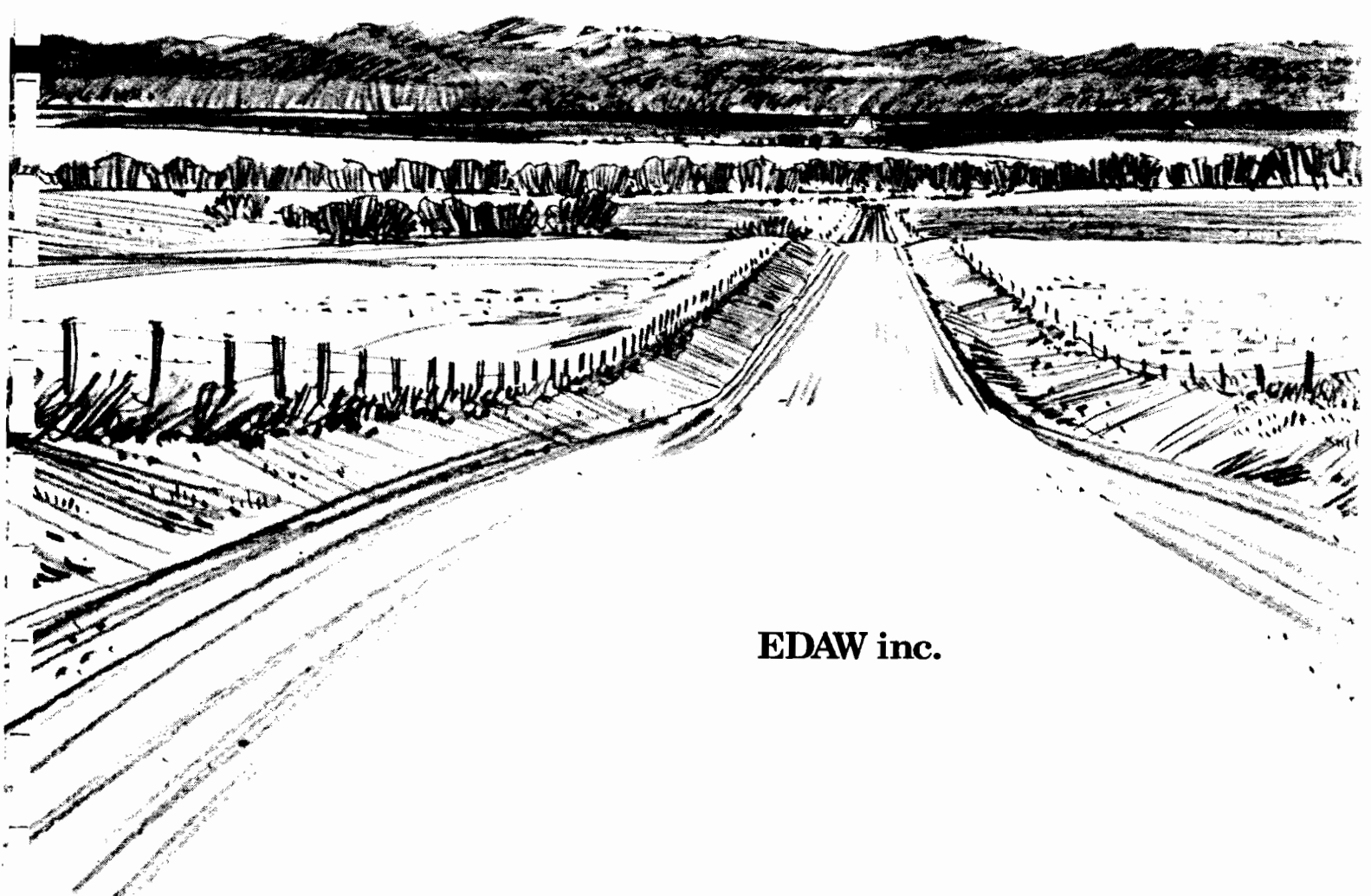


Coal Creek and Rock Creek Planning Study

Phase B-Proposed Plan

Urban Drainage and Flood Control District Boulder County



EDAW inc.

COAL CREEK AND ROCK CREEK PLANNING STUDY
PHASE B - PROPOSED PLAN

March 1987

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L. INTRODUCTION

The Coal Creek and Rock Creek floodplains are an important resource for the citizens of Louisville, Lafayette, Broomfield, and adjacent portions of unincorporated Boulder County. These floodplain areas are primarily undeveloped and include scenic features, historic sites, and valuable wildlife habitats. As such, the floodplains provide an important opportunity to maintain open space within an urbanizing area, provide a natural corridor for development of a trail system to serve the local communities, and provide a future connection to the emerging Regional Trail System.

Portions of the floodplain are also subject to fairly shallow flooding and are strategically located for future commercial/industrial uses. Development of these areas would also serve important community needs, and could be done in a safe manner that would not prevent creation of a trail system or preservation of a linear open space network.

The challenge of the Coal Creek and Rock Creek Floodplain Planning Study has been to develop a land use plan that recognizes the flood hazards and the important open space and natural resource values of these drainages, while addressing the other diverse community needs that exist. This Phase B Report presents the results of that planning effort, an effort that includes approximately 18 miles of the two drainages within Boulder County. The planning area is shown in Map 1. The purpose of the planning effort is to provide a framework for guiding future land use decisions within the floodplains.

Initial efforts on the Coal Creek and Rock Creek Floodplain Planning Study began in May of 1985. The results of the first planning analysis were documented in a detailed study, described as the Phase A Report, that was distributed in December of 1985. The Phase A Report explored a broad range of alternatives in an effort to identify a plan that addresses the somewhat diverse needs of the several jurisdictions with responsibility for the Coal Creek and Rock Creek floodplains. The results of the Phase A Report, together with a description of the events that followed release of the Phase A Report, are discussed later in this introduction.



Urban Drainage & Flood Control District
and Boulder County

Coal Creek & Rock Creek Floodplain Planning Study

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0 500 1000 2000 4000 feet

0 1/8 1/4 1/2 1 mile

Source: Flood Hazard Analyses,
Coal Creek and Rock Creek, Boulder
and Weld Counties, Colorado,
USDA Soil Conservation Service,
Colorado Water Conservation Board,
Urban Drainage and Flood Control
District, Coal Creek Water Users
Association, Boulder County,
Weld County. October, 1976.

Map 1

Flood Hazard Areas

Floodway
Note: The floodway
shown on this map
has been identified for
purposes of this planning
study only, and should not
be used for regulatory
purposes.

100 Year Floodplain
SF
**Unpredictable
Shallow Flooding,
100 Year**

As noted earlier, this report was prepared to document the results of the Phase B planning effort. The Phase B Report is concerned with refinement and development of the initial plan selected by the local governments, resulting in a more specific identification of future land uses within the floodplain. The plan, together with recommendations on how the plan should be implemented, is presented in Chapters 2 and 3 of this report.

Several jurisdictions have participated in the planning effort, including the Urban Drainage and Flood Control District, Boulder County, and the communities of Louisville, Lafayette, and Broomfield. Funding for development of the plan was provided by the Urban Drainage and Flood Control District and Boulder County.

A. Summary of Phase A Report

A review of the Phase A Report is a necessary first step in describing how the plan, described in this report, was developed and the rationale behind its development. The Phase A planning process consisted of several steps. The initial phase included meetings with local governments, and site visits to identify key issues and obtain information on existing land uses and environmental conditions within the floodplains. Following data collection, existing conditions, as well as proposed land uses, were mapped and analyzed. The development of several alternative scenarios followed from this analysis. The scenarios proposed various types of uses, e.g., open space, recreation, and urban development for each portion of the floodplains. The scenarios were defined to illustrate a broad range of choices — Maximum Preservation, Balanced Preservation/Urban Development, and Maximum Urban Development. Acquisition, construction, and maintenance costs were also approximated for each scenario.

Through a review of these scenarios with representatives of each of the jurisdictions involved in the planning effort, a fourth scenario was developed and presented as the recommended scenario in the Phase A Report. The recommended scenario was a hybrid of several scenarios that resulted in the establishment of a

continuous open space corridor along the two drainages, while still respecting the stated objectives of each of the local jurisdictions to designate certain portions of the floodplain for development.

B. Activities Following Release of Phase A Report

As noted earlier, the Phase A Report was completed in December of 1985. On March 25, 1986, the plan was presented to the City of Louisville Planning Commission. The Louisville Planning Commission adopted the recommended plan, subject to adjustments in two specific areas:

- o Coal Creek, just below the crossing of U.S. 36. The recommended scenario identified this area as an area proposed for acquisition; the Planning Commission proposal identifies the area as an area less suitable for development, managed in accordance with applicable floodplain regulations.

- o Coal Creek, immediately upstream from the crossing of 96th Street. The recommended scenario identified this area as an area proposed for acquisition; the Planning Commission proposal identifies the area as an area designated for development.

The exceptions adopted by the Louisville Planning Commission are described in a memorandum from the Director of Community Development that is included in Appendix A of this report.

On July 30, 1986, the Boulder County Long Range Planning Commission meeting also included a review and discussion of the Coal Creek and Rock Creek Floodplain Planning Study. The Boulder County Board of County Commissioners also considered the plan at their August 19, 1986, meeting. Both bodies approved the plan, subject to the incorporation of comments from each of the communities. A memorandum describing the plan, as approved by both bodies, is included in Appendix A.

A letter describing the City of Lafayette's comments on the recommended plan is also included in Appendix A. In essence, Lafayette supports preservation of the Coal Creek and Rock Creek floodways, but also believes that the adjacent floodplains should be available for commercial/industrial development.

The City of Broomfield includes only a small portion of the planning area within its jurisdiction - the area along Rock Creek between U.S. 36 and the Rock Creek Farm. This area is zoned PUD and may be developed in the future for commercial/industrial uses. For this reason, the floodplain at this location is designated for development, while the floodway is shown as a preservation area. A letter from the City of Broomfield commenting on the Phase A plan is included in Appendix A.

On October 24, 1986, representatives of all the jurisdictions participating in the Coal Creek and Rock Creek Floodplain Planning Study met to review progress on development of the Phase B Report. As a result of the discussions held during this meeting, additional adjustments were made to the plan. These include:

- o An area within the floodplain on Coal Creek, immediately downstream from U.S. 36, has been designated for development. Between this development zone and the crossing of Dillon Road, the floodplain has been designated for preservation through acquisition or other measures. Previous comments from the City of Louisville, as shown in Appendix A, indicated that this area should be shown as an area less suitable for development, managed in accordance with applicable floodplain regulations.
- o An area on Coal Creek extending approximately 3/4 mile upstream from the crossing of U.S. 287 has been designated for development. This area was shown in the recommended scenario from the Phase A Report as a preservation area. The floodway, however, remains an area designated for acquisition or preservation through other means.

II. PLAN FOR USE OF THE FLOODPLAIN

A. Introduction

The floodplains of Coal Creek and Rock Creek are, for the purposes of this planning study, defined as the 100-year floodplain (including unpredictable 100-year shallow flooding areas), as identified in the October 1976 Flood Hazard Analysis by the USDA Soil Conservation Service, et al. This area is indicated on the Proposed Plan Map in this report (and on all the data and scenario maps in the Phase A Report) as the Study Area.

The plan defines an agreed level of development/protection for all portions of the floodplain/study area. Six classes of development/protection are used. These, in decreasing order of probability of development, are as follows:

- o Existing development
- o Areas designated for development
- o Areas less suitable for development, managed in accordance with applicable floodplain regulations
- o Areas unsuitable for development (floodway), managed in accordance with applicable floodplain regulations
- o Areas designated for protection by acquisition or other methods
- o Existing open space

All existing open space areas that are partially in the floodplain or immediately adjacent to it are shown in their entirety (to the limits of the project base map). Potential future open space areas proposed by the various local jurisdictions (see the Recreation Areas and Open Space Map in the Phase A Report) are also shown outside the floodplain.

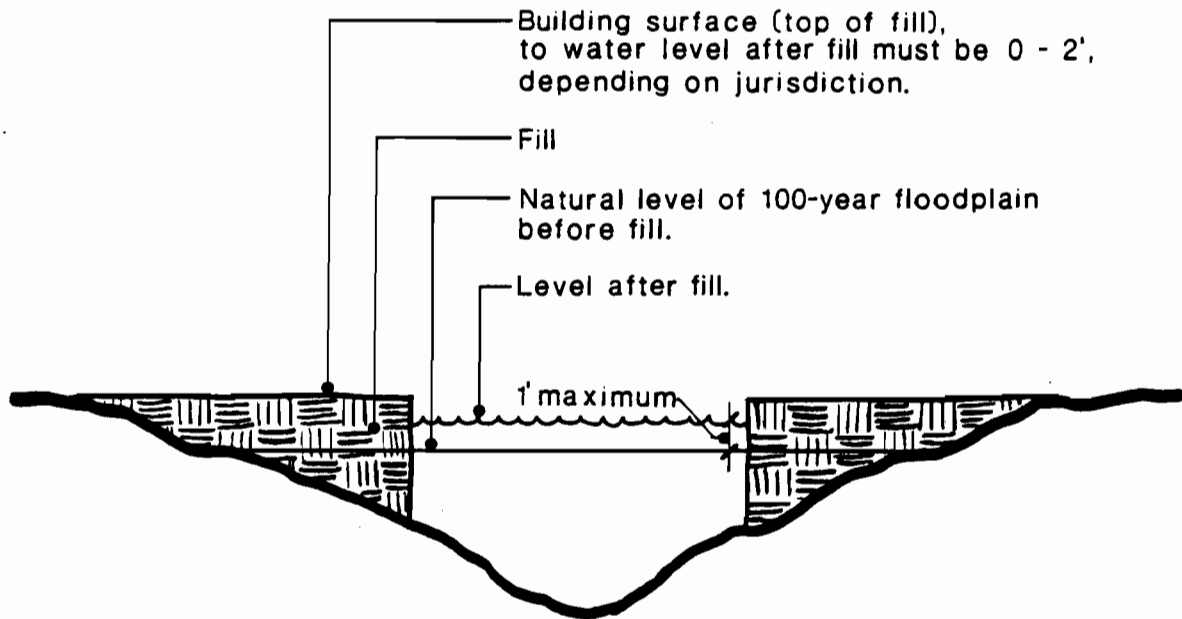
A basic foundation of the plan is that the floodway (that portion of the floodplain where floodwater tends to be relatively deep and relatively fast moving) should, in all cases, be protected from development.

A review of the following terms may be useful in understanding the selected plan. The 100-year floodplain consists of a floodway and flood storage areas. The floodway is characterized by hazardous and significant depths and velocities; no buildings, and most other types of development are prohibited by regulation within the floodway. Although development is prohibited within the floodway, the land remains in private ownership and public use can only occur with the permission of the landowner.

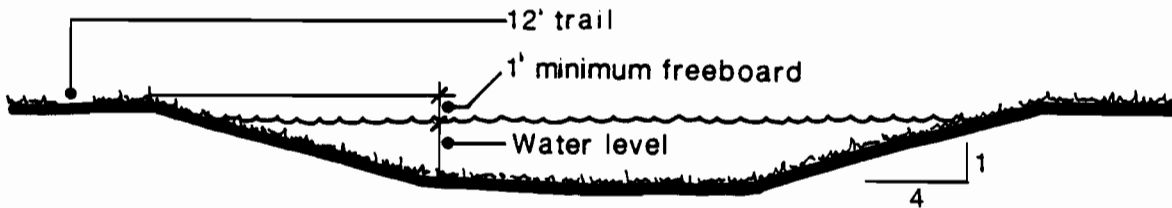
The flood storage area refers to the area within the 100-year floodplain, but outside the floodway. Flows within the flood storage area are characteristically of shallow depths and low velocities. Many types of development can occur within the flood storage area, provided they meet the requirements of the applicable floodplain regulations. Boulder County and each of the municipalities have floodplain regulations that regulate how development may occur within the flood storage area. Typically, these regulations provide that development may occur if adequate fill is placed within the flood storage area so that the resulting building elevation is elevated to the level, or above the level, of the 100-year flood. The cities of Louisville and Broomfield require that buildings be located two feet above the flood elevation; Boulder County and Lafayette require the building to be at or above the flood elevation.

Development can also occur within the existing floodplain by constructing channel improvements which can carry a greater flow within a smaller area than the existing channel. Such improvements can result in a narrowing of the floodplain, which then allows development to occur in what formerly was floodplain. Figure 1 illustrates potential floodplain improvements.

As with the floodway, flood storage areas also remain in private ownership, and public access can only be accomplished through permission of the landowner or when the land or the right of public entry has been purchased by a public entity.



**Representative Section
Fill to Narrow Floodplain
not to scale**



**Representative Section
Grass-Lined Channel Construction
not to scale**

**Figure 1
Potential Floodplain
Improvements**

B. Recommended Land Uses

Map 2 (following Page 13) presents the recommended plan, which is described in detail in the remainder of this report. The description starts with Coal Creek at the upstream end of the study area at U.S. 36, and proceeds downstream to the Weld County Line. It then addresses Rock Creek, starting at U.S. 36 and proceeding downstream to the confluence with Coal Creek. The approximate lengths of the various segments given below are measured along the approximate centerlines of the floodways and not along the meandering of the two creeks. They are therefore considerably shorter than the lengths along the creeks. Table 1 summarizes the land use pattern associated with the proposed plan.

Coal Creek: U.S. 36 to Empire Road (Highway 42)

This segment of the Coal Creek floodplain is about 12,500' (2.4 miles) long. It is located entirely within Louisville's service area and partly within Louisville's incorporated area. Most of the segment is unincorporated land of Boulder County.

As shown on the Proposed Plan Map, immediately downstream from U.S. 36 is a short (approximately 1,200') segment of floodplain where development is proposed on both sides of the floodway (a small area of existing development occurs in the left bank floodplain). The floodway is intended to be managed in accordance with applicable regulations.

Next, downstream and crossed by Dillon Road (a minor arterial highway) is a long (approximately 4,500') segment of relatively extensive floodplain, all of which is intended to be protected from development by acquisition or other methods, except for two small areas of existing development at the crossing of Dillon Road. The land adjacent to the right bank floodplain is proposed open space. Adjacent to the upstream end of the left bank floodplain is an area of existing open space. The upstream end of this segment is crossed by an existing transmission line.

Below this segment is a segment about 3,200' long, where the overall floodplain is relatively narrow and where the edge of the floodway coincides with the edge of the floodplain in several places. In this segment, all of the left bank floodplain

Table 1

FLOODPLAIN SEGMENTS

Proposed Plan
 Land Use Pattern: Development/Protection
 Approximate Area in Acres

	1	2	3	4	5	6	7	8	3+7	2+4, 6+8	1-8
DEVELOPMENT/PROTECTION LEVEL	Coal Creek: US 36 to Empire Road (Louisville service area).	Coal Creek: Empire Road to Western Lafayette City Boundary (unincorporated Boulder County).	Coal Creek: Lafayette Western City Boundary to Eastern City Boundary at 120th Street (Lafayette service area).	Coal Creek: Lafayette Eastern City Boundary to Adams County Line (unincorporated Boulder County).	Rock Creek: US 36 to Broomfield Eastern City Boundary (Broomfield incorporated area).	Rock Creek: Rock Creek Ranch to Lafayette Southern City Boundary (unincorporated Boulder County).	Rock Creek: Lafayette Southern City Boundary to Eastern City Boundary (Lafayette service area).	Rock Creek: Lafayette Eastern City Boundary to confluence with Coal Creek (unincorporated Boulder County).	Total Lafayette service area.	Total unincorporated Boulder County.	Total study area.
o Existing development. ¹	14.0	4.0	24.7	18.1	—	31.9	.8	—	25.5	5.4	93.5
o Areas designated for development.	20.2	—	211.9	—	59.2	—	91.5	—	330.4	—	382.8
o Areas less suitable for development, managed in accordance with applicable floodplain regulations.	—	—	—	32.9	—	—	—	—	—	32.9	32.9
o Areas unsuitable for development (floodway), managed in accordance with applicable floodplain regulations.	9.6	—	—	35.6	—	—	—	—	—	35.6	45.2
o Areas designated for protection by acquisition or other methods.	161.4	24.7	54.3	138.0	45.8	122.2	96.0	16.1	150.3	301.0	658.5
o Existing open space.	43.1	—	42.2	5.3	—	231.7	—	—	42.2	237.0	322.3
o Total acreage of study area.	248.3	28.7	331.1	229.9	105.0	385.8	188.3	16.1	528.4	660.5	1535.2
o Total open space area (existing, plus designated for acquisition, plus other portions of floodway).	214.1	24.7	96.5	178.9	45.8	353.9	96.0	16.1	192.5	573.6	1,026.0
o Total open space as percent of total area.	86%	86%	29%	78%	44%	92%	51%	100%	35%	87%	67%
o Approximate length measured along centerline of floodway.	2.4 M	0.6 M	2.4 M	2.1 M	0.6 M	2.8 M	1.6 M	0.2 M	—	—	12.7 M

Notes:

¹ Areas where development has impinged on the floodway are assigned 50% to existing development and 50% to the designated development/protection type.

and floodway are existing open space, with the exception of one small area of floodplain that is designated for protection by acquisition or other methods. The right bank floodplain/floodway are similarly designated for acquisition. As with the segment immediately upstream, the upland area adjacent to the right bank floodplain is proposed as open space. Part of the right bank floodplain in this area contains some former gravel extraction pits that might have some potential as wildlife habitat.

Proceeding downstream, a short (1,500') segment occurs that is crossed by 96th Street and terminates at a culvert under the Colorado and Southern Railroad. Here, the entire floodway and the relatively narrow right bank floodplain are designated for protection by acquisition.

A relatively narrow strip of the left bank floodplain, immediately adjacent to the floodway, is similarly designated except for a small area of existing development. The floodplain extends much farther back beyond this left bank strip, however, apparently because the culvert beneath the railroad is inadequately sized and causes some backing up in a major flood, with a consequent increase in the natural extent of the floodplain. It is probable that this could be rectified by increasing the flow capacity of the culvert; therefore the area is designated for development. It is assumed, however, that the cost of the improvements would be largely borne by the developers; therefore these costs are not included in the plan. The uppermost portion of the floodplain in this area contains existing development.

The last segment of the floodplain within the Louisville service area stretches between the Colorado and Southern Railroad and Empire Road (Highway 42). It is about 2,000' long, with a relatively narrow floodway, a narrow and discontinuous right bank floodplain, and an extensive left bank floodplain. This entire area consists of a patchwork of existing open space and land designated for protection by acquisition or other methods. However, there is one small area of existing development in the right bank floodplain and two more extensive existing development areas at the upland edge of the left bank floodplain. Adjacent to the upland edge of the right bank floodplain is an area of proposed open space.

Coal Creek: Empire Road (Highway 42) to the Western Lafayette City Boundary

This segment of the Coal Creek floodplain is about 3,000' (0.6 mile) long. It is entirely within unincorporated portions of Boulder County and is not in the current service area of either Louisville or Lafayette.

As shown on the Proposed Plan Map, it consists of a narrow floodway with discontinuous floodplains on either side that (where they occur) are also narrow, except that one portion of the left bank floodplain is relatively wide. This wide area is partly occupied by existing development. The entire undeveloped area of the floodplain and floodway is designated for protection by acquisition or other methods. Adjacent to both upland edges of the floodplain is proposed open space.

Coal Creek: Lafayette's Western City Boundary to Eastern City Boundary at 120th Street

This segment of the Coal Creek floodplain is about 12,700' (2.4 miles) long. It is located entirely within Lafayette's service area and partly within the Lafayette incorporated area.

As shown on the Proposed Plan Map, immediately downstream (east) from Lafayette's western boundary is a 3,000' long floodplain segment, in which all of the relatively narrow floodway and essentially all of the extremely narrow and isolated portions of the floodplain that occur outside the floodway on both sides are existing open space.

Downstream from this segment is a 4,000' segment extending to U.S. Highway 287 (a principal arterial). Most of the narrow floodway in this segment is designated for protection by acquisition, though its lower third is existing open space. The right bank floodplain here is broad and is designated for development. The left bank floodplain (above and beyond the floodway) in this segment is nonexistent, except for a single small isolated area. This area is also designated for development. The segment is crossed by the proposed U.S. Highway 287 bypass.

Immediately downstream of U.S. Highway 287 is a 3,500' long floodplain segment that has a floodway varying from narrow to moderately wide. This floodway is designated for protection by acquisition. The floodplain above this floodway is extensive on the right bank and designated for future development (except for a small area of existing development). The left bank floodway is moderately extensive and likewise designated for development.

Below this is a short (1,300') segment that extends to the Burlington-Northern Railroad. All of this segment's narrow floodway is existing open space. The right bank floodplain above the floodway is first, existing open space and then, beyond that, designated for development. The left bank floodplain is also existing open space, and is partly designated for development and partly existing development, some of which may impinge on the floodway.

From the Burlington-Northern Railroad and extending a few hundred feet beyond 120th Street is the final Coal Creek segment that is in the Lafayette service area. This is a very short (900') segment where most of the initially relatively narrow floodway has been seriously intruded upon by existing development. This is proposed as a site for rehabilitation/enhancement, as described below. Immediately below 120th Street, the floodway is existing open space and the floodplain on the left bank is existing development; on the right bank is existing development with (above it) areas designated for future development.

Coal Creek: Lafayette's Eastern City Boundary to Weld County Line

This segment of the Coal Creek floodplain is about 11,000' (2.1 miles) long. It is entirely within the unincorporated area of Boulder County.

As shown on the Proposed Plan Map, immediately downstream from the Lafayette City Line and extending to the confluence of Rock Creek is a 2,200' segment that has a narrow floodway and extensive floodplains on each side of this floodway. A narrow upland zone beyond the left bank floodplain is proposed as open space. The entire segment is proposed for protection through acquisition or other means, except for a small area of existing development immediately downstream from 120th Street.

Beyond the confluence and extending for about 3,500' is a segment where the floodway is moderately wide. The right bank floodplain beyond the floodway is narrow and discontinuous. The left bank floodplain is relatively wide. The floodway and the floodplains on both banks are areas designated for protection by acquisition, except for one small area of existing development in the left bank floodplain. Beyond the floodplains on both banks are upland areas proposed as open space.

Continuing downstream and extending to the Weld County Line is a complex segment about 5,300' long, crossed by Base Line Road. Several conditions apply to the floodway of this segment. First, is a small area of existing open space; next, a small area designated for protection by acquisition; and lastly, a long segment designated as unsuitable for development simply on account of its being floodway, and to be managed in accordance with applicable regulations. The floodway in this segment appears to have been impinged upon in two places by existing development. Above the floodway, the right bank floodplain is very narrow and discontinuous. Two small portions of it are designated for protection by acquisition. One portion is occupied by existing development, the remainder is designated for management in accordance with applicable floodplain regulations. The left bank floodplain is extensive downstream to Base Line Road. In this area, proceeding back from the edge of the floodway, it is occupied by several areas of development, by an area (surrounding the development) that is designated for management in accordance with applicable floodplain regulations, and by an area designated for protection by acquisition. The acquisition area includes a wetland that is proposed for preservation, as explained later in this report. Downstream of Base Line Road, the few isolated portions of the left bank floodplain that exist above the floodway are designated for management in accordance with applicable floodplain regulations.

Rock Creek: U.S. 36 to Eastern Boundary of Broomfield Incorporated Area

This segment of the Rock Creek floodplain is about 3,200' (0.6 mile) long. It is entirely within Broomfield's incorporated area and is crossed by the Colorado and Southern Railroad. As shown on the Proposed Plan Map, the floodway in this

segment is relatively wide and is designated for protection by acquisition. The right bank floodplain above the floodway is relatively narrow and not continuous. It is designated for development. The left bank floodway is wider and also designated for development.

Rock Creek: Rock Creek Farm to Lafayette's Southern Boundary

This segment of the Rock Creek floodplain is about 15,000' (2.8 miles) long. It is located entirely in unincorporated land of Boulder County. As shown on the Proposed Plan Map, immediately downstream from the Broomfield boundary and extending to Highway 287 is a long segment (approximately 9,000') of floodway and floodplains which are almost entirely existing open space. This is the County-owned Rock Creek Farm. The sole exception to this land use type is a relatively small area that is designated for protection by acquisition. Most of the floodway here is relatively wide. The right bank floodplain beyond the floodway varies from wide to narrow and is almost continuous. The left bank floodplain is discontinuous and, where it exists, relatively narrow.

Immediately downstream from Highway 287 is a complex floodplain segment about 6,000' long and extending to the southern boundary of Lafayette. This segment is crossed by Dillon Road (a minor arterial) and is both crossed and paralleled by the Burlington-Northern Railroad. All of the moderately wide floodway in this segment is designated for protection by acquisition, though its central portion has been seriously impinged upon by existing development (this is proposed as a rehabilitation/enhancement area as described below). The right bank floodplain above the floodway occurs only intermittently, and is narrow. It is also designated for protection by acquisition. The left bank floodplain is more extensive. Its upstream portion here is occupied by a considerable area of existing development; the remainder is designated for protection by acquisition. Beyond the right and left bank floodplains are upland areas proposed for future open space.

Rock Creek: Lafayette's Southern Boundary to Lafayette's Eastern Boundary

This segment of the Rock Creek floodplain is about 8,200' (1.6 miles) long. It lies entirely within Lafayette's service area and almost entirely within its incorporated area. The segment crosses 120th Street (a minor arterial) and is paralleled for

most of its length by the Burlington-Northern Railroad. The floodway in this segment varies from wide to moderately narrow, and is designated for protection by acquisition. The right bank floodplain is first narrow and then discontinuous. It is designated for development and contains some existing development. The upland area that lies above this floodplain (and is separated from it, except at one point) is proposed as open space. The left bank floodplain is continuous and is likewise designated for development. It contains some existing development at its downstream end.

Rock Creek: Lafayette's Eastern Boundary to Confluence with Coal Creek

This segment of the Rock Creek floodplain is about 1,200' (0.2 mile) long. It is located entirely within unincorporated land of Boulder County.

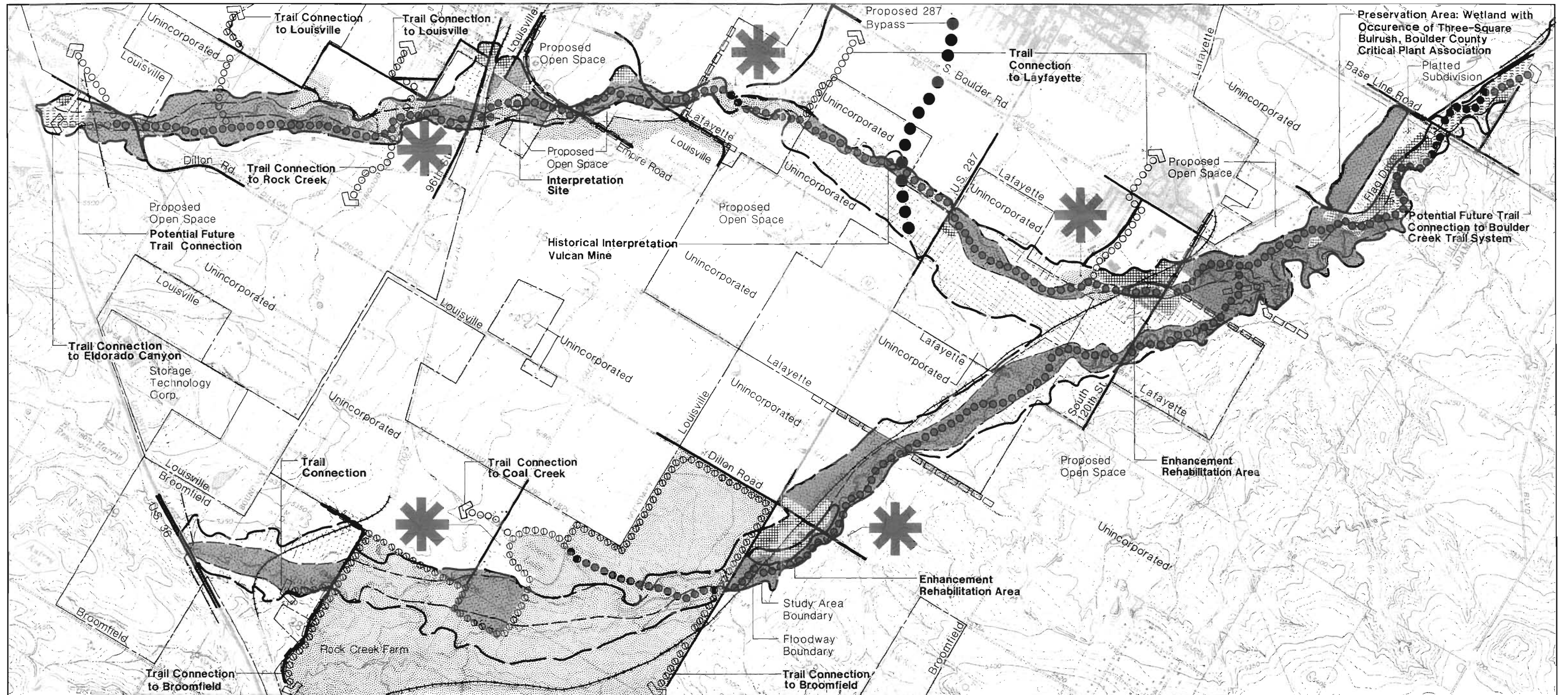
As shown on the Proposed Plan Map, the floodway here is narrow, the right bank floodplain above the floodway is essentially absent, and the left bank floodplain relatively extensive (it combines with Coal Creek's right bank floodplain). All floodway and floodplain areas are designated for protection by acquisition.

C. Recreation Features

The following is a description of the proposed plan's recreation features. The description follows the same format as that of the development/protection levels (Section B above), being organized by floodplain segment and defined on the basis of responsible jurisdiction. The description should be read in conjunction with the Proposed Plan Map.

The main recreational features of the proposed plan include a trail following most of the floodplain corridor, with simple bridges across the creeks as necessary; a total of six trailhead activity centers, located to allow vehicular and pedestrian access from the adjacent communities; and two historical/archaeological interpretation sites.

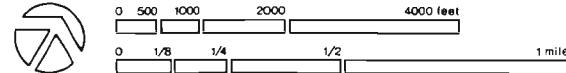
The location of the trail corridor shown on Map 2 is conceptual, and would be specifically located following further study and discussions with landowners. A number of trail connections to adjacent communities and other areas are defined



Urban Drainage & Flood Control District
and Boulder County

Coal Creek & Rock Creek Floodplain Planning Study

EDAW inc.



Map 2

Proposed Plan

- | | | | |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------|
| Existing Development | Areas Unsuitable for Development (Floodway) Managed in Accordance with Applicable Floodplain Regulations | Existing Open Space. (Areas shown are either wholly or partially within floodplain) | Trailhead Activity Center |
| Areas Designated for Development | Areas Designated for Protection by Acquisition or Other Methods | Proposed Open Space (Outside Floodplain) | Trail Proposed as part of this Plan |
| Areas Less Suitable for Development, Managed in Accordance with Applicable Floodplain Regulations | Jurisdiction Boundary, Incorporated Area | Existing Trail | Potential Future Trail |
| | | Floodplain Segment, as discussed in text | |

in the plan, but are assumed to not be included in the costs of the plan. These connections contain both existing and proposed trail segments. The trail is (assumed for cost purposes) to be 8' wide with a concrete surface, and designed to be usable by pedestrians, bicyclists, and maintenance equipment. In addition, the trail easement should include enough width to allow equestrian use of an unpaved shoulder on one side of the trail.

The trailhead activity centers are assumed to include a gravel parking lot for about 20 cars, several picnic tables, signage, and a minimum amount of planting. The interpretation sites would each have signage and a few benches.

Coal Creek: U.S. 36 to Empire Road (Louisville Service Area).

A trail is proposed for all but the uppermost portion of this segment. All of it would probably be located on existing open space. The trail would be accessed by a trailhead/activity center located upstream from the crossing of 96th Street on land that is publicly owned, but appears to have no existing public facilities. At this location, an ample level area exists out of the roadway, but within the floodplain. The area is concurrently accessed by a collector type road. Between the Colorado and Southern Railroad and Empire Road, an interpretation site is proposed, since this is an area that has cultural resource significance.

Four trail connections originate in this segment. The first, near the upstream end of the segment, is a potential connection to, and possibly beyond, the existing public open space north of Dillon Road and northeast of U.S. 36. The second uses a proposed drainage easement and connects to an existing trail that passes through the east edge of Heritage Park, thus accessing several residential neighborhoods in Louisville. A possible alternative location for this trail connection would be the ROW of an apparently abandoned irrigation ditch immediately west of the proposed drainage easement. The third trail connection originates at the trailhead/activity center described above. It proceeds west for a short distance as a sidewalk, then turns north using an existing trail to other Louisville districts. The fourth trail connection in this segment also originates at the trailhead/activity center, but proceeds south with the potential to extend to Rock Creek, and ultimately Broomfield, using the ROW of an existing irrigation ditch.

Coal Creek: Empire Road to Western Lafayette City Boundary (Unincorporated Boulder County).

A trail is proposed for the full length of this short segment, which contains no other recreation features. The trail would primarily be located on existing open space or areas proposed for acquisition.

Coal Creek: Lafayette's Western City Boundary to Eastern City Boundary (Lafayette Service Area).

A trail is located along the full length of this floodplain segment. Again, it would primarily be located on existing open space or areas proposed for acquisition. Two trailhead/activity centers are sited in the segment. The first of these is proposed to be located a few hundred feet east of the western boundary of Lafayette on existing public land, primarily outside the floodplain. The area appears to be adequately sized and does not contain any existing public facilities. Access is conveniently obtained by a collector road serving a residential neighborhood. The second activity center is located upstream of the Burlington-Northern Railroad. It is also on land that is now in public ownership and outside the floodway. An existing road is available and suitable for access. The amount of suitable land appears to be adequate for the proposed purpose. West of where U.S. Highway 287 crosses the floodplain, at the former Vulcan Mine, facilities are proposed to interpret the mining that was such an important part of the history of the region.

Two trail connections to Lafayette originate in this segment. The first of these proceeds north from a point midway between the first trailhead/activity center and the Vulcan Mine. It uses first an existing trail, then a proposed drainage easement. The second trail connection proceeds north from the second of the two trailhead/activity centers in this segment, though at first it is essentially only a sidewalk.

Coal Creek: Lafayette's Eastern City Boundary to Weld County Line
(Unincorporated Boulder County).

A trail runs the full length of this floodplain segment. Slightly over half of it would probably be on publicly owned land, the remainder would probably be accommodated on an easement purchased from the private owners of the floodway. One trailhead/activity center is located here at the existing Flag Park. It is assumed that the existing parking area would be a basis for the trailhead, but it is also assumed that, as part of the plan, some improvements to Flag Park would be made, primarily improved landscaping and planting of additional trees and native grasses. There is convenient existing access to Flagg Park via Flagg Drive.

The proposed Rock Creek Floodplain Trail intersects the trail that follows this segment, and provides a connection to Rock Creek Farm and ultimately Broomfield. There is also the potential for a future trail downstream along Coal Creek into Weld County, connecting to the proposed Boulder Creek trail system.

Rock Creek: U.S. 36 to Broomfield's Eastern City Boundary (Broomfield
Incorporated Area).

No recreation facilities are proposed as part of the plan in this short segment. Future trail connections may be added here, depending on how the regional trail system develops.

Rock Creek: Rock Creek Farm to Lafayette's Southern City Boundary
(Unincorporated Boulder County).

The majority of this segment crosses the County-owned Rock Creek Farm. This entire open space area is served by an existing trail located around its periphery. This peripheral trail is proposed to be used as part of the Rock Creek trail system, except that at the eastern end of the ranch, the peripheral trail detours far to the north of the creek. In this area, a new trail following the floodplain and probably sited primarily along the alignment of an existing ranch road is proposed. Downstream from Rock Creek Farm, a trail runs the full length of the remainder of the segment, probably located entirely on publicly-owned land. The trails in this segment are accessed by two trailhead/activity centers. The first of these is on

the Rock Creek Farm near Stearns Lake, providing access to the existing peripheral trail system. This is on public land, well outside the floodplain. The area is conveniently accessed from Broomfield by an existing road. The second trailhead/activity center is located on the right bank of Rock Creek on Dillon Road, east of U.S. Highway 287. At this location, the floodway is relatively narrow and extends essentially the full width of the floodplain. The activity center would need to be located partly in the floodway/floodplain and partly beyond it. This would require acquisition of a small amount of additional land outside the floodplain. Opposite this trailhead/activity center is an area proposed for enhancement/rehabilitation as described below.

There are four trail connections in this segment. The first of these commences as part of the existing Rock Creek Farm peripheral trail system. It proceeds south, parallel to the access road, and has the potential to connect to Broomfield. The second trail connection proceeds west and then north from the Rock Creek Farm peripheral trail system at Stearns Lake, following the right-of-way of an existing irrigation ditch, and connects to Coal Creek at the trailhead/activity center west of 96th Street. The third trail connection also uses part of the existing Rock Creek Farm trail system, and parallels U.S. Highway 287 south towards Broomfield. A fourth potential trail connection extends upstream on Rock Creek.

Rock Creek: Lafayette's Southern City Boundary to Eastern City Boundary (Lafayette Service Area).

A trail follows the entire length of this segment. It would probably be located entirely on land proposed for acquisition. The segment contains no other proposed recreation facilities.

Rock Creek: Lafayette Eastern City Boundary to Confluence With Coal Creek (Unincorporated Boulder County).

A trail follows the entire length of this short segment. It would probably be located entirely on land proposed for acquisition. The segment terminates at Coal Creek, and therefore connects with the Coal Creek trail system described above. It contains no other proposed recreation facilities.

D. Preservation

One area has been designated for preservation. This is an area containing a wetland within which the three-square bulrush, a Boulder County critical plant association, occurs. As explained in Section B above, it is designated for protection by acquisition.

The area is located within the floodplain, above the floodway, in the Coal Creek floodplain segment between the Lafayette eastern city boundary and the Weld County Line. This is in an unincorporated portion of Boulder County. The wetland is separated from the floodway corridor by a platted subdivision with several existing residences. No facilities for public use of the preservation area are foreseen as part of the plan.

E. Enhancement/Rehabilitation

Two areas are proposed for enhancement/rehabilitation as part of the plan.

The first of these is on Coal Creek, immediately upstream of 120th Street within the Lafayette service area. This is an area where industrial land uses have impinged on the floodway and floodplain, and construction debris has been dumped on the banks above the creek, probably to prevent flood scour from eroding the banks and thus cutting into the area under use. As shown on the plan map, enough of the area to accommodate a reasonable trail corridor is designated for acquisition under the plan. The measures proposed to rehabilitate the area are described and illustrated in Section III.D., Development Guidelines.

The second area proposed for rehabilitation is on the left bank of Rock Creek between Highway 287 and Dillon Road, and also for a short distance downstream of Dillon Road. This area is in an unincorporated portion of Boulder County. In this area also, industrial land uses have impinged on the floodway. Wrecked vehicles and construction materials and debris have been dumped or are being stored there. Rehabilitation measures are described in Section III.D.

III. IMPLEMENTATION

A. Priorities/Phasing

This section provides an estimate of the construction/acquisition costs associated with the proposed plan, and other aspects of its implementation. Successful implementation of the plan will require a substantial level of cooperation among the various jurisdictions involved. Although four of the five jurisdictions have adopted the proposed plan, a joint resolution/agreement should be developed to clarify the responsibilities of each entity and to provide further commitment that the plan will actually be implemented.

A basic requirement in the phasing of the acquisition and subsequent construction of the recreational trail corridor is contiguity. If several short, separate segments of corridor were acquired in each phase, many of them might be too short to be usable alone. In some cases, the lengths of the segments available for public recreation might not be sufficient to attract use by pedestrians and bicyclists until several phases had been accomplished. If, on the other hand, single contiguous segments of significant length are acquired and constructed in each phase, these segments are likely to be large enough to be usable initially. If, moreover, the large segments that are acquired and constructed in each subsequent phase are adjacent to each other, the usable length of the system is at the maximum during all phases up to completion.

A second requirement is to phase the acquisitions of these major segments, so that the areas under greatest pressure for development and where the greatest populations are located are acquired first.

Because of these requirements, an acquisition/construction program of five phases is proposed. Under this phasing, acquisition/construction proceeds down Coal Creek as far as the confluence of Rock Creek, then begins on Rock Creek.

The first phase acquisition/construction program will apply to the Coal Creek corridor from its upstream end at U.S. 36 all the way through the Louisville service area that ends at Empire Road, and also through the short segment of

unincorporated county land between Louisville and Lafayette. This is the area where development appears to be expanding most rapidly towards the corridor system.

The second phase is proposed to be applied to the Lafayette service area segment of the Coal Creek corridor and beyond it into a portion of the unincorporated Boulder County segment, as far downstream as the confluence of Rock Creek. This area also appears to be under some development pressure.

The third acquisition/construction phase will be applied to a segment of Rock Creek, immediately upstream of its confluence with Coal Creek, and therefore contiguous to the second phase. This third phase extends upstream through a small area of unincorporated Boulder County land, through the entire extent of Lafayette's service area that lies along Rock Creek, and through another portion of unincorporated land as far as Highway 287.

The fourth phase of acquisition is applied to the Coal Creek corridor below the confluence with Rock Creek. It is located entirely on unincorporated county land. Some development has occurred within the floodplain within this segment, and only a small amount of the floodplain is publicly owned.

The corridor along Rock Creek, upstream of Highway 287, is proposed for acquisition during the fifth and final phase. This corridor consists primarily of unincorporated county land. Most of this land is included in the County-owned Rock Creek Farm, and therefore is not under development pressure. However, a small area of privately-owned land extends into the open space property as far as the Creek. A higher acquisition priority for this area might be necessary. The remainder of the fifth phase segment is the Broomfield incorporated area between Rock Creek Farm and U.S. 36.

B. Cost Estimate

The estimated total acquisition/construction costs to implement the plan would be \$2,392,100. Total annual maintenance costs are estimated to be \$262,500.

Acquisition Costs

Two basic assumptions lead to the plan's land acquisition costs. The first assumption is that, within municipal service areas or areas zoned for development, all floodway and floodplain land designated for acquisition can be obtained by dedication at no direct cost to the public. As has occurred in the past in Louisville and Lafayette, as developments are reviewed through the PUD process, flood-prone land is dedicated for public open space. The second assumption influencing the plan's land acquisition costs is that the flood-prone land in the study area that is not zoned for development and is unincorporated can be acquired for about \$3,000 per acre. This is an approximate number that is based on the experience of other local jurisdictions in acquiring floodplain land for open space and trail use.

In a few locations, a trail corridor is proposed on floodway land that is not designated for acquisition. In these cases, only a 50' wide easement would be acquired to accommodate a trail. It is assumed that such an easement would cost \$18,000 per mile (i.e., \$3,000 per acre).

In the proposed plan, 658.5 acres of land are designated for acquisition. Of this total, 357.5 acres are assumed to be acquired through dedication and 310.0 acres to be purchased at \$3,000 per acre, for a total cost of \$903,000. Approximately 1.0 mile of trail is located on land not designated for acquisition. Land acquisition costs for easement for this trail mileage would therefore, under the assumption given above, cost \$18,000. The overall acquisition cost of the plan under the three assumptions stated above would therefore be \$921,000.

If one assumes that the various segments of the overall open space system are owned and purchased by the local government units most directly responsible for the land through which they pass, all of these land acquisition costs would fall to Boulder County. This assumption is somewhat conservative, given the possibility that some floodplain lands within the county could be acquired through donations or some form of land dedication. In light of past experience in the planning area, however, it seems more likely that land can be acquired within municipal boundaries through dedication than it can in unincorporated areas.

The amounts of land (in acres) to be acquired by dedication breaks down as follows:

- o Louisville: 161.4
- o Lafayette: 150.3
- o Broomfield: 45.8
- o Boulder County: none

If the W470 project proceeds, and the alternative that parallels Rock Creek is selected, there may be some potential for the highway project to share in the cost of the open space system.

Facility Development Costs

The various constructed elements of the plan include the trail itself, bridges carrying the trail over the creeks, the trailhead/activity centers, interpretation sites, fencing between the trail corridor and other land uses (such as agriculture), and enhancement/rehabilitation.

The assumed costs for each of these elements per unit area, or unit length, and their number or total length are given below.

- o Trail

Only the corridor trail is included in this cost estimate; connecting trails are excluded, except that any short connections that may be required to the trailhead/activity centers are included. An 8' wide concrete trail is assumed at a cost of \$100,000 per mile. If it is assumed that the length of trail is 10% more than the length down the centerline of the floodway, then 12.0 miles of trail are included in the plan (most of the trail through and around Rock Creek Farm is existing). The cost for trail construction would therefore be \$1,200,000.

- o Bridges

Although keeping the trail on one side of the drainage is preferable from a cost and flood control perspective, it will probably be necessary to avoid certain areas when the trail is constructed. For this reason, the cost estimate assumes that 2 bridges will be required, each 8' wide and averaging 60' long. Each is assumed to cost \$18,000. Total cost for bridges is therefore \$36,000.

- o Trailheads/Activity Centers

Six of these are included in the plan. The average area is assumed to include a 300' long gravel access road and a gravel parking lot for 20 cars, 4 picnic tables/benches, signage, and a minimum amount of planting. It is assumed very little grading is required. No outhouses are included in the cost estimate, although local governments may want to consider adding these at a later date. On this basis, each trailhead would cost about \$15,000. Total cost would therefore be \$90,000.

- o Interpretation Sites

Two are included in the plan, each with signage and two benches. Each would cost \$1,500, for a total cost of \$3,000.

- o Fencing Between Floodplain Corridor and Other Land Uses

It is assumed that fencing would be required by the owners of many adjacent land parcels, if the implementation of the plan resulted in probable access by the public to presently unfenced land. Agriculture would certainly need to be fenced off in these circumstances. Ten miles of new post and wire fencing are assumed to be required at a cost of \$12,000 per mile. Total fencing cost is \$120,000.

o Enhancement/Rehabilitation

There is very little available information on the costs of this operation which would involve removing wrecked cars, construction materials, and debris (including debris that has been dumped on stream banks). If one assumes that the costs would be similar to those of clearing and grubbing heavy tree stumps, then the costs might be in the range of \$1,000 to \$1,600 per acre; \$1,300 per acre is assumed. It appears that about 17 acres would require this treatment; therefore, the total cost would be about \$22,100. However, there might be opportunities to reduce this cost by using volunteer or public service labor.

Therefore, the total cost to construct the plan features, under the above assumptions, would be \$1,471,000.

It is assumed that fencing and screening planting for future development, and grading and planting at the edge of floodplain development on fill would be paid for by the developer.

Maintenance Costs

A figure of \$250 per acre per year is assumed as the cost of maintaining the plan's open space. As shown on Table 1, there are 1,026 acres of open space, i.e., areas designated for acquisition, plus existing open space, plus other portions of the floodway, in the plan. Therefore, the annual maintenance costs would amount to \$256,500. In addition, if the costs of maintaining the trail surface itself are assumed to be \$500 per mile per year, this would add \$6,000 annually, for a total of \$262,500. This cost does not account for potential income that could be derived from leasing portions of the acquired or open space areas for agriculture.

C. Acquisition Strategies

There are two basic strategies proposed in the plan for acquisition of floodplain and floodway land. The first is to purchase lands generally only in the unincorporated areas of Boulder County that are not zoned for any type of development. Because of their susceptibility to flooding and because Boulder County has a

policy of discouraging development in such high risk areas, they can often be obtained at reasonable cost for open space. An average cost of \$3,000 per acre is assumed for these lands. The second strategy is to acquire floodway and floodplain lands by negotiating for their dedication as public open space at the time that they, and adjacent areas, are being planned for development. This would occur as developments are being reviewed through the PUD process. The success of the process depends on the parcel, or aggregation of parcels, being considered for development having enough of its area above the floodplain in developable land. The process has already been successfully used by both Louisville and Lafayette in obtaining substantial areas of public open space. In order to facilitate and encourage this dedication process, the cities and county should consider allowing some portion of an area's development rights that would have applied to the flood hazard areas to transfer outside these areas.

Acquisition of open space corridor land by dedication depends on the continuation of development pressure. If this does not occur, the cities or county should consider the purchase of at least a trail easement in appropriate areas.

A general review of potential acquisition strategies is presented in the remainder of this section.

- o Zoning — Louisville, Lafayette, Broomfield and Boulder County have adopted comprehensive land use plans and attempted to bring zoning regulations into conformance with those plans. Although all zoning categories will result in some level of development, land use plans and local zoning should be consistent with the preservation and development scenario eventually approved for the Coal Creek-Rock Creek corridors.
- o Floodway and Floodplain Regulations — All four jurisdictions preclude development within the floodway. Within the flood fringe area (floodplain), development may occur only if floodproofing requirements are met. Since this is often costly, the floodplain regulations provide some incentive for keeping structures outside the flood fringe area.

- o Wetlands Protection — Although the County's comprehensive plan includes as a goal the protection of wetlands, both the County and the cities rely on the Federal Clean Water Act to achieve this objective. Section 404 has established a permitting process which is intended to maintain water quality standards as determined for each stream; this is administered by the state. Section 404 is administered by the Army Corps of Engineers and requires a permit for activities which might result in the discharge of fill or dredged material to the stream. In both cases, the review process for the permit does not eliminate development, but it does allow the imposition of mitigating measures to protect wildlife habitat and other environmental features. The permit requirements might serve as further inducement to keep development out of some flood fringe areas.
- o Subsidence Risk Reduction — Until the subsidence study being conducted by the Mined Land Reclamation Office is complete, there can be no assessment of how subsidence risk might be a factor in preserving the floodplains of Rock Creek and Coal Creek.
- o Partial Development/Transfer of Development Rights — To the extent that floodplain, wetlands, and subsidence area regulations are disincentives to development, owners of land which extend beyond the flood fringe area should be encouraged to develop only those portions of their properties which lie outside the areas of concern. The cities and county should consider allowing any development right within the area of concern to transfer outside that area.
- o Park/Open Space Dedication — The four jurisdictions should use their land dedication requirements to acquire easements or ownership in the floodplains of both creeks.
- o Acquisition — Although regulatory tools may result in protecting portions of the flood fringe area from development, in locations where public access is desired, one or more of the four jurisdictions would need to acquire an interest in the land. Beyond any land interest which can be acquired through park dedication requirements, the cities and the county should attempt to obtain land or easements through purchase or donation.

In both instances, there can be substantial tax benefits to the landowner. Donations of land or easements (trail or conservation) to government bodies are treated as charitable donations for income tax purposes. Bargain sales (where the seller receives less than the appraised or market value) are treated as partial donations. Easements, whether purchased or received through donation, may also reduce the amount of property tax on the land covered by the easement.

In some cases, purchase at fair market value might be the only option in meeting the preservation/recreation objectives, and purchases may need to recognize ownership boundaries rather than just the floodplain boundaries. Terms can usually be negotiated to work to the advantage of both the seller and the buyer.

Not all acquisition needs to be carried out by the four local governments. Land trusts, such as Colorado Open Lands and Trust for Public Lands, or organizations such as the Nature Conservancy and Boulder County Nature Association, could be instrumental in implementing the plan for the Coal Creek/Rock Creek corridors. It is possible, too, that a new organization (which would qualify for 501(C)(3) status under the Internal Revenue Service regulations) could be formed for the specific purpose of working with the three governments and the landowners to achieve the desired objectives of the project.

Financing

Since the Coal Creek/Rock Creek project involves lands within the cities of Lafayette, Louisville, and Broomfield, as well as unincorporated Boulder County, it is presumed that all four jurisdictions would be directly involved in any program to finance the project. For purposes of this report, a variety of options for financing will be discussed. Some are familiar and some may require additional research to determine their suitability for this specific project.

- o Property Tax — All four jurisdictions currently levy property taxes, and the County uses this as a partial means of financing its open space program. One mill levied county-wide would generate slightly more than \$1,000,000.
- o Sales Tax — Only the three cities have local sales taxes, and any county sales tax would require a vote of the electorate county-wide. A one-half percent sales tax levied county-wide would raise 6.5 to 7 million dollars.
- o Plant Investment Fees (PIF's) — Commonly used in the cities, but less frequently in the county, these are special fees attached to building permits issued in a particular development area and are for the purpose of financing public improvements. Since the improvements must usually be tied to demand generated by the development paying the fee, this approach might not be suitable for financing the overall project; however, it could be used for such items as floodway and drainage improvements, creek crossings, and construction of pedestrian/bicycle/equestrian paths. The municipalities collect park fees and might encounter fewer obstacles to this funding tool than would the county.
- o Cash-In-Lieu Payments — The cities and the county accept cash-in-lieu payments as an alternative to parkland dedication which is required as part of the subdivision process. Like PIF's, these funds are restricted to satisfying needs of the subdivision/development providing the payment. Trail linkages, linear parks, etc., in close proximity (not necessarily adjacent) to the development are well suited to the expenditure of such funds.
- o Bond Issue — This would require a vote of the electorate to set aside certain designated tax proceeds to retire bonds which could be sold to finance the public improvements.
- o Special Improvement District — Property owners within a designated geographic area, including the project area, could, by election, become a special district. A property tax could then be levied just within that area in order to carry out the special purpose of the district, i.e., floodplain preservation with recreation improvements.

- o Urban Drainage and Flood Control District Funds — This is, in fact, a special district which has as its purpose making improvements to drainageways and providing flood protection. The district levies property taxes and makes project grants to local governments, usually on the basis of a 50-50 match. For the last several years, Boulder County has received a disproportionately small share of the project funds. Until that shortfall is made up, the County will qualify for a 75% match.

Some of the improvements proposed in this plan, including the acquisition of land for preservation of the floodplain, qualify for district funds. District funds could also be used to construct maintenance access routes, which could serve a dual purpose and also be used as recreational trails.

- o Lottery Funds — Although this is an indefinite source of funds, it is specifically designated for parks, recreation, conservation, and open space purposes and could be used for this project.
- o Land and Water Conservation Funds — A continually dwindling source of funds from the federal government for land and water recreation projects, 50% matching grants are made available to local governments after approval by the Colorado Division of Parks and Outdoor Recreation. In recent years, Colorado has received approximately \$1,000,000 and funded 10 to 15 local projects each year.
- o State Trail Funds — Approximately \$500,000 per year has been set aside for grants to local government trail projects. The trail must be on the state trails plan (and this is), and trails providing recreation and transportation links between cities are especially good candidates for matching funds.
- o Abandoned Mine Land Reclamation Program — Although these funds have been used to reclaim mined lands and to cover shafts or other mine openings, the criteria for expenditure would not seem to preclude the acquisition of lands subject to high subsidence risk from underground coal mines. The extent to which this might have application in the project area would require further study. The state currently receives approximately \$2.2 million per year for this program.

- o Foundation Grants — These are several foundations based in Denver which have provided partial funding for similar projects.
- o Corporate Gifts — Because projects of this nature carry considerable potential as evidence of corporate–community relations, corporate resources within or near the project area should be further explored.
- o Private Donations and In-Kind Contributions — Citizen groups and community businesses are often willing to provide labor, equipment, and materials. The biggest problem, coordination, can be overcome by reducing portions of the project to small tasks suited to the resources available. A catalog showing opportunities for private donations and in-kind contributions is often a successful means of appealing to the individual giver.

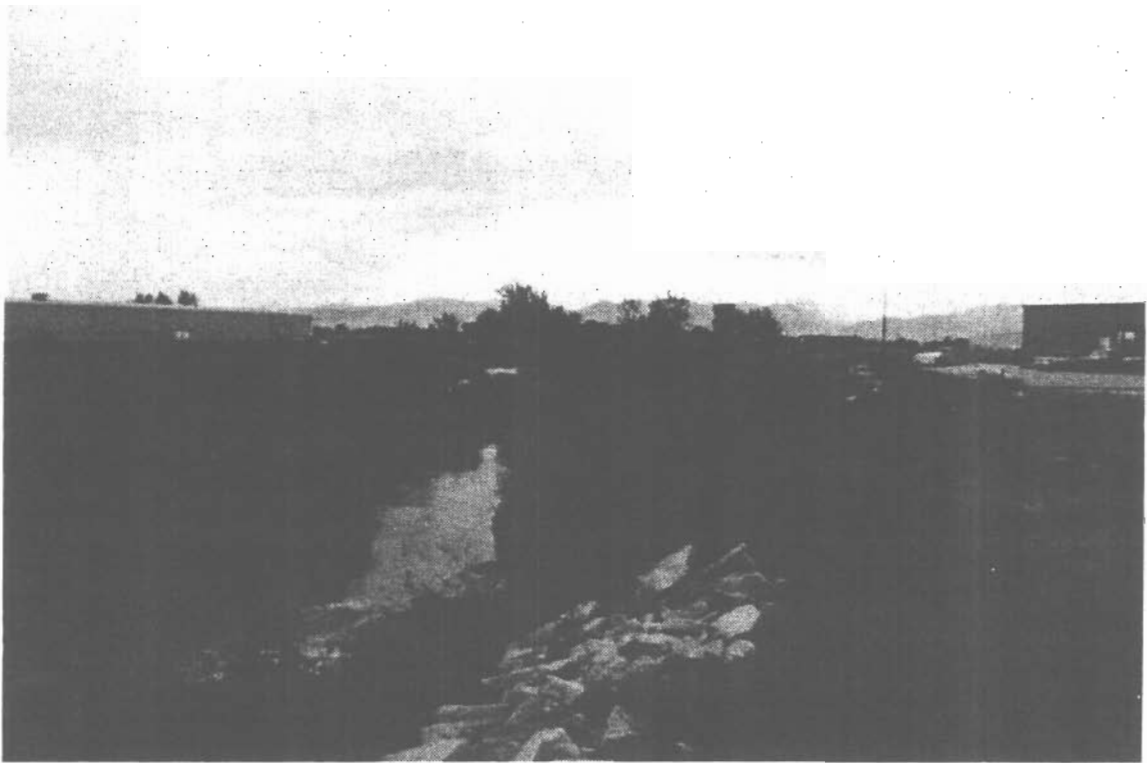
The Coal Creek/Rock Creek project could involve a variety of financing approaches and should not, at this time, hinge on a single funding mechanism. Public financing requires that consideration be given to legal and political factors, as well as to who benefits and who pays. As a specific plan for floodplain preservation evolves from public view, the most suitable means of implementation may also become more evident.

D. Development Guidelines

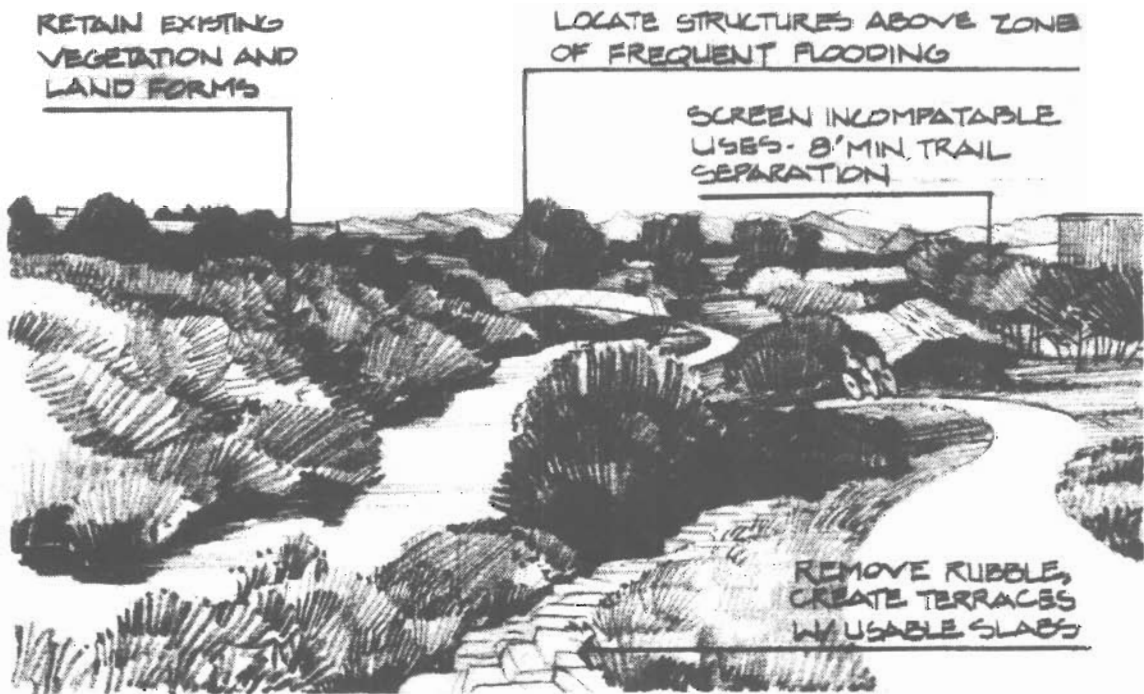
Enhancement/Rehabilitation

There are two locations within the study area where industrial uses have impinged on the floodplain and where enhancement/rehabilitation is proposed. These are on Coal Creek at 120th Street, and on Rock Creek between Highway 287 and Dillon Road. The areas are indicated on the Proposed Plan Map.

Figure 2 - Enhancement/Rehabilitation Guidelines - shows the proposed enhancement area on Coal Creek in its existing condition, with the boundary fences of industrial uses close to both creek banks and construction debris on the banks. It also shows some suggestions for the enhancement/rehabilitation of the area. These consist primarily of: retaining existing landforms and vegetation wherever



Existing Conditions (Coal Creek at 120th Street)



After Rehabilitation

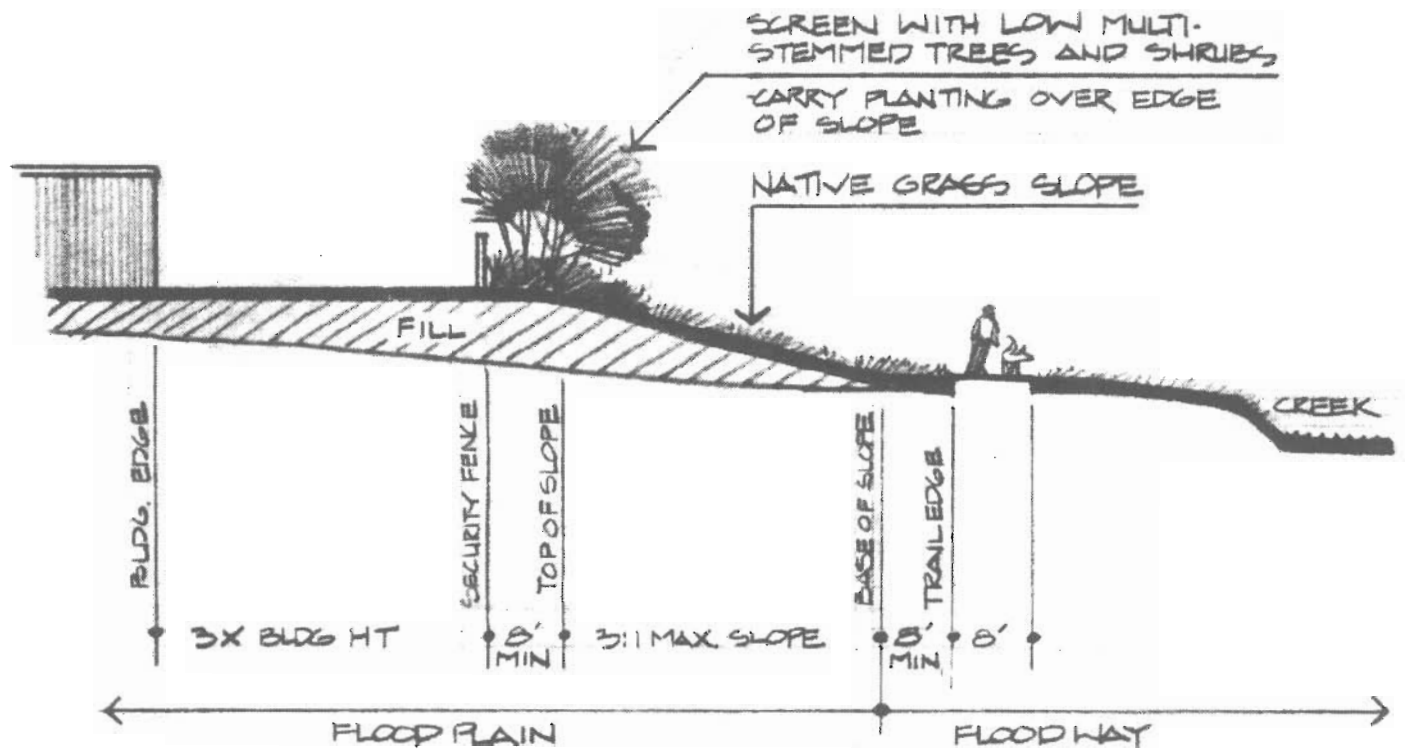
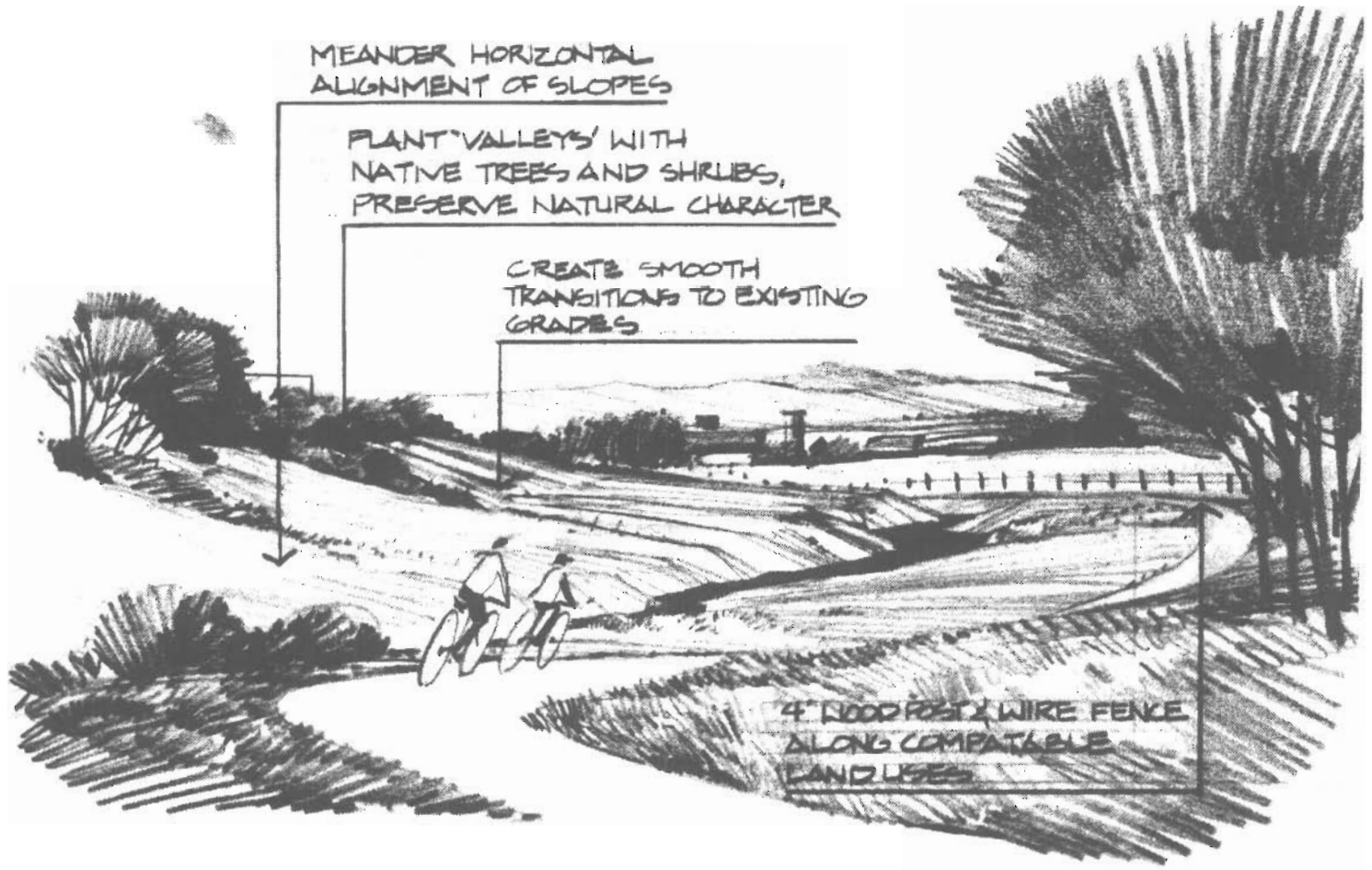
possible; adding dense plantings of low maintenance, small trees and shrubs to screen visually intrusive land uses, with the trail kept as far from these uses as feasible; removing rubble from stream banks and steep floodway slopes; and creating terraces with riprap where necessary to resist erosion and flood scour.

Development Bordering the Open Space System

Criteria for the design of the edge of the open space system, whether that edge is an area of fill within the floodplain that is to be developed or the natural border of the floodplain, are illustrated in the Figure 3 - Development Guidelines.

The design criteria include:

- o Keep buildings as far back as feasible from the edge of the open space corridor.
- o Relate building setback to building height to minimize visual intrusion on the open space corridor; a minimum setback of three times the building height is suggested.
- o Screen developed areas with dense plantings of low maintenance, multi-stemmed trees and shrubs, restricting such plantings to areas above the floodline so as not to restrict flood flow.
- o Retain as much of the natural vegetation as possible in riparian areas and other areas where natural vegetation remains.
- o Restrict plantings within the floodway primarily to grass and single-stemmed trees.
- o Where fill is added to allow development of the floodplain, the slopes to the floodway should be no steeper than 4 horizontal to 1 vertical. Such slopes should be meandered and planted so as to have a natural appearance.



Development Guidelines

Floodplain Developed on Fill. Floodway Preserved as Open Space

Structural Improvements to Flood Channel

As described earlier, some portions of the floodplain are proposed for development. Development within these areas may require structural improvements, such as those illustrated in Figure 1. In those areas, structural improvements should be designed in a manner that maintains a natural appearance, using a design that is consistent with the open space/recreational uses that are proposed in this plan.

APPENDIX: COMMENTS ON PHASE A REPORT



Parks and Open Space Department

13th & Spruce Streets • Courthouse Annex • Boulder, Colorado 80302 • (303) 441-3950

TO: Land Use Staff, Planning Commission
FROM: Parks and Open Space Advisory Committee
RE: Coal Creek/Rock Creek Planning Study
DATE: January 22, 1986

At their regular meeting on January 16, the Parks and Open Space Advisory Committee reviewed the Coal Creek/Rock Creek Planning Study scenarios and made the following recommendations.

1. POSAC recommends the approval of scenario #1 on the Coal Creek/Rock Creek floodway since it most closely aligns with the Boulder County Comprehensive Plan Goals and Policies for open space and trail corridors.
2. In the event that scenario #1 is not the plan which is approved, POSAC believes that the final plan should, at a minimum, preserve what is recommended in scenario #4 with the following qualifications: a. the trail corridors should follow State trail specifications; b. that the trees along the stream corridor should be preserved; c. that development should be set back far enough to insure stream quality; d. that where development is absolutely necessary, the artificial channelization of the stream should be kept at a minimum and that the natural stream bed and bank should be preserved; e. that any structural modifications should be as natural as possible.



Land Use Department

2040 14th Street • 14th & Spruce Streets • Administrative Services Building, 2nd Floor • Boulder, Colorado 80302 • (303) 441-3930

MEMORANDUM

TO: LONG RANGE PLANNING COMMISSION

FROM: LAND USE, PUBLIC WORKS AND PARKS AND OPEN SPACE STAFFS *JH*

DATE: JULY 30, 1986

RE: COAL CREEK/ROCK CREEK PLANNING STUDY

PURPOSE

The purpose of this meeting is to review and discuss the Coal Creek/Rock Creek Planning Study and forward a recommendation to the Board of County Commissioners.

BACKGROUND

At the January Long Range Planning Commission meeting the Commission endorsed Scenario I but did not recommend taking the study to the Board of County Commissioners until the Planning Commission had reviewed responses from all of the Cities involved in the study. We now have responses from all of the cities and they are included in your packet.

The Coal Creek/Rock Creek Planning Study was initiated by Boulder County with the support of Louisville, Lafayette and Broomfield in response to the growing concern over the future preservation of the Rock Creek and Coal Creek floodplain corridors. The purpose of the study funded by Urban Drainage and Flood Control and the Boulder County Public Works Department is to evaluate alternatives for the management of lands within the floodplains and select an alternative that provides a basis for guiding future land uses within the floodplains. The study is divided into two reports; Phase A (this report) which develops three scenarios that provide a broad range of alternative land uses within the floodplains. The consultant also developed and recommended a fourth scenario which was felt to be a compromise between initial comments from Boulder County and the City of Lafayette. Phase B Report will specifically develop a more specific plan for implementation and where appropriate, public use of the Coal Creek/Rock Creek Corridors. In developing the scenarios, the consultant used environmental and land use information with cost considerations (which included the cost of a trail along both creeks in all scenarios).

DISCUSSION

Coal Creek and Rock Creek are located in southeast Boulder County with portions in Jefferson and Weld Counties. This study focused on the portions of Coal Creek and Rock Creek that lie between U.S. 36 and the Boulder

County line near Baseline Road. The study area includes approximately 18 miles of the two drainage areas and 1530 acres. As previously stated, the consultant developed three alternative scenarios and a scenario recommended by the consultant. They are as follows:

Scenario I: Maximum Preservation

The first scenario is titled "Maximum Preservation" because 81% of the floodplain area is targeted for preservation as Open Space. The remaining 19% is either existing development in the floodplain or was determined to have no special designation and will be managed in accordance with applicable floodplain regulations. The following criteria determined the land use pattern for Scenario I:

All sensitive resource areas and other appropriate areas are designated for protection by acquisition or other land protection techniques (e.g., conservation easements).

No development within the floodway.

Remaining areas in the floodplain (are to be) managed in accordance with applicable floodplain regulations.

No additional areas within the floodplains are designated for urban development. However, these areas could be developed in accordance with applicable floodplain regulations.

A trail corridor is included in the vicinity of each drainage; this corridor is enhanced by several trail connections to the municipalities. The trail corridor would also provide access for maintenance of potential flood control improvements.

The approximate cost of Scenario I: \$6,084,000

Scenario II: Balanced Urban Development/Preservation

Scenario II seeks more of a balanced approach between urban development and preservation resulting in 67% of the floodplain area preserved as Open Space. Scenario II allows for 185 acres of designation for urban development. The following criteria determined the land use pattern for Scenario II:

Development of suitable area for urban growth.

No development within the floodway.

Selected sensitive resources and other appropriate areas protected through acquisition or other methods.

Remaining areas of the floodplain managed in accordance with applicable regulations.

A trail corridor is included in the vicinity of each drainage; this corridor is enhanced by several trail connections to the municipalities. The trail corridor would also provide access for maintenance of potential flood control improvements.

The approximate cost of Scenario II: \$3,646,500

Scenario III: Urban Development/Minimum Preservation

This scenario emphasizes urban development over preservation. Scenario III targets no lands for acquisition or other protective methods while designating 370 acres for urban development. Scenario III has 50% Open Space as part of the total floodplain area, which is either existing Open Space or Floodway. The following criteria determined the land use pattern for Scenario III:

Development of suitable area for urban growth.

No additional land acquisition for Open Space.

The floodplain managed in accordance with applicable floodplain regulations.

No development within the floodway.

A trail corridor is included in the vicinity of each drainage; this corridor is enhanced by trail connections at several points to the municipalities nearby. The trail corridor would also provide access for maintenance of potential flood control improvements.

The approximate cost of Scenario III: \$988,000

Consultant's Recommended Scenario

The Recommended Scenario developed by the consultant is a combination of Scenario I and II. This scenario responds to the desires and future land use plans for Boulder County, the City of Lafayette and the City of Broomfield. The Recommended Scenario preserves 75% of the floodplain as Open Space while allowing 218 acres for urban development. The implementation of the Consultant's Recommended Scenario would cost approximately \$3,367,800.

IMPLEMENTATION AND FINANCING

In a memo from Carolyn Holmberg, Director of Parks and Open Space and included in the report on pages 4-15 thru 4-20 is implementation and financing information for the consultant's report. This information is provided because local governments already have available tools which determine where and how development occurs.

SUMMARY

Boulder County staff endorses Scenario I and a non-structural approach to floodplain preservation throughout the study area. Lafayette supports a hybrid of Scenarios 1-3. While Lafayette supports preservation of flood-prone areas, the economic goals of the City may necessitate development of flood storage areas (floodplain). The City of Broomfield supports a combination of Scenarios II and III for the Varra property which is the only property in the City of Broomfield that is part of this study. The City of Louisville recommends the Consultant's Recommended Scenario with two exceptions. The portion of Coal Creek from U.S. 36 east 2500 feet should be labeled as "Areas less suitable for development, Managed in accordance with Applicable Floodplain Regulations". Secondly, where Coal

Creek goes under 96th Street should be shown as "Areas Designated for Development". Even though all of the cities (Lafayette, Louisville and Broomfield) plan to develop some parts of the floodplains, all of the cities have agreed to leave the floodway as a natural corridor, as much as possible.

RECOMMENDATION

Boulder County recommends Scenario I be adopted for the unincorporated area of Boulder County outside of designated Community Service Areas, except the Varra property annexed to Broomfield, but not included in the Broomfield Community Service Area, and incorporate comments from Broomfield, Lafayette and Louisville into one scenario while preserving the floodway the entire length of both Rock Creek and Coal Creek as natural stream corridors.

JH/nj
hv

Attachments

- A - Correspondence Received
- B - Rock Creek/Coal Creek Study Document

TO: PLANNING COMMISSION

FROM: RICHARD S. WANUSH, DIRECTOR OF COMMUNITY DEVELOPMENT

SUBJECT: COAL CREEK & ROCK CREEK PLANNING STUDY

Attached is the Phase A Report of the Coal Creek and Rock Creek Planning Study. Its purpose is to evaluate alternatives for the utilization and management of the lands within the floodplains of both creeks.

The study is being jointly undertaken by the Urban Drainage and Flood Control District, Boulder County and the Cities of Lafayette, Louisville and Broomfield with EDAW, Inc. as the consulting firm. The Phase A Report is currently being reviewed by all of the parties. After the Cities have had an opportunity to respond, the Boulder County Commissioners will get a final presentation.

After the consideration of these Phase A recommendations, the consultant will be given a selected alternate for further study and preliminary design during Phase B. No final plan will be adopted until all parties have been given the opportunity to review and comment on all recommendations.

Scenario 1 (Maximum Preservation), Scenario 2 (Balanced Urban Development/Preservation) and the Recommended Scenario are all generally consistent with our Comprehensive Plan. Staff recommends approval of the Recommended Scenario with two exceptions:

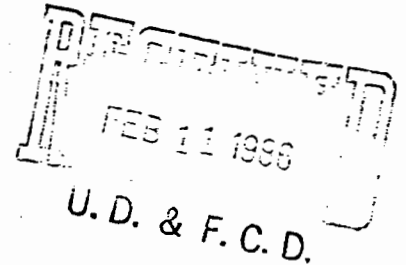
1. The portion where Coal Creek exits from the culvert under U.S. 36 for a distance of approximately 2500 feet should be labeled "Areas Less Suitable for Development, Managed in Accordance with Applicable Flood Plain Regulations." This recommendation is made since this portion of the stream contains virtually no unique qualities.

2. The portion of the stream just before it crosses under the railroad near Highway 42 should be labeled "Areas Designated for Development." The plans does this for the already developed areas near the downtown but not for the land in the County just south of the downtown. This is an open field and could provide for some limited urban expansion to the south. The possible eastward extension of Bella Vista would also cross this property. Any structural modification to reduce the floodplain in the already developed area should remove the floodplain in this area.

Planning & Building

February 5, 1986

Mr. Bill DeGrote, P. E.
Chief Flood Plain Management
Urban Drainage and Flood
Control District
Suite 156B
2480 West 26th Avenue
Denver, CO 80211



Dear Bill:

This letter is in response to the Phase A report Coal Creek and Rock Creek planning study. I have general comments on the reports with the exception of consideration of the recommendation policies and statements within the document listed Section 4.

Page 4-12, Recommendation Scenario, should recognize that the scenario is a hybrid of all scenarios 1-3. The last sentence within the third paragraph recognizes the City's position in general but should also state very clearly that much of the flood prone areas within the study area are within industrial parks. While the City supports preservation of flood-prone areas within these sections, the economic goals of the community need to be recognized. Where possible, floodplain areas will be preserved, but when necessary for development the flood storage areas may be utilized for commercial/industrial development.

Page 4-13, second paragraph, the section regarding Lafayette should recognize floodway not floodplain. Within this paragraph, it should also be noted that some portions of the Rock Creek flood plain are within the proposed open space buffer between Broomfield and Lafayette, but not the total area.

Map #10, Recommended Scenario - The boundaries east of 287 north of the City limits along rock Creek, should be adjusted to only the floodway areas. The map should be designated as shown on scenario 3 within this area indicating areas designated for preservation and areas unsuitable for development and areas less suitable for development.

The following are general comments regarding the report:

Page 3-1, fourth paragraph - The last sentence should be modified to read "possibility that a subsidence hazard event could occur."

Map #4, proposed land use - I still feel that this map should show the proposed W470 alignment, however, the statement on page 3-4 does help in the recognition factor of the W470 corridor.

Map #6, proposed open space designation within Adams County may be inaccurate.

Should you have any questions regarding this, please feel free to contact me at your convenience.

Sincerely,



Brent H. Bean
Planning Director

BHB/clc
(c-degro)



City of Broomfield

NUMBER SIX GARDEN OFFICE CENTER • BROOMFIELD, COLORADO 80020 • PHONE (303) 469-3301

April 14, 1986

U.D. & F.C.D.

Mr. John Hinkelman
Boulder County Land Use Department
P.O. Box 471
Boulder, Colorado 80306

RE: Review of "Coal Creek and Rock Creek
Planning Study"

Dear Mr. Hinkelman:

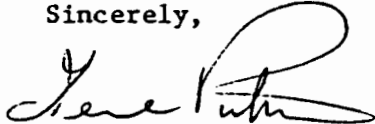
We appreciate the opportunity to review EDAW's report on the Coal Creek-Rock Creek Floodplain Management Project. Floodplain management is an important aspect of the City of Broomfield's Master Plan. Following are our comments on the above-referenced study:

1. The City of Broomfield's current city boundaries should be shown on all maps.
2. Map 4 - Proposed Land Use. Several areas shown on the map call out that the area is commercial/industrial. As of this date, the Varra land is zoned PUD and should be shown as such.
3. Pages 4-17 Financing HB 1405. This Special Mill Levy is for roads and bridges, not capital projects in general. The last year the special mill levy will be allowed under CRS 29-1-301 is 1986.
4. City staff feels the best scenario would be a combination of scenarios 2 and 3. This combined scenario of balanced preservation and urban development provides a realistic approach to floodplain management and open space. This combined scenario would also provide an open space area of about 60 percent of the total area within the floodplain.
5. The Recommended Study Scenario. The combination of scenarios 1 and 2 as a recommended scenario is proper for areas with little existing or proposed developments, such as the Rock Creek Ranch Open Space. In those areas where development can occur, a combination of scenarios 2 and 3 is more likely.
6. This Planning Study is a good preliminary planning study. It should be followed up with a more comprehensive drainage study similar to the "Outfall Planning Study" which was completed by the City of Broomfield. This followup study should indicate whether the floodplain right-of-way is to be under the City's or County's jurisdiction.

7. The followup study should include the area upstream of U.S. 36. The present study is rather short-sighted in that it did not take into consideration the drainage area of Coal Creek and Rock Creek, upstream of U.S. 36. This area impacts what occurs in the areas studied.

We look forward to discussing this study and the much needed expanded future drainage study. This study will help us direct our attention with regard to land use and how to protect the much needed floodplain area and its open space use.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gene Putman".

Gene Putman, P.E.
City Engineer