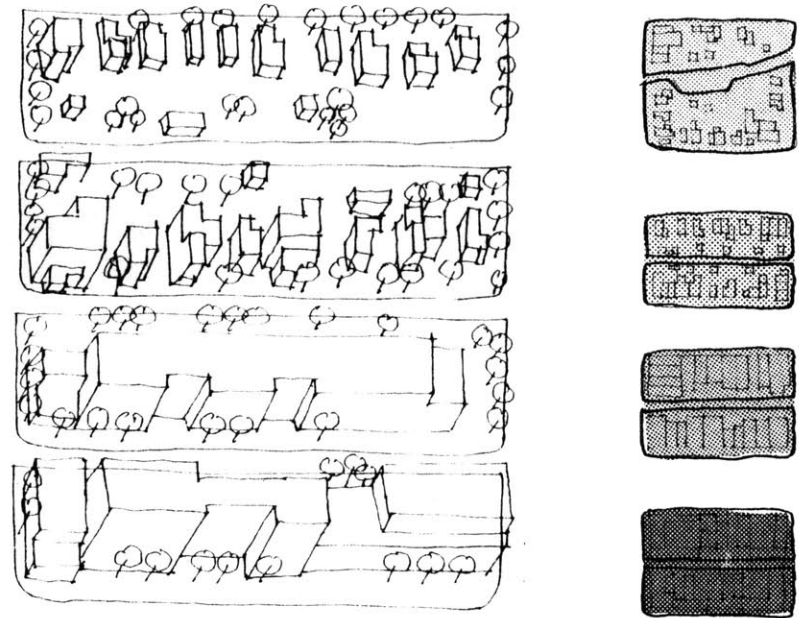
Union Station, a classic example of a compositional building type which establishes its meaning by not following typical infill to network relationships.

3. Compositional form - a discrete building form of some communal or symbolic importance located in space formed by the two previous categories. A characteristic of a compositional form is its singularity which normally lacks the linking component of the aggregate form. A subgroup of the compositional form is the monument. Both the compositional form and monument may be used to define a specific place or direction. In pre-1930 Denver examples of compositional forms and monuments were common. Compositional forms such as schools and churches were often located at specific street intersections. Union Station, which defined both the termination of a downtown street and the edge of a public plaza is an example of a compositional form. Before their removal to allow for increased vehicular traffic, monuments and gates defined public city places within Denver's street grid.

OBSERVED DENSITIES

Four basic FAR densities have been observed in areas adjacent to the site. I have identified these as FAR of 1.0, 1.5, 2.0 and 3.0. It is not the objective of this thesis to design infill of these various categories but to provide a framework whereby they might exist.

1.0
1.5
2.0
3.0



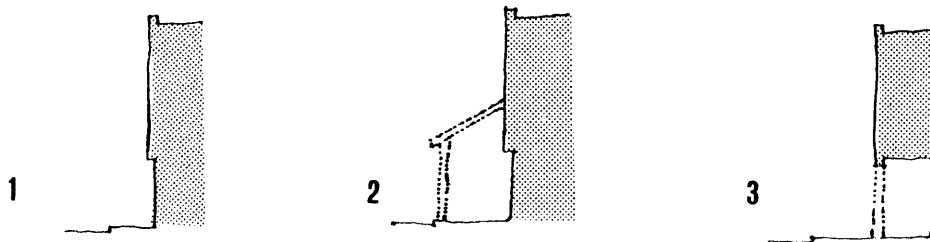
Sketch of Tabor House, Central City, Colorado.



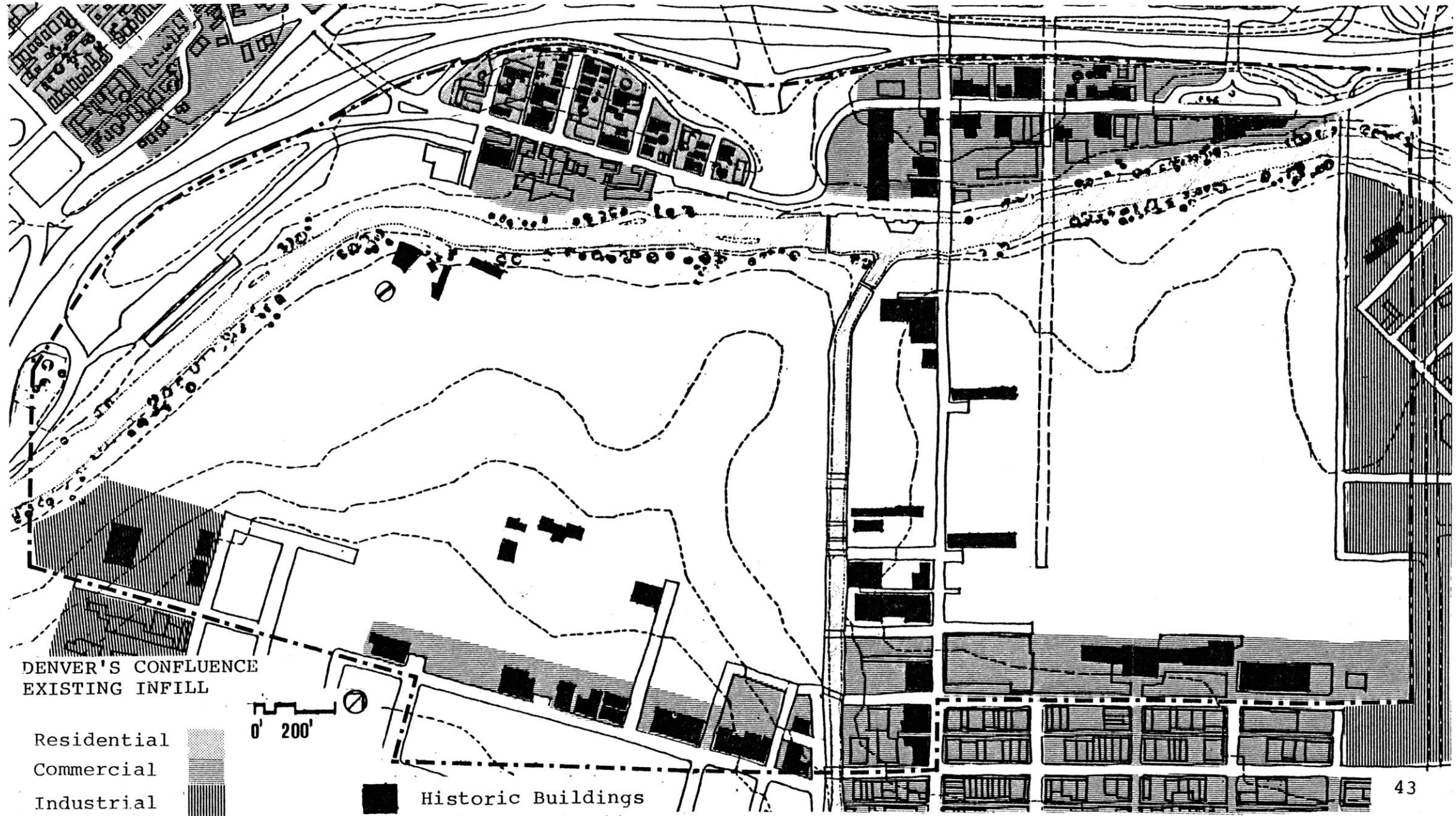
A three-part illustration of the evolutionary development of commercial street edges in Denver, Colorado

The earliest buildings were of a type brought to Denver from regions of different climates. Through the gradual adaptation to the intensity of the Colorado sun and a desire to encourage retail trade, successful structures were modified at the edge.

1. the building type before modification
2. application of adjacent structure to existing building
3. later modification of existing structure by removing first bay of cluster, at street level, arcade built into new structure



Little has been written about this sequence of edge change. My observations come from examination of photographs taken between 1857 and 1900. By 1867 the incorporation of a street level arcade appears to have been a common practice.



DENVER'S CONFLUENCE
EXISTING INFILL

Residential
Commercial
Industrial

0' 200'

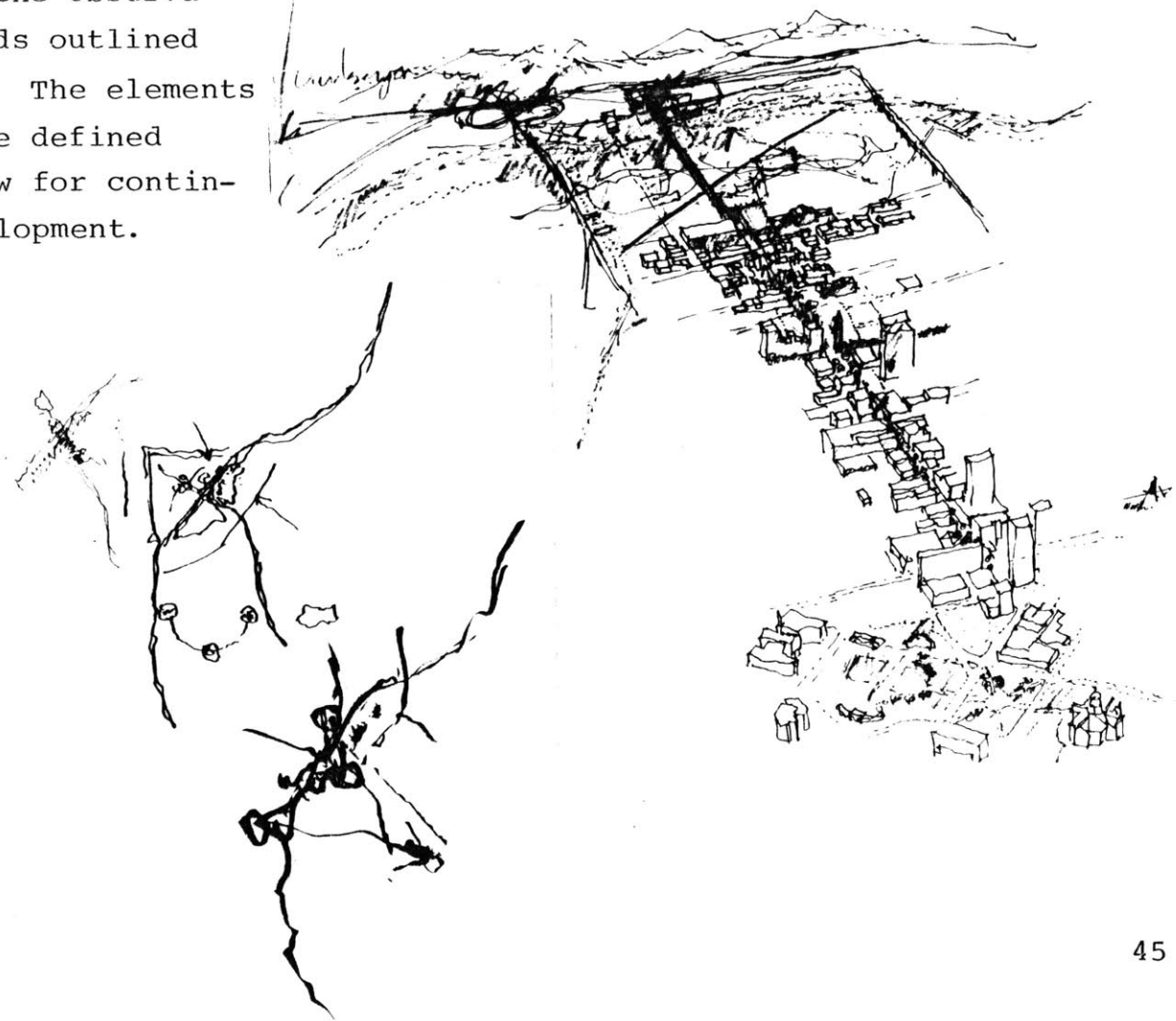
Historic Buildings

Section V PROPOSALS AND STRATEGIES

The following design illustrates a process which uses the observations goals and methods outlined in previous sections. The elements used in the design are defined incrementally to allow for continued analysis and development.



The existing 16th Street viaduct. The viaduct was constructed nearly 60 years ago to cross the railyards and connect neighborhoods at a higher elevation northwest of Denver with the central business district of Denver. The viaduct, which is structurally unsound to continue its present use, acts as a pedestrian as well as vehicular link.



"Seams" As Edge Extensions

I have proposed mending the gaps in Denver's fabric with seams. A seam is a form of continuity which brings together segments of now unrelated city fabric. They may be built edges or built edges to landscape edges, which allow for continuity and exchange of public activity.

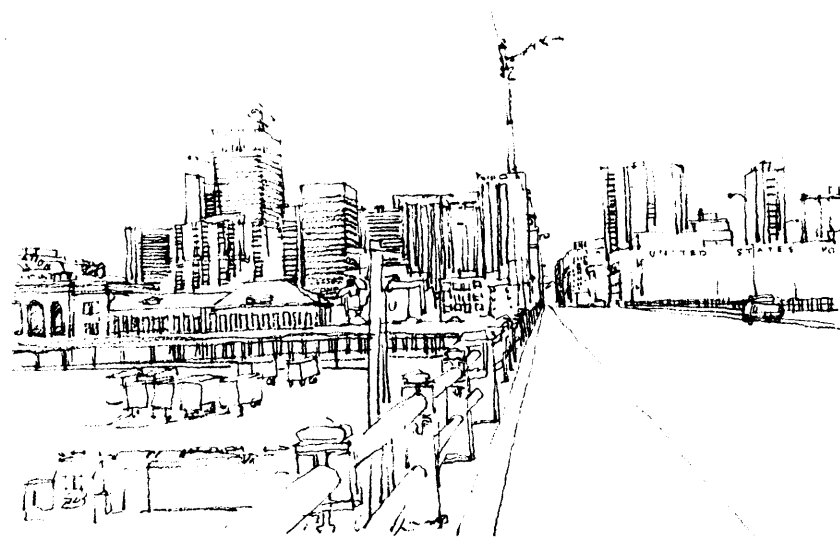
"An edge may be more than simply a dominant barrier if some visual motion penetration is allowed through it-it is, as if it were structured to some depth with the regions on either side, it then becomes a seam rather than a barrier, a line of exchange along which two areas are sewn together."

Kevin Lynch 11

This thesis identifies several locations in the Platte River Valley where seams might be

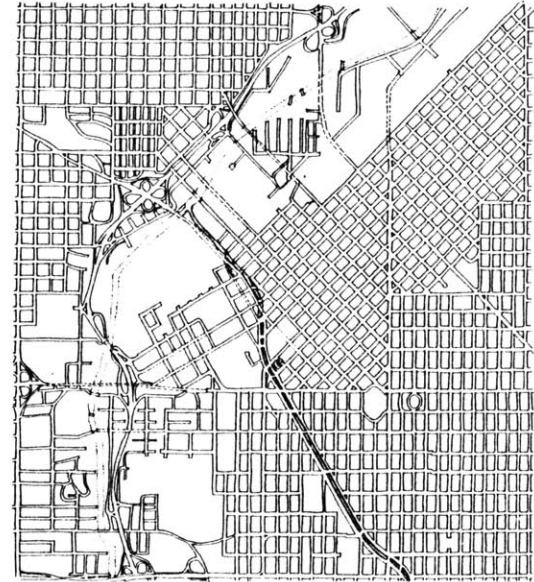
built. Primary is the continuous park edge along the Platte River which may support recreational activities. The 16th Street Viaduct, which for structural reasons is inadequate to support continued present use as a vehicular carrier, is identified as a pedestrian seam supporting bus transit between the 16th Street Mall and the commercial area on the north west side of the river.

View of Denver's central business district from the 16th Street viaduct.

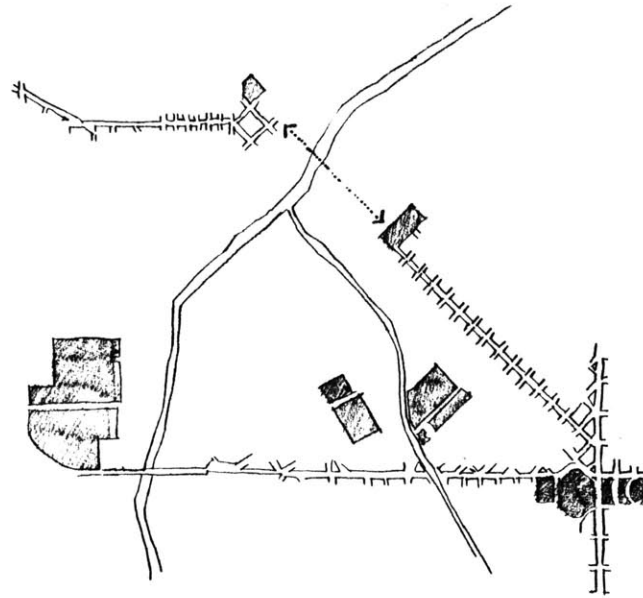




Identification of major public places and their joining links in Central Denver. The places are parks and civic buildings; (The State Capital and Union Station, commercial streets, Colfax and 16th Streets provide links between the places. This drawing illustrates the gap, now created by the railroad yards, between Union Station and the northwest bank of the Platte River.



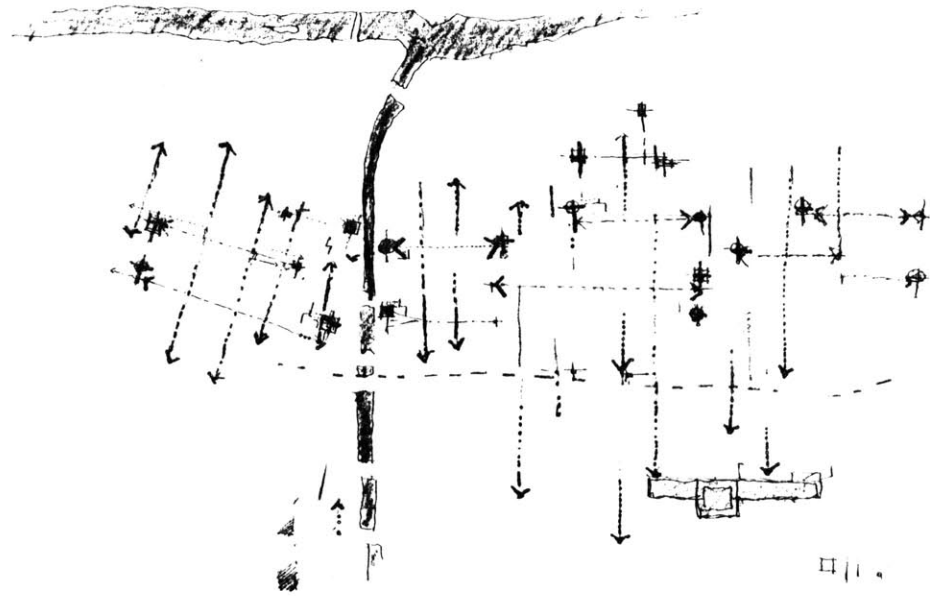
Street plan of Central Denver adjacent to confluence site.



Extending the Landscape

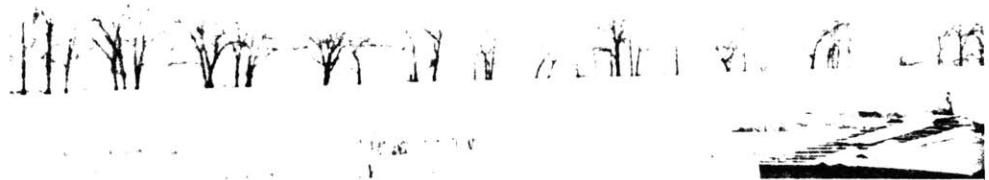
Through the quality of contrasts, landscape edges may give identity to building edges. The following outlines ways this might be done:

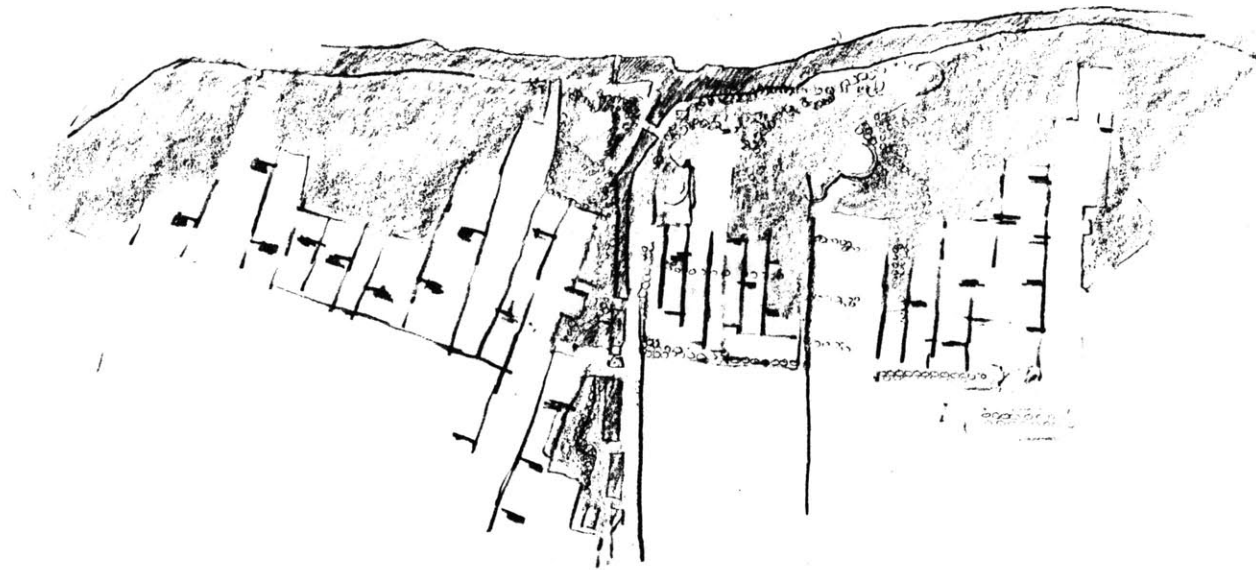
- developing a public access system based on the direction of the river
- by allowing public networks to reach the river's edge, while not cutting off public access to the river through the use of networks low in the system of hierarchy
- by allowing seams of open landscape to overlap with city extensions
- by allowing a landscape seam to penetrate building area with network elements
- through defining the landscape and city edge with continuous building forms and compositional buildings



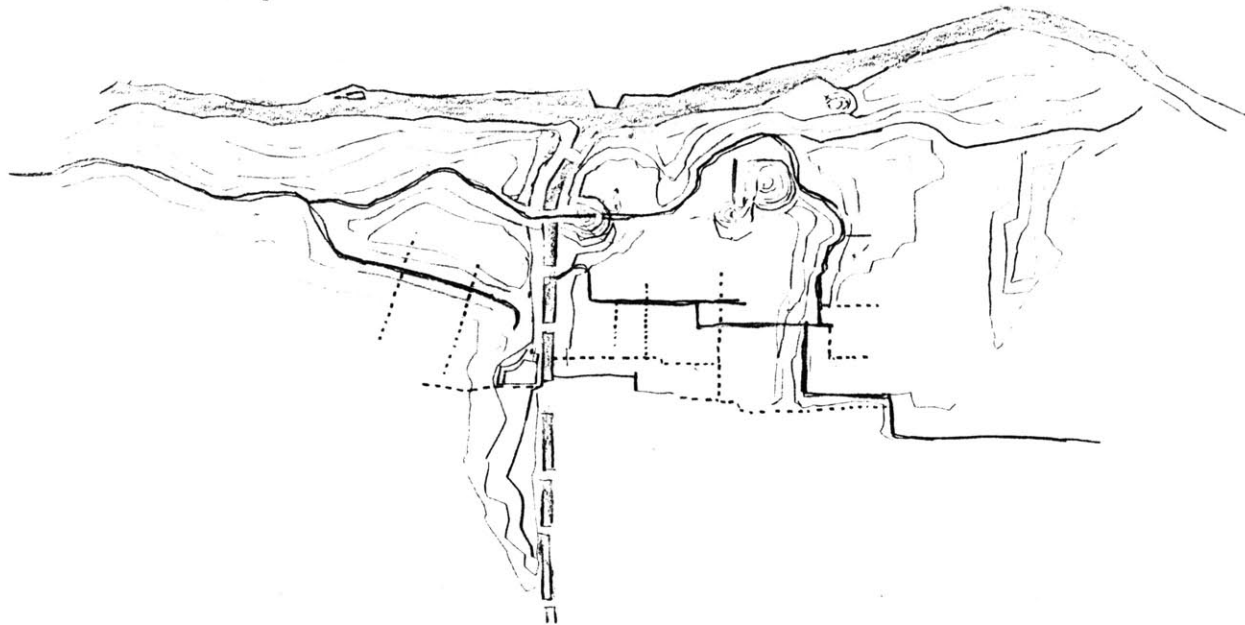
- creating network termination points through the use of compositional buildings, these may also reinforce a directional relationship by allowing for a landscape element to continue from the river's edge into the city.

The arrows represent desired links between now-segregated city regions and the Platte River Valley. If a design follows this directional orientation it would allow for a continuity to be established with the river. Dotted lines in the lateral direction indicate termination after a size has been established allowing for identity to exist at the edge of a continuous "seam."

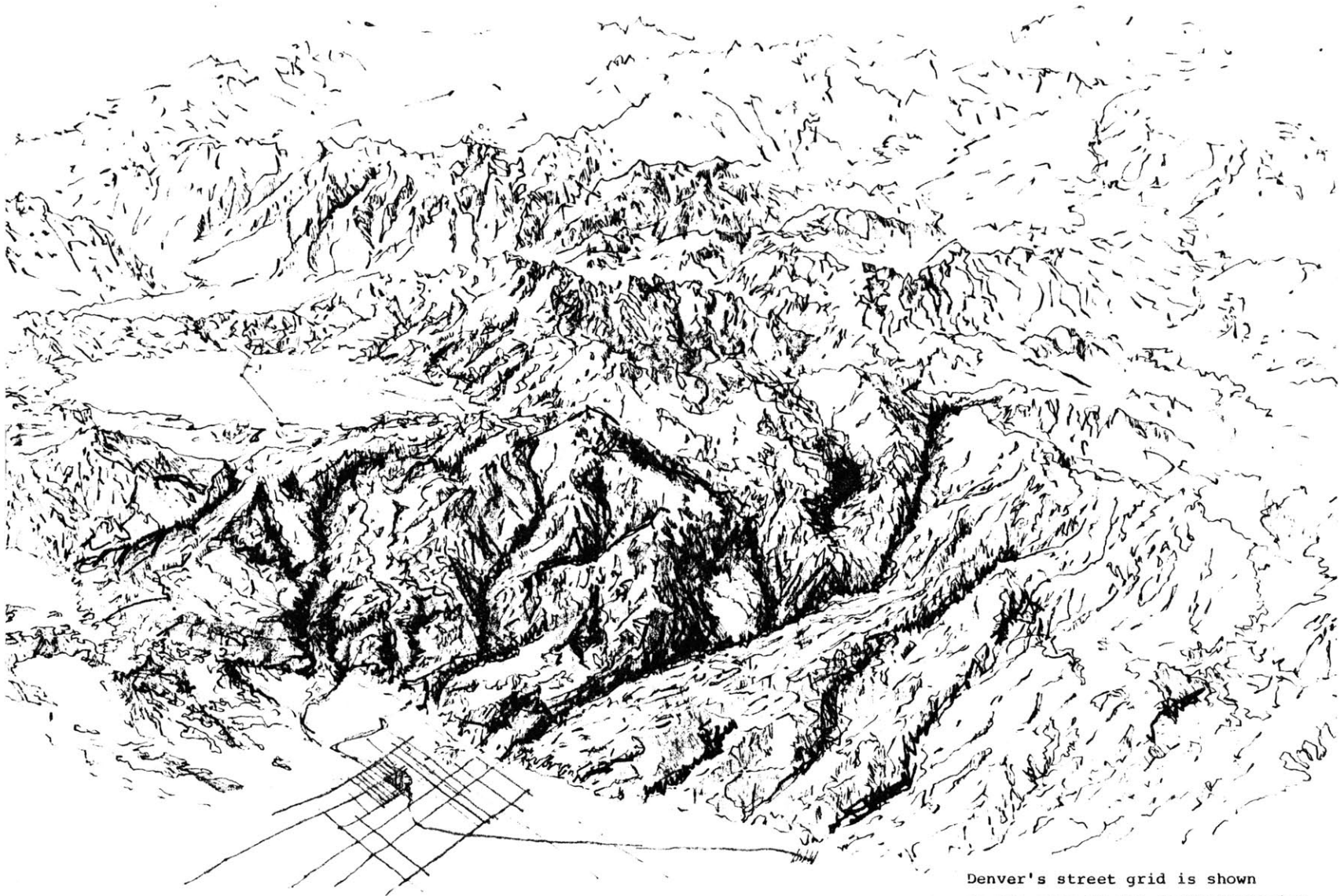




Design study showing landscape edge and continuity into the city structure.



Design study showing irrigation framework which would allow for continuous tree planting in Denver's semi-arid climate.



Denver's street grid is shown at the edge of the Rocky Mountains. River canyons cut through the mountain ramparts to the valley of the Platte River.

Extending the Grid

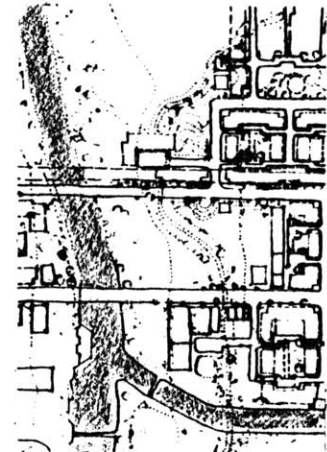
Denver's traditional morphological framework is its grid. I have analyzed the grid both for its positive and limiting factors. In a positive way it provides an easily understood unit for movement, orientation and growth. Through its permanence it also allows for a sense of continuity while still accepting flexibility within its structure. However, with its more uniform use in Denver, it lacks the quality of identity and greatly limits relationships between landscape and use differentiation.

The following list outlines deformation principles for grids which add a quality of identity.

- The development of a network hierarchy within the grid.
- This includes a range of vehicular and pedestrian movement systems allowing for each to claim greater stability within the grid. It may be done by reducing vehicular through traffic in some areas to provide more continuous pedestrian movement.
- By adding joints to intersections of network links. A joint allows for freer movement and place identity.
- Shifting the network around a framework or landscape element. This allows for the continuity of a direction or seam.
- Allowing for directional shifts and branching in network elements low in the hierarchy of movement circulation. This may occur within a block or semi-public zone.
- Deforming the grid at the edges. This may happen at a landscape edge.

In a study of Boston's Back Bay Bainbridge Bunting noted a quality of unity in the district which seemed to be lacking in the New South End. "Neither element, the lanes of traffic nor the lines of houses is strong enough to establish a dominant sense of direction, a feeling of ambiguity pervades. Nor is there a sense of spacial unity here. The pedestrian's attention is divided between residential streets and busy traffic ways; he discovers no focal points and no dominant and predictable order."

"In contrast to the cellular aspect of the New South End, a feeling of spacious unity pervades the Back Bay. The green mall down Commonwealth Avenue links the green open areas of the Public Garden and Fenway Park and serves as a channel to bring a sense of open country into the heart of the district." 13

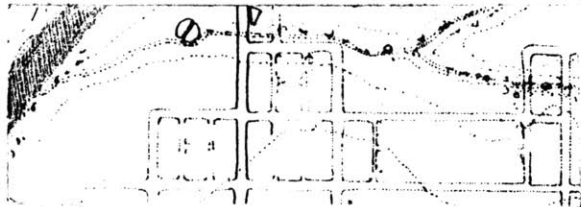


- By creating a range of block sizes. These may relate directly to the density of building within the blocks and the blocks' proximity to network elements of different hierarchies having greater public access and higher building densities which may support commercial activities, and by using longer blocks in residential areas of lower densities.








- Through use of partial blocks.

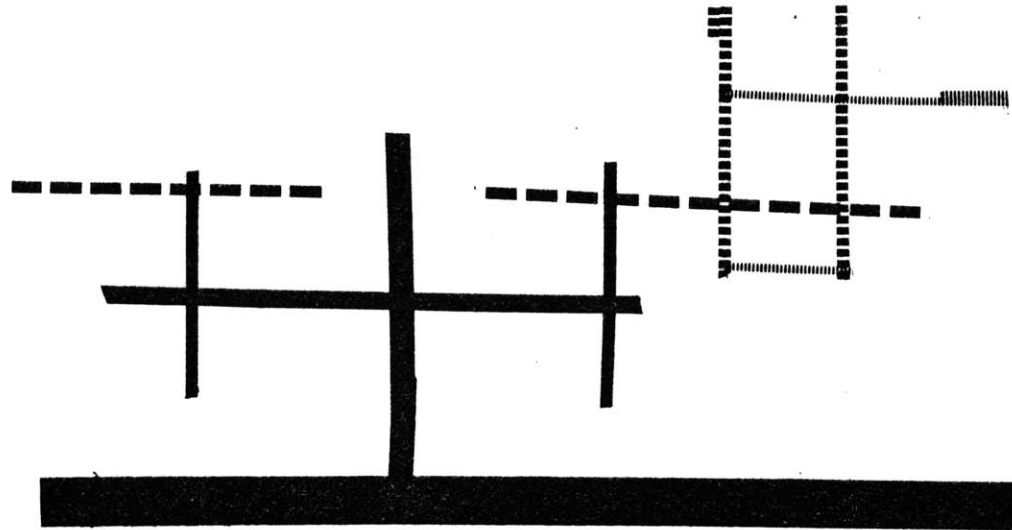
- By allowing a part of a network system to continue beyond the block into an open landscape. These conditions normally end at a point of arrival such as a public activity area at the edge of a grid.

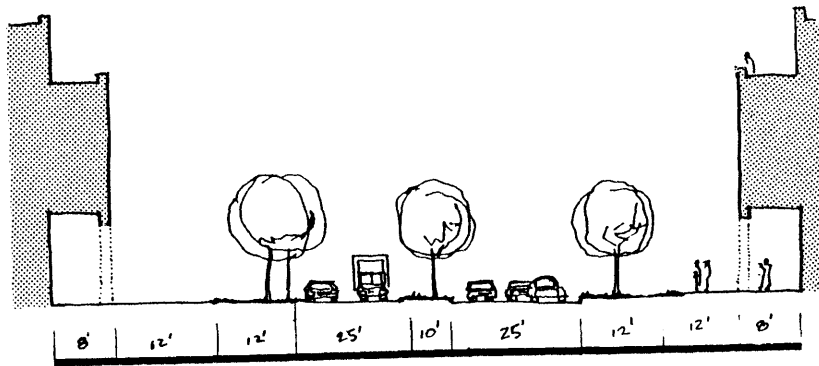
- Allowing for a change in network direction to correspond with a change in landscape. This may happen in a sloped area or at the edge of a river.



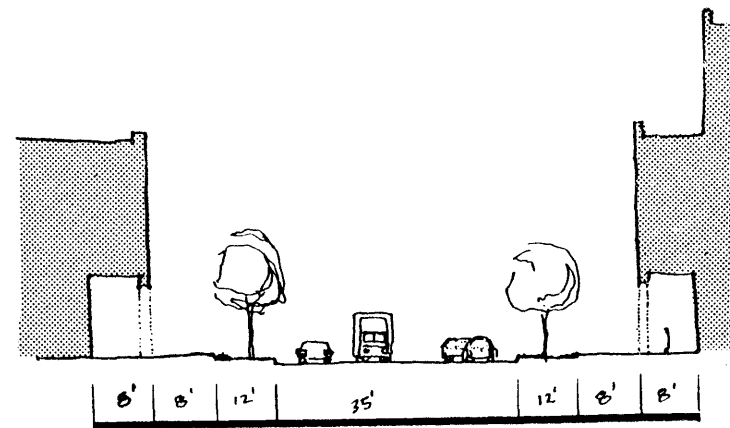
Network Hierarchies

Limited Access	
Regional Vehicular	
Collector	
Distributor A	
Distributor B	
Feeder	
Pedestrian	

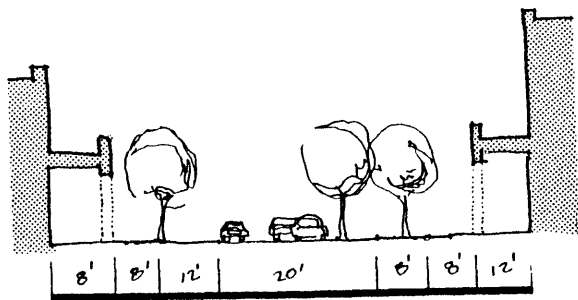




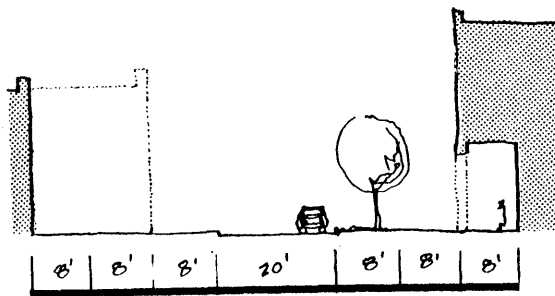
Regional Vehicular



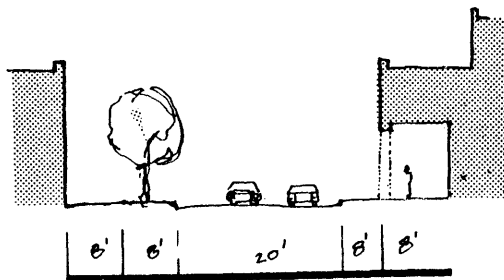
Collector



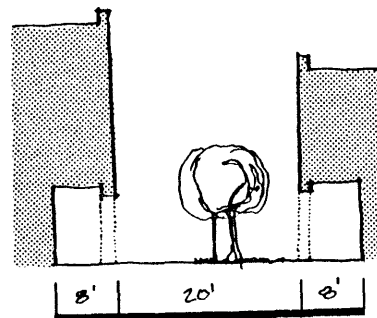
Distributor A



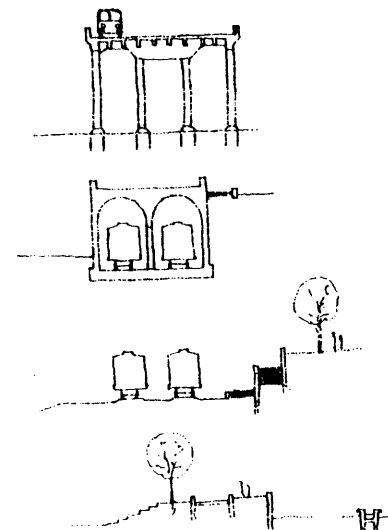
Distributor B

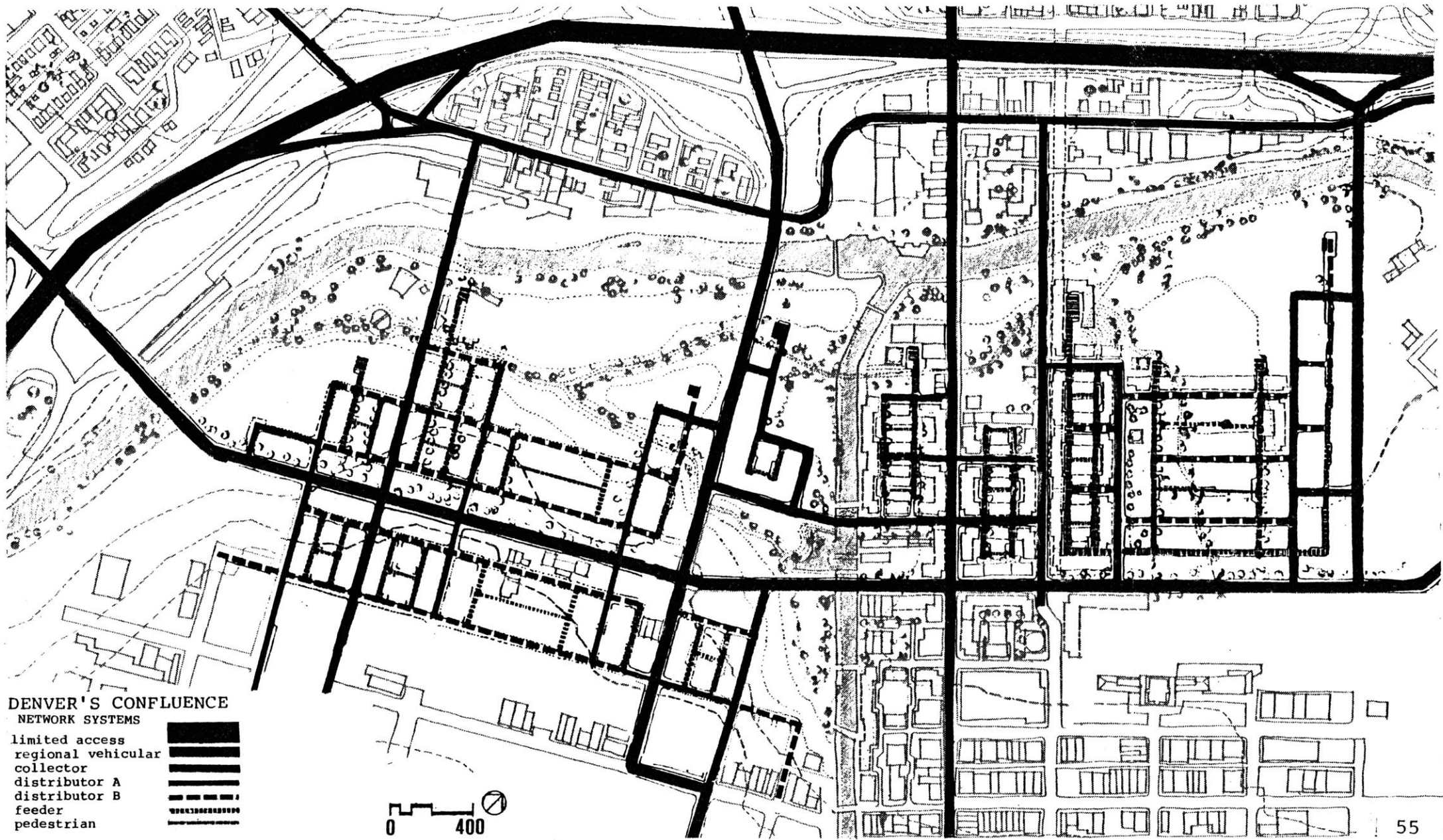


Feeder



Pedestrian





DENVER'S CONFLUENCE
NETWORK SYSTEMS

- limited access
- regional vehicular
- collector
- distributor A
- distributor B
- feeder
- pedestrian

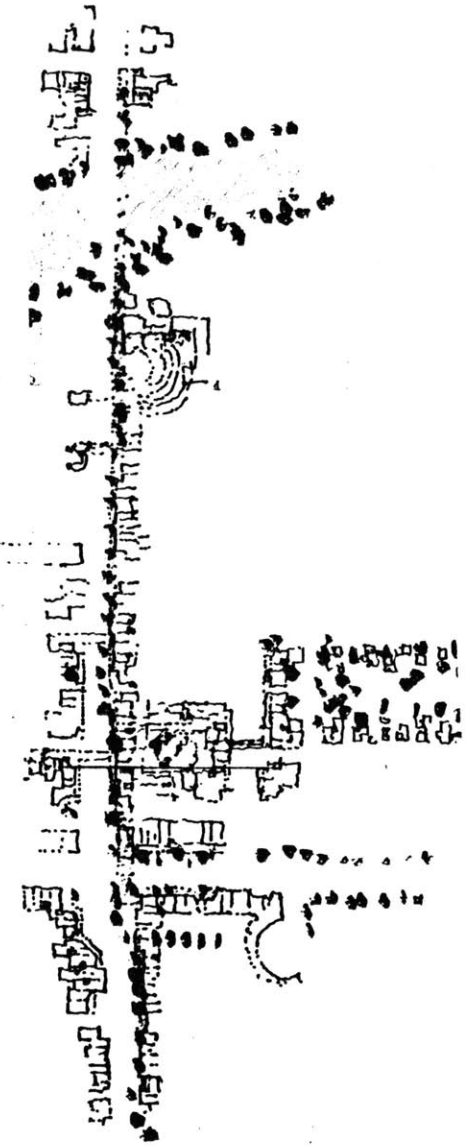
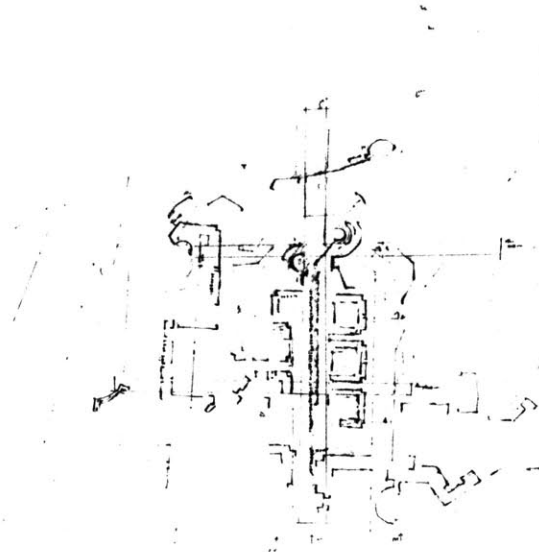


Inhabiting the Extension

An extension may have a range of densities. The more public seams which reach across the river to points of arrival support the highest density of commercial activity. These densities occur at the short ends of the block which add up together to build a continuous seam. Where the networks allow, the building forms of these blocks span streets below them with a raised access level.

The long sides of the blocks have lower densities, in most cases, residential. These are parallel with the flow of the river and allow for lateral networks off the river into block interiors.

The block ends therefore become megaform infill while aggregate forms between have a greater range of flexibility in orientation. They may also change more over time, in density and orientation without directly affecting the continuity of movement at the block ends.

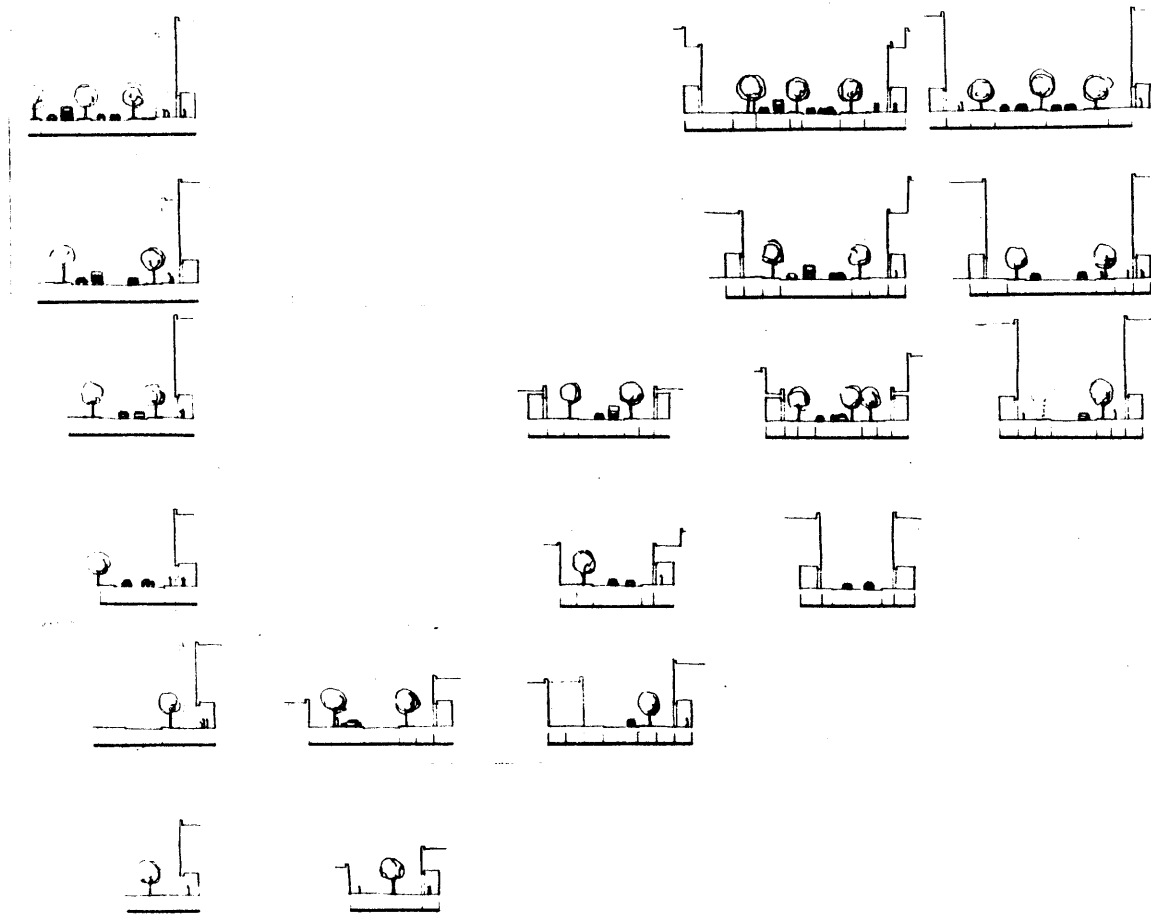
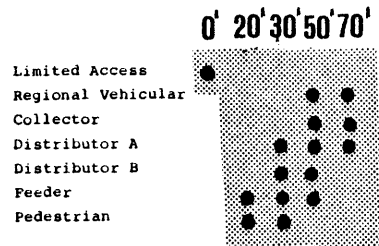


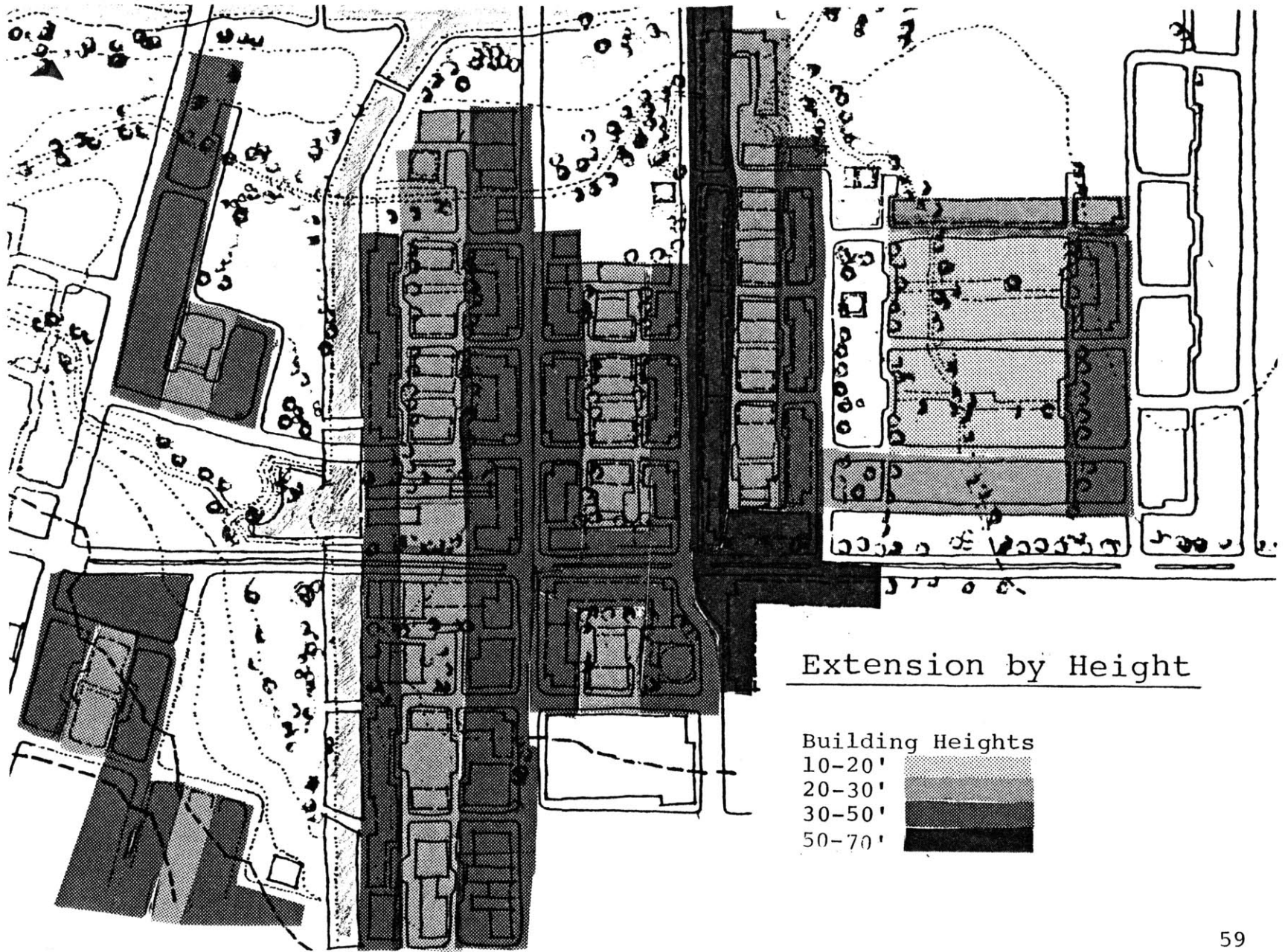
Design exploration of the infill of a seam.

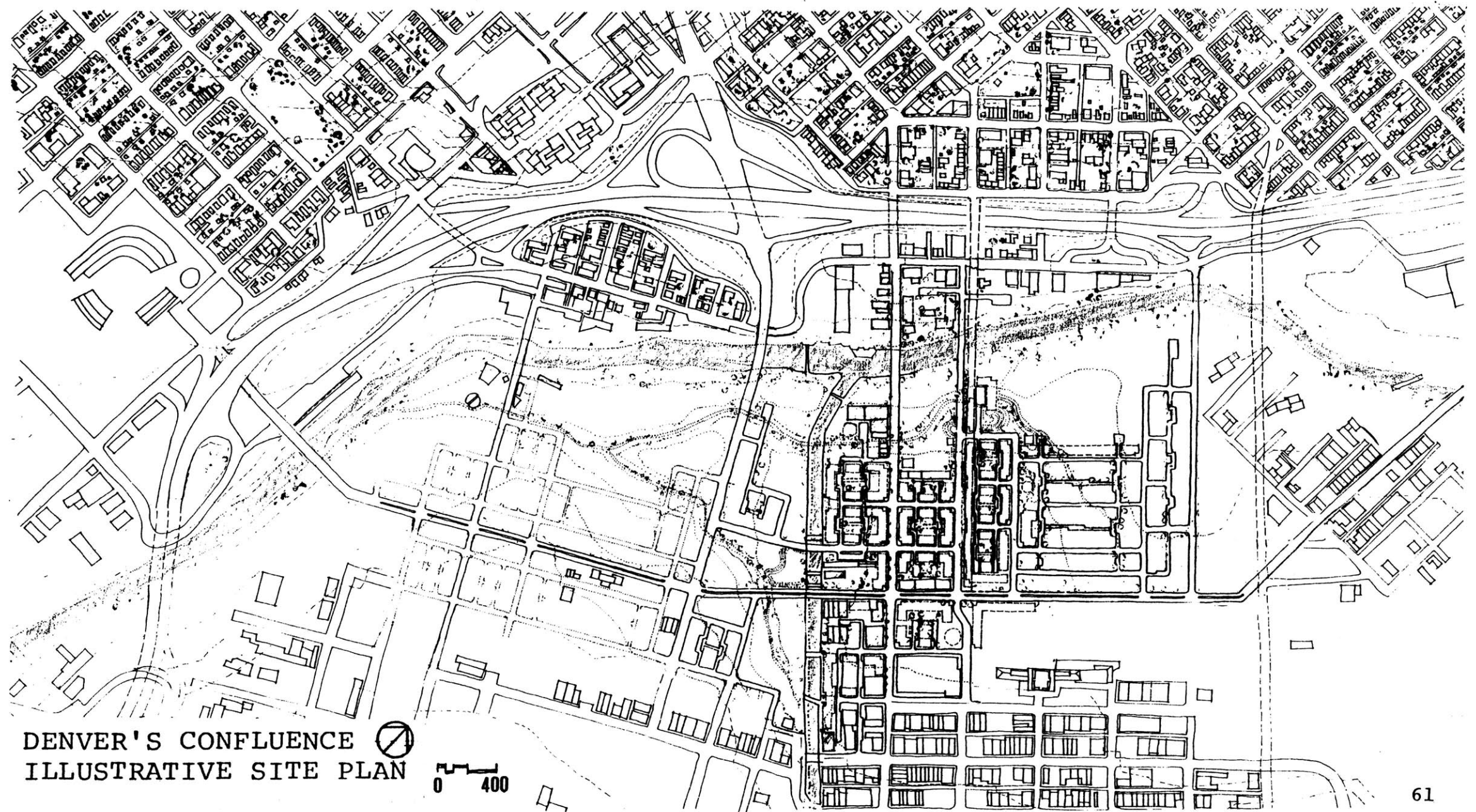
Network/Building Height Matrix

The matrix describes a hierarchy of street edge conditions. The network system may be directly related to the height of its adjacent building. It should be noted that this is a generic condition and that exceptions shall exist. An added level of pedestrian access between networks is not included in this matrix.

Proposed Network - Building Height Matrix



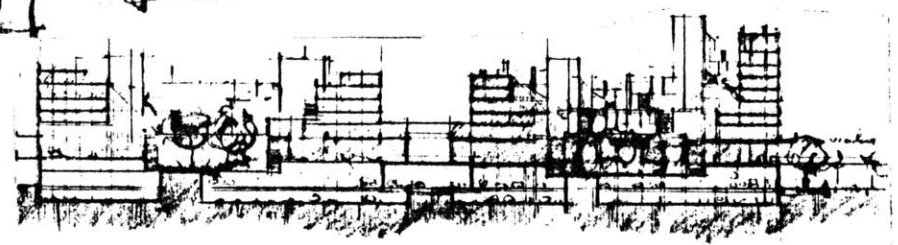
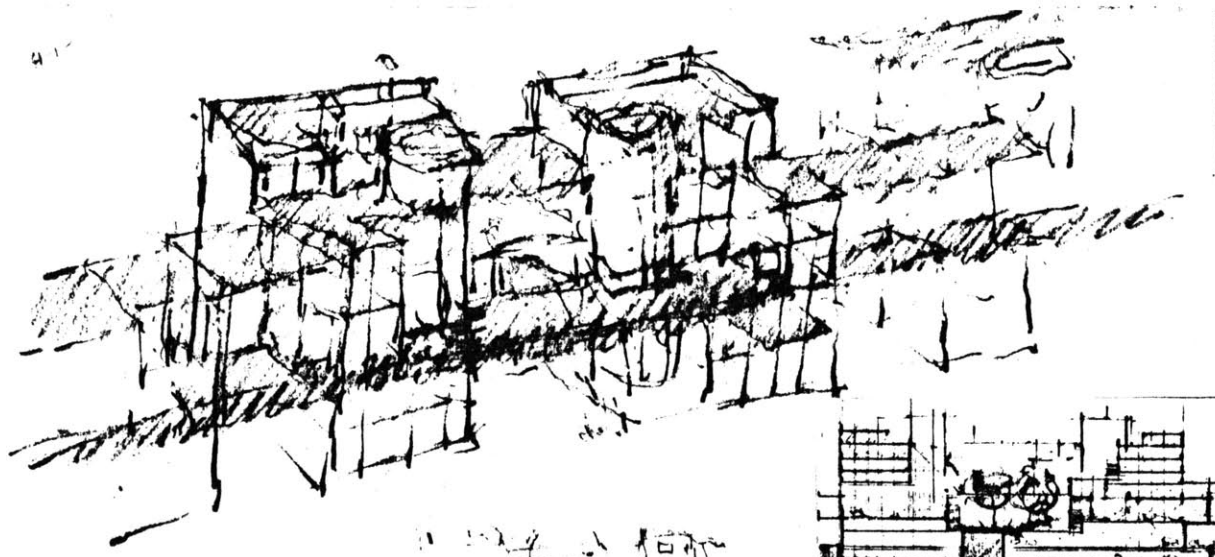
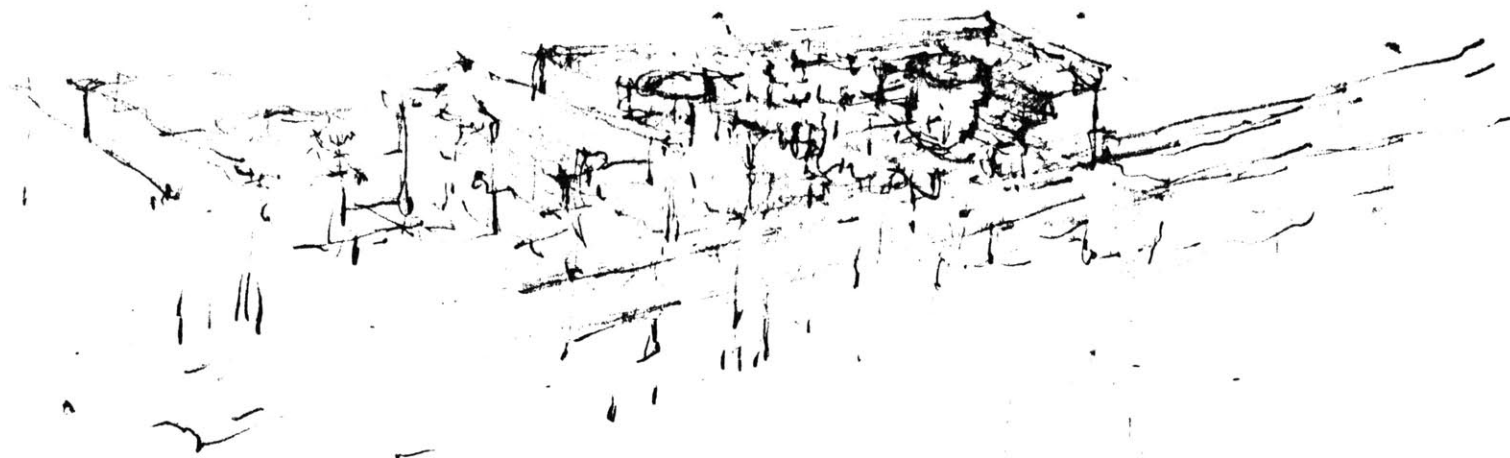




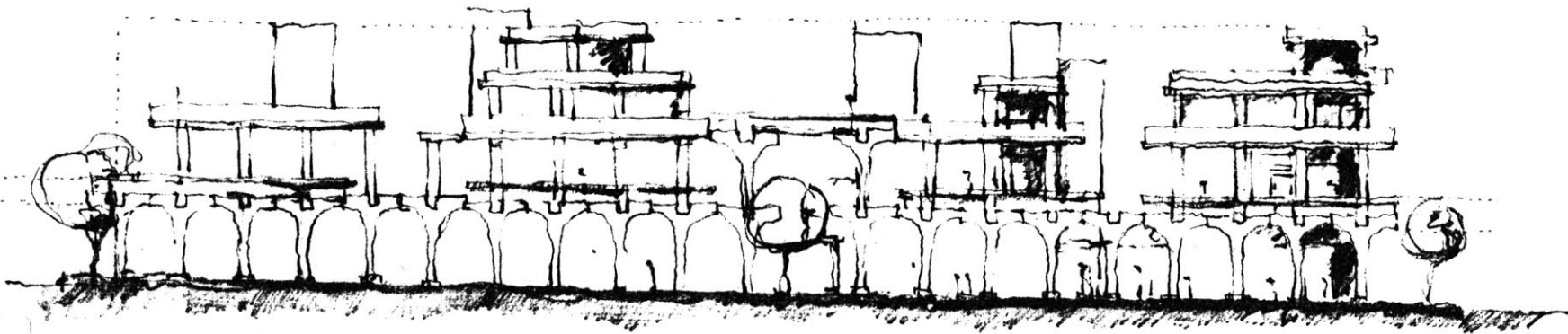
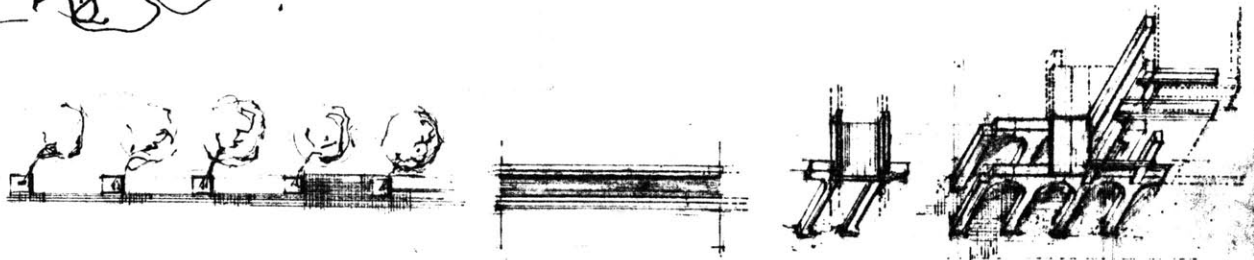
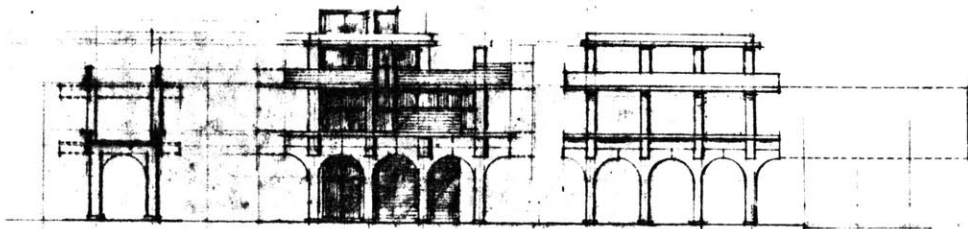
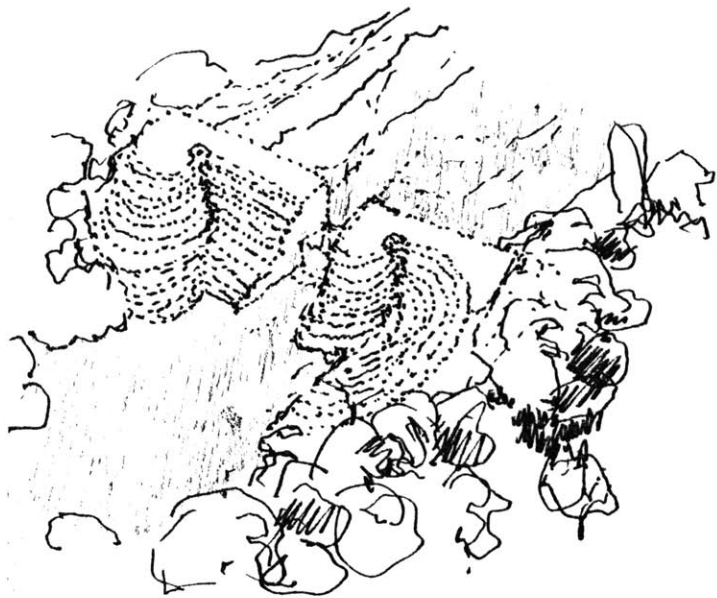
DENVER'S CONFLUENCE
ILLUSTRATIVE SITE PLAN

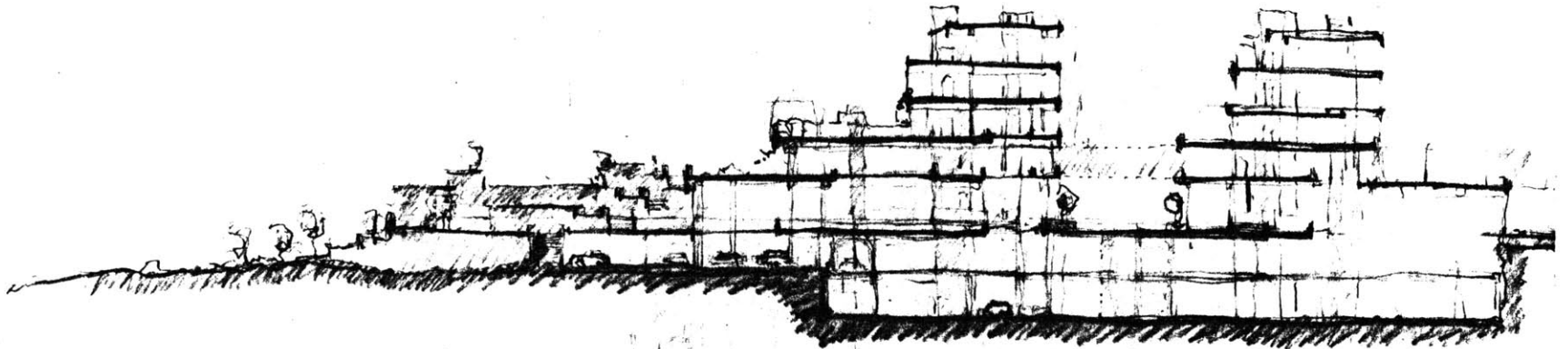
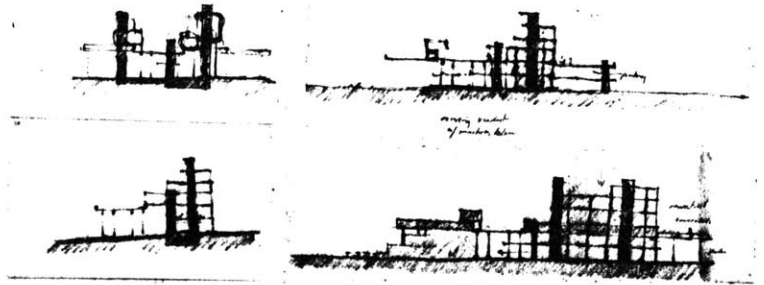
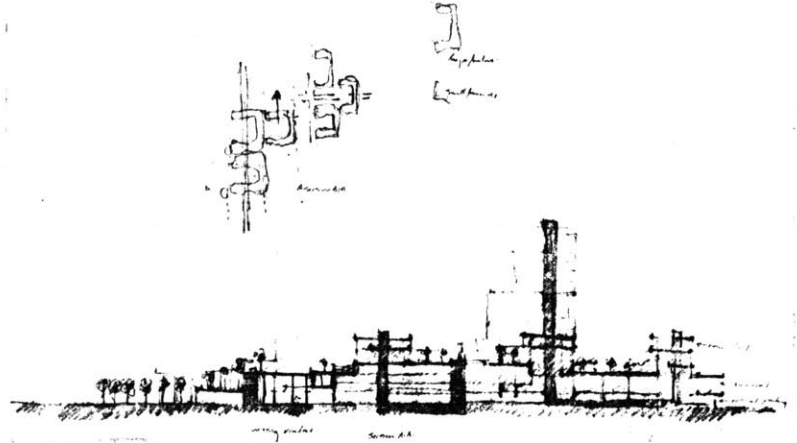
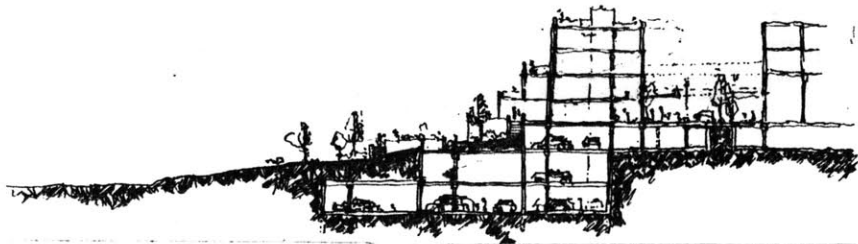
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Studies of infill at the viaduct.



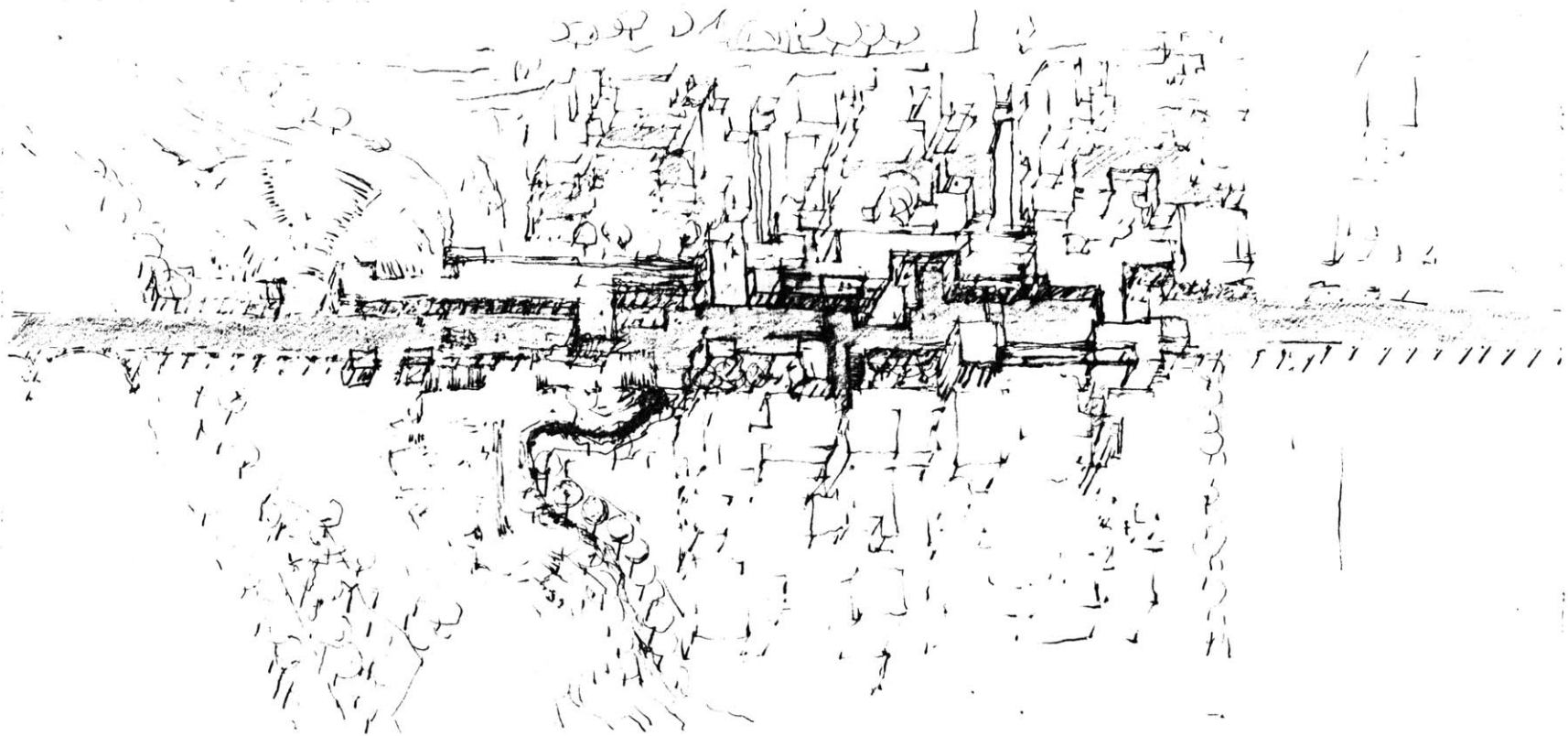
Infill components which might support an aggregate building unit.



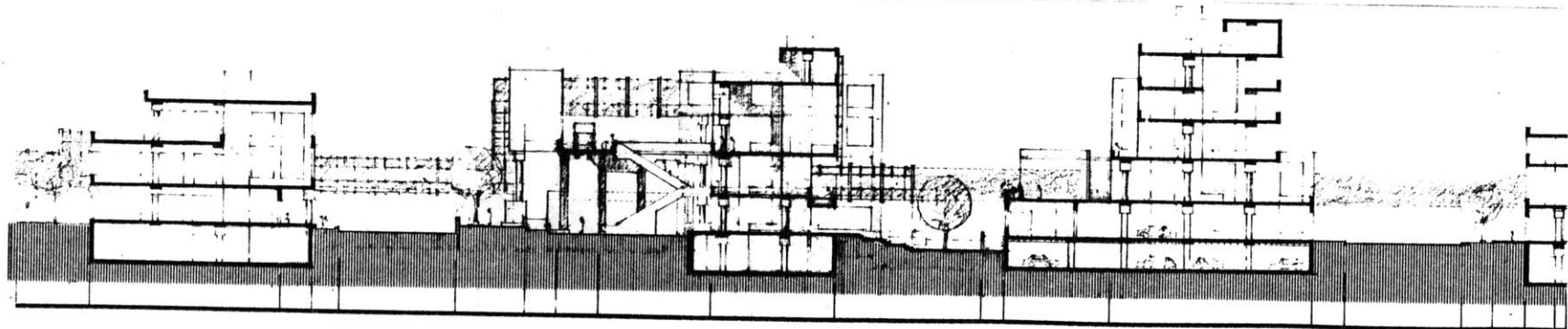
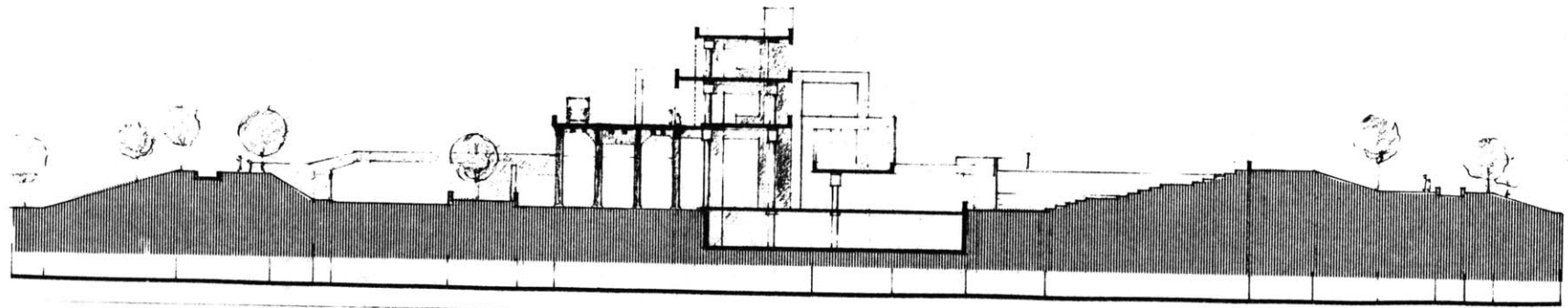




Section through infill at the viaduct.

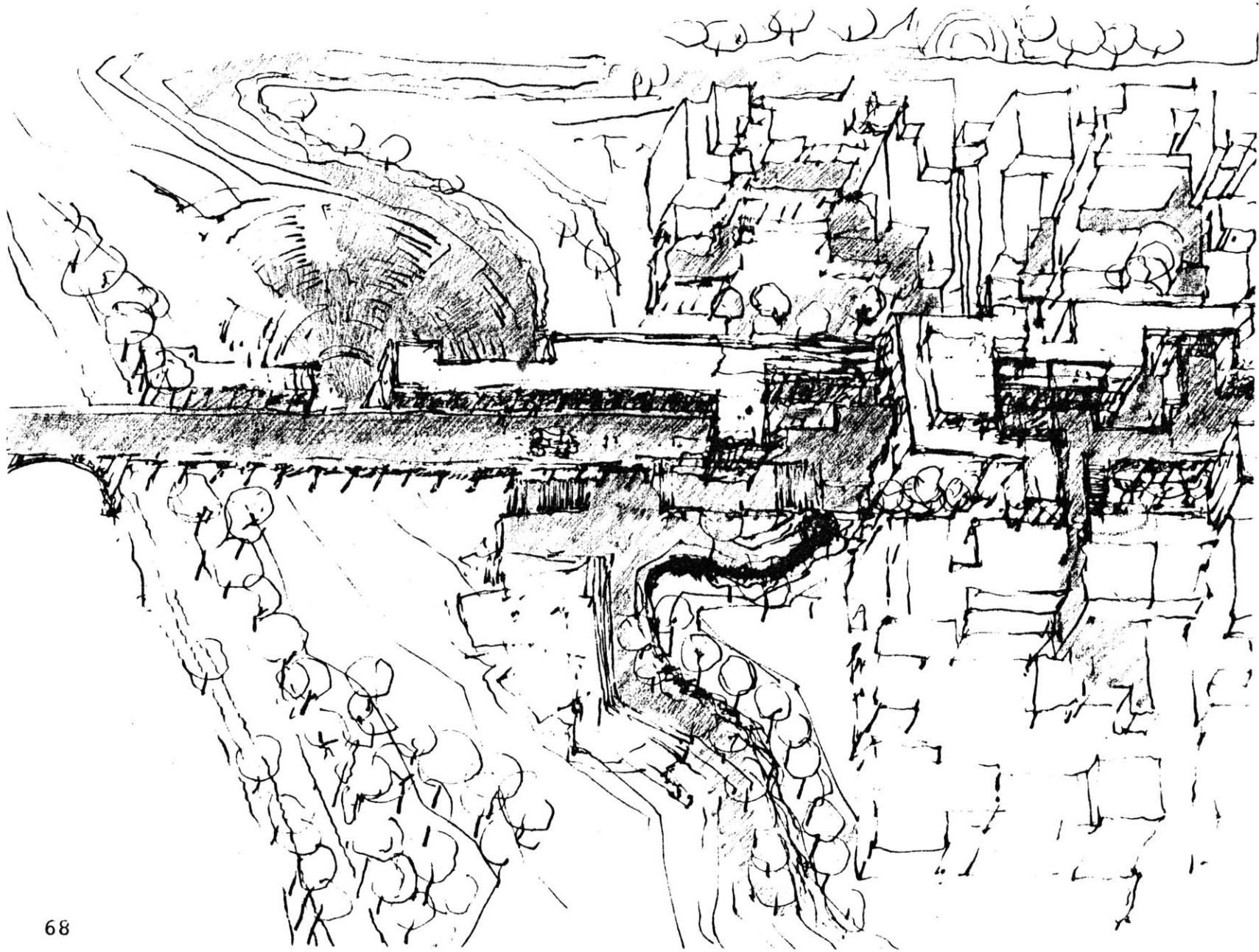


66 Illustrative sketch of infill at the viaduct.



Sections at the viaduct showing parking below grade, street-related activities at ground and viaduct level.

Section and edge plan study showing viaduct and adjacent buildings. The viaduct supports a continuation of the 16th Street bus line, is arrived at by escalators, stairs and elevator. A primary access level is at 14 feet above grade and allows for raised access to connecting levels and blocks, lateral to the direction of the viaduct.



POSTSCRIPT

Among many others this thesis shares common attitudes about city growth previously documented by David Cooper, Fernando Lugo and Michael Raphael. Many of the methods I have used come directly from each.

A basic assumption of this thesis is that future city growth may develop from an understanding of traditional urban forms and a recognition of their qualities as well as more contemporary models within their own context. This thesis attempts to examine an aspect of architecture which is often overlooked in the professional world of building design; the space between buildings and the nature of buildings which might support that space.

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FOOTNOTES

¹Doxiadis, Constantinos A. "Between Dystopia and Utopia," Trinity College Press, Hartford, Connecticut, 1966,p.5

²Reps, John. The Forgotten Frontier, p. 66.

³Cameron, J. Robert. "Denver Reshapes Its Future," AIA Journal, June 1966.

⁴Shoemaker, Joe; Stevens, Leonard. "Returning the Platte to the People," Tumbleweed, 1981.

⁵Denver Planning Office. "Proposed Comprehensive Plan Amendment," p. 1, 1977.

⁶BNL Development Corporation-DMSM. "Concept Plan," pp. 8-14.

⁷Ellis, William C. in Anderson, Stanford (ed.). On Streets, M.I.T. Press, Cambridge, Mass., 1978, p. 130.

⁸Lynch, Kevin. A Theory of Good City Form, M.I.T. Press, Cambridge, Mass., 1981, p. 246.

⁹Reps, John. "Town Planning in Frontier America," Princeton Press, Princeton 1969p.248

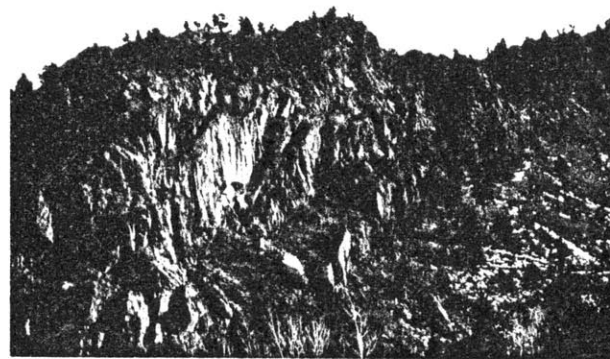
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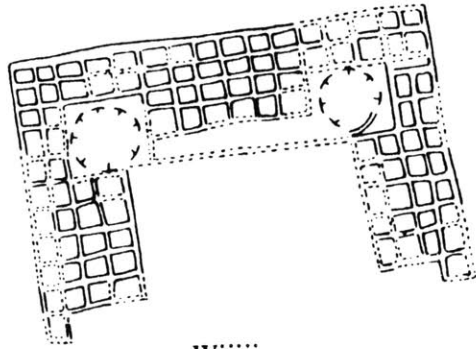
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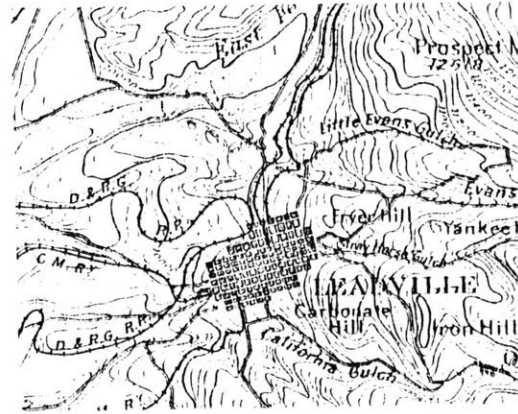
APPENDICIES





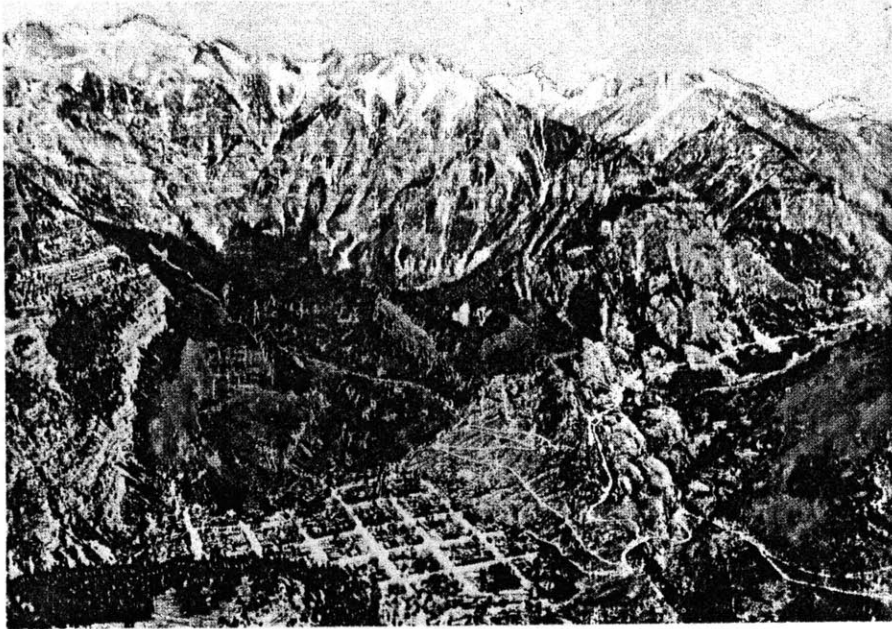
Wijiji

21



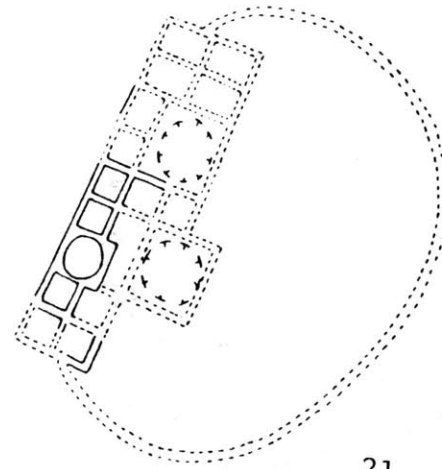
Leadville, Colorado.

22



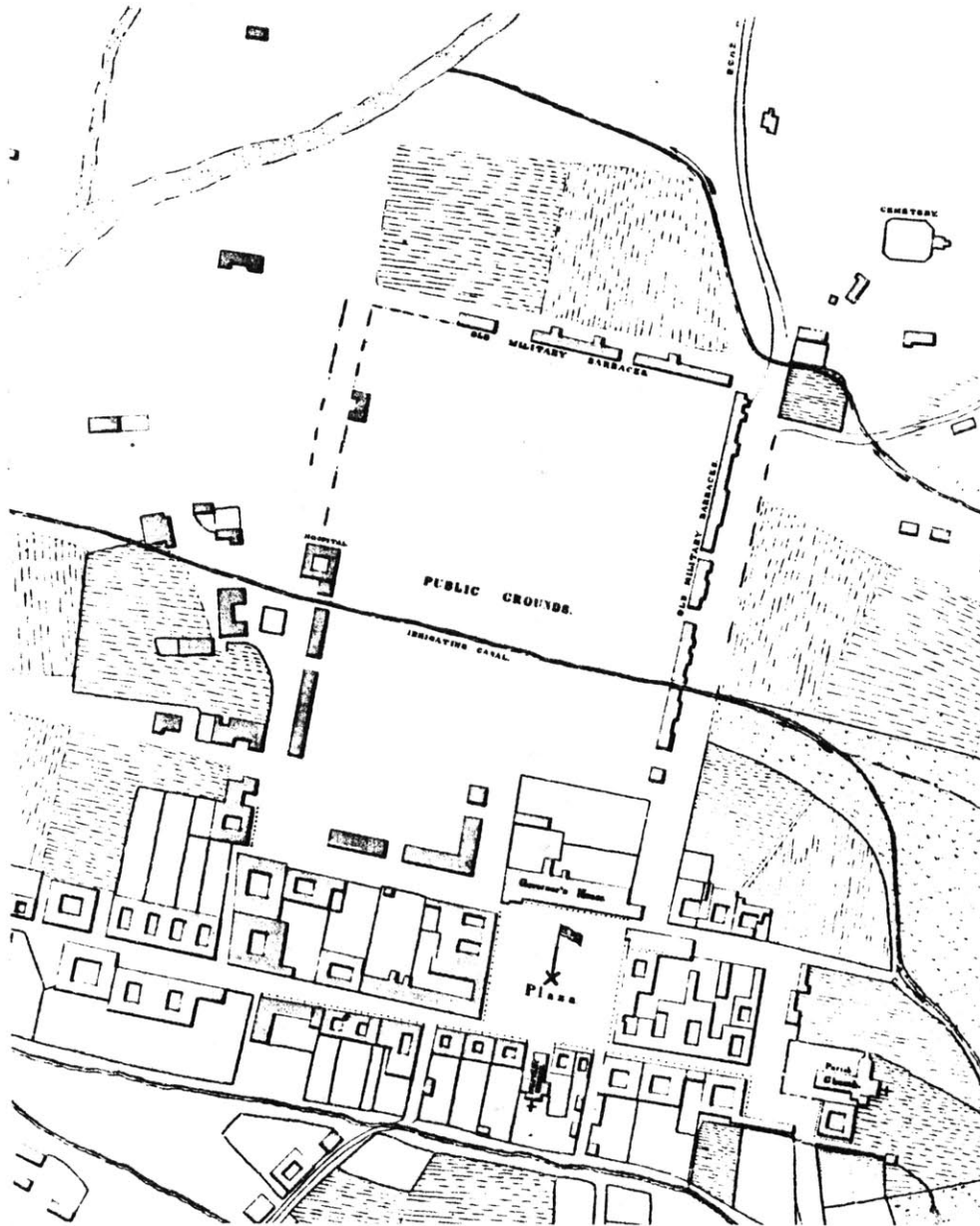
Ovray, Colorado.

23



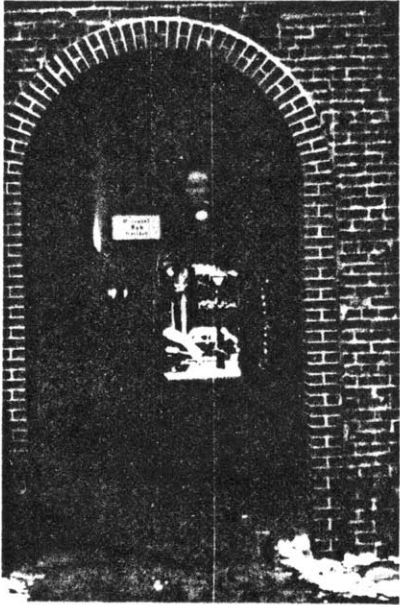
21

Kin Klizhin



Passage through block
Santa Fe, New Mexico.





Passage through mid-block
Denver, Colorado.



Georgetown, Colorado.



Central City, Colorado. The
continuous building edge is
supported by pedestrian uses.

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- ²⁴Lt. Gilmer, 1846, Santa Fe, New Mexico.