EXTENDING THE GRID: A Formal Exploration for Expanding a Small Colorado Town

By David G. Cooper
A.B., University of California, Berkeley, 1975

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

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

September 1980

Signature of Author ______________________________
Department of Architecture
June 16, 1980

Certified by ______________________________
Imre Halasz, Professor of Architecture
Thesis Supervisor

Accepted by ______________________________
Professor Maurice Smith, Chairman
Departmental Committee for Graduate Students

Extending the Grid:

A Formal Exploration for Expanding a Small Colorado Town

by David G. Cooper

Submitted to the Department of Architecture on June 12, 1980, in partial fulfillment of the requirements for the degree of Master of Architecture.

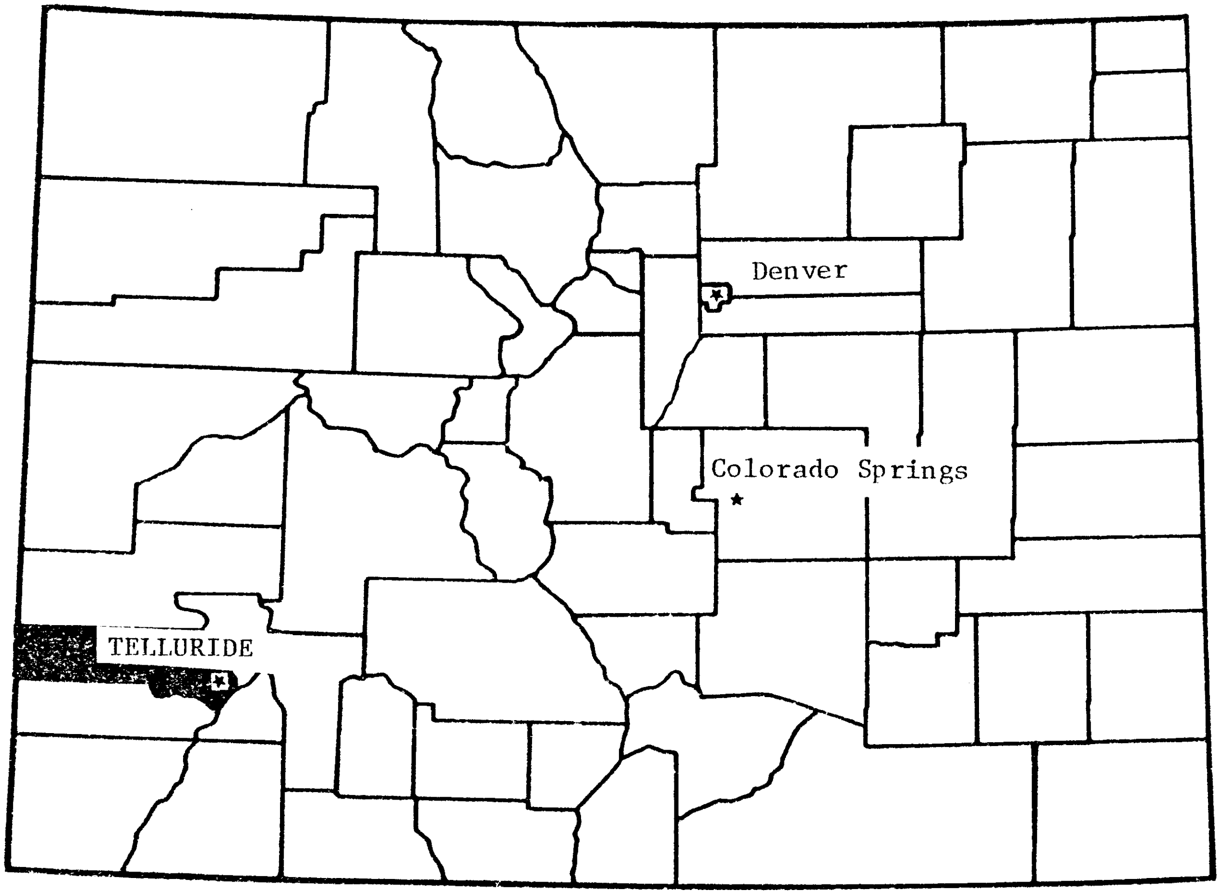
ABSTRACT

This thesis is an examination of the morphological aspects of future growth in Telluride, Colorado, a 19th-century mining town in the Rocky Mountains. Its aim is to demonstrate that further expansion of this grid settlement can occur in a manner that establishes a morphological continuity with the existing context.

The first three sections document a method of observation and analysis of the town's past patterns of growth and existing morphology. This method relies in part on firsthand observation and the study of available documentation of the town.

The final section contains the design projections -- my recommendation about how the town could expand. These are presented as a site plan that illustrates the physical form of expansion, and supporting diagrams and design studies.

Thesis Supervisor: Imre Halasz
Title: Professor of Architecture



REGIONAL LOCATION MAP: COLORADO

Acknowledgements

I would like to express my gratitude to Imre Halasz for his encouragement and thoughtful criticism thoughout the semester, and my appreciation to Anne Vernez-Moudon and Doug Mahone for providing advice when I asked for it.

My thanks go to Steve Wolf, Tom Chastain and Fernado Castro for their expert technical assistance.

And finally, my very special thanks are for Barbara, for living throughthis with me.

Preface

The work on this thesis really began in Telluride during the summer of 1979 with a series of community workshops to elicit community values about the form of new develoment that was taking place within the town. The design guidelines that were developed from these workshops became part of the town's ordinances to help guide the form of new construction within the existing context of buildings. (A sample of these design guidelines for one of seven districts, or "Treatment Areas," is included in Appendix A.)

The basis for developing these design guidelines relied in part on the work of Kevin Lynch (Appendix B contains a summary of Lynch's relevant work). Workshops were held throughout the summer of 1979 to establish a system for describing the physical environment based on residents' perceptions and understanding of the town's visual structure.

This work demonstrated that, although there was considerable agreement that existing patterns of building should be continued in most fully developed areas, residents were confused about how the undeveloped edges should be built up. As a result, the design guidelines for the core area were quite specific, while those for the areas around the edges of the town were much more general. In addition, the design guidelines as they applied to the town's edges were primarily directed toward the physical form and relationship of individual buildings, rather than the design of undeveloped areas and the town as a whole.

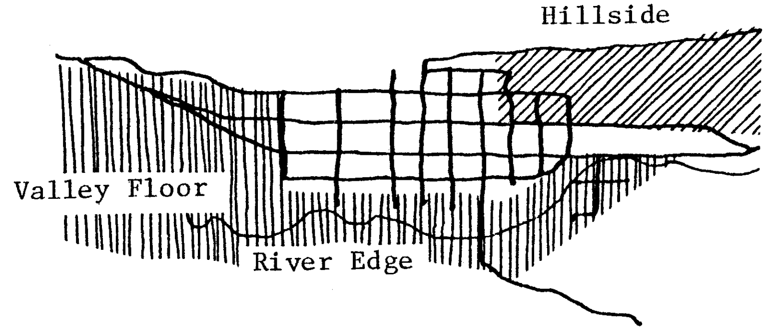
The inherent weakness of the design guidelines for the undeveloped edges of town demonstrated the need to study the town at the larger urban scale in order to understand better its physical form and possibilities for expansion. The development of design projections illustrating what might be built in the outlying areas (or edges), and for which there was no precedent, appeared to be the best way to accomplish this task. The resulting projections could be used as a catalyst for discussion with the town about the location, form, and intensity of possible town expansion.

In the first sections of the thesis, the town is described and analyzed in terms of its historic patterns of growth and existing morphology. An understanding of this morphology is the basis for projections of the physical form expansion might take, the final section of the thesis.

In developing these projections, which are presented in Section IV, the town was viewed as a morphological system of elements that behave according to formal and organizational principles. By first identifying these principles, projections for new development were generated that had some continuity with the existing morphology.

The formal projection is an attempt to demonstrate that expansion that establishes morphological continuity with the existing context can occur with reference to three critical areas. Tis final projection is presented as a site plan illustrating the physical form of expansion and examining the three areas -- the river edge to the south, the valley to the west, and the hillside to the east -- in greater detail. Accompanying this site plan are supporting design studies that show in greater detail vehicular and pedestrian networks, the effect of varying building densities, solar access, and the generation of new building form. (Appendix C presents some of the formal precedents from other grid cities that were drawn upon in this projective stage.)

A step which might follow this work, but is not a part of this thesis, would be to begin to develop an urban design plan for Telluride based on these projections and understanding of the town's morphology, as well as of its particular social, economic, and political conditions.



Possibilities for Expansion

Table of Contents

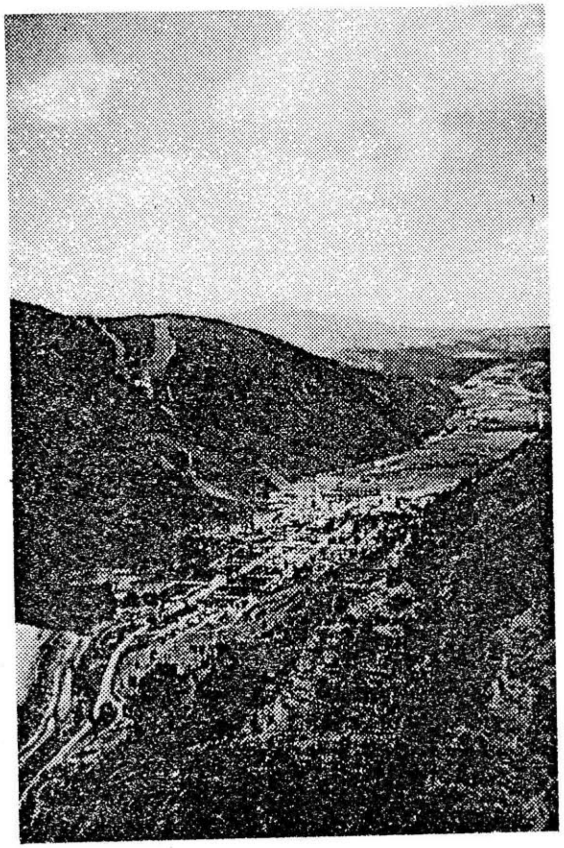
View of Telluride from the San Miguel Valley

Section I: Introduction

Situated at the end of a horseshoe-shaped valley at an elevation of 750' in the San Juan mountain range of western Colorado, the town of Telluride is known for a unique physical setting and a colorful mining history. Viewed from its western approach, the role played by natural features -- 12,000-foot mountain peaks on three sides, steep canyon walls, and a river that meanders through a mile-wide subalpine valley -- in shaping the town's physical development is obvious.

Since its founding over 100 years ago, Telluride has weathered several cycles of growth and decline because of its economic reliance on the local mining industry. At present, Telluride is experiencing a new kind of growth, the result of its transformation from a mining economy to a year-round resort.

I first visited Telluride in 1979 after having been hired to work with the community in developing design



Elevated View of Telluride and the San Miguel Valley

guidelines for new construction. (See Appendix A, "Design Guidelines for Telluride," for excerpts from these guidelines.)

Beginning with this work, I have grown increasingly interested in the question of how continuities of physical form could be established between what already existed in the town -- both natural and manmade -- and what might be built in the future.

This thesis, an examination of the morphological aspects of future growth in Telluride, grew out of this early interest. It is based on an assumption of continued incremental growth in the town. I propose that a practical form for such growth can be generated through expansion beyond the boundaries of what is presently built.

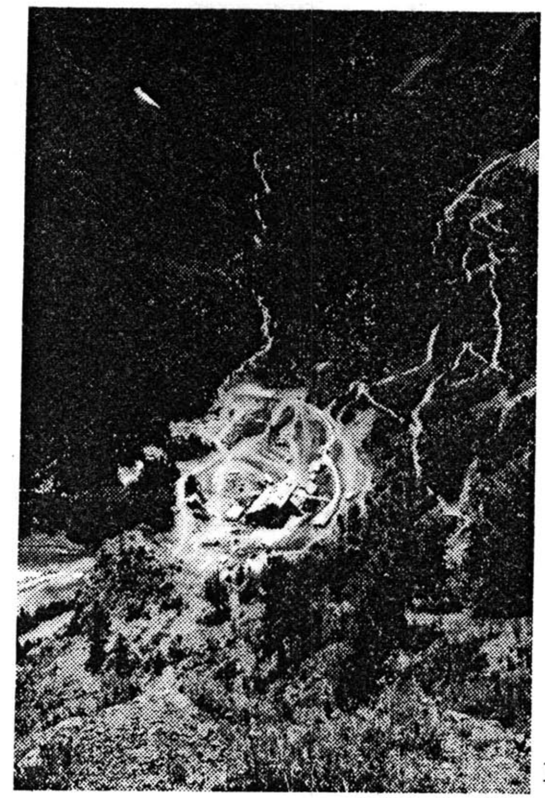
The major goal of this thesis is to explore ways of establishing continuity between the existing morphology of the town and its surroundings. I illustrate three different approaches for accommodating this expansion through physical form. The first approach is growth of the present core south to the river edge. The second is expansion to the west beyond the present town boundaries. The third approach entails movement up the hillside east of town.

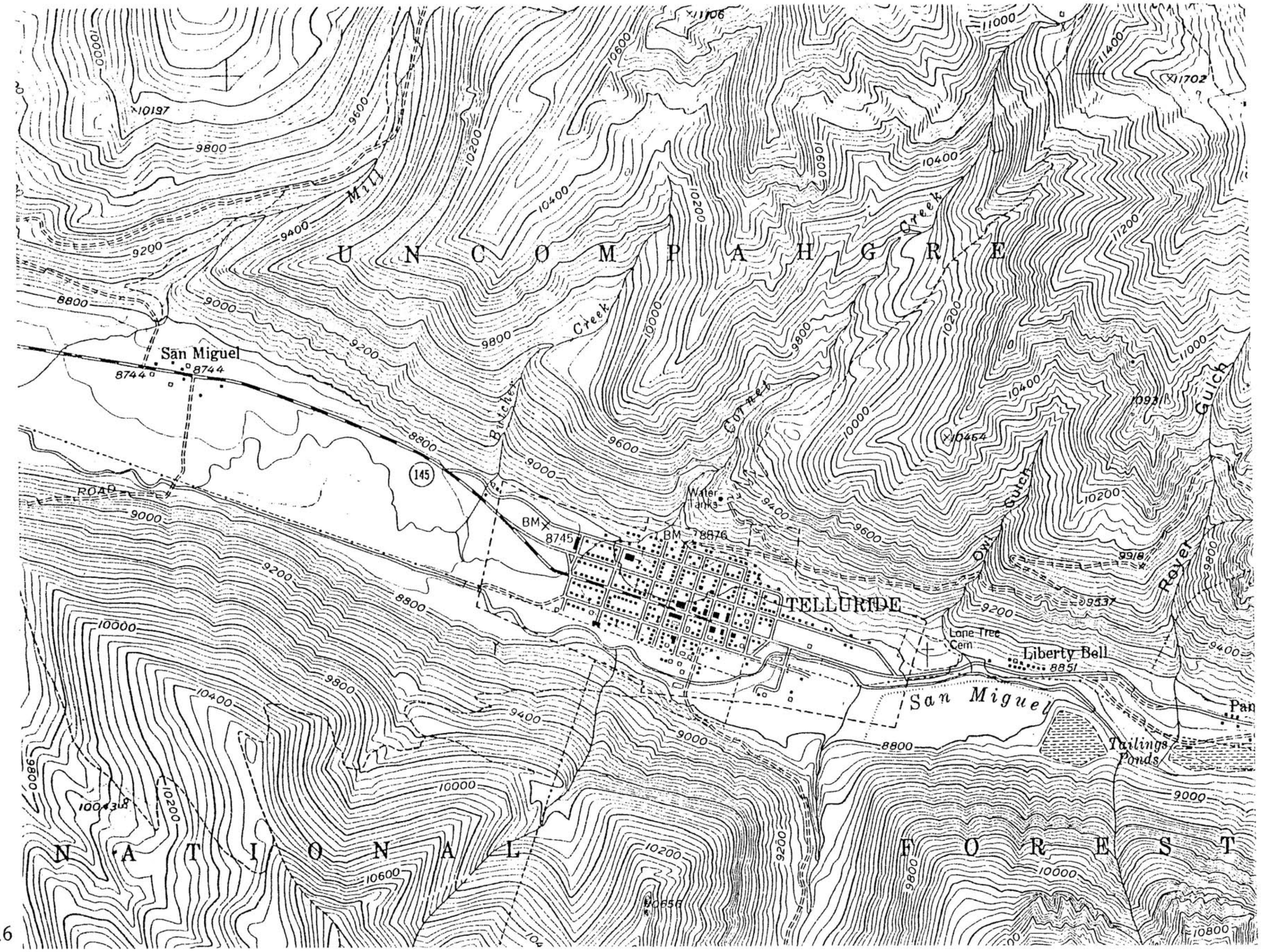
These approaches were chosen because they seemed the most reasonable from a formal point of view, and because they contained a range of differences which invited comparison. The exploration of increasing density to accommodate growth was not considered because it was implicit in the three approaches.

The method of exploration includes an examination of past patterns of growth, a description of the existing morphology, and a generation of the three different approaches for expansion. The exploration is documented in diagrams, drawing studies, design illustrations, reproductions, and written commentary.

From my perspective as a designer, the San Juan mountain range and settlements within it offer striking examples of the dramatic coexistance of natural and manmade forms. The natural forms are part of powerful

The Pandora Mine

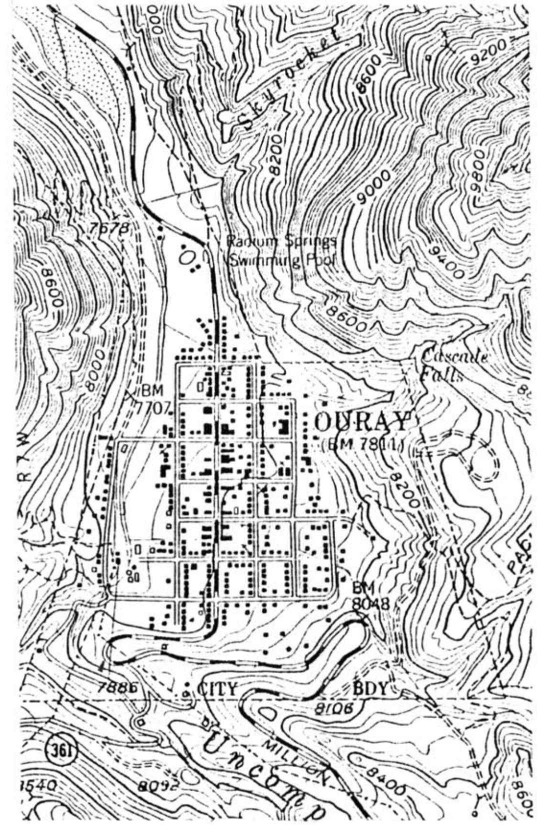




MAP OF TELLURIDE AND THE SAN MIGUEL VALLEY regional landscape of rugged mountains, glacier-carved basins, river valleys, and alpine mesas. The manmade landscape comprises isolated mining and mill buildings, evidence of Colorado's earlier era of mineral exploitation. To the eyes of an earlier generation of observers, these structures may have disfigured the landscape, but today their forms seem to approach the scale of the natural landscape. Remote settlements such as Ophir (population 80), Rico (700), Ouray (900), and Telluride (1,200) are similar references to the region's frontier era.

As a group, these towns present fairly typical examples of 19th century town planning as carried out by miners, mine owners, or the railroads. Each town is laid out according to a gridiron pattern of rectangular blocks, wide streets, and deep, narrow lots. In most cases, they are aligned with the cardinal directions or with the railroad or regional roadway.

The buildings erected within the towns usually follow another typical 19th century pattern: one- to



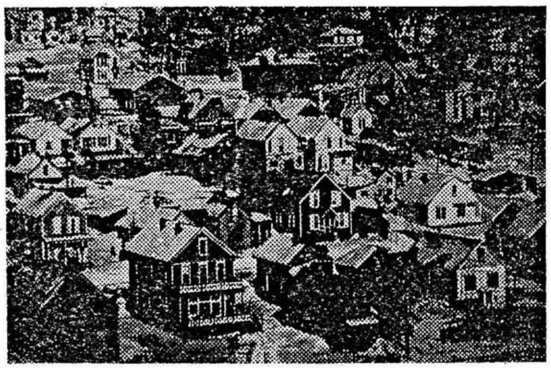
The Town of Ouray


An Early Mine Building

three-story frame-and-masonry structures copied from various contemporary pattern books. Each building was executed with different degree of skill and sophistication, and each reflects, as well, the differing attitudes of its builders toward its permanency.

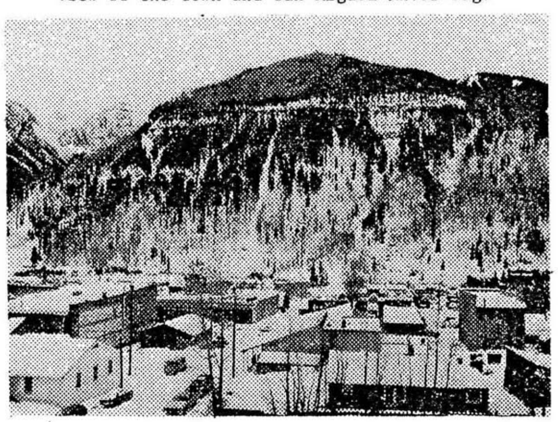
Telluride also follows this 19th-century settlement pattern. Recognition of its historic significance as a mining town came in the form of designation of the entire town as a National Historic Landmark in 1963.

Since its founding in 1878, the town has grown through a series of incremental annexations. The original gridiron -- so ideally suited to the featureless plains states from which it was transplanted -- was extended in all directions: up mountainsides, along the river, down the valley. The layout of these plats indicates a minimal regard for the landscape's features, notably steep moutain slopes and rivers. These are features which have traditionally influenced the form of grids -- or precluded their extension.



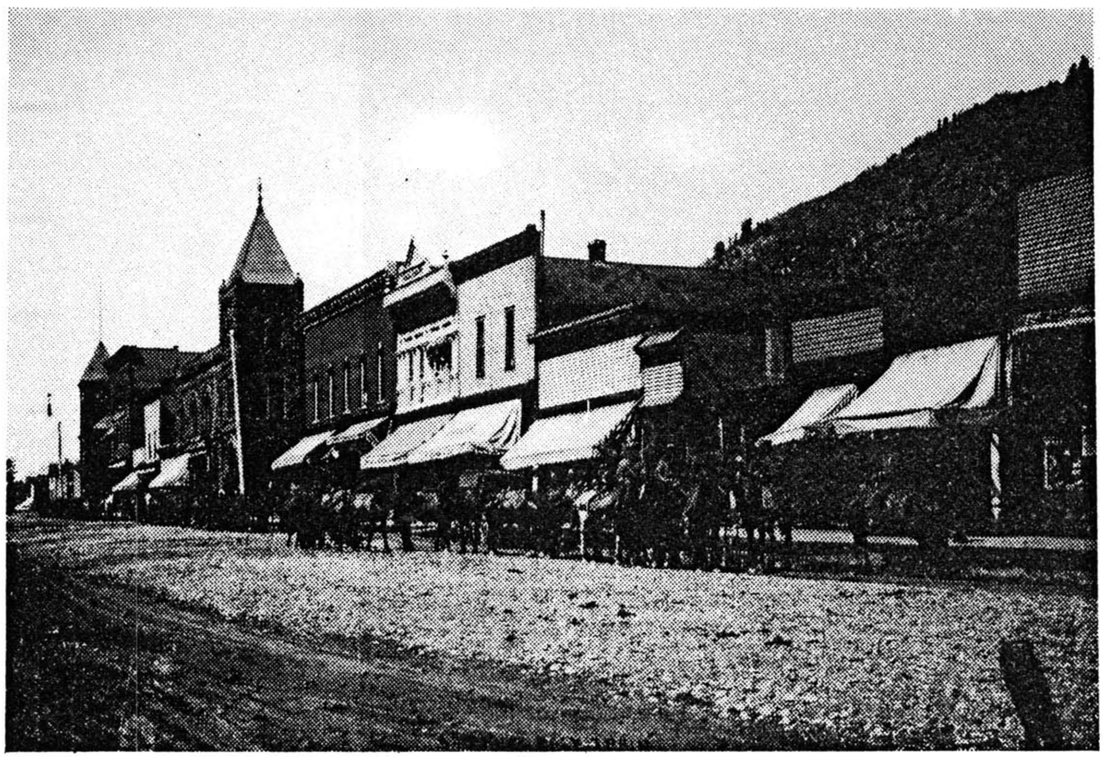
Typical fram buildings in the Historic Core

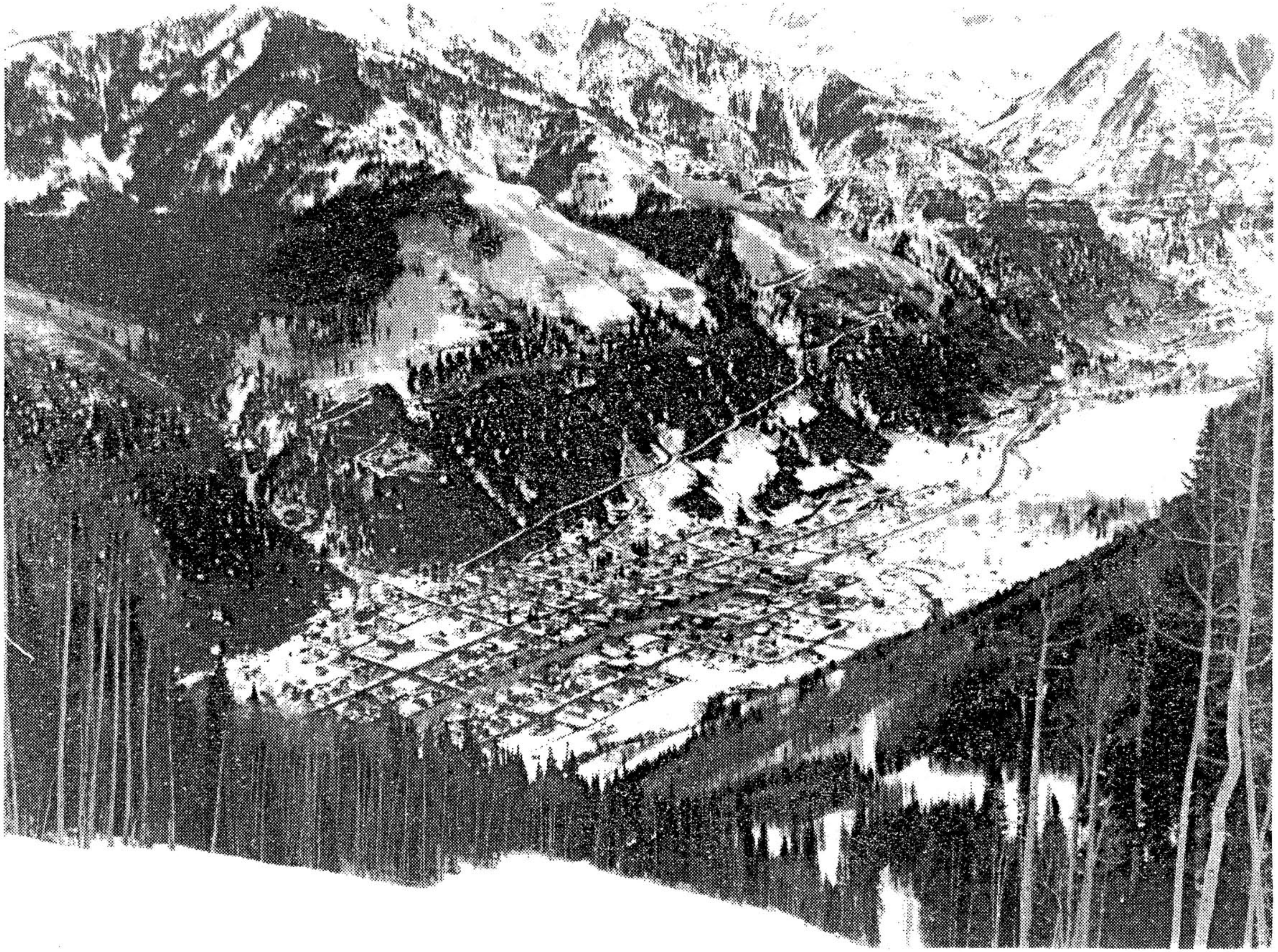
View of the town and San Miguel River edge



However, as the town developed, the buildings that infilled the grid responded to these natural constraints. The result of this is a relatively compact urban form bounded on the north by the increasing slope of the Umcompaghres Mountains and on the south by the San Miguel River.

An Early Photo of Colorado Ave. The buildings are much the same today.





Section II: Defining the Design Task

A. MORPHOLOGICAL DESCRIPTION: A THEORETICAL OVERVIEW

The System of Framework/Network/Infill.

In order to examine Telluride in terms of its present morphology and to project extensions for growth, it was necessary to have a system of description for elements of the form and structure and their relationships to each other.

For this I chose to use a three-element system for describing urban morphology presented in a recent study for the revitalization and structuring of downtown Santiago, Chile. In Revitalization y Estructuracion al Centro del Santiago (1979 with English translation), Halasz, Underhill and the Catholic University of Chile described their plan for Santiago in terms of Framework, Network, and Infill:

> The framework is the largest, most permanent, element of physical organization; it changes

(opp.) Elevated view of Telluride

least and is therefore the most neutral part of the system. In Santiago, the framework is the square grid. The extendable framework organizes the other two parts of the system.

Networks refers 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. In Santiago the public transportation network was simply the streets -- identical with the framework. By contrast, the water network ran parallel to the east-west streets in the middle of the block; hence the water network was organized with reference to the framework, but did not coincide with it.

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. [ref p74]

In this study, the system of framework, network, and infill was employed to understand the existing "urban grammar" of the core, and to help generate proposals for physical intervention that would meet the objectives of the urban design project.

There were several reasons for selecting this system as my main tool for observing and projecting designs for Telluride:

1. The system could express a hierarchy of elements and relationships when being used to describe physical aspects of urban structure. This would enable me to "weight" particular elements to reflect my understanding of how easily they could be manipulated as part of a larger design strategy.
2. The system was suited to situations in which design projections depended on a clear understanding of the morphology of the larger context.
3. The system was general enough that it invited my own interpretations in adapting it to a new context.

B. ASSUMPTIONS

In defining the design task, I have made certain assumptions about the physical, economic, and institutional context of Telluride:

1. The present rate of population growth in Telluride has averaged 15 percent over the past ten years. The anticipated rate of growth for the town and region over the next ten years is estimated at 10%.

2. The recreation/tourist industry is basic to the local economy. Projections for the industry point to increasing demand, particularly for the ski area adjacent to town.

3. The mining industry will continue to be basic to the economy of the region and the county. One result of this is that the Pandora mine, located east of Telluride, and which closed in 1978, might be reopened. This could add 400 workers and their families to the town's population, and would generate considerable truck traffic into and out of the valley.

4. The trend toward compact, more intensive development will continue. This is likely to result from a combination of factors:

a. Increasing costs for infrastructure.
b. Public concern for the loss of open space. due to low-density development in the valley, especially the outlying mesas.
c. Need to use more efficiently the available privately owned land, owing to the large percentage of publicly held land in the eastern end of San Miguel County.
d. Reliance on the automobile.
e. More energy-efficient construction.

5. Building within the town will gradually infill because of these features of the town's zoning:

a. Residential areas -- one dwelling unit per 2500-square-feet lot.
b. Commercial areas -- an achievable FAR (floor area ratio) of 1.2:1.0.
c. Accommodations areas -- an allowable FAR of 1.5:1.0. This would apply to any new areas annexed to the town.

6. The Town of Telluride will continue to implement its present Parking and Transportation Plan, which calls for:

a. Eventual ban (or imposition of severe restrictions) on private automobile use in town.
b. Development of regional parking centers for 300-500 cars, especially for the ski areas.
c. Development of subsidized public transportation in town.

C. STATEMENT OF GOALS

As part of defining the design task, I established a general set of goals to guide my exploration of the morphology of Telluride. These goals were based on my assumptions about the context of Telluride and my understanding of the design issues related to physical growth at the time of the study.

These were largely general statements of my design attitude and were not linked to specific design objectives for particular sites.

GOAL #1: MORPHOLOGICAL CONTINUITY WITH THE CONTEXT.

Any physical expansion of the town should maintain morphological continuity with the existing physical form.

Continuities of physical form can exist at all levels of the manmade context, including region, town, block, and adjacent buildings.

All of these levels should be explored for clues which may be used to generate new physical form that shares morphological continuities with the existing physical form.

GOAL #2: NATURAL LANDSCAPE AS FORM GENERATOR.

Elements of the natural landscape should be used to influence positively the physical form.

In the past, natural elements -- the river, steep mountain slopes -- were generally ignored as possible generators of different kinds of physical form. My attitude is that these natural elements should be used positively, in addition to the manmade elements of the context.

GOAL #3: HIERARCHY OF VEHICULAR MOVEMENT.

The physical form should define a hierarchy of vehicular movement which differentiates levels of regional and local traffic.

Even if the parking and transportation goal of banishing the private automobile from town is ultimately achieved, providing for the movement and storage of automobiles in town remains a short-term concern. The allocation of resources and the tradeoffs needed to accommodate automobiles are substantial; they should be planned and designed so that conversion to other uses in the future is possible.

GOAL #4: CONTINUITY OF PEDESTRIAN MOVEMENT.

The network of pedestrian movement should be as continuous as possible, provide access to all points of town, avoid conflict with automobiles, and should be designed to encourage walking as a year-round means of transportation.

The town is small enough to make walking a practical form of transportation -- in theory. At present, vehicles and pedestrians are frequently in conflict, largely because the automobile is free to roam anywhere there is a roadway (and road rights-of-way constitute nearly 30 percent of the town's area).

A pedestrian network should be established which minimizes this conflict, is usuable throughout the year, and provides access to natural areas such as the river and creek edges.

GOAL #5: LEGIBILITY.

The arrangement of Paths, Nodes, Landmarks, Edges, and Districts should result in a physical environment that is legible from the perspective of a pedestrian.

Some strong patterns contributing to legibility already exist in town; they should be reinforced. Existing weak patterns should be strengthened or discouraged.

GOAL #6: HIERARCHY OF CLAIM.

A clear definition of public to private spaces should be made, and it should be apparent in the physical form.

As population increases and the number of short-term residents grows, it becomes increasingly important to have spaces which communicate, through physical form, their ownership and intended uses.

GOAL #7: COMPACT DEVELOPMENT.

The form of new development should achieve an intensity of land use that is more resource-conserving than the existing pattern.

The historical land use pattern in Telluride resulted in an FAR range of 0.5:1.0 to 1.0:1.0 in residential areas, and 0.7:1.0 to 1.2:1.0 in commercial areas. More recent development has aimed at achieving an FAR of 1.5:1.0, incorporating both residential and commercial uses.

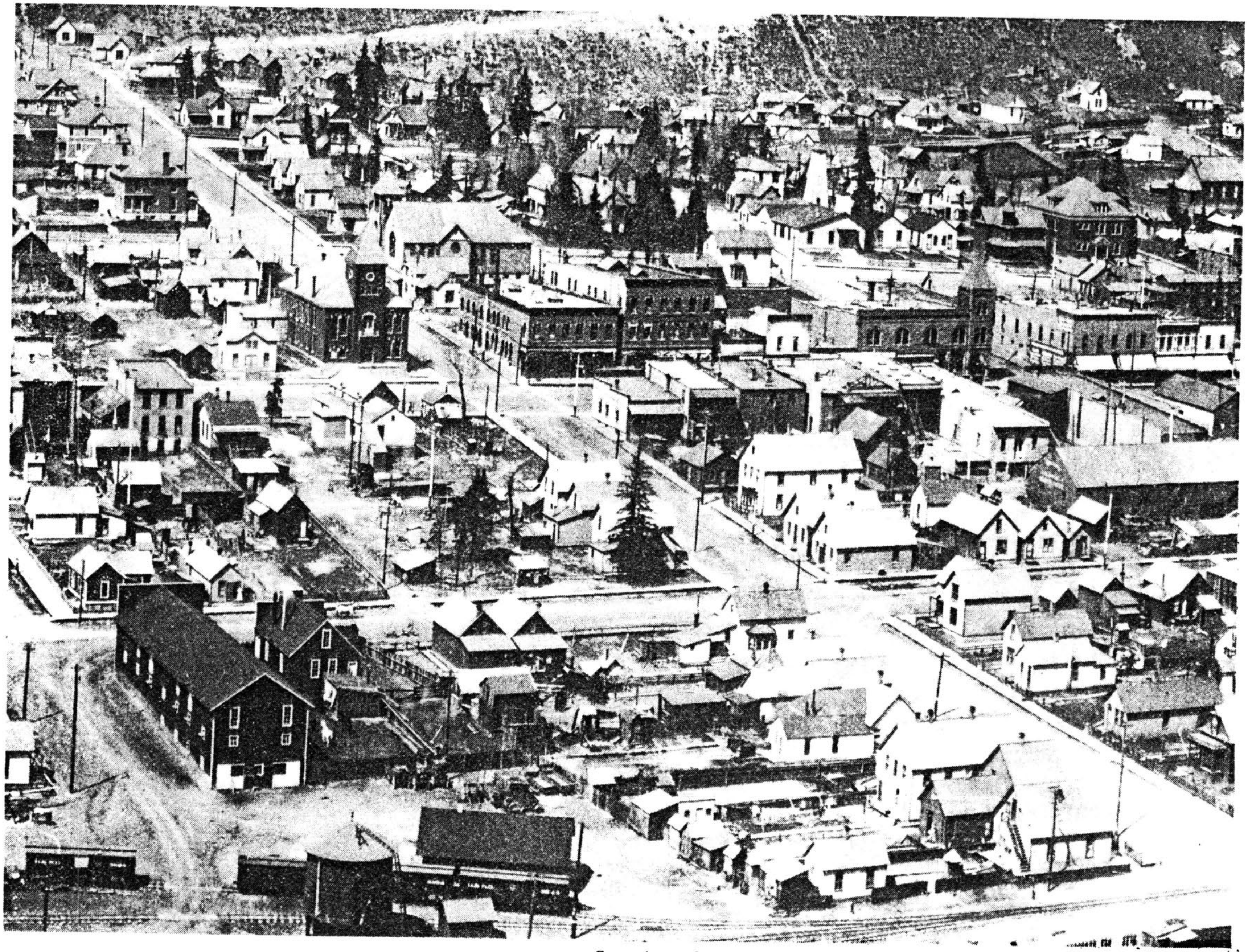
This trend toward greater density should be encouraged, but with the intention of creating more publicly used open space and of affording greater solar access to these spaces, as well as the exterior walls of buildings.

GOAL #8: INCREMENTAL PHASING.

<u>Any extensions of the town should be designed so that they may be built over a period of several years</u>.

The physical form of the town has evolved in phases over more than a century. The gridiron has served as an excellent framework for growth, expanding the town through large plat additions and intensifying areas by the replacement of infill.

These kinds of growth characteristics should be continued in the future at all levels of Framework, Network, and Infill.



Section from a panoramic photograph of Telluride (1906)

Section III: Observations

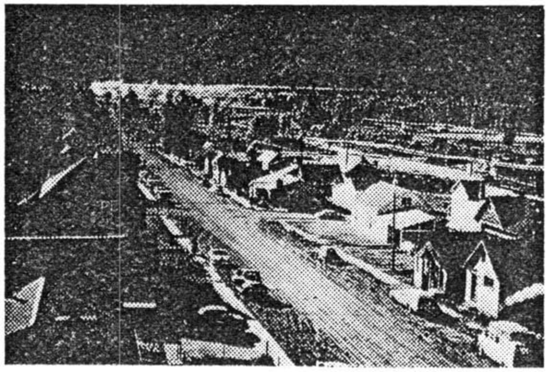
A. CLIMATE

Climate: Owing to its protected valley location at an altitude of 8,750 feet, Telluride experiences extreme fluctuations of temperature during the year.

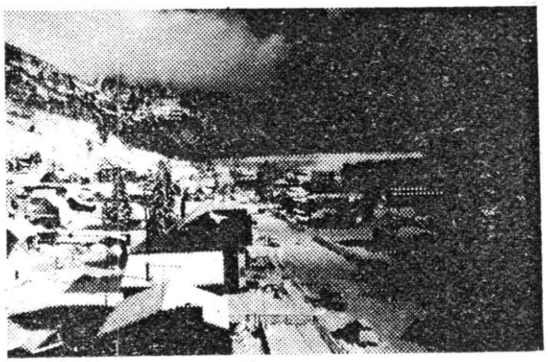
For several weeks during the summer, daytime temperatures may be high, while nighttime levels are considerably lower. In July and August, the mean maximum is 78F and mean minimum 42F. Winter temperatures are lowest during December and January; the recorded temperatures for these months are 38F (mean maximum) and 8F (mean minimum).

The Degree-Day calculation for determining necessary heating or cooling loads is an indicator of the coldness of the Telluride climate. The average annual heating requirement is 9400 Degree Days (calculated from a base of 65F).

Precipitation: Precipitation varies throughout the



Summer and winter views of Columbia Ave., which runs east west through the town



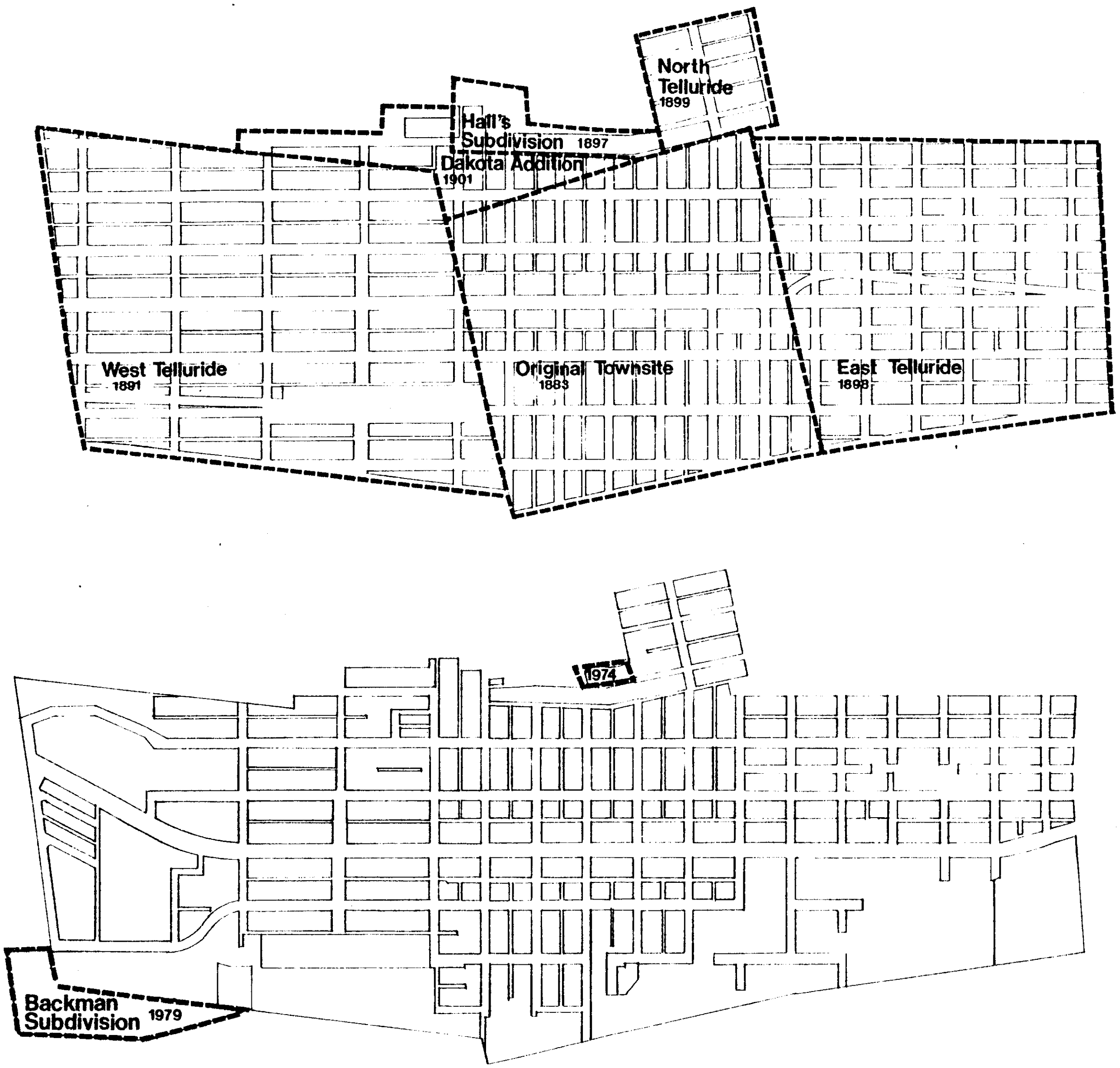
year. The first winter snowfall can come as early as October, and the snowpack in town during the winter may vary from zero to four feet. Snowfall continues into the spring and is followed by rain in the summer and fall. Humidity is low, about 10-15 percent.

Sun: In summer, when the sun is at or near its zenith (75 degrees above horizontal on June 22), most of the town receives from ten to twelve hours of sunlight each day. However, during the winter, this changed considerably as the sun drops lower on the horizon (28 degrees above horizontal on December 22), and it is blocked by the mountains. The latitude of Telluride is 38 degrees north.

The amount of sun that different parts of the town receive varies considerably. During the winter the Manitou Lodge, south of the river, receives no sun for a short period; the Post Office, in midtown, receives 3.5 hours of sun daily during December, and some buildings high on the south-facing slopes never receive less than six hours of sun at any time.

Due to the skewed street grid, east- and south-facing windows are the most effective in taking advantage of available solar radiation.

Air Movement: Despite its sheltering valley, Telluride occasionally experiences extreme winds that accompany storms from the west. These winds have been measured at speeds as high as 70 mph. In addition, cold air drainage down Bear Creek Valley and the north-facing slopes affects the microclimate of building sites in town.



34 ANNEXATIONS TO TELLURIDE: 1887 - 1979

B. HISTORY OF DEVELOPMENT: 1887-1980

The history of physical growth in Telluride since its founding 102 years ago closely follows the development of the local mining economy. In 1875, the Sheridan gold vein was discovered, and within a year, the Sheridan and Union Mines were in operation, the claim for the Smuggler Mine had been staked, and the Pandora Mill had been built, all in the canyon above what is now the east end of town.

The earliest stage of urban development in the valley was the mining camp of San Miguel at the mouth of a canyon several miles down valley from the present town. San Miguel was established on October 10, 1877, shortly after the last Ute Indians were driven from the valley, but it never developed much beyond a mining camp. Although it had a post office and several saloons in addition to the numerous tents and wooden buildings characteristic of a camp, San Miguel never developed a rational grid system of streets and building lots. Today, little of the town remains except for a half-dozen buildings along the state highway.

The town of Columbia, Telluride's predecessor, was founded on January 10, 1878, and differed from the mining camp in two important ways: 1) Columbia was closer to the mines, which tended to be found in the 11,000- to 13,000-foot high mountains east of town, and 2) it skipped the stage of an informally settled mining camp. From the time of its founding, the town was platted in the system of blocks, streets and alleys which characterized the layouts of most frontier towns. The first platting, recorded on the date of the town's founding, "consisted of some 80 acres in a park six miles long and half a mile wide in the San Miguel Valley."

The platting extended across the San Miguel River but was contained by the mountain slope on the north and south. The orientation of this original grid was 18 degrees west of a true north/south axis, parallel to the pre-existing roadway.

From the outset, a distinctive feature of the town was its unusually wide streets -- large enough to allow a team of oxen to reverse direction without difficulty. Otherwise, the block module employed was fairly typical for frontier towns of the era: blocks of 250' by 250', 20-foot-wide alleys in mid-block, and rectangular lots 117.5' deep and either 25' or 50' wide. The lots on the main thoroughfare, Colorado Avenue, were all 25' wide and clearly intended for commercial use. Alleys in these commercial blocks ran east/west as well as north/south. All other lots had the long dimension running east/west and were laid out with 50' frontages which, in some cases, were subdivided immediately into 25' frontages. The alleys in these blocks ran north/south. Sometimes referred to as "residential blocks," these blocks were adapted to the myriad building uses found in such an expanding mining town: workshops, foundries, warehouses, stables, hotels, saloons, and brothels.

When the town of Telluride was founded, the surrounding area had an estimated population of 600-700, and its economic base was primarily silver mining.

Infill development of buildings within the gridiron took place rapidly during the 1880s. Major public buildings were constructed, including the City Hall (1883) and the County Courthouse (1884), following the selection of Telluride as the county seat for the newly formed County of San Miguel. Numerous commercial and residential buildings were also built.

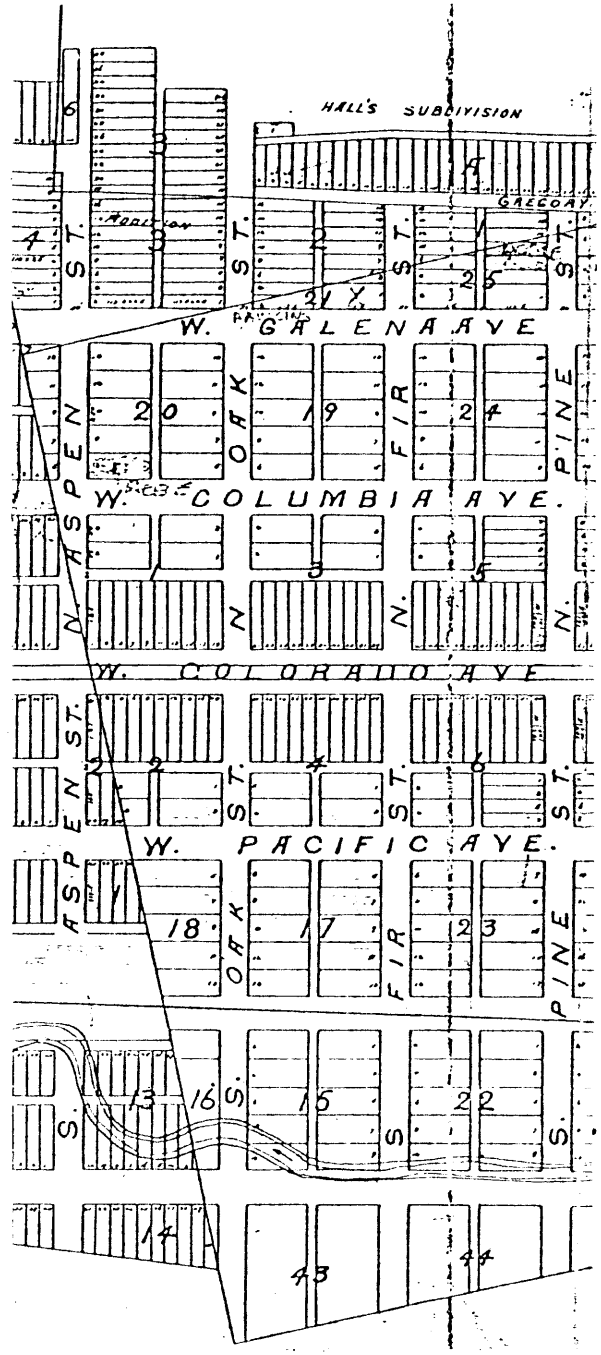
San Miguel County Courthouse (1884)

The town prospered in the 1890's because of two developments that greatly reduced the cost of producing ore from the surrounding mines. First, the Rio Grande & Southern Railroad tied the town into the national rail network, thereby lowering the cost of shipping ore out and supplies in. Second, the world's first transmission line for alternating electric current was constructed, which also served to lower production costs.

Physical growth accompanying this economic boom more than doubled the size of the town. In each case, the extensions continued the gridiron pattern. In 1891, the West Telluride Addition was platted down the valley, adding an area of nearly 100 acres. This extension included both sides of the river and stopped just as it abutted the steeply sloping mountains to the north and south. The railroad yard was an important deletion in the block layout. The railroad right-of-way extended through town, running close to the northern bank of the San Miguel River.

The addition continued the wide avenues running parallel to the main street, but in it a different form of rectangular block was adopted. The new block was 500' wide and 250' deep -- a 50 percent increase in size. All lots were 25' wide, 117.5' deep, and aligned north/south to front on the major avenues. Alleys were, again, in midblock, and ran parallel to the avenues.

In 1897 Hall's subdivision was created on the mountain slope above the 1878 townsite. Again, there was an attempt to extend the gridiron, but this one was accomplished only by introducing two major distortions into the pattern. The first was an accommodation for the Tomboy Road, which linked the town with the Tomboy Mine to the east. This important roadway, which was deeply cut into the mountain, became the terminus and collector for north/south streets that could not be extended beyond



the original townsite. The second distortion was in the actual form of the block basic to the addition. The strictly rectangular shape was abandonned, replaced by much smaller groupings of lots which were placed on the slope with more attention to local topography.

In 1899 the East Telluride Addition was platted, and it added another 70 acres to the town. It extended over flat land, steep land, the San Miguel River, and a marshy area south of the river. The avenues were extended east and west, streets ran north/south, and the plan restored the 250' x 250' block module of the orginal site. Again, the railroad provided a major discontinuity, its right-of-way crossing several blocks in a broad curve before joining Colorado Ave. The result was the slicing of four blocks on the diagonal to create the characteristic "flatiron" shapes. A second departure from the gridiron pattern was the creation of an additional avenue (Pandora) in what would normally have been an alley right-of-way. This ocurred at the foot of the slope and may have extended east to the mine of the same name.

Although the block size matched that of the original townsite plat, a much simpler system of parcelling was used in the East Telluride Addition. All lots were oriented north/south, with the exception of a few near the railroad right-of-way. The dimension of street frontage common to all was 25'.

In 1899 a fourth addition, the North Telluride, was platted on steep land above the Tomboy Road. This plat deviated from the existing pattern in that it was aligned to true north and the Tomboy Road. The blocks were 350' wide but otherwise the same as those in East Telluride.

Infill development of the grid continued in the 1890s. Public buildings such as the Miner's Hospital (1893), the Old Schoolhouse (1895), and the Methodist Church (1897) were constructed as the town's physical form consolidated in harmony with its steady growth as a mining center. Important public or commercial buildings were frequently built with the native red sandstone, and most other buildings were usually of log or milled lumber. The town developed several districts based on

use. Main Street clearly constituted the commercial core, and in it were the important businesses, offices, and hotels. The area north of Main Street in the 1878 and 1891 subdivisions became the preferred location for residences. Advantages here included large lots, a commanding view of town, good surface drainage, and the best solar exposure in town. Telluride's finest buildings -- both residential and institutional -- were built in this area.

East Telluride developed as an area of small frame buildings which housed mine workers. Factors which may have contributed to this included:

1) Proximity to the mines and the railroad.

2) Distance from the commercial core.

3) Uniform, small 25-foot-wide building lots.

4) Low lying topography (except for the hillside, which was not built upon).

The area south of Main Street developed as the warehousing and industrial area. The obvious factor contributing to this was its proximity to the railroad station. Warehousing, a foundry, workshops, stables, and an icehouse were all located here. Generally, it was not a desireable place in which to live because it was the lowest part of town, plagued by drainage problems and set in the shadows of nearby mountains, which blocked much of the winter sun. In addition, this area contained the town's saloons and brothels.

By 1900 the town's population had reached 4,000 -- a figure that turned out to be a historic peak. The prosperity and rapid development of the 1890's were followed by two decades of decline. Population dropped 40 percent as the town grappled with a series of problems: a prolonged strik in 1901 that lasted three years; a dam break in 1909 that isolated the town; and a flood in 1914. This period saw only one expansion of the town, the Dakota Addition of 1901, on the northwestern hillside. It brought the total area of the town to 283 acres and was the last annexation until 1974.

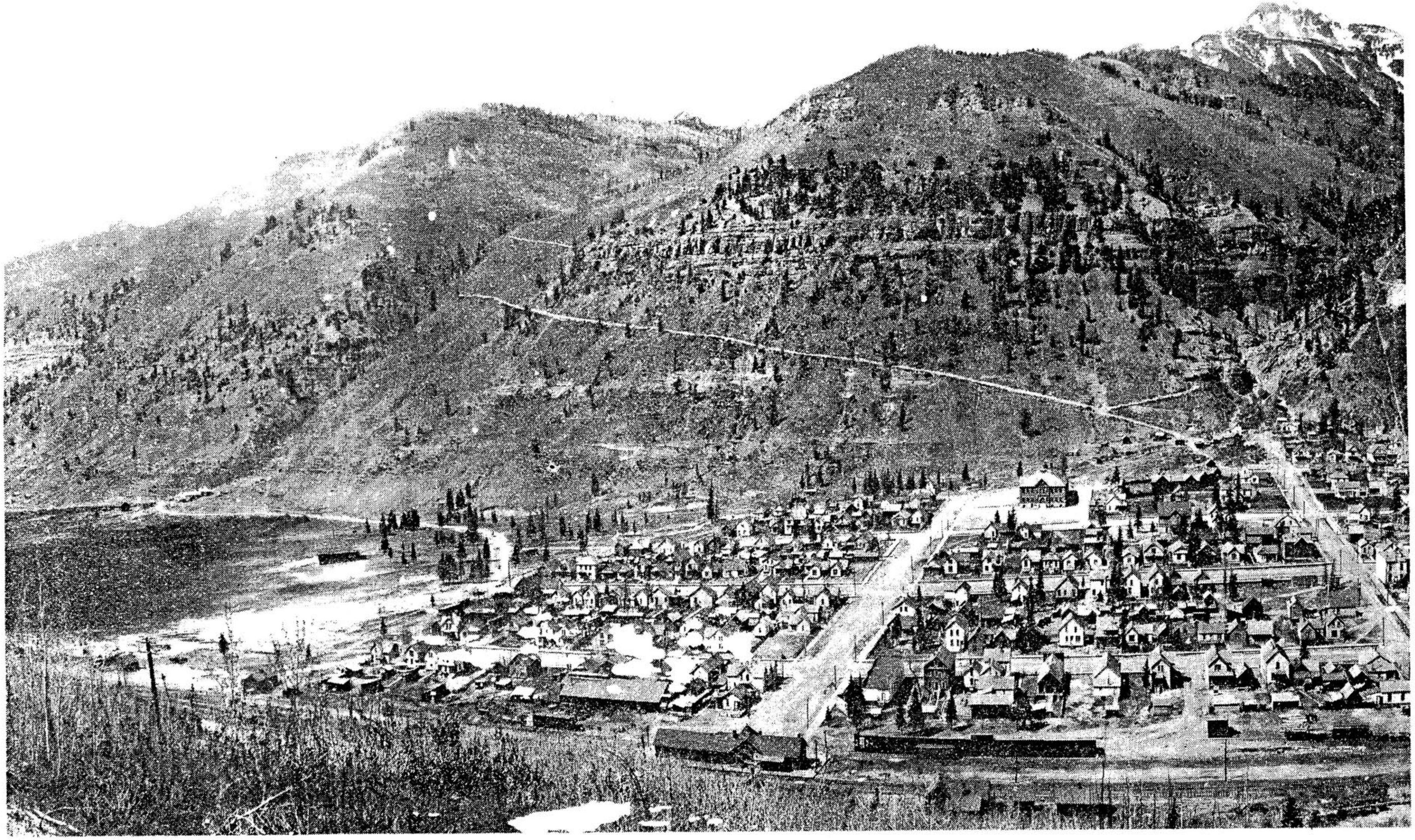
The Dakota Addition completed the existing grid across a small, irregularly shaped inholding formed by the 1873, 1891, and 1897 plats. It extended the town over the last section of Coronet Creek, which had originally formed a northern boundary of the settled area. Additional public buildings were constructed at the time of the Dakota Addition, including the Methodist Church (1900) and the new Miners Union Hospital (1902), as well as residential and commercial buildings. A notable example of the latter is the Telluride Brewery (1903), built on an isolated hill at the western edge of town.

According to Sanborn Insurance Maps (1908) and contemporary panoramic photographs (1891, 1897-8, 1906), a 15-year period of intense building activity began about 1891, and continued through most of the first decade of the new century. An underground sewage collection system of vitrified clay pipe was installed along the railroad right-of-way in 1914, completing the town's physical infrastructure of the town (water, sewer, electricity, roads).

Telluride's economy and population continued to decline between 1910 and 1930 due to rising operating costs, the stock market crash, and the onset of the Great Depression. The Tomboy Mine, one of the area's oldest and largest, was shut down, as was the town bank. Population reached 512 by 1930, one-fifth of what it had been 30 years before.

Physical growth came to a standstill. Decreasing population led to a large surplus of building stock. A great number of buildings lost to fire and vandalism were not replaced. Telluride became a Depression ghost town.

In 1938 the Tomboy reopened, as mining reestablished itself nationally after the Depression. By 1942 Telluride's population had grown to 1,400. The Tomboy changed owners that year, but it was shut down again in 1953, despite the fact that San Miguel at that time ranked first among metal-producing areas in the state. The closing precipitated another period of general decline. The Rio Grande Railroad was closed in 1951, and those employees still working in the mines were subsequently brought in by company bus from towns like Norwood, Montrose and Ouray.



PANORAMIC PHOTOGRAPH (ca. 1906)

Physically, the town stagnated. Not only was there no significant construction during this period, numerous frame buildings were destroyed in practice drills staged by the fire department. Mobile homes became the predominant form of new housing and could be seen planted on the narrow lots throughout town.

Summer tourism began to develop in the 1960's as outsiders bought up older homes and commercial buildings to renovate them. Although there was little new construction, Telluride was virtually rebuilt from the inside out. Interest in the town heightened in 1969 with the announcement by California developer Joseph T. Zoline of plans to build a major ski area. In 1972, after having made large land acquisitions in town and the surrounding region, 87 new condominum units were built in the vacant West Telluride Addition, and five ski lifts were constructed in the mountains to the south. The town's population stood at close to 450.

The year 1973 marked the start of a new era of physical development for Telluride. New infill buildings rose on the numerous vacant lots (a report that year by the town planning staff estimated that 36 lots in town had no buildings on them). Land prices began to climb: a 2,500-square-foot residential lot that cost $3,000 in 1973 sold for $18,000 in 1976 and $36,000 in 1979. Summer and winter tourism, second-home development, and the national demographic shift to smaller, more rural communities all had a particular impact on Telluride.

The 1970's have been a period of sustained economic and physical growth for Telluride. The closing of the Mine in 1978 had little effect on the town, which no longer relied on a single economic base. In 1974, the first annexation in 73 years added a small parcel of land lying to the north of town boundaries (refer to accompanying map).

In 1979, 10.5 acres near the Telluride lodge were annexed as part of the new Backman subdivision, the clearest departure yet from the traditional gridiron. When the 87-unit lodge was constructed, the town agreed to vacate all city-owned rights-of-way in the area. With all land under one ownership and control, the new development was laid out as if on a "tabula rasa." The new subdivision attempted to distribute building types, sizes, and densities within a complex system of private restrictive covenants for each building parcel. The physical form of the subdivision layout (which has not yet been infilled with buildings) has an entirely new pattern of streets and lot sizes, which appear to have been determined more by the shape of the parcel and the existing lodge than by a desire to maintain physical continuity with the gridiron.

C. FRAMEWORK

Framework was described earlier as the controlling element of the three-part system of Framework, Network, and Infill. The important characteristics of Framework are that:

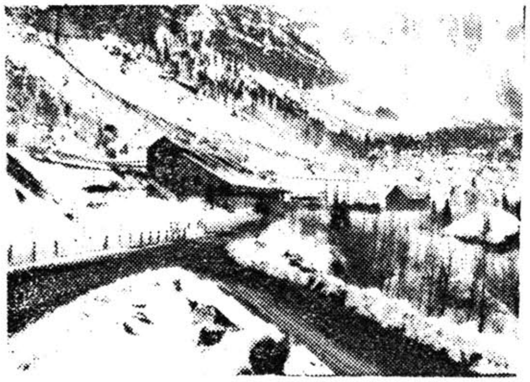
1. It is the largest element of organization.
2. It lasts longest, and is usually the most expensive.
3. It is the most central and the most difficult to change.

In Telluride and environs, the following Framework elements were identified.

Natural Forms

a. The mountain slopes on both sides of the valley, traditional barriers to the town's expansion. These slopes were determined to be greater than 30 percent.

b. San Miguel River and Coronet Creek are both watercourses which have controlled the way in which the town developed. A 50-year flood plain in the river increases the lateral dimension of the river framework.



Manmade Forms

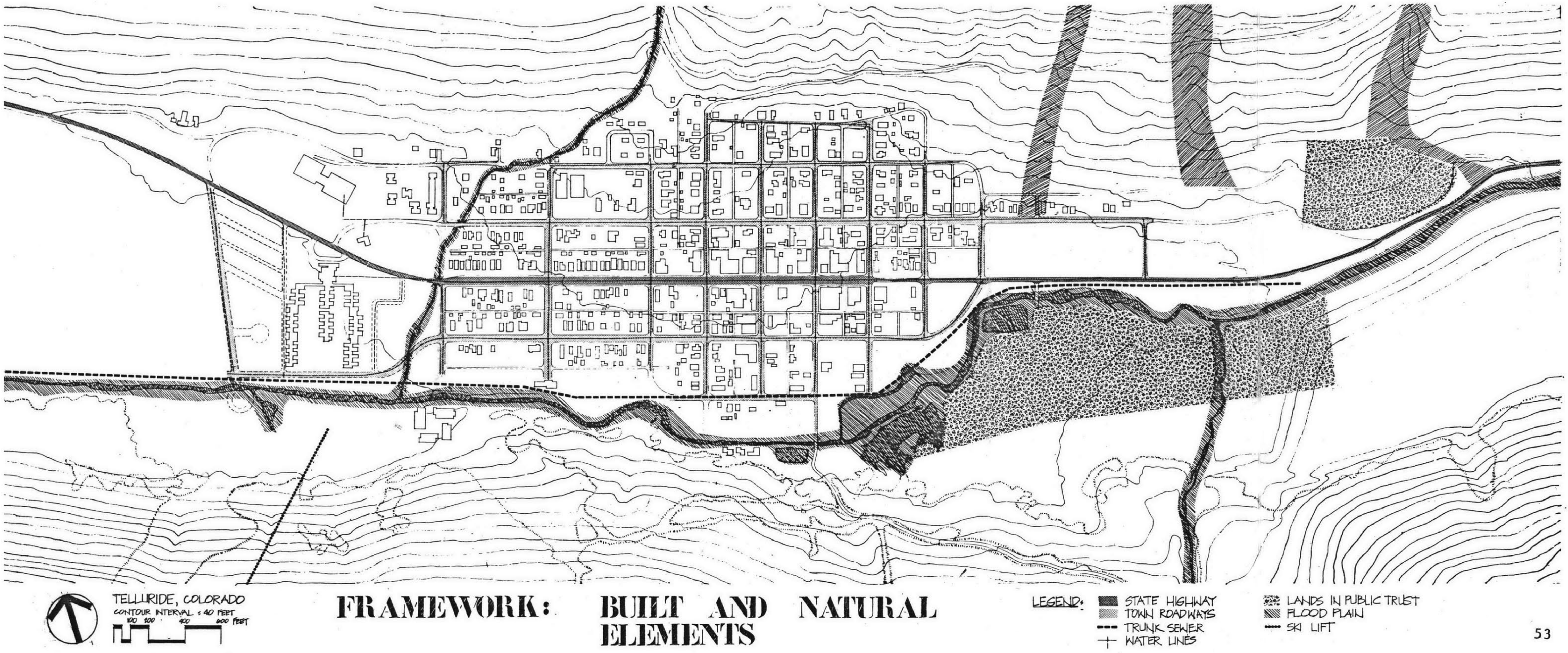
a. State Highway 145 enters town from the west, becomes coincidental with Colorado Avenue, and terminates two miles east of town at the Pandora Mine. The right-of-way is 100' wide, although the paved surface itself varies from 30 to 60 feet in width.

b. Town-owned roadways -- including avenues, streets, and alleys -- are graded, have improved surfaces, and are maintained on a year-round basis.

c. Below-ground physical infrastructure comprises main water lines and trunk sewer lines. Main water lines run down the center of streets and avenues and are fed from a 150,000-gallon tank one mile east of town. A trunk sewer line, built in 1914, runs through town along the old Denver and Rio Grande right-of-way until it meets the river.

d. Above-ground physical infrastructure includes electrical lines, which run down alleys, and ski lifts.

e. Lands in public trust include the Town Park and the Cemetary, both at the east end of town.



FRAMEWORK: BUILT AND NATURAL ELEMENTS

D. NETWORKS

Networks were described earlier as the lines of movement of people, goods, and services within the Framework. They are not physical elements and do not have to correspond to the Framework (although they may at some times). Networks can help to generate Infill, and vice-versa.

Telluride has several significant networks:

1. Regional Vehicular Network: This consists of truck, bus and automobile traffic destined for Telluride, the "Ski Ranches" (a housing development three miles south of town), or the Pandora Mine.

Presently, all regional traffic flows directly into the local traffic system. This situation would be aggravated by the reopening of the mine, which would generate a large volume of truck traffic through town. Automobile traffic moving through the town toward surround U. S. Forest Service land does not yet constitute a problem. In winter, the town operates an parking area for visitors outside of town.

2. Local Service Network: Service vehicles, including vans and large trucks, presently reach the five-block commercial core directly from Colorado, Columbia, or Pacific Avenues, sometimes using the side streets and alley. There is already a problem resulting from service vehicle competition with pedestrians and other vehicles. This will worsen as the number of buildings on Colorado Avenue increases.

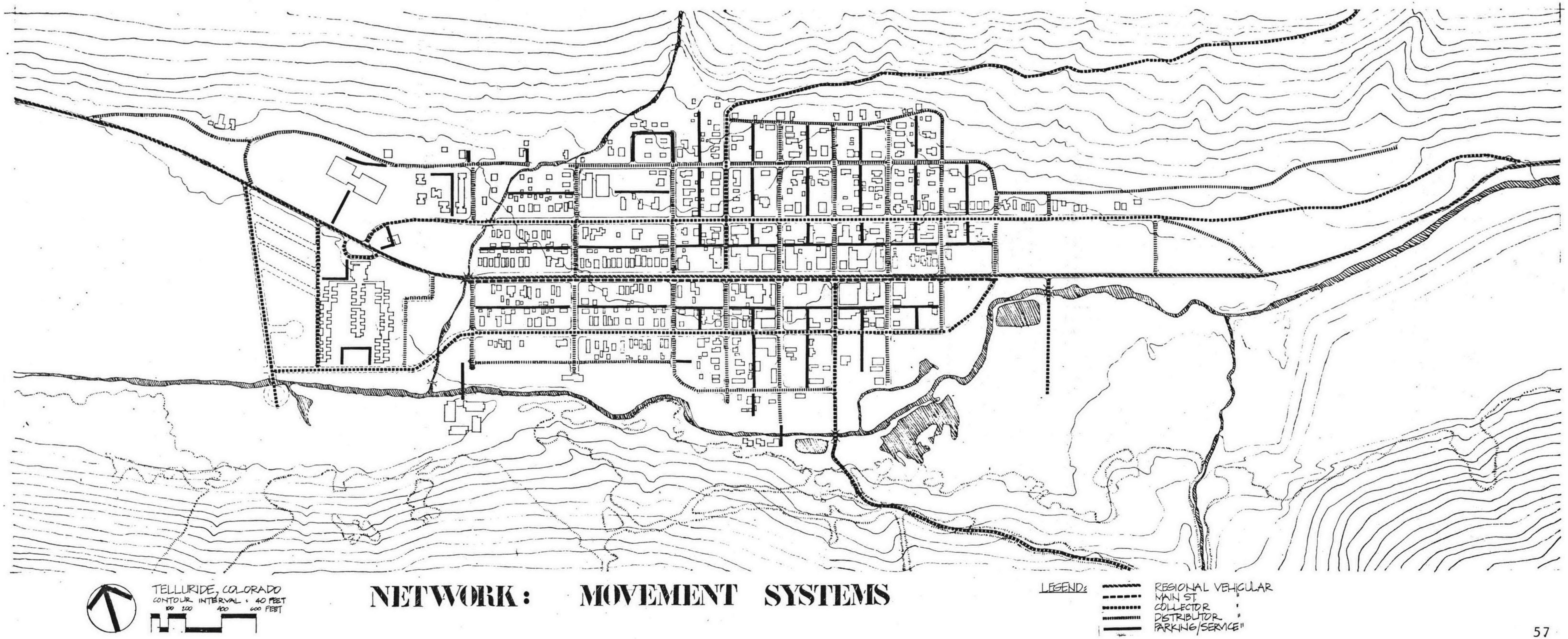
3. Local Vehicular Network: Private vehicles travel in any direction along any public right-of-way. Parking for private vehicles at present is generally on-street, although there is an off-street parking requirement (1 space for each residential unit; 2 spaces/3 lodge units; 1 space/1,000 square feet of commercial area). Such parking is generally in driveways off the main street or along alleys behind buildings.

4. Public Transportation Network: The Denver and Rio Grande Railroad discontinued its Telluride service in 1951, and today regional bus transportation links the town with the cities of Montrose and Grand Junction.

Within Telluride, during the winter season, parking is provided for visitors outside of town, and a subsidized in-town public transportation system of buses and vans has been established. The system runs in a loop on existing roadways and links the parking area, ski area, and downtown.

Expansion of this network, as projected by the Civic Transportation and Parking Report (1978), will include a light rail installation in town, enlarged bus loop and vehicle storage, and a cog rail link with the proposed Mountain Village. All of this is to be operated on a year-round basis.

5. Pedestrian Network: Most pedestrian movement is along sidewalks on the perimeter of blocks, which provides direct access to the main entrances of most buildings. There is also a strong pattern of movement through the service alleys in mid-block; this frequently conflicts with regular servicing functions being carried out there.



NETWORK: MOVEMENT SYSTEMS

E. INFILL

The element of Infill was defined previously in terms of the Santiago, Chile, project. Based on this description, the criteria for identifying Infill in Telluride are the following:

1. It is the smallest element of organization and can be physical form as well as a use of or agreement concerning that physical form.

2. It is usually controlled by the higher-level elements of Framework and Network.

3. It is more frequently altered than Framework or Network.

4. It is the most variable of the three elements and the most subject to individual variation.

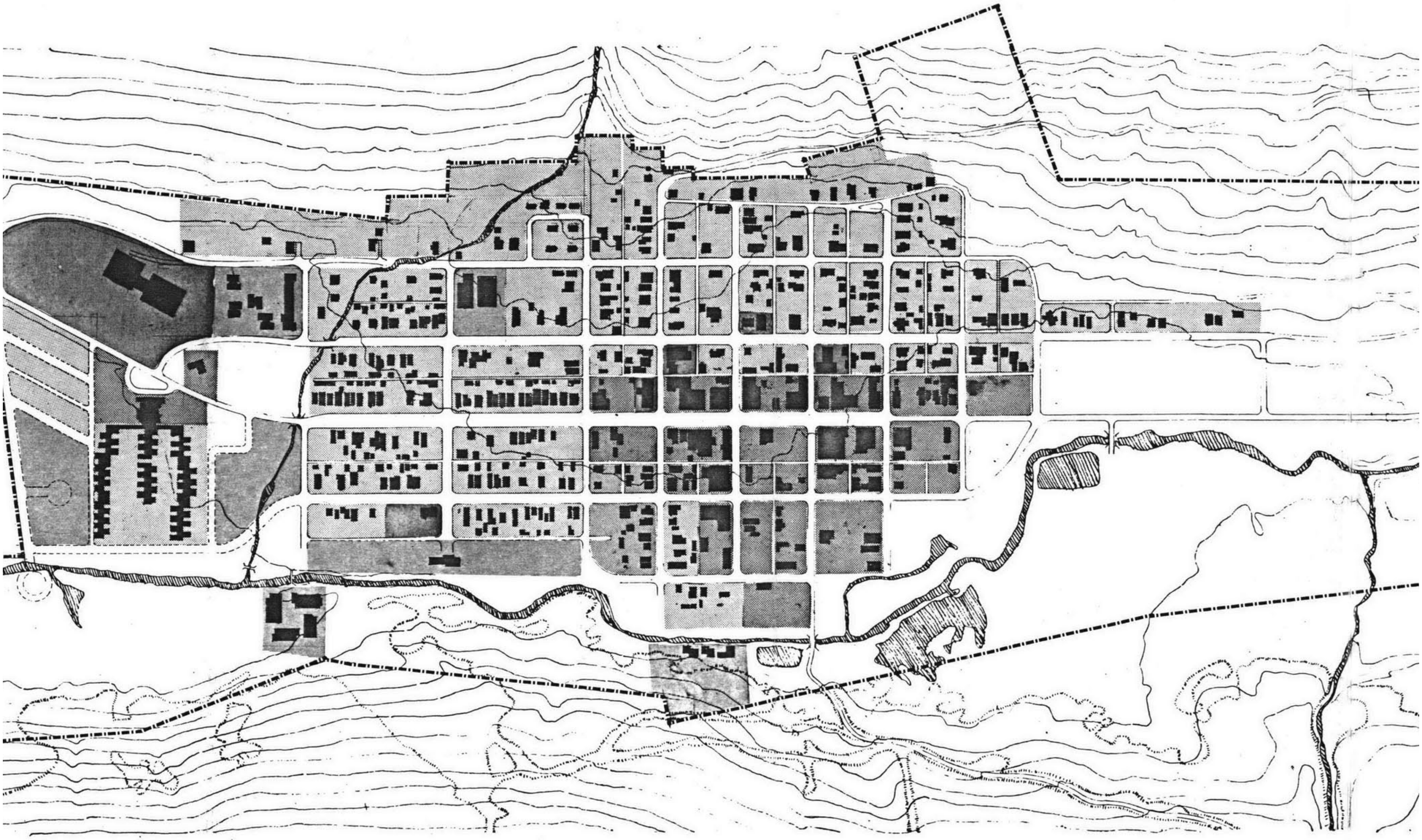
Using these criteria, the following general categories of Infill in Telluride were identified: A) Parcelling and Property Boundaries B) Buildings C) Ownership D) Uses E) Legal Mechanisms. These categories are discussed below with respect to their contribution to the urban morphology of Telluride.

A. Parcelling and Property Boundaries

The early plattings for Telluride all adopted some form of the rectangular block to describe a unit of privately owned land which then was subdivided systematically into rectangular building lots. The original block subdivision consisted of lots 117.5' deep and either 25' or 50' wide. Depending on the type of block, these lots were oriented to the avenues running east/west or to the streets running north/south. All lots had some sort of access from the interior of the block by way of a 15- to 20-foot-wide public alley.

Comparison of present-day plats with the 19th century originals revealed two very different trends for reparcelling blocks. The first trend was the reparcelling of lots within the framework of a single block, making no changes in the public/private boundary. The second type was the agglomeration of several blocks into one parcel, changing the public/private boundaries, and creating a framework of organization larger than the individual block.

Numerous examples of the first type of reparcelling were analyzed, and the following patterns were identified:



INFILL: EXISTING USES, BOUNDARIES, AND BUILDINGS

LEGEND:
- TOWN BOUNDARY
- COMMERCIAL
- RESIDENTIAL
- INSTITUTIONAL

1) Reparcelling to change street frontage: The original street frontage of lots was either 25', 50' or 117' (if the lot was on the end of the block). By combining several lots, or by subdividing, a range of different frontages was generated (25', 37.5', 40', 50', 67.5', 75', and 100'). A module common to all these frontage dimensions is 12.5', one-half the width of the smallest original lots.

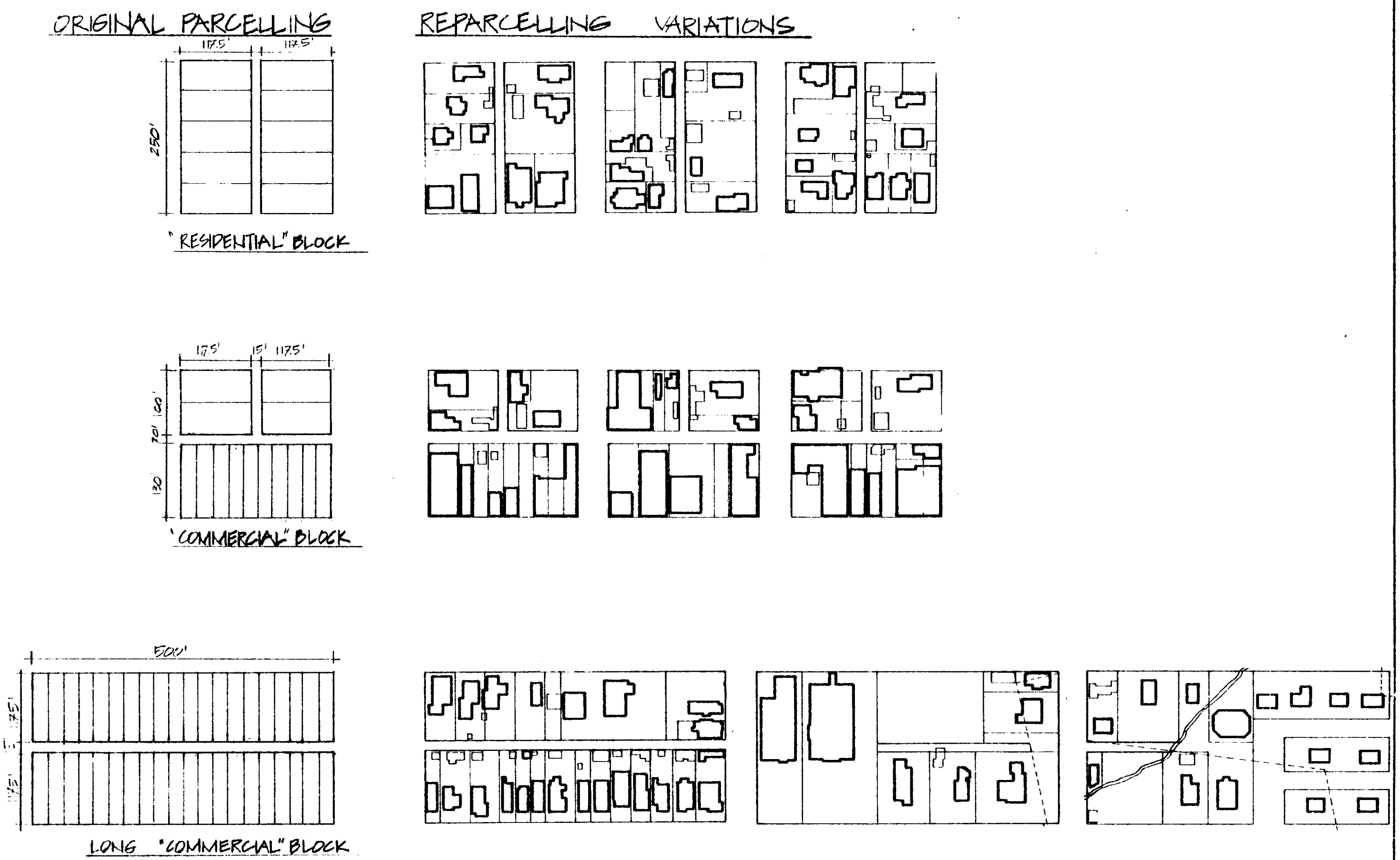
2) Reparcelling to change orientation: The orientation of buildings on lots in mid-block was usually predetermined -- a public zone on the street and a private or service zone on the alley. In the case of lots at the end of blocks, buildings could be oriented to either street or alley. Reparcelling to maximize the number of lots fronting on a particular roadway became a common pattern.

3) Reparcelling to create corner lots: A variation on 2) above. Square corner lots were created with equal frontage on, and access to, both street and avenue.

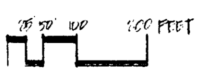
4) Reparcelling to create interior lots: This pattern developed before frontage on a street or avenue was established as a legal requirement for subdivision. In this case, a single large lot was subdivided laterally, creating two lots approximately 50' x 50' each, one fronting the main public roadway and one facing the interior of the block but accessible from the alley.

The second trend identified, that of agglomerating several blocks into one parcel, followed two patterns.

1) Consolidation of blocks outside the town core: In several areas, notably south of the river,



PARCELLING STUDY



the gridiron, although platted, was never well established due to poor soil conditions, flooding, or steep slope. Much later, land was consolidated under single ownership, public rights-of-way vacated, and buildings located within the new parcel which did not use the grid as an organizer. The public park and the cemetary are two examples of block consolidation

2) Consolidation of blocks adjacent ot the town core: In areas to the west of town, developments built during the past 15 years have dropped the gridiron that was platted in 1891 and have established a different system of land parcelling. The parcels are larger, less land is devoted to public roadways, and the edges of the parcels are defined by the State Highway, the river, and the steep slope.

B. Buildings

The buildings and other built forms in Telluride are compared according to their morphological characteristics. This morphological typology was outlined by Fumikiko Maki in Investigations in Collective Form (1964). It was further developed by Imre Halasz, applying to all built forms at all levels of scale in the physical environment, as the following:

1) Compositional Form: Complete, discrete volume with freestanding edges, frequently axially oriented. At large scales, its use is often public or ceremonial in nature.

The important characteristics of compositional form are that it is generally singular and cannot easily be linked to other compositional forms. One result of this is that compositional forms are usually set in isolation, spatially separate from other built solids.

The archetypal compositional form is the Parthenon.

2) Megaform: A large "skeleton" or master form is first established, and into it smaller forms are placed. The smaller forms are much more short-lived than the master form. It is essential that the smaller forms derive their support through the master form and that they be unable to exist outside of it. This approach toward creating a collective form was explored at the scale of urban design by Condellis and Woods, Tange, and others.

The infrastructure of utilities and streets in an urban grid are also a kind of megaform that feeds individual buildings.

A fundamental disadvantage of megaforms is the huge investment of resources necessary to complete the (word) before any smaller forms can be attached or put in place.

3) Aggregate Form: Aggregate form evolves from a system of generative elements, each with a built-in link to allow the joining of another. It is a true "growth form."

Two important characteristics of aggregate form are consistent use of materials and builing methods, and sequential development of the basic elements.

The best examples of aggregate form come from traditional or vernacular building. Usually, the solids are continuously built, the essential "link" being solid as well. However, the link can be spatial, producing aggregate form which is not continuously built.

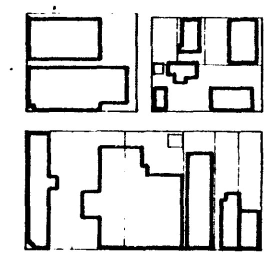
The advantage of aggregate form is that it can be created incrementally. Resources are invested as needed, in stages.

All three morphological building types are found in Telluride, although some are more prevalent at different scales than others. Within the Aggregate Form category, two patterns can develop, depending on whether the building(s) is(are) located within or outside of the gridiron.

1) Aggregate Forms within the block: This most commonly occurs on the 25-foot-wide lots on Colorado Avenue. The result is the characteristic western "flat front," which forms a continuously built wall along the street. The form can "grow" by adding additional units of built form within the block framework.

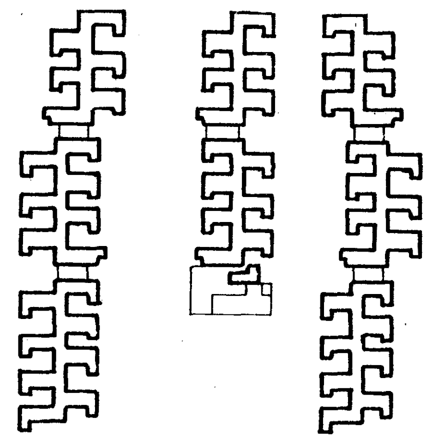
2) Aggregate Forms outside the gridiron: The best example of this pattern is the lodge west of town. Removed from the constraints of the gridiron, this form can "grow" by simple addition until it is obstructed by some Framework element such as a roadway or the river.

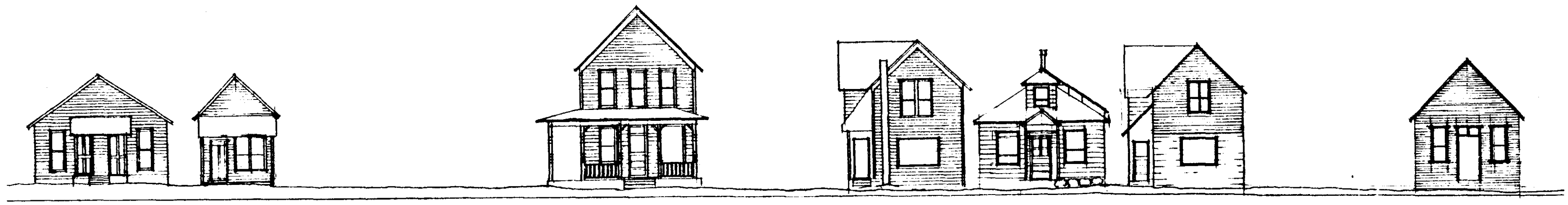
There are also two patterns for Compositional Forms; which one develops depends, again, on whether they occur



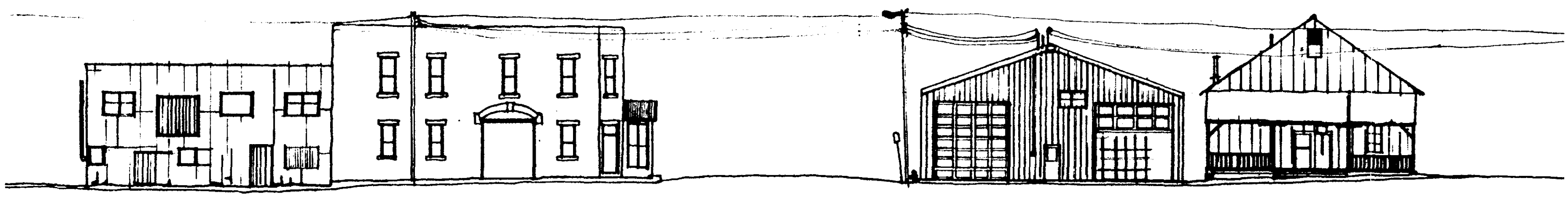
Aggregate Form within the Block: Buildings on Colorado Ave.

Aggregate Form outside the Gridiron: The Lodge





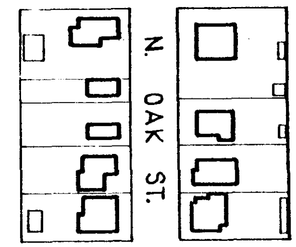
STREET FACADE OF DETACHED BUILDINGS



STREET FACADE OF DETACHED AND CONTINUOUS BUILDINGS

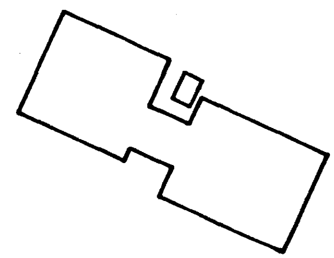
STREET FACADE OF CONTINUOUS BUILDINGS

within or outside of the grid framework.



Compositional Form within the Gridiron: Typical detached residential buildings

1) Compositional Forms within the gridiron: This is the most common pattern in the town. Each detached residence or building is a discrete compositional from located within the boundaries of the building lot. Important public buildings such as the old school or County Courthouse may occupy several lots, but they still follow the same pattern. Although the forms are intrinsically separate and discontinuous, continuity is established by strong and consistently shared patterns in the vocabulary of building elements, materials, private outdoor spaces, and public street edge.



2) Compositional Forms outside the gridiron: This form seems characteristic of more recent buildings. The orientation and location result from one of several organizing elements. For example, the new school building west of town is oriented to the State Highway, the small service nearby is aligned on a north/south axis, and the cluster of four lodge buildings south of the river is oriented to a central courtyard.

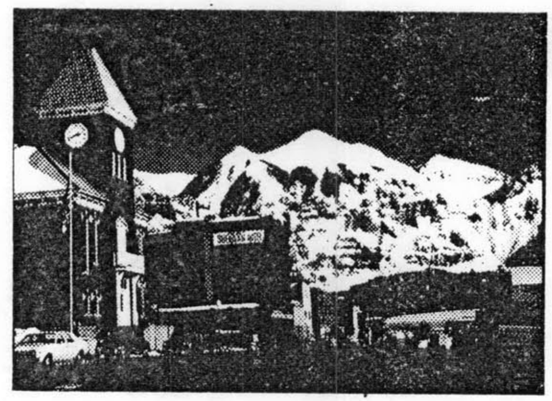
C. Ownership

In the description of parcelling patterns, the ownership of platted public rights-of-way was identified as a critical element in determining the built form. In cases where public ownership was maintained, a high degree of predetermination of parcelling and buildings results. In the four blocks studied, the largest building was the old school -- 120' x 70' measured in plan, 4 stories high, located on a 125' x 250' parcel which had been created from 10 lots and part of an alley. More often, buildings are much smaller because they are located on one, two, or three lots. Another factor which contributed to this rather fine texture of built/unbuilt spaces is the length of time over which ownership was spread. So many lots were built up in the town's first century that opportunites for combining more than a few empty ones into a single parcel are rare today.

In cases where public ownership of rights-of-way was given up, extremely large and irregular parcels were created. The shape of those parcels exerted very little influence on building form -- virtually all types and sizes of buildings were possible. New street layouts could be designed to accommodate (albeit ungracefully) existing or proposed buildings. One example of this is West Telluride, where a new street layout allowed infill of buildings that was abruptly discontinuous with the rest of town. As a result, the texture of built/unbuilt space changed drastically.

D. Uses

One of the most striking things about the land use pattern in Telluride is that it has changed so little since the town's founding. Residential and institutional buildings generally are located north of Colorado Avenue in the "Sunnyside," at the higher elevation, with the best views and exposure to sun. Commercial and retail buildings are located along both sides of Colorado Avenue, with the best vehicular and pedestrian access. Service buildings and warehouses are located south of Colorado Avenue in the lowest, coldest and darkest part of town.



However, the location of the ski facility at the southwest corner of town in the mid-1960's significantly affected subsequent land use patterns. Because of the demand for housing near the lift, there is now a trend toward building residential units south of Colorado Avenue. The common form is mixed use-commercial on the ground and condominiums above. This is encouraged by the abundance of unbuilt land closer to the ski area and zoning regulations that favor multifamily development at higher densities here than elsewhere in town.

E. Legal Mechanisms

Little is known about any legal mechanisms, public or private, that were used to control the form of infill in the early stages of Telluride's growth. The first zoning regulations, based on existing land use patterns, were established in the early 1970's. This was conventional use-by-right zoning which delineated two districts and outlined permissable uses, building heights, setbacks, location, ground coverage, and off-street parking requirements for land within each district. The two districts established initially were residential and commercial.

In addition to the dissimilar uses, the two districts prescribed very different building forms: buildings in the residential district were restricted to a height of 25', a front yard setback of 15', a side-yard setback of 2.5', and a rear setback of 15'. Buildings in the commercial districts were limited to a heigh of 40';

no street, side-yard, or rear yard setbacks were stipulated.

After this initial zoning, additional districts were established, each with particular regulations, until the small town had its own equivalent of "big city zoning." The new districts included Historic Preservation District; Open Space Zone; Hillside Residential District; Hillside Commercial District; and Park District.

This zoning was further embellished by subdivision regulations, a planned-unit development ordinance, a historic district ordinance, and a mass-and-scale ordinance that restricted FAR to 2:1 in order to limit the potential density and size of new structures in commercial districts. In addition, various environmental regulations -- such as flood plain and geologic hazards ordinances -- were enacted in an effort to prevent unsafe construction in hazard-prone areas.

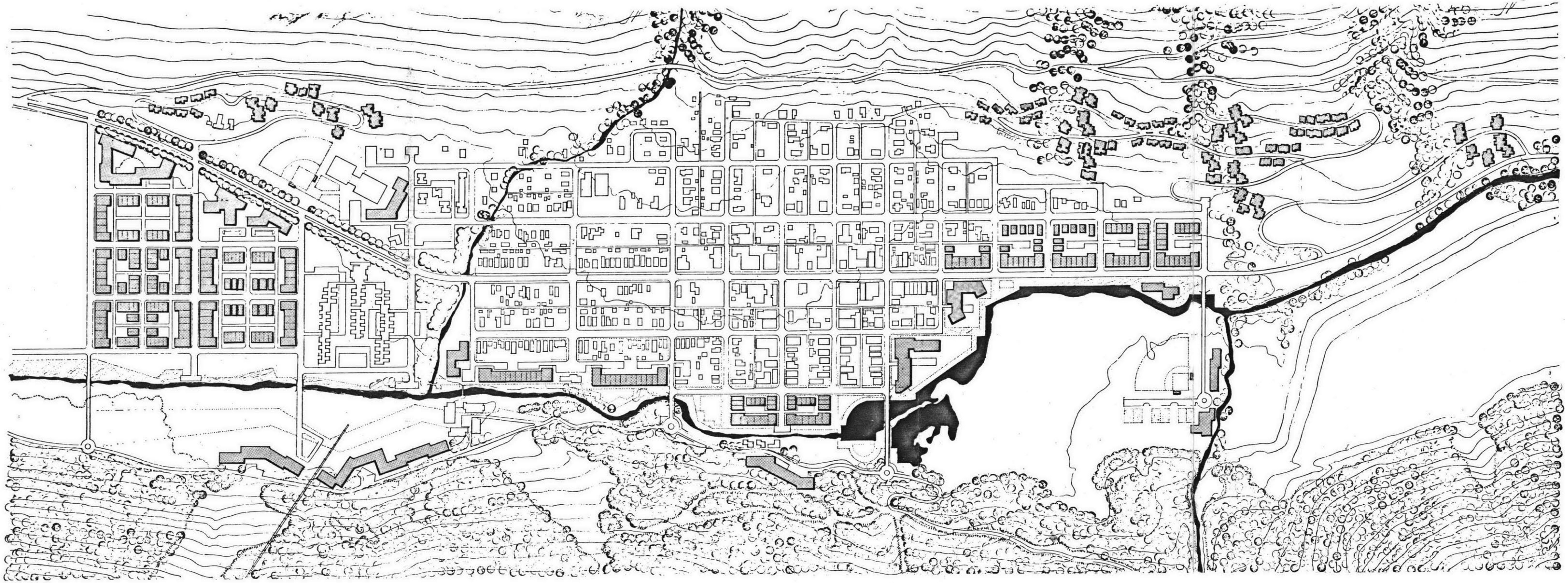
The most recent phase in the development of legal mechanisms to govern land use has two parts. The first is the revision of the present districts and regulations in order to control more tightly the form and impact of new construction. This includes consolidation and further differentiation of districts and regulations. At present, the new system of districts comprises these categories: Residential, Commercial Core, Warehouse Commercial, Residential Commercial, Accommodations, Park/Open Space.

The second part of the town's most recent effort is the use of private agreements, or "restrictive covenants," which can control development more strictly than publically administered zoning. Restrictive covenants were used in the most recent annexation of land to Telluride, in 1979, and attached to each parcel of land specific requirements for building height, number of units, ground coverage, setbacks, parking, and special public easements.

The effect of these regulations remains unclear. In large part they have been developed primarily to protect the existing "character" of the physical form of the town as it is perceived on the level of individual buildings. However, little has been done to investigate how new physical form might be successfully integrated with existing form through large-scale design at the level of one or several blocks, or the entire town.

Section IV: Design Projections

The accompanying illustrative site plan, diagrams, and detailed design studies show how physical expansion of the town of Telluride can be accomplished while maintaining strong morphological continuity with the existing context. Based on the problem definition, observations, and analysis in the first part of this work, the following general strategies were developed for dealing with the expansion of the town as a whole, as well as the selected ares of River Edge, Valley Floor, and Hillside.



TELLURIDE, COLORADO
CONTOUR INTERVAL : 40 FEET
100 200 400 600 FEET

ILLUSTRATIVE SITE PLAN

LEGEND: NEW BUILDINGS

A. PROPOSAL FOR A NEW VEHICULAR AND PEDESTRIAN NETWORK

The accompanying diagram illustrates how a new movement system could be developed in the existing town, as well as in the projected expansions, which would fulfill the following objectives:

1. Reduce the "territory" devoted to the automobile while still allowing vehicular access to all buildings.

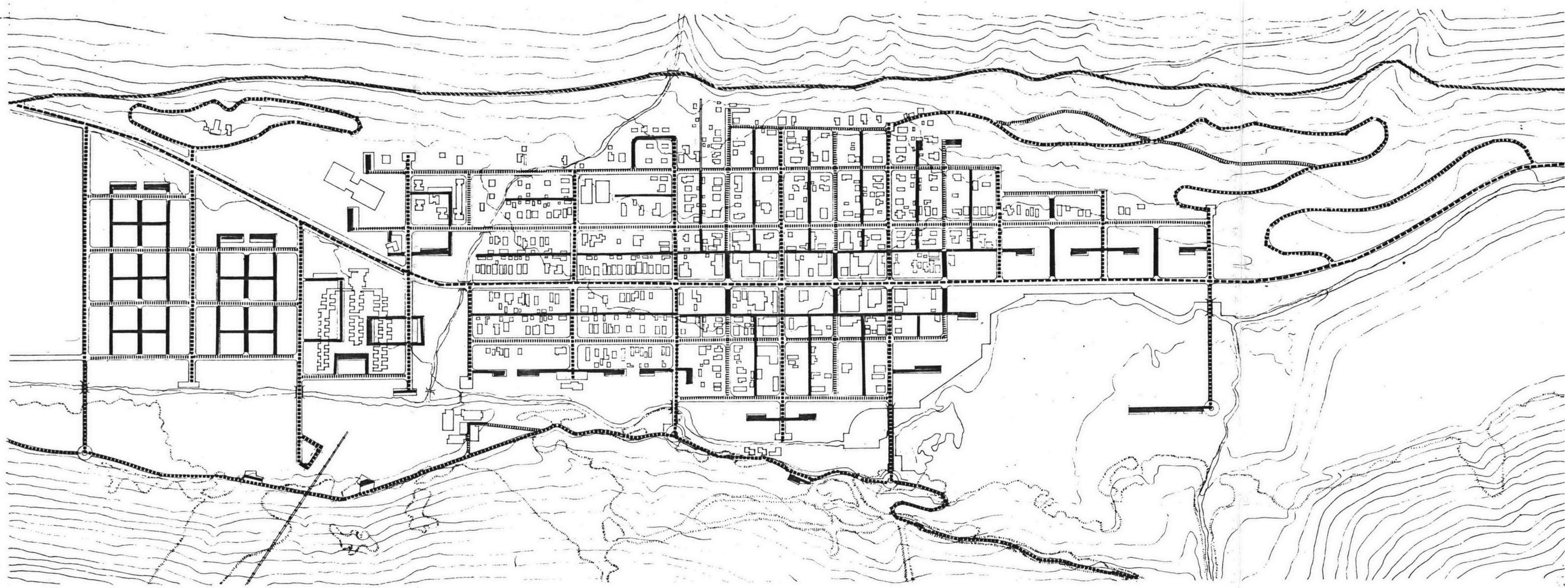
2. Create a separate and continuous system of pedestrian movement through the entire town.

3. Provide for mid-block parking that could later be converted to a non-automobile use if regional parking is implemented.

4. Allow for the future installation of light rail public transportation in public rights-of-way.

The system distinguishes among five levels of automobile movement; defines restricted pedestrian thoroughfares; and provides for future public transportation.

Regional traffic could be diverted around the town in the event of the mine reopening and/or traffic increasing significantly. In this case, Main Street



TELLURIDE, COLORADO
CONTOUR INTERVAL : 40'
100' 200' 400' 600'

NETWORK: PROPOSED MOVEMENT SYSTEMS

LEGEND:
REGIONAL VEHICULAR
MAIN ST. "
COLLECTOR "
DISTRIBUTOR "
SERVICE/PARKING VEHICULAR
PEDESTRIAN

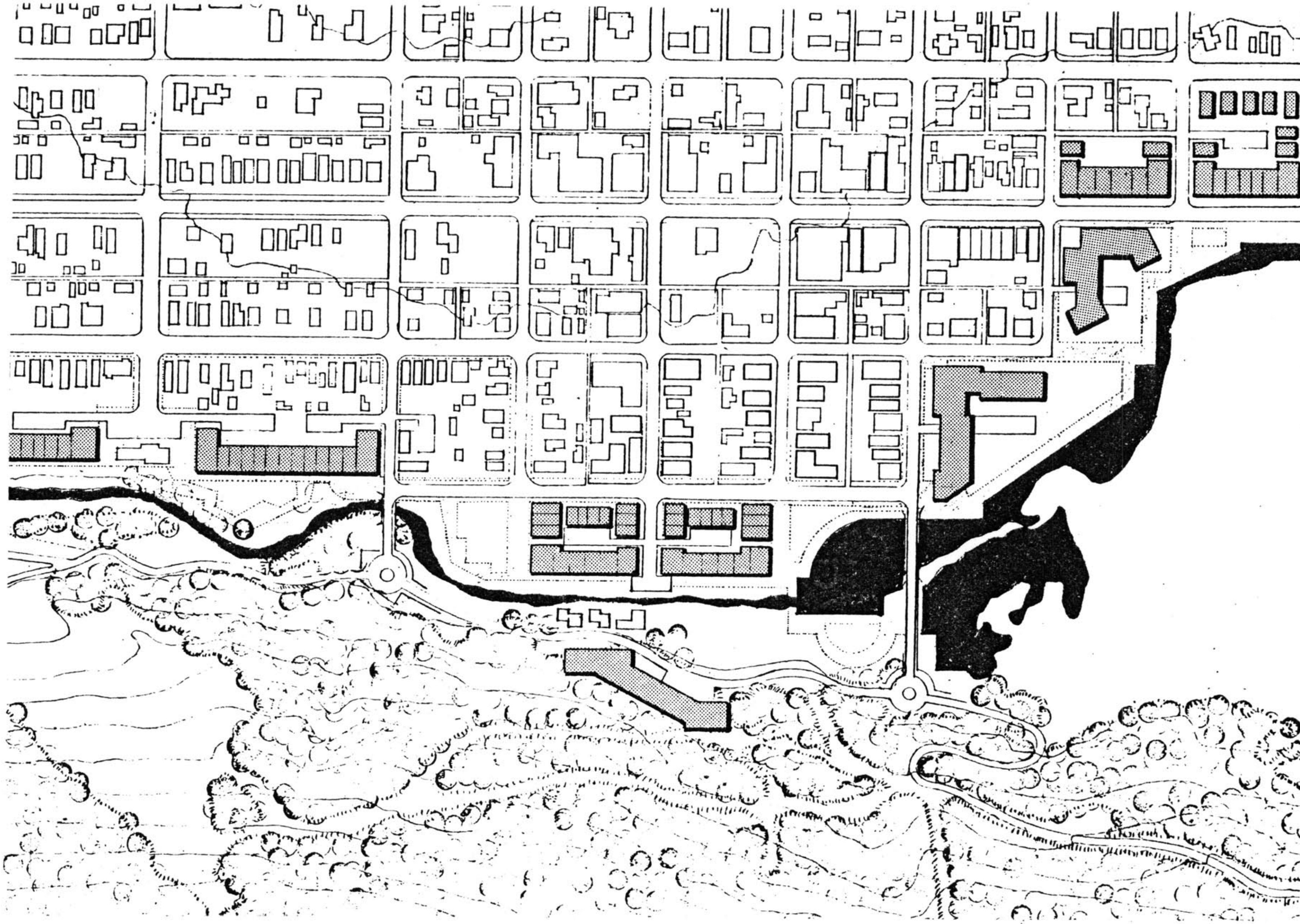
would be extended east and west along the state highway, providing a limited-access boulevard entry to the town and a link between regional and grid-level traffic. Collector streets every two blocks would collect traffic from all minor streets within the grid, and would link directly with important destinations outside the grid (for example, the ski area in the southwest corner of town). Major commercial uses could be located on the collector streets. Distributor streets would provide access to the block perimeter as well as the interior service/parking alley.

Pedestrian movement would be nearly continuous along the river edge and would connect with the pedestrian malls created by closing alternate north/south streets.

A future light rail system could be extended along Pacific Avenue and the river edge in an easement that would exclude automobiles.

B. EXPANSION TO THE SOUTH-RIVER EDGE

The meeting of a river and a gridiron is an archetypal design problem (graphic examples in Appendix C illustrate the variety of solutions to this problem, including some from contemporary Western sites). A goal of this design exploration was to exploit both natural and manmade contexts as positive generators of the form of the town expansion. Partly as a result, the strategy employed in this solution is to allow the grid to complete itself with full or partial rectangular blocks that never cross the river. Infill of the blocks would be continuously built in order to create a clearly defined edge and to accommodate increased density while remaining within the range of existing building heights. The area between river and grid is used for open space or a river parkway. Located in this space are "compositional forms" that respond to the directions of both river and gridiron. Additional "compositional forms" that respond to the geometry of the landscape are



TELLURIDE, COLORADO
CONTOUR INTERVAL: 40 FEET

ILLUSTRATIVE SITE PLAN

RIVER EDGE

placed across the river in an axial relationship with the major collector streets. The building density is much greater than the existing density because development potential is consolidated from areas to be kept as open space.

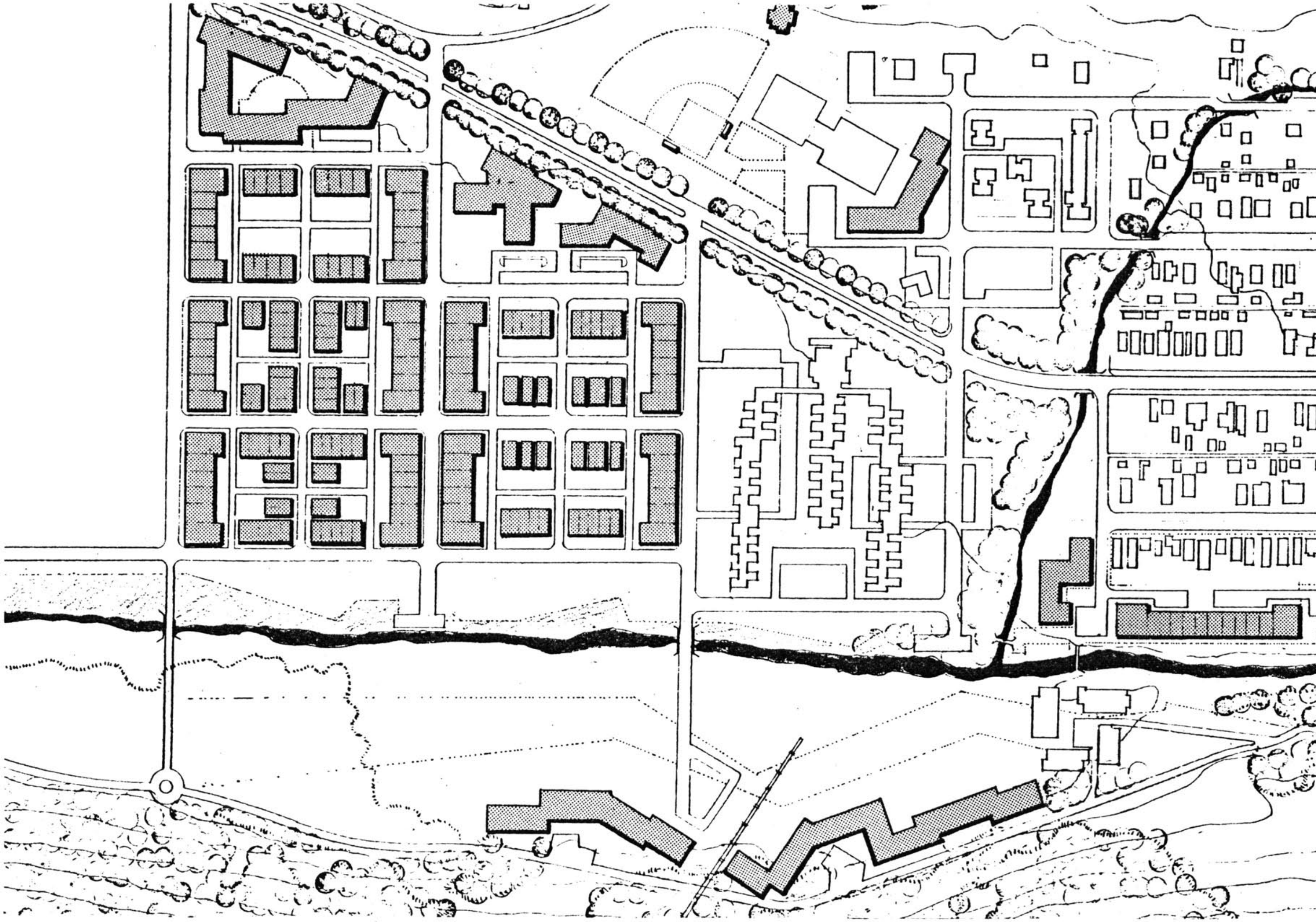
The axonometric design study shows how the "edge" of continuously built forms alongs the river would relate to the predominantly detached built form of its surroundings.

C. EXPANSION TO THE WEST-VALLEY FLOOR

Expansion to the west best demonstrates the intrinsic growth characteristics of a gridiron. Although contained on three sides by the existing town, river, state roadway, and mountain slope, the grid can extend indefinitely to the west, using the additive module of a new rectangular block. This new block, based on the 250' x 250' parcelling module of existing town blocks, is designed for more clearly ordered networks and can support a range of building forms, uses, and densities. Phasing of growth can occur on a block-by-block basis or by individual building parcels.

The linear open spaces between and within the blocks are designed to accommodate the new differentiated vehicular and pedestrian network as well as of the projected built form for the area. In addition, existing built form on the western edge of the present town is accommodated within the revised street framework.

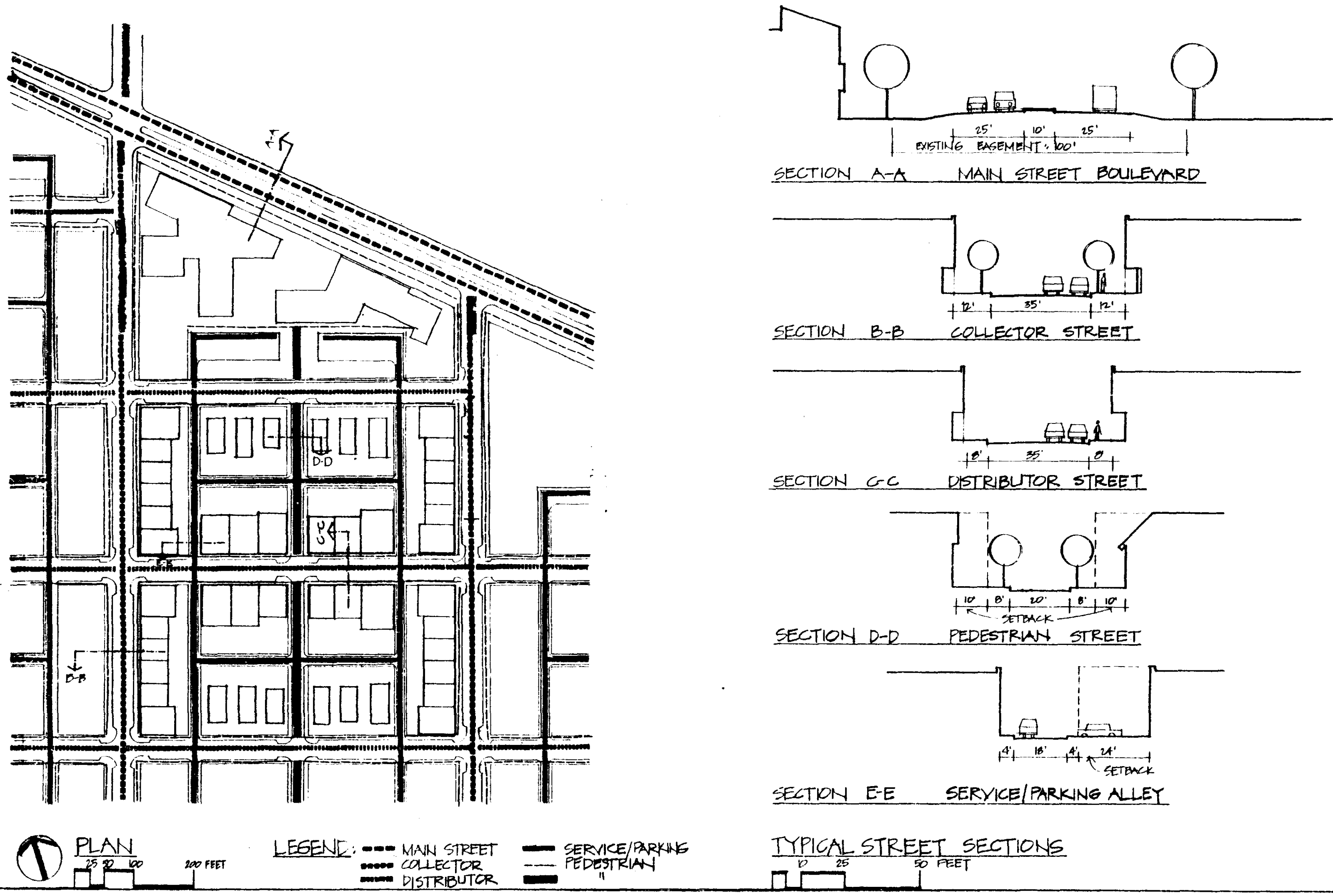
The spaces between the gridiron and the existing



TELLURIDE, COLORADO
CONTOUR INTERVAL : 40 FEET

ILLUSTRATIVE SITE PLAN

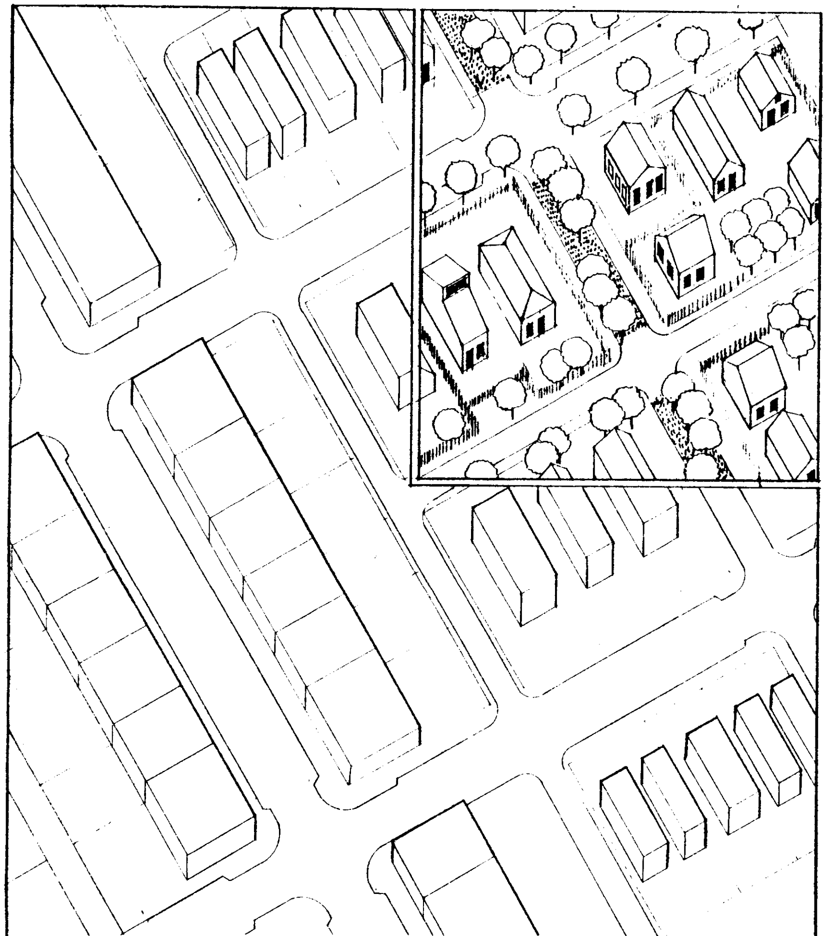
VALLEY FLOOR



FRAMEWORK- NETWORK STUDY VALLEY

state highway are used for special built forms which are accessible from the gridiron. Their form responds to the geometries on either side.

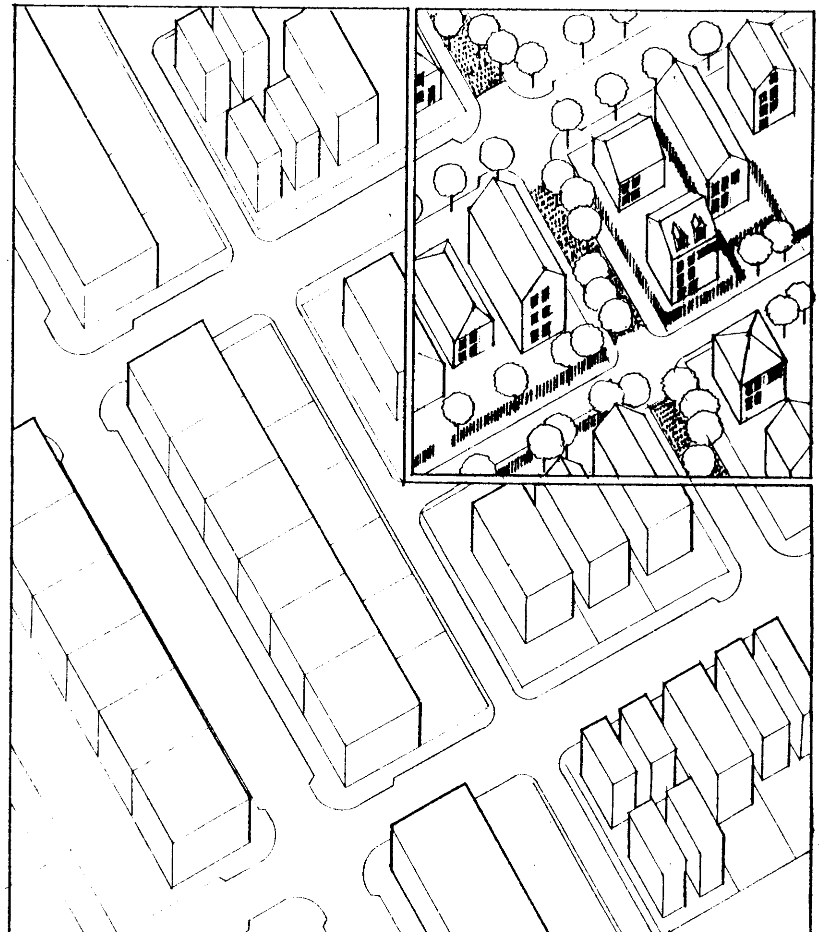
Four design studies are included with this illustrative site plan. The first shows how the vehicular and pedestrian networks would function within four blocks, and illustrates in section the typical streets. The second and third design studies are projections of varying densities within this typical block. The resultant built form is transformed in terms of typology, coverage, setbacks, and heights. The fourth study shows how the building envelope might be modified to allow varying degrees of solar access to the publicly used open space.



AXONOMETRIC SKETCH

0 20 40 80 FEET

BUILDING DENSITY: F.A.R.=.5



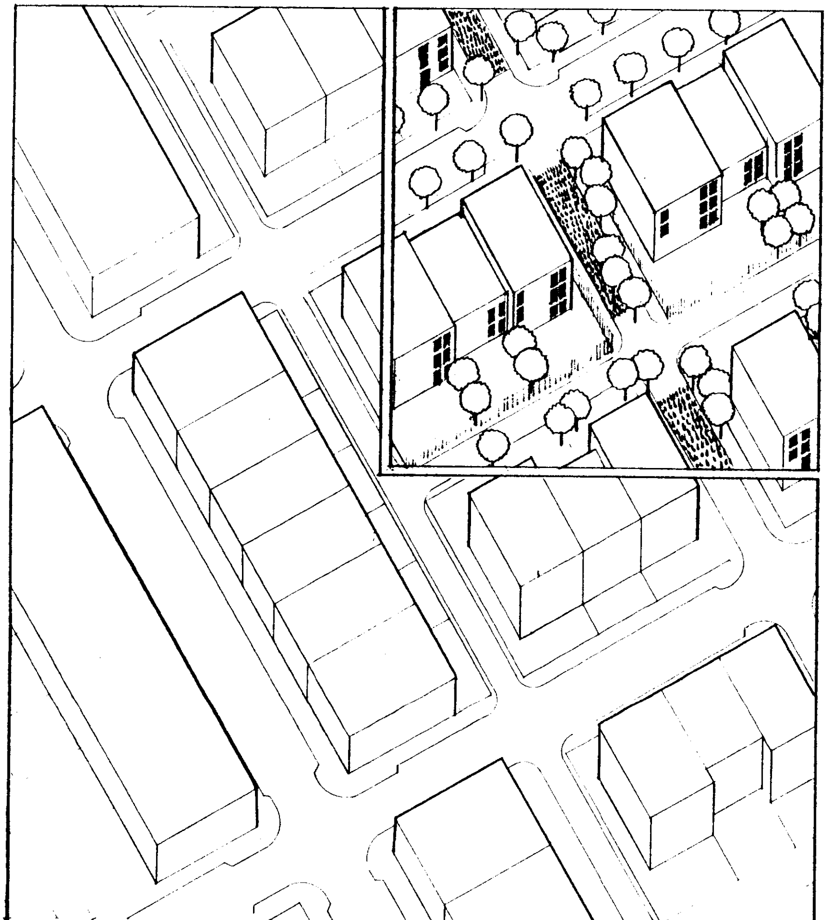
AXONOMETRIC SKETCH

0 20 40 80 FEET

BUILDING DENSITY: F.A.R.=1.0

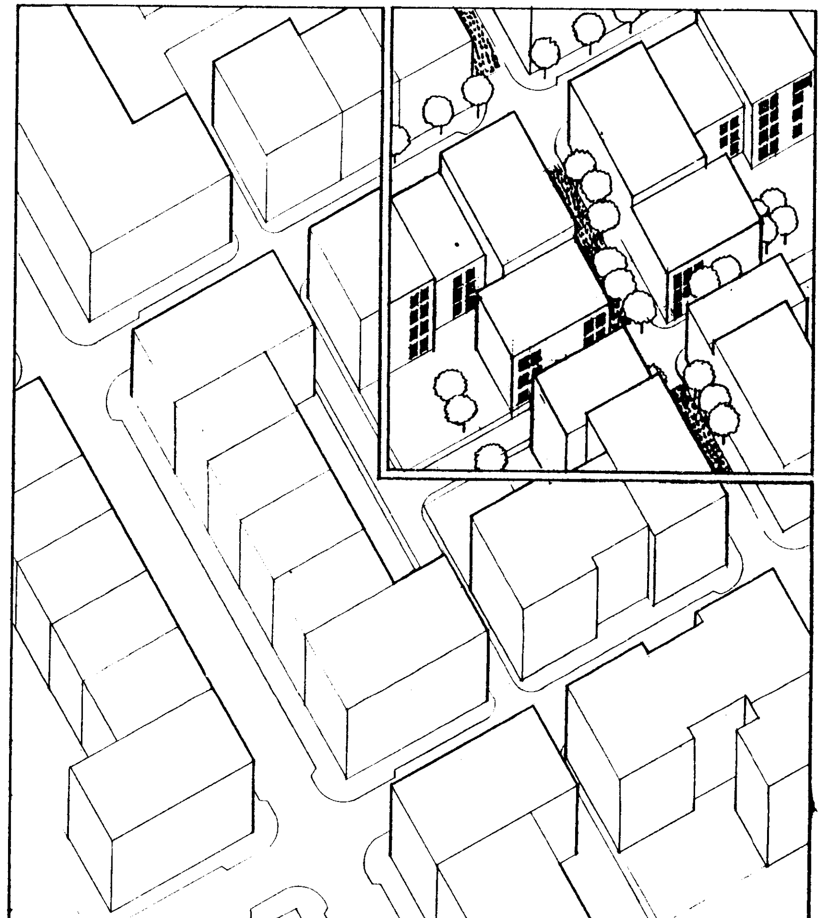
INFILL STUDY: VARYING DENSITY

SHOWING HOW THE REDESIGNED 250'X250 BLOCK ACCOMODATES INCREASING DENSITY AND DIFFERENT BUILDING FORMS.



AXONOMETRIC SKETCH
10 20 40 80 FEET

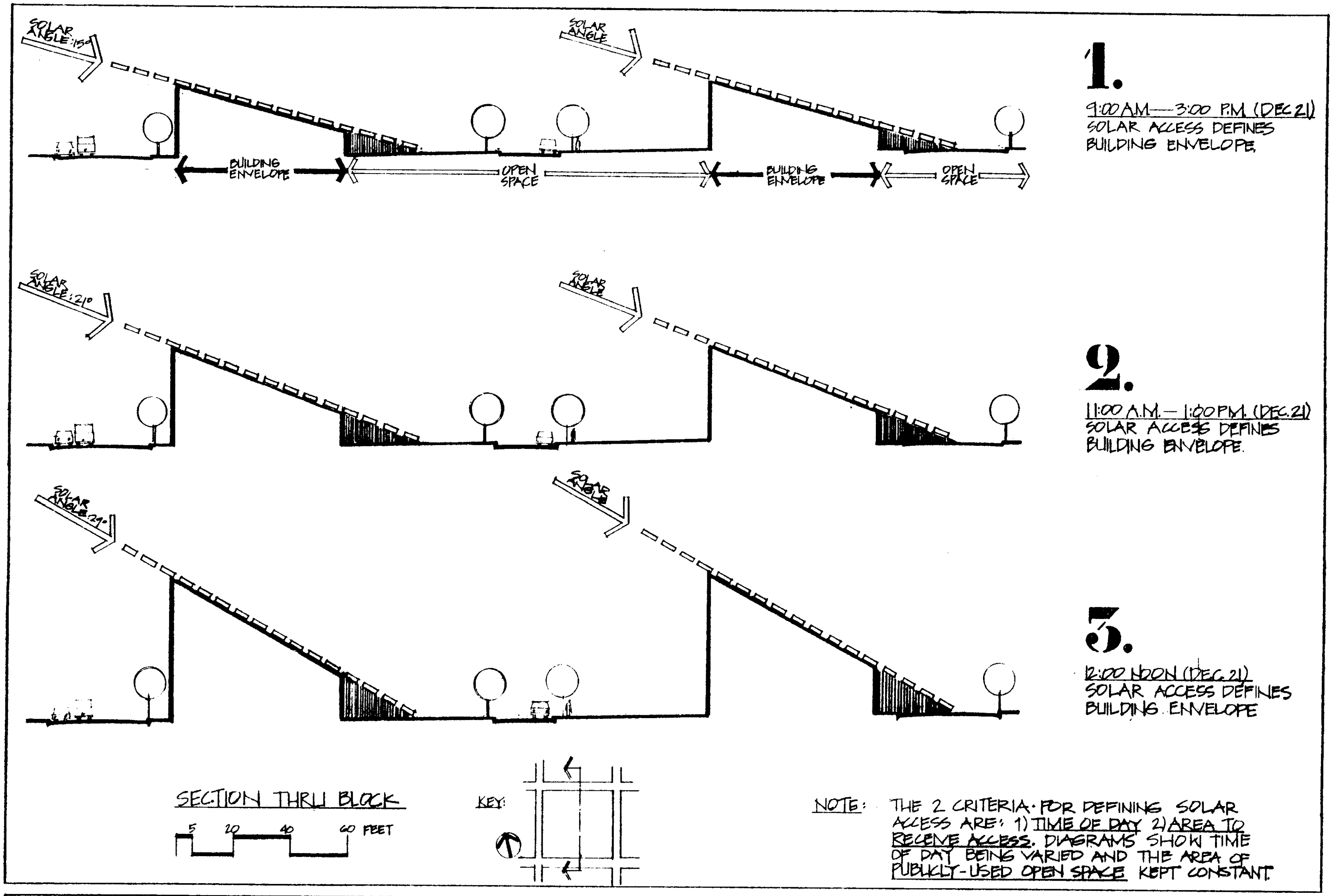
BUILDING DENSITY: F.A.R.=1.5



AXONOMETRIC SKETCH
10 20 40 80 FEET

BUILDING DENSITY: F.A.R.=3.0

INFILL STUDY: VARYING DENSITY



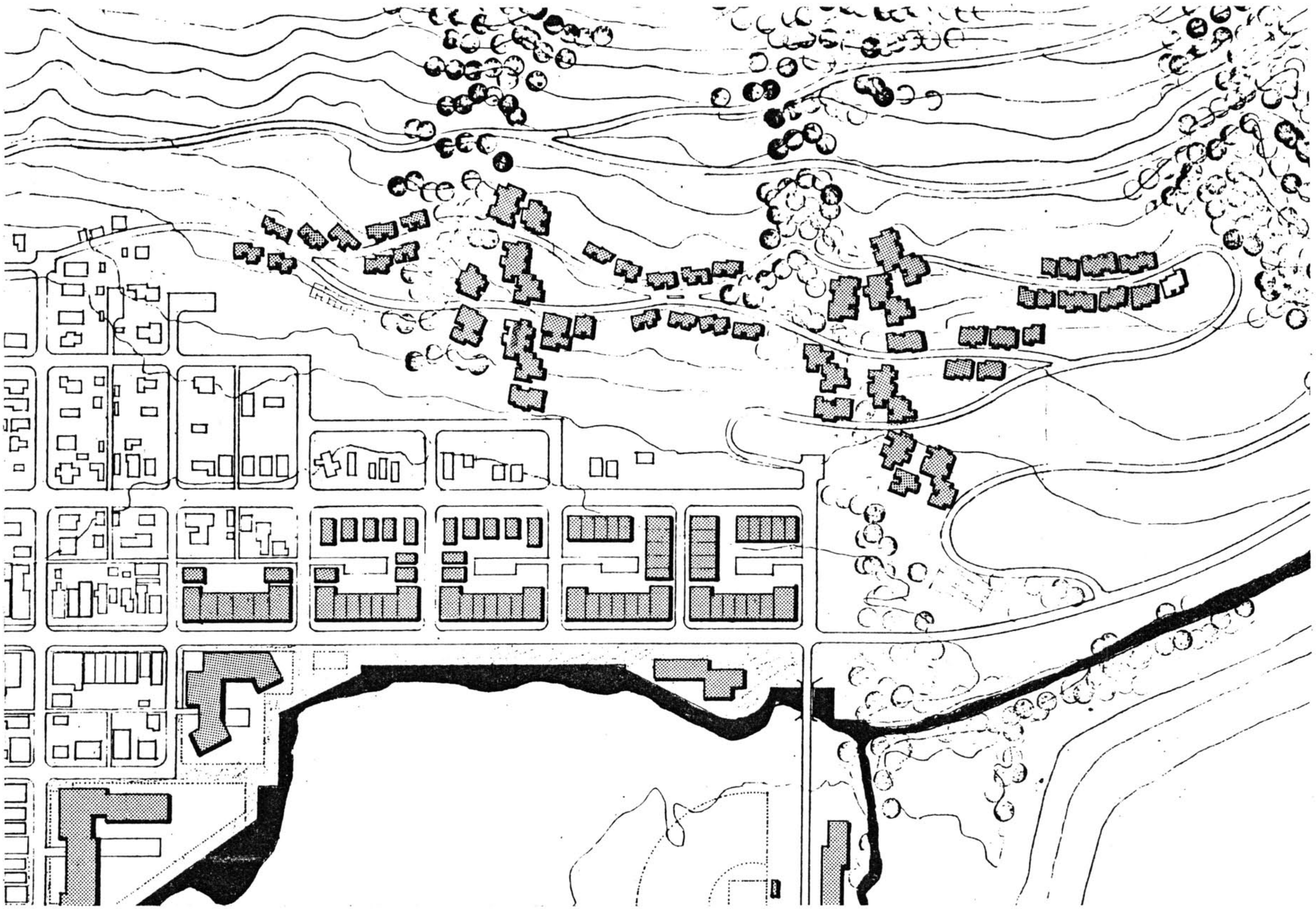
INFILL STUDY : SOLAR ENVELOPES

SHOWING HOW THE BUILT FORM OF 250'X250' BLOCKS CAN BE MODIFIED BY DIFFERENT RULES FOR SOLAR ACCESS.

D. EXPANSION TO THE EAST-HILLSIDE

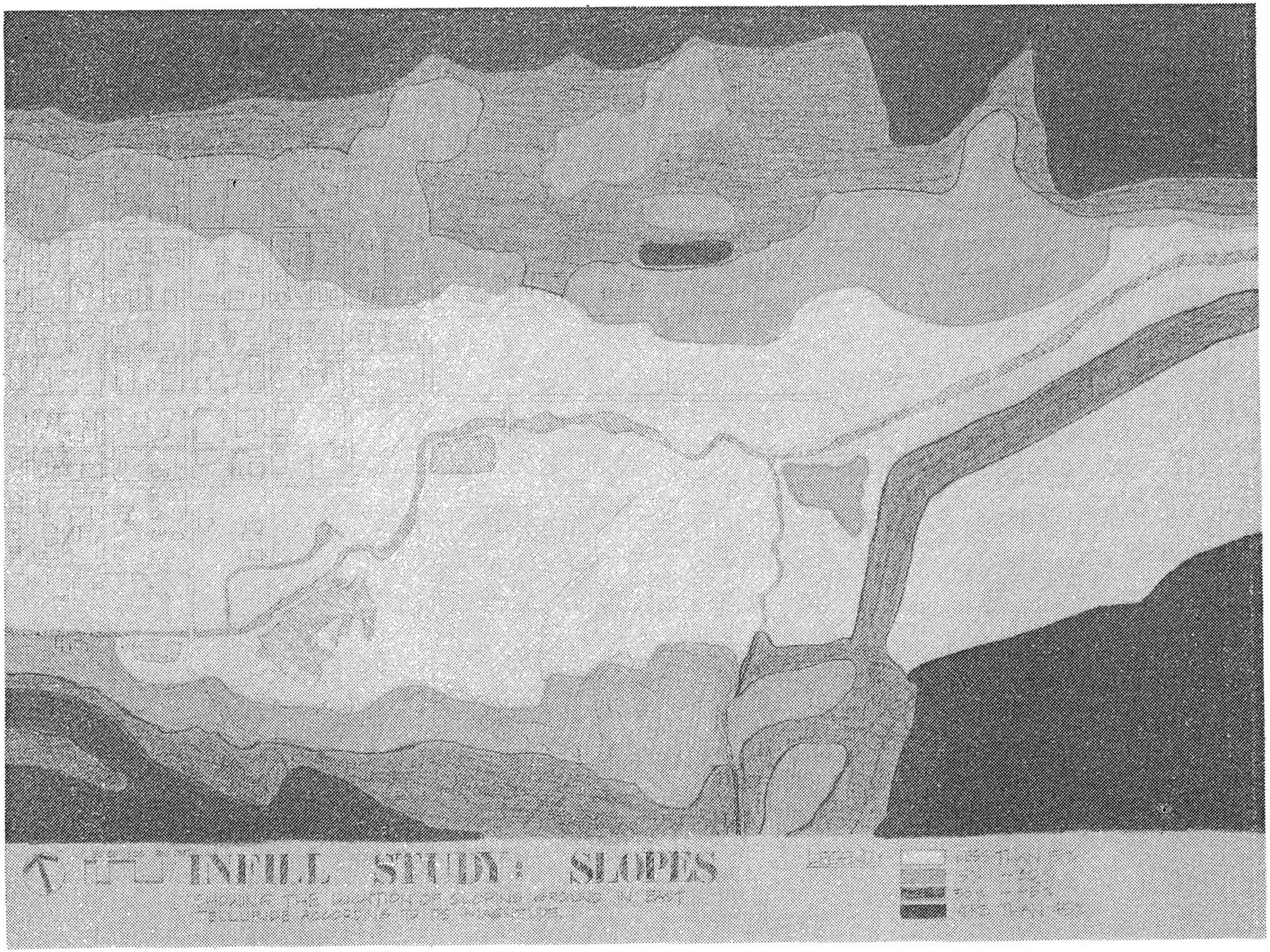
Building on slopes up to 45% offers an opportunity to develop a new type of parcelling and infill of buildings, since strong incentives to build on this hillside did not exist previously in Telluride. The strategy is to complete the gridiron while still on relatively flat land (less than 15% slope), extend the new vehicular and pedestrian networks from the gridiron, and deploy a new infill of buildings which reflects the slope as the primary generator of form. An advantage of this strategy is that it can be implemented incrementally.

The site plan illustrates the deployment of different densities of building: the higher densities are concentrated along the pedestrian movement network, and the lower densities are more distant. The accompanying design studies illustrate the principles for developing new infill of buildings. The first study is a map of slopes for the eastern portion of Telluride. The



ILLUSTRATIVE SITE PLAN

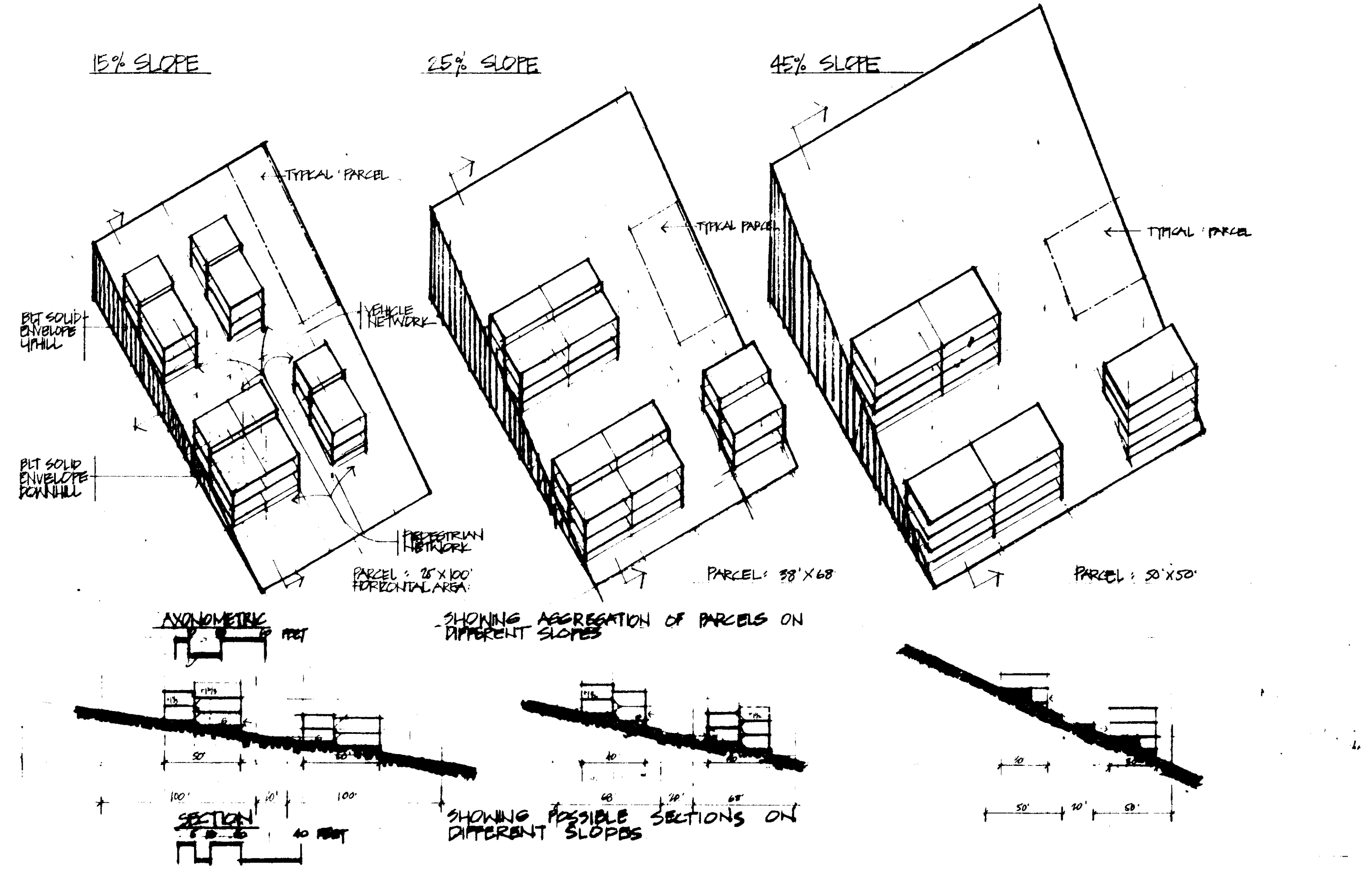
HILLSIDE


INFILL STUDY: SLOPES

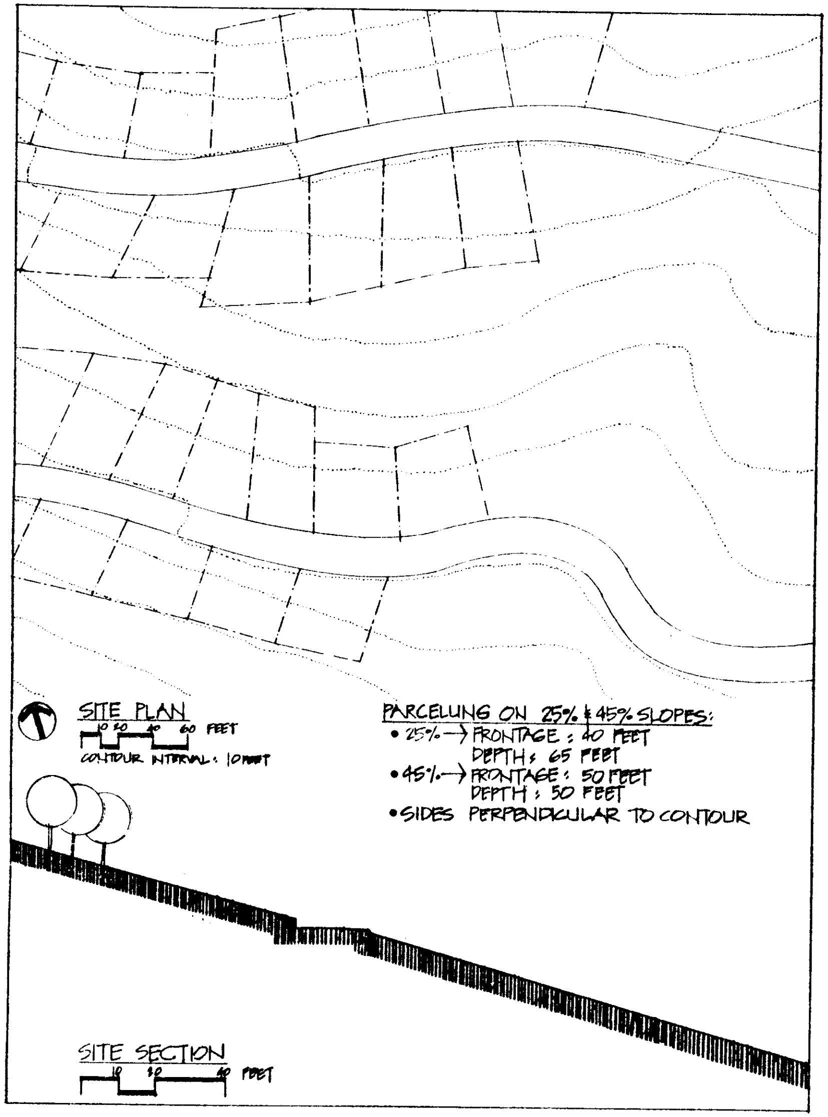
slopes are identified as being less than 15%, between 15% and 30%, 30% to 45%, and greater than 45%. Based upon this study and the surface drainage conditions of the hillside, vehicular networks were extended from the grid, which would allow vehicular access at grades no greater than 8%.

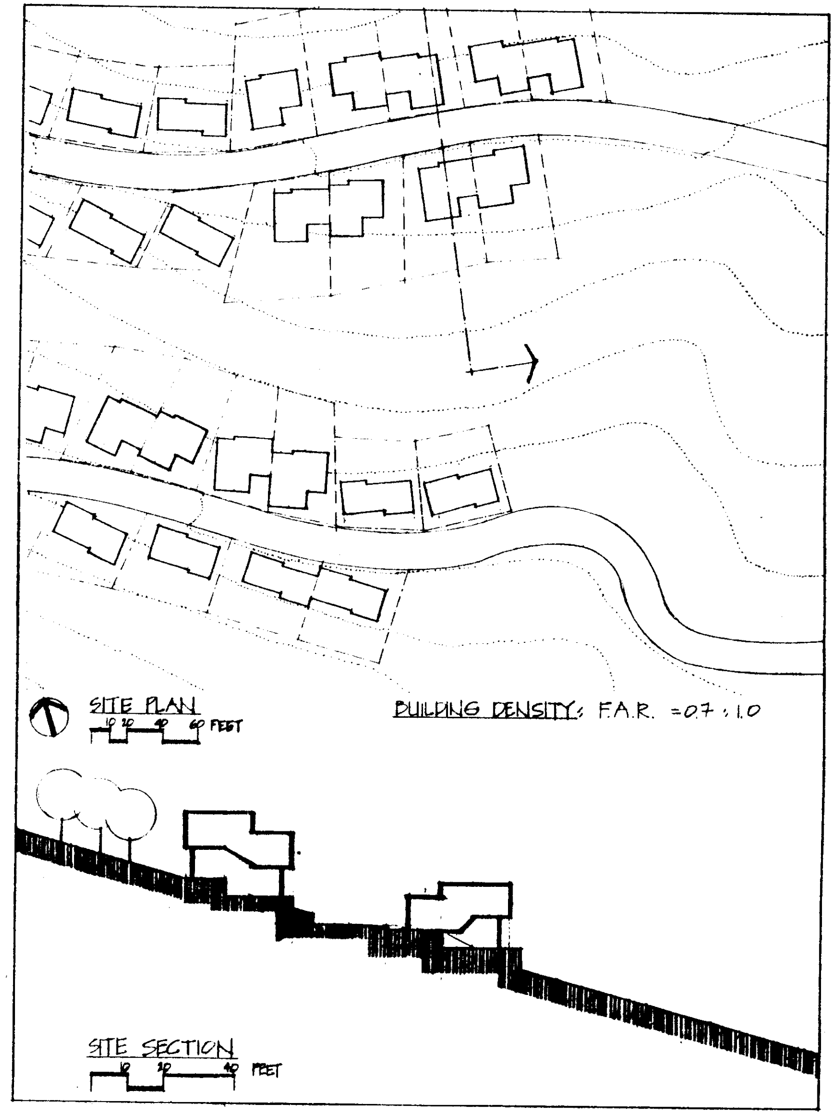
The second study establishes rules for creating building parcels based on the degrees and direction of slope. Assuming that large amounts of the hillside are to be left unbuilt, it was decided to develop intensively those portions with access from the vehicular network. 2,500 square feet was established as the standard parcel area. The shape of the parcel depends upon the magnitude and direction of the slope: 25' frontage, and 100' depth for less than 15% slope; 40' frontage and 65' depth for 15%-30% slope; 50' frontage and 50' depth for 30%-45% slope; and no parcels for slopes greater than 45%.

The third and fourth studies show the deployment of increasinging densities on representative 25% and 40% slopes. With the greater densities and introduction of pedestrian networks separate from the vehicular network, the built form can "grow" by aggregation beyond the original parcelling.



INFILL STUDY
HILLSIDE

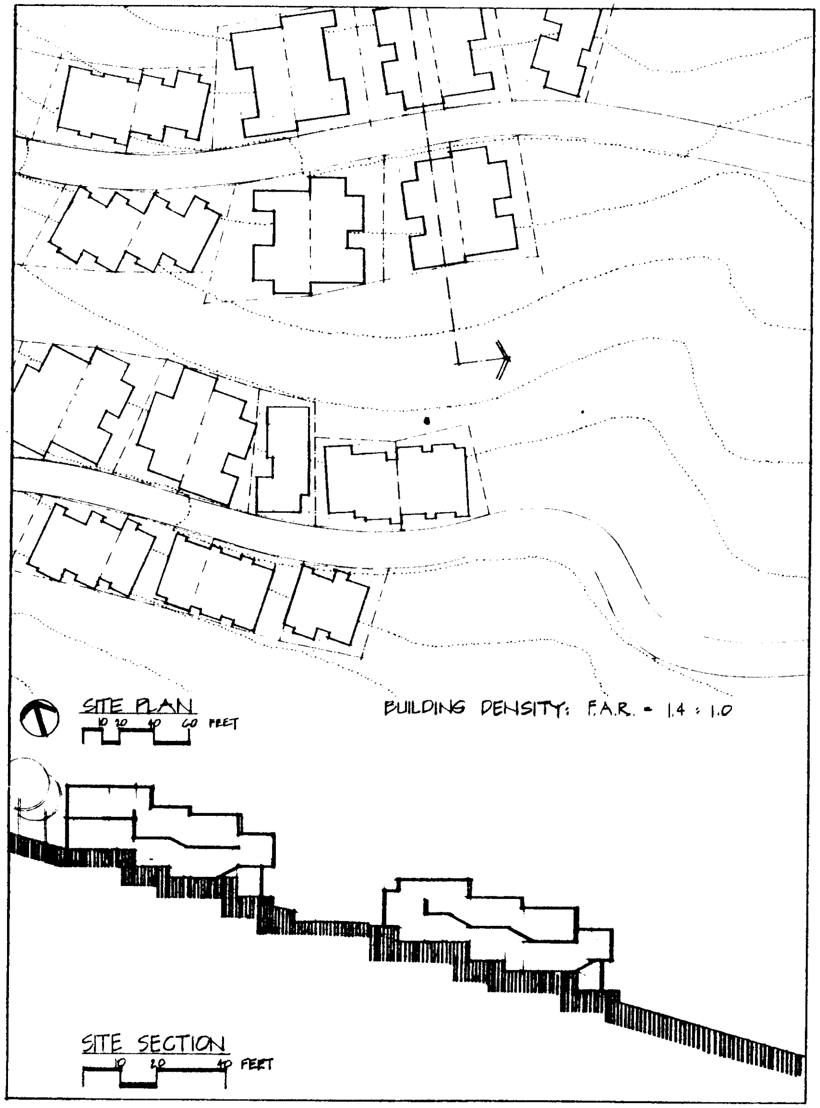


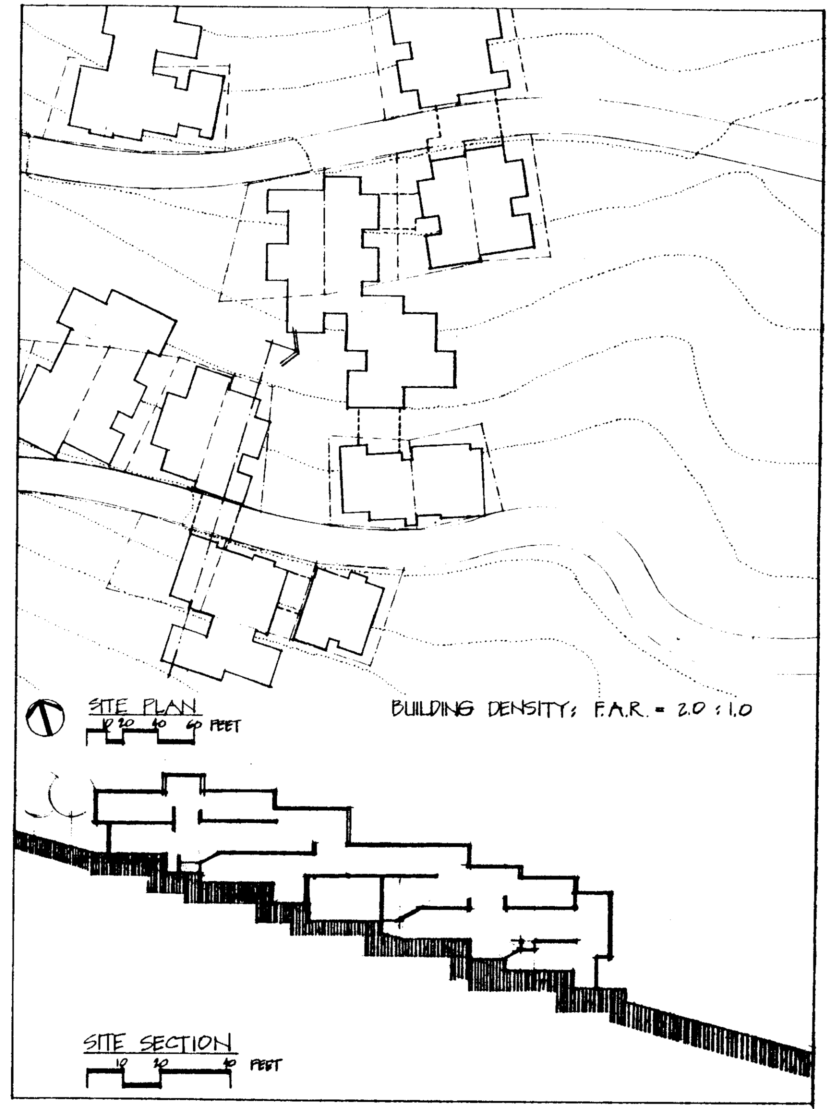


INFILL STUDY: VARYING DENSITY ON A SLOPE

HILLSIDE - 25% 45% SLOPE

SHOWING HOW THE BUILT FORM CAN BE GENERATED FROM DIRECTION AND MAGNITUDE OF GROUND SLOPE WITH BUILDING DENSITIES OF F.A.R. [illegible]: 1.0.





INFILL STUDY: VARYING DENSITY ON A SLOPE

HILLSIDE - 25% 45% SLOPE

SHOWING HOW THE BUILT FORM CAN BE GENERATED FROM DIRECTION AND MAGNITUDE OF GROUND SLOPE AT DENSITIES OF F.A.R. = 1.4:1.0 AND 2,0:1:1.0

Bibliography

Castagnoli, Ferdinando. Orthogonal Town Planning in Antiquity. Cambridge, MIT Press, 1971.

Despo, Jan. Die ideologische struktur der Studte. Akademie der Kunste Berlin, Berlin, Gesamther stelling: Brieden Hartmann, 1973.

Evans, W. Houghton. Architecture and Urban Design. New York, the Constitution Press, 1978.

Halasz, Imre, et al. Revitalization y Estructuracion del Centro de Santiago. Santiago, Chile, Pontitica Universidad Catolica, 1978-79.

Jaffee, Martin and Duncan Erley. Protecting Solar Access for Residential Development: A Manual for Residential Developers and Site Planners. Chicago, American Planning Association, 1979.

Knowles, Ralph L. Energy and Form: An Ecological Approach to Urban Growth. Cambridge, MIT Press, 1977.

Krier, Leon. "Fourth Lesson: Analysis and Project for Traditional Urban Block," in 19 Lotus International. New York, Rizzoli International Publications, June 1978.

Lynch, Kevin. Image of the City. Cambridge, MIT Press, 1960.

__________. Site Planning. Cambridge, MIT Press, 1962.

Maki, Fumihiko. Investigations in Collective Form. St. Louis, Washington University School of Architecture, 1964.

Morris, A. E. J. History of Urban Form: Prehistory to the Renaissance. London, George Goodwin, Ltd., 1972.

Reps, John W. The Making of Urban America. Princeton, New Jersey, Princeton University Press, 1974.

____________. Cities of the American West: A History of Frontier Planning. Princeton, New Jersey, Princeton University Press, 1979.

Stichting Architecten Research. SAR 73: The Methodical Formulation of Agreements Concerning the Direct Dwelling Environment. Eindoven, Holland, 1973.

Wolff, Ramier. Hauser am Hauz (Housing in Slopes), Munich, Verlag Georg D.W. Calley, 1975.

DOCUMENTS OF THE TOWN OF TELLURIDE:

Existing Land Use and Structural Conditions in Telluride, 1973.

Parking and Transportation Plan, 1978.

Report on Historic Structures, 1979.

Building in Telluride: A Handbook for Builders, Architects, Property Owners, and Developers, 1980.

Sanborn Maps, 1906.

Appendices

A. DESIGN GUIDELINES FOR TELLURIDE

Building in Telluride: A Handbook for Builders, Property Owners, Architects and Developers is a companion to the Design Guidelines Ordinance, and is intended to help improve the quality of new buildings by suggesting ways in which they can be made compatible with existing buildings and patterns of urban development. In addition, the handbook explains the various environmental, historic, and legal considerations involved in designing buildings within the historic core of Telluride.

The following design guidelines are excerpts from the handbook and apply to one of seven districts, or "Treatment Areas," identified in the town.

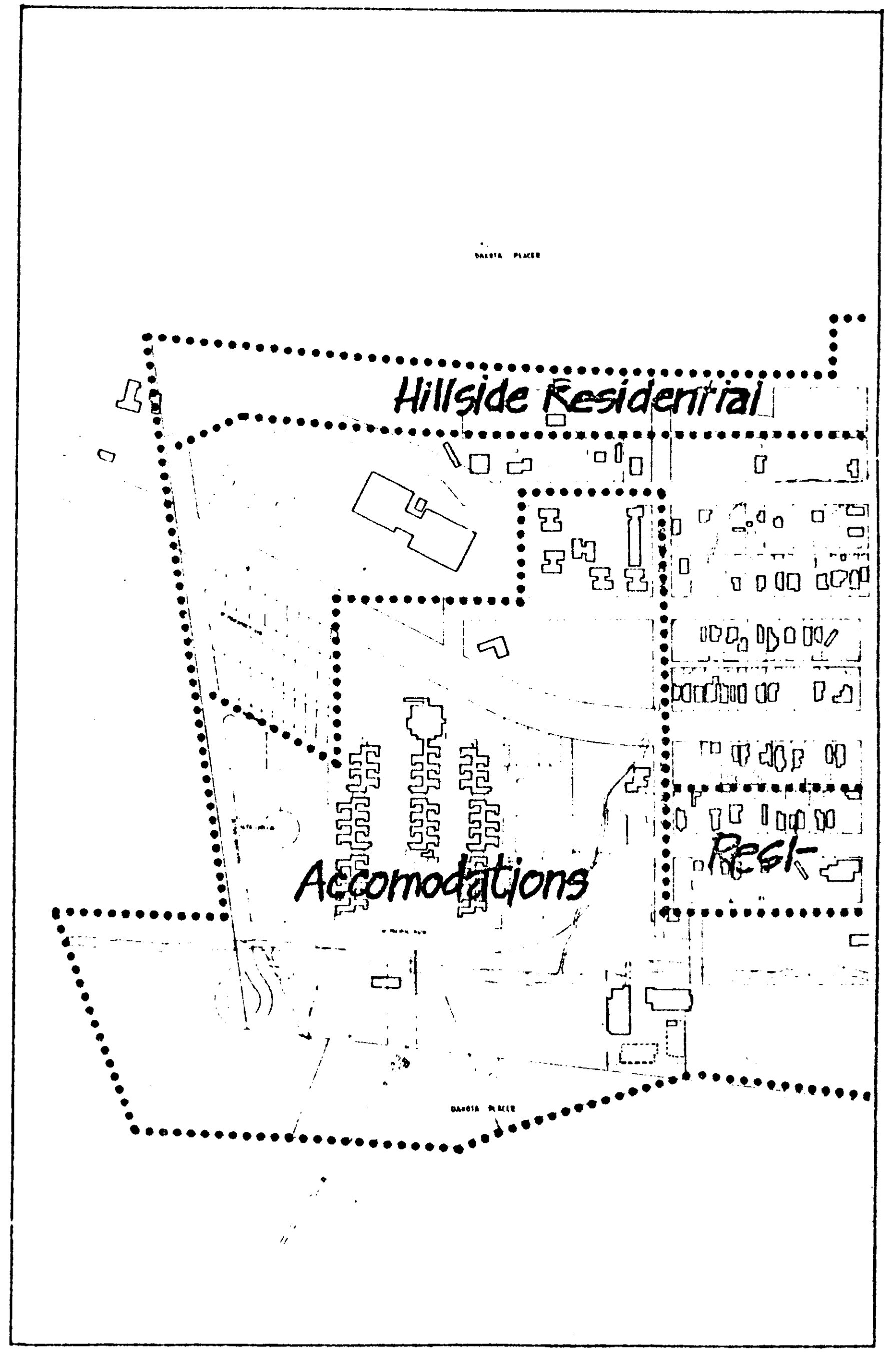
DESIGN GUIDELINES FOR THE TREATMENT AREAS

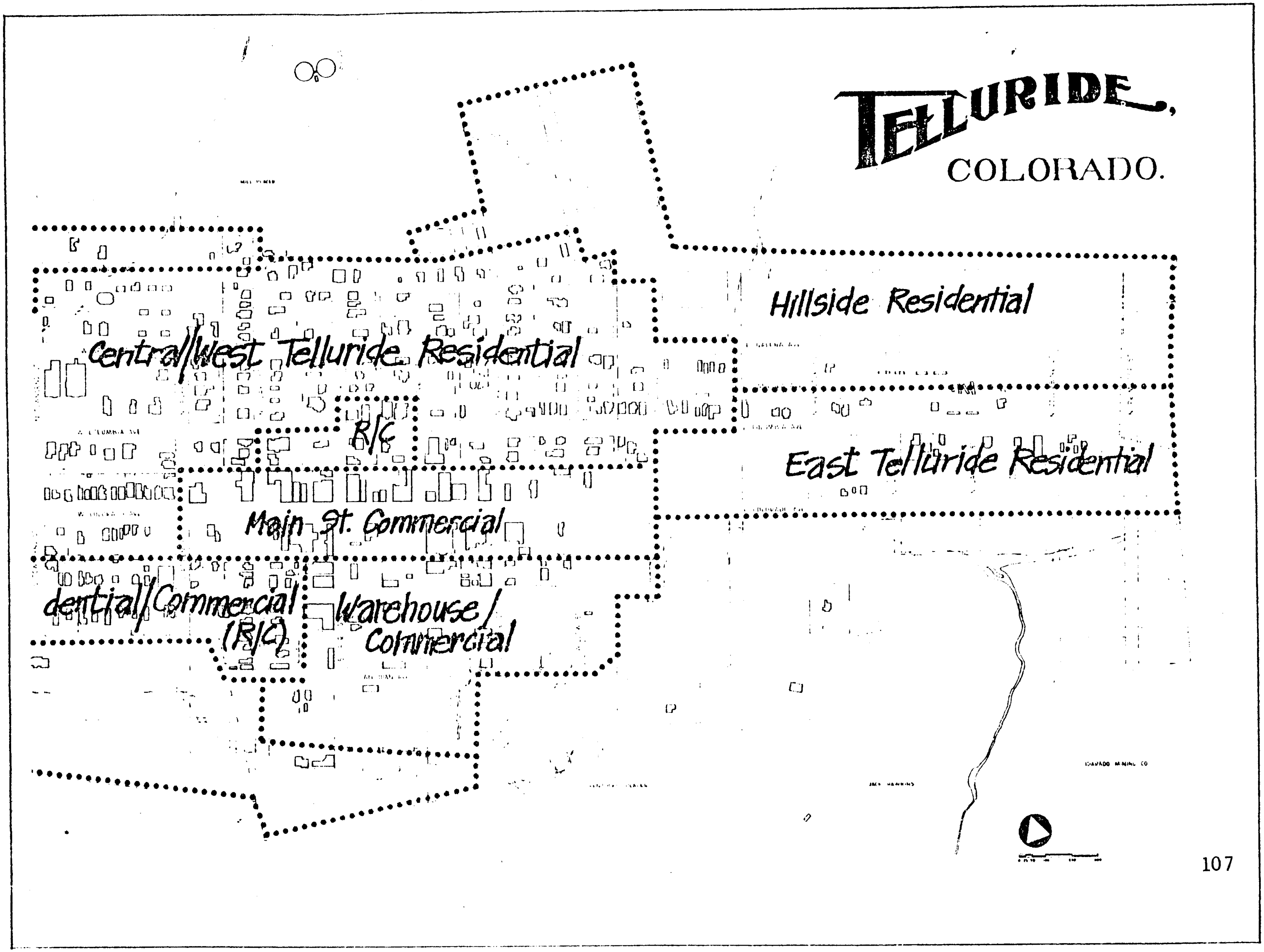
The following Design Guidelines were developed in a series of community workshops held in Telluride in 1978 and 1979. It is the intent of the Design Guidelines to identify, on an area by area basis, the critical patterns of buildings, materials, yards, and landscaping which contribute to the distinctive character of Telluride. By identifying these patterns and expressing them in terms of Guidelines it is hoped that they will be more easily understood and incorporated into the design of new and rehabilitated buildings.

The Design Guidelines are not to be applied uniformly throughout Telluride. For example, a Guideline for the Main Street Commercial Treatment Area is not relevant to buildings in the East or West/Central Residential Treatment Areas. The Treatment Areas are shown on the map as the following:

1. Main Street Commercial Treatment Area
2. Warehouse Commercial Treatment Area
3. Accommodations Treatment Area
4. Residential/Commercial Treatment Area
5. Central/West Telluride Residential Treatment Area
6. East Telluride Residential Treatment Area
7. Hillside Residential Treatment Area

The delineation of boundaries of the different Treatment Areas reflect differences in the existing patterns of buildings and development as well as the present uses for the areas as allowed by the Town's zoning ordinance. Of particular importance is the transition from one Treatment Area to another.




TELLURIDE,
COLORADO.
Hillside Residential
Central/West Telluride Residential
R/C
East Telluride Residential
Main St. Commercial
dential/Commercial
(R/C)
Warehouse /
Commercial

UNDERSTANDING THE DESIGN GUIDELINES

Each of the Design Guidelines is a two part statement. The first part, denoted by a number, is a description of an existing pattern which has been identified as important to the physical character of Telluride. Its often includes an illustrative diagram or photograph. The second part is the guideline or instruction which is to be followed in the design of new or rehabilitated buildings. This instruction is elaborated by statements which further describe its application to building projects.

The numerical ordering of the Design Guidelines does not imply a ranking of importance. The interpretation of relative importance or applicability of various guidelines to different projects is left up to the Historic and Architectural Review Commission.

The Design Guidelines will be used by the Commission in combination with the General Standards for Review to evaluate the appropriateness of different design proposals.

It should be recognized that the Design Guidelines are to be used with discretion. In some cases they may conflict or may not be relevant. The intent is to encourage quality contemporary design which fits within the particular Treatment Area.

DESIGN GUIDELINES
MAIN ST. COMMERCIAL TREATMENT AREA

1. Basically, the street is perceived as two stories, although there are one and three story buildings. The significant factor is that there is a strong alignment of horizontal elements. This alignment occurs at the first floor with the alignment of window moldings, and at the upper levels with the alignment of cornices. This is one of the strongest characteristics of the street.

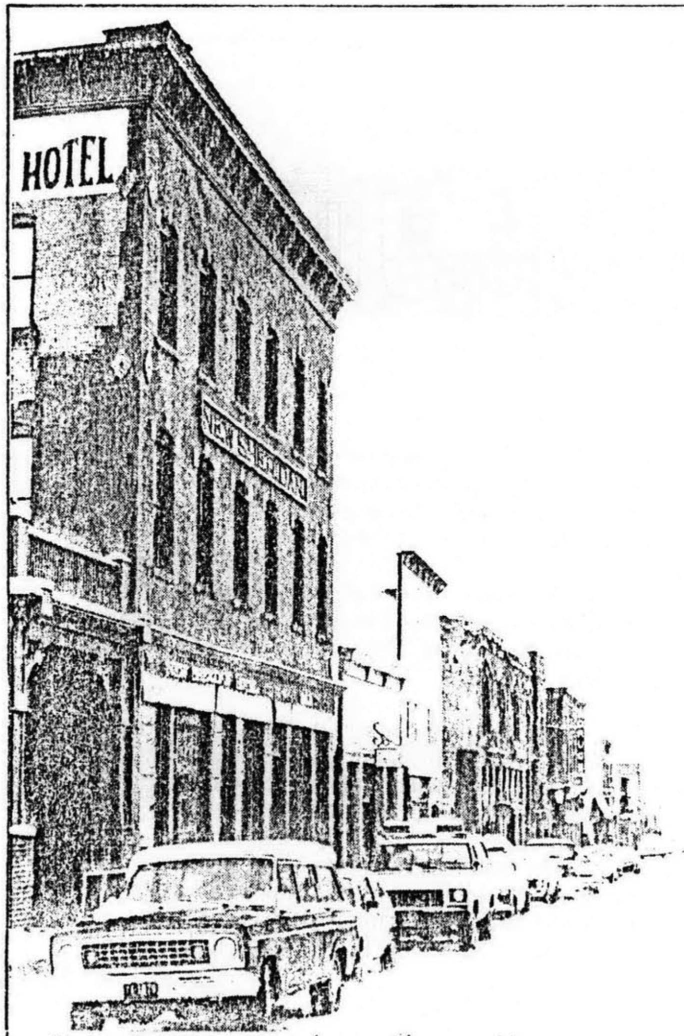
GUIDELINE: THE HORIZONTAL ALIGNMENT CREATED BY WINDOW MOLDINGS, THE TOPS OF DISPLAY WINDOWS, CORNICES, AND THE GENERAL HEIGHT OF THE BUILDINGS MUST BE MAINTAINED.

GUIDELINE: MAINTAIN THE PATTERN AND ALIGNMENT CREATED BY UPPER STORY WINDOWS. IT IS PARTICULARLY IMPORTANT TO MAINTAIN EXISTING WINDOW PATTERNS WHEN RENOVATING.

2. Buildings create a strong edge to the street. They are aligned on the front lot line (there is no setback of the facades).

GUIDELINE: MAINTAIN THE ALIGNMENT OF FACADES AT THE SIDEWALK'S EDGE. COMPLIANCE IS STRONGLY URGED.

* Where facades must be set back, alignment should be preserved by using columns, hedges, fences, low walls, or other screen to define the site's edge.



Building Alignment on Main St.

3\. Buildings are dense on Main Street. Although there are gaps, buildings are usually built to the side lot lines.

GUIDELINE: PRESERVE THE SENSE OF A BUILT EDGE ALONG THE STREET, BY BUILDING TO THE SIDE LOT LINES WHEN POSSIBLE. WHERE OPEN SITES DO OCCUR, PROVIDE SCREENING THAT MAINTAINS THE EDGE.

4\. The street floors are clearly distinguishable from the upper floors. The street floors are predominantly glass with a small percentage of opaque materials. Upper floors are the reverse; opaque materials dominate, windows are small openings puncturing the wall.

GUIDELINE: MAINTAIN THE CLEAR DISTINCTION BETWEEN STREET FLOORS AND UPPER FLOORS.

- * The street floor should be predominately glass.
- * Upper floors should be perceived as being more opaque than the lower floors.

5\. Finished wood and brick are dominant materials, though metal and stone are also found. (Finished wood usually means painted wood).

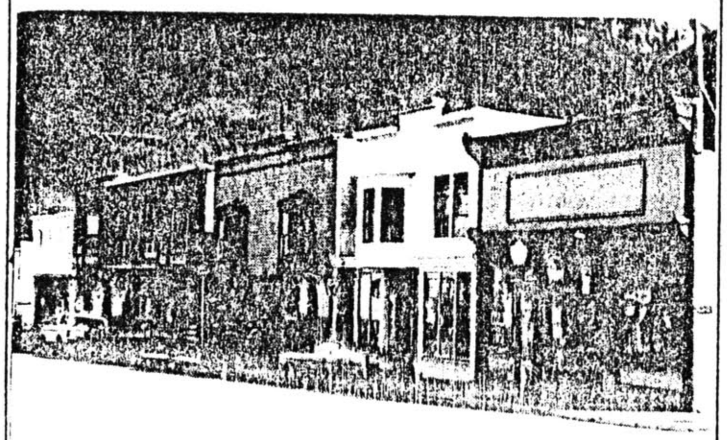
GUIDELINE: MAINTAIN THE PRESENT DISTRIBUTION OF BUILDING MATERIALS, KEEPING BRICK AND PAINTED LAPSIDING THE MAJOR MATERIALS.

- * Other materials are acceptable <u>only</u> if the other guidelines are adhered to. In other words, material selections are less important on Main Street than other criteria. The materials become more critical when other criteria are not strongly met.
- * Rustic, unpainted or unfinished siding materials are strongly discouraged.

6\. Most entrances to buildings are recessed. Doors are topped with transom windows.

GUIDELINE: MAINTAIN THE PATTERN CREATED BY RECESSED ENTRY WAYS.

Clear distinction between upper and lower floors



Similar Sizes and Shapes on Main St.

7. Each building as a composition of smaller components such as flat fronts, bay windows, cornices and street level display windows. These elements are important to the character of the street.

GUIDELINE: REPEAT SIMILAR SHAPES AND SIZES WHEN MAKING ADDITIONS TO EXISTING BUILDINGS, AND WHEN BUILDING NEW STRUCTURES.

* Windows are similar sizes and shapes are particularly encouraged.

* Rectangular shapes are predominant.

8. There is a strong repetition of similar facade elements. In particular, windows, details, ornaments and cornice moldings reoccur frequently.

GUIDELINE: USE BUILDING COMPONENTS WHICH REINFORCE THE RHYTHM AND PATTERN OF ORNAMENTATION.

* Duplicating or mimicking historic details is discouraged.

GUIDELINE: SIGNS SHOULD BE SUBORDINATE TO THE BUILDING FACADE.

* Pay particular attention to placing new signs on existing buildings when renovating. The signs should not obscure existing details. It is best to mount them so they fit within "frames" created by the decorations and components of the facade.

* Other graphics applied to exterior walls, such as painted decorations and murals, also should not obscure building details.

B. UNDERSTANDING VISUAL STRUCTURE

In exploring the morphology and physical growth of Telluride, I felt it necessary to have some understanding of how people perceive and experience that environment on a daily basis.

The work of Kevin Lynch, particularly The Image of the City, offered some of the clearest insight into how design might be used to facilitate the process by which people experience and come to know cities.

One of Lynch's major contributions was to point out that the way people perceive their urban environment was a concern of planners and designers. Central to this is the concept of legibility, Lynch's term for "the ease with which the parts can be recognized and organized into a coherent pattern." [Lynch, 1960, pp2-3]

A good city, to Lynch, is one in which the observer can identify parts and functions without difficulty:

> Just as this printed page, if it is legible, can be visually grasped as a related pattern of recognizable symbols, so a legible city would be one whose districts or landmarks or pathways are easily identifiable and are grouped into an overall pattern. [Lynch, p3]

Lynch elaborates by introducing a five-element classification of the environment and explaining how his typology can help designers understand what things contribute to legibility. He defines five elements:

1. Paths are the channels along which the observer customarily, occasionally, or even potentially moves (e.g., streets and railroads).
2. Edges are the linear elements not used or considered as paths by the observer. They are

the boundaries between two phases, linear breaks in activity, lateral references (rather than coordinate axes). They may be barriers, more or less penetrable; or they may be seams, lines along which two regions are related and joined together (e.g., rivers, cliffs, edges of development, walls).

3. Districts are the medium-to-large sections of the city, conceived of as having two-dimensional extent, which the observer mentally enters "inside of," and which are recognized as having some common, identifiable character (e.g., Beacon Hill in Boston).
4. Nodes are the points or strategic spots in a city which an observer can enter. They are the intensive focii to and from which people travel (e.g., Park Street Station corner on Boston Common; street corner hangouts; enclosed squares).
5. Landmarks are external-point references which the observer does not customarily enter (e.g., the golden dome of the Massachusetts Statehouse, the CITGO sign in Boston's Kenmore Square). [Lynch, pp46-48]

In defining my goals and design objectives, I identified legibility as a key characteristic to be developed in all of the design proposals. With this in mind, I chose to use Lynch's five-element environmental description, first, as a means of understanding the present visual structure of Telluride and, second, as an aid in designing additions to Telluride which contribute to its visual structure.

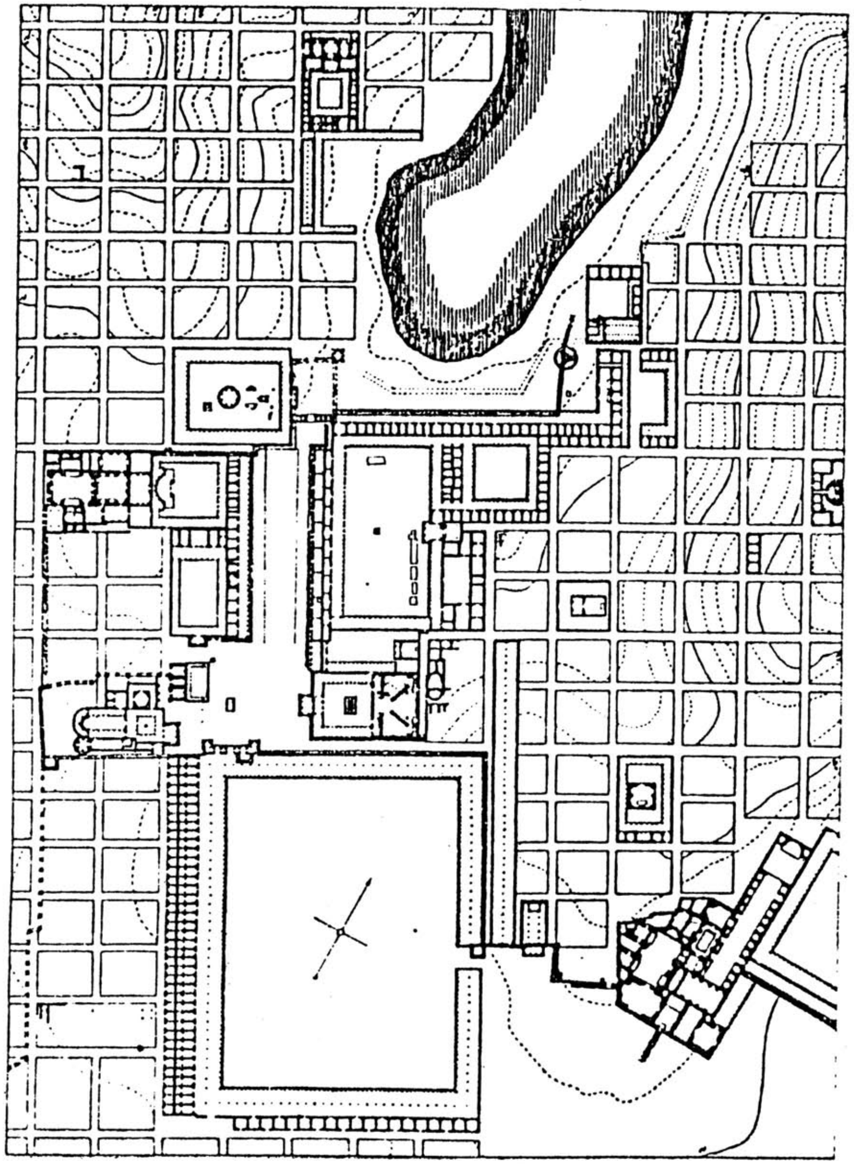
The information I used to generate an "image" of Telluride, however, was not collected from interviews with a carefully selected population sample. Rather, it was the result of my own observations as I came to know the town during several lengthy visits.

C. FORMAL PRECEDENTS- GRIDIRON PLANS

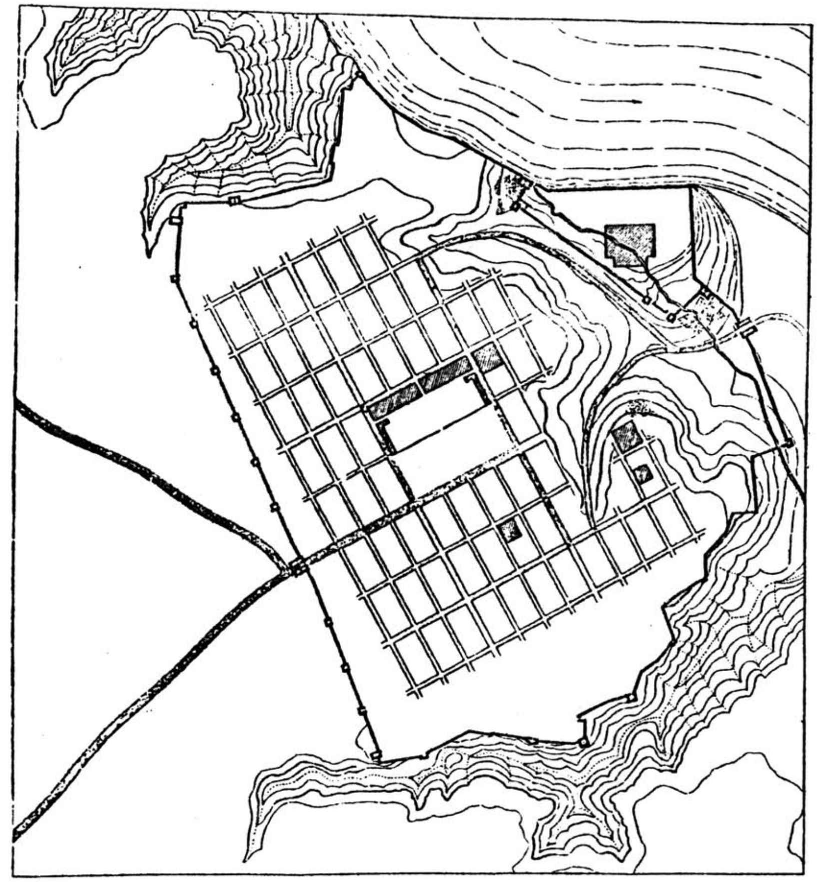
The meeting of a gridiron and a geographical feature, such as a river or mountain slope as found in Telluride, has numerous precedents. Early Greek towns demonstrate clear attitudes toward maintaining the integrity of the grid by allowing it to complete itself, and by developing specialized built forms with non-secular uses in the spaces between the gridiron and the geographical feature.

Some European and almost all American cities were designed with the rectangular block as the replicable module of growth. In particular, during the period of 19th-century expansion in the United States, innumerable grid towns and cities were laid out by public and private interests in the Western frontier. Although these grid plans frequently did not have to accommodate unusual manmade or natural features because of the flat and homogenous landscape, there are sufficient examples in which larger physical constraints had to be dealt with.

All of these examples are seen as possible references for the design projections in this thesis. Included in this Appendix are several which illustrate the range of formal attitudes that were investigated in developing the projections.

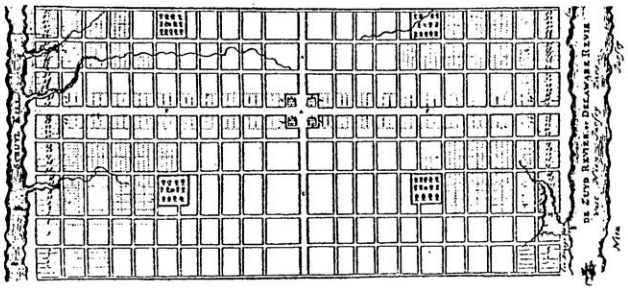


Miletus: Detail of Agora



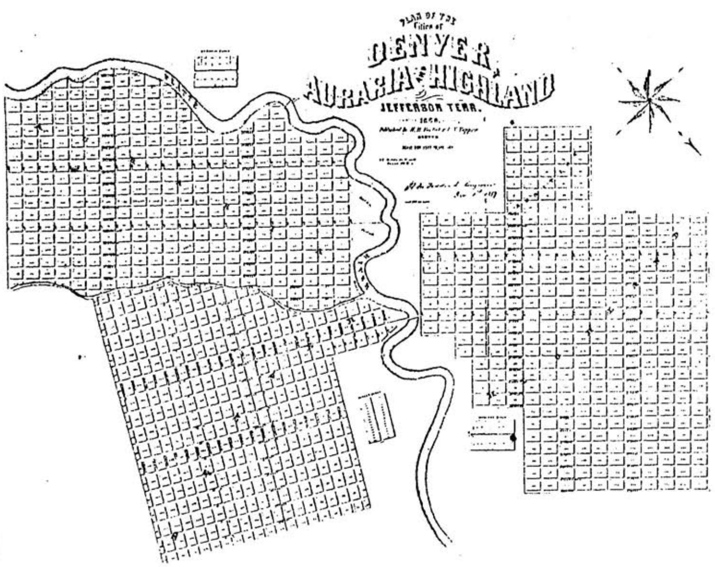
Antioch

CLASSICAL GRIDIRONS



Philadelphia (1683)

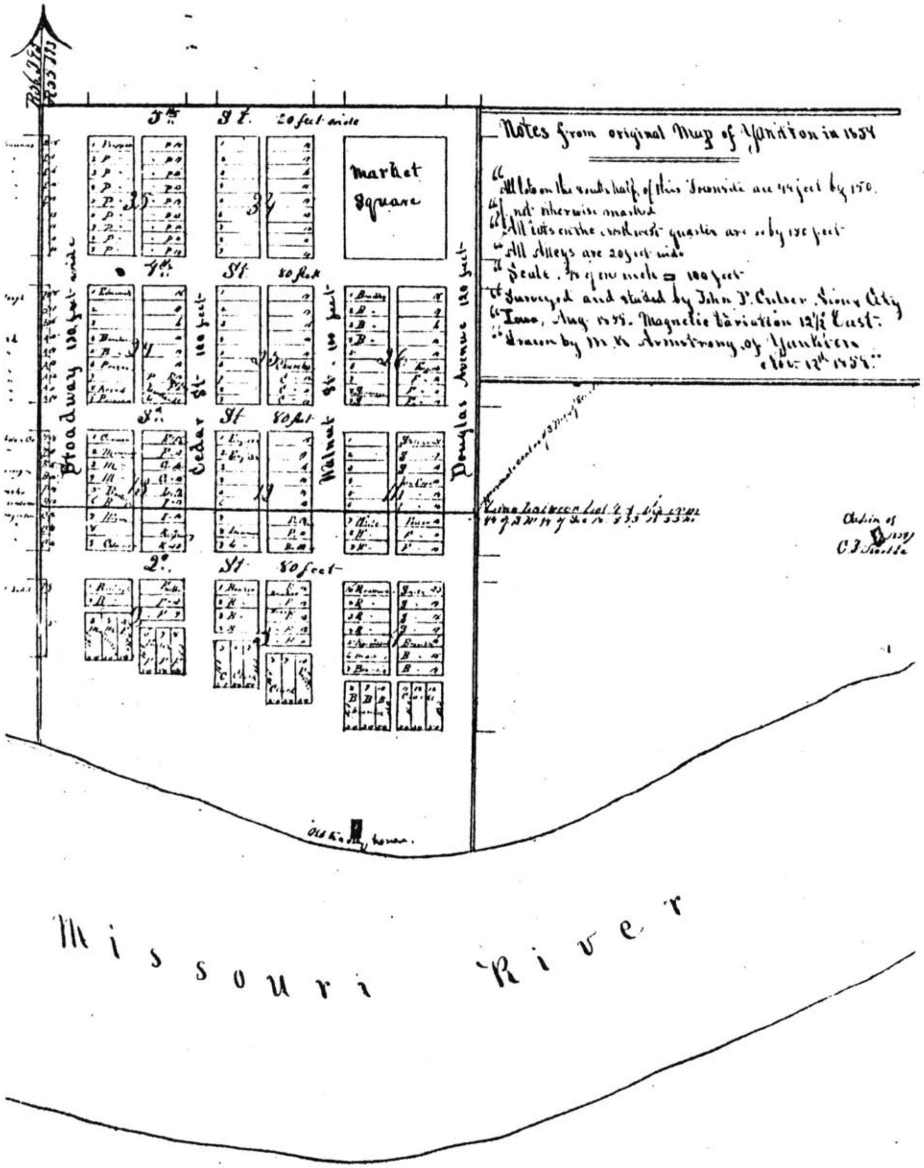
Figure 9.12 – Philadelphia. Penn and Holmes's plan of 1683 (north at the top). The city was approximately two miles in length, from the Delaware in the east to the Schuylkill in the west, by one mile in width. The two main cross streets were 100 feet wide; the eight east-west and twenty north-south minor streets were 50 feet wide. The grid blocks were 425 feet by 675 feet and 425 feet by 500 feet. The main central square was of 10 acres, the four minor squares were each of 8 acres. The 'Dock', off the main stream of the Delaware, was the first harbour.



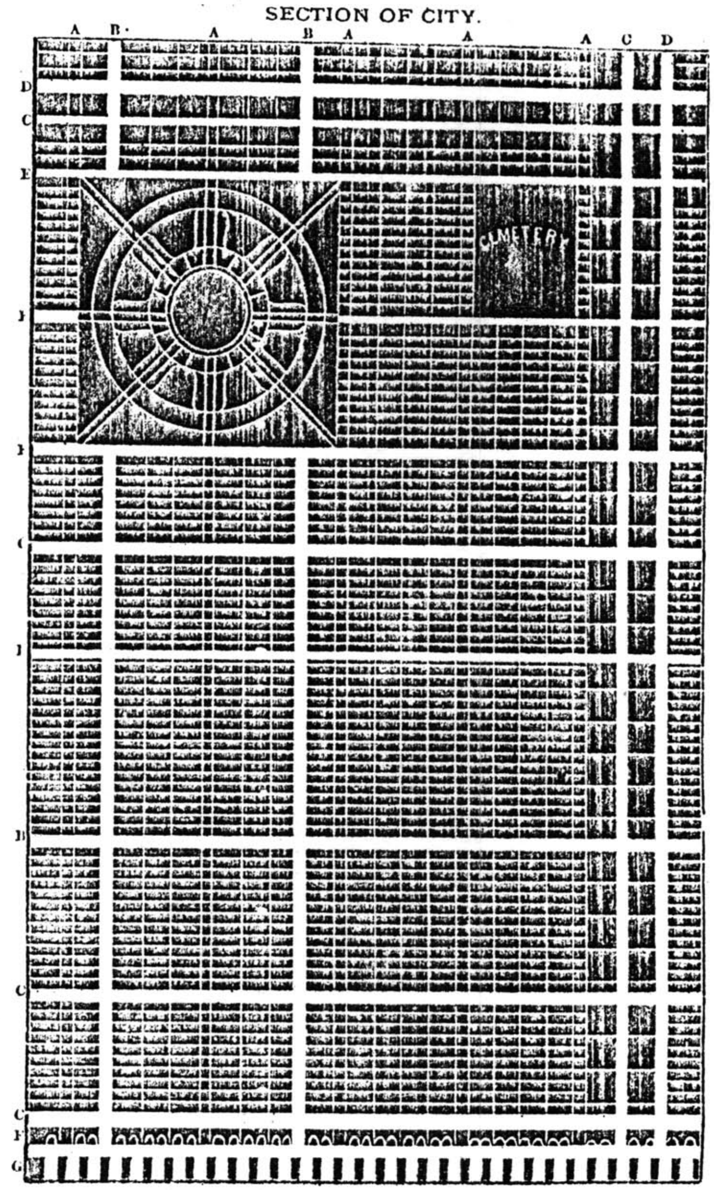
Denver (1860)

Figure 9.35 – Atlanta, plan of the central part of the city in 1847 within a circle of a radius of one mile. The plan shows how the early unrelated gridiron districts of the first railway settlement were subsequently resolved into a standard north-south, east-west orientated pattern.

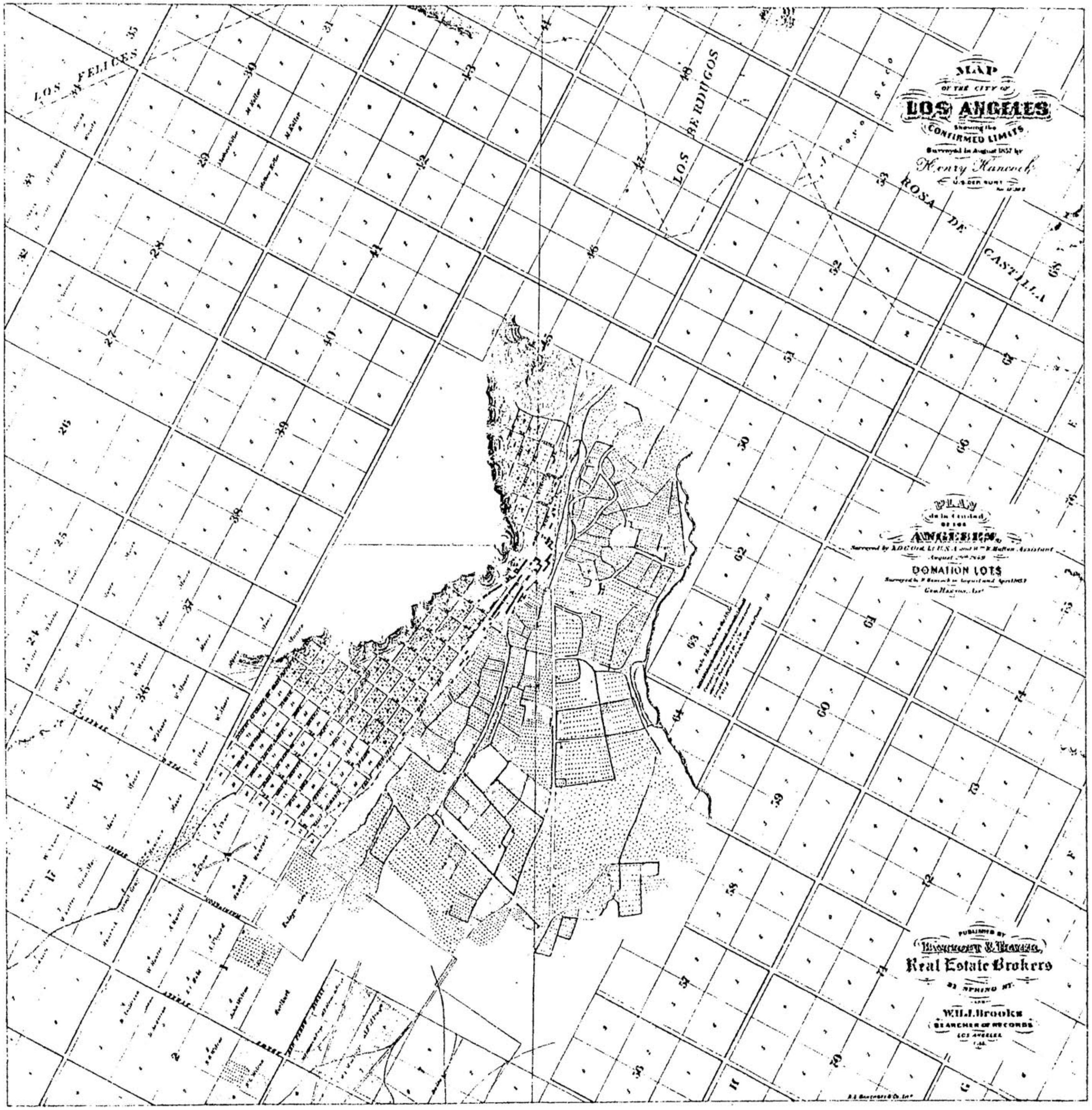
Atlanta (1847)



Yankton, South Dakota (1966)



An Ideal Railroad Town (1872)



Los Angeles (1857)