Prairieways Action Plan

Guidelines for Parks, Trails and Open Space

In fifty years we will not be remembered for the resources we developed; we will be thanked for those we maintained for future generations."

—Michael Dombeck

Acknowledgements

Project Owner

City of Commerce City

- E.E. “Casey” Hayes, Mayor
- Members of City Council

Michael J. Benallo Debbie C. Mitchell Sean Ford Rene Bollock
Rocky W. Teter Roland E. Cole James Allen

Commerce City Department of Parks, Recreation and Golf

Parks and Recreation Advisory Committee

- Roland Cole, Chair
- Jim Allen
- Rene Bullock
- Vi Vigil

Parks and Recreation Staff

- Richard Byler, Director of Parks and Recreation
- Rob Thames, Superintendent of Parks
- Tom Acre, Parks Planner
- Tony Jaramillo, Maintenance Supervisor
- Lori Rodcay, Administrative Assistant

Advisory and Partnering Staff

City Manager’s Office

- Timothy J. Gagan, City Manager
- Trish Layton, Economic Development Manager

Commerce City Community Development

- Steve House, Director
- Neil Goodenough, Planning Manager
- Brett Limbaugh, Planner

Public Works

- Gregg Clements, Director
- Daren Sterling, City Engineer
- Edward Stafford, Development Engineer

Project Direction

- Rob Thames, Project Principal
- Tom Acre, Project Manager

Consultant Team

- Robert Searns, Urban Edges, Inc. Principal Author
- William Neumann, DHM Design Corporation Principal Landscape Architect
- Mark Wilcox, DHM Design Corporation Landscape Architect
- Bruce Soehngen, DHM Design Corporation Data/GIS Specialist
- Daniel Giroux, Tuttle Applegate, Project Engineer
- Todd Yee, Tuttle Applegate, Data Specialist
- Tiffany Snyder, Tuttle Applegate, Data Specialist
- Steve Dougherty, ERO, Inc. Wildlife Specialist
- Tracy Esslinger, Urban Edges, Inc. Public Participation
- Diana Maglischo, Urban Edges, Inc. Project Support Services
- Quint Redmond, TSR, Inc. Data/GIS Advisor

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Denver International Airport

On May 16, 1989, construction of Denver International Airport was voter- approved to be located five miles from Commerce City. Shortly thereafter, a series of intergovernmental agreements among Commerce City, Adams County, Thornton Aurora and Brighton allocated the land surrounding the new airport and identified forty three square miles as the Commerce City annexation area.

This expanse of mostly undeveloped prairie is flanked by large, preserved open spaces—the crown jewels of the Northeast Metro Area. These include: Barr Lake State Park to the north (2,600 acres) and the Rocky Mountain Arsenal National Wildlife Refuge to the south (17,000 acres). These two land expanses provide some of the richest wildlife in the entire state including deer, coyote, fox, and numerous species of birds. Bald Eagles also roost here and hawks are frequently sighted.

The airport and the newly opened E-470 beltway have created a strong impetus for development. Indeed, Commerce City's Northeast quadrant will become the major gateway to the Denver metro area and Rocky Mountain West. As a result, Commerce City is poised to expand its residential population from the existing 16,500 people to 80,000 or more within the next twenty years.

As the number of people increase, greater demands will be placed on facilities that are already at capacity. Areas that are currently open plains, agricultural lands, prairie, wildlife habitat, water resources, and unique landscapes will potentially be lost forever as they are developed for residences, businesses and industry. Commerce City must be ahead of this development with a plan that balances community growth with the protection of important natural areas and provision of adequate outdoor recreational facilities. This implies the need for a plan based on forethought and cooperation; a plan that will provide a legacy of new parks, open spaces, trails and greenways that will meet increasing recreational demands while preserving the character of the region.

Contents

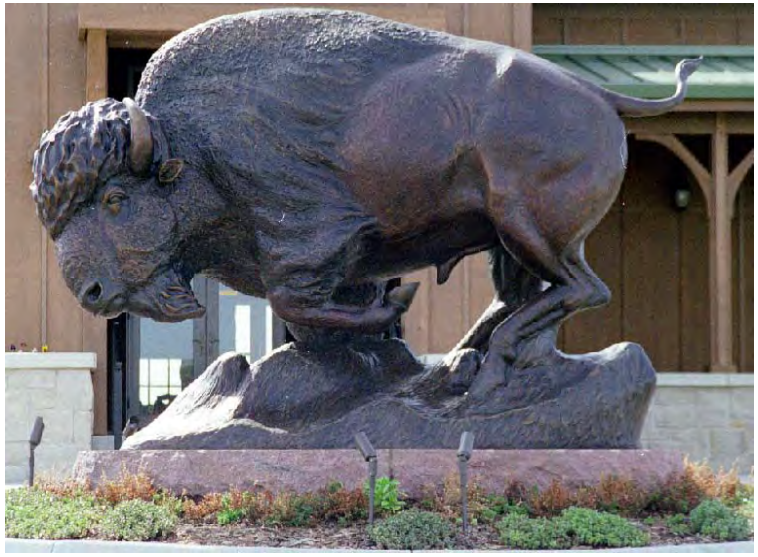
120th Avenue near Buckley Road

Chapter

1

Commerce City Prairieways Action Plan

Purpose and Use of This Document



Buffalo Run Golf Course

Summary of Key Points

- *The mission is to enhance quality of life and protect our resources.*
- *The study area covers 43 square miles north of the Rocky Mountain Arsenal National Wildlife Refuge and west of Denver International Airport.*
- *The plan aims to meet established local, regional and national park standards.*
- *Guiding Principles set a level of quality for parks, trails and open space.*
- *The plan fits within a larger regional and metro-wide trail and open space system.*

Mission Statement

Maintain and enhance the quality of life of current and future Commerce City residents. Protect and enhance environmental and cultural resources through a quality park, trail and open space system that is affordable to create and maintain. Accomplish this vision through a well thought out plan, guiding criteria, and cooperative effort between public and private sectors.

The Study Area

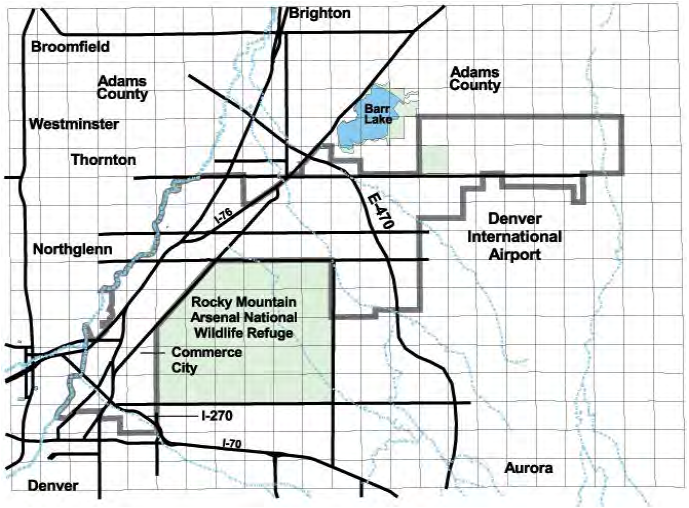
The planning area, also known as Commerce City's Northern Range includes roughly 43 square miles bounded by The South Platte River, Barr Lake State Park, Denver International Airport, Pena Boulevard, East 56th Avenue, Quebec Street and 88th Avenue. The study area also includes The Rocky Mountain Arsenal National Wildlife Refuge. Simply put, these are the largely undeveloped portions of Commerce City about to receive new residential, commercial and industrial land uses.

Study Area in Regional Setting

This plan was built upon several existing plans including:

- *Commerce City Parks & Recreation Master Plan*
- *The New Lands Comprehensive Plan*
- *Land Use Guidelines and Design Standards For New Residential and Neighborhood Development*
- *The Adams County Open Space Plan*
- *The Platte River Heritage Plan*
- *A Conservation Vision For Barr Lake State Park*
- *School Facility Planning for Brighton School District 27J*
- *The Win-Win Trails and Open Space Roster and Matrix*
- *The Rocky Mountain Arsenal Wildlife Refuge Plan*
- Drainage and Utility Plans for 1st , 2nd and *3rd Creeks*
- *Park and Recreation Plans From surrounding jurisdictions*

This plan updates and complements the *New Lands Comprehensive Plan's* park, trail and open space elements and is a key foundation in shaping the urban fabric. The planning process also looks at surrounding jurisdictions to plan an interconnected system of trails, open spaces and greenways in the Northeast Metro Area. Finally, it is important to note this plan is one of several similar plans that, taken together, begin to envision the future of open space and greenways throughout the metro region. Some of these include: *The Mountain Backdrop Study; The Platte River Heritage Plan, The Jefferson County Open Space Plan; The Chatfield Basin Conservation Network Plan; The Douglas County High Plateau Conservation Area Study; and the DRCOG Open Space Plan.* Commerce City is proud to be making a major contribution to this metro-wide effort with this plan.



Study Area Map

Use of This Document

This document is intended to be a vision for the future and a tool for daily use in the review of all private and public projects proposed for development in the study area. The *Atlas* and *Planning Standards* are specific in that they pursue a high level of quality and consistency. The plan, however, also intends to promote creativity and flexibility on the part of land developers (both private and public) provided the level of quality, interconnectedness and consistency presented in the *Planning Standards* and *Atlas* are met.

This *action plan* consists of four basic components:

- Guiding Principles and Planning/Management Standards for parks, trails and open space;
- An *Atlas* indexed to each of 43 land sections in the study area. The atlas shows topography, physical features, property boundaries, and the recommended location of proposed parks, trails and open spaces;
- Cost Estimates, Phasing and Implementation strategies;
- Design and Maintenance Manuals to provide supplemental and more specific details and guidelines for park trail and open space amenities.

Projected Park, Trail & Open Space Needs

As a general guideline, Table 1.1 below presents key projected facility needs. These are based on minimum standards presented in the *Commerce City Parks and Recreation Mater Plan* (EDAW, 1994), a survey of park standards in surrounding communities and by the National Recreation and Park Association's *Recreation, Park and Open Space Standards and Guidelines*.

Table 1.1: Projected Park, Trail and Open Space Needs

Sources: National Park and Recreation Association, planning in surrounding communities, adopted *Commerce City Parks and Recreation Master Plan.*

Type	Acres or Miles per 1000 residents (Minimum)	Minimum Net Total Need at Pop. 80,000 (10 sections build-out)
▪ Overall Parks	6.0	480
▪ Community Parks	3.5	280
▪ Neighborhood Parks	2.5	200
▪ Trails	1/3 mile	27 miles
▪ Open Space	Varies	Protect flood plains, wildlife, views

Guiding Principles for Parks, Trails & Open Space

The following guiding principles present an overall picture of what parks, trails and open space in Commerce City shall be. More detailed standards are presented in Chapter 2 and in the *Design Manual*, an appendix to this document.

PARKS

1. Park acreage shall meet the needs of future populations and meet national standards per the adopted *Commerce City Parks and Recreation Master Plan.*

2. Park and recreational facilities including neighborhood, and community parks shall serve present and projected types of recreational activities regardless of income, age, physical ability, or location in the city.

3. Parks shall be carefully integrated with the trails and open space network and be readily accessible via trails and walkways from homes and places of employment.

4. Park and recreational facilities shall integrate with, and enhance the quality of neighborhoods.

5. Park and recreational facilities shall not adversely impact residences, places of business or the natural environment.

6. Park sites shall be located to take advantage of existing topography, views, vehicular access, interpretive opportunities and school facilities.

7. Park and recreational facilities shall be safe and affordable to build and maintain.

Community Park, Colorado Springs

TRAILS

1. There shall be an integrated network of multi-use trails readily accessible from neighborhoods, schools, businesses, activity centers, and transportation systems regardless of income, age, physical ability, or location in the city.

2. All trails shall meet state-of-the-art design standards appropriate to the types of trail uses with attractive fixtures and furnishings and an integrated information/interpretive system.

3. Trails shall run through pleasant settings offering a variety of experiences as well as connecting to places of interest such as historic sites, parks, waterways, state parks and wildlife areas.

4. No home shall be more than one mile from a multi-use trail with safe on-street bicycle and sidewalk connections to trails.

5. The trail network system shall tie into core city and regional trail networks.

6. There shall be an on-street bikeway and sidewalk system that ties to the trail network.

7. Trails and trail facilities shall not adversely impact or be adversely impacted by residences, places of business, roads or the natural environment.

8. Where appropriate, trails may serve multiple objectives such as drainageway maintenance roads and non-motorized transportation.

9. The trail system shall be properly designed and adequate to avoid user conflicts and overcrowding;

10. Trails shall be safe and affordable to build and maintain.

Mary Carter Greenway, Littleton

OPEN SPACE

1. Open spaces shall be naturalistic, undeveloped and set aside in addition to active park and recreation facilities. Open space may be either privately or publicly owned, provided open space guiding principles are met.

2. An inter-connected system of open spaces shall be conserved including *The South Platte River, 1st, 2nd and 3rd Creeks,* canals, *Barr Lake State Park, The Rocky Mountain Arsenal National Wildlife Refuge* and special prairie lands.

3. Open Space corridors shall be continuous and of adequate width to accommodate the movement of wildlife and create a sense of separation of adjacent urban uses.

4. Special open space areas and corridors such as canals, creeks, ponds and wetlands shall have a vegetated buffer strip (within the designated open space) on each side of sufficient width to protect visual, water quality and wildlife integrity.

5. Mountain and prairie vistas shall be preserved from roadways, trails, parks and other vantage points.

6. Adequate open space shall be set aside along drainageways to naturally contain the100-year flood.

7. Open space shall be used as a way to store and convey stormwater as an alternative to channelization and hard structures.

8. Open spaces shall not create nuisances, adversely impact or be adversely impacted by residences, places of business, roads, parks and other land uses.

9. Open spaces shall be safe and affordable to set aside and maintain.

View of 2nd Creek, Commerce City

Park, Trail, and Open Space Site Selection Criteria

In developing this plan, specific criteria were used in selecting sites for parks, routes for trails and recommending open space areas for preservation. The criteria were derived from the *Guiding Principles* presented above, from previous plans and practices in the planning and design professions.

PARK SELECTION CRITERIA

- Attractive sites with attractive views.
- Sites with distinguishing topographic, historic, ecological or cultural features not adversely impacting wildlife areas.
- Good existing (or future) road, sidewalk and trail access.
- Level, well-drained sites suitable for park development.
- Parcel size and shape suitable for park uses and recreational facility development.
- Neighborhood park sites located on an approximate one-mile spacing grid.
- Sites not prone to erosion or frequent flooding (above the 10-year storm event).
- Soils suitable for park development.
- Potential for park site to enhance and complement future residential or commercial development.
- Compatibility of park use with existing or future adjacent land uses.
- Ability to share sites with schools.
- Ability to link parks, trails, open spaces and neighborhoods with interconnected networks.

Mountain vista near 2nd Creek, Commerce City

TRAIL ROUTE SELECTION CRITERIA

- Attractive corridors with attractive views.
- Corridors with distinguishing topographic, historic, ecological or cultural features.
- Ability to link neighborhoods, civic areas, schools, shopping and other important destinations.
- Ability to link, parks, trails and open spaces with interconnected networks.
- Grade-separated corridors with minimal conflicts with automobile traffic such as streets or driveway cuts.
- Available rights-of-way such as canals, major road corridors, and drainageways.
- Opportunities for multi-objective benefits such as drainageway, canal and utility maintenance roads serving as trails.
- Opportunities to cross barriers such as using existing or proposed highway underpasses.

- Avoids adverse impacts on sensitive wildlife areas, agricultural activities and private property.
- Avoids steep grades, crossing hazardous barriers such as existing or proposed highways or arterials, noisy or unpleasant settings.
- Avoids close proximity to sensitive stream bank areas.

OPEN SPACE SELECTION CRITERIA

Protects floodplains, floodways and other areas unsuitable for development.

- Attractive sites with attractive views.
- Highly visible sites to help preserve a sense of historic prairie/agricultural character.
- Adequate size and shape to support natural vegetation, wildlife movement and habitat.
- Preserves valued agricultural lands.
- Preserves sites with distinguishing topographic, high elevation points, historic, ecological or cultural features.
- Helps create an interconnected system linking wildlife habitat areas, parks, trails and open spaces.
- Areas that buffer sensitive places such as wildlife habitat, wetlands, and drainageways.
- Supports current open space planning such as the Barr Lake Buffer Zone, Rocky Mountain Arsenal National Wildlife Refuge and Adams County Open Space Plan.

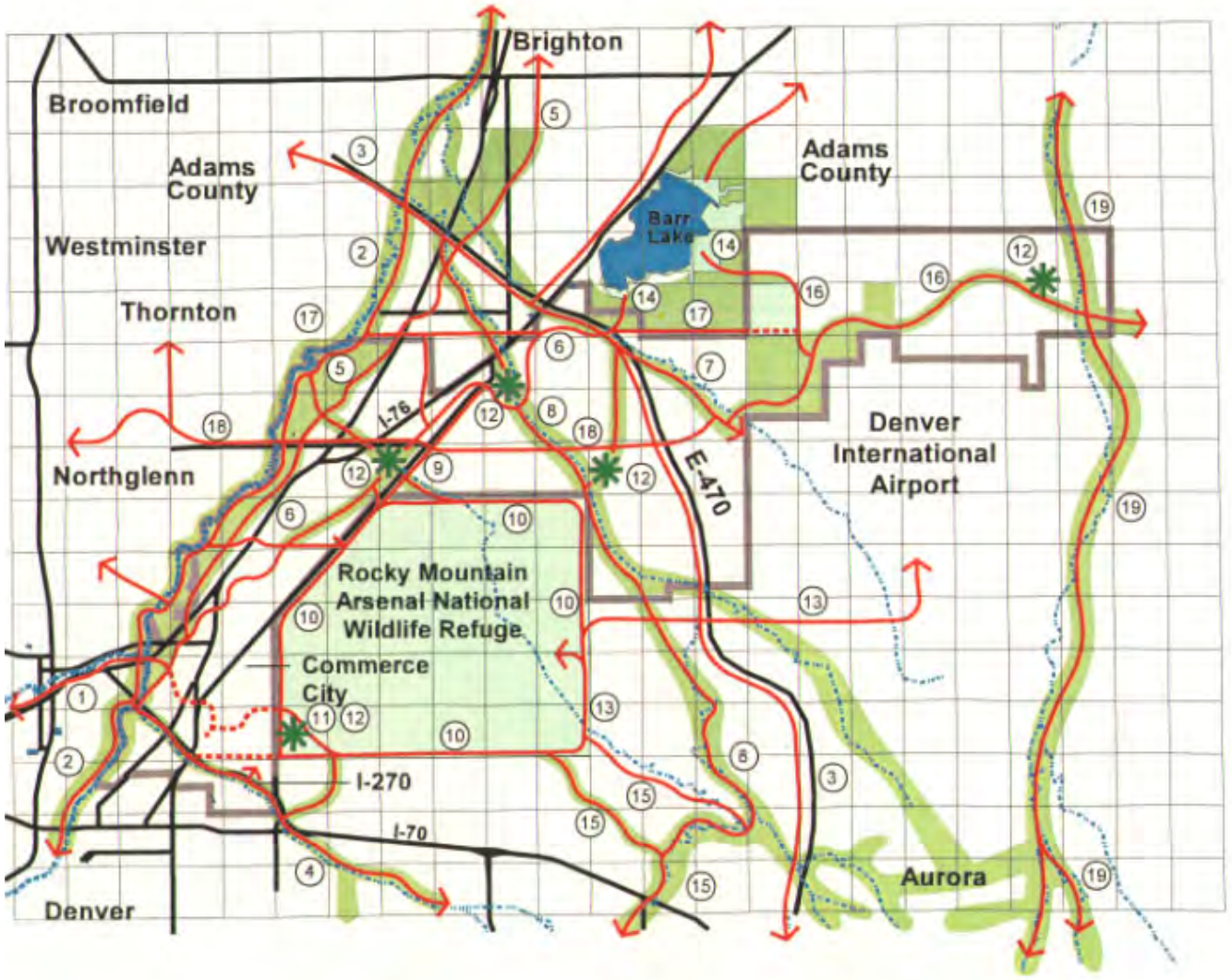
Northern Range West of Denver International Airport

The Overall Vision and The Regional Context

The *Regional Context Map* on page 8 presents the overall vision for the *Northern Range* and the areas surrounding the *Northern Range* study area. This bigger picture planning vision includes key Commerce City projects such as the *Sand Creek Greenway*. It also takes into account important plans being developed by surrounding jurisdictions such as the *South Platte River Heritage Corridor*, the *Barr Lake State Park Buffer Area*, as well as plans for the *Rocky Mountain Arsenal National Wildlife Refuge*, *Stapleton Redevelopment*, the *DIA Gateway Area*, the cities of Aurora, Thornton and Brighton. These plans were coordinated through the *North East Metro Win-Win Trails and Open Space Sub-Committee* and through on-going staff interaction among the various agencies and entities. Table 2.2 presents a summary roster of some of the leading projects throughout the regional context area.

Table 2.2: Roster of Key Regional Corridors and Projects

Project	Description	Lead Entities
Clear Creek Greenway	Trail/Greenway Plate River to Golden	Adams County
Platte River Greenway/ Heritage Corridor	Trail/Greenway Littleton to Brighton	Adams County Denver
E-470 Trail	Trail along E-470 & C-470 Beltway	Commerce City Adams County
Sand Creek Greenway	Trail/Greenway Along Sand Creek Platte to Highline Canal	Commerce City Denver Aurora
Fulton Ditch Greenway	Trail/Greenway Along Fulton Ditch	Commerce City Adams County Brighton
O'Brian Canal Greenway	Trail/Greenway Along O'Brian Canal (Links Barr Lk. S.P. & Rocky Mtn. Arsenal NWR	Commerce City FRICO
3rd Creek Greenway	Trail/Greenway Along 3rd Creek	Commerce City Brighton
2nd Creek Greenway	Trail /Greenway Along 2nd Creek.	Commerce City Denver, Aurora
1st Creek Greenway	Trail/Greenway Along 1st Creek	Commerce City
Perimeter Trail/Visitor Center	Trail around Rocky Mountain Arsenal Wildlife Refuge	Commerce City Arsenal
Prairie Park/Pavilion	Community Park and Gateway to Refuge and Trail System	Commerce City Arsenal
New Community Parks	New Community Parks at 1st Creek, 2nd Creek, Buckley Road and Box Elder Creek	Commerce City
DIA Trail	Access Trail to DIA Terminal Via Pena	Denver, Arsenal Commerce City
Barr Lake Buffer Zone	Protective Open Land Around State Park	Adams County Barr Lake State Park, Brighton
High Line Canal Greenway	Trail/Greenway Along High Line Canal From Littleton to Arsenal Wildlife Refuge	Denver Denver Water Aurora
Barr Lake Loop and Prairie Trails	Trails Linking to Barr Lake and Box Elder Creek	Commerce City
120th Avenue Trail	Cross Town Trail along 120th Avenue	Adams County Commerce City
104th Avenue Trail	Cross Town Trail Along 104th Avenue	Adams County Commerce City
Box Elder Creek Greenway	Trail/Greenway along Box Elder Creek	Adams County Commerce City



Regional Planning Map

Chapter

2 *Commerce City Prairieways Action Plan*

Planning and Management Standards

View Toward 104th Avenue, Commerce City

Summary of Key Points

- *It is important to specifically define and describe the character of the planned improvements in order to have an inter-connected system with consistent quality.*
- *A key design aspect of parks, trails and open spaces is how they interface with urban development. The character of this edge is a determinant of the overall quality of the public space.*
- *Public and private sector developers should adhere to these standards as closely as possible.*
- *Ideally, park sites are shared with an elementary or middle school.*

Creation of new parks and trails and the preservation of open space in the developing areas of Commerce City will extend over a period of years and affect more than 43 square miles of the northeast metro area landscape. It is important to specifically define and describe the character of the planned improvements in order to have an interconnected system with consistent quality. The following planning and management standards provide a review checklist and reference for all parks, trails and open spaces in Commerce City. Please also refer to the *Design* and *Maintenance* manuals that are provided as a supplement to this action plan. The manuals provide more detailed and specific design guidelines.

The Interface of Urban Development with Parks, Trails & Open Space

A key design aspect of parks, trails and open spaces is how they interface with urban development. The character of this *edge* is an important determinant of the overall quality of the public space and also affects the quality of adjacent private properties. The *edge* should provide a smooth, open, uncluttered and natural-appearing transition between developed and undeveloped spaces while protecting the privacy, peace and quiet of private yards, residents and businesses. Conflicts between adjacent properties and wildlife should also be avoided. The following guidelines should be followed on all private and public development projects in Commerce City:

- Promote the use of compatible landscaping on adjacent private properties to provide privacy and screen unattractive uses such as trash receptacles, parking areas, and service docks.
- Avoid continuous solid walls, stockade fences, chain link and other monolithic barriers between development and public spaces.
- Provide inviting access and connections between open spaces and neighborhoods, places of employment and other developed areas.
- Promote the use of consistent attractive property boundary delineators such as open split rail fencing or landscaped earthen berms with landscaping that blends open space and private uses.
- Avoid inappropriate intrusion into public spaces including dumping, storage, and private structures on public properties.
- Set back buildings, fences, sheds and other structures along stream valleys and ridgelines where slopes exceed 15%. Setback should be at least 25’ (100’ preferred) from the *break-line* of the slope. Avoid disturbance of vegetation in these areas.

Poor Interface

Attractive Park/Yard Interface

Open Space/Yard Interface

Definitions, Planning and Management Standards

The following pages present the basic definitions and standards for desired parks, trails and open space in Commerce City's Northern Range. The standards are based on commentary at community meetings, guidance by consultants, planning by Commerce City Parks and Recreation, Commerce City Community Development and Commerce City Public Works. The standards were also derived from the adopted *Commerce City Parks and Recreation Master Plan.* Interested parties in the surrounding jurisdictions were consulted and materials were used from the National Park and Recreation Association and other nationally recognized and accepted sources.

It is the intent of Commerce City that both public and private sector developers adhere to these standards as closely as possible as the Northern Range develops. It is recognized, however, that each specific project should be compatible with local site conditions, existing and projected neighborhood demographics and recreational demands contemporary at the time of project development.

PARKS

Four classes of parks are addressed:

- *community*
- *neighborhood*
- *regional*
- *Barr Lake State Park/Rocky Mountain Arsenal National Wildlife Refuge*

COMMUNITY PARKS

Definition and Purpose

Community Parks are 80-200acres and serve multiple neighborhoods with a greater variety of recreational opportunities than neighborhood parks. They serve large community events and may preserve large areas of open space. Community parks often include athletic complexes, court games, large swimming pools, walking paths, preserved natural areas and may incorporate natural features such as wetlands, ponds or creeks. A community park may be adjacent to an elementary, K-8, middle or high school site with some overlap of uses where appropriate.

Example: *Fairfax Park, Commerce City; Washington Park, Denver*

Minimum Standards (Please also see Design Manual**)**
Community parks should have an area of no less than 80 acres.

- They should be sited to serve at least 4 one-square-mile neighborhoods with a service area radius of approximately one mile, preferably adjacent to historic or natural resources.
- Community parks should have good vehicular access from adjacent arterial and/or collector streets. The park should be easily accessible by interconnecting trails, greenways and sidewalks.
- Approximately 50% of the site should be reasonably flat with suitable topography and soils to accommodate field sports such as soccer, baseball and football.
- Sites should be suitable for year-round use with suitable topography and soils for quality athletic facilities and not prone to erosion.
- Developed portions of the park (irrigated turf, playfields playgrounds, parking, hard courts, shelters) must be built above the 10-year floodplain and at least 150 feet from the bank of any creek. All park development must conform with the Floodplain Ordinance.
- There should be adequate parking (175 to 300 cars) for the specific program elements including spaces for people with disabilities and bike spaces with lock racks equal to 5% of the number of auto spaces provided;

- There should be lighting for parking and to accommodate evening uses such as tennis, baseball and football and to ensure the safety and comfort of park users. Lighting should not adversely impact adjacent homes, businesses, wildlife or thoroughfares.

- Landscaping should provide a balance of screening, shade, color, and texture that creates year round visual interest and a strong park identity.

- The park should include loop trails accessing at least 75% of the site and connect to adjacent trails, greenways, and sidewalks.

- There should be an attractive interface with adjacent development as described above. Ideally, there should be a 100'-wide landscaped park edge buffer with trees and shrubs along the perimeter of the park with a jogging trail.

Management Guidelines

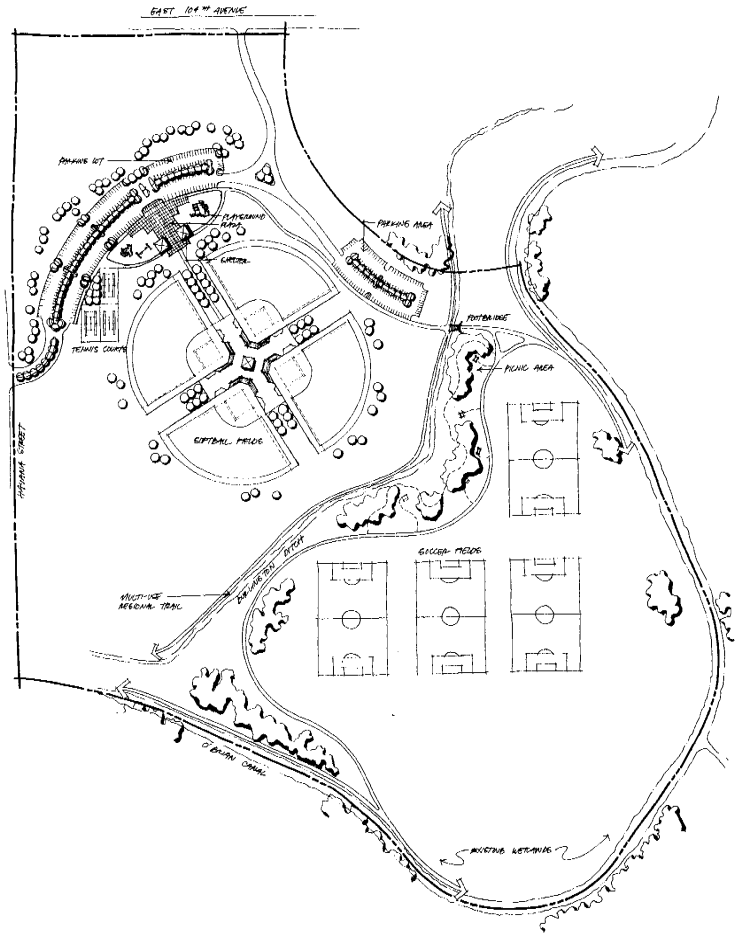
- Community parks are managed and maintained by local or regional park agencies.

- They are well maintained free of litter, debris, weeds and unkempt vegetation although managed natural vegetation is encouraged where appropriate.

- Play equipment, sports facilities, restrooms, parking lots, roadways, concession facilities and other infrastructure are kept in excellent condition.

- They are adequately patrolled and there are appropriate rules and regulations to ensure visitor safety, protection of park facilities and privacy of adjacent properties.

- Detailed records are kept of maintenance, safety and security conditions and remedies.



Typical Community Park Concept

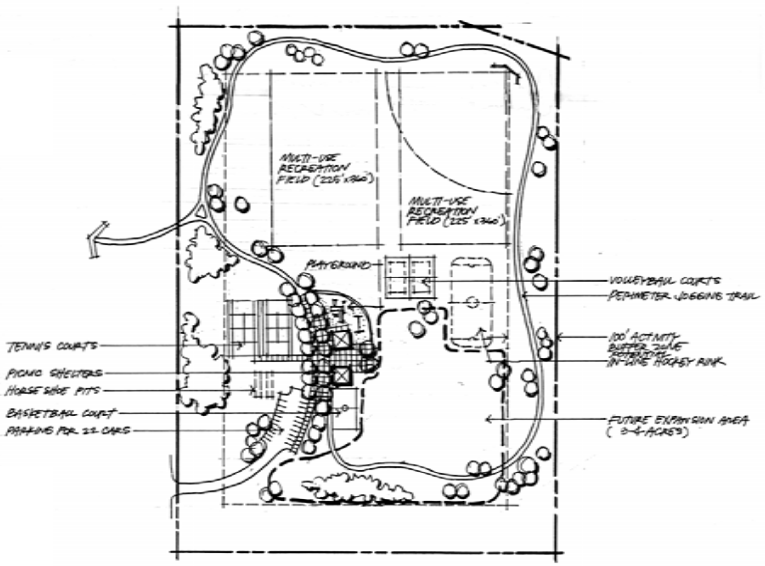
NEIGHBORHOOD PARKS

Definition and Purpose
Neighborhood parks are 20 acres and serve the surrounding neighborhood within an approximate radius of ½ mile. There are facilities for field and court games (including a minimum of 2 graded playfields), playgrounds, picnicking and walking/jogging paths. The park should be a focal point of the neighborhood. A neighborhood or community park may be integrated with an elementary, K-8, or middle school with some overlap of uses where appropriate.

Example: *O'Kane Park, Lakewood*

Minimum Standards (Please also see Design Manual):
Neighborhood Parks have an area of no less than 20 acres (size may include some overlap if combined with a school site).

- They are located in residential areas, approximately one per every square mile and where feasible and appropriate, adjacent to an elementary, K-8 or middle school.
- They are within walking distance of users and have good pedestrian/bicycle access with service on two sides by low volume local streets.
- Sites must be suitable for year-round use with suitable topography and soils for quality play fields and facilities.
- Developed portions of the park (irrigated turf, playfields, playgrounds, parking, hard courts, shelters) must be built above the 10-year floodplain and at least 150 feet from the bank of any creek. All park development must conform with the Floodplain Ordinance.
- Parking should be provided for 15 to 20 cars with at least 2 spaces accessible for people with disabilities and at least 4 bike parking spaces with lock-up posts. For larger lots, the number of bike spaces and posts must equal 5% of the number of auto spaces provided. School and park parking facilities may overlap and be shared.
- There should be adequate low-level lighting for evening activities and safety of users, but the lighting must not adversely impact neighbors.
- Landscaping should provide a balance of screening, shade, color, and texture that creates year round visual interest and a strong park identity.



Typical Neighborhood Park Concept

- Park facilities and activities such as picnic areas, spectator facilities, play equipment, surfacing, court games, walking/jogging paths, drinking fountains and restrooms should be accessible by people with disabilities (ADA compliant).

- There should be a balance between active and passive activities based on the needs and desires of the neighborhood with active recreation being informal and unstructured, with the exception of some youth teams.

- There should be an attractive interface with adjacent development as described above. Ideally, there should be a 100'-wide landscaped park edge buffer with trees and shrubs along the perimeter of the park with a jogging trail.

Management Guidelines

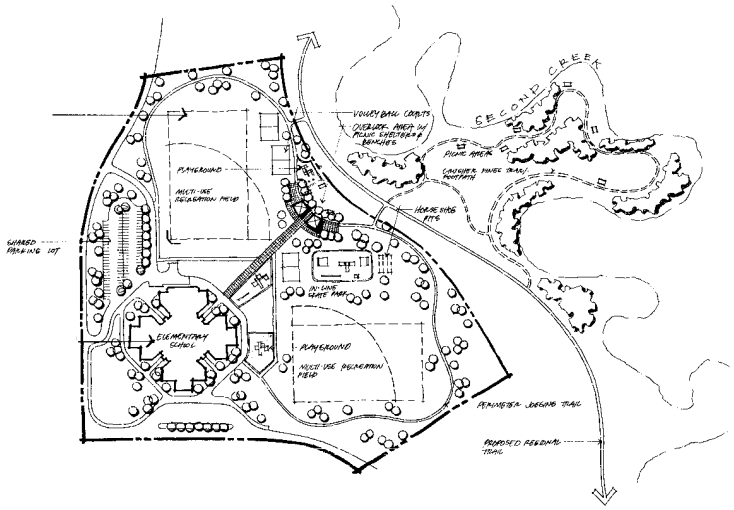
- Neighborhood parks are managed and maintained by the city or by homeowner associations.

- They are well maintained free of litter, debris, weeds and unkempt vegetation, although managed natural vegetation is encouraged where appropriate.

- Play equipment, sports facilities, portable toilet enclosures, parking lots, roadways, and other infrastructure are kept in excellent condition.

- They are adequately patrolled and there are appropriate rules and regulations to ensure visitor safety, protection of park facilities and privacy of adjacent properties.

- Detailed records are kept of maintenance, safety and security conditions and remedies.



Typical Neighborhood Park with School Concept

REGIONAL PARKS

Definition and Purpose
Regional parks require 150 to 200 or more acres and serve several communities. They provide a full spectrum of recreational activities and generally are contiguous to, or encompass a significant natural resource such as a river, forest or prairie. A regional park accommodates more heavily programmed athletic fields for organized sports and a wider variety of activities.

Example: *Adams County Regional Park, Cornerstone Park, Littleton; Clement Park, Jefferson County*

Minimum Standards (Please also see Design Manual)
Regional parks have no less than 150 acres.

- They are strategically sited to serve populations within a reasonable driving distance, easily accessible from major thoroughfares;
- Unless there is careful impact planning and buffering, they are not located directly adjacent to residential areas and avoid access through residential areas.
- They are programmed to accommodate large league play with quality play fields, facilities and adequate parking for participants and spectators.
- Sites should be suitable for year-round use with suitable topography and soils for quality athletic facilities and not prone to erosion or frequent flooding.
- The park should have lighting to accommodate organized evening programs such as tennis and softball and provide enough light to ensure safety and comfort to park users. Lighting should not aversely impact adjacent homes, businesses or thoroughfares.
- Landscaping should provide a balance of screening, shade, color and texture that creates year-round visual interest and a strong park identity.
- Park facilities such as picnic areas, spectator facilities, play equipment, surfacing, court games, walking/jogging paths, drinking fountains and restrooms should be accessible by people with disabilities (ADA compliant).
- There should be adequate parking (500 to 1000 cars) for the specific program elements including spaces for people with disabilities and bike spaces with lock-up posts equal to 5% of the number of auto spaces provided.
- The park should include loop trails accessing at least 75% of the site and connect to adjacent trails, greenways, and sidewalks.
- There should be an attractive interface with adjacent development as described previously.

Management Guidelines
- Regional parks are managed and maintained by local or regional park agencies;
- They are well maintained free of litter, debris, weeds and unkempt vegetation although managed natural vegetation is encouraged where appropriate.
- Play equipment, sports facilities, restrooms, parking lots, roadways, concession facilities and other infrastructure are kept in excellent condition.
- They are adequately patrolled and there are appropriate rules and regulations to ensure visitor safety, protection of park facilities and privacy of adjacent properties.

- Detailed records are kept of maintenance, safety and security conditions and remedies.

BARR LAKE STATE PARK AND ROCKY MOUNTAIN ARSENAL NATIONAL WILDLIFE REFUGE

Barr Lake is an existing State-managed facility and natural area. The Rocky Mountain Arsenal National Wildlife Refuge is a federal facility. A major goal of this plan is to preserve a buffer area around the State Park and provide trail linkage and access to the National Wildlife Refuge.

Barr Lake State Park

TRAILS

Seven classes of trails are addressed:

- regional multi-use
- multi-use roadside pathways
- greenway links and local service trails
- on-street routes
- in-park/loop trails
- primitive/natural trails
- sidewalks

REGIONAL MULTI-USE TRAILS

Definition and Purpose

Regional multi-use trails form an interconnected off-street recreational and transportation right of way system serving a variety of non-motorized uses including biking, hiking, jogging, horseback riding, and cross country skiing. Regional trails may be paved or non-paved. Paved regional trails accommodate *street* (narrow tire) bicycles, as well as all-terrain bikes and in-line skates. Regional trails link to other regional trails and communities, ultimately forming a metro-wide network. They may have either a crusher-fine (granular stone) or concrete surface depending on anticipated use (i.e. paved for skates).

Example: *Platte River and Mary Carter Greenway Trails, Denver*

Minimum Standards (Please also see Design Guidelines Manual)

- Built on a compacted, properly graded surface meeting state and national design standards. (see AASHTO guidelines).

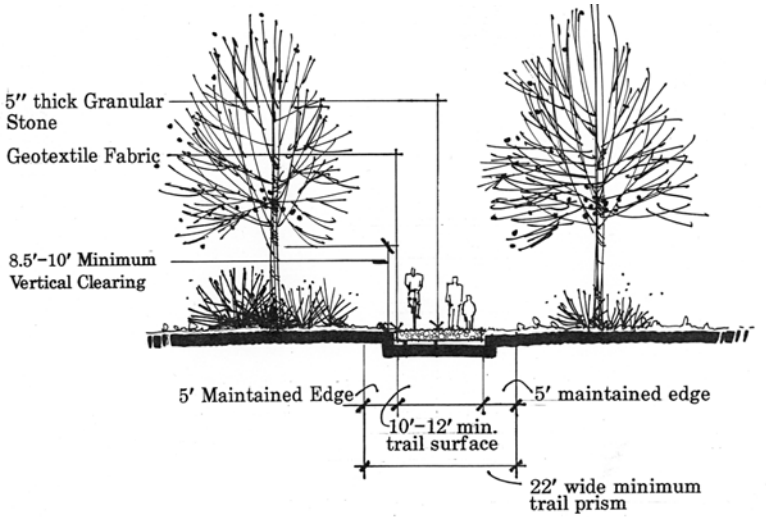
- Trail tread adequate width (minimum 10’ wide, upgradable to 12’ wide) with 2.5’ to 5’ wide shoulders and headroom (8.5’ to 10’ with horse use) to accommodate multiple uses.

- Two to fifty or more miles in length built in logical segments with no dead ends or dangerous barriers such as busy highways.

- Grade-separated and buffered from street traffic.
- Located in attractive corridors such as linear parks, greenways, stream corridors, canals, and along ridge lines.
- Easy to find with attractive, highly visible trailheads, rest areas, benches, water fountains, toilets, interpretive signs and other amenities, published mapping and public information;
- Signage is provided at entry points informing users of trail distances, level of difficulty, accessibility information and user responsibilities and laws. Signs also identify street crossings and mile marks.

Multi-Use Trail, Littleton

- Readily accessible to area users including meeting standards under the *Americans with Disabilities Act (ADA*).



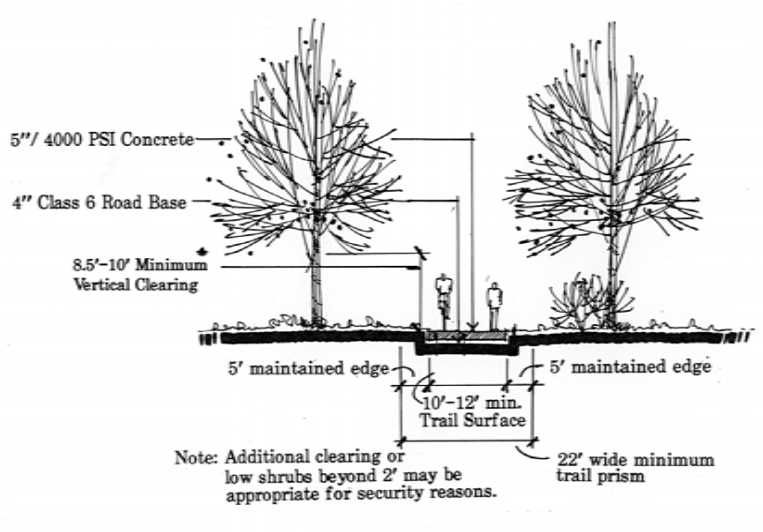
Crusher Fine Trail Cross-Section

- Meander sensitively through the landscape with adequate buffer zones provided between trail and environmentally sensitive areas and sensitive land uses such as residences, to ensure preservation of environmental integrity and privacy.
- Connect to local service trails, parks, and other attractions.
- Maximum 10 minute drive or 20 minute bike trip to a regional trail.
- Extended grades in excess of 5% are avoided.
- Constructed to be durable and easy to maintain.

- Attractive interface (including landscape buffering) with adjacent development.

Management Guidelines

- Managed by local or regional park agencies.
- Kept in good repair, free of litter and debris and groomed.
- Adequately patrolled to ensure user safety and security and privacy of adjacent properties.
- Have mile markers for easy reporting of maintenance problems.
- Records are kept of maintenance, safety and security problems.
- Provide safe detours at disruption points.



Concrete Trail Cross-Section

MULTI-USE ROADSIDE PATHWAYS (please also see *New Lands Comprehensive Plan and Commerce City Street Design Guidelines* for more detailed standards*)*

Definition and Purpose

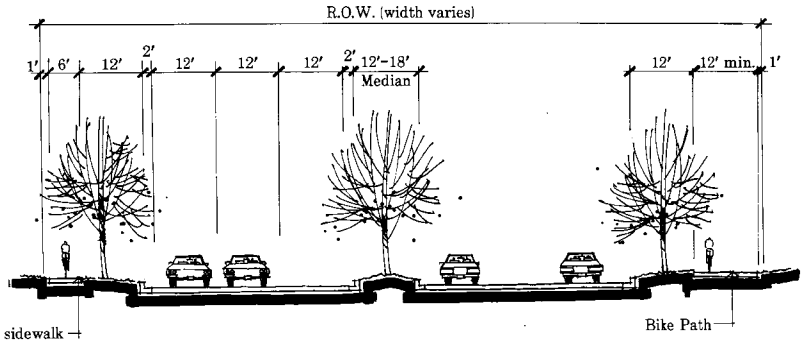
Multi-use roadside pathways facilitate bicycle and pedestrian transportation along *regional/ principle* and *minor arterial* streets where traffic speeds and volumes make it unsafe or unpleasant for bicycle or pedestrian traffic. They are separated from auto traffic by a landscaped median or a painted bike lane delineator.

Example: *Multi-use roadside pathways along South Kipling Street between Hwy. 285 and C-470 in Jefferson County*

Minimum Standard (Please see also Design Guidelines Manual)
Built on a compacted, properly graded surface meeting state and national design standards. (See AASHTO guidelines).

- Durable, 10' to 12'-wide paved surface with 8.5' to 10' of headroom depending on level of use with no dead ends or dangerous barriers such as highways.
- Separate from, and in addition to, sidewalks.
- Off-street option is generally located on the north sides of streets to facilitate snow melt.
- Signage is provided at entry points informing users of trail distances, level of difficulty, accessibility information and user responsibilities and laws. Signs also identify street crossings and mile marks.
- Minimal driveway cuts intersect multi-use roadside path.
- Ramps provided at street crossings.

- Separated from street by a 12’ wide landscaped median.
- Avoid extended grades in excess of 5%.
- Provided on at least one side of all arterial streets unless bike lane option offered.
- Attractive interface (including landscape buffering) with adjacent development as described previously.



Roadside Multi-Use Path (Example—See Current City Standards)

Management Guidelines

- Managed and maintained by City streets crews.
- Kept in good repair, free of litter, debris, ice and snow.
- Potholes, bumps and cracks are quickly remedied.
- Provide safe detours at disruption points.

Roadside Pathway, Denver

GREENWAY LINKS AND LOCAL SERVICE TRAILS

Definition and Purpose

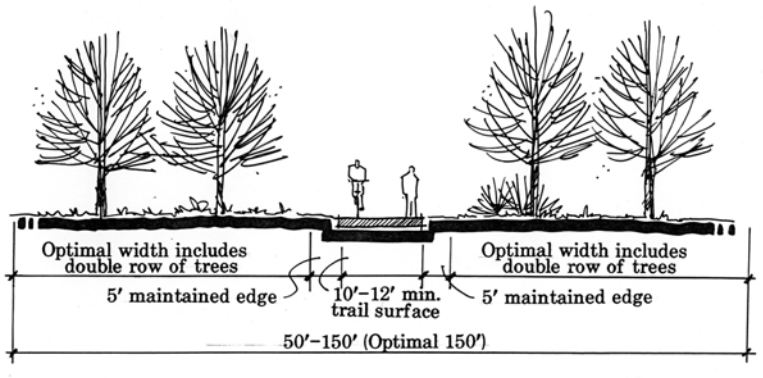
Greenway Links and Local service trails meet local circulation needs, linking neighborhoods, schools, shopping, parks and other community destinations. They also connect to and feed into regional multi-use trails. They may be paved or unpaved depending on local preference.

Example: *Ken Caryl Ranch Pathway System, Jefferson County*

Minimum Standards

- Built on a compacted, properly graded surface meeting state and national design standards. (See AASHTO guidelines).
- Trail tread adequate width (minimum 8’ wide, upgradable to 12’ wide), 2.5’ to 5’ wide shoulders to accommodate multiple uses.

- Length varies with no dead ends or dangerous barriers such as busy highways.
- Grade-separated and buffered from street traffic.
- Located in attractive corridors such as parks, greenbelts, and stream corridors.
- Is readily accessible to local users including meeting standards under the *Americans with Disabilities Act (ADA*).
- Meander sensitively within a 50' to 150'-wide landscaped corridor with adequate buffer zones provided between trail and environmentally sensitive areas and land uses such as residences to assure preservation of environmental integrity and privacy (optimal width is 150' to accommodate a double row of trees on either side).
- Signage is provided at entry points informing users of trail distances, level of difficulty, accessibility information and user responsibilities and laws. Signs also identify mile marks.



Local Trail/Greenway Link Concept

- Connect to regional trails, parks, schools and other neighborhoods.
- No more than a 10-minute walk from any residence.
- Avoid extended grades in excess of 5%.
- Constructed to be durable and easy to maintain.
- Has attactive interface (including landscape buffering) with adjacent development as described above.

Management Guidelines

- Managed by local community or homeowners association.
- Kept in good repair, free of litter and debris and groomed.
- Adequately patrolled to ensure user safety and security and privacy of adjacent properties.
- Records are kept of maintenance, safety and security problems.

ON-STREET ROUTES

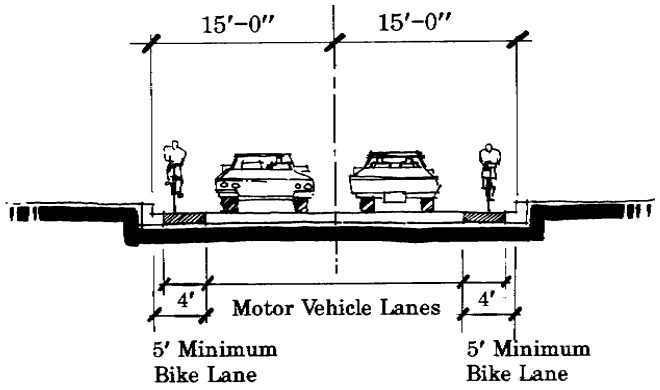
Definition and Purpose

On-street routes include local streets, collector streets, and arterials suitable for bicycle use. They are used for bicycle transportation and may link regional and local service trails and trail segments together. On-street routes may have defined bike lanes or "bike route" designation. **Note that design requirements for on-street bicycle usage will vary depending on traffic speed and volumes, grades, parking and other factors. Planners and engineers should consult *Guide for the Development of Bicycle Facilities* and, *A Policy on Geometric Design of Highways and Streets* both published by the American Association of State Highway and Transportation Officials (AASHTO).**

Example: *Boulder's and Denver's on-street bicycle system*

Minimum Standard*s

- Designs conform to current AASHTO and other applicable standards.
- Except on very low speed, low volume local streets, provide a 14'-wide traffic lane (width totals 14' plus 1' curb pan) where parking is not permitted.



On-Street Bicycling Concept (Example—See Guide for the Development of Bicycle Facilities, AASHTO, 1999 or Current City Standards)

- Has minimum 12'-wide parking/bicycle travel lane where parking is permitted with an additional 1'-2' where parking volume and turnover is high (refer to AASHTO guidelines).
- "Share the Road" yellow diamond-shaped signs with bicycle icon and green "bicycle route" signs are posted along on-street routes at appropriate locations.
- On-street routes are identified with signage and guide maps.
- Drain inlet grates are designed so as not to catch bicycle wheels.
- ***Management Guidelines***
- Maintained by City streets department.
- Streets and street shoulders are kept in good repair, free of litter, snow, ice and debris.
- Potholes, bumps and cracks are quickly remedied.

IN-PARK/LOOP TRAILS

Definition and Purpose
The trail is entirely contained within a single park, subdivision, or other limited area. They are generally circuitous. They may accommodate hikers, bicyclists, in-line skaters, equestrians, cross country skiers, and interpretive programs.

Example: *Crown Hill Trail in Crown Hill Park, Jefferson County*

Minimum Standards

- Built on a compacted, properly graded surface meeting state and national design standards. (See AASHTO guidelines).
- Adequate width (minimum 8' wide, upgradable to 10' wide) with 2.5' to 5' wide shoulders to accommodate multiple uses.
- They are ¼-mile to three miles in length.
- They are grade-separated and buffered from street traffic.
- They are readily accessible to local users including meeting standards under the *Americans with Disabilities Act (ADA).*

- Signage is provided at entry points informing users of trail distances, level of difficulty, accessibility information and user responsibilities and laws. Signs also identify mile marks.
- Whereever feasible, they are provided in neighborhood, community and regional parks.
- Avoid extended grades in excess of 5%.
- Have rest areas, toilets facilities and water fountains for trails of two miles or longer.
- Constructed to be durable and easy to maintain.
- There is an attractive interface (including landscape buffering) with adjacent development as described previously.

Management Guidelines
- Parks agency or homeowners association manages trails.
- Trails are kept in good repair, free of litter and debris and groomed.
- Trails are adequately patrolled to ensure user safety and security and privacy of adjacent properties.
- Records are kept of maintenance, safety and security problems.

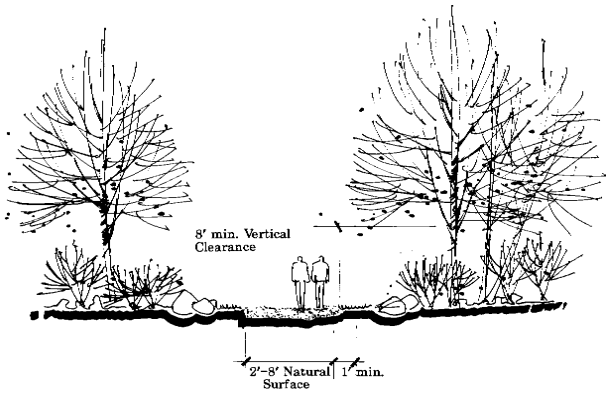
PRIMITIVE/NATURAL TRAILS

Definition and Purpose
The trail is usually entirely contained within a single park, subdivision, or other limited area. They are generally circuitous. They may accommodate hikers, equestrians and in some cases all-terrain bicyclists and cross-country skiers as well as interpretive tours and programs.

Example: *Ken Caryl Ranch, Jefferson County*

Minimum Standards
- Avoids conflicts with sensitive wildlife or private property areas.
- Built on a compacted, properly graded earthen surface.
- Adequate width (2' to 8' wide).
- They are 1/10 mile to 1 mile in length.
- They are grade-separated and buffered from street traffic.
- They are readily accessible to local users including, wherever feasible, meeting standards under the *Americans with Disabilities Act (ADA).*
- Signage is provided at entry points informing users that trail is primitive and may meet AASHTO standards for certain uses. Trail map, accessibility, user responsibility and interpretive signage may also be provided.
- There is an attractive interface (including landscape buffering) with adjacent development as described previously.

Management Guidelines
- Managed by parks agency or homeowners association;
- Kept in good repair, free of litter and debris with vegetation grooming to avoid conflict with users;
- Trails are adequately patrolled to ensure user safety and security and privacy of adjacent properties;
- Records are kept of maintenance, safety and security problems.



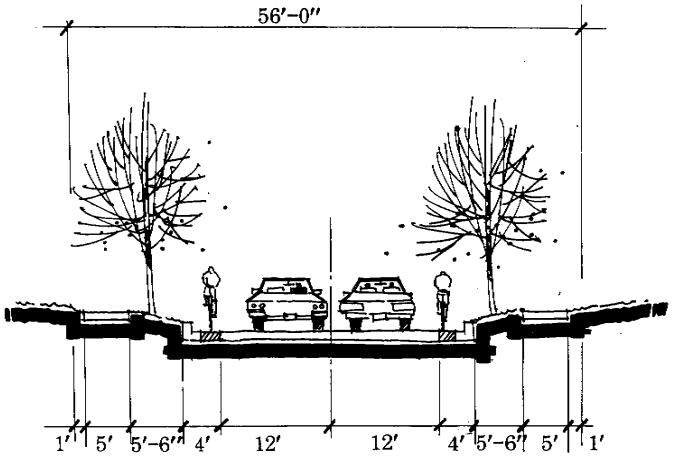
Primitive Trail Cross Section

SIDEWALKS (please also see *Commerce City Residential and Neighborhood Design Standards for New Development*)

Definition and Purpose
Sidewalks are paved pathways located along the edges of streets. They are for pedestrian use only. They are separated from the street by a landscaped median.

Example: Sidewalks in Denver's *Park Hill Neighborhood*

Minimum Standards
- Durable (4000 psi, 4"-thick concrete), 4 ½'-wide (local street), 5'-wide (collector) 6'-wide (arterial) paved surface.
- There are ramps at street crossings for wheelchairs.
- Separated from street by a 5.5' to 12'-wide landscaped median.
- Provided on both sides of all collector and arterial streets.
- ***Management Guidelines***
- Managed by City or homeowners association..
- Sidewalks and medians are kept in good repair, free of litter and debris and groomed.
- Provide safe detours at disruption points.



Collector Street with Sidewalk (Example—See Current City Standards)

OPEN SPACE

Four classes of open space are addressed:

- Infrastructure
- greenways
- core reserves
- buffers

INFRASTRUCTURE OPEN SPACE

Definition and Purpose

Infrastructure open space lands serve a specific community safety or welfare purpose such as conveyance and storage of storm water runoff, aquifer recharge, steep slopes, unsuitable soils for building, wetlands, ponds and other necessary natural functions. These are sometimes referred to as *primary conservation areas.* Infrastructure open space may also include canals, utility rights of way, airport buffer zones and noise attenuation buffering zones along major highways. Infrastructure open space may be either publicly or privately owned property.

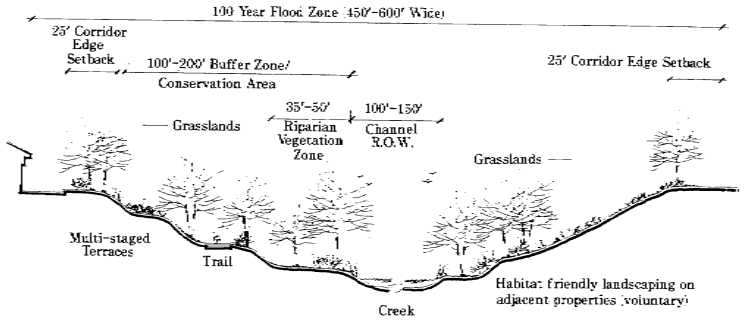
Example: *Littleton Floodplain Park, O'Brian Canal*

Minimum Standards

- Adequate space is set aside for the specific infrastructure functions.
- No flood-prone development or filling in the floodway or 100-year floodplain as projected at build-out in the watershed.
- No filling of ponds, lakes, streams or wetlands.
- No building on steep or erosive slopes per City Development Standards and City Zoning Ordinances.
- There is adequate buffering to protect the function of the open space and screen adjacent uses (see buffer zones below).
- There is an attractive interface (including landscape buffering) with adjacent development as described above.

Management Guidelines

- Prevent encroachment, filling or dumping including yard wastes.
- Control invasive and noxious weeds and feral animals (such as loose dogs and cats).
- Patrol where necessary and appropriate.
- Maintain infrastructure such as erosion control devices, check dams, etc. by the appropriate agency.



Optimal Urban Stream Cross Section

GREENWAYS (Recreational and Conservation)

Definition and Purpose

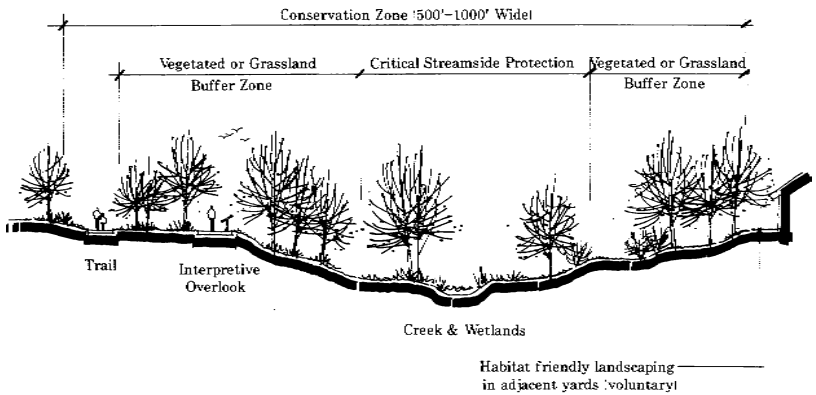
Greenways are linear parks and open space corridors that serve recreational and conservation purposes. Recreational greenways generally include trails, trailheads, and possibly other attractions such as parks, playgrounds and interpretive facilities. Conservation greenways preserve wildlife habitat and routes of wildlife circulation and link core

wildlife habitat areas. Many greenways serve both conservation and recreational purposes. Greenway land may be on both public and private property.

Example: *Platte River Greenway, Denver, Mary Carter Greenway, Littleton*

Minimum Standards

- Adequate width and buffer zones to protect desired recreational, aesthetic or wildlife benefits—generally 600' wide along creeks and 40' to 100' wide on either side of canals. Greenway corridors that do not follow waterways are 150' to 200' wide.



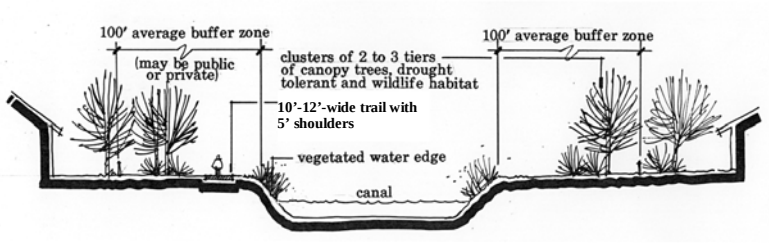
Conservation Oriented Greenway Cross Section

- There are adequate buffer zones to project privacy and security of adjacent properties.

- There is minimum intrusion into sensitive areas by trails and other human activities. Active park areas may encroach to within 150' of the stream bank.

- Avoid windowless walls, unscreened outdoor storage, loading docks, trash receptacles and other incompatible uses along the edge.
- Avoid continuous, solid screen fences, walls, or non-coated chain link fencing along the edges.

- There is attractive interface (including landscape buffering) with adjacent development as described above.



Canal Greenway Cross Section

Management Guidelines

- Maintain trails and other recreational improvements (see trails above).

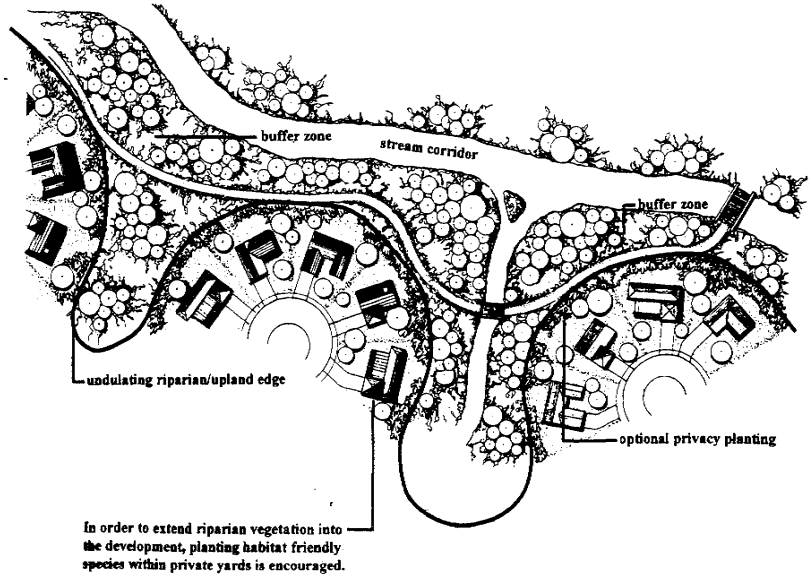
- Prevent encroachment, filling or dumping including yard wastes.

- Control invasive and noxious weeds and feral animals (such as loose dogs and cats).

- Control erosion and dust.

- Patrol where necessary and appropriate.

- Maintain infrastructure such as erosion control devices, check dams, etc. by the appropriate agency.



Interface of Greenway with Neighborhood

CORE RESERVES

Definition and Purpose

Core reserves protect significant natural habitat, agricultural lands, visual or historic values. They are generally deep rather than narrow and linear. They are large enough to sustain and support diverse plant and animal populations including large mammals such as deer, elk or even Bison.

Example: *Barr Lake State Park and Rocky Mountain Arsenal National Wildlife Refuge*

Rocky Mountain Arsenal National Wildlife Refuge

Minimum Standards

- There is adequate acreage to support desired and diverse plant and animal species.
- There are adequate buffer zones to protect internal values as well as adjacent properties.
- There are linkages to other core reserves where need is indicated.
- There is protection from invasive species and ferrule animals such as itinerant dogs and cats.

- There is attractive interface (including landscape buffering) with adjacent development as described above.

Management Guidelines

- Protect wildlife and wildlife habitat.
- Maintain trails and other recreational improvements (see trails above).
- Prevent encroachment, filling or dumping including yard wastes;
- Control invasive and noxious weeds and feral animals (such as loose dogs and cats).
- Patrol where necessary and appropriate.
- Where appropriate, provide public access and educational programs.

BUFFERS

Definition and Purpose

Buffers occur along the margin of greenways, canals, core reserves, agricultural lands and other open spaces. Buffers help protect natural resources, water quality, and wildlife habitat. They also help avoid land use conflicts and protect privacy and security of properties adjacent to open spaces. Buffers may also serve to separate various land uses such as residential areas and roadways. Buffer lands may be either publicly or privately owned property.

Example: *Barr Lake Buffer Zone; Bear Creek Greenway, Lakewood, High Line Canal Trail, Denver*

Minimum Standards

- There is adequate width to accommodate management objectives of the open space.
- A streamside buffer zone should be a minimum of 150’ and average 225’ wide on each side from top of channel bank—or the with of three to five mature trees.
- A canal buffer zone should be a minimum of 40’ wide back from the top of bank and average 100’ wide on each side. (If providing a minimum buffer strip is not practical the owner may opt to provide Parks Department-approved landscape screening along the edge of the property. In no case should the setback be less than 25’).
- Builders and owners are encouraged to provide 46”-high attractive, open fencing for protection of small children and control of pets with landscaping on both sides of the fence.
- Where parking lots abut the buffer zone there should be low (3’ high) landscaped berming or a low (2’-3’ high) wood or masonry walls or planting strips to help screen autos.

Bear Creek Greenway Buffer Zone with Trail

Management Guidelines

- *Prevent encroachment, filling or dumping including yard wastes.
- Control invasive and noxious weeds and animals.
- Educate adjacent property owners about the value of the open space use such as wildlife or agriculture, and provide information about what impacts to expect and how best to live next to wildlife or farming.
- Patrol where necessary and appropriate.;

THE ISSUE OF BARRIERS

Barriers such as highways, railroads, viaducts, and busy streets can easily fragment a trail system as well as discourage trail use and create serious safety hazards to trail users. This barrier problem is especially significant for Commerce City because several mainline railroads, major highways, as canals, creeks and the South Platte River bisect the community. **In the interest of both public safety and non-motorized transportation convenience, it should be a first priority, therefore, to address both existing and potential future barriers by providing the appropriate signals, crossings, tunnels, bridges and sidewalks.** These facilities must be of adequate width and meet accepted design standards for bicycle and pedestrian use as well as allowing movement of wildlife.

Types of barriers and Solutions:

Barriers

Major Roads

Railroads

Solutions

Trail Underpass

Tunnel

Viaduct with Crossing

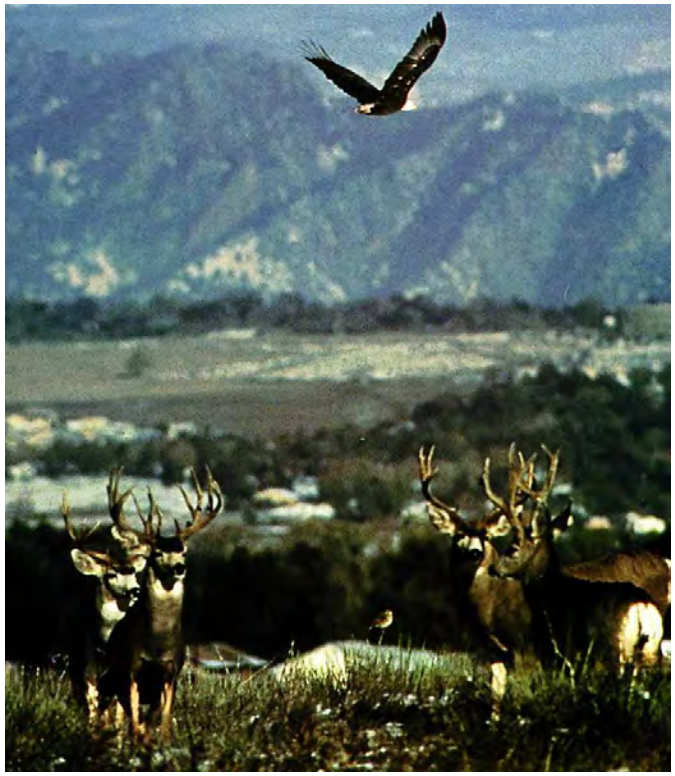
At-Grade Street Crossing

Barr Lake State Park

Chapter

3 *Commerce City Prairieways Action Plan*

Planning Atlas



Rocky Mountain Arsenal National Wildlife Refuge

From U.S. Fish & Wildlife Service

Summary of Key Points

- ***This chapter (the "Atlas") depicts the location*** *and layout of the proposed parks, open spaces and trails to guide developers and planners by providing the specific configuration and recommended site improvements.*
- *The Master Plan Map and associated computer files provides "big picture" overall plan and shows background information such as roads, streams and topography.*
- *The Section Plates show more site-specific planning information such as park layouts and specific trails.*
- *This is a dynamic plan that will be continually refined and updated as development occurs in the Northern Range. Computer files are kept at Commerce City Parks and Recreation.*
- *It is a policy of Commerce City to achieve the layouts shown in this Atlas or for the criteria and objectives*

This chapter of the plan—also referred to as the "Atlas"—depicts the location and layout of the proposed parks, open spaces and trails for the *Commerce City Northern Range* study area. The purpose of this *Atlas* is to guide developers and planners by providing the specific configuration and recommended site improvements for proposed parks, open spaces and trails. The maps, section plates, roster of projects and descriptions that follow indicate goals and expectations with respect to specific site amenities such as ballfields, trail improvements, natural resources preservation and landscaping.

The *Master Plan Map* shows the entire proposed system and serves as a reference key for individual *section plates* presented on the pages that follow. In each section (formed by 1-square-mile USGS grid lines) on the *Master Plan Map*, the legal s*ection* description (i.e. "Township 1 South, Range 65 West, Section 35") and S*ection Plate* number in the *Atlas* are shown. The *Master Plan Map* is associated with an *Arcview*[tm] *Geographic Information System* (GIS) computer file. The section plates are associated with an *AutoCAD*[tm] computer file. The computer files are stored and maintained at the *Commerce City Parks and Recreation Department.*

The *Master Plan Map* and associated computer files provide most of the planning information themes such as roads, streams and land uses provided for general planning and information sharing. The *Section Plates* show more site-specific planning information such as park layouts and specific trail locations. In addition, there is a *Context Map* in Chapter 1 that depicts the proposed *Northern Range* improvements and how they relate to open spaces, trails and greenways in surrounding communities.

Please note that this is a dynamic plan that will be continually refined and updated as development occurs in the Northern Range. Elements such as proposed school sites as well as planned and actual land uses may change. The maps printed in this document, therefore, may not be the same as the digitally stored mapping available from *Commerce City Parks and Recreation Department.* Both versions should be reviewed for a complete up-to-date picture.

It is a policy of Commerce City to either achieve the layouts shown in this *Atlas* or for the developer to provide alternative designs that meet the same criteria and objectives depicted in the *Master Plan Map* and *Section by Section* plates.

The Database

The park, greenway, trail and open space sites identified in this atlas were identified and defined on the basis of the project and site selection criteria identified in Chapter 1 of this report and using the database developed for this plan. The database includes a number of planning factors such as topography, floodplains, land ownership, sensitive wildlife areas, roads and proposed development sites. The database also includes other items such as related planning studies, reports, public comments, agreements with land developers and pertinent decisions by public officials.

Finally, the database includes recommended changes or modifications to the plan— referred to here as *redline* data. While much of the data necessary to prepare this plan was gathered during the planning process, some data was either incomplete, not available, or changing at the time this plan was published. Indeed, the database is an evolving tool subject to continual change and updating as new information becomes available or as site conditions change over the years. *Table 3.1* summarizes the data sources used.

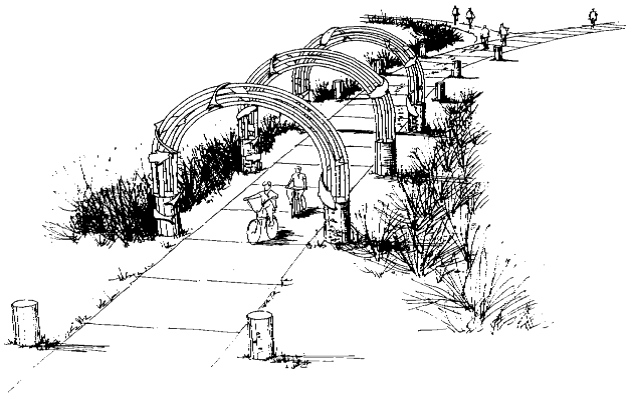


Table 3.1: ***Listing of Data Sources***

Data Attributes	Description/Comment	Source	Digitized	Status/Availability
Physical/Cultural Features				
➢ Topography	2' contours	Adams County Engineering & USGS Maps	Yes	Have CAD Map
➢ Sections	Range, township, section	Adams County Engineering	Yes	Have Arcview & CAD Maps
➢ Streets & Roads	Highways, section roads, street grids, railroads	Adams County Engineering	Yes	Have Arcview & CAD Maps
➢ Property Boundaries	Per assessor's maps—as of data available 3/98	Adams County Planning	Yes	Have Arcview Map
➢ Land Ownership	Owner name contact information—digitally tied to parcel on map. Shows planned parks, trails, or open space projects and adjoining properties.	Adams County Planning	No	Ongoing Arcview Map
➢ Waterways/ Water Bodies	Rivers, creeks, canals, lakes, ponds	Adams County Engineering Harrison Data Sets West	Yes	Have Arcview & CAD Maps
➢ Floodplains	100-yr. historic flood plain shown. Projected flood plain not digitized, watershed boundaries shown.	Urban Drainage and Flood Control Dist., FEMA Harrison Data Sets West	Yes	Have Arcview Map
➢ Wetlands	Wildlife expert inspected aerials. Reviewed CDOW, CDOT and E-470 materials as well as Harrison Data Sets West sources. Note that wetlands are likely at numerous locations along South Platte River, 1st, 2nd, & 3rd Creeks and along canals—although they we not delineated for this plan. Field delineation should be carried out on each project. Wetland areas may increase as development occurs in the watersheds due to more run off.	ERO, Inc. Aerials, Colorado Division of Wildlife. Harrison Data Sets West. CDOT 404 Permit for 120/76 interchange	Yes	Have Arcview Map
➢ Aerial Photos	Color aerial maps of entire area. Good source for resource identification.	Commercial aerial photography.	Yes	Have Separate aerial map file
➢ Existing Land Uses	Harrison Data Sets West, printed *Commerce City Community Development* mapping.	Harrison Data Sets West Aerials	Yes	Have Arcview Map
➢ Agricultural Lands	Prime agricultural lands.	Adams County Open Space Plan.	Yes	Have Arcview Map
Jurisdictional Features				
➢ Jurisdictional Boundaries	Cites, counties, special districts, school districts, DIA, State and Federal lands, *General Improvement District* (GID).	Harrison Data Sets West, Commerce City Community Development	Yes	Have Arcview Map
➢ Public Lands	City, state, county, federal with potential recreation, wildlife or resource value	Harrison Data Sets West	Yes	Have Arcview Map
➢ DRCOG Urban Growth Boundary	Proposed limits of growth through 2020. Per inter-governmental agreements to limit utility & road service areas.	Community Development Map	Yes	Have Arcview Map

Planned Projects and Features				
➢ Planned Parks, Greenways, Trails, and Open Space	Shows all currently proposed park, greenway, trails, and open spaces.	*Commerce City Parks Plan Adams Co. Open Space Plan, Platte River Heritage Plan, Barr Lake Plan Prairieways Action Plan*	Yes	Have Arcview Map
➢ Planned School Lands and Facilities	Shows proposed elementary, middle and high school sites.	Brighton School District 27J *(Western Education and Public Planning, Inc.)*	Yes	Have Arcview Map
➢ Planned Highways and Roads	Shows planned and proposed freeways, regional/principle, and minor arterials. Many of these will be routes of multi-use roadside pathways. They may also form major barriers to trails and open space corridors.	E-470 Authority, CDOT interviews, DRCOG, Commerce City Community Development, New Lands Comprehensive Plan Future sources may be better.	Yes	Have Arcview Map
➢ Proposed Land Uses	Shows proposed future land uses in the study area.	Commerce City Comprehensive Plan	Yes	Have Arcview Map
➢ Planned Private Sector Development	Shows properties where owners have indicated intent to develop, or are currently developing.	Commerce City Community Development	Yes	Have Arcview Map
➢ Other Planned Projects	Such as wetland banks, mining sites. None are shown at this time. Should be added in future as they come on line.	No source material available at this time.	No	Future Arcview Map
➢ Comments and "Redline" Attributes	Reflects citizen comments, rulings, policy decisions, agreements, and suggested modifications to the plan. Also lists applicable reference documents such as master plans or studies that may impact a given area (section). Material is presented in the electronic database not in the printed Atlas.	On-going input by community and stakeholders. Updated by Park Dept. Staff.	Yes	On-Going Arcview Map

Roster of the Specific Park, Open Space and Trail Amenities

The following roster of projects reflects the minimum requirements for the specific recommended improvements. Please see Chapter 4 for cost estimates.

PARKS

SPECIAL COMMUNITY PARK

1. Prairie Legacy Park (shown below)

Location:
Township 1 South, Range 67 West Sections 4 and 9 (Quebec Street and 64th Avenue) Western edge of Rocky Mountain Arsenal National Wildlife Refuge)

Description:
A 200-acre community park with formal play fields, interpretive pavilion, aquatic center, picnic areas, trails and other amenities. Includes a 100-acre native prairie preserve park with walking paths, camping and interpretive sites.

Legacy Community Park Concept

COMMUNITY PARKS

1. 1st Creek Community Park (plate 46)

Location:
Township 1 South, Range 67 West Section 14 (Havana Street and 104th Avenue)

Description:
A 100-acre community park with multi-use play fields, 4-plex baseball complex, plaza area with shelters, 2 playgrounds, court games and sand volleyball, picnic areas, picnic shelters, foot/jogging and soft surface trails, wetlands, interpretive areas, and stormwater detention. Includes 20 acres of wetland, riparian natural areas and 60 to 80 acres of developed landscape zones. Links to *O'Brian Canal* and *1st Creek Regional* trails. The park may also be used for special events such as fireworks displays.

2. Buffalo Run Community Park (plates 21 & 36)

Location:
Township 1 South, Range 66 West Section 6 (Chambers Road and 112th Avenue)

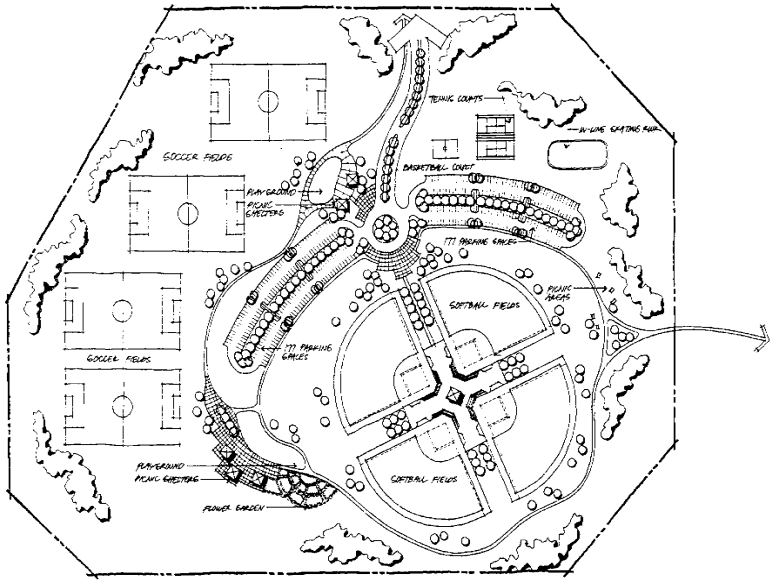
Description:
A 130-acre community park with links to adjacent elementary, middle and high schools with 7 multi-use play fields, 2 picnic shelters, picnic areas, 2 playgrounds, foot/jogging and soft surface trails, wetlands, interpretive areas, and stormwater detention. Includes 70 acres of natural areas (riparian and wetland) and 60 acres of developed landscaped zones. Links to *O'Brian/ Burlington Canal* and *2nd Creek Regional* Trails. Can also be used for special events such as fireworks displays.

3. Buckley Community Park (plate 50)

Location:
Township 1 South, Range 66 West Section 16 (Buckley Street and 96th Avenue)

Description:
An 80-acre community park with 3 multi-use play fields, 4-plex baseball/sports complex, 2 playgrounds, picnic areas, paved rollerblade™ trails, skate and BMX complex, overlooks, flower gardens and interpretive areas. Includes both prairie areas and developed landscaped zones. Can also be used for special events such as fireworks displays. *Links to Buckley Parkway and 2nd Creek Regional* trails.

Community Park in Colorado Springs



4. Box Elder Community Park (plate 7)

Location:
Township 1 South, Range 65 West Section 25 (Watkins Mile Road and 128th Avenue)

Description:
An 80-acre community park with multi-use play fields, 2 playgrounds, picnic areas, trails, wetlands, and interpretive areas. Links to native areas along the *Box Elder Creek Greenway*. Long term project.

NEIGHBORHOOD PARKS

Please Note: Most of the park sites described below assume a school/park joint use of the land. Elementary, middle and "K-8" schools might be combined with parks. Actual configurations will be determined in cooperation with Brighton School District 27J. Minimum park size is 20 acres. School/park site combinations will range in size from 25-40 acres depending on the type of school or schools sharing the site.

1. Riverrun Neighborhood Park (plate 19)

Location:
Township 2 South, Range 67 West Section 2 (Peoria and 112th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, playground, parking 15-20 cars (net for park use), picnic areas, and perimeter jogging trails. Internal trail and on-street links are provided to neighborhoods and schools. Suggest future pedestrian crossing over or under Hwy. 85 to link with Dunes subdivision, *Fulton Ditch* and *Burlington Ditch* Trails.

2. Third Creek Ranch Neighborhood Park (plate 23)

Location:
Township 2 South, Range 66 West, Section 4 (Tower Road and 112th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, playground, parking 15-20 car (net for park use), court play and sand volleyball complex, picnic areas, and perimeter jogging trails. Internal trail and on-street links are provided to neighborhoods and schools. Located on the *Buckley Parkway Trail/Greenway*.

3. Box Elder Neighborhood Park (plate 5) (Long Term)

Location:
Township 1 South, Range 65 West, Section 27 (Hayesmont Mile Road and 128th Avenue)

Description:
Specific layout to be determined, possibly combined with middle and elementary schools. Should meet general neighborhood park standards. May serve industrial area employees as well as residents. Internal trail and on-street links are provided to neighborhoods and schools. Located on *Prairie Trail Greenway*.

4. Potomac Neighborhood Park (plate 35)

Location:
Township 2 South, Range 67 West Section 12 (Potomac and 104th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, parking 15-20 cars (net for park use), picnic areas, playground, court play/sand volleyball and perimeter jogging trails. Internal trail and on-street links are provided to neighborhoods and schools.

5. Buckley Parkway Neighborhood Park (plate 38)

Location:
Township 2 South, Range 66 West Section 9 (Tower Road and 104th Avenue)

Description:
A combined neighborhood park/elementary and middle school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games and sand volleyball, picnic areas, and perimeter jogging trails. Located on the *Buckley Parkway Trail/Greenway* with access to regional rollerblade™ trail. Internal trail and on-street links are provided to neighborhoods and schools.

6. Third Creek Neighborhood Park (plate 40)

Location:
Township 2 South, Range 66 West Section 11 (Picadilly Road and 104th Avenue)

Description:
A combined neighborhood park/elementary site (possible high school site nearby but separate) with 2 multi-use play fields, picnic areas, parking 15-20 cars (net for park use), playground, court games and sand volleyball, perimeter jogging trails and primitive trails with picnic areas extending to the 3rd Creek floodplain area. Located near the *3rd Creek Greenway* with trail links to it. Internal trail and on-street links are provided to neighborhoods and schools.

Combined Park/School Site with Greenway in Colorado Springs

7. Peoria Street Neighborhood Park (plate 47)

Location:
Township 2 South, Range 67 West Section 13 (Potomac and 96th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games and sand volleyball, picnic areas, playground and perimeter jogging trails. Provide trail links to the 104th *Avenue Multi-use Trail and 1st Creek Greenway trail*. Internal trail and on-street links are provided to neighborhoods and schools.

8. Buffalo Meadow Neighborhood Park (plate 48)

Location:
Township 2 South, Range 67 West Section 18 (Chambers and 96th Avenues)

Description:
A combined neighborhood park/elementary and middle school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games, sand volleyball, picnic areas, and perimeter jogging trails. Provide trail links to the *104th Avenue Multi-use Trail and Rocky Mountain Arsenal National Wildlife Refuge*. Internal trail and on-street links are provided to neighborhoods and schools.

9. Second Creek Neighborhood Park (plate 49)

Location:
Township 2 South, Range 66 West Section 17 (Buckley Road and 96th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games and sand volleyball, picnic areas with shelter, and perimeter jogging trails. Includes primitive interpretive trails with boardwalks accessing wetlands and floodplain area. Connects to *2nd Creek Greenway* with streamside natural park and regional trail. Internal trail and on-street links are provided to neighborhoods and schools.

10. Section 14 Neighborhood Park (plate 52)

Location:
Township 2 South, Range 66 West Section 14 (Picadilly and 96th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games and sand volleyball, picnic areas, and perimeter jogging trails. Connects to *3rd Creek Greenway* via *Greenway Link Trail*. Internal trail and on-street links are provided to neighborhoods and school.

11. Section 21 Neighborhood Park (plate 57)

Location:
Township 1 South, Range 66 West Section 21 (Tower Road and 88th Avenue)

Description:
A combined neighborhood park/elementary school site with 2 multi-use play fields, parking 15-20 cars (net for park use), playground, court games and sand volleyball, picnic areas and shelter, and perimeter jogging trails. Includes primitive interpretive trails with boardwalks accessing wetlands and floodplain area. Connects to *2nd Creek Greenway* with streamside natural park and regional trail. Internal trail and on-street links are provided to neighborhoods and schools.

Rocky Mountain Arsenal National Wildlife Refuge

GREENWAYS, TRAILS AND OPEN SPACES

1. O'Brian Canal Greenway (plates 61,55,56,45,46,34,35,20,21,8,9)

Location:
Township 2 South, Range 68, 67 and 66 West Sections 36 31,29,20,21,22,15,14,11,12,1,6, Township 1 South 31,32 (64th to 128th Avenue)

Description:
A 15-mile (Commerce City mileage) greenway following the *O'Brian Canal* from Sand Creek to *Barr Lake State Park*. Open space includes the canal plus a 100'-wide buffer strip extending back from both banks of the canal. Includes a 12'-wide crushed stone multi-use trail along entire length of the *O'Brian Canal* and landscaping in the buffer zones with canopy trees that provide shading and wildlife habitat. Corridor includes 5 trailheads in addition to access points in *1st Creek and Buffalo Run Community Parks.*

High Line Canal, Littleton

2. Burlington Canal Greenway (plates 19,20,21, 34)

Location:
Township 2 South, Range 67 and 66 West Sections 11,2,1 (104th to 116th Avenue)

Description:
A 3.7-mile greenway following the *Burlington Canal* from the proposed *1st Creek Community Park* (104th Avenue) to the proposed *Buffalo Run Community Park (*166th Avenue). Open space includes the canal plus a 100'-wide buffer strip extending back from both banks of the canal. Includes a 12'-wide crushed stone multi-use trail landscaping in the buffer zones with canopy trees that provide shade and wildlife habitat. The corridor includes 1 trailhead in addition to access points in *1st Creek and Buffalo Run Community Parks.*

3. 1st Creek Greenway (plates 32,33,45,46,47)

Location:
Township 2 South, Range 67 West Sections 4,9,15,14,13 (120th to 96th Avenue)

Description:
A 3-mile greenway following 1st Creek from the *Rocky Mountain Arsenal Wildlife Refuge* to the *South Platte River Floodplain Open Space*. Open Space includes a 150' wide floodway with 225' wide buffer zones (total 600' wide). Includes a 12'- wide crushed stone multi-use trail along entire length. The trail also passes through 1st Creek Community Park and has trailheads at Old Brighton Road, in 1st Creek Park, and on 96th Avenue.

4. 2nd Creek Greenway (plates 21,36,37,49,57,63,64)

Location:
Township 2 South, Range 66 West Section 6,7,17,21,28,27 (120th to 80th Avenue)

Description:
A 5.3-mile (Commerce City mileage) greenway following 2nd Creek from the O'Brian Canal to the Highline Canal. Open Space includes a 150' wide floodway with 225' wide buffer zones (total 600' wide—average width undulating). Includes a 12'-wide crushed stone multi-use trail along entire length. The Greenway continues into Denver and Aurora with both trail and open space links to other greenways and trails. There are trailheads in *2nd Creek Community Park*, in *Second Creek Neighborhood Park* (Buckley Road), 96th and Buckley, and at 88th and Buckley.

5. 3rd Creek Greenway (pages 8,9,23,24,25,40)

Location:
Township 2 South, Range 66 West Section 32,33,4,3,2,11 (I-76 to Picadilly Road)

Description:
A 3.5-mile (Commerce City mileage) greenway following 3rd Creek from the O'Brian Canal to the western boundary of Denver International Airport. Open space includes a 150'-wide floodway with 225'-wide buffer zones (total 600' wide—average width undulating). Includes a 12'-wide crushed stone multi-use trail along the length upstream (southeast) of E-470 and 120th Avenue. The portion north of 120th Avenue is concrete and coincides with the E-470 Trail. The Greenway continues into Brighton and Adams County with both trail and open space links to the South Platte River corridor and other greenways and trails. Trailheads are located at Buckley Road, in *Third Creek Ranch Neighborhood Park*, at Tower Road and E-470, and in *Third Creek Neighborhood Park.*

6. Fulton Ditch Greenway (plates 60,54,43,44,32, 33,18,19)

Location:
Township 2 South, Range 67 West Section 30,20,16,9,10,3 (80th to 120th Avenue)

Description:
A 6.8-mile (Commerce City mileage) greenway following the Fulton Canal from the *O'Brian Canal* to 120th Avenue. Open Space includes the canal plus a 100' wide buffer strip extending back from both banks of the canal. Includes a 12'-wide crushed stone multi-use trail along entire length of the canal and landscaping in the buffer zones with canopy trees that provide shade and wildlife habitat. The greenway continues into Brighton and Adams County with both trail and open space links to other greenways and trails. There are trailheads at 96th Avenue, Old Brighton Road (at 1st Creek Greenway.

Massy Draw Greenway, Ken Caryl Ranch

7. The E-470 Trail (plates 8,9,23,24,39,51,58,59,65)

Location:
Township 2 South, Range 66 West Section 26,23,22,15,10,3,4,33,32 (80th Avenue to I-76)

Description:
A 7.1-mile (Commerce City mileage) paved 12'-wide concrete multi-use trail following the E-470 right-of-way through Commerce City. The trail runs along a landscape corridor in the highway right of way set back far enough from the roadway to reduce traffic noise impacts on trail users. The trail continues along the entire length of E-470 from I-25 North to I-25 South with links to other greenways and trails. There are trailheads at 120th and Buckley in *3rd Creek Ranch Neighborhood Park*, at Tower Road and at 96th Avenue.

E-470 near Tower Road

8. The Rocky Mountain Arsenal National Wildlife Refuge Perimeter Trail (plates 62,56 (South and Eastern segments not shown section by section in the Atlas)

Location:
Township 2 South, Range 66, 67 West Section 9,4,33,28,22,23,24,19,20,29,32,5,8,7, 12,11,10 (56th to 96th Avenues)

Description:
A 20-mile crushed stone 10'-wide multi-use trail following the perimeter of the *Rocky Mountain Arsenal National Wildlife Refuge*. The corridor links the proposed *Eagle Watch Viewing Area*, the *Havana Ponds Wetland Interpretive Site, Prairie Legacy Community Park*, the proposed *Legacy Pavilion* and the *O'Brian Canal Trail* at 96th Avenue. The Commerce City portion of the corridor also includes trailheads at 64th, 72nd, 88th, and 96th Avenues. The trail runs outside the Refuge fence in a landscaped corridor set back far enough from the Quebec Street, Highway 2, 96th Avenue, Buckley and Pena Boulevard roadways to reduce traffic noise impacts on trail users. The portion along the east edge of the Refuge can run coincident with the proposed Pena Boulevard trail. The trail also forms a segment of the Stapleton Prairie Path that will link the Rocky Mountain Arsenal Wildlife Refuge to Sand Creek via the Stapleton Redevelopment area.

9. The Barr Lake Loop Greenway (plates 1, 10, 27, 26, 41)

Location:
Townships 1 South and 2 South, Range 66 West Section 11,12,1,36,25 (104th to 136th Avenue)

Description:
A 4.9-mile greenway linking 3rd Creek to *Barr Lake State Park*. The greenway passes through open space in the *DIA Buffer Zone* and the *Section 36 State Heritage Land.* A 55-acre open space corridor is recommended in Section 1 that includes the southwesterly portion of the section between the trail and the section boundaries. A crushed stone, 10'-wide multi-use trail will follow the greenway along its entire length. This greenway will also link to the *Prairie Trail Greenway* that extends to *Box Elder Creek.* The trail is accessed from

the *3rd Creek Trail, Barr Lake State Park* and from a trailhead at 120th and Gun Club Road.

10. The Prairie Trail Greenway and Prairie Conservation Area (plates 11,12,12,5,14,6,7)

Location:
Township 1 South, Range 65 West Section 31,32,33,27,26,25 (Gun Club Road to Box Elder Creek)

Description:
A 6.4-mile greenway linking the *Barr Lake Loop Trail* to *Box Elder Creek*. The greenway passes through open space in the *DIA Buffer Zone* and includes a 150'-wide open space corridor through Sections 33, 27,26 and 25. A crushed stone 10'- wide multi-use trail will follow the Greenway along its entire length. Trailheads will be located at 120th and Gun Club Road, in *Box Elder Neighborhood Park* and *Box Elder Creek Community Park*.

This concept also includes a prairie conservation area that encompasses approximately 17 sections of land east of Picadilly road, north of DIA and west of Box Elder Creek. This is land outside the DRCOG 2020 service area and would be preserved through land use planning and cooperative land management techniques working with property owners. The concept does not involve land purchase.

11. The Buckley Parkway Trail (plates 23,38,50)

Location:
Township 2 South, Range 66 West Section 16,9,4 (96th to 120th Avenues)

Description:
A 3.7-mile trail following the proposed Buckley Parkway linking the *2nd Creek* and *3rd Creek Greenways* as well as three parks. The trail runs along a 150'-wide open space corridor through Section 16 then along a landscaped parkway—in the tradition of Frederick Law Olmstead's urban parkways—that includes preserved prairie landscape and a scenic arterial roadway. The trail surface will be 12'-wide concrete design to accommodate multiple uses including roller blades. The trail is intended to form part of a 6-mile loop that includes the *Buckley Parkway*, *E-470* and *104th Avenue Roadside* trails. Trailheads will be located in *Buckley Community Park, Buckley Neighborhood Park* and *Third Creek Ranch Neighborhood Park*.

12. Box Elder Creek Greenway (plates 7,16)

Location:
Township 1 South, Range 64 West Section 25,36 (120th to 136th Avenue)

Description:
A 2.5-mile (Commerce City mileage) greenway following *Box Elder Creek* from 120th to 136th Avenues. Open Space includes a 150' wide floodway with 225' wide buffer zones (total 600' wide). Includes a 10' wide crushed stone multi-use trail along the length. The greenway continues into *Adams County* ultimately linking to the *Black Forest* region in *El Paso County*. Access is from *Box Elder Creek Community Park*.

13. Greenway Links (plates 19,23, 35,38,40, 47,48,49, 52)

Location:
Township 2 South, Range 67 West Sections 2, 12, 13, Range 66 Sections 4, 9,11, 14, 17,18,)

Description:
These are greenway segments that link other greenways, neighborhoods and parks. These are at least 50' wide and include a 10'to12'-wide crushed stone (or concrete where appropriate) multi-use trail and water-conserving landscaping along the length. Access is from neighborhoods, parks and other trails.

14. South Platte River Greenway and Heritage Lands

(plates 17,18, 32, 43, 44, 53, 54,60 Portions south of 80th Avenue not shown on plates)

Location:
Township 2 South, Range 67 West Section 12, 1, 36, 31, 30, 20, 17, 9 (56th to 120th Avenue)

Description:
A 9-mile (Commerce City mileage) greenway running from the Denver city limit to Brighton. The corridor links the *Sand Creek* and *3rd Creek Greenways*. The greenway includes a paved multi-use trail, river bank buffer zones and passes through several thousand acres of preserved floodplain open space in *Commerce City*, *Thornton* and *Adams County*. The lands include both public open space and lands preserved through voluntary conservation agreements with agricultural, mining and water storage interests. The *Platte River Greenway* also is part of a larger regional Greenway extending from Douglas County to Brighton. Access is available via the Platte Trail, and via the trailheads serving *the Fulton Ditch* and *1st Creek Greenways* (96th and 110th Avenues).

15. The Highway 2 Trail (plates 62,56,46,34,35,20 Portions south of 80th not show on plates)

Location:
Township 2 South, Range 67 West Section 5, 32, 28, 22, 14, 12, 6 (96th to 120th Avenues)

Description:
A 9.6-mile paved 12'-wide multi-use trail following the west side of Highway 2 from Vasquez Boulevard to 114th Avenue. The trail shares the railroad and road right of way and is a major link between the existing neighborhoods of central *Commerce City* and the *Northern Range* area. The trail links to *the Rocky Mountain Arsenal National Wildlife Refuge Perimeter Trail*, The *1st Creek*, *2nd Creek* and *O'Brian and Burlington Canal* Greenways. Trailheads are located 88th and 96th Avenues and in *2nd Creek Community Park*

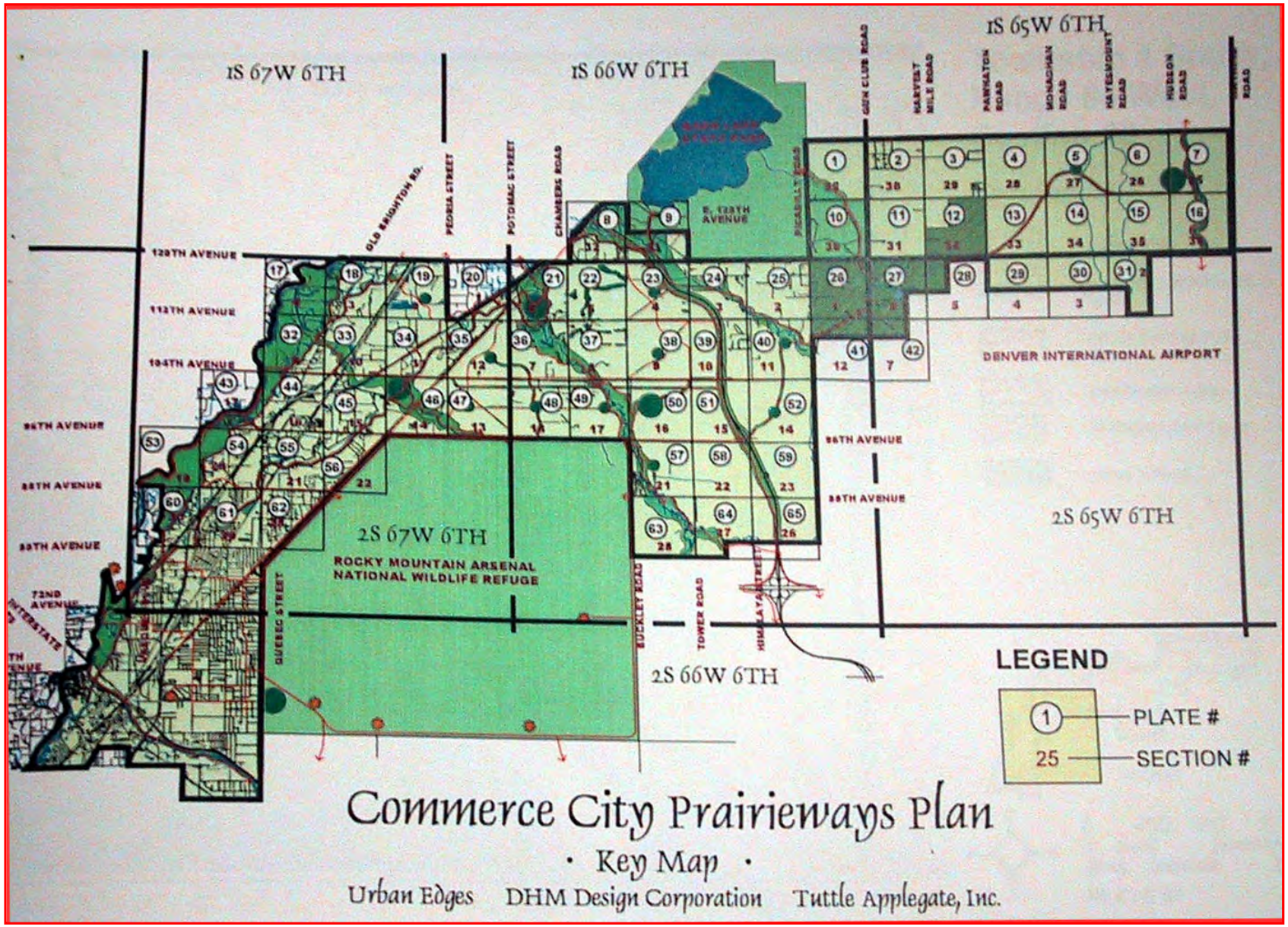
16. MULTI-USE ROADSIDE PATHWAYS (located on plates throughout this chapter)

Location:
Refers to trails that run along regional, principal, and minor arterioles and major collector roadways throughout the *Northern Range*.

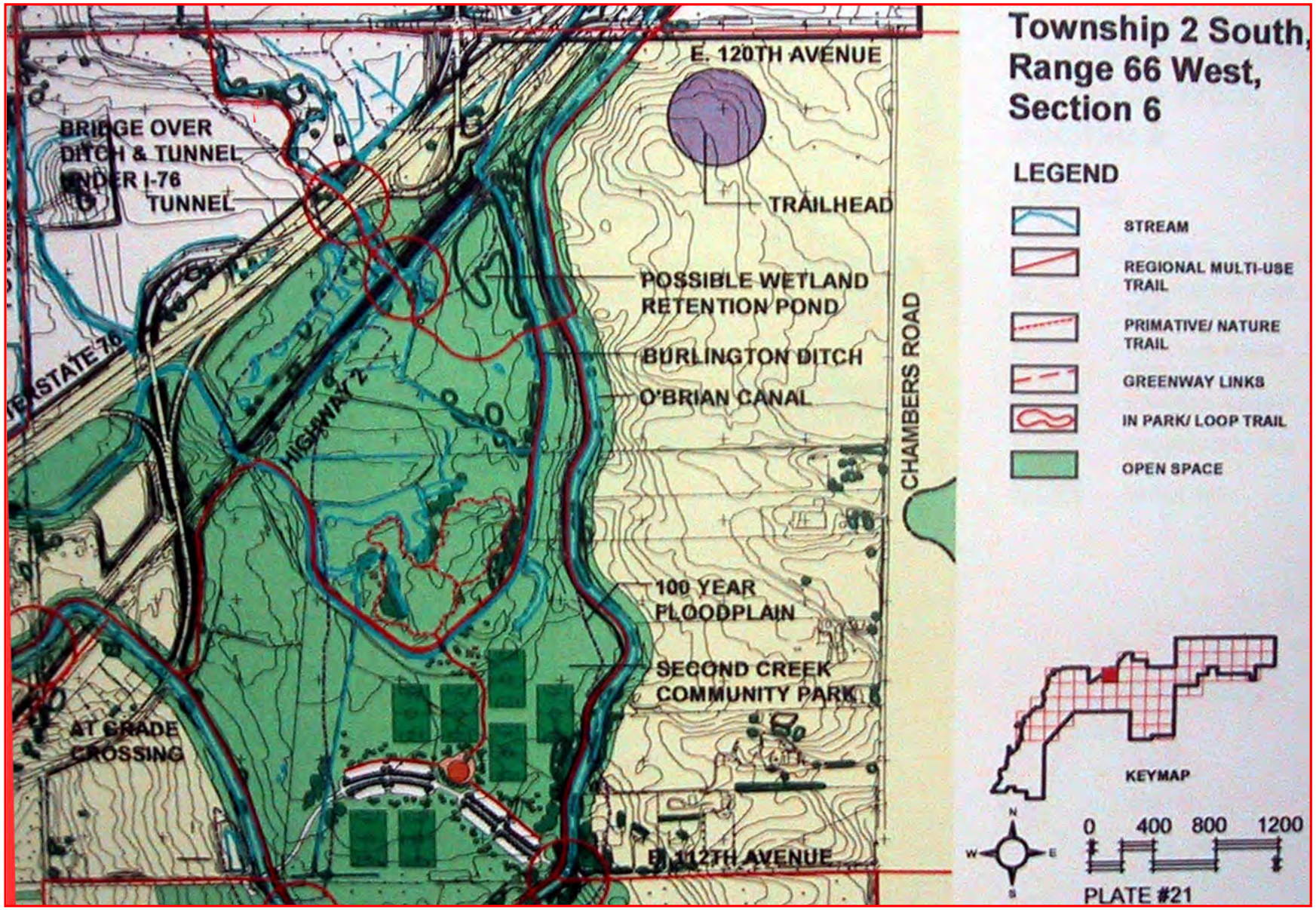
Description:
In accordance with the *New Lands Comprehensive Plan* and *Land Use Guidelines and Design Standards of Commerce City, Multi-Use Roadside Pathways* are separate paved 10' and 12'- wide multi-use trails following the rights of way throughout Commerce City. They run along landscaped road edge corridors separated from the traffic lanes by a 51/2' to 12'-wide medians. In general, they follow the major section line roads. Driveway and property access cuts are consolidated and kept to a minimum along these paths, to minimize auto/bicycle and auto/pedestrian conflicts. A high priority is placed on the 120th and 104th Avenue Corridors since these will serve as major east/west connectors in the trail system. Alternatively a portion of the 104th Avenue Trail could run along the Public Service power line easement from Peoria Street to 2nd Creek.

Roadside Multi-Use Pathway, Denver

Sample Plates—Key Map



Sample Plate, Section 6 of 65 Plates. Remaining Plates Available Upon Request



Chapter

4

Commerce City Prairieways Action Plan

Cost Estimates, Phasing and Implementation

Summary of Key Points

- *Estimated cost of the recommended parks, trails and open space is $173 million.*
- *Development of most of the study area is expected to occur over the next 20-30 years.*
- *Commerce City should move forward immediately with securing critical open space and trail rights-of-way as well as building demonstration projects, as part of a quality growth management process.*
- *Commerce City should initiate and maintain an effective review process—including staff commitment—for all private and public development actions that will impact the plan.*
- *Commerce City should promote, facilitate and participate regularly in a regional coordination and review process including signed proclamations-of-endorsement and support from agency heads, elected councils and boards.*
- *Wherever possible and feasible, Commerce City should build partnerships with developers, school districts, agricultural interests, Adams County, utilities, transportation agencies and other stakeholders.*

The *Prairieways Action Plan* is visionary and ambitious. Like any plan, however, it will mean little if not implemented. Realization of a plan calls for addressing several important factors including:

- Understanding the cost implications of the plan—both capital and maintenance.
- Identifying specific funding sources and partners.
- Having a phasing scheme with schedule of projects to be implemented.
- Building and maintaining strong long-term community support for the plan.
- Organizing and sustaining leadership to champion the plan.

Cost Estimates and Implications

*The **Prairieways Action Plan*** calls for the creation of 5 community parks (*including Prairie Legacy Park*), 11 neighbor-hood parks, 100 miles of trails, 36 miles of roadside pathways and almost 3,000 acres of preserved open space. Total dollar cost to implement all of the recommended improvements is estimated at $173 Million. This breaks down approximately as follows (Please see Tables 4.2-4.4 below for a more detailed listing).

Table 4.1 Overview of Costs

Parks:	$ 62 Million
Legacy Park:	31 Million
Open Space:	21 Million
Trails:	*46 Million*
Roadside Paths:	*13 Million*
Total:	$ 173 Million

Commerce City will clearly need both time and ingenuity to garner the resources necessary for implementation.

Funding Sources and Partners (Please See Detailed Listing of Sources at the End of This Chapter)

Assuming a 20-year implementation program and the potential funding sources listed in table 4.2 below (including the Adams County Open Space Tax), we can project the availability of $2 million to $6 million annually with a total of $43 to $119 million available over the next two decades. While the projections are somewhat optimistic, they are realizable. Partnering with both private and public sector stakeholders will be essential. At the high end, the projections represent a significant portion of the $173 million projected cost.

Table 4.2*: Projection of Potential Funding for Northern Range Projects*
(Does not include land acquired through gifts, cluster development and other non-cash or regulatory techniques)

Likely Funding Source	Annual Amount	20 yr. Amount
Developer Fees and Dedications	$ 1 Million to $1.5 Million	$ 10 to $ 30 Million
Adams County Open Lands Tax (7 yrs.)	500,000 to 2 Million	3 to 14 Million
General Funds	50,000 to 100,000	1 to 2 Million
In-Kind Resources	50,000 to 100,000	1 to 2 Million
GOCO Legacy	250,000 to 500,000	5 to 10 Million
GOCO Trails	50,000 to 150,000	1 to 3 Million
E-470 Funds	To be determined.	3 to 4 Million
GOCO Parks, Open Space, Planning	50,000 to 150,000	1 to 3 Million
Urban Drainage and Flood Control	50,000 to 150,000	1 to 3 Million
TEA 21	100,000 to 300,000	1 to 6 Million
Military/Corrections Labor	50,000 to 100,000	1 to 2 Million
Foundations	50,000 to 100,000	5 to 10 Million
Corporations	50,000 to 100,000	5 to 10 Million
Entrepreneurial Partnerships	50,000 to 100,000	5 to 10 Million
Rounded Off Base Total:	**$ 2 to $ 6 Million**	**$43 to $109 Million**
Other Sources		
Bond Referenda*	To be determined.	$ 10 Million

Roster of Projects, Planned Completion Time and Cost Estimates

Tables 4.3 and 4.4 summarize cost estimates for the proposed park, trail and open space projects. Cost estimates include engineering, administrative and contingencies factored at 25% of construction. **(Note: Land prices are 1999 estimates)**

Table 4.3: Unit Cost Factor For Parks and Open Space

Unit Cost Assumptions

Land Acquisition Cost Assumptions

■ Uplands	$ 12,000/ac.
■ Floodways	4,000/ac.
■ Floodway fringe/Wetlands*	6,000/ac.
■ Legacy Park acquisition from Arsenal	3,000/ac.

Floodway Fringe is area outside floodway assumed to be 225' wide on either side of the floodway for a total of 450' and total average corridor width of 600'. Wetlands are jurisdictional waters of the U.S. requiring a permit and mitigation under Sec. 404 of the U.S. Clean Water Act.

Construction Cost Assumptions

■ Community park active recreation	$ 110,000/ac.
■ Neighborhood park active recreation	95,000/ac.
■ Natural area (inc. trails, overlooks, interpretive sites, etc.)	30,000/ac.
■ Wetland/natural area creation/restoration	50,000/ac.
■ Retention Basin/Pond Construction	by others

Projected Annual Maintenance Cost Assumptions

■ Active park maintenance	$ 3,500
■ Natural open space maintenance	100-800

Sources: Urban Edges, Inc., DHM, Design Corp. Greenways, Inc., Urban Drainage and Flood Control District, South Suburban Park, Denver Parks, Boulder Parks and Recreation District and East Bay Regional Park District, CA

Table 4.4: Cost of Neighborhood Parks

Note: Estimates are based on a freestanding 20-acre park. Costs may vary where parks are combined with school sites depending configuration.

Project	Phasing	Estimated Land (Net 20 Acres)	Estimated Construction (Net 20 Acres)	Annual Maintenance
1. River Run (Sec.2)	1-3 yrs.	$ 240,000	$ 1,900,000	$ 70,000
2. Third Creek Ranch (Sec.4)	3-5 yrs.	240,000	1,900,000	70,000
3. Box Elder (Sec.27)	10+ yrs.	240,000	1,900,000	70,000
4. Potomac (Sec.12)	1-3 yrs.	240,000	1,900,000	70,000
5. Buckley Parkway (Sec.9)	5-7 yrs.	240,000	1,900,000	70,000
6. Third Creek (Sec.11)	7-10 yrs.	240,000	1,900,000	70,000
7. Peoria (Sec.13)	3-5 yrs.	240,000	1,900,000	70,000
8. Buffalo Meadows (Sec.18)	3-5 yrs.	240,000	1,900,000	70,000
9. Second Creek (Sec.17)	5-7 yrs.	240,000	1,900,000	70,000
10. Section 14 Park (Sec. 14)	7-10 yrs.	240,000	1,900,000	70,000
11. Section 21 Park (Sec.21)	7-10 yrs.	240,000	1,900,000	70,000
	Sub-Totals:	**$2,640,000**	**$20,900,000**	**$770,000**
Total Estimated Development Cost for Neighborhood Parks: $ 23,540,000				

Total Neighborhood and Community Parks: $ 61,980,000
Total with Legacy Park: $ 92,880,000

Table 4.4 Continued: Cost of Special Park (Prairie Legacy Community Park)

Project	Phasing	Comments	Estimated Land	Estimated Construction	Annual Maintenance
1. Prairie Legacy Park	3-5 yrs.	Special Project	$ 600,000	$ 30,300,000	$ 430,000
					Total Special: $ 30,900,000

Cost of Community Parks

1. First Creek Community Park	1-5 yrs.	**Acquire land now!** Multi-use playfields, wetlands, fishing pond/storm detention. (60-80 acres active, 20-40 acres natural)	$ 990,000	$ 8,550,000	$ 231,000
2. Buffalo Run Community Park	1-7 yrs.	**Acquire land now!** Multi-use playfields, wetlands, storm detention. (60 acres active 70 acres wetlands)	1,140,000	9,400,000	217,000
3. Buckley Community Park	7-10 yrs	**Acquire land now!** skating/BMX, sport fields, wetlands w/ High School (80 acres active)	960,000	8,800,000	245,000
4. Box Elder Community Park	10+ yrs.	Multi-use playfields, wetlands w/ elementary. Long term project (70 acres active)	900,000	7,700,000	245,000
		Sub-Totals:	**$3,990,000**	**$ 34,450,000**	**$ 938,000**
					Total Development Cost For Community Parks: $ 38,440,000

Mary Carter Greenway, Englewood

Table 4.4 Continued: Greenway, Open Space and Trail Cost Estimates

Project	Phasing	Comments	Estimated Land	Estimated Construction	Annual Maintenance
1. O'Brian Canal Greenway	1-3 yrs.	Crusher fine trail, 100' wide strip either side of ditch. 11 tunnels and 5 trailheads. **(80,000 lf/367acres)**	$ 4,400,000	$ 8,290,000	$ 85,000
2. Burlington Greenway	5-7 yrs.	Crusher fine trail, 100' wide strip on either side of ditch bank. 2 tunnels, 1 trailhead. **(20,000 lf/91 acres)**	1,100,000	1,700,000	21,000
3. 1st Creek Greenway	2-7 yrs.	Crusher fine trail, 150' wide floodway plus 450' net fringe for total of 600' 5 tunnels, 1 bridge **(16,000 lf/282 acres)**	1,600,000	2,700,000	40,000
4. 2nd Creek Greenway	1-5 yrs.	Crusher fine trail, 150' wide floodway plus 450' net fringe for total of 600',.6 tunnels, 1 bridge, 2 trailheads**(28,000lf/382 acres)**	2,121,000	3,974,000	60,000
5. 3rd Creek Greenway	4-7 yrs.	Crusher fine trail, 150' wide floodway plus 450' net fringe for total of 600' **(14,000 lf trail above E-470/303 acres)**	1,666,000	1,762,000	42,000
6. Fulton Ditch Greenway	3-5 yrs.	Crusher fine trail, 100' wide strip on either side of ditch bank., 3 bridges, 4 trailheads. **(36,000 lf/165 acres)**	1,980,000	3,388,000	38,000
7. E-470 Trail	2-5 yrs.	Paved trail in C-470 ROW. 3 tunnels, 1 trailhead **(38,000 lf)**	0.00	4,100,000	27,000
8. Rocky Mt. Arsenal Perimeter Trail	3-5 yrs.	Crusher fine trail on refuge. 3 trailheads, 2 tunnels, move fence. **(105,000 lf)**	0.00	5,750,000	63,000
9. Barr Lake Loop	3-5 yrs.	Crusher fine trail, 1 tunnel, 1 trailhead, and SW corner of Sec. 25 as open space. From Third Creek to Barr Lake primarily mostly through the DIA Buffer Zone and Sec. 36 State Land Board area **(18,000 lf/55 acres to acquire)**	660,000	1,244,000	16,000
10. Prairie Trail (Box Elder Cr. Link)	10+ yrs.	Crusher fine trail, 150'-wide strip from Barr Lake Loop to Box Elder Creek.**(34,000' trail/116 acres)**	1,396,000	1,122,000	23,000
11. Buckley Parkway	3-5 yrs.	150' wide strip through Section 16 then along roadway corridor with 12' wide paved trail, 2 tunnels.**(20,000 lf/14 acres)**	168,000	1,800,000	14,000
12. Box Elder Ck. Greenway	10+Yrs.	Preserve 150' wide floodway plus 450' net fringe for total of 600'. No trail. **(12,000 lf/165 acres)**	909,000	396,000	26,000
13. Greenway Links	3-5 yrs.	Paved trails linking neighborhoods, parks and schools to system 50' -wide greenway on average. 4 tunnels. **(Totals 66,000lf/48 acres)**	900,000	6,220,000	46,000
14. South Platte River Greenway	3-10yrs.	Floodplain lands along South Platte. Trail by others. Some land held privately **(800 net acres to acquire)**	3,200,000	000.00	80,000
15. Highway 2 Trail	10+ yrs.	50' wide strip on side of roadway with 12'-wide paved trail. 2 trail heads. **(44,000 lf/50acres)**	600,000	3,140,000	36,000
		Sub-Totals:	**$20,700,000**	**$45,586,000**	**$617,000**
				Total Development Cost for Greenways and Trails: $ 66,286,000	
16. Multi-Use Roadside Pathways	3-10+ yrs	Includes 12'-wide trail along edge of key regional/principle arterials, and 1 minor arterial (112th) **(192,000 lf) (See also 104th Ave. utility line route from Hwy 2 to Himalaya St.)**	000.00	13,440,000	134,000
		Totals:	**$20,700,000**	**$59,026,000**	**$751,000**
				Grand Total Development Cost for Greenways, Trails and Roadside Pathways: $ 79,726,000	

Phasing Scheme and Schedule of Projects

The *Commerce City Community Development Department* estimates *build-out* of the Northern Range within the *DRCOG Urban Growth Area Boun*dary (generally the area between the South Platte River, Brighton and DIA) over the next 20-30 years. The projected flow of funding for park, greenway and trail improvements roughly follows the same schedule.

This suggests the need for a strategic phasing plan to bring projects on-line at a pace coordinated with development. It is important facilities are available to new residents, and open space and trail right-of-way opportunities are not lost. Based on this and other factors, several important criteria to guide project phasing can be identified.

- Availability of funds, resources or regulatory tools to complete in 5-yr timeframe.
- Critical properties, natural resources and rights of way.
- Traverses critical barriers such as highways and railroads.
- High visibility, usable projects, with broad community benefit.
- Demonstrates the plan's vision.
- Forms a vital link or spine of a larger system or network.
- Takes advantage of special funding, land acquisition or partnering opportunities.

Special emphasis is placed on traversing critical barriers such as highways, overpasses, railroads, and drainages to promote safety and convenience of non-motorized users. By planning ahead significant dollars as well as injury and loss of life due to pedestrian and bicycle/traffic conflicts can be avoided. Using these criteria, the following projects are recommended for implementation over the next one to five years:

Table 4.5: Five-Year Project Phasing Strategy

Project	**Strategy**
General Land and Right-of -Way Acquisition	Acquire wherever possible
Secure *O'Brian Canal* Right of Way	Immediately
Traverse critical barriers	**Immediately**
Develop *O'Brian Canal Trail*	Over 1-3 years
Develop *Legacy Pavilion Trailhead*	Over 1-2 years
Develop West segment of Arsenal Trail/ Pavilion to O'Brian Canal	Over 1-3 years
Acquire land for *1st Creek Park*/Detention /Wetland Area	Immediately
Acquire land for *Buffalo Run Park*/Detention /Wetland Area	Immediately
Acquire land for Buckley Community Park	Immediately
Develop 56th Ave. segment of Arsenal Trail	Over 1-2 years
Acquire land for 2nd Creek corridor open space	Over 1-4 years
Develop *2nd Creek Trail* to E-470	Over 2-5 years
Develop *E-470 Trail*	Over 2-5 years

Building and Maintaining Long-Term Community Support

Solid community support for the project is critical. Citizens must not only be inspired by the plan, but also embrace it over the long term since it may take two generations to implement. Addition-ally, much of the proposed work is in areas currently unpopulated.

Clearly, Commerce City residents need to be kept informed, involved and realize a direct benefit to them and their neighborhoods. This can be accomplished by:

- having an effective public information program including clear, easy-to-read reports, brochures, posters, and progress presentations;
- prioritizing projects that will benefit all City residents and provide linkage to the Northern Range, such as *Prairie Legacy Park, the Arsenal Perimeter Trail, The O'Brian Canal Trail, 1st C*reek Community Park and *The Highway 2 Trail;*
- immediately moving forward with pilot projects that demonstrate the Prairieways concept as well as completing and dedicating additional projects or project elements year by year; and
- having a quality management and maintenance program that includes an effective citizen and use feedback mechanism to provide a responsive ear for each user concern.

Leadership to Champion the Plan

The *human factor* will be vital to the success of this plan. This means sustained leadership by staff, elected officials and especially the community. This requires an effective and enduring organizational structure and process. Key functional areas include:

- **review and follow-up action** for all proposed private and public land development projects to assure compliance with the plan;
- **building and maintaining effective partnerships** among all key agencies, jurisdictions and stakeholders to coordinate actions and optimize use of resources;
- **overseeing and coordinating implementation activities** such as land acquisition, fundraising, design, construction, and maintenance of facilities.
- **garnering resources and funds** necessary to implement the plan.

Review and Follow-Up Action

A consistent effective review process is essential to the success of this plan. All private and pubic sector development projects proposed in the study area or affecting the study area should undergo this review process. Commerce City Parks and Recreation Department should document findings, decisions, and agreements affecting this plan and its implementation both in written form and digitally in the plan database that is maintained. The review process has the following key steps.

1. Plan and Proposal Introduction

- Referral from Community Development Department or direct from applicable agency or interested party.
- Parks Department caseworker assigned.
- Case file created in database.
- Other City agencies notified by Parks Department.
- Developer or agency given process outline and checklist.
- Developer receives copy of plan and printout and/or digital copy of applicable *Atlas* pages.
- Developer provides an oral or written schematic of project plans.
- Parks and Open Space Advisory Committees briefed.
- Regional partners and stakeholders briefed.

2. Schematic Site Development Plan

- Developer or agency presents schematic plan showing proposed park sites, trails, sensitive areas auto and pedestrian circulation, and open space areas.
- Developer provides copy of draft design guidelines if applicable.
- Parks Department provides review and comment and logs proceedings.
- Parks Department provides a written response to developer within in a timely manner.

3. Revision and Recommended Plan

- Developer or agency submits revised schematic plan and presents it to Parks Department and other stakeholders.
- Parks and Open Space Advisory Committees are briefed.
- If approved, plan is forwarded to Community Development Department with recommendation of support.

4. City Approval Process

- Plan moves forward according to city approval process.
- *Action Plan* and *Atlas* are updated accordingly to reflect any revisions.
- Regional and partnering stakeholders and agencies are notified of outcome.

5. Follow-up

- Parks and Community Development Caseworkers monitor file and project monthly to verify compliance.
- Coordinate with and update regional partners.

BUILDING AND MAINTAINING EFFECTIVE PARTNERSHIPS

Coordination between Commerce City and other key jurisdictions and stakeholders will help ensure the success of the *Prairieways Action Plan* by optimizing funds and resources, strengthening the position of all the partners in securing grants, and promoting policies and programs that support the plan. Coordination will also help promote an integrated system of trails and open space corridors that transcend jurisdictional lines. Some of the key jurisdictions and stakeholders include:

- Adams County (Parks and Planning)
- Adams County School District 14
- Barr Lake State Park
- Brighton School District 27J
- City of Aurora (Parks and Planning)
- City of Brighton (Parks and Planning)
- City of Denver (Parks, Planning, Transportation)
- Colorado Division of Wildlife
- Colorado Department of Transportation
- Colorado State Land Board
- Commerce City Community Development
- Commerce City Public Works
- Denver Metro Wastewater Reclamation
- Denver Regional Council of Governments
- Denver Water
- E-470 Authority
- Farmers Reservoir & Irrigation (FRICO)
- Rocky Mountain Arsenal NWR
- Rocky Mountain Arsenal Remediation Office
- Sand Creek Regional Greenway
- Stapleton Development Corporation
- Urban Drainage and Flood Control District
- U.S. Army (Rocky Mountain Arsenal)
- U.S. Army Corps of Engineers (404 Permits)
- U.S. Natural Resources Conservation Service
- U.S. Fish and Wildlife Service
- U.S. Environmental Protection Agency

Most of the entities listed above began meeting in 1997 in an effort to promote coordination and effective implementation of trails, open space and other common objectives. Known as the *Trails and Open Space Sub-Committee of the Win-Win Forum,* and facilitated by the *Rocky Mountain Arsenal National Wildlife Refuge*, the group has met regularly to develop a northeast metro regional concept map and roster of projects.

It is strongly recommended that Commerce City continue its participation and leadership role with the *Win-Win Forum.* It is also recommended that the *Trails and Open Space Sub-Committee* continue to meet on a quarterly basis to facilitate communications and mutual actions to implement the trails and open space concept and project roster. The group should also pursue an adopted *Proclamation of Endorsement and Support* for the concept plan and project roster signed by the agency heads, city councils and boards of the member agencies and jurisdictions.

Commerce City should work with the other partners to assure on-going availability of staff services and resources needed to coordinate the effort. This might be done through a rotating "staff coordinator" position provided by the various staff representatives of participating agencies. Commerce City should also work and communicate regularly with the appropriate individual partners such as *Adams County Parks, Brighton School District 27J, FRICO* and the *Rocky Mountain Arsenal National Wildlife Refuge* as needs and opportunities dictate.

OVERSEEING AND COORDINATING PROJECTS

Given the thousands of acres of land and millions of dollars of construction anticipated, effective and coordinated project management will be essential. Tasks will include land acquisition negotiation, appraisals, surveys, environmental evaluations, legal services, engineering, design, fundraising, bidding, project management and myriad other tasks necessary to carry out what will be a major public works project.

Commerce City needs a management organization to coordinate this effort and also needs to recruit the specialized expertise required. To accomplish this, the Parks Department should designate a special project manager assigned to overseeing the effort. In addition, the City may want to appoint a special citizen's committee to oversee the effort. This group may also want to incorporate as a non-profit under *Sec. 501(c)(3)* of the *Internal Revenue Code*.

Alternatively, the City may want to designate the non-profit as the development authority to act on the City's behalf. The non-profit would hire their own staff or contract with a development consultant to implement projects. All major actions, however, would still be subject to *Parks Department, Parks Board* and *City Council* approval and the non-profit would coordinate regularly with the designated *Parks Department* and *Community Development Department* staff representatives.

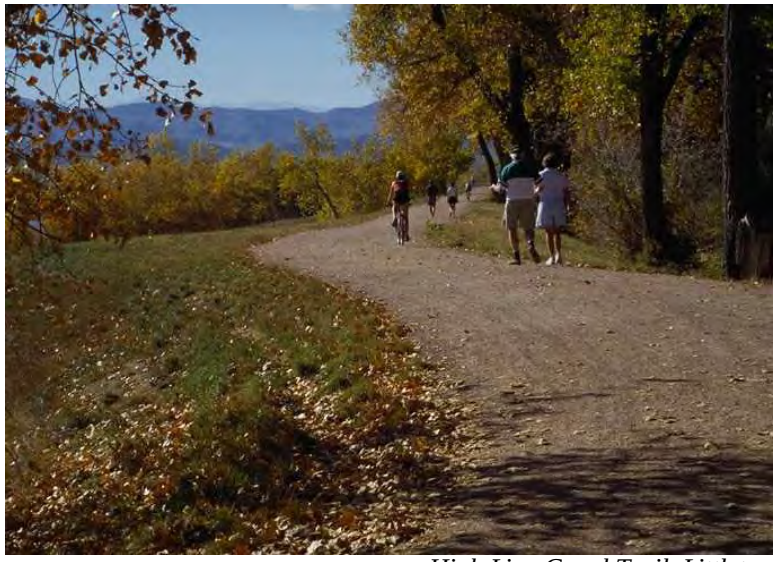
GARNERING RESOURCES AND FUNDS (Implementation Mechanisms)

There are a number of programs, regulatory devices, incentives and other tools available to Commerce City to aid in the implementation of parks,

greenways, open space and trails. Each has its relative advantages and disadvantages. As a general rule, it is preferable to use mechanisms that are based on incentive rather than regulation although some regulation may be necessary, appropriate and even positively received by both private and public land developers.

Ideally, most needed open space can be negotiated with property developers as part of the subdivision and planned unit development process. Hopefully, most open space will remain in private hands such as homeowner associations, although accessible to the general public where open space is part of regional trail and greenway systems.

Following are some current tools that should be regularly reviewed and updated by the City.



High Line Canal Trail, Littleton

Policy and Regulatory Mechanisms

EXISTING COMMERCE CITY POLICIES AND REGULATIONS

Note: *Recent court decisions have reexamined the circumstances under which property owners can be required to transfer land or fees to local government without monetary compensation. For example in July, 1994, the U.S. Supreme Court, in the case of Dolan v Tigard, stated that there must be a direct and "roughly proportionate" relationship between the reason for the exaction of property and what is being exacted that is tied to the impact of the new development.*

The implication of this for Commerce City is the need for an adopted comprehensive plan element that addresses a comprehensive system of open space corridors, trails and parks that affords benefits of flood hazard reduction, transportation, recreation and other benefits that proportionally mitigate the impact of development. This plan helps to draw that connection.

1. SUBDIVISION REGULATIONS

Description and Applicability

The Subdivision Regulations require developers to submit plans for review and approval. The plans must meet certain engineering criteria as stipulated in the City zoning ordinance and municipal codes.

The City can require that land unsuitable for development due to flooding, improper drainage, steep slopes, unsuitable soil conditions, utility rights of way and other conditions that may be harmful to public safety, health and general welfare may not be developed unless adequate methods are formulated and approved by the City. Furthermore, the city may withhold approval of the subdivision if it is determined that increased stormwater runoff may overload existing downstream drainage facilities.

In addition, developers are required to dedicate land for parks, open space and recreational facilities or make cash-in-lieu-of-land dedication and pay fees for park and recreation facilities. The developer is also required to make certain street and sidewalk improvements. At the time of plan publication, there was no provision for funding of land or construction for schools.

Dedication requirements are as follows:

- For local private/homeowners association park and recreation facilities, the developer must provide land equal to 3% times the square feet of usable residential land;
- For public regional parks, community parks, trails and recreation facilities, the developer is required to share in the cost of providing facilities at a set rate per square foot of usable land. Note that the fee

requirement may be adjusted based on the actual fair market value of the land.

- The City can also require that the developer provide easements of sufficient widths for pedestrian access from streets to schools, parks, playgrounds or other nearby streets.

See *Subdivision Regulations for the City of Commerce City* (Ord. No. 1246 and Resolution 98-25 adopted 9-14-98)

Advantages
For residential areas, this requirement can potentially generate 13 acres per developed square mile for local parks and funds for community and neighborhood parks, open space and trails. Commerce City Community Development Department estimates 70% useable land for residential and 85% useable land for commercial per square mile against which a fee can be assessed per square foot.

Disadvantages or Deficiencies:
At current estimated land values ($12,000 per acre) and estimated neighborhood park development costs of $1 million each, the fee requirement will fall slightly short of funding neighborhood parks, leaving little or no funding to acquire open space or develop trails.
Funding does not cover maintenance costs.

2. EXISTING FLOODPLAIN OVERLAY DISTRICT—COMMERCE CITY ZONING ORDINANCE

Description and Applicability
Article XXIV .FP of the Commerce City Zoning Ordinance provides for a *floodplain overlay district*. This applies to floodplain lands either identified by the *Federal Emergency Management Agency (FEMA)* or reports prepared by the *Urban Drainage and Flood Control District*. The measure requires that all structures or land modifications in the overlay district comply with terms of the article. Specifically, a permit is required before any construction can take place in the overlay district. Any encroachment floodway is prohibited unless a licensed professional engineer or architect can demonstrate that encroachment will not increase the flood level of the 100-year flood by more than one foot in the floodway fringe and result in no flood level increase in the floodway.

Advantages
By restricting development in the floodway and floodway fringe, the city imposes a strong incentive on developers to dedicate and maintain these areas as open space or parks at no cost.

Disadvantages or Deficiencies
The developer still has the option of narrowing or channelizing the stream corridor if design criteria are met, although this may be more costly than setting it aside as open space.

Allowing the developer to raise the 100-year flood level in the floodway fringe by one foot may tend to promote a narrower open space corridor. Some communities restrict flood level increase in the floodway fringe to 0 feet or ½ foot.

The ordinance does not provide for a buffer zone or setback that would help preserve the integrity of the flood plain, protect wildlife habitat and filter run-off water.

3. EXISTING COMMERCE CITY ENGINEERING REGULATIONS—DEPARTMENT OF PUBLIC WORKS

Description and Applicability
The City Engineer has authority to impose certain engineering restrictions and requirements on private and public development. At the time of publication of this plan, draft *Roadway and Parking Details* and *Typical Street Sections* were being considered for inclusion in the Engineering Regulations. Among other requirements, these standards provide for sidewalks, and bike paths along arterial, collector and local streets.

Advantages
The City may have authority to require developers to provide for sidewalks, trails, landscaped medians and adequate roadway design for on-street bicycles.

Disadvantages or Deficiencies
It may be difficult to build consistent continuous trails along road corridors since different segments will develop at different times. It may be difficult at times to allocate costs to developers.

4. BUFFER/TRANSITION ZONES (Not Currently in Commerce City Code)

Description and Applicability
Buffer zones requires the developer to dedicate open space and/or setbacks along the edges of stream corridors, wetlands, and other places where potentially incompatible land use may abut. The goals may include preserving water quality, protecting groundwater discharge, attenuating stormwater runoff and other general health, safety and welfare benefits. Care must be taken, however, to avoid unreasonable requirements or destroying the value of a property without compensation. A number of communities in Colorado have buffer zone requirements along steam corridors including Eagle, Pitkin and Summit Counties and the City of Durango.

Advantages
This is an effective way to preserve water quality that reduces flood damage and provides open space corridors.

Disadvantages or Deficiencies
This may be interpreted as a "taking" if not carefully tied to development impacts and health, safety and welfare benefits.

5. CONSERVATION SUBDIVISION PROVISIONS (Not Currently in Commerce City Code)

Description and Applicability
The plan encourages developer to plan the property with an emphasis on preserving the natural and cultural resources of the site. The developer is also given the flexibility to "cluster lots" on land more suitable for building in order to set aside more sensitive areas such as floodplains and floodplain buffer areas for open space. The open space might be held by a non-profit land trust controlled by the homeowners affording certain tax benefits. Under such a program the City may provide technical assistance as well as certain incentives such as reduced application fees, increased density bonuses, and speedy application review.

Douglas County offers a similar program called a Design Enhancement Overlay Process where a 10% lot bonus is granted to developers who keep 40% of their land in open space and a 20% bonus for those who keep at least 50% of the land in open space.

Advantages
It is a low cost way to preserve and maintain open space and provides marketing and sales advantages to developers. There is also value appreciation.

Disadvantages or Deficiencies
There may be limitations from market conditions such as minimum salable lot sizes.

6. WATERSHED PROTECTION AND STORM DRAINAGE IMPACT FEES (Not Currently in Commerce City Code)

Description and Applicability
This provides for an impact fee based on the square footage of impervious surfaces such as created by roads or rooftops. The funds are earmarked for storm drainage facilities including acquisition of open space (including stream corridors, wetlands and ponds) for stormwater storage and conveyance.

Advantages
It provides a way to equitably fund the acquisition of open space for regional detention facilities, floodplain and buffer zone preservation.

Disadvantages or Deficiencies
It may be perceived as an additional tax and be resisted especially by those not in floodplains.

7. DEDICATION/DENSITY TRANSFERS (Not Currently in Commerce City Code)

Description and Applicability
It allows the dedication of greenway corridors or open space by the transfer of density to other portions of the property or to contiguous land that is part of a common development plan. The greenway or open space may be deeded to the City or owned and maintained by a property owners

association. While the overall density of the development remains the same, development may be clustered onto smaller lots or by other means.

Advantages
The same numbers of development units are allowed while preserving open space or conservation values.

Disadvantages or Deficiencies
Smaller lot size may not be suitable to all markets.

8. TRANSFERABLE DEVELOPMENT CREDITS (Not Currently In Commerce City Code)

Description and Applicability
This allows property owners to sell development rights under current zoning. These rights may be purchased and used in designated receiving areas where the densities can be better accommodated with less impact on floodplains, agricultural lands or natural resources.

Advantage:
It has potential as a land conservation tool with relatively low cost to the City and potential benefits to developers.

Disadvantages or Deficiencies:
If underlying zoning allows developers to meet market demands without zoning changes, it is not generally effective.

REGIONAL AND STATE POLICIES AND REGULATIONS

1. URBAN DRAINAGE AND FLOOD CONTROL DISTRICT (UDFCD)

Description and Applicability
UDFCD is a metro-wide stormwater management and coordinating agency funded by property taxes. While UDFCD does not have regulatory authority per se, it does provide planning and engineering services as well as funding for drainage and flood control projects, including regional detention facilities, stream channel work and acquisition of floodplain lands. Pplease see also "Potential Funding Sources".

While UDFCD does not have regulatory authority, it does have significant clout through its funding policies including the requirement that funded projects conform to adopted UDFCD planning and design standards.

Advantages
It may be an influential factor in persuading public and private land developers to conform to design standards including acquisition and protection of floodplains as open space and the creation of lakes and wetlands to serve as regional detention basins.

Disadvantages or Deficiencies
There is no direct regulatory authority and fund are limited.

2. CONSERVATION EASEMENT TAX CREDIT PROGRAM

Description and Applicability
In 1999, the Colorado Legislature passed a bill permitting landowners, who forgo development and gift to a land trust or public agency the development rights on their property, the right to receive up to a $100,000 tax credit. The credit can be spread over a period of up to 20 years.

Advantages
Some landowners may be encouraged to protect properties as open space.

Disadvantages or Deficiencies
It applies only to the value of lost development potential for conservation purposes—the value of the conservation easement granted. It would only be significant with at least $100,000 worth of development potential. There would be associated legal and administrative costs to either the landowner or recipient of the granted conservation easement.

3. COLORADO NATURAL AREAS PROGRAM (CNAP) AND STATE WILDLIFE CONSERVATION EASEMENTS

Description and Applicability
Through the Colorado Division of Wildlife, this program helps private landowners and public land agencies identify and protect land with special wildlife habitat values. Protection is through voluntary cooperative agreements. Small grants are sometimes available. The Division of Wildlife can also acquire wildlife conservation easements.

Advantages
Some landowners may be encouraged to protect properties. Some funding is available through the Cooperative Habitat Improvement Program (CHIP) to make improvements on private property such as wetland creation.

Disadvantages or Deficiencies
There is no regulatory authority. Special wildlife values need to be identified.

4. STATE LAND TRUST FISH AND WILDLIFE ENHANCEMENT PROJECTS

Description and Applicability
The State Land Board controls approximately 3 million acres of land statewide include Section 36, located near Barr Lake State Park in the plan study area. Under a memorandum of agreement with the Colorado Division of Wildlife certain properties may be managed for wildlife benefits. Section 36 has been considered for wildlife management although not so designated.

Advantages
There may be a way to preserve the integrity of this parcel and also offer a potential trail right of way.

Disadvantages or Deficiencies
Parcel 36 has not been designated for wildlife-related uses as of publication of this plan.

5. COLORADO MINED LAND RECLAMATION ACT

Description and Applicability
This act regulates mining permits statewide. Permitting addresses mining as well as reclamation after mining is completed. Through the permitting process, Commerce City and its partners may have some say in the disposition of mine sites including gravel mines along the Platte River corridor and elsewhere.

Advantages
It affords an opportunity to work with mine owners to promote open space and wildlife habitat. A good example is the reclamation of the South Platte Park in Littleton by Cooley Gravel Company.

Disadvantages or Deficiencies
Regulatory authority may be limited.

6. WATER SOURCE PROTECTION

Description and Applicability
Under Colorado Law, municipalities have the power to maintain and protect water sources within and outside their jurisdictional boundaries. This could include the creation of open space buffer zones to protect water quality.

Advantages
Under some circumstances, this might enable Brighton, Commerce City or Adams County to protect buffer zones or other open spaces where water sources, such as Brighton's ground water source, might be affected.

Disadvantages or Deficiencies
There would need to be a clear tie to water source protection. Property owners may still need to be compensated.

FEDERAL POLICIES AND REGULATIONS

1. SECTION 404 OF THE CLEAN WATER ACT AND THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

Description and Applicability
This is probably the most powerful and effective non-local regulatory tool. Under Section 404, permits are required when a project will disturb more than one acre of wetland. Related programs such as the *Wetlands Reserve Program* and *Conservation Reserve Program* promote the preservation of wetlands on agricultural properties.

NPDES aims to reduce degradation of water quality from "non-point" sources such as soil erosion or parking lot run off. Commerce City is required to submit a plan in the year 2003 showing how it will achieve clean water objectives. Open space and buffer zones, especially along streams may be one important technique.

Advantages
It may help protect floodplain and wetland areas and may also help promote creation of wetlands and open space buffer zones as mitigation. (See "mitigation banking" below). NPDES may strengthen the justification for requiring developer buffer zones along drainage corridors.

Disadvantages or Deficiencies
Section 404 is limited to areas defined as "jurisdictional waters of the U.S." such as streams, lakes and wetlands.

2. NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Description and Applicability
The Federal government will provide for flood hazard insurance to property owners in communities that meet guidelines set by the Federal Emergency Management Agency (FEMA). This provides a strong incentive for communities to write and enforce floodplain protection ordinances. FEMA has also created a *community rating system* that provides an insurance premium reduction if communities go beyond the minimum requirements.

Advantages
This may provide an incentive for Commerce City and developers to set aside more flood-prone and buffer lands as open space.

Disadvantages or Deficiencies
The program is not mandatory, but communities must be willing to enforce it if they want to be eligible for insurance or insurance at reduced rates.

Buffalo Run Golf Course

3. THE ENDANGERED SPECIES ACT (ESA)

Description and Applicability
The ESA is designed to protect the wrongful killing or injury of wildlife. Court decisions have also broadened this interpretation to include the protection of wildlife habitat and movement routes under certain conditions, including potential impact on federally listed threatened or endangered species. If the presence or potential of listed species is indicated, private and public land developers are obliged to prepare critical habitat and recovery plans for any identified listed species. If the U.S. Fish and Wildlife Service accept plans, a permit may be issued to alter habitat and possibly impact some listed wildlife. If no permit is issued, than penalties may be imposed or legal action by citizens upheld in court with substantial damage settlements.

Advantages
Certain areas may be protected if listed species are identified. A potential source of mitigation funds could be provided as a result of a penalty or lawsuit settlement.

Disadvantages or Deficiencies
At the time of publication significant habitat for listed species has not been identified in the study area.

4. NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

Description and Applicability
Where projects are undertaken, funded, or in some cases permitted by the Federal government, an evaluation of the project must be undertaken. In some cases, mitigation may be required

Advantages
Land and water may be protected from damage by a federally- funded project such as an airport improvement or highway. Wetlands or open space might be provided as mitigation.

Disadvantages or Deficiencies
Applicability is limited to federally funded projects.

LAND ACQUISITION AND MANAGEMENT MECHANISMS

These mechanisms apply to the direct acquisition of property or property rights for park, open space, greenway or trail purposes.

Note: Colorado has Recreational Use Statute (RUS) (Sec.33-41-101 thru – 105, C.R.S.) meaning that the liability of property owners and adjacent property owners who grant right of way for recreational purposed is limited. The RUS also has language limiting liability of Canal and Irrigation companies who grant recreational rights of way. Note that some grantors may require additional insurance to protect beyond limits of government coverage.

1. FEE SIMPLE PURCHASE

Description and Applicability
The City buys the property outright including the entire "bundle" of rights. The City might lease back the land to the owner for agricultural purposes or another compatible use with certain restrictions.

Advantages
This is a simple and effective way to conserve land.

Disadvantages or Deficiencies
Acquisition can be expensive and the City will have a land management/maintenance obligation as well as legal liabilities.

Examples include the right for a trail to pass through a State Highway right of way or along an irrigation ditch.

2. EASEMENTS

Description and Applicability
Easements are a conveyance of certain, but not all, rights associated with a property. Several types of easements may be applicable here including: **public access (**i.e. for trails**); conservation** (to protect natural resources, floodplain or water quality values); and **preservation easements** (to protect historic integrity or values of a property) or combinations thereof. Many easements may allow the owner to continue his use of the property for compatible purposes such as farming and some easements may allow the owner to restrict public access. In some cases, the City may simply purchase the development rights

Advantages
This is a less costly way to acquire property, with little or no management burden on the City. Property may remain in productive use and on the tax roles at a reduced value.

Disadvantages or Deficiencies
Public access may be limited or excluded. City has limited rights with respect to use and disposal of the property.

3. DONATION/BARGAIN SALE/TAX INCENTIVES

Description and Applicability
A willing property owner conveys the property or interest in property as a charitable contribution or at a less than fair market value price (bargain sale). The donor may be eligible for federal, state and local tax deductions and may be able to avoid inheritance taxes, capital gains or recurring property taxes. In some cases, the owner may donate a future interest in the land or retain a life tenancy allowing the donor to remain on the property, use the property, or take income from the property for the remainder of their life or lives.

Advantages
City has a reduced cost for acquisition. Action may promote others to do the same.

Disadvantages or Deficiencies
City still has management costs.

4. OPTION, LEASE/ OPTION OR FIRST RIGHT OF REFUSAL

Description and Applicability:
The City negotiates an agreement with the owner to secure the right to acquire the property in the future. This protects the land in the short term until funds are found to make the purchase. Variations on this might include transaction through a third party such as a land conservancy or The Trust for Public Lands, where
the third party buys and holds the land on the City's behalf. The city might make rent payments or installment payments on the property over an extended period of time.

Advantages
This allows protection of key properties until the City has adequate funds.

Disadvantages or Deficiencies

The City will need to make multi-year funding commitments.

5. License or Revocable Permit

Description and Applicability
A property owner grants the right to use the property (usually a trail right of way) for a period or years (usually 25 yrs. or more). In the case of a revocable permit, the grantor may terminate the right of use or access under certain conditions. Examples include the right for a trail to pass through a State Highway right of way or through a property where the owner is hesitant to grant permanent access.

Advantages
This is a low-cost flexible tool that can be quickly expedited.

Disadvantages or Deficiencies
This is a temporary solution. Right-of-way may be revoked.

6. Cooperative and Partnership Land Management Mechanisms

Description and Applicability
Certain public agencies may choose to cooperate and partner in the pursuit of mutual land management benefits. Examples include the DIA airport buffer zone, The State Land Board regarding Section 36, The Farmers Reservoir and Irrigation Company (FRICO), the Metropolitan Wastewater Reclamation District, the *General Improvement District* (GID) and others. Under this scenario, public land managers agree to manage the land for multiple objectives such as conservation, land treatment of wastewater, wetland banking, joint use recreational/ maintenance trails and water quality benefits. These might be implemented through short and long term intergovernmental agreements.

Advantages
This is a very low cost way to preserve open space and provide trail rights of way.

Disadvantages or Deficiencies:
It is generally limited to public and quasi-public lands.

7. Condemnation

Description and Applicability
Under certain circumstances that the City may need to take property through its powers of eminent domain. This may be a forceful taking or a "friendly condemnation" where eminent domain may resolve difficult legal problems for both sides. It should seldom be used with an unwilling property owner and only when the need for the property is critical and all reasonable efforts to negotiate a settlement with the owner have been exhausted.

Advantages
Friendly condemnation may resolve complex legal issues such as multiple heirs for some owners.

Disadvantages or Deficiencies
This may result in high legal costs and promote widespread ill-will toward the City and the plan. Some fundors such as GO Colorado will not fund properties acquired through condemnation or threat of condemnation.

Potential Funding Sources

A number of potential funding sources are available for the projects proposed in this plan. While by no means all-inclusive, the following sources offer the greatest potential for cash and in-kind resources.

Local Funds

1. Developer Dedications, Fees in Lieu

Description
Per Commerce City Subdivision Ordinance (please see "policy and regulatory measures" above).

Likely Annual Amount For This Project
$ 500,000 to $ 1,000,000 or more depending on the rate of development..

Limitations or Restrictions
Some fees and land dedications may be tied to specific subdivision sites.

2. BOND REFERENDA FOR PARKS, TRAILS AND GREENWAYS

Description
Funds are borrowed through the issuing of bonds. Source of repayment could be sales taxes, property taxes or other anticipated revenues. This might either be done City-wide or through special improvement districts

Likely Annual Amoun:
$ 10 million for Legacy Park and Pavilion

Limitations or Restrictions
Currently Commerce City is limited to about $10 Million in capacity for sales tax funded bonds and first priority for these funds is Legacy Park and Pavilion at 64th and Quebec Street. Most of the electorate lives outside the Northern Range planning area and is unlikely to fund park trail and greenway improvements outside the older, more developed part of the city.

3. GENERAL FUNDS

Description
Includes appropriations of funds by City Council in the capital improvement budget from general revenues and from annual Conservation Trust Fund payments to Commerce City.

Likely Annual Amount
$ 50,000 to $ 100,000

Limitations or Restrictions
It competes with other City needs and demands especially in the developed part of the City.

4. IN-KIND RESOURCES

Description:
There is use of city labor and equipment to build projects.

Likely Annual Amount
$25,000 to $100,000

Limitations or Restrictions
This is based on availability of personnel and equipment.

REGIONAL AND STATE FUNDS

1. GO COLORADO LEGACY PROGRAM

Description
The Legacy Program makes substantial grants for project of statewide or regional significance. Historically, grants have ranged from $1 Million to $10 Million.

Likely Annual Amount
$2.5 to $5 million every 10 years—not an annual program.

Limitations or Restrictions:
Project must be of statewide or regional interest and it must compete with many other projects statewide. Property cannot be condemned and the project will likely require a local match.

2. GO COLORADO STATE TRAILS PROGRAM

Description
Funding for trails and trail facilities

Likely Annual Amount
$50,000 to $150,000

Limitations or Restrictions
The project must compete with many other projects statewide. Property cannot be condemned and a local match is required.

3. GO COLORADO OPEN SPACE FUNDS, PARK FUNDS AND PLANNING FUNDS

Description
This is funding for open space, park facilities or planning depending on the specific grant round.

Likely Annual Amount
$50,000 to $150,000

Limitations or Restrictions
There are many other competing projects statewide. Property cannot be condemned and a local match is required.

4. URBAN DRAINAGE AND FLOOD CONTROL DISTRICT FUNDING

Description
This is funding for stormwater management planning, capital improvements and maintenance. Eligible projects include acquisition of land for floodplain preservation and retention/detention.

Likely Annual Amount
$50 to $150,000

Limitations or Restrictions:
Funds must be used for drainage and flood control projects. Competes with other local and regional needs and usually requires a local match.

5. E-470 AUTHORITY FUNDING

Description
The E-470 Corridor concept includes a paved multi-use trail along the highway corridor. While the trail is not currently funded by the E-470 Authority, right of way is available. In addition, E-470 officials have indicated a willingness on the part of the Authority to consider a partnership arrangement where a portion of toll booth revenues would be committed to the retirement of bonds or other trail financing fronted by Commerce City or other communities along the E-470 corridor. The arrangement could yield sufficient funding to cover the cost of the length of the E-470 Corridor through the study area. Part of this corridor would also serve as the *3rd Creek Greenway* trail since the road and creek corridor run parallel to each other.

Likely Annual Amount
$ 3 - $4 Million (This is a one time amount based on estimated cost of the E-470/Third Creek Trail.)

Limitations or Restrictions
This is generally (although not necessarily) limited to the E-470 and 3rd Creek corridors and would require Commerce City to front the necessary dollars to build the trail. Trail would need to meet E-470 design standards.

6. ADAMS COUNTY OPEN LANDS TAX INITIATIVE

Description
In 1999, voters passed sales tax to fund open land projects. The tax will raise $3.5 to $5.2 Million over a 7-year period Countywide. This will hopefully be a very important funding source depending on the amount allocated to Commerce City.

Likely Annual Amount
This could yield $ 500,000 to $ 2 Million for Commerce City annually**.**

Limitations or Restrictions
Allocation formula to Commerce City not yet determined.

FEDERAL FUNDS

1. TRANSPORTATION EQUITY ACT—21ST CENTURY (TEA-21)

Description
A sequel to the ISTEA program, TEA-21 makes funds available for trails, bicycle facilities, and certain environmental and historic preservation improvements. The program pays 80% of the cost with at 20% local match requirement. Funding is expected to be available through 2003.

Likely Annual Amount
$100,000 to $300,000

Limitations or Restrictions
It requires a local match and there is limited flexibility on land acquisition, bidding and construction decisions.

2. MILITARY AND CORRECTIONS IN-KIND RESOURCES

Description
This is the use of military or corrections institution labor and equipment to build projects.

Likely Annual Amount
$25,000 to $100,000

Limitations or Restrictions
Based on availability of personnel and equipment.

3. SETTLEMENTS ON ENVIRONMENTAL LAWSUITS

Description
Proceeds from settlements on lawsuits based on violations of federal laws, often through the Sierra Club, Earth Law or similar organization.

Likely Annual Amount
Not projected.

Limitations or Restrictions
Based on availability funds from settlements.

PRIVATE SECTOR AND ENTREPRENEURIAL FUNDS

1. PHILANTHROPIC AND INDIVIDUAL CONTRIBUTIONS

Description
There are grants from local and national private foundations such as the Gates, Boettcher, and El Pomar Foundations. In some cases wealthy individuals may contribute to a project.

Likely Annual Amount
$50,000 to $100,000

Limitations or Restrictions
This generally requires that match money be raised from private sources. Not likely to get multi-year grants from any single foundation or individual.

2. CORPORATE CONTRIBUTIONS

Description
These are grants of funds or in-kind materials or services by businesses.

Likely Annual Amount
$50,000 to $ 100,000

Limitations or Restrictions
Companies generally will expect a promotional or advertising benefit.

3. ENTREPRENEURIAL PARTNERSHIPS

Description
Entrepreneurial partnerships include special projects such as wetland banks and water storage reservoirs where a business interest has a financial incentive to fund an open space project. It might also include providing fill to the E-470 project that might be generated by digging out pond and wetland sites.

Likely Annual Amount
$50,000 to $100,000

Limitations or Restrictions
It depends upon marketability of the project and the economic scale with larger scale projects of 100 acres or more preferred.

4. VOLUNTEER PROJECTS

Description:
Use of volunteer labor to build trails, plant trees, construct wetlands, park or other improvements. Could include both hand labor and equipment operators.

Likely Annual Amount:
$25,000 to $100,000

Limitations or Restrictions:
Projects need to be suitable for volunteer labor. Significant coordination and funding for infrastructure and materials needed.

The Prairieways Action Plan

Appendix Volume A:
Design Guide For Parks, Trails and Greenways

Commerce City Parks and Recreation Department

Document Under separate Cover

A: Design Guide

The Prairieways Action Plan

Appendix Volume B:
Guidelines for Operations, Maintenance & Stewardship

Commerce City Parks and Recreation

Document Under separate Cover

B: Maintenance

The Prairieways Action Plan

Appendix Volume A:
Design Guide For
Parks, Trails and Greenways

Commerce City Parks and Recreation Department

A: Design Guide

Topics Addressed

Design Components Manual

Note: Material used herein is derived from a number of sources including Urban Edges, Inc. files, DHM Design Corporation files, other relevant planning materials and standards and material authored by Robert Searns and Charles Flink in the Island Press Publication: *Greenways: A Guide to Planning Design and Development.*

I. Park Facilities

General Overview

The parks shown in the *Planning and Management* and *Atlas* section of the *Prairieways Action Plan* are conceptual and intended to show approximate size and location of facilities. Facilities shown in each conceptual park layout, however, illustrate key program elements such as ballfields, picnic areas, play courts, landscaped areas and parking and are to be used as a guide in the actual park design.

Parks should interface *seamlessly* with adjacent schools, trails, open space and surrounding development, whether residential, commercial, industrial or mixed use. Each park should take on the characteristics unique to its individual neighborhood site and should not be standardized. Parks can be the focal point of a neighborhood and should be carefully planned for the people who will use them.

Park Standards and Programming Elements

Specific park programming and design should be developed for each individual park with input from residents, developers, *Park and Recreation Department* staff, *Community Development Department* staff, and interested community groups. Following is a list of park standards and suggested program elements based on the adopted *Commerce City Parks and Recreation Master Plan* and other sources.

COMMUNITY PARKS

Definition and Purpose

Community parks are 80-120 acres and serve multiple neighborhoods with a greater variety of recreational opportunities than neighborhood parks. They can host large community events and may preserve large areas of open space. Community parks often include athletic complexes, court games, large swimming pools, walking paths, preserved natural areas and may include natural features such as wetlands, ponds or creeks. A community park may be adjacent to a middle or high school site with some overlap of uses where appropriate.

Minimum Standards (Please also see *Chapter 2 Planning and Management Standards*)

1. Community parks should have an area of no less than 80 acres.
2. They should be sited to serve at least 4 one-square-mile neighborhoods with a service area radius of approximately one mile preferably adjacent to historic or natural resources.
3. Community parks should have good vehicular access from adjacent arterial or collector streets. The park should be easily accessible by interconnecting trails, greenways and sidewalks.
4. Approximately 50% of the site should be reasonably flat with suitable topography and soils to accommodate field sports such as soccer, baseball and football.
5. Sites should be suitable for year-round use with suitable topography and soils for quality athletic facilities and not prone to erosion.
6. Developed portions of the park (irrigated turf , playfields, playground, parking , hard courts, shelters) must be built above the 10-year floodplain and at least 150 feet from the bank of any

creek. All park development must conform with the Floodplain Ordinance.

7. There should be adequate parking (175 to 300 cars) for the specific program elements, including spaces for people with disabilities, with bike spaces and posts equal to 5% of the number of auto spaces provided.

8. There should be lighting for parking and to accommodate evening uses such as tennis, baseball and football and to ensure the safety and comfort of park users. Lighting should not adversely impact adjacent homes, businesses or thoroughfares.

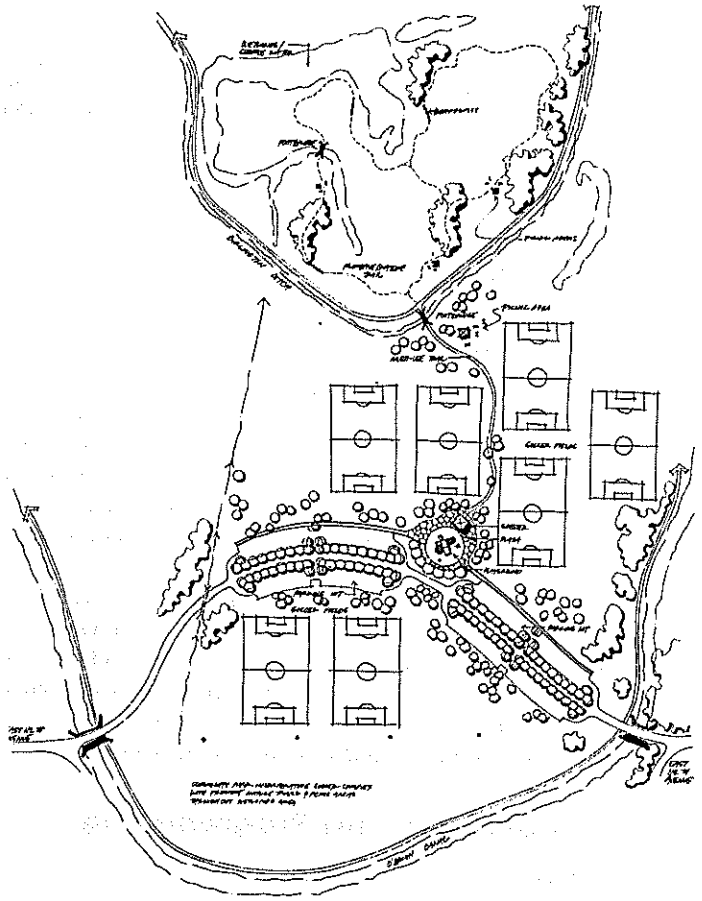
9. Landscaping should provide a balance of screening, shade, color, and texture that creates year-round visual interest and a strong park identity.

10. The park should include loop trails accessing at least 75% of the site and connect to adjacent trails, greenways, and sidewalks.

11. There should be an attractive interface with adjacent development as described previously. Ideally, there should be a 100'-wide landscaped park edge buffer with trees and shrubs along the perimeter of the park with a jogging trail.

Community Park Summary of Program Elements

Active Uses	Passive Uses
▪ Regulation Softball Field	▪ Wooded and Shaded Area
▪ Youth Baseball Field	▪ Informal Picnic Area
▪ Senior Level Baseball Field	▪ Group Picnic Area
▪ Soccer/Football Field	▪ Lakes or Ponds
▪ Racquetball Court	▪ Trails and Pathway System
▪ Tennis Court	▪ Free Play Area on Improved Turf
▪ Recreation Ctr./Swim Pool	▪ Amphitheater
▪ Special Events Area	▪ Riparian and Wetland Area
▪ In Line Skating	▪ Wildlife Habitat Area
▪ Volleyball Court	▪ Education/Interpretive Site
▪ Playground	▪ Permanent Restroom Facility



Typical Community Park with Natural Areas

NEIGHBORHOOD PARKS

Definition and Purpose
Neighborhood parks are at least 20 acres and serve the surrounding neighborhood within an approximate radius of ½ mile. There are facilities for field and court games (including a minimum of 2 graded playfields), playgrounds, picnicking and walking/jogging. The park should be a focal point of the neighborhood. A neighborhood community may be integrated with an elementary, K-8 or middle school site with some overlap of uses where appropriate.

Minimum Standards (Please also see *Chapter 2: Planning and Management Standards*)

1. Neighborhood parks have an area of no less than 20 acres.

2. They are located in residential areas, approximately one per every square mile and where possible and appropriate, adjacent to an elementary or middle school.

3. They are within walking distance of users and have good pedestrian/bicycle access with service on two sides by low volume local streets.

4. Sites must be suitable for year-round use with suitable topography and soils for quality play fields and facilities and not prone to erosion.

5. Developed portions of the park (irrigated turf , playfields, playground, parking , hard courts, shelters) must be built above the 10-year floodplain and at least 150 feet from the bank of any creek. All park development must conform with the Floodplain Ordinance.

6. Parking should be provided for 15 to 20 cars with at least 2 spaces accessible for people with disabilities and at least 4 bike parking spaces with lock-up post. For larger lots, the number of bike spaces and posts must equal 5% of the number of auto spaces provided. School and park parking facilities may overlap and be shared.

7. There should be adequate lighting for evening activities and safety of users, but the lighting must not adversely impact neighbors.

8. Landscaping should provide a balance of screening, shade, color and texture that creates year-round visual interest and a strong park identity.

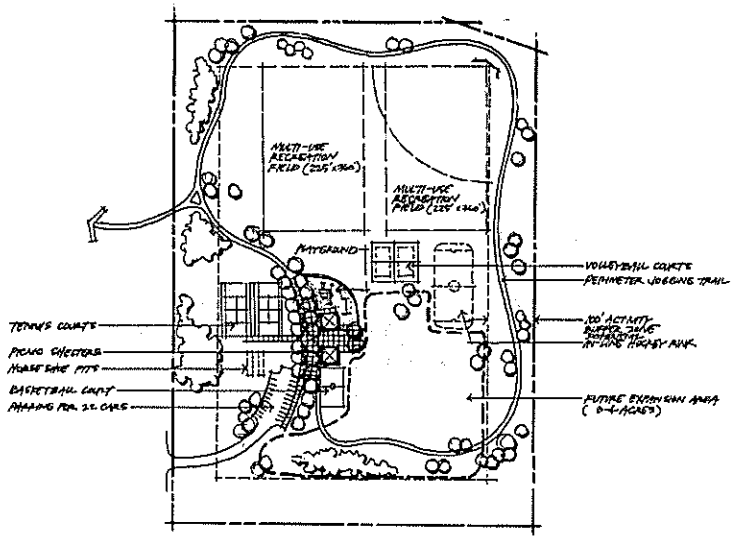
9. Park facilities and activities such as picnic areas, spectator facilities, play equipment, surfacing, court games, walking/jogging paths, drinking fountains and restrooms should be ADA compliant.

10. There should be a balance between active and passive activities based on the needs and desires of the neighborhood with active recreation, informal and unstructured with the exception of some youth teams.

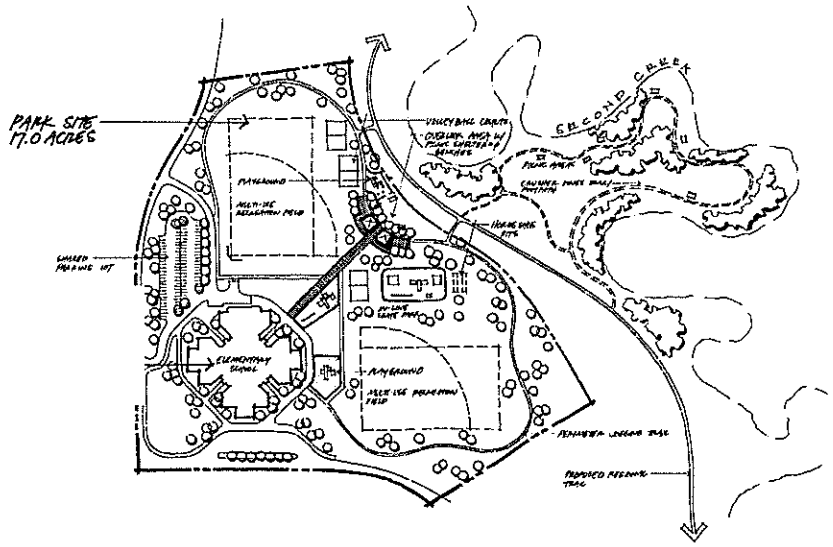
11. There should be an attractive interface with adjacent development, as described previously. Ideally, there should be a 100'-wide landscaped greenbelt with trees and shrubs along the perimeter of the park with a jogging trail.

Neighborhood Park Summary of Program Elements

Active Uses	Passive Uses
▪ Informal Softball Field	▪ Wooded and Shaded Areas
▪ Irrigated Turf Areas	▪ Informal Picnic Tables
▪ Informal Soccer/Football	▪ Picnic Shelters
▪ Basketball Court	▪ Benches
▪ Tennis Court	▪ Pond or Water Feature
▪ Volleyball Court	▪ Loop Trail System
▪ Outdoor Fitness Apparatus	▪ Flower/Vegetable Gardens
▪ Playground Apparatus	▪ Native Landscape Areas
▪ Horseshoe Pits/Shuffleboard	▪ Wildlife Habitat Areas
▪ Chemical Toilet Enclosure	▪ Education/Interpretive Sites



Typical Neighborhood Park



Neighborhood Park with School and Natural Area

POCKET PARKS

Definition and Purpose
Pocket parks are less than 1-2 acres and serve the immediate neighborhood within an approximate radius of ¼th mile. Pocket parks are not owned, managed or maintained by *the Parks Department*. A pocket park generally has graded turf areas, small groves of trees, several benches and landscaping. If appropriate to the surrounding neighborhood, there may be a basketball court, volleyball court and a tot lot. Pocket parks may also be located in a "loop-de-lane" or internal landscaped island on each block (See also *Land Use Guidelines and Design Standards for New Residential And Neighborhood Development* published by the *Commerce City Community Development Department*).

Minimum Standards (Please see *Chapter 2: Planning and Management Standards*)

1. They are located in residential areas with number and location to be determined by the developer.

2. Sites must be suitable for year-round use with suitable topography and soils for quality turf/informal play areas and landscaping and not prone to erosion or frequent flooding.

3. Landscaping should provide a balance of screening, shade, color and texture that creates year-round visual interest and blends with the surrounding properties.

4. Park should be accessible by people with disabilities.

5. The homeowners association must maintain pocket parks.

Pocket Parks Summary of Program Elements

Active Uses	Passive Uses
▪ Irrigated Turf Areas	▪ Tree Groves/Shaded Areas
▪ Basketball Court (if appropriate)	▪ Benches
▪ Volleyball Court (if appropriate)	▪ Landscaped Areas
▪ Tot Lot (if appropriate)	

LANDSCAPING AND FACILITY STANDARDS

Landscaping and facilities are crucial to the identity and overall image of all parks. Landscaping should provide a balance of screening, shade, color and texture. Xeriscape principles (plants and methods that utilize less water) are encouraged. Facilities should be high quality and relatively easy to maintain.

- **Protection of Existing Vegetation**—Protect existing vegetation when possible during construction. Receive approval from the *Parks and Recreation Department* prior to removing any trees. Preserve existing wetlands, floodways, floodplains and riparian zones. Allow creeks to meander as naturally as possible and leave natural vegetated buffer zones in place along creeks. (See following stream cross sections.)

- **Turf**—Sub grade for turf area to smooth and level without lumps or depressions. Roto-till and apply appropriate soil organic material as dictated by site conditions. Sod or grass seed mix to be approved by Parks and Recreation Department, meet industry standards and USDA regulations.

- **Trees**—Tree species selected should be compatible with the microclimate, moisture, exposure and soil type in which they are planted. Avoid planting trees with thorns or fruit near walkways to minimize maintenance and reduce pedestrian conflicts. All trees shall be staked or guyed for a minimum of one year.

- **Shrubs**—Shrubs should be used to provide screening of parking lots and restrooms and can also be used to provide separation of activities and screen undesirable views. Consider park and adjacent property security when selecting shrub varieties and locations. Select species that provide a variety of color and texture that are compatible with site soils, moisture and exposure.

- **Minimum Plant Sizes**—Plant material, when installed, shall meet the following sizes:

  - Deciduous Shade Trees, B&B, 2"-2 ½" minimum caliper;

- Flowering Ornamental Trees, B&B or large container, 1 ½" minimum caliper;
- Evergreen Trees, B&B, 6' minimum height;
- Shrubs, 5 gallon container;
- Perennials/Groundcovers, 2 ¼" pots or 1 gallon container.

- **Mulch**— Mulch shall be approved bark or rock, free of weeds or contaminants. Weed barrier/filter fabric shall be used under all rock mulches.

- **Soil Amendments**— Soil amendments should be used on all irrigated turf areas with slopes less than 3:1 at the rate of 3 cubic yards of organic matter per 1000 square feet. All turf areas of 3:1 or greater slope shall receive 4 cubic yards of organic matter per 1000 square feet.

- **Irrigation**—All turf areas shall be watered by an automatic irrigation system, using equipment approved by *Commerce City Parks and Recreation Department.* All trees and shrubs outside turf areas shall be watered by drip or pop-up spay heads and shall be zoned separately from turf areas. Irrigation must be designed to provide appropriate amounts of water to plants with minimal waste. Rotor heads shall be used for all turf areas greater than 25' in width and pop-up spray heads for areas less than 25' width. Irrigation layout shall provide head-to-head coverage with no over spray on streets or parking areas. Irrigation controllers shall have rain sensors installed to monitor precipitation and help manage water consumption.

- **Structures**—Restrooms shall utilize commercial type, wheelchair accessible chemical toilets in an attractive architectural frame (see illustration).

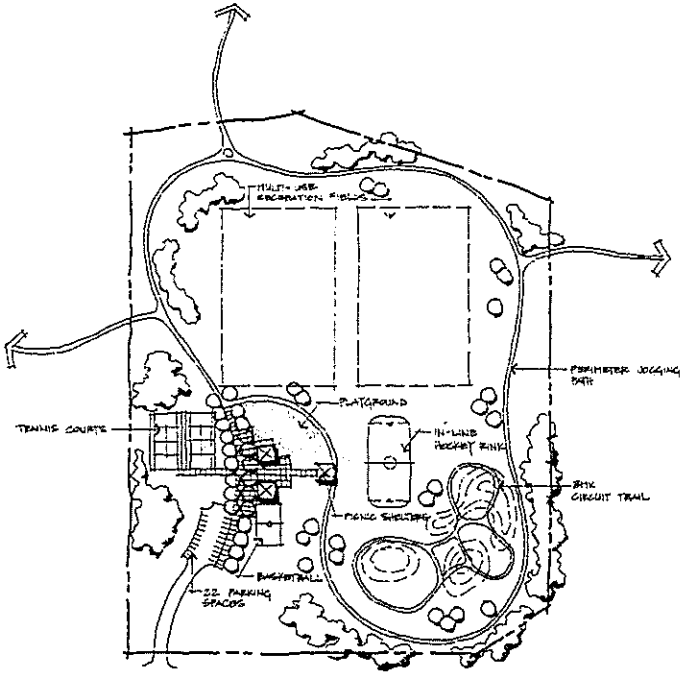
- **Site Furniture/Accessories**—Site furniture and accessories should include heavy-duty commercial grade barbecue grills, trash receptacles (galvanized trash cans or 55 gallon drums will not be allowed), benches and picnic tables. Furniture must be made of metal, expanded wire or recycled materials or as approved by Commerce City Parks and Recreation.

- **Sports Fields**—Field dimensions shall conform to *National Park and Recreation Association* standards and shall be approved by the *Parks and Recreation Department.* All chain link elements such as backstops and fencing must be vinyl coated. Wood fencing, if used, must be jumbo split rail or heavy dimensional post and rail fence type as approved by the *Park and Recreation Department.*

Chemical Toilet Concept (Sized to be Wheelchair Accessible)

- **Play Equipment**—shall be manufactured from durable materials that cannot be easily vandalized, burned or disassembled. Play equipment must be *IPEMA* certified to meet *ASTM* safety standards and *CPSC* guidelines. Wood play equipment will not be allowed. Play equipment shall be accessible in conformance with *Americans with Disabilities Act (ADA)* standards. Play surface material shall be soft to cushion falls but cohesive such as rubber mating, vitro turf or *Fibar*™ type products. Gravel or granular materials are not acceptable.

- **Signage**—Park identification, informational and rules and regulation signage shall be consistent with all Commerce City park facilities and *Park and Recreation Department* specifications and details. Signage materials shall be standardized, durable and easy to maintain.



Neighborhood Park with BMX Track and In-Line Skating

II. Open Space/Land Stewardship

(Please also see *Chapter 2: Planning and Management Standards*)

Open Space Widths, Shapes, and Connections

Urban open space serves several important functions including:

- providing core reserves for wildlife and wetlands;
- providing space to store and cleanse storm run-off;
- providing aquifer recharge zones to replenish ground water;
- providing visual relief and definition of community edges;
- providing routes of wildlife movement;
- providing space for recreation such as trails and outdoor education.

To function effectively open space must be of adequate width, shape and configuration. Generally, width should be 600' on average along creeks and include both the floodway and the 100- year floodplain. This corridor may be considerably wider along rivers such as the South Platte to accommodate floodplains, meanders and other river-related functions. Along canals, the width should be 200'-300'on average including the width of the canal itself. Open space should also include buffering 100'-150' around core reserves, wetlands, lakes and significant ponds.

Visually, it takes 250' to 1000' of width to create a true sense of natural space depending on the density of vegetation. In addition, width should be adequate to allow the establishment of naturally functioning plant communities. Otherwise, managed park-like landscaping will be required to control weeds and provide an attractive appearance. Shapes of open space should conform to natural characteristics and functions such as topography, floodplains, vegetation and wildlife habitat, and visual features.

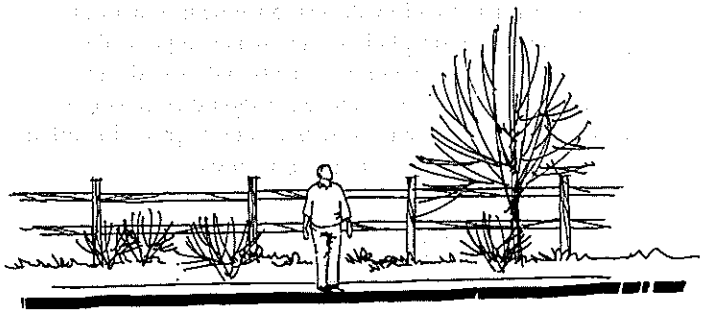
Open space should be integrated regionally into an interconnected system to allow both the movements of wildlife and corridors for interconnected trails and greenways.

Interface of Open Space with Urban Development

PROPERTY EDGES

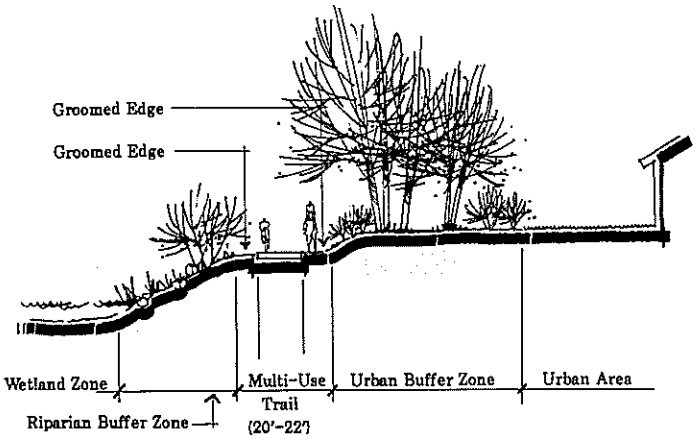
An important aspect of parks, trails and open spaces is how they interface with urban development. The character of this *edge* is an important determinant of the overall quality of the public space and it also affects the quality of the adjacent private properties. The *edge* should provide a smooth, open, uncluttered and natural-appearing transition between developed and undeveloped spaces while protecting the privacy, peace and quiet of private yards, residents and businesses. Conflicts between adjacent properties and wildlife should also be avoided. The following guidelines should be followed on all private and public development projects in Commerce City.

- Promote the use of compatible landscaping on adjacent private properties to provide privacy and screen unattractive uses such as trash receptacles, parking areas, and service docks.
- Avoid continuous solid walls, stockade fences, chain link fences and other monolithic barriers between development and public spaces.
- Promote the use of consistent architecturally attractive property boundary delineators such as open split rail fencing or earthen berms in conjunction with landscaping that visually blends open space with private land uses.



Park Edge Concept

- Avoid inappropriate intrusion into public spaces including dumping, outside storage, and private structures on public properties.
- Set back buildings, fences, sheds and other structures along stream valleys and ridgelines where slopes exceed 15%. Setback should be at least 25' (100' preferred) from the *break-line* of the slope (please see *Design Manual* for additional details). Avoid disturbance of vegetation in these areas.



Interface of Open Space with Urban Development

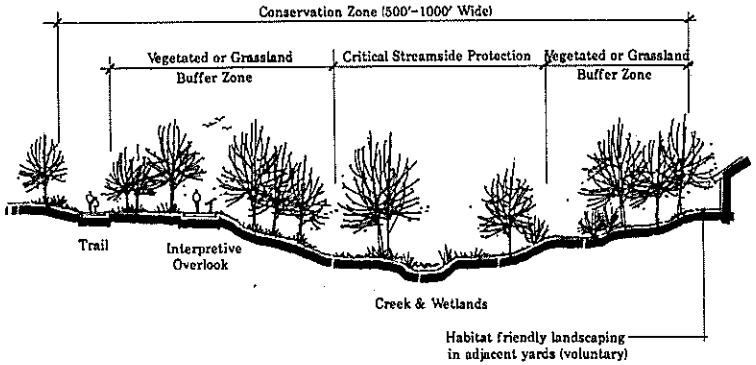
Creek Corridors, Canals, Wetlands and Ponds

CREEK CORRIDOR DESIGN CROSS SECTIONS

The following typical creek corridor cross-sections are recommended. These include several general cross-section types as well as cross-sections that apply to a number of specific conditions that may exist along Commerce City streams.

General Stream Protection Area

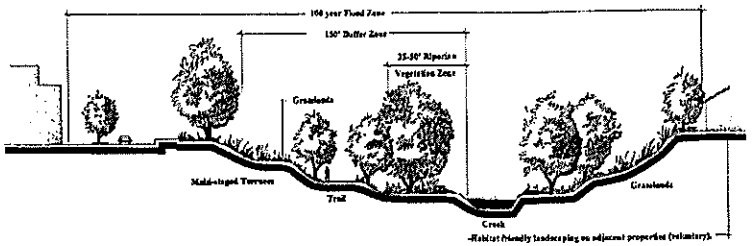
For planning purposes, a *Stream Protection Area* is defined as the area where development and other human activities could directly and adversely impact the benefits of stormwater storage and conveyance, water quality, wildlife, recreation and aesthetics. **Note that this area does not necessarily need to be entirely in public ownership.** Ideally, it should contain the 100-year floodplain and include the stream low flow channel, related riparian areas along the banks and a buffer zone. Generally, this area should extend at least 300 feet from either side of the centerline of the creek. All activities proposed for this area should be carefully reviewed to ensure compatibility with *Commerce City* and *Urban Drainage and Flood Control District* plans and policies.



Stream Protection Area Concept

Optimal Urban Stream Development

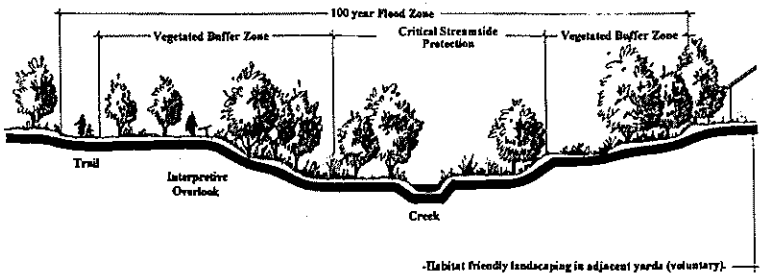
This concept reflects a best effort to integrate urban uses with stream benefits of stormwater storage and conveyance, wildlife habitat, wildlife migration and aesthetics. Wherever feasible, *Commerce City* stream cross-sections should adhere to this concept. It is based on preserving the creek low flow channel itself, sensitive riparian lands and a buffer zone. It is terraced with a mixture of forest and grasslands. With the exception of the trail, development does not encroach into this area. Special attention is also paid to confluence areas that tend to be important to wildlife.



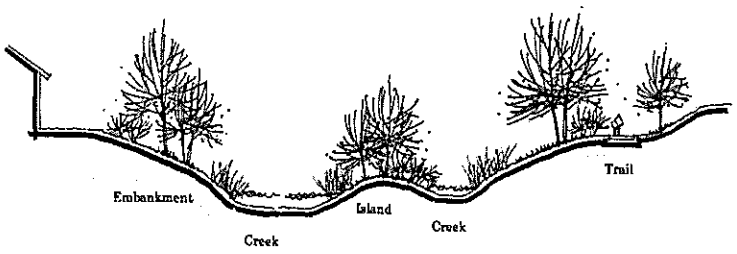
Optimal Urban Stream Development

Sensitive Habitat Preserve

This cross section provides for wider buffering of environmental preserve areas. A wildlife expert should be consulted to determine specific locations and limits of sensitive habitat preserve areas. Human intrusions should be kept to a minimum including keeping trails along the outer edges. At select locations, interpretive overlooks can provide views and information about wildlife. Adjacent property owners should be encouraged in publications such as homeowners guides and covenants to plant *wildlife-friendly* landscaping in their yards to help enhance the resource. In some locations, islands are deliberately created to provide places of sanctuary for wildlife.



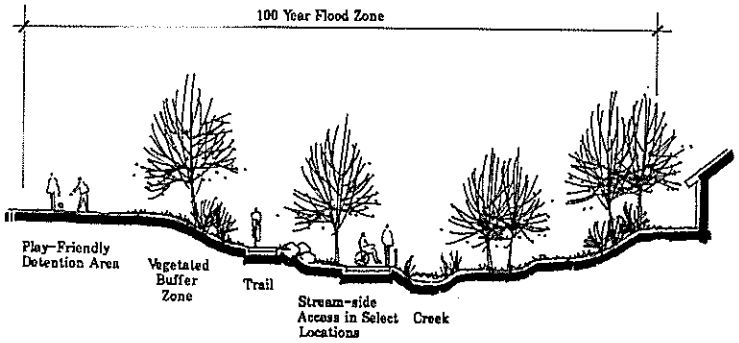
Sensitive Habitat Preserve Cross Section



Habitat Island Concept (Greg Tickle)

Recreation-Oriented Stream Cross Section

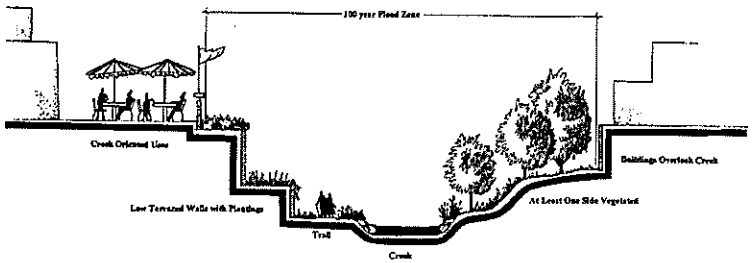
A hybrid cross section that combines natural area preserves with more groomed stream side access can be used along sections of streams that run through more formal parks and landscaped areas. Features include multi-use trails, streamside access including pads for wheelchairs and play fields that can also serve as storm water detention areas.



Recreation-Oriented Stream Cross Section

Highly Urbanized/Contained Stream

While strongly discouraged, it may be necessary in some places to contain streams because of urban development. Where this occurs, terraced vertical walls are recommended keeping at least one side of the stream vegetated. Vines and other planting in the walls help soften character of these reaches.

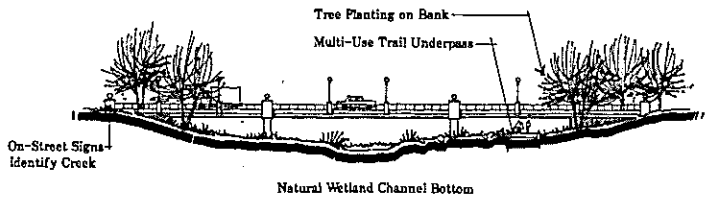


Optimal Highly Urbanized Contained Stream

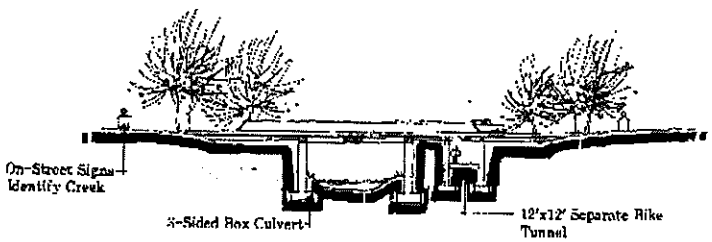
Bridges and Underpasses

Bridges should be designed to convey or, in some cases, store the 100-year storm event without disruption to traffic. All bridges and underpasses should have room for a multi-use recreation/ maintenance trail with accessible ramps to street grade. Underpasses should also accommodate migration by large mammals such as deer and fox. **Creek underpasses should not be confined to narrow and unsightly culverts.**

Creek crossings and roads bordering stream corridors should be enhanced with landscaping, giving special architectural treatment to bridge abutments, railings and spans. Design of bridge components, street signage, lighting and other elements may have special design themes, sculpture and logos.



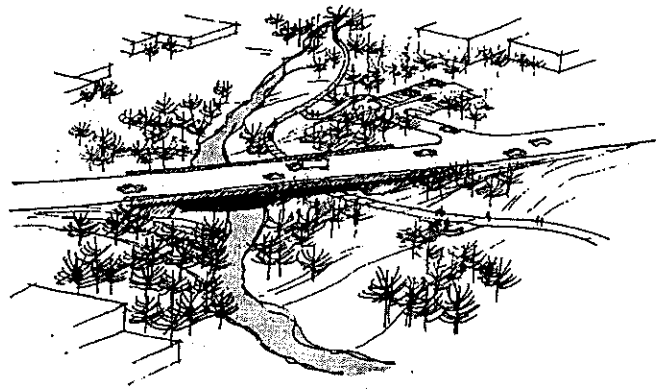
Ideal Stream Underpass Concept



Concept for Smaller Stream Underpass

Land Uses at Road Crossings and Gateways

Land-use planning at road crossings of creek and along roads next to streams or open spaces should capture the essence of the amenity with compatible landscaping, parks, trailheads, overlooks and other elements that celebrate the presence of the creek or natural area. Creek corridor open spaces should widen out at roadways to emphasize the presence of the stream and signs should identify the creek by name.



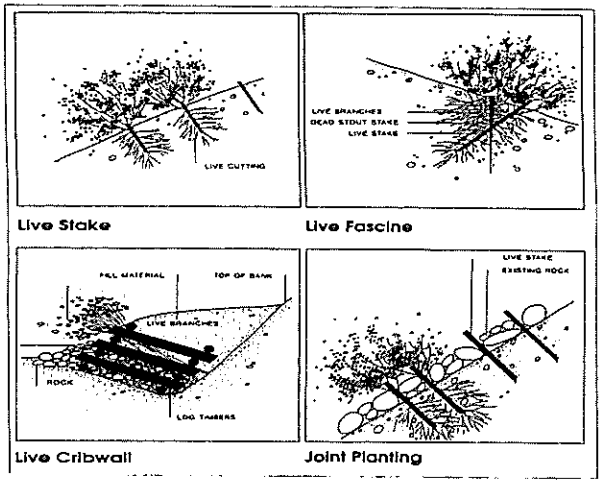
Land Uses at Stream Crossing Complement as a Natural Feature

Flood Damage Reduction and Erosion Control Devices

In some locations, stream channels will be modified to handle flood water or limit erosion. The process may involve:

- vegetation removal and re-grading to create more channel capacity;
- installation of bank erosion control structures;
- placement of grade control or energy dissipation structures to reduce streambed head cutting.

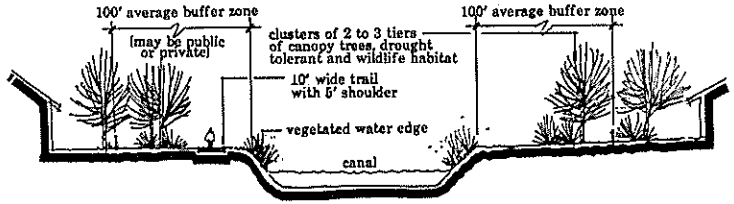
In each case, these modifications should be kept to a minimum. Whenever possible, naturalistic (bio-engineered) erosion control should be used such as willow plantings either alone or in conjunction with rock riprap. Grade control structures should be natural-appearing using placed rock boulders or low profile vertical sheet pile or concrete drop structures. Concrete paving, grouted rock or high concrete walls should be avoided as should chain link fencing along creeks.



Soil Bio-Engineering Techniques (Robin Sotir and Associates from Greenways by Flink and Searns)

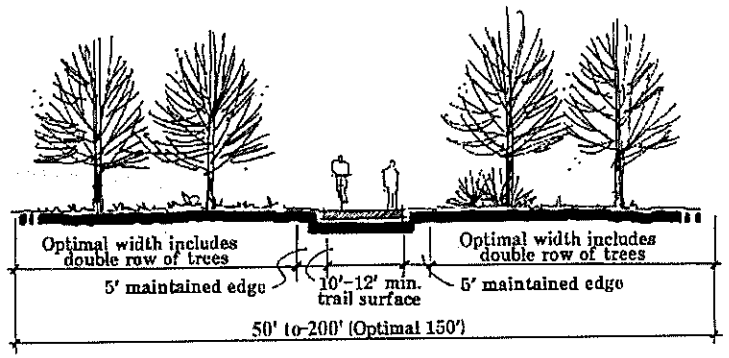
Canal and Prairieway Corridors

Canals offer excellent recreational trail corridors. They provide visual relief and places for wildlife habitation and movement. They also connect other open space areas together. Generally there should be an average 100' setback from the top of the canal bank that is landscaped with trees and other wildlife-friendly vegetation. This landscaped zone can be on either public or private property (through covenants or landowners cooperation). The corridor width may undulate between 40' and 150' or wider along both banks of the canal. In places where site conditions make a wider corridor unfeasible, landscaping should be used to screen adjacent uses. In no case should the setback be less than 25'.



Canal Corridor Concept

Prairieway Corridors are linear open spaces that do not follow a waterway. Similar to canals they provide routes for trails, visual relief and link other open spaces together. Generally there should be room for a 12'-wide trail with 5' shoulders along with space for landscaping with trees and other wildlife-friendly vegetation. This landscaped zone can be on either public or private property (through covenants or landowners cooperation). The corridor width may undulate between 50' and 200' or wider. In places where site conditions make a wider corridor unfeasible, landscaping should be used to screen adjacent uses. In no case should the setback be less than 25'.



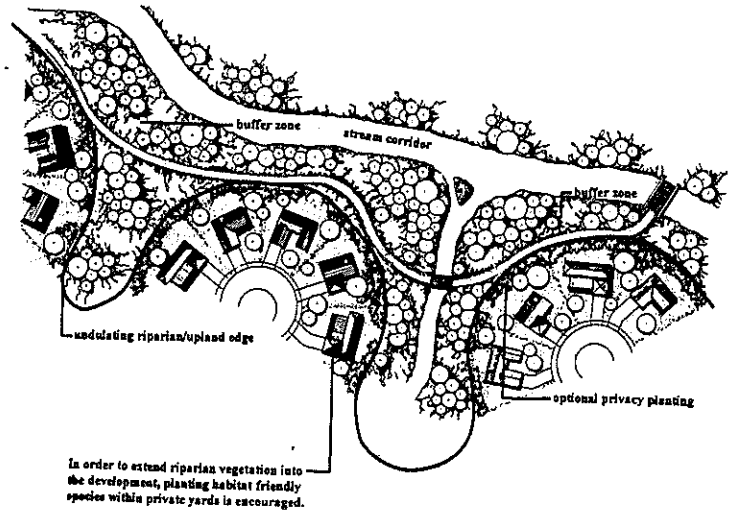
Prairieway Corridor Concept

Optimal Streamside Residential, Commercial and Industrial Development

The drawings represent optimal relationships between development and stream corridors where the two complement each other. The concept leaves a naturally vegetated stream bank on terraced slopes that can contain the 100-year flood. At the top of the bank there is a landscaped buffer zone that serves to filter the impacts of development on the stream corridor including run off of contaminants and disturbance of wildlife by human activities.

Further back from the bank, property owners should provide compatible landscaping and uses on residential properties, and amenities such as employee picnic areas and walkways on commercial or industrial properties. Landscaping, including trees and shrubs, offer food and cover for stream corridor wildlife as well as enhancing the beauty of the site.

Development avoids "turning its back" on the stream. Rather, there are windowed walls and outdoor spaces that enhance the value of offices or restaurants as well as the quality of the creek corridor. Some developers may even provide decks for sitting or outdoor dining.



Optimal Streamside Residential Development

Aquatic Habitat Improvements and Drop Structures

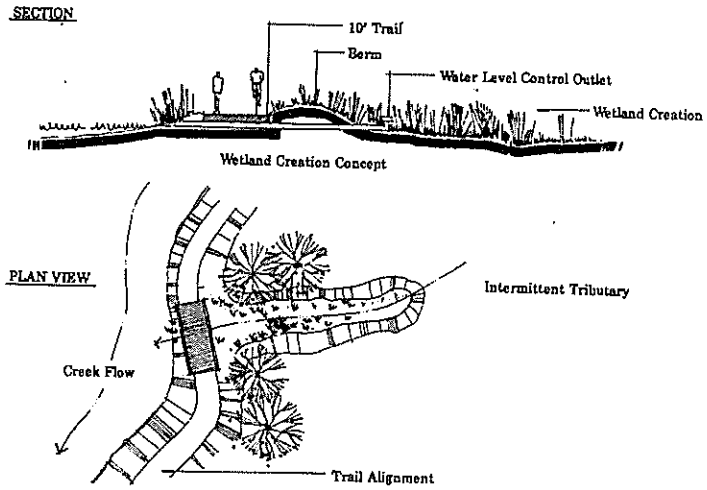
With urban development will come increased flows in 1st, 2nd and 3rd Creeks. This will likely support a number of aquatic species that provide a source of food especially for bird life that will inhabits the corridors. A long-term goal is to improve the opportunities for species to migrate up and down the creeks in search of food, cover and breeding places. A key objective is to ensure adequate water depth and temperature. This can be done by small rock drop structures that impound water and create mini-ponds and wetlands along with streamside vegetation such as willow and dogwood.

Wetland Treatments

Wetlands can be enhanced and created at many locations throughout the Northern Range. In addition to building the drop structures described above, this may call for dredging out low areas and planting them with indigenous wetland species such as bulrush, sedges and other wetland plants. Ideally, school children and community volunteers will carry out these projects. Such projects could occur within the stream channels or on nearby uplands. Trails and other public access should skirt, but not penetrate these areas. In addition, low areas along the banks or edges of the wetland area should be preserved and even dredged out in places to expand wetland and riparian habitat. These areas can help enhance the value of future development as an amenity in these areas. Tremendous wetland creation opportunities also exist at the confluences of the steams with the canals.

Water Polishing

Surface water drains into the creeks and other water bodies from a number of points on both public and private property. Much of this water will come from street run-off via culverts or from properties via swales. Where possible, it is recommended that this water be captured and held in small wetlands in order to filter out some of the contaminants that might be present. These wetlands might range in size from a few hundred square feet to an acre or more depending on the amount of water draining in and the available area. Properly designed, they can become aesthetic features.



Water Polishing Concept (Erik Olgeirson)

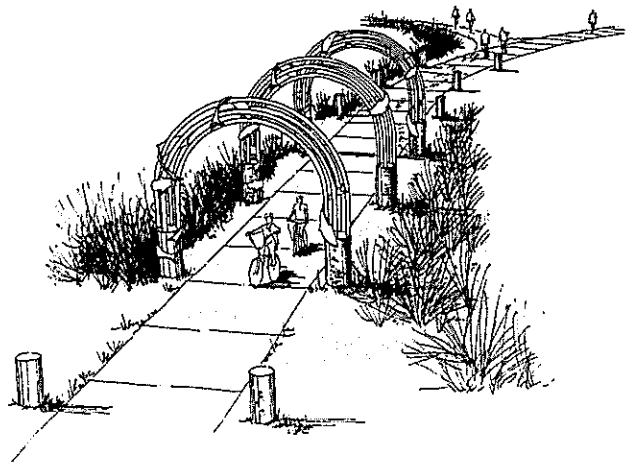
Wildlife Interpretation and Stewardship Projects

The Northern Range is home to myriad species of plants and animals. Because many wildlife areas will be accessible by trail, there will be outstanding opportunities for visitors to watch wildlife or see evidence of their activities. Interpretation will occur in four ways:

- **Interpretive Signage**--This includes signs--and/or other interpretive media such as sculpture--that describe environmental issues as well as the role and impact of development along the corridor. The signs will include artist's drawings of the plant and animal species to observe as well as views of hidden features and depictions of the past and future wildlife habitat. Some signs will be located at opportune spots along the trail while others will be incorporated into wildlife overlooks that may include benches, spotting scopes, and other features.

- **Interpretive Parks**—These areas are set aside, restored and managed for wildlife and wildlife educational purposes especially near schools and parks. These sites might range from 1-3 acres in size and may include created wetlands, forests and grasslands along with footpaths, interpretive signs, viewing blinds, parking, and informal picnicking.

- **Stewardship Projects**--Stewardship projects are on-going efforts by area schools, businesses and volunteer groups to care for natural areas such as prairie lands and stream corridors. The projects can include wetland plantings, clean-ups, monitoring, species surveys, outdoor classrooms and employee participation programs. Ideally different groups will *adopt* segments of the creeks or other land parcels for permanent stewardship. Plaques could be erected to acknowledge stewardship groups.



Sculptural Interpretive Element

- **Casual Observation**--A guiding factor in trail layout and park design will be the opportunity for visitors to "discover" things for themselves. Strategic location of trails, rest areas, overlooks and parks can help in this process.

Jeffrey Joyce

III. Trail Facilities

Trail Components—An Overview

Generally, it is recommended that all trail components have simple, durable attractive designs that conform to a common theme. Exotic elements should be avoided. Use easy to repair and replace components.

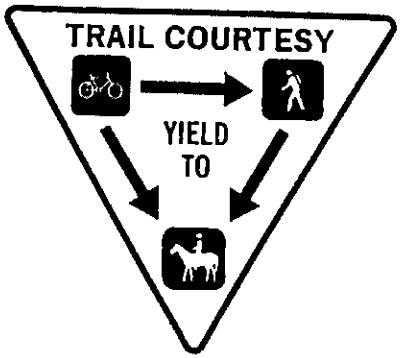
User Conflicts: The Issue of Multiple vs. Single Use

When trails become popular, they may also become crowded with different types of users trying to use the same trail tread. This can lead to conflicts that can diminish the quality of the trail experience and, in some cases, compromise safety. Common conflicts include fast vs. slow bikers; pedestrians vs. bikers; bikers vs. equestrians; and skaters vs. other uses. Potential equestrian conflicts can be of special concern if a horse is surprised by a fast approaching bicyclist or skater.

Numerous solutions to this problem have been employed ranging from separate treads for each use to regulatory exclusion of certain uses. Cost and the fact that the stream channels have relatively narrow corridor limits discourages providing separate treads for each use. This would also diminish the quality of the trail setting and have an adverse impact on the environment.

Instead, this plan recommends providing an adequate trail tread for bikes with graded and groomed shoulders whenever possible to accommodate joggers. In larger park areas, separate loop trails can accommodate joggers, skaters and walkers taking some of the load off the main trail.

Signage should be provided at trailheads and along the trail to remind users of the proper yielding etiquette and to keep speeds at prudent levels in the interest of safety. In areas where extensive equestrian use is likely, signs should advise users to provide a voice warning when approaching horses from behind. (Horns and bells are more likely to startle a horse than a human voice.)



Typical Yield Etiquette Sign

Trail Component Design Standards

Trail Surface and Cross Sections

To best meet the range of predicted trail users a multi-use trail system is recommended. Surfaces can be paved in the more heavily-trafficked areas such as multi-use paths that run along major streets and arterials or where in-line skating takes place. Generally, granular stone is recommended for other regional and local trails such as along creeks and greenways. Paving can be either asphalt or warm-tone concrete, per the specifications below—although warm-tone concrete is preferred where paving is used. The trail cross-sections and surfaces should meet the following design criteria:

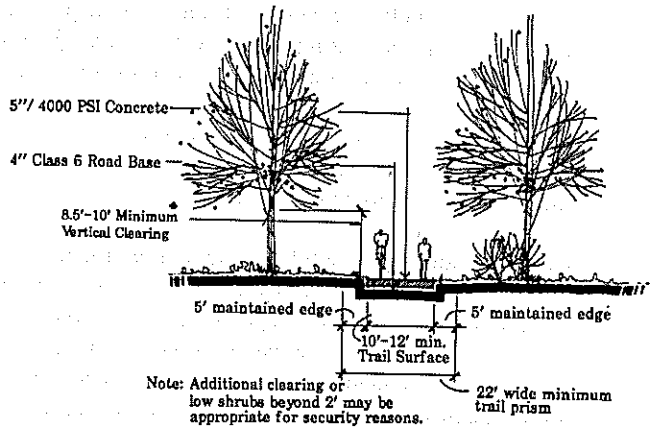
- Minimum 10'-wide trail tread (12'-wide in high traffic areas and as specified in Chapter 3 above) with 2 ½' to 5' (minimum 2 ½') graded and mowed shoulders except along steep embankments. In these areas, or anywhere else that a shoulder cannot be provided, a 54" -high handrailing should be installed (see handrailing specification). If higher use is anticipated in the future, it is recommended that all trail infrastructure such as grading, drainage work, bridges, etc. be designed to accommodate a future widening;

- Minimum head clearance of 8.5' for bicycle use and 10' for equestrian use;

- Proper sub-grade and base preparation to ensure surface is stable. Use geo-textile on unstable or soft soils;

- A wearing surface that supports use by walkers, joggers, bicyclists, wheelchairs, and other disabled people as well as maintenance and emergency vehicles. Concrete, asphalt, granular stone (crusher fines), will meet these criteria. On all multi-use trails, concrete should be used in areas prone to frequent flooding such as bridge underpasses. For concrete, a warm tone mixture (using a concrete coloring agent such as *Frank Davis Omaha Tan*™) is recommended. It should be broom finished to avoid slipping, and have smooth control and expansion joints. A 5" - thick, 4000 *psi* concrete is recommended.

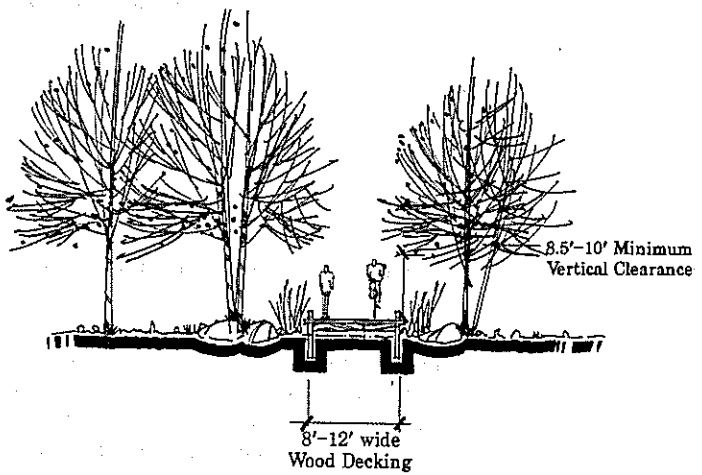
- In certain special locations such as where the trail intersects with intensive pedestrian uses, it may be advisable to provide a special textured surface such as pavers to identify a special area and promote slower speeds. Specially scored concrete could also be used for bicycle speed reduction areas.



Typical Paved Trail Cross-section

(For Asphalt Use Minimum 2" Thickness on 6" Road Base Material)

- There will be places where a deck or boardwalk trail surface is required. Instances include where the trail goes through a wetland area or along an embankment that is too steep for a standard trail. Wood decking, recycled plastic or other structural systems might be employed. The edge of the deck may require curbing or a railing to prevent people from falling off.



Typical Decking Cross-Section

- Good surface drainage that will minimize puddles and washouts including 1% to 2% trail cross slopes or crowned trail surface and inlets and drainage swales where necessary to collect water and carry it away from the trail. Note: Wherever possible, uniform sheet flow of run-off water across vegetated slopes should be promoted to minimize erosion problems.

- All primary trail surfaces, access ramps, bridges, boardwalks and other structures must be strong enough to carry a 12,000-pound emergency vehicle.

- Lines of sight, grades and other design criteria **must** conform to engineering standards for bicycle speeds per *American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (1999 edition or later)* **or the installation of warning signs is necessary where standards absolutely can not be met.**

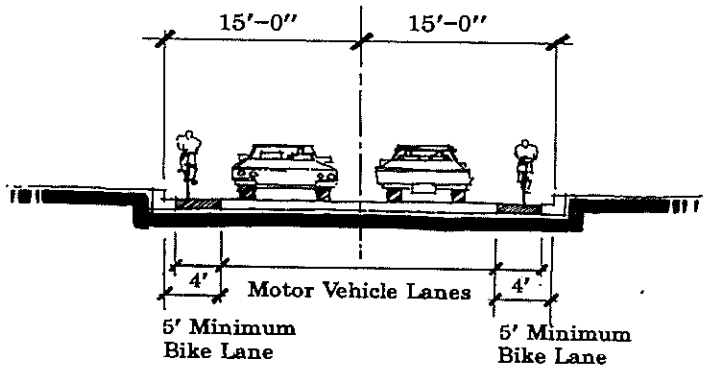
- All facilities should strive to support universal access and use by the disabled *per Americans With Disabilities Act*. This includes: no extended grades in excess of 5% with no grades in excess of 8.33%; no cross slopes in excess of 2%; adequate (5'x 5') level resting points for every 30" of vertical rise and a minimum 36" passageway around any obstacles. Resting pads (minimum 5'x'5) should also be provided every 1/2-mile or less if there are grades. Provide trail difficulty information including grades and distances between rest areas at trailheads.

- On-street routes should be clearly identified and signed with both bike route markers and "share the road" caution signs. Lane widths must meet *minimum American Association of State Highway and Traffic Officials (AASHTO)* standards.

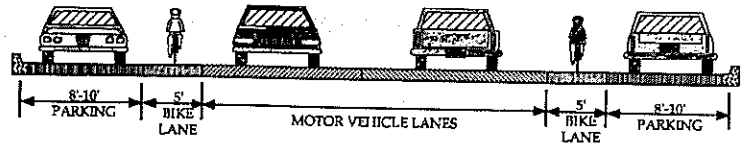
- A minimum combined bike and traffic width of 15' is recommended (takes into account a 14' lane plus a 1' curb pan). If parking is present, the combined bike and parking lane should be a minimum of 12' with 13'-14' preferred if there is high parking volume and turnover. Ramps to on-street routes should meet both *AASHTO* and *ADA* standards of width, grade and line of sight. Paint stripe or symbol delineators between traffic and bike lanes may or may not be used depending on final review by City traffic engineers.

- If a delineated on-street bike lane is provided, it should be a minimum of 5' wide with 6' of width provided if there is heavy traffic. Painted delineators or symbols should conform to AASHTO and Federal Highway Administration *Manual of Uniform Traffic Control Devices* (MUTCD) standards.

Note that on-street standards are subject to change and will vary depending upon factors such as traffic speeds and volume. **A traffic engineer with expertise in bicycle facilities design must be consulted for bike facility projects and all street design must be in conformance with current Commerce City design standards.**



Typical On-Street without Parking (Example—See Current Commerce City Standards)



Typical On-Street with Parking (Example—See Current Commerce City Standards)

PEDESTRIAN SPANS, UNDERPASSES, TUNNELS, AND LOW AREAS
A number of bridges and underpasses will be required to complete the trail system. Bridges can be custom designed and, alternatively, there are a number of pre-fabricated products available using Cor-ten™ steel, reinforced concrete, laminated wood, fiberglass and other materials. Regardless of type, bridge spans must meet several criteria.

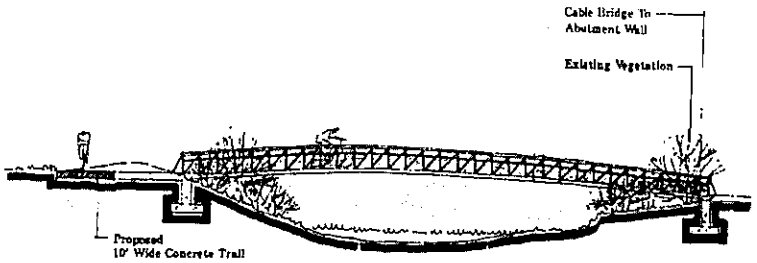
- They should be able to carry weight of maintenance and emergency vehicles (12,000 pounds).

- They should be wide enough to accommodate both through trail traffic and people who may want to linger on the span to enjoy

the view. Absolute minimum width should be 10' but 12' is preferable both to accommodate those who linger and possible future trail widening.

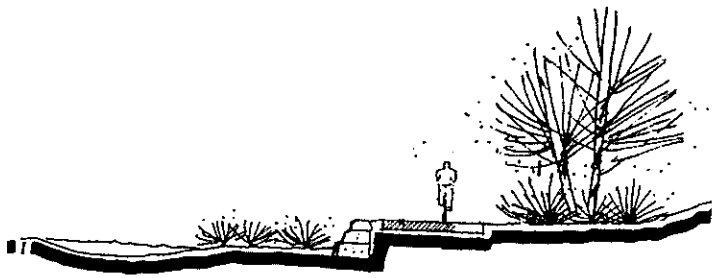
- All railings should be at least 54" high (see handrailing discussion).

- It is recommended that only clear-span crossings be utilized--as opposed to low water crossings. This will avoid wash out and sediment build-up problems. Clear spans should be placed above the 100-year flood level wherever possible, but in some instances may be lower, provided the structure will not raise the 100-year flood level (a hydraulic engineer should be consulted).

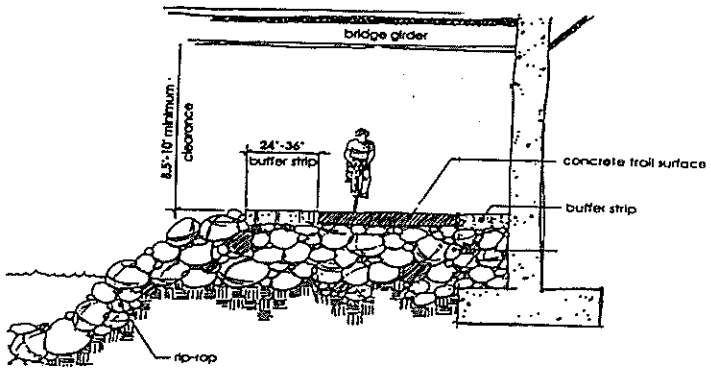


Typical Pedestrian Crossing

- In some locations, the trail will go under bridges or through low areas subject to flooding. In these cases, the trail should be substantially anchored (with concrete, gabions, *Geoweb*^{tm} or similar system) and armored with rock and concrete to prevent wash out. A hydraulic engineer should be consulted to ensure the underpass is durable and will not constrict floodwater to raise the 100-year flood level.

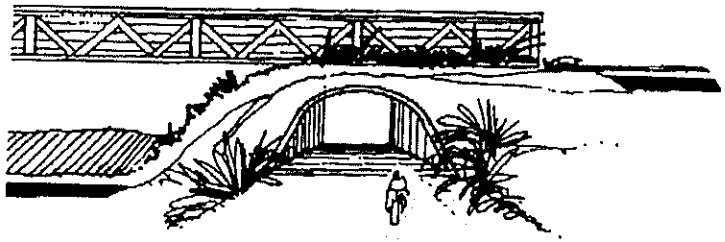


Typical Low Area Trail Concept



Typical Trail Underpass Concept

- Tunnels should have at least 8.5' of headroom and (10' for equestrians) and be at least 12' wide. They should be well lighted either with natural light or vandal-resistant electric lighting if necessary. Entries to tunnels should have gentle grades (no more than 5%) and have clear lines of sight per AASHTO guidelines.



Tunnel Concept

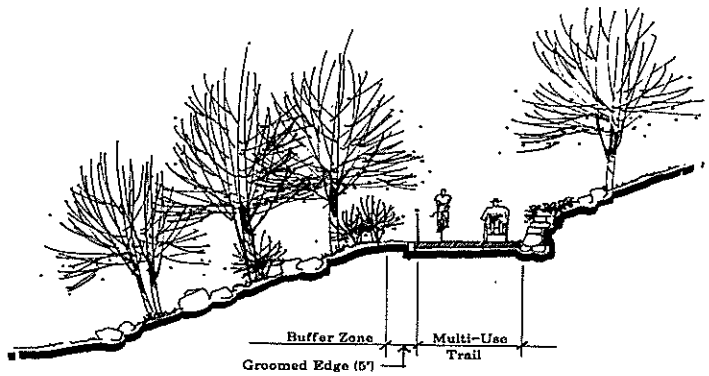
Ramps and High-water Bypass

The trail plan includes alternate routes for use during high water. These include ramps and alternative on-street routes that allow trail users to detour. Ramps and on-street routes should meet the following standards:

- achieve ADA criteria for disabled users as described previously;
- use, where necessary, on-street systems suitable for bicycle and pedestrian travel;
- have clear, easy to follow signage depicting alternative routes and how to follow them to trail destinations;
- have appropriately engineered intersections with the main trail so as to avoid traffic conflicts;
- **not lead users into potentially hazardous situations such as unsafe crossings of high volume streets or highway.**

Retaining Wall/Slope Stabilization

Steep embankments along some segments of the trail system may require retaining walls or other steep slope treatments. In general, any slope in excess of 3:1 grade will require retention to control erosion. Where possible, it is desirable to keep wall height less than 4'. On very steep slopes this may require "splitting" a wall with half of the height on the uphill side of the trail and half on the downhill side. Walls can be constructed of concrete, anchored block system, wood, stone or other appropriate material. Generally, a 54" high handrailing should be placed on the downhill side if the wall exceeds 18" in height.



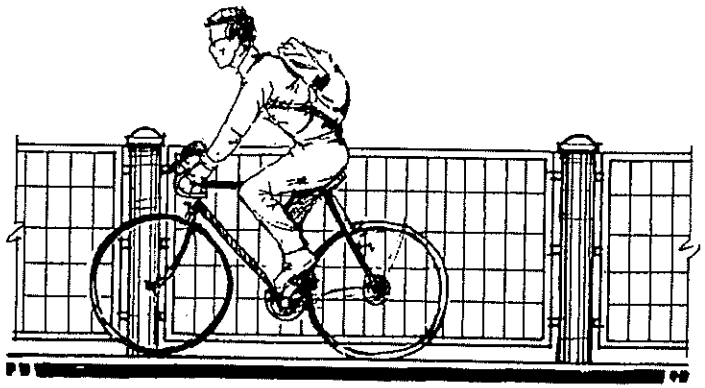
Trail with Retaining Wall

Handrailing/Bike Guardrails

Handrailing and/or bike guardrails will be required in a number of locations including bridges and decks as well as places where a drop off or other hazard exists and adequate shoulders cannot be provided. Handrailing and bike guardrails should meet the following criteria (See also AASHTO guide).

- The handrailing/bike guardrail should be 54" high with openings such that a 4" sphere will not pass through. Avoid 5" to 7" openings as they may trap a child's head. To reduce costs, consider using a woven wire or chain link type mesh with vinyl coating for handrail panels).
- The rail should withstand a 250 lb. load with 1/2" deflection with a w=50 pound per linear foot transverse and vertical load capacity.
- The rail should not present sharp or protruding edges and ends should be flanged to reduce the chance of collision.

- A smooth rub bar should be provided at bicycle handlebar height (42").



Handrailing Section Using Woven Wire Panels)

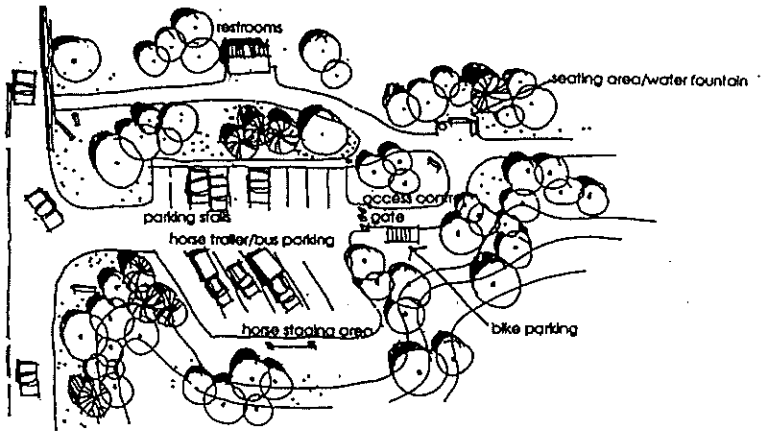
TRAILHEAD/ACCESS POINTS/PARKING

Three kinds of access points are recommended in this plan: intermodal, neighborhood (or ride/walk) and interconnected.

- An ***Intermodal access*** serves automobiles, bicycles, pedestrians, wheelchairs, equestrians and other users seeking access to the trial system. The facility is designed to accommodate users arriving by auto as well as those who arrive on foot, bike or other means. An intermodal access area offers adequate parking (15 to 100 spaces depending on location), possibly rest rooms, informational signage, and other amenities such as benches, bike racks, emergency phones, picnic tables, drinking fountains and trash receptacles. It should accommodate vans, buses and horse trailers as well as cars and should include at least on parking and loading space adequate for disabled users (12.5' wide with disabled parking symbol).

  Intermodal access points may be combined with parks, shared commercial parking lots, park-n-rides and other facilities. They should be carefully planned and sighted with landscaping and buffering, if necessary, from adjacent uses. They should **not** be located directly adjacent to residences or other uses where there might be a conflict or security problem.

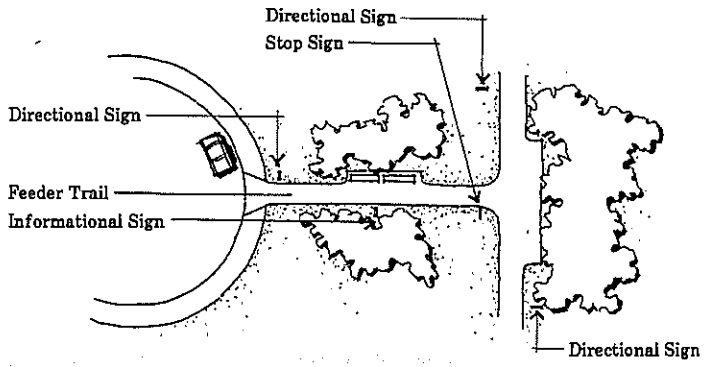
Typical Trailhead Access Concept



Typical Intermodal Trailhead Plan

- **Neighborhood or Ride-up/Walk-up Access** are locations where people from local neighborhoods, employment centers or other adjacent areas can access the trail corridor on foot, bicycle or

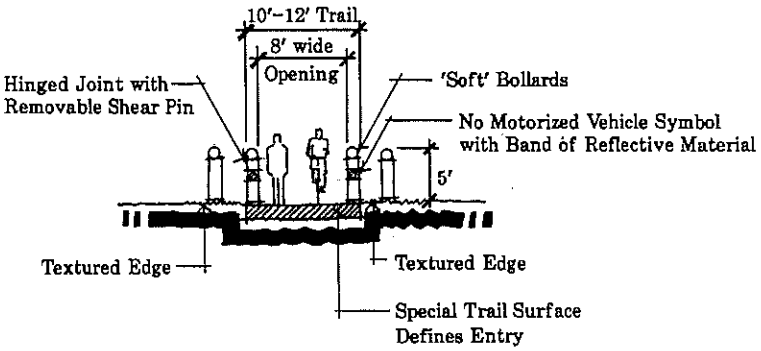
wheelchair. If parking is provided, it would be very limited. There should be adequate informational signage and minimal amenities such as benches and trash receptacles;



Typical Neighborhood Ride-up/Walk-up Trailhead

- **Interconnected Trail Access Points** refer to locations where off-street and/or on-street non-motorized routes join with the trail system. There may or may not be auto parking. Features include informational signage and other minor amenities such as benches, bicycle lock bollards, and trash receptacles. Many interconnected trail access points may also be intermodal or neighborhood access points. The key difference is that interconnected trail access points tie to other on-street bike routes and trails.

Generally, all types of access points should include access control that admits maintenance and emergency vehicles but not other motorized vehicles; a trailhead sign with a system map, *you are here* marker, degree of difficulty, disabled access and distance information, and list of trail user responsibilities. All facilities must be designed to accommodate users with disabilities. To discourage unauthorized motor vehicle access a defining entry feature using bollards, pavement texturing and signage should be used. Bollards or posts in the center of the entry should not be used because the posts may be hard to see and may create an obstacle for bicyclists.



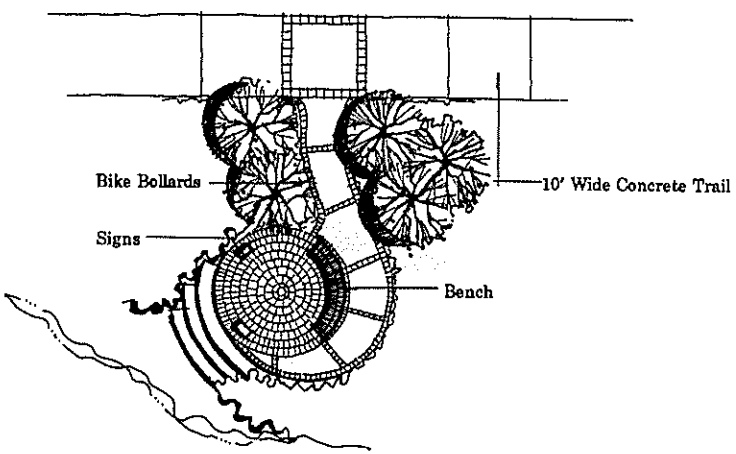
Entry Control Concept

REST AREAS/OVERLOOKS/AMENITIES

Rest areas and overlooks should be provided at regular intervals along the trail. Several kinds of rest areas could be offered including: rest pads, standard rest areas, overlooks, and trail pavilions. All rest areas and overlooks should be designed to move users off the main trail to eliminate any possible traffic hazard.

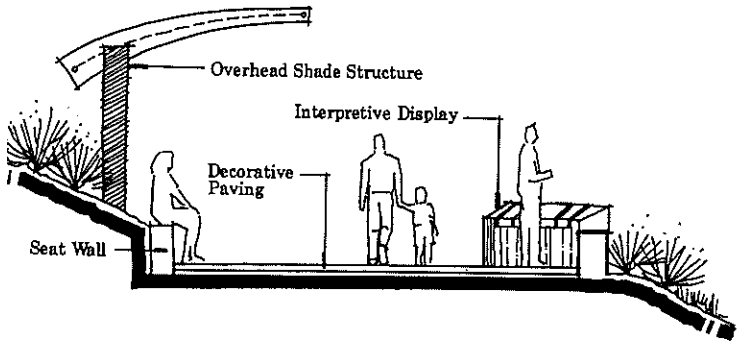
- **Rest Pads** can consist of a 10' x 10' stopping point just off the trail with a simple bench and perhaps informational or donor credit signage. These should be located every 1/4 to 1/2 mile depending on grade.

- **Standard rest areas** should be located every one to two miles and should include a crushed stone or concrete pad with benches, an informal bike rack, informational signage and, perhaps, a drinking fountain.

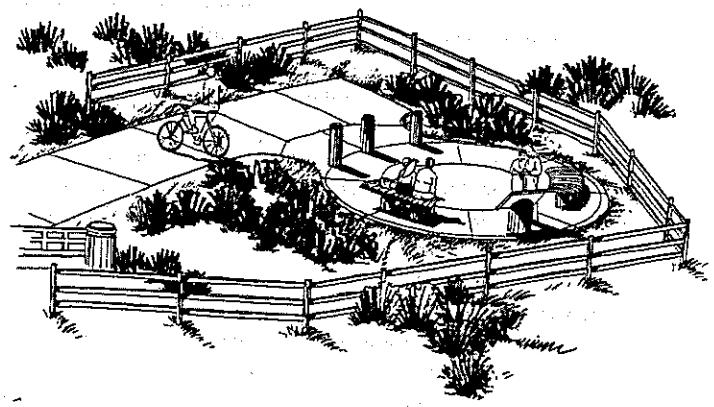


Streamside Rest Area Concept

- **An overlook** is a special kind of rest area tied to a view of special interest such as a wildlife area. In addition to the standard rest area features, an overlook would likely include interpretive signage describing the area being viewed.



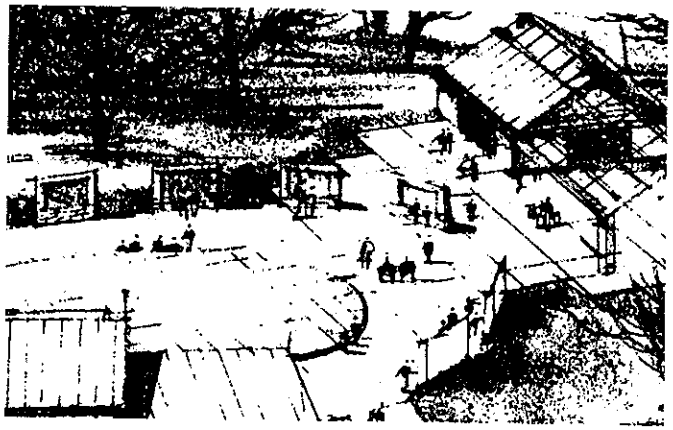
Overlook Concept



Trail Rest Area Concept

- **Storm shelters** may be necessary along long open expanses of trail. These should be designed to provide cover from lightning, hail and heavy rain where other cover is not available. They could be incorporated into rest areas.

- **A trail pavilion** is a more developed site that might include benches, picnic tables, parking, and more extensive trail and interpretive information. These would be located at key regional access and activity points and might be funded by private donors. It may also include a shelter.



Trail Pavilion Shelter Concept ***(art by Jeffrey Joyce)***

The Commerce City trail system will include other amenities.

- Picnic areas located at major trailheads and other suitable locations in groupings of one to two tables with trash receptacles and, possibly a grill. Tables, grills and other amenities must be universally accessible.

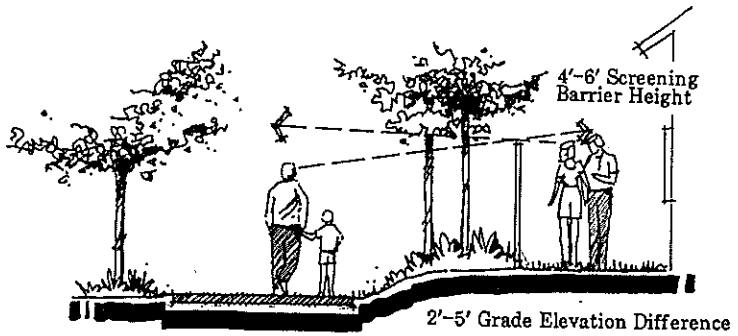
- Toilets and drinking water facilities should also be available at key locations. As a rule of thumb, one toilet and drinking fountain per three miles of main trail should be provided. They should be universally accessible (per *ADA*) with adequate signage directing users to these facilities. A chemical toilet in an architectural shell is recommended.

- A "pack in/pack out" policy is recommended for most of the *Commerce City Trail System*. However, standard trash receptacles can be placed at key access points. These trash receptacles should allow for sorting of bottles and cans from other trash and the City or homeowner associations should arrange recycling of the materials. Signs should inform visitors of the *pack in/pack out* and recycling policies.

- Generally, lighting should not be located along the *Commerce City Trail System* because it is costly to build and maintain. It may also be disturbing to wildlife and adjacent residences. However lighting may be desired or appropriate at certain high use or commercial areas. Simple low level, low height lamps or simple wood and metal street lamps drawing on the structural elements of surrounding architecture could be used. Overhead utility lighting on unobtrusive posts may also be required.

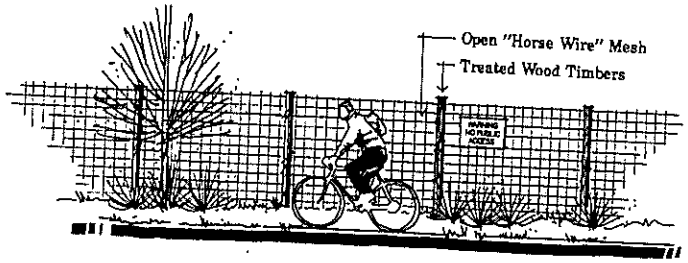
SECURITY/PRIVACY ELEMENTS

In many locations, the trail runs near private properties. The use of grading, fencing and screening, approved by the property owner, should be used to minimize any impact on adjacent properties. Generally, a 5'- high open mesh fencing is recommended. Horse wire on treated wood posts should be used in more open and rural areas and vinyl coated chain link can be used in more urban settings.



Note: Purpose is to allow property owner to see out while trail user cannot see in. Barrier may be vegetative material or fencing.

Typical Privacy Treatment



Horse Wire Fence Concept

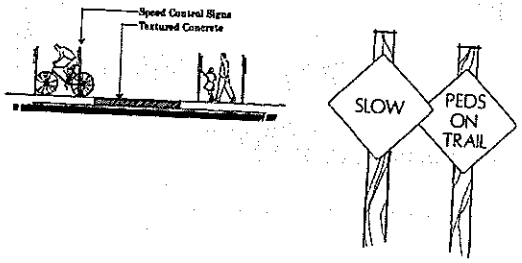
SIGNAGE AND SPEED CONTROL

Three basic categories of signs are recommended for the Commerce City trail systems.

1. SAFETY SIGNS

These signs address trail user safety. For ease of understanding, these signs should follow standard formats for traffic control devices (See *Manual of Uniform Traffic Control Devices*). The following sign types exist within the safety category:

- **traffic control** signs include stop, yield, and curve in trail;
- **warning signs** which include, but may not be limited to: "slippery when wet", "bicycles slow to walking speed", "icy conditions may exist", and hazard panels for possible trail obstructions or dangerous objects within the trail right of way. Surface texture may be another way to promote bicycle speed control in busy areas;



Speed Reduction Concepts

- **miscellaneous safety signs** such as safety signs near water features.

2. INFORMATION SIGNS

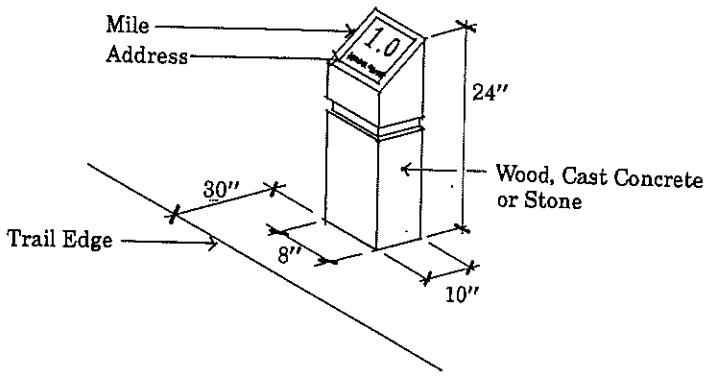
These signs provide travel information to trail users. The following signs are considered in the information sign category:

- **directional signs** show trail users how to reach their destinations, distance from a destination, and location signs such as mile markers, and street signs placed on bridges to identify cross streets;
- **system signs** are used at major entry points of the particular trail and/or trail system. They address comprehensive issues such as system-wide trail maps, location of rest areas, degree of difficulty, accessibility and system trails rules and regulations. Due to the amount and importance of the information conveyed on system signs, it is best to place them in locations where users are encouraged to safely stop and review the information represented.

3. TRAIL UNDERSTANDING & WAYFINDING SIGNS INCLUDING:

- **credit signs** that provide information about those who contributed to the development of the trail and/or amenities along the trail;
- **interpretive signs** addressing natural and/or cultural features. Important topics include ecological and geophysical interpretation and history.

All signs should be durable, easy to read and conform to a uniform design theme consistent with other trail sign systems in the area. Non-safety signs should include the *Commerce City Trail System* logo.



Mile Marker Concept

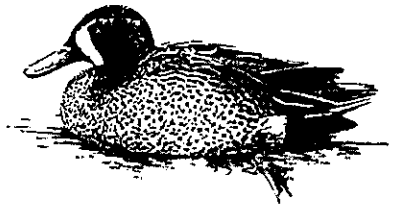
TRAIL EDGES LANDSCAPE TREATMENTS AND STREAM CORRIDOR BUFFERING

It is a goal to preserve and enhance the existing natural landscape along the *Commerce City Trail System* wherever practical. In a number of places, vegetation trimming or additional trail edge landscaping will be appropriate. Generally, landscaping should use indigenous, wildlife-supporting materials and species. The landscaping will both supplement the native vegetation that grows—or once grew—in the area and will help screen nearby buildings. Wildflower plantings can also enhance the trail edge. Planting can serve as a visual buffer between the trail, sensitive areas and adjacent properties. A mixture of evergreens and deciduous trees might be recommended to provide both winter and summer greenery.

The effects of microclimates (the impact of sun, shade, and wind in the immediate area) should be considered when planting trees and shrubs. Generally, deciduous trees should be planted on the south side of the trail to provide shade in summer while allowing the sun to shine through during winter months when the trees have shed their leaves. Evergreen trees are preferred on the north side of the trail to provide a windbreak, yet not shade the trail so the winter sun can melt snow and ice from the surface.

Landscaping must consider trail safety security. Thick brush may need to be trimmed back in places along the trail edge to provide good visibility and prevent hiding places. Generally, on multi-use trails, clearing and grubbing of vegetation should be trimmed and maintained to a width of 4-5' beyond the edge of the trail surface and provide head clearance of 10' feet. Selective thinning for security should extend 9' or more beyond the trail edge depending on local conditions.

The impacts on flood levels from any vegetation planted throughout the corridor should also be considered. Vegetation planted in areas where flooding may threaten public and private property should be such that it will lay flat and not excessively back up water during flood events. It should also be maintained to ensure adequate growth of the root structure that will stabilize soils and anchor the plant material, thus preventing the possibility of excess debris that may form dams at structures that cross the creeks or the South Platte River.



Jeffery Joyce

The Prairieways Action Plan

Appendix Volume B: Guidelines for Operations, Maintenance & Stewardship

Commerce City Parks and Recreation

B: Maintenance

Topics Addressed

Management Approach and Philosophy

The Need For Inter-Agency Cooperation

Operational Considerations

Types of Maintenance

Formal Park Maintenance

Trail, Greenway and Open Space Maintenance

Stream Channel Maintenance

User Safety and Risk Management

Programming and Events

Stewardship and Enhancement

The Concept of Design Review

Protection of Adjacent Private Property Interests

Typical Maintenance Regimes with Cost Estimates

- Typical Range of Operational Costs

Tables

- Table M.1 Interested Agencies and Their Objectives
- Table M.2 Maintenance Checklist
- Table M.3 Typical Range of Operational Costs

If you can't maintain it...don't build it!

-Joe Shoemaker

Management Approach and Philosophy

Once completed, Commerce City's parks, trails and open space amenities will represent a substantial investment—improvements that will be used and enjoyed by thousands for many generations. The open space areas will also be an important natural resource and provide wildlife habitat. These investments should be well cared for and must be safe and pleasant places to visit. This is why a management plan is important.

Well managed and maintained parks, trails and open spaces will be a point of pride for Commerce City, and a model for other communities in the metro region—an asset that will endure for generations. Effective operations and maintenance will require a commitment of time and resources, a sound management plan, a responsible management agency and an organizational structure to carry out these activities.

The Need For Inter-Agency Cooperation

There are a number of different entities and stakeholders involved in management of public lands and natural resources. A key objective of this *Prairieways Action Plan*, and other plans for *the Northeast Metro Area*, is to have these entities work together toward an effective multi-objective program. These key entities include:

Table M.1 Interested Agencies and Their Objectives

Entity	Primary Interest/Objective
■ Adjacent Property Owners	Enjoy homes and effectively operate businesses without floods, erosion and unauthorized intrusion. Responsible for upkeep of their yards and property fronting on parks and open spaces. Volunteer projects in parks and open spaces. Avoid dumping and encroachment into open space areas.
■ Homeowner Associations	Maintain parks, trails and open spaces owned by homeowners.
■ Commerce City Parks & Recreation Department	Operate and maintain public parks, outdoor recreation facilities, trails, and habitat preservation. Organize volunteer projects.
■ Commerce City Police/Adams County Sheriff	Patrol parks, trails and open spaces.
■ Adams County Fire Marshall	Address public safety issues

Entity	Primary Interest/Objective
■ Commerce City Community Development	Economic and Community Development agencies to review plans to ensure guidelines are met. Ensure land use proposals are in conformance with policies, regulations and laws.
■ Commerce City Public Works	Protect public and private property from floods and erosion. Ensure the smooth operation of roads, bridges and utilities during storm events.
■ Urban Drainage and Flood Control District	Provide planning, technical advice, capital and maintenance funds for creek and storm water management. Review all plans impacting floodplains.
■ U.S. Army Corps of Engineers	Help protect creek/wetland environments through Sec.404 permit process.
■ School Districts 14 and 27J	Possible joint maintenance of shared facilities.
■ Colorado Division of Wildlife	Preserve and enhance wildlife habitat. Promote wildlife awareness/ education.
■ Colorado Department of Public Health and Environment	Address air, water, and soil quality issues.
■ U.S. Environmental Protection Agency	Protect public health, air and water quality, and wildlife habitat.
■ U.S. Natural Resources Conservation Service	Advice on soil, water, and wildlife conservation.
■ Surrounding Entities (*Adams County Parks, Barr Lake State Park, Rocky Mountain Arsenal National Wildlife Refuge, Denver, Aurora* and *Denver International Airport*)	Maintain communications and coordinate on the care of trails, open lands, run-off water and other factors that cross jurisdictional lines.
■ Service Organizations, Church Groups, Businesses, Scouts	Volunteer projects.

While some of these interests and objectives may appear at times to be at cross-purposes, they can, to some extent, be mutually supportive if the entities are able to work effectively together. For example, the *Public Works* and *Urban Drainage and Flood Control District* should work closely with *Parks and Recreation* in planning streamside revegetation and habitat restoration. This should include exploring optimal tolerances for tree and shrub planting that provides wildlife habitat and improves water quality without constricting the channel or creating other flood hazards. The parties can benefit by working together while failure to communicate could be unnecessarily costly to both interests.

Operational Considerations

An effective operational plan should consider the following areas:

- Maintenance
- User Safety and Risk Management
- Programming and Events
- Stewardship and Enhancement
- Protection of Adjacent Private Property Interests

Types of Maintenance

Routine and Remedial Maintenance

Good maintenance begins with good planning and design—followed by quality construction. Initial investment in quality design, construction materials, and installation will pay off many-fold over the long term. An effective, on-going maintenance program is also essential (Table M.2 outlines common maintenance activities). Overall, there are two kinds of maintenance to consider—*routine* and *remedial*.

Routine Maintenance— refers to the day-to-day regime of trash/debris removal, sign replacement, weed control, tree/shrub trimming, trail sweeping, ice and snow removal from commuter trails, and other regularly scheduled activities. Routine maintenance also includes minor repairs and replacements such as fixing cracks and potholes in trails, replacing a broken signpost, fixing a ball field backstop, or painting a bridge.

While some agencies' objectives may appear at first to be at cross purposes, they can be mutually supportive if the various entities are able to work together effectively.

Remedial Maintenance— refers to correcting significant defects as well as repairing, replacing or restoring major components that have been destroyed, damaged, or significantly deteriorated during the life of the project. Examples of remedial maintenance include stabilization of a severely eroded hillside or replacing a bridge lost in a flood. Ideally, remedial maintenance will be part of a long-term capital improvements plan. Several areas of maintenance should be considered:

Formal Park Maintenance

Formal parks must be maintained to ensure safety and enjoyment for the community. The landscapes within parks must be manicured, watered, trimmed, fertilized and managed for weeds, insects, animal pests and possible disease on a regular basis. Turf grasses should be mowed to maintain a desired height and neat appearance. A turf grass management plan should be developed to best utilize maintenance funds and water resources. Native and non-irrigated grass areas should be mowed periodically to help control noxious weed growth and provide a groomed appearance—especially along the edges.

Trees and shrubs should be watered by an automatic water-conserving irrigation system (such as a bubbler device that delivers water directly to the base of the tree). Trees and shrubs must also be trimmed, fertilized, and monitored for disease and insects. Irrigation systems for both turf and trees should be inspected and adjusted to ensure water coverage of all needed areas and to avoid over-spraying onto non-landscaped surfaces.

Parks should be policed for trash and debris on a regular basis to maintain a neat appearance. Receptacles should be provided to adequately handle trash volumes and emptied to avoid litter and health issues.

Parking lots, walkways, fencing furniture, shelters, play and sports equipment should be visually inspected periodically for damage or wear and should be replaced or repaired as soon as possible. Park lighting should also be inspected and maintained to ensure safety for park users.

Trail, Greenway and Open Space Maintenance

The trail/maintenance road system must be kept in good repair. The main multi-use trail will require regular sweeping to remove accumulated loose gravel, broken glass or thorns. Unpaved and primitive side trails will need regular repair of washouts, periodic patching, vegetation control, and edge repair. Underpasses must be kept free of sediment and debris. Removed sediment could be deposited in rock riprap areas to help facilitate vegetation growth.

Maintenance crews may need to address temporary ice build-up especially in shaded areas. Paved routes designated for year-round commuting and wheelchair access should be plowed during snow or ice events. Surface drainage components including culverts, ditches and swales should be kept in good operating condition including removal of debris from inlets and outflows. Maintenance crews should also address any problems caused by unchecked runoff such as puddles and washouts. Safety railings, pedestrian bridges, signage and other components must be kept in good repair. There should be periodic inspections by a structural engineer to assess any deterioration or damage.

It is important to trim overhead vegetation for adequate headroom. Multi-use pedestrian/bike paths should have a minimum of 10' of head clearance. For equestrian use, provide a minimum of 12' of clearance. Large, dead overhanging limbs and nearby dead trees that may fall on the trail ought to be routinely inspected and, when necessary, trimmed or cleared away. Ideally, a two to five-foot wide swath should be mowed along both sides of the multi-use trail to create a shoulder for joggers and horses. Groomed shoulders should be kept level and graded to ensure a proper running or walking surface. The mowed shoulder also creates a groomed look making the trail more inviting. This may not be appropriate, however, in sensitive wildlife areas, on primitive side trails, or in other areas where preserving riparian vegetation is critical.

Disruptions and Detours

It is important that all public and private projects that disrupt the trail or connect sidewalks and bike lanes include a clearly marked, safe detour that is suitable for bicycles, pedestrians and people in wheelchairs. Success of a detour system calls for a reporting procedure that ensures that responsible agencies are aware of the closings and have appropriate detour procedures in place. Should trail underpasses be blocked by either construction or flooding, it is critical that a safe well-marked or supervised alternative street crossing be provided to avoid the risk of trail users—especially young children—being struck by cars crossing busy streets when the underpass is blocked.

Should trail underpasses be blocked, it is critical that a safe well-marked or supervised alternative street crossing be provided.

Graffiti and Vandalism Control

Project components such as benches, signs, railings, lamps, and picnic tables should be durable and easy to repair or replace. Exotic custom-made elements should be avoided if they are prone to damage. Maintenance personnel should have a policy of quick repair or replacement when items are damaged. If possible, the maintenance agency should store spare parts and replacement components. Again, there should be regular monitoring for damage so that action can be taken quickly.

Graffiti treatments include removal by chemicals or sandblasting, special graffiti-proof surfacing, and painting over. Painting over generally works best and this suggests using painted surfaces to begin with. For example, a concrete wall can be given a coating of a product such as Thoroseal™ (a special durable concrete paint) rather than an exposed aggregate surface. Maintenance crews can simply paint over the graffiti.

Exotic custom-made elements should be avoided.

Trail Corridor Vegetation Management

Except in the formal parks and urban activity districts, the trail corridor should be natural-appearing rather than groomed and formal. If turf grass areas are called for, they should be of minimal size. The illusion of a larger formal park can often be created by attractively grooming feature areas such as trailheads, picnic areas and other focal points. In general, trail and open space areas should feature a low maintenance, natural landscape that is inviting to the user. This might be achieved over time using native grasses, wild flowers, selective weed removal, and, *articulated mowing*. Articulated mowing means shaping a natural landscape by grooming the trail shoulders and selectively creating mowed meadows and sweeps along the corridor.

Under such a regime, noxious and undesirable weeds should be identified and removed—ideally by cutting rather than using a chemical application. Finally, it is important to manage vegetation for user security. Maintain good lines of sight, user surveillance, and escape routes. Avoid blind thickets close to the trail where a person could hide. These areas may pose, or appear to pose, a threat to users.

Trail Mile Markers and Street Location Signs

The installation of trail mile-markers every ¼ mile is recommended. In addition to telling users where they are and how far they've gone, they can help maintenance people locate problems; help police and rescue personnel determine where an accident or incident has occurred; and index problem spots or needed remedial maintenance. In addition, major street crossings should be clearly signed, perhaps with a street sign—that is visible from the trail—attached to the overpass. Again, this helps both users and rescue people identify locations.

Connecting On-Street Routes

On-street bicycle and pedestrian access routes connecting to trails must be kept in good operating condition including pavement repair, good drainage, properly functioning signs and signals, clear pavement markings and other elements. In addition, there are special bicyclist needs. These include:

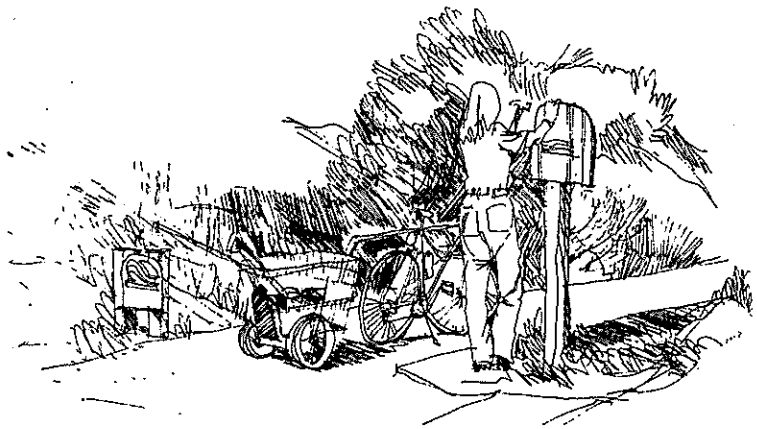
- street sweeping to remove debris and grit which tend to accumulate in the gutter areas (where bicyclists usually ride);
- snow and ice removal--especially from the gutter areas;
- keeping traffic signals properly timed;
- conscientious repair of chuckholes and cracks to ensure a smooth surface suitable for bicycling.

Maintain good lines of sight, user surveillance, and escape routes. Avoid blind thickets close to the trail where a person could hide.

Patrol and Emergency Procedures

Patrol is an essential element of greenway operations and maintenance. Along the trail, patrolling personnel can provide a number of services including: helping to prevent vandalism and other crimes against persons or property; handling injuries and medical emergencies; arranging for rescue; directing evacuation in the event of flooding or other problems; and disseminating information to trail users.

Trail patrol can be handled in several ways. It could be by a law enforcement agency providing regular visits by police officers including bicycle or horse-mounted police, or by a special *trail ranger* crew. The *rangers* might be trained (and even armed) law enforcement personnel although seasonal employees who merely advise and assist may suffice. Trail patrol personnel should travel on foot, horseback or bicycle and ideally carry a two-way radio or cellular phone. If unarmed trail rangers are used, they should have back up by police who routinely patrol the trail. Some cities have used their greenway trails for training motorcycle police. This might be a cost-effective way to have a more frequent police presence on the trail. As always, motor vehicle speeds must be kept low and care taken by officers to avoid accidents or other conflicts with trail users.



There should also be provision for medical treatment of injured or incapacitated trail users. This includes emergency treatment as well as non-emergency first aid. Either full-time or part-time personnel might provide treatment. For this reason, all patrol personnel, even seasonal employees, should be certified in first aid and cardiopulmonary resuscitation (CPR).

There should be an emergency evacuation plan prepared in conjunction with police, fire and medical center personnel. The plan should define points of access, safe and effective routes for emergency vehicle travel, and load limits for bridges and boardwalks (ambulances and rescue vehicles may weigh as much as 12,000 pounds). The distance in minutes and miles from trail access points to local hospitals and other medical facilities should be known and jurisdictional responsibility of police, fire and medical agencies determined. The emergency plan should be graphically illustrated and posted at the entrance of the trail or trail system so that users will see it and have immediate access to essential telephone numbers and other critical information. Ideally, there should be emergency phones along the trail. These could be solar powered cellular phones that can dial 911 with the push of an emergency button (Boulder, CO has this kind of system along the Boulder Creek Trail).

Maintenance Inventory and Schedule

The maintenance agency or agencies should keep a checklist and schedule that addresses both routine and remedial maintenance functions. The checklist should itemize all maintenance functions and provide a way to report problems and their location. There should also be a way to log the outcome of each reported maintenance problem. These reporting sheets should be kept on file and periodically reviewed by maintenance supervisors to determine if the problems were solved and to identify any trends or problem areas.

The maintenance program should include a public monitoring mechanism that offers a way for citizens to report and receive feedback on maintenance problems. There should also be a procedures manual for performing maintenance functions as well as projected total annual cost of the program.

Stream Channel and Canal Maintenance

While a neatly trimmed stream edge might be appealing to some people, it is the nooks, crannies, rootwads, and fallen branches that give creeks and rivers their special character and provide food and cover for wildlife. The challenge is to meet user safety and flood damage reduction objectives while preserving as many of these natural characteristics as possible. This includes care of the channel bed, stream banks and related structures.

While a neatly trimmed stream edge might be appealing to some, it is the nooks, crannies, rootwads, and fallen branches that provide food and cover for wildlife.

Canals still used for irrigation water conveyance have a somewhat different standard of maintenance. Canals must be kept free of sediment and vegetation must not interfere with water conveyance.

Waterway maintenance activities include removal of large trash, debris (note: "debris" means material that can pose a flood hazard by clogging bridges and other constricted areas), litter collection; erosion control and repair; maintenance of in-stream structures, care of fish habitat, and water quality monitoring. This maintenance work will help keep Commerce City's waterways in top condition and, more importantly, improve flood control, aquatic habitat, and water quality. Note that the bike path will also serve as an "access road" for channel maintenance. Be sure, however, that such access by maintenance vehicles is kept to a minimum and that speeds are controlled to ensure user enjoyment and safety.

The stream channel maintenance program should be environmentally sensitive using a number of "habitat-friendly" techniques. The City of Colorado Springs, CO *Maintenance Guidance Plan for Monument Creek* prepared by *ERO Resource Corporation* suggests some ideas that are applicable to Commerce City's waterways including:

- not removing or scraping sandbars (except canals);
- whenever possible, limiting use of heavy maintenance equipment in sensitive riparian, stream bottom and wetland areas--ideally not entering, mowing or trimming during sensitive times such as breeding, migratory roosting or nesting seasons; and,
- having a policy of *rotational* cutting of woody vegetation that avoids leaving long denuded reaches along the river, creek and canal corridors.

In addition, it is recommended that:

- for streams, only vegetation that absolutely needs to be cut to maintain flood flows should be cut, replanting with flood-compatible indigenous species; and,
- mowing or cutting back should not occur on both sides of the stream at the same time.

User Safety and Risk Management

It is important to ensure a safe and enjoyable experience for users and, at the same time, minimize liability exposure. Total safety and protection from possible lawsuits can never be guaranteed. Sooner or later, there will be accidents and possible legal actions. Commerce City should strive to minimize problems by adhering to a basic *standard of care* to ensure that avoidable hazards are removed or avoided and unavoidable hazards are clearly marked and known to users.

All plans, designs and maintenance procedures should be reviewed by a range of experts including maintenance staff, police and fire/rescue personnel, industrial facility managers, user groups and the public.

User safety should be considered at the beginning of the design process. Flood control improvements such as weirs and walls should be designed to minimize hazards or attractive nuisance factors. For example, weirs and dams should not have a uniform face that can create a hydraulic *keeper*. Consider instead, attractive rock drops that create "staircases" of sets of pools and weirs that will expel debris or a person who falls in. Walls can be terraced or stepped to avoid steep drops and the need for security fencing. All trails, on-street bike routes, and other components should meet state-of-the-art engineering standards.

All plans, designs and maintenance procedures should be reviewed by a range of experts including maintenance staff, police and fire/rescue personnel, industrial facility managers, user groups and the public. Anticipate problems and try to solve them ahead of time.

A risk-management program should be put in place that includes:

- routine inspection of facilities;
- having a reporting and response program that allows both citizens and maintenance staff to identify problems that promotes a quick response to remedying those problems;
- coordination with owners and managers of industrial operations to identify possible risks or hazards;
- a cooperative record- keeping system with local police and rescue department so that recurrent problems can be identified and addressed; and,
- a program of regular internal staff review of operations and maintenance procedures to assure hazards are being properly addressed.

Commerce City should adhere to a basic standard of care to assure that avoidable hazards are removed or avoided and that unavoidable risks are clearly marked and known to users.

Programming and Events

Once major parks and segments of the Commerce City trail and open spaces improvements are complete, these facilities will undoubtedly fill with people and there will be inquiries about special events including bike tours, concerts, group events, races, and other activities. Environmental groups, historic organizations, wildlife watching clubs and school groups may also plan tours and events.

It is advisable that the administering agencies, in cooperation with the community, set policies for use addressing special events, vendors, concessions, and other commercial activities. All of these activities can benefit the park, trail and greenway system, but the scale, character and location of such activities must be consistent with the overall recreational and resource preservation purpose of the corridor and not negatively impact adjacent property owners.

Stewardship and Enhancement

Particular attention should be given to on-going protection, renewal, refinement, and embellishment of the creek and open space corridors and related lands. This should include a long term habitat restoration program that is accomplished by removing and controlling weeds and invasive plants, enhancing vegetation and creating new upland habitat and wetland areas. Other issues to consider include maintenance of adequate minimum stream flow, water quality, expanding and protecting buffer zones along the edges, protecting views, and reviewing the design of new street crossings and utility structures.

To accomplish some of these stewardship objectives there must be a permanent entity or group of agencies to watch over the river, creek and open space corridors. Ideally, this entity will include an effective combination of agency staff, concerned citizens, and responsible elected officials. This group should continually review and respond to proposed actions by other agencies and property owners evaluating projects such as dams, roadway crossings, encroachments, new development, utility lines and other activities that might compromise the resource protection objectives. This includes both local Commerce City concerns and coordination with surrounding jurisdictions.

The Concept of Design Review

Long term management of Commerce City's parks, trails, greenway and open spaces should embrace the concept of *Design Review*. Design review is time well invested. Design review is a multi-disciplinary (engineers, planners, landscape architects and maintenance personnel) review of projects prior to implementation. Ideally, the design review team should meet before any plans are put on paper to help identify problems up front. This can be handled in two ways. First, it is important to keep an agency review list and to circulate draft plans, bid documents, design guidelines and other materials for review and comment prior to implementation. Typical reviewers on this agency list could include: *Parks and Recreation Department*; *Community Development Department*; police and fire; water, sewer and energy utilities; flood control personnel; neighboring communities and others who might be involved in the process.

The second component of design review takes place *within* the implementing agency. Be sure that the maintenance people review and comment on all projects before they go out to bid or otherwise go under construction.

Be sure the maintenance people review and comment on all projects before they go out to bid or construction begins.

The purpose of design review is to refine the product and be sure critical elements are not overlooked. The design review process should not be lengthy and cumbersome. Keep a good working relationship with the key reviewing agencies. The successes of this process will of course depend upon the diplomatic skills of the staff and the effectiveness of support from elected officials. Good design is the best route to good, cost efficient maintenance.

Protection of Adjacent Private Property Interests

The parks, trails, and greenway corridors will pass adjacent to and, where easements are granted, through private property. Landowners and businesses along the proposed trail corridor are understandably concerned about the impact of the trails on privacy, businesses, security and wildlife on their lands. The management program must assure that these concerns are addressed and that negative effects on adjacent property owners are avoided. This can be accomplished in several ways including:

- a well-run maintenance program;
- privacy/security fences where required;
- education of the public through pamphlets and informational signage.

It is recommended that close contact be maintained with property owners through regular one-on-one communication. It is also recommended that property owners be represented on the community entity or entities formed to watch over the park, trail and open space system.

Feedback and Trouble Shooting

Perhaps the most important component of a quality greenway system is having an efficient way to obtain timely feedback from the public. There must be an effective monitoring system that includes a way for stream advocates, bicyclists, pedestrians and wheelchair users to report problems. This might be best accomplished by posting a "hotline" number for people to call when problems are noted. The hotline number could be posted in prominent locations such as on signs along the trail. It is essential that a person be designated to respond to and follow up on all legitimate complaints.

There must be an effective monitoring system that includes a way for stream advocates, bicyclists, pedestrians and wheelchair users to report problems.

Typical Maintenance Regimes with Cost Estimates

Table M.1 presents a typical maintenance schedule for parks and a non-trail motorized system that includes on-street elements as well as stream-oriented greenways. The list is by no means all-inclusive, but does provide an overview of key maintenance concerns.

As a general rule of thumb, annual maintenance costs for a full service urban greenway corridor and adjacent parks can be expected to run between $ 2,500 and $ 10,500 per mile. The City of Boulder, Colorado, for example, annually spends $ 45,000 per year to maintain 5 miles of the Boulder Creek Greenway--a full-service, paved urban greenway. Seattle, on the other hand, spends $ 2,500 annually per mile to maintain its bicycle trails. An east coast park agency indicated that it spends $ 6,700 per year per mile on routine maintenance annually with a equal annual expenditure for capital equipment, re-paving and other major maintenance items.

Table M-2: Maintenance Checklist

Maintenance Item	Times/Year	Comments
Park and Upland Features		
■ Weed Control (Very important for appearance and wildlife enhancement)	3-6	Remove noxious and invasive species preferably by mechanical means rather than chemical.
■ Natural Areas	as-required	Weed control and pick up litter. Address nuisances or wildlife problems.
■ Turf Areas, Structures and Plazas	as-required	Mow, fertilize, sweep, repair, weed.
Stream Care		
■ Routine Inspection	18-26	Volunteers can assist with a checklist.
■ Routine Channel Maintenance	3-6	Debris and litter removal, erosion control, revegetation, weed control.
■ Remedial Channel Maintenance	as required	Structural repair or replacement.
■ Aquatic habitat (fish, amphibians, etc.)	as required	By others including volunteers and school groups.
■ Insect Control	as required	Identify and remove potential breeding areas. Note: Healthy wetlands do not necessarily breed mosquitoes and a healthy bird population will help control bugs.
Trail Maintenance		
■ Inspection	18-26	Can be done by volunteers with a checklist.
■ Sweeping	18-26	Applies to paved trails. Use a vacuum sweeper.
■ Silt & Mud Control	as required	Remove silt and mud from trail including underpasses.
■ Mow Trail Shoulders	3-5	Mow a 2' to 5' wide swath on either side of trail.
■ Snow/Ice Removal	as required	Especially from shaded spots and underpasses. **Warning: Do not use salt. It pollutes and damages concrete.**
■ Detours/Disruptions	as required	Always provide a safe, usable, alternate route. Agencies should coordinate on this item.

Maintenance Item	Times/Year	Comments
■ Concrete Path Remedial	as required	Patch and fix heaved sections.
■ Asphalt Path	as required	Patch, seal, overlay
■ Crusher Fine & Non-Paved	as required	Fill holes and washouts, smooth out.
■ Litter Pick up	18-26	Can be done by volunteers.
■ Erosion Control	as required	Stabilize sources of silt on trail.
■ Graffiti Removal	as required	Paint over with matching color. Remove graffiti as quickly as possible to discourage more.
■ Toilets/Drinking Fountains	weekly	Use chemical toilets. Contract with a service to provide and maintain.
■ Police/Range Patrol	daily	Also install emergency #'s on signs and provide phones. Have a crime/accident-reporting program with legal address system along Creek. Also use mile markers and identify cross streets with signs visible from the trail.

Source: Urban Edges, Inc.; So Suburban Park & Rec. Dist.; Boulder Parks.; Urban Drainage and Flood Control.; Denver Parks Dept; Jefferson County Open Space.

TYPICAL RANGE OF OPERATIONAL COSTS

Table M.3 presents a typical range of operational costs that might be anticipated for Commerce City. Caution: these estimates are general and actual costs may vary significantly depending on local conditions, level of maintenance and accounting techniques. These estimates are intended as a rough benchmark and not for specific budgeting purposes.

Table M-3: Typical Range of Operational Costs

Maintenance Item	Cost/Year	Comments
■ Formal Park Areas	$ 3,500/ac.	May be lower for basic turf grass--higher for ball fields, shelters, and other upgrades.
■ "Natural" Open Space	$100-800/ac.	Weed & pest control, patrol, general mgt. High end is primarily for mowing 4/yr.
■ Routine Stream Channel	$0.50/lf	Debris removal, erosion control, weed control, repairs.
■ Multi-Use Trail (Crusher Fine)	$0.60/lf	Mow edges, minor repairs, erosion control, and patrol.
■ Multi-Use Trail (Paved)	$0.70/lf	Sweep, mow edges, minor repairs, and occasional patrol.
■ Primitive Trail	$0.40/lf	Erosion, vegetation mgt, etc. Can be done by volunteers.
■ Trail Ranger Patrol	$0.35/lf	For 2-person bicycle patrol
■ Remedial Work	$2,500	$25,000/mile every 10 years

*Source: Urban Edges; So. Suburban Park & Rec. Dist.; Boulder Park.; Urban Drainage & Flood Control.; Denver Parks; Jefferson Co. Open Space ;*East Bay Regional Park Dist..(Oakland, CA).

ADMINISTRATION--WHO IS RESPONSIBLE FOR WHAT

There are several options for managing the parks, trails, greenway and open space system. The *Parks and Recreation Department* will maintain public parks and the recreational elements of the trail system. *Urban Drainage and Flood Control District* may agree to maintain the storm water and erosion control elements of the creeks and creek-side trails to the extent that the trails also serve as maintenance access roads. Roadside multi-use trails and on-street routes should be maintained by the city street maintenance agency as well as Colorado Department of Transportation and the E-470 Authority. Water and sanitary districts and ditch companies may also maintain or partner in maintaining trails where they double as service roads. Homeowner associations or special metro districts will maintain privately held parks and open spaces or may partner *with Commerce City Parks and Recreation* where appropriate.

An inter-agency coordinating committee should be established consisting of key agency personnel. This group could include agency staff and property owner representatives as well as other partners and citizen group representatives. There should be a mutually adopted management plan and the members should meet or otherwise communicate regularly to assure continued coordination and quality.

There have been creative attempts in other communities to fund flood damage reduction, trail and open space maintenance. These include special district or more extensive owners association funding where property owners and businesses contribute to annual costs of amenity maintenance within the district boundaries. Maintenance activities might be through a private contractor or through the appropriate city agency.

Another approach for trail and amenities upkeep involves building a maintenance endowment fund from a percentage of capital grants, bequests, and certain tax-saving arrangements such as donated stocks or other securities where earnings are retained by the donor during their lifetime but go to the endowment after death. Some trail agencies have funded a portion of maintenance costs by charging a trail user fee. Trail agencies in Iowa have placed collection boxes at strategic points along the trails. Users buy trail permits on the honor system. A day permit costs $1 to $2 and a season pass can be purchased for $5 to $10. The purchaser keeps a stub to show a ranger that they have paid their way. The money is turned over to local *county conservation boards* (governmental entities) who provide the maintenance services. Indications are that in a number of counties, sufficient funds have been raised this way to cover full trail maintenance expenses. Another entity on the east coast leases its trail right of way to a fiber optics company. The cable is buried out of sight beneath the trail but it brings in hundreds of thousands of dollars annually in lease payments.

Volunteers can also help. They can clean up trash, plant and prune vegetation, repair trails, and serve as interpretive guides. Scouts, elderly and retired people and community service organizations might help as well. A number of school districts around the nation require students to participate in a community service project in order to graduate from high school. This might be another source of "volunteer" labor. Prison labor and alternate "community service" programs can also be a source.

Volunteers and community service labor, however, is not really cost-free. Workers must be recruited, trained, supervised and provided with tools. This calls for an investment of resources. Also, the consistency of workmanship and the availability of volunteer labor are not guaranteed. Volunteers can be great, but it would be unrealistic to totally rely on them. While grants, bequests and other approaches offer potential, funding, operations and maintenance money is very hard to raise in the private sector, necessitating a public sector commitment to long term maintenance.

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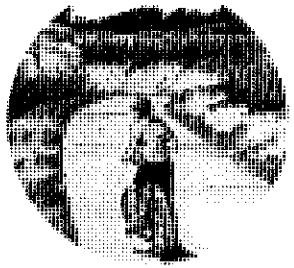

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Lakewood	Denver	Ft. Collins	Longmont
Louisville	Lafayette	Boulder	Broomfield
Westminster	Highlands Ranch	Ken Caryl Ranch	

Data Sources Used in Preparation of This Plan

Please see Table 3.1 on pages 3.4 and 3.5 of this plan for a listing of data sources used.

Key Contacts

Following is a listing some of the key individuals contacted during preparation of this plan or who may by useful referral or information source:

Commerce City Parks, Recreation and Golf

Mr. Rob Thames
Superintendent of Parks
City of Commerce City
6060 Parkway Drive
Commerce City, CO 80022
303-289-3713

Mr. Tom Acre
Parks Planner
City of Commerce City
6060 Parkway Drive
Commerce City, CO 80022
303-289-3758

Commerce City Community Development

Mr. Steve House
Director of Community Development
City of Commerce City
5291 E. 60th Avenue
Commerce City, CO 80022
303-289-3680

Mr. Neil Goodenough
Planning Manager
Community Development
City of Commerce City
5291 East 60th Avenue
Commerce City, CO 80022
303-289-3673

Commerce City Engineering

Mr. Daren Sterling, City Engineer
Commerce City Public Works
8602 Rosemary Street
Commerce City, CO 80022
303-289-8175

Commerce City Economic Development

Ms. Trish Layton
Economic Dev. Director
5291 East 60th Avenue
Commerce City, CO 80022 303-289-3717

Adams County

Ms. Crystal Gray, Director
Adams County Parks
9755 Henderson Road
Brighton, CO 80601
303-637-8005

Mr. Rick Anderson, Planner
Adams County Planning
4955 E. 74th Avenue
Commerce City, CO 80022
303-853-7000

City of Brighton

Mr. Mark Heidt, Superintendent
Brighton Parks and Recreation Dept.
225 4th Avenue Suite #104
Brighton, CO 80601
303-655-2170

City of Denver

Ms. Carolyn Poissant
Denver Parks Department
2300 15th Street Suite 150
Denver, CO 80202
303-964-2554

Mr. Dennis Piper
Stapleton Development
3090 Syracuse St.
Denver, CO 80207
303-393-7700

City of Aurora

Mr. Mike Turner, Principal Planner
Aurora Parks/Open Space
1470 So. Havana St Suite 502
Aurora, CO 80012
303-739-7168

Barr Lake State Park

Mr. Dan Weber, Park Manager
Barr Lake State Park
13401 Piccadilly Road
Brighton, CO 80601
303-659-6005

Rocky Mountain Arsenal National Wildlife Refuge

Ms. Deborah Long
Mr. Tom Jackson
Rocky Mountain Arsenal
National Wildlife Refuge
Building 111
Commerce City, CO 80022
303-289-0633

Colorado Division of Wildlife

Mr. David Weber, Ecologist
Ms. Vicki Vargas Madrid
District Wildlife Manager
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
303-291-7137

Mr. Obe Lowry
District Wildlife Manager
Colorado Division of Wildlife
6060 Broadway
Denver, CO 80216
303-291-7132

Natural Heritage and Historic/Archeological

Mr. John Amrstrong
Environmental Review Coordinator
Colorado Natural Heritage Program
254 General Services
Fort Collins, CO 80523
970-491-1309

Urban Drainage and Flood Control District

Mr. Bill DeGroot
Chief, Floodplain Management Program
Urban Drainage & Flood Control District
2480 West 26th Ave,#S-156B
Denver, CO 80211
303-455-6277

School Districts

Ms. Joy Gerdom,
Planning Department
Shannon Bingham, Consultant
School District 27 J
630 South 8th Avenue
Brighton, CO 80601
303-655-2984

Mr. John Pennoyer,
Superintendent
School District 14
4625 East 68th Avenue
Commerce City, CO 80022
303-289-3111

Ditch Companies

Mr. John Akolt
Farmers Reservoir and Irrigation Company (FRICO)
80 South 27th Avenue
Brighton, CO 80601
303-659-7373

E-470 Authority

Mr. John Bright
Director of Engineering
E-470 Authority
7600 East Orchard Road
Greenwood Village, CO 80111
303-773-9788

Denver Regional Council of Governments

Mr. Larry Mugler
DRCOG
2480 West 26th Avenue, Suite 200B
Denver, CO 80211-5580
303-455-1000

Utilities and Highways

General Improvement District
c/o Black and Veatch
Mr. David Vidikan
11900 E Cornell Ave # 300
Aurora CO 80014
303-671-4200

South Adams Water and
Sanitation District
6595 E 70th Avenue
Commerce City, CO
303-288-2646

Mr. John K. Knop, P.E., Senior Project Manager
Colorado Department of Transportation Dist. 6
2000 South Holly Street
Denver, CO 80222
303-757-9296

Developers Consulted

- Waterson/Buffalo Run
- Mountain View Industrial Park
- Phelps Tointon Industrial Park
- Melody Homes/River Run
- Fullenwider/Buffalo Hills
- Catellus/Burlington Northern
- The Villages at Buffalo Run
- Calson/3rd Creek Ranch & Potomac Farms
- Black Creek

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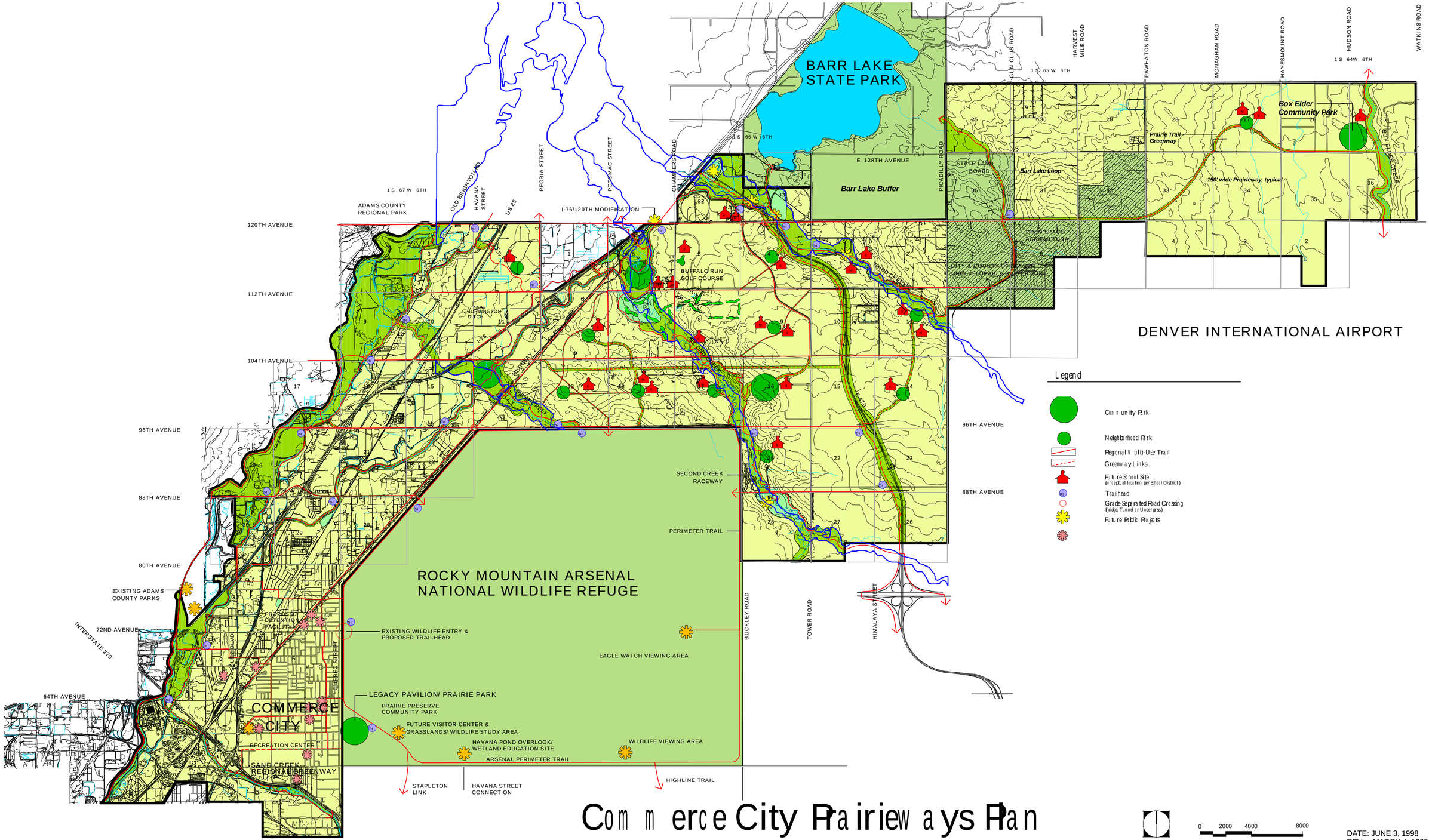
- *Shapins Associates;*
- *Ron Straka, Planning Consultant;*
- *Dave Weber, Scott Hoover, Obie Lowry, Vicki Vargas, Colorado Division of Wildlife;*
- *Dan Weber, Barr Lake State Park; and,*
- *Judy McCarty , DHM Design Corporation for editing.*

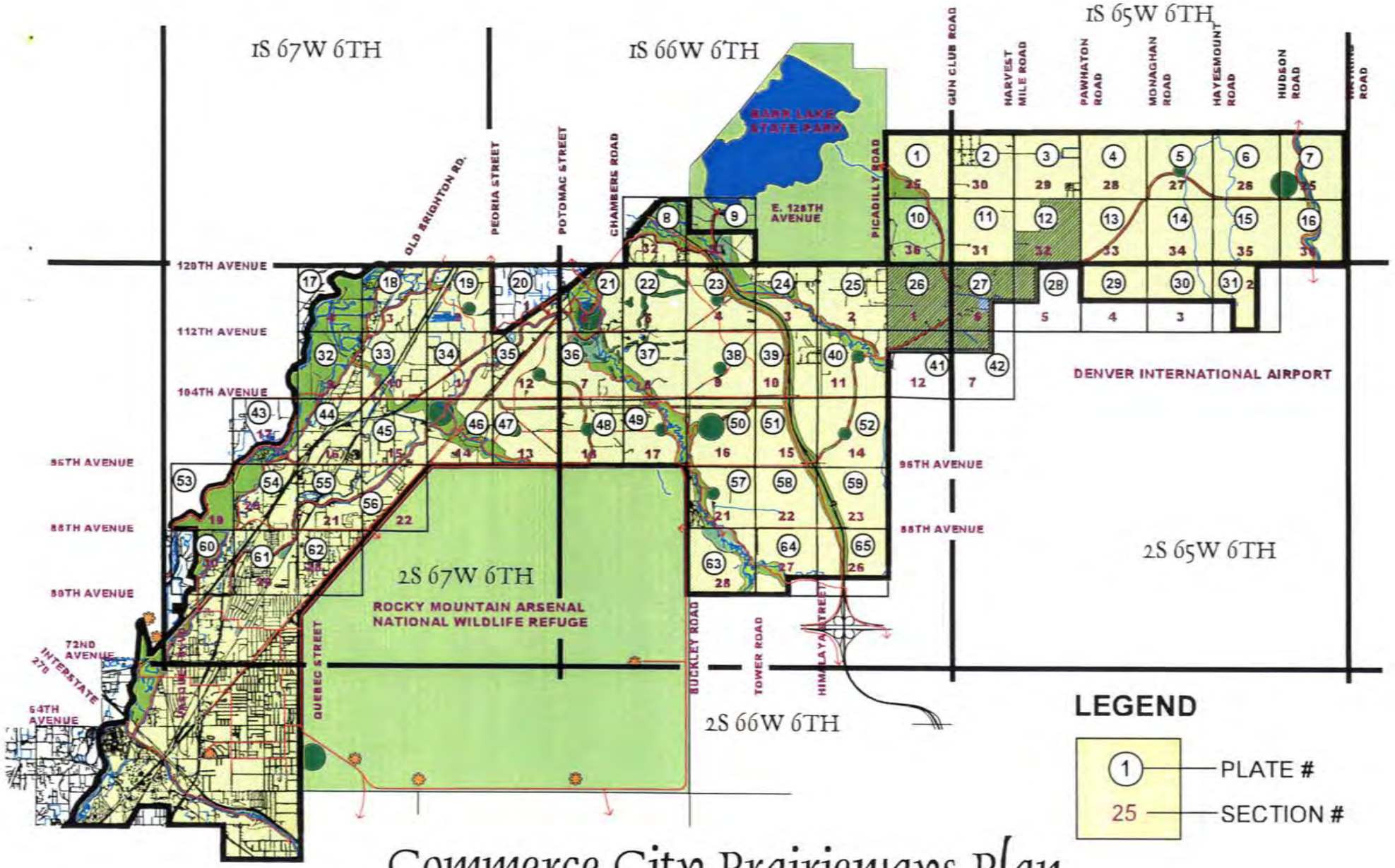


Commerce City Prairieways Plan

Urban Edges • DHM Design Corporation • Tuttle Applegate, Inc.

0 2000 4000 8000
1000

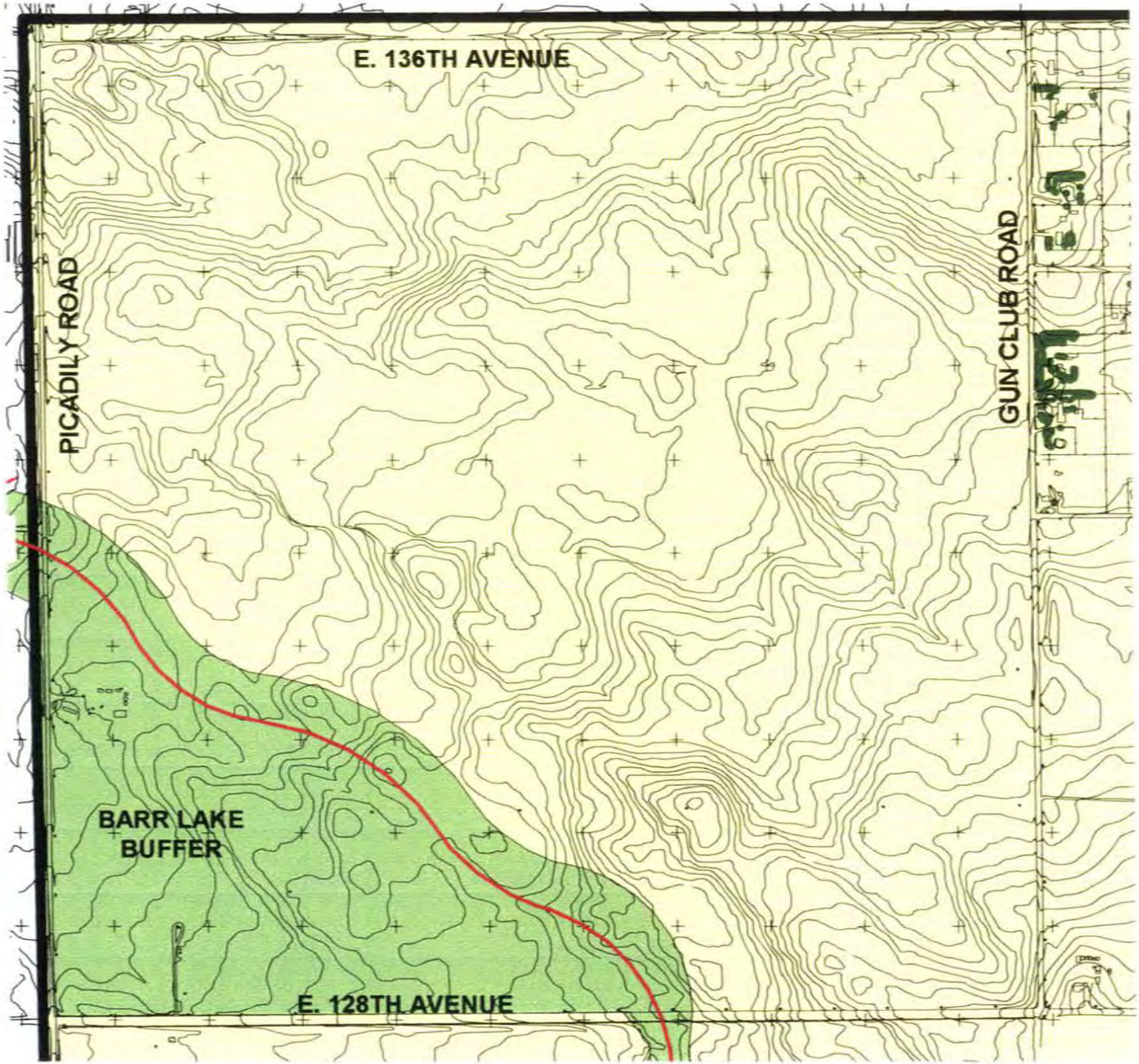
DATE: JUNE 3, 1998
REV. MARCH 4, 1999
FEBRUARY 29,1999
MARCH 21, 2000



Commerce City Prairieways Plan

· Key Map ·

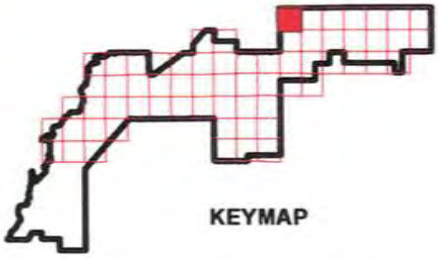
Urban Edges DHM Design Corporation Tuttle Applegate, Inc.



Township 1 South, Range 66 West, Section 25

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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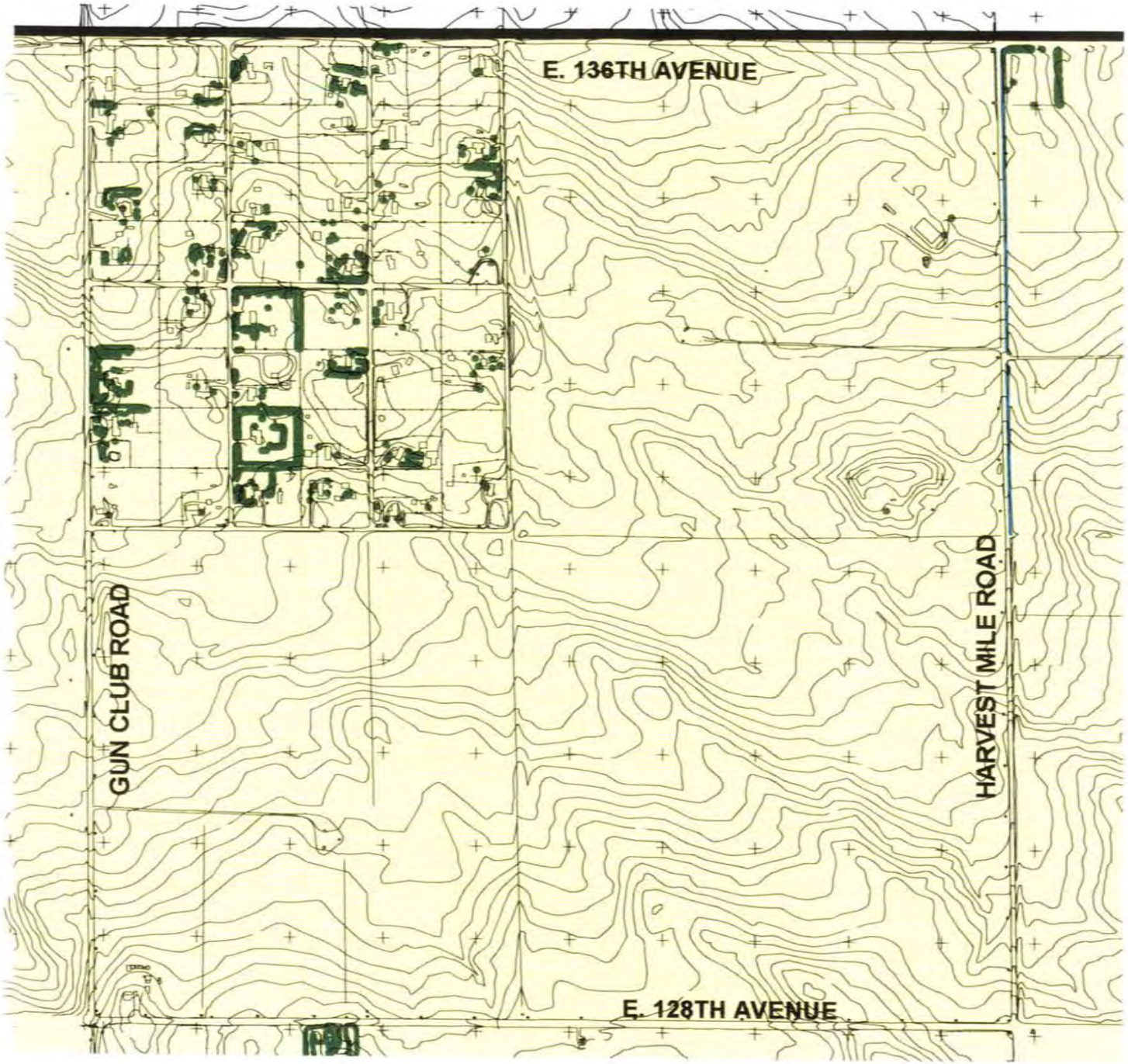
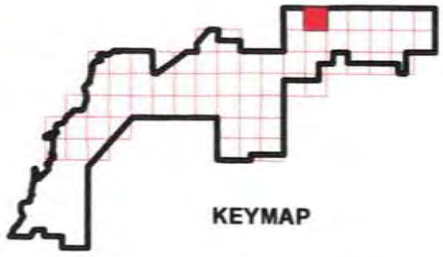
PLATE #1



Township 1 South, Range 65 West, Section 30

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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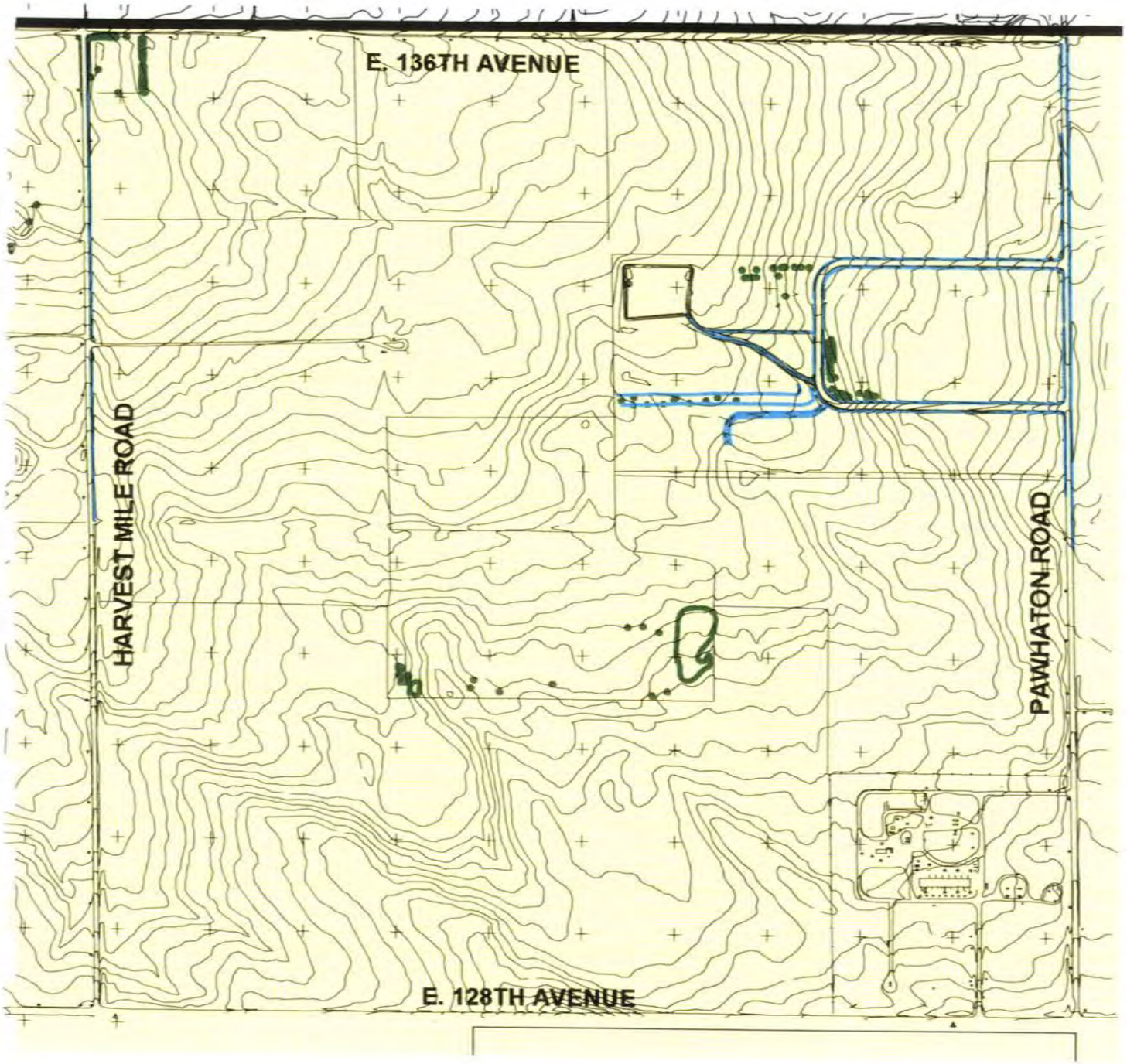
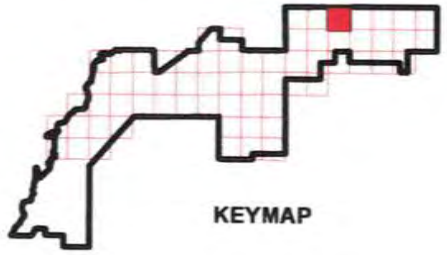
PLATE #2



Township 1 South, Range 65 West, Section 29

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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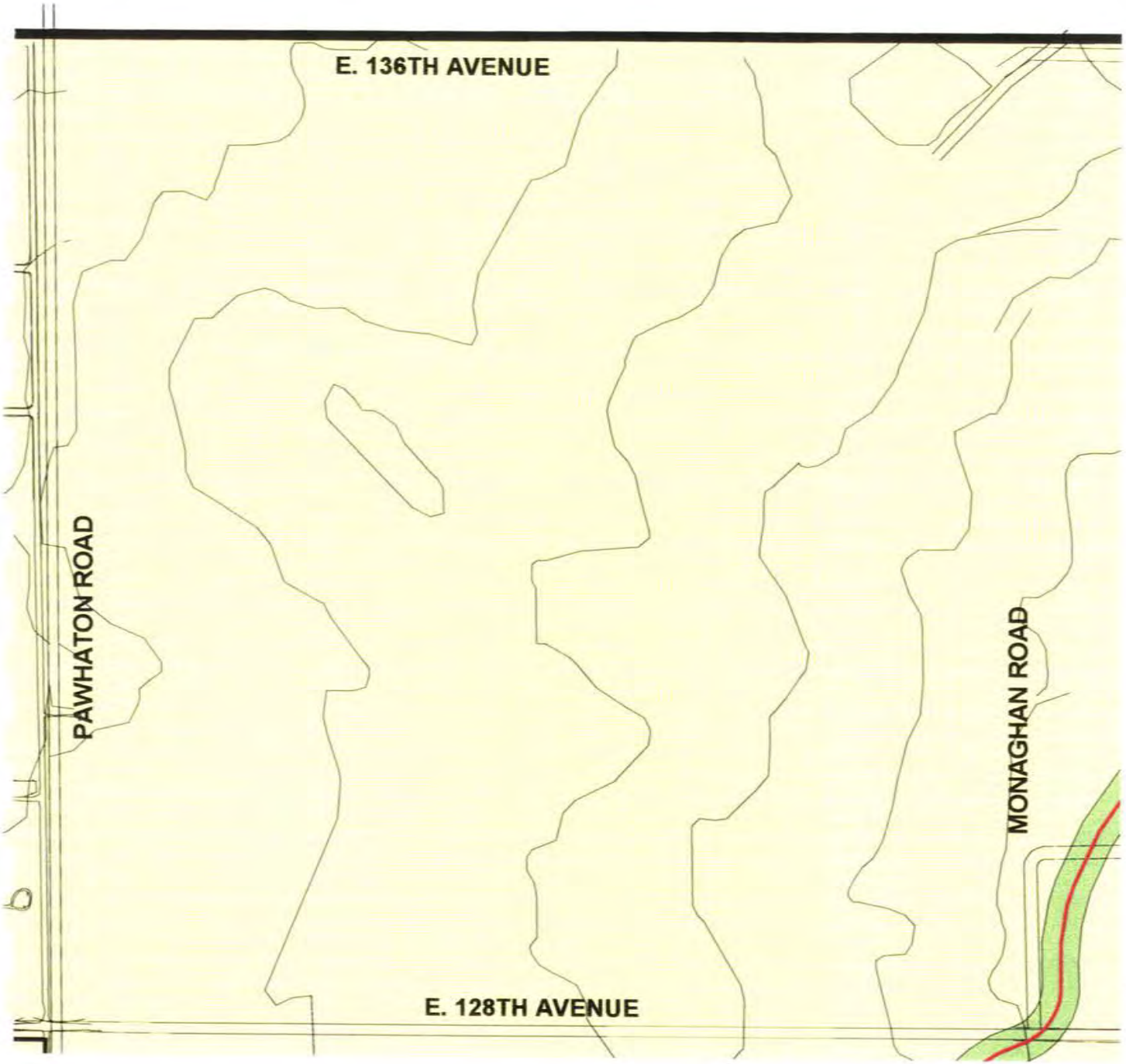
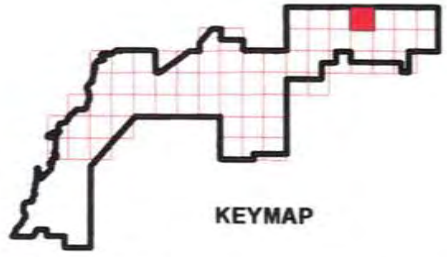
PLATE #3



Township 1 South, Range 65 West, Section 28

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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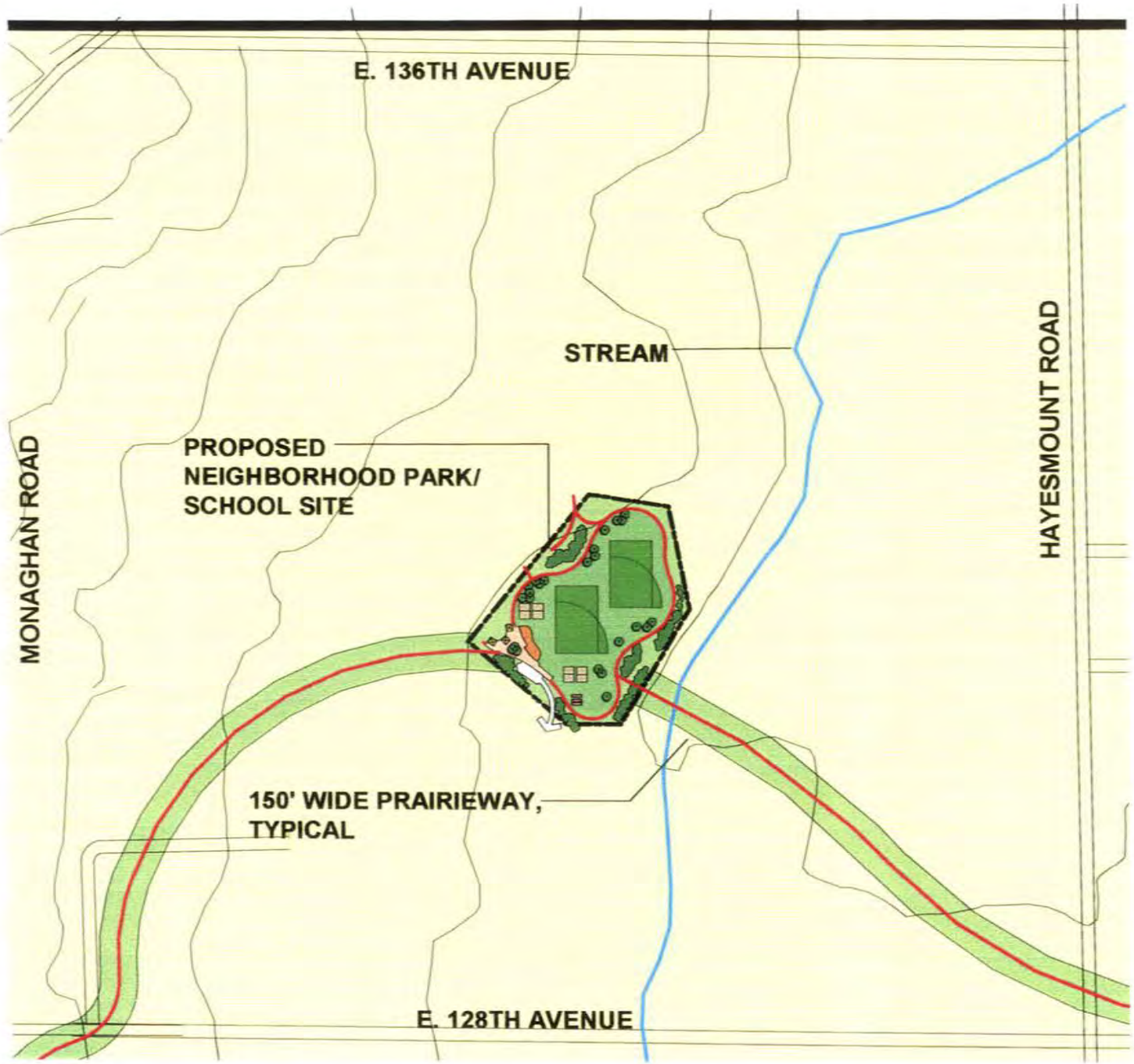
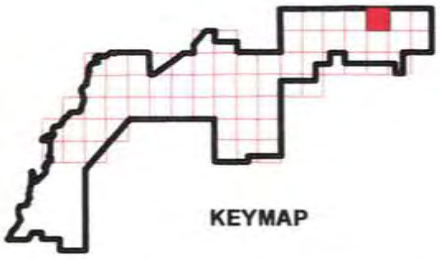
PLATE #4



Township 1 South, Range 65 West, Section 27

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



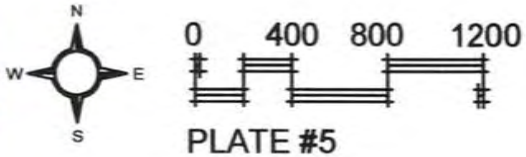
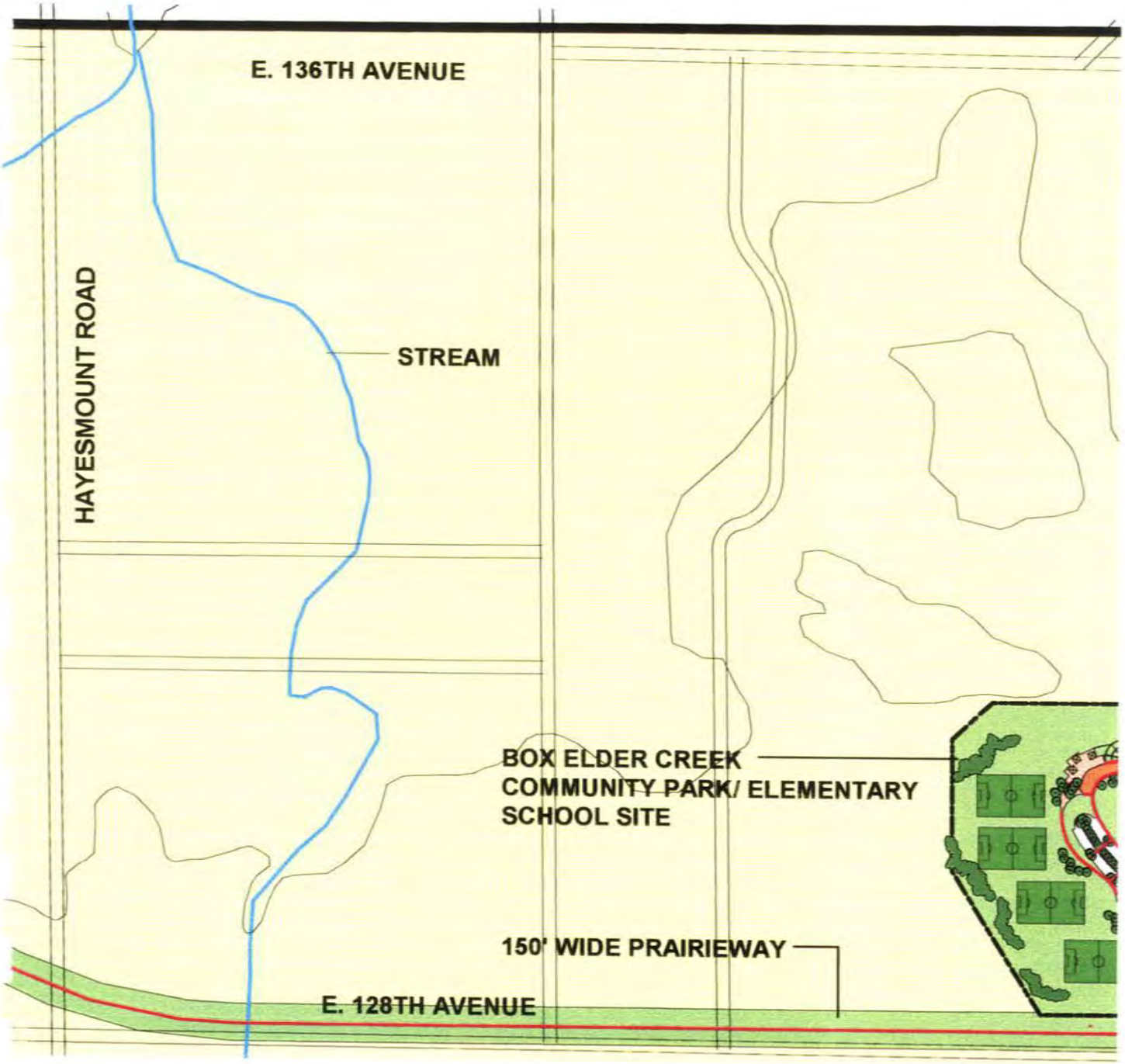


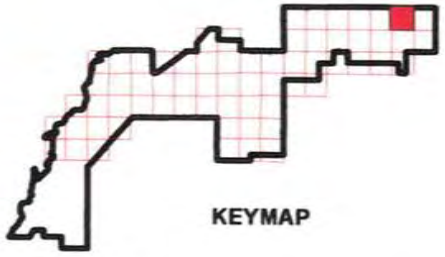
PLATE #5



Township 1 South, Range 65 West, Section 26

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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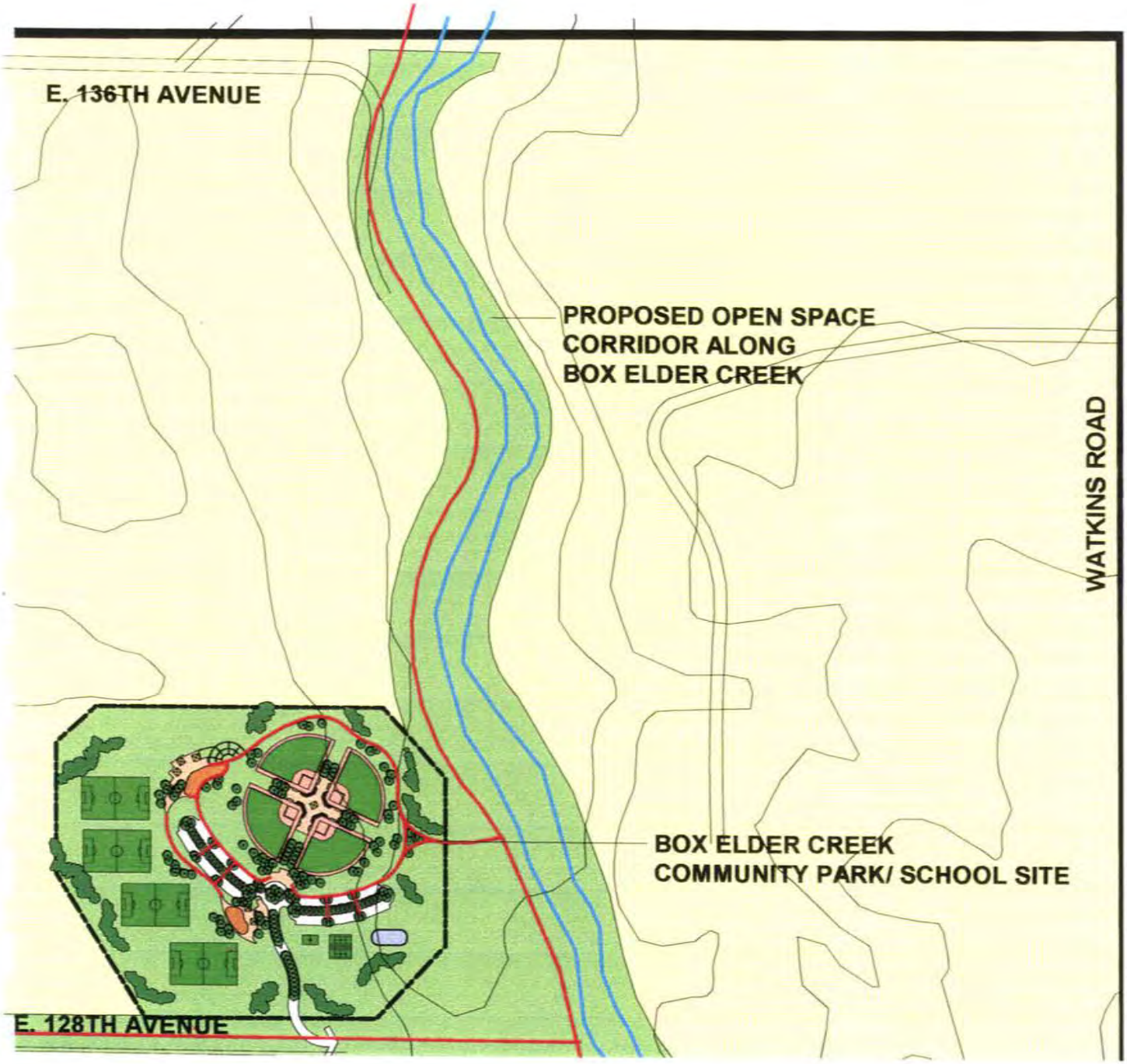
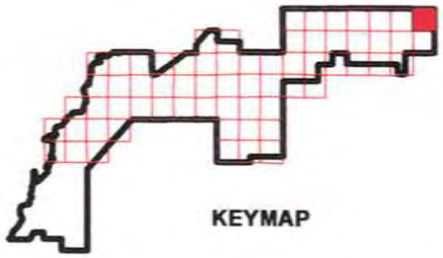
PLATE #6



Township 1 South, Range 65 West, Section 25

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



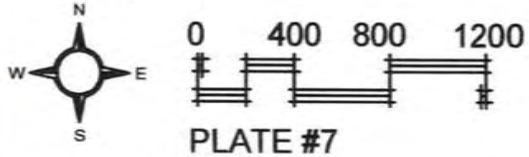
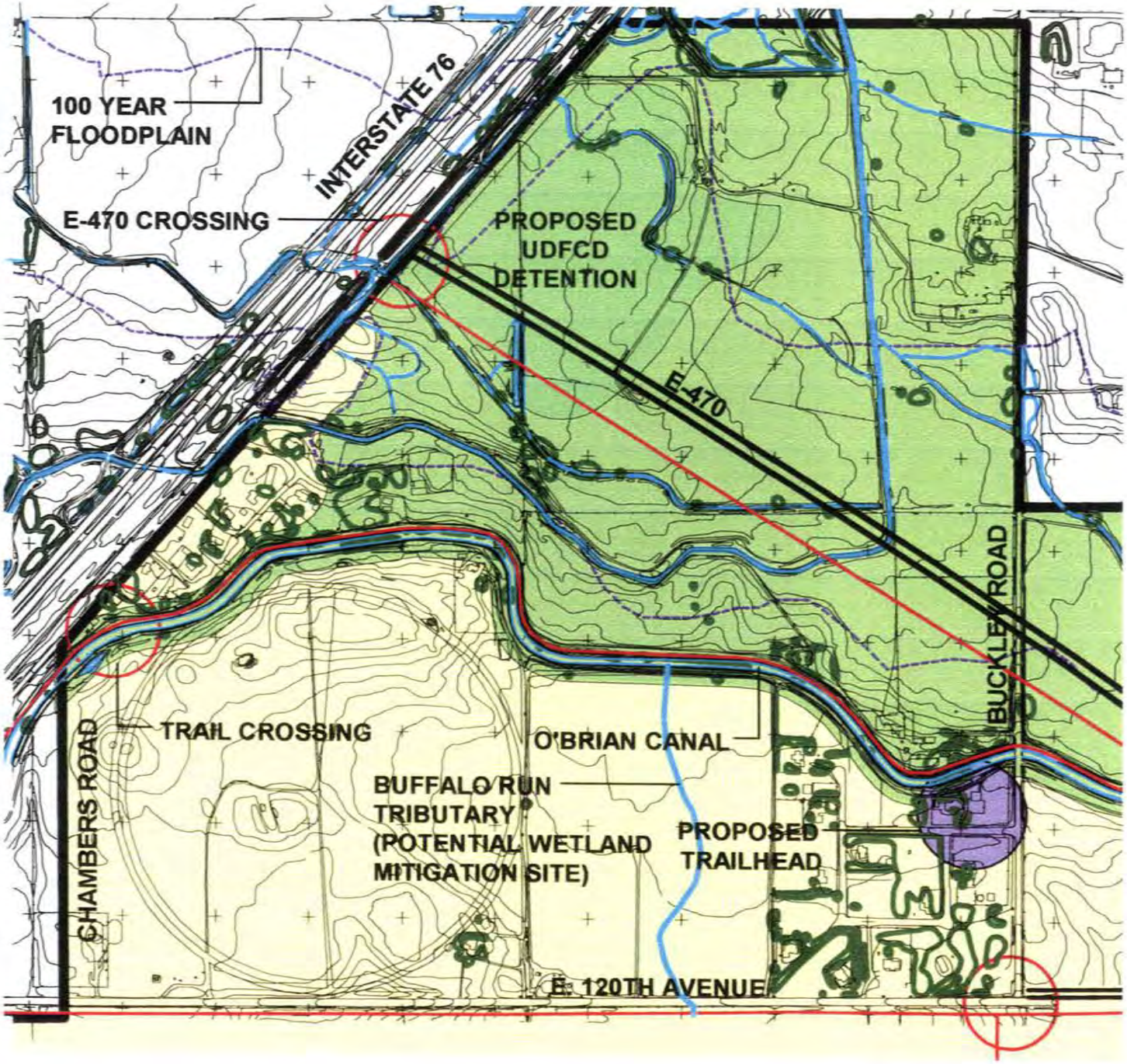


PLATE #7



Township 1 South, Range 66 West, Section 32

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

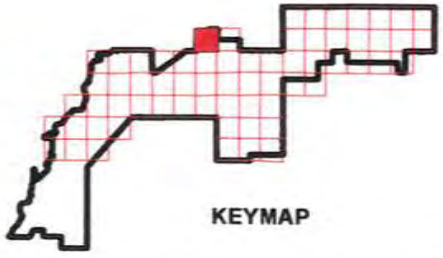


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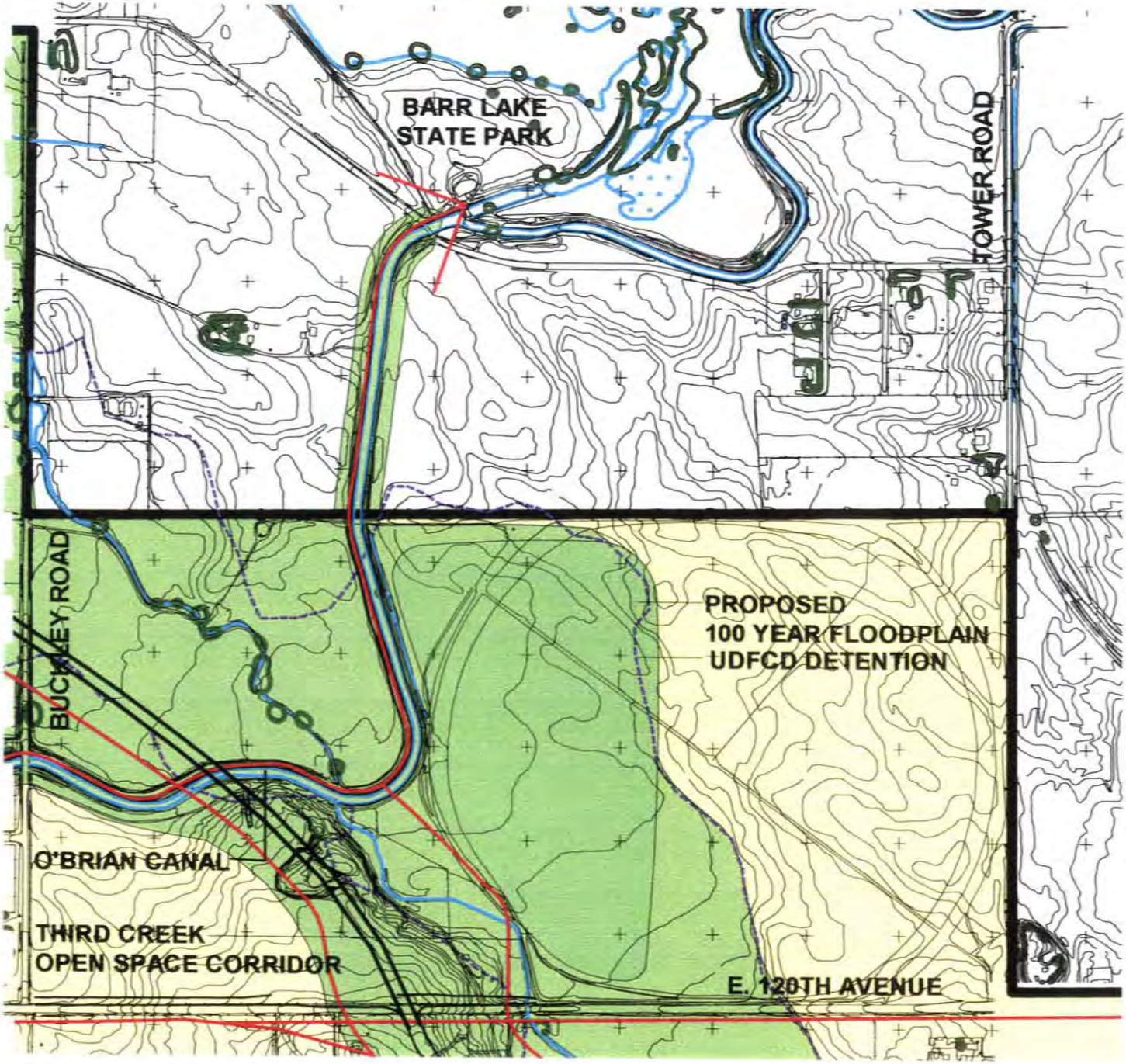
PLATE #8



Township 1 South, Range 66 West, Section 33

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

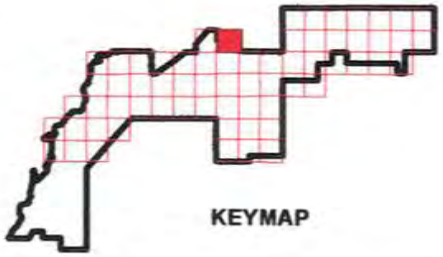


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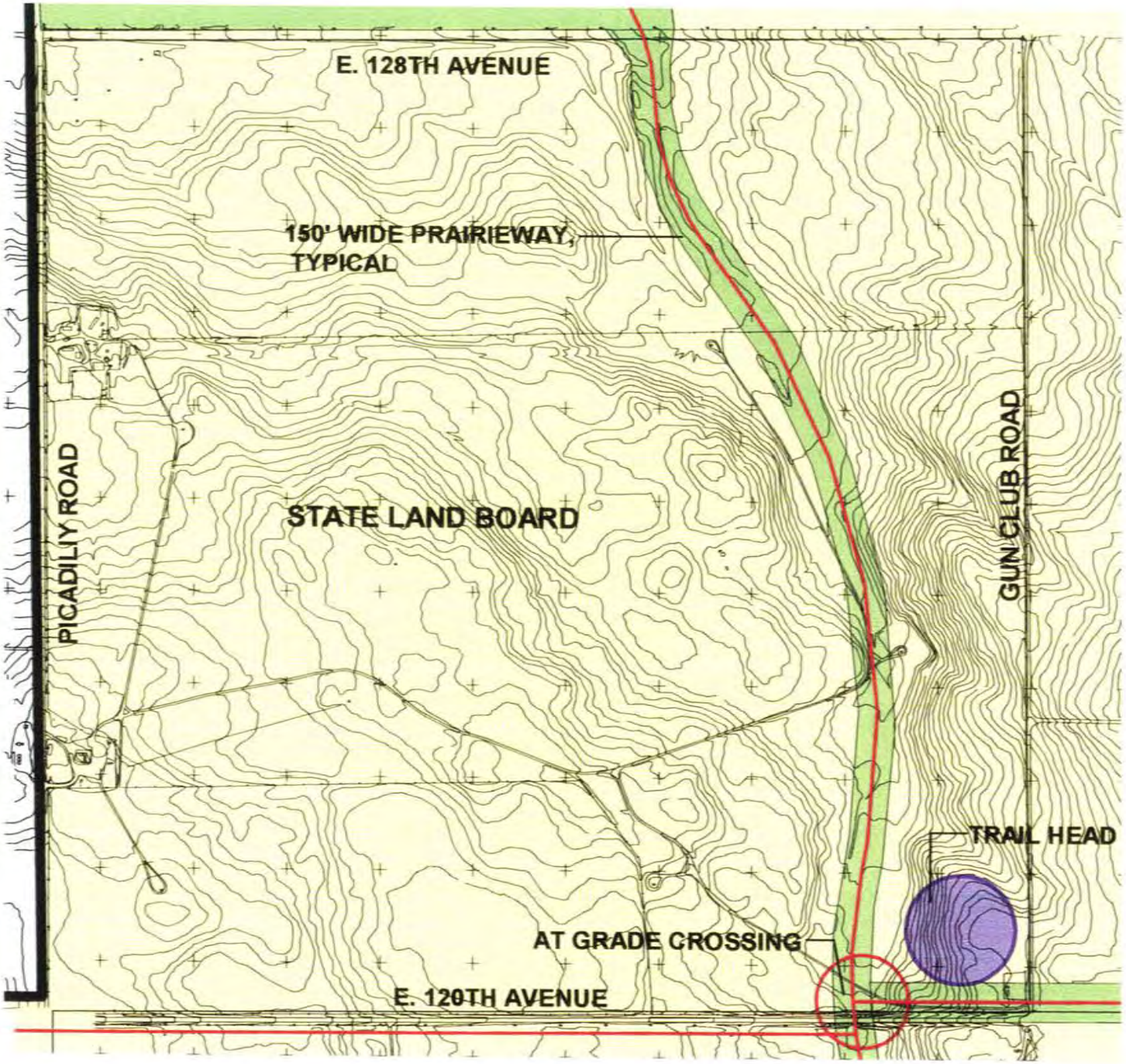
PLATE #9



Township 1 South, Range 66 West, Section 36

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

KEYMAP

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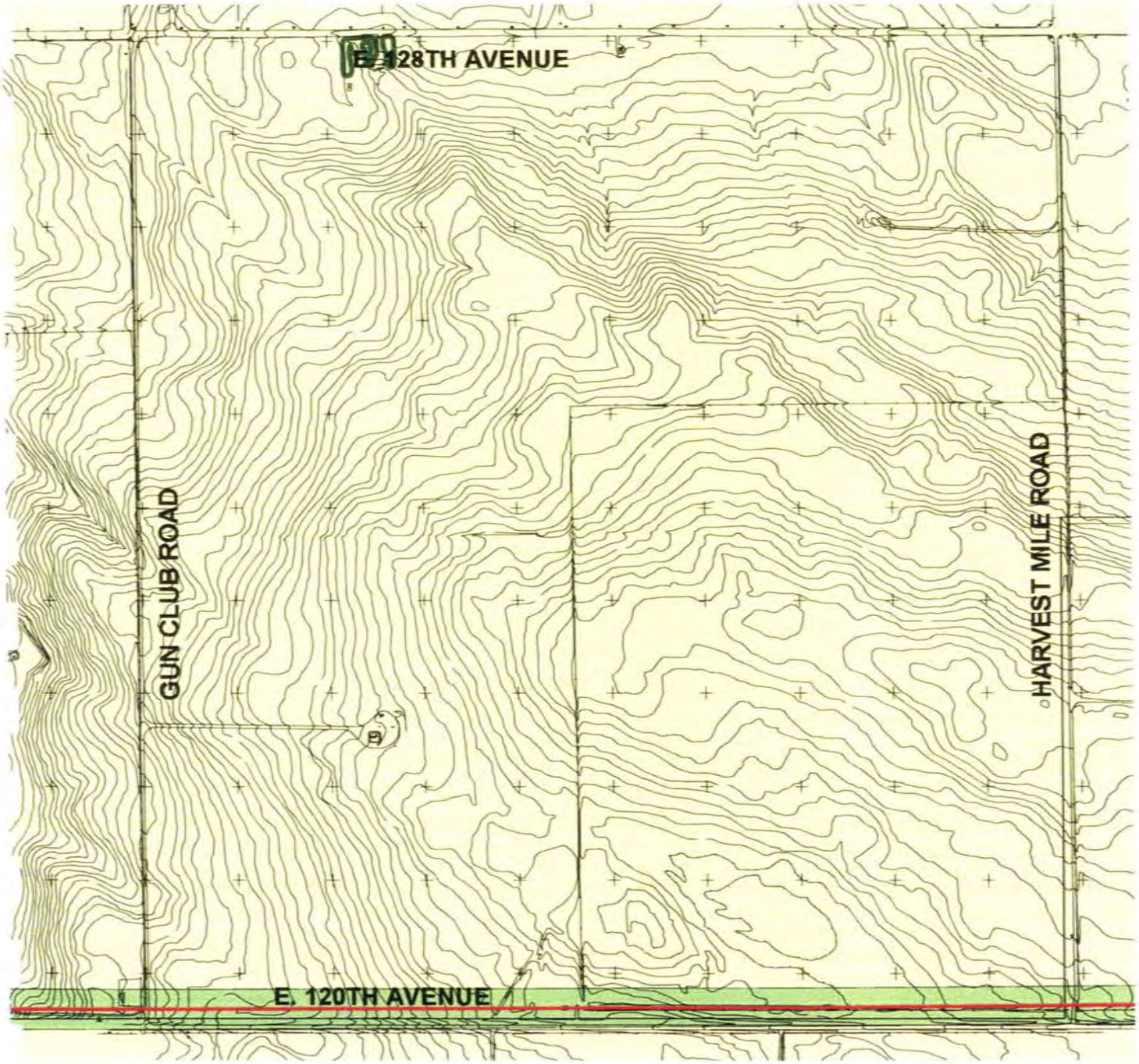
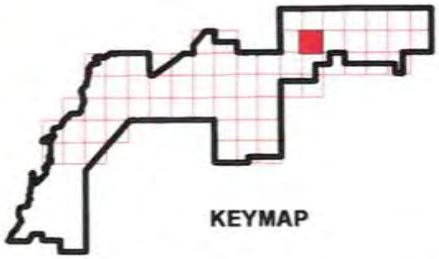
PLATE #10



Township 1 South, Range 65 West, Section 31

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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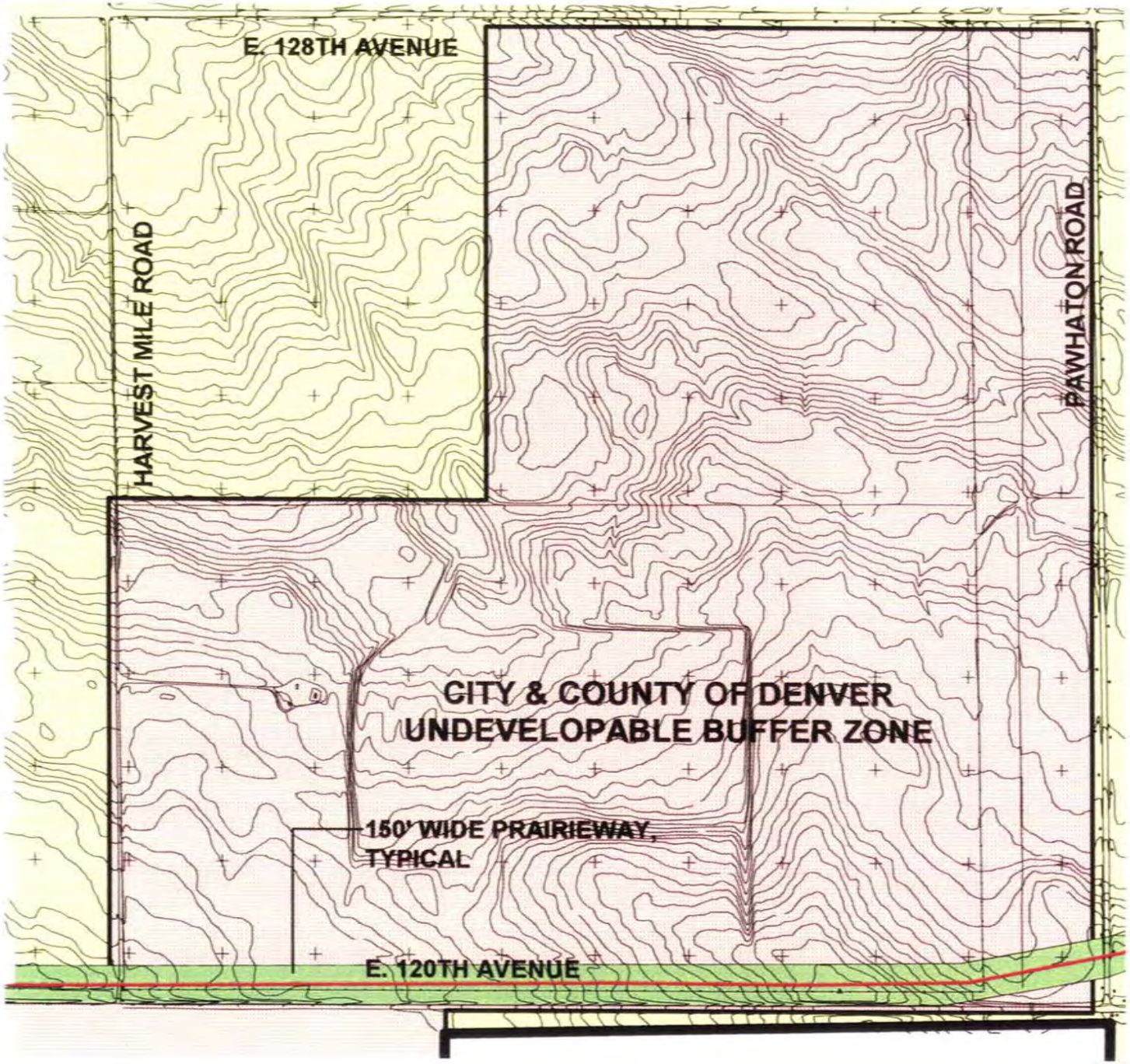
PLATE #11



Township 1 South, Range 65 West, Section 32

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

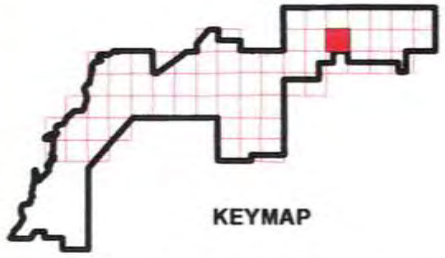


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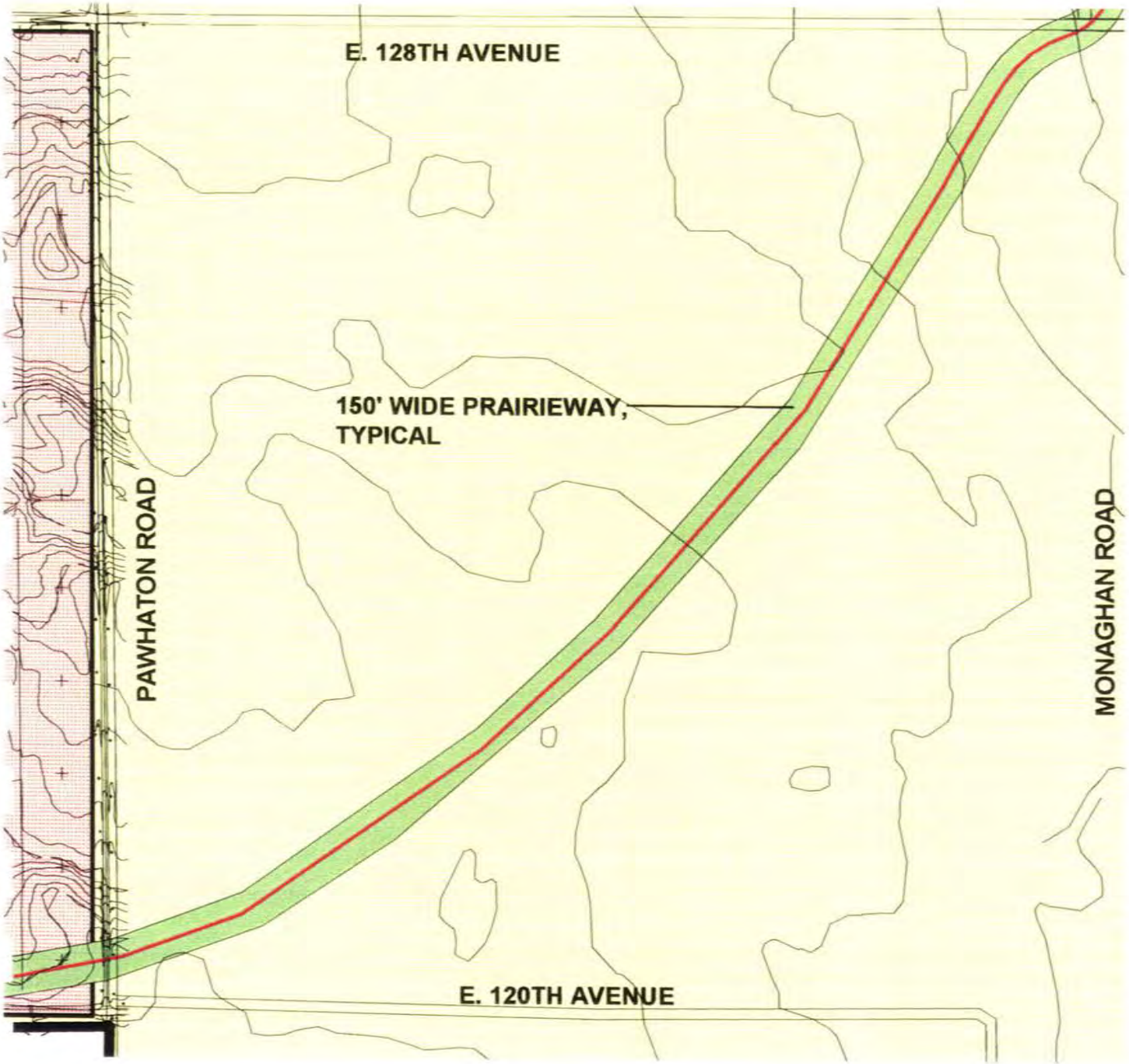
PLATE #12



Township 1 South, Range 65 West, Section 33

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

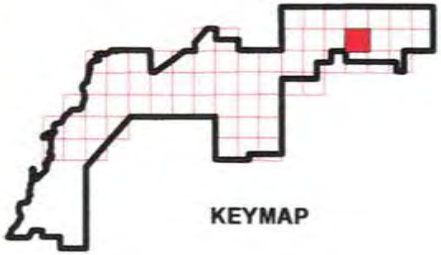


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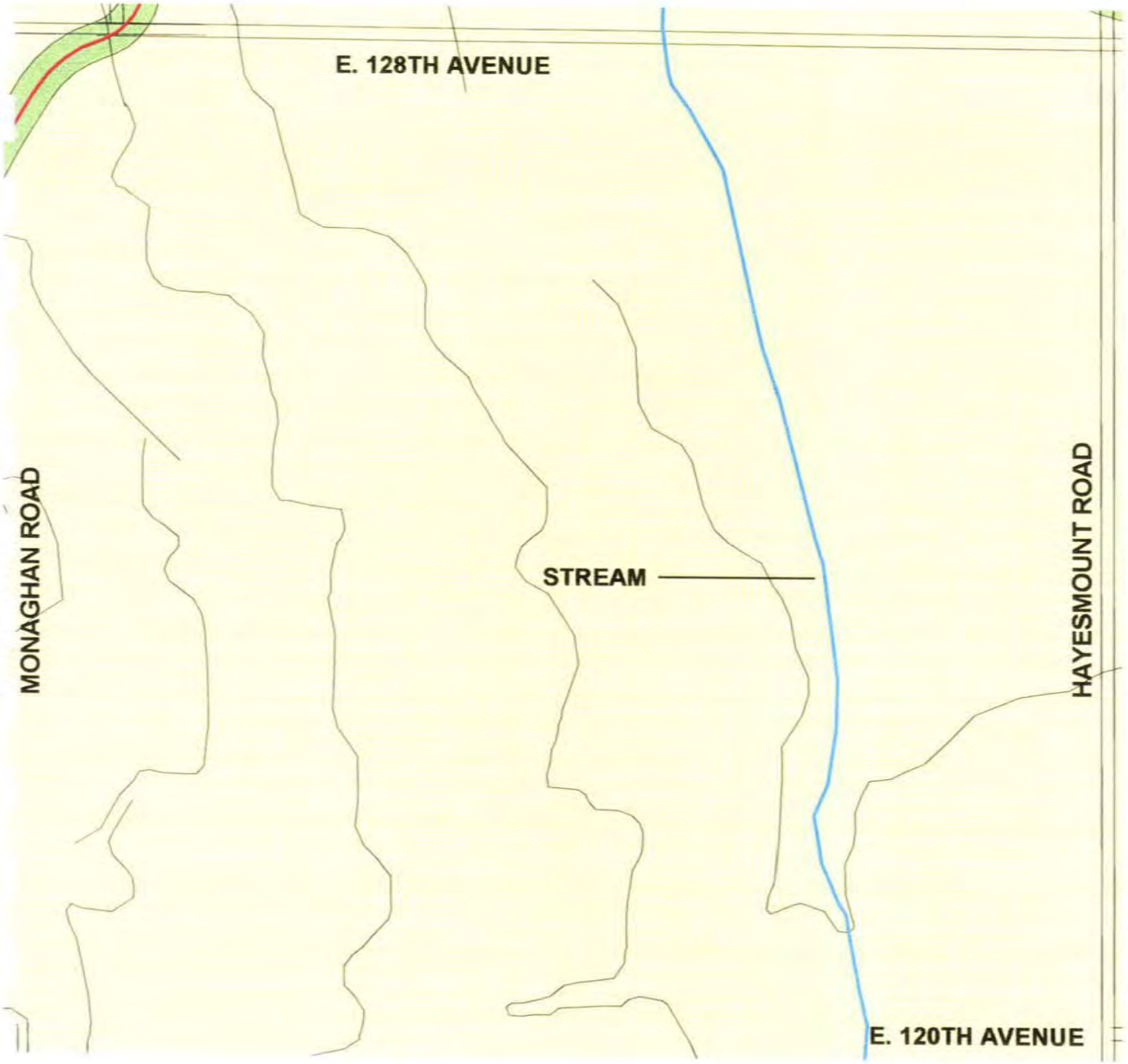
PLATE #13



Township 1 South, Range 65 West, Section 34

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

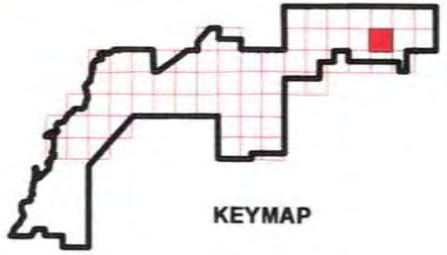


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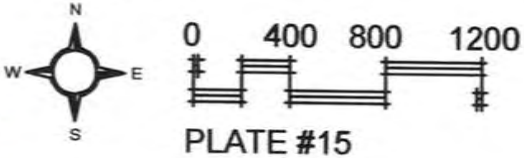
PLATE #14

Township 1 South, Range 65 West, Section 35

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

KEYMAP



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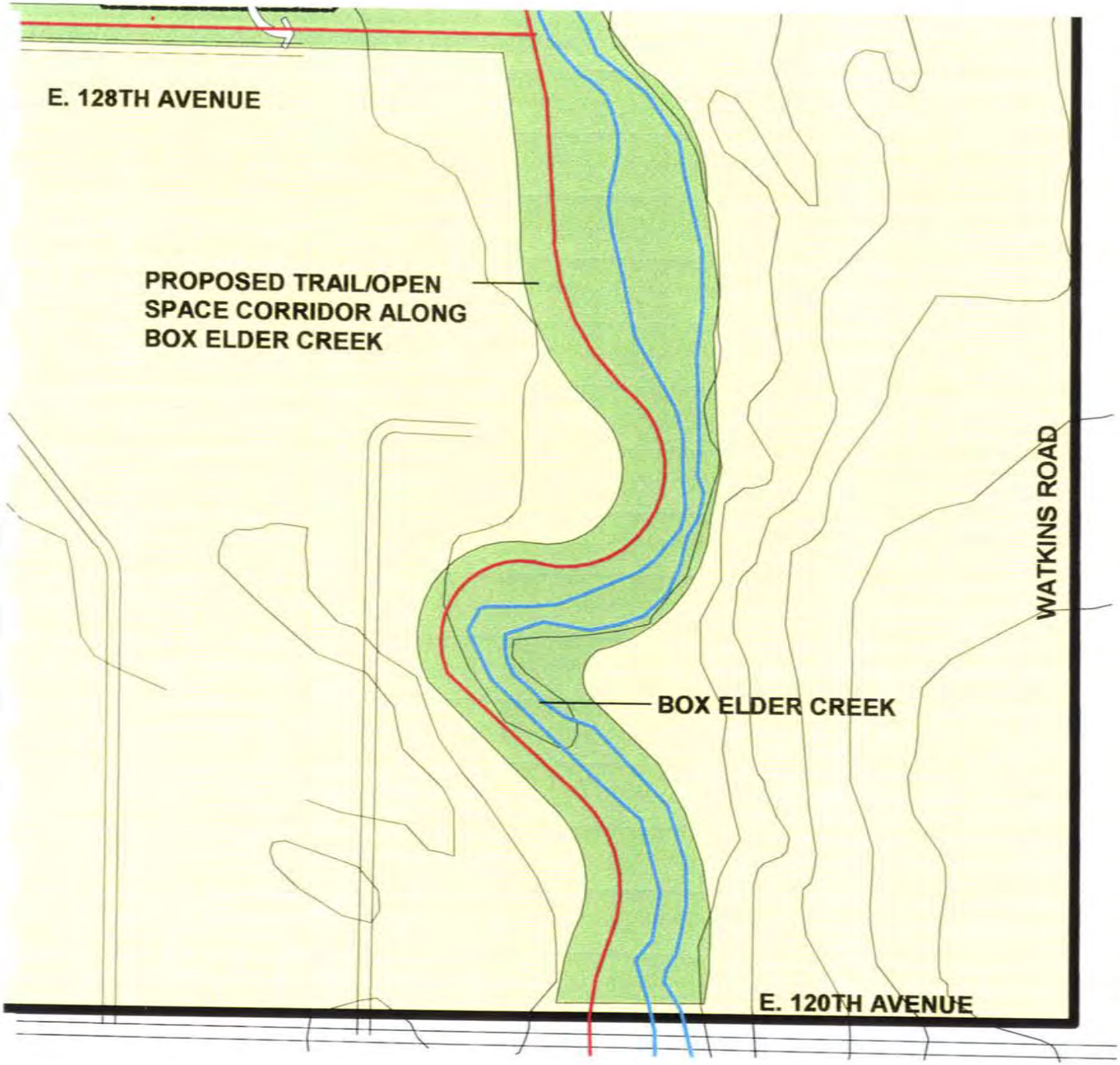
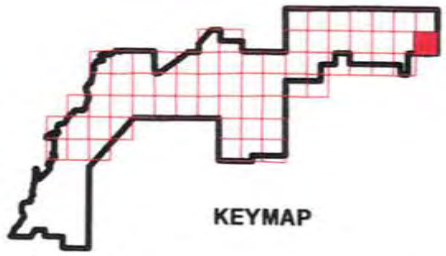


Township 1 South, Range 65 West, Section 36

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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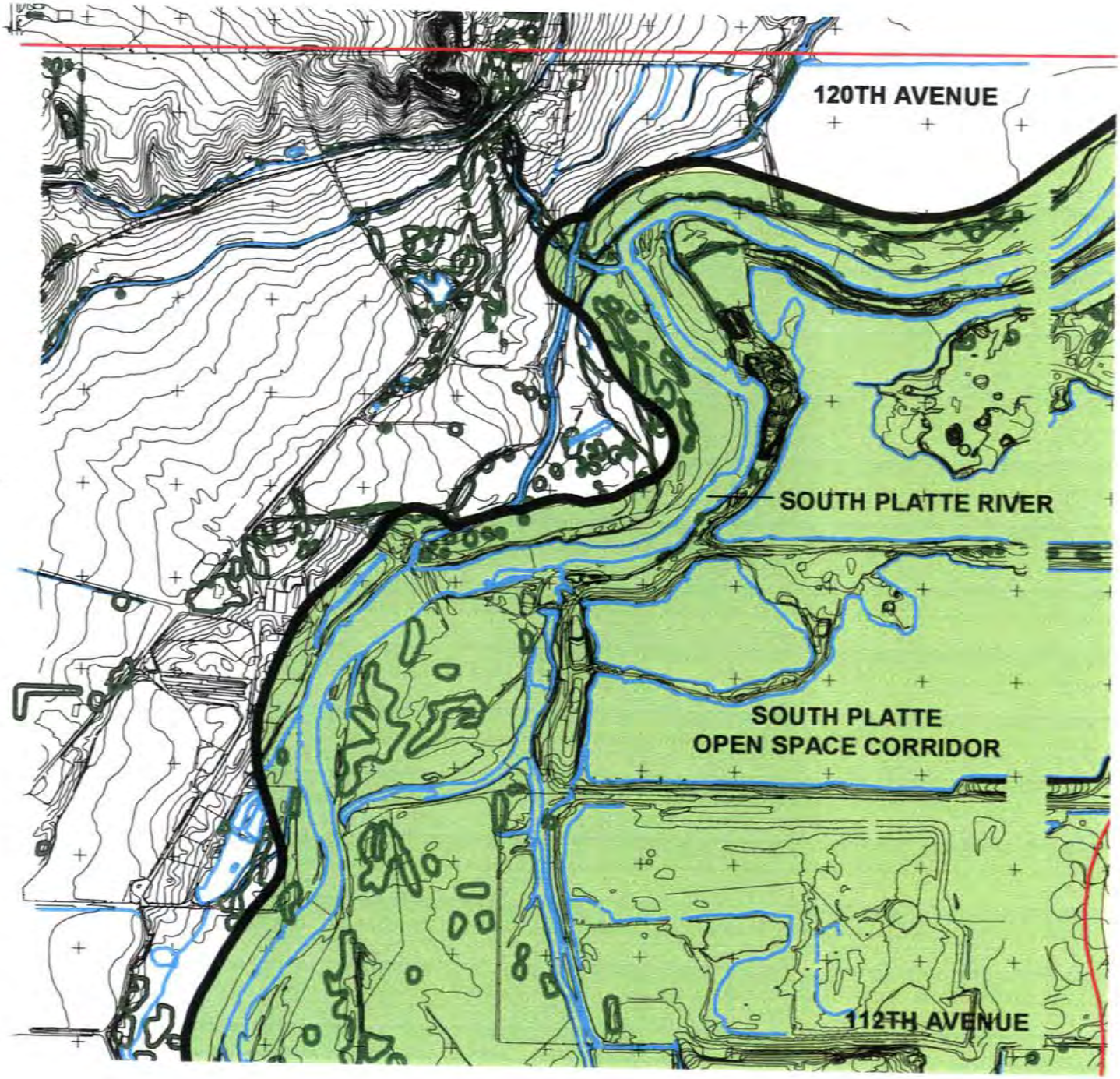
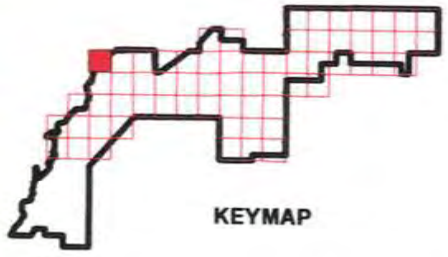
PLATE #16



Township 2 South, Range 67 West, Section 4

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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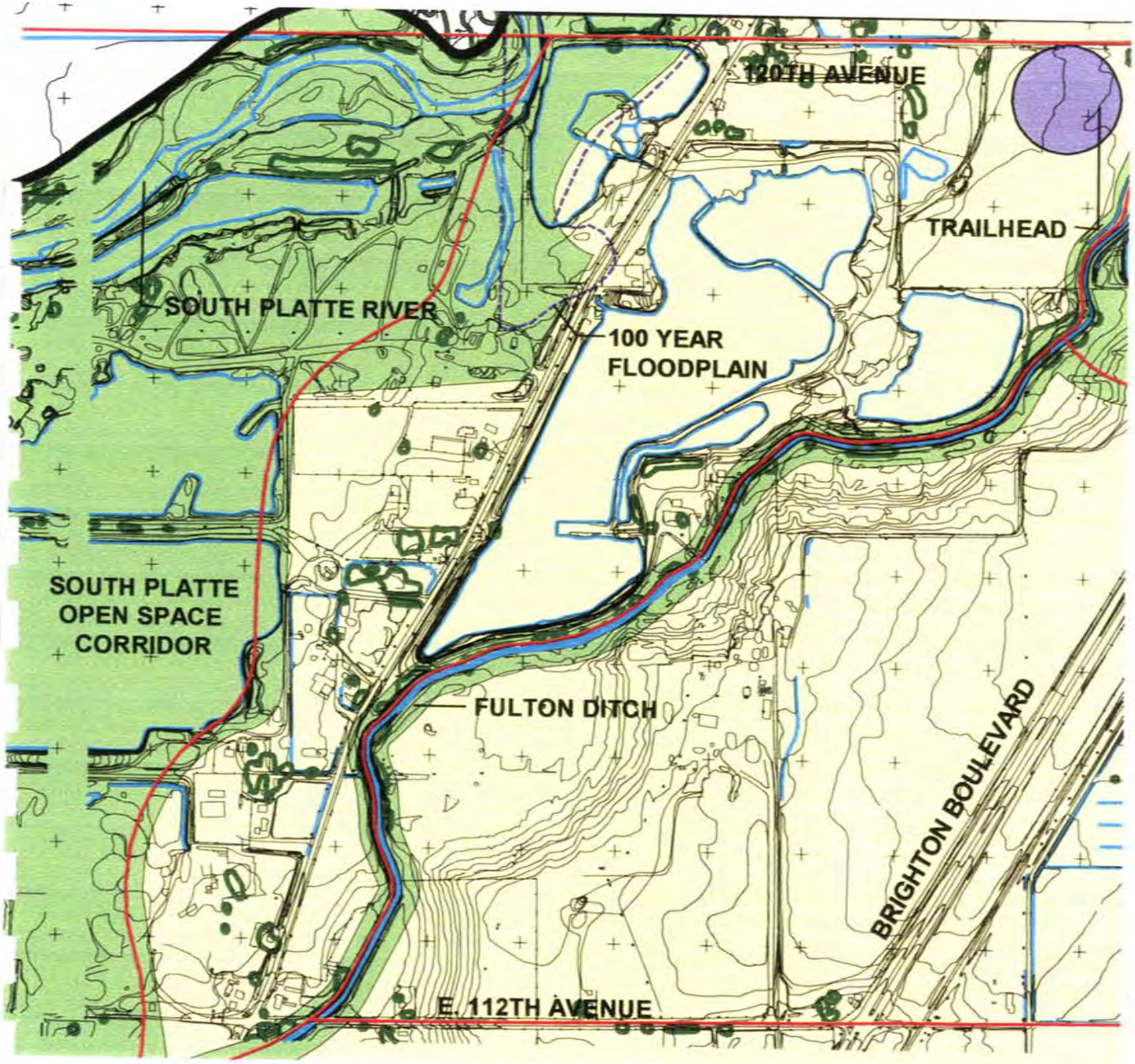
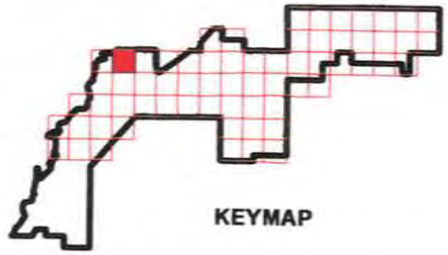
PLATE #17



Township 2 South, Range 67 West, Section 3

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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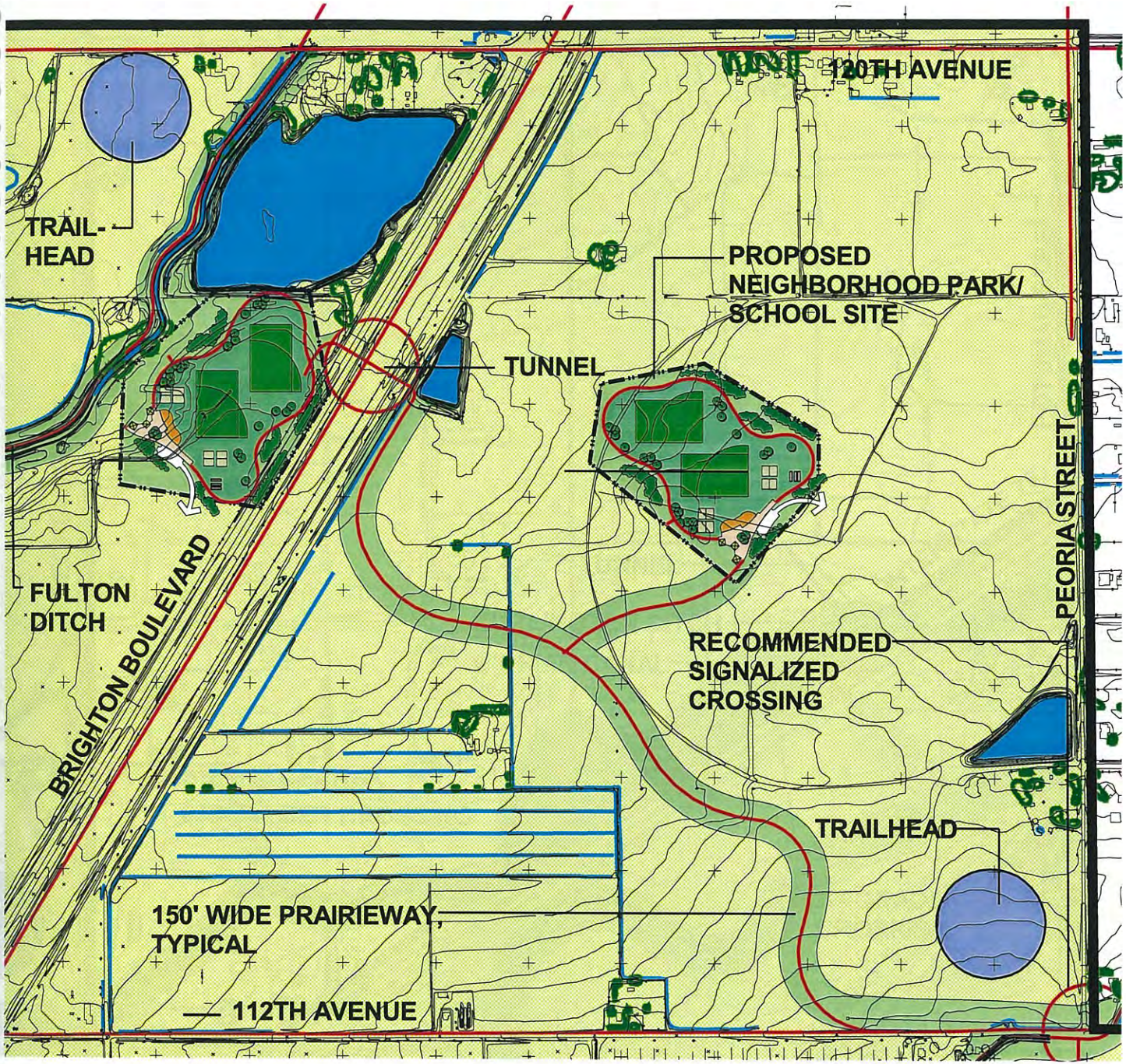
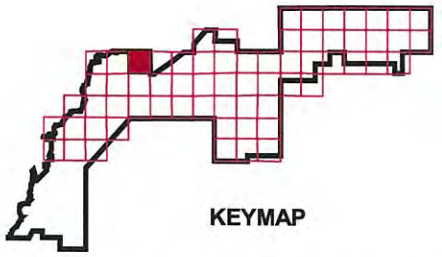
PLATE #18



Township 2 South, Range 67 West, Section 2

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

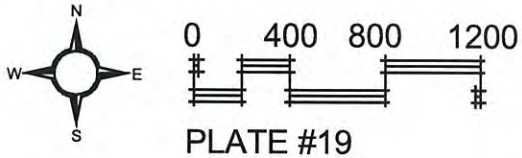
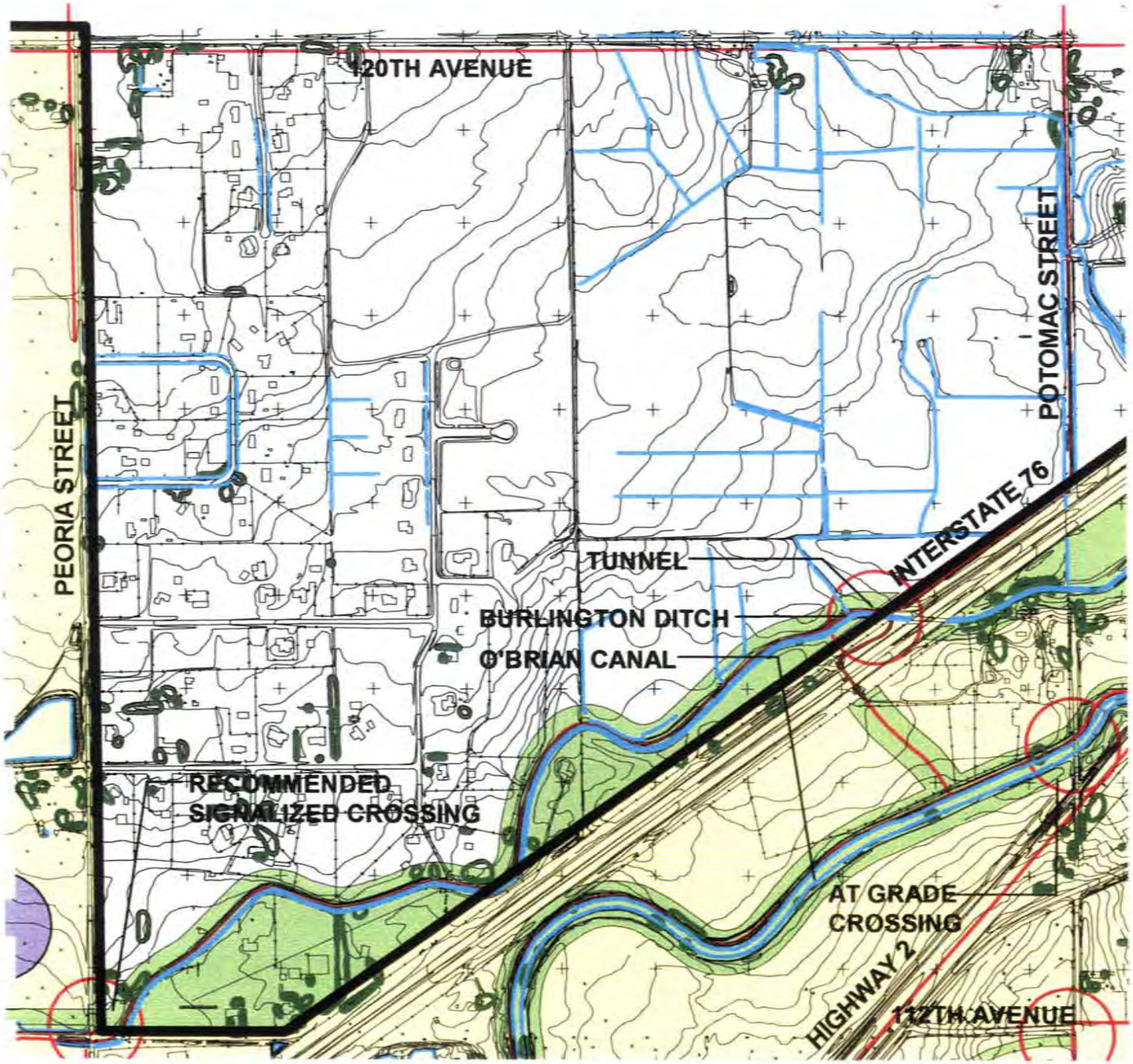


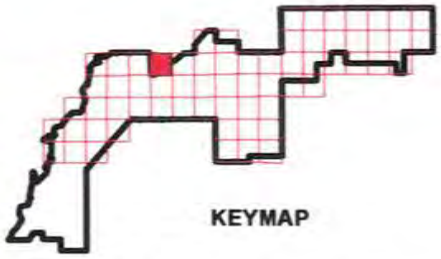
PLATE #19



Township 2 South, Range 67 West, Section 1

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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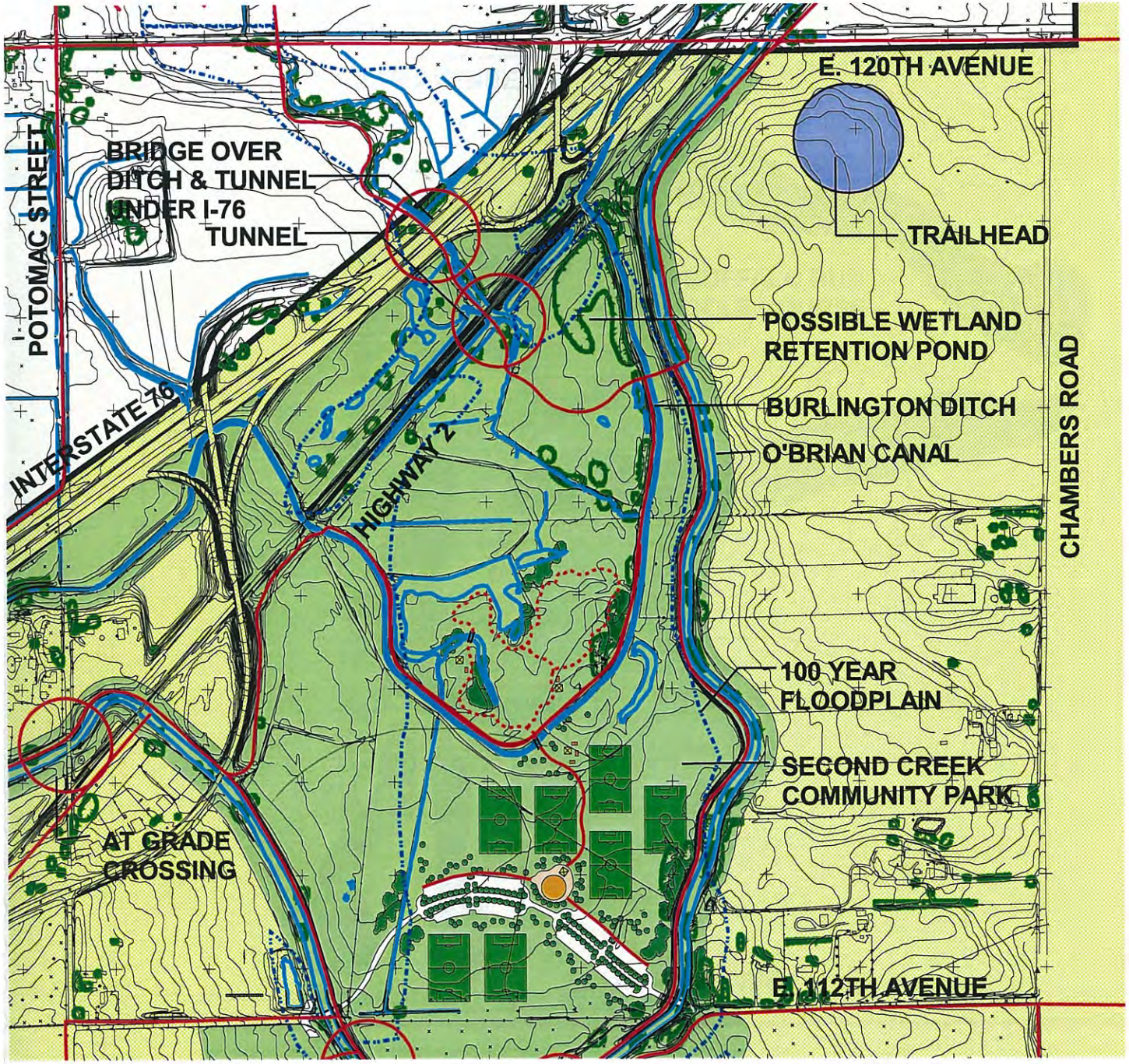
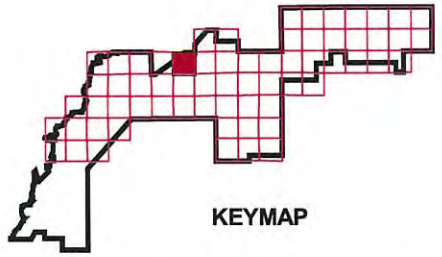
PLATE #20



Township 2 South, Range 66 West, Section 6

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



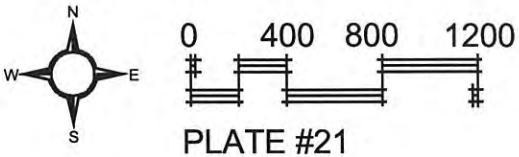
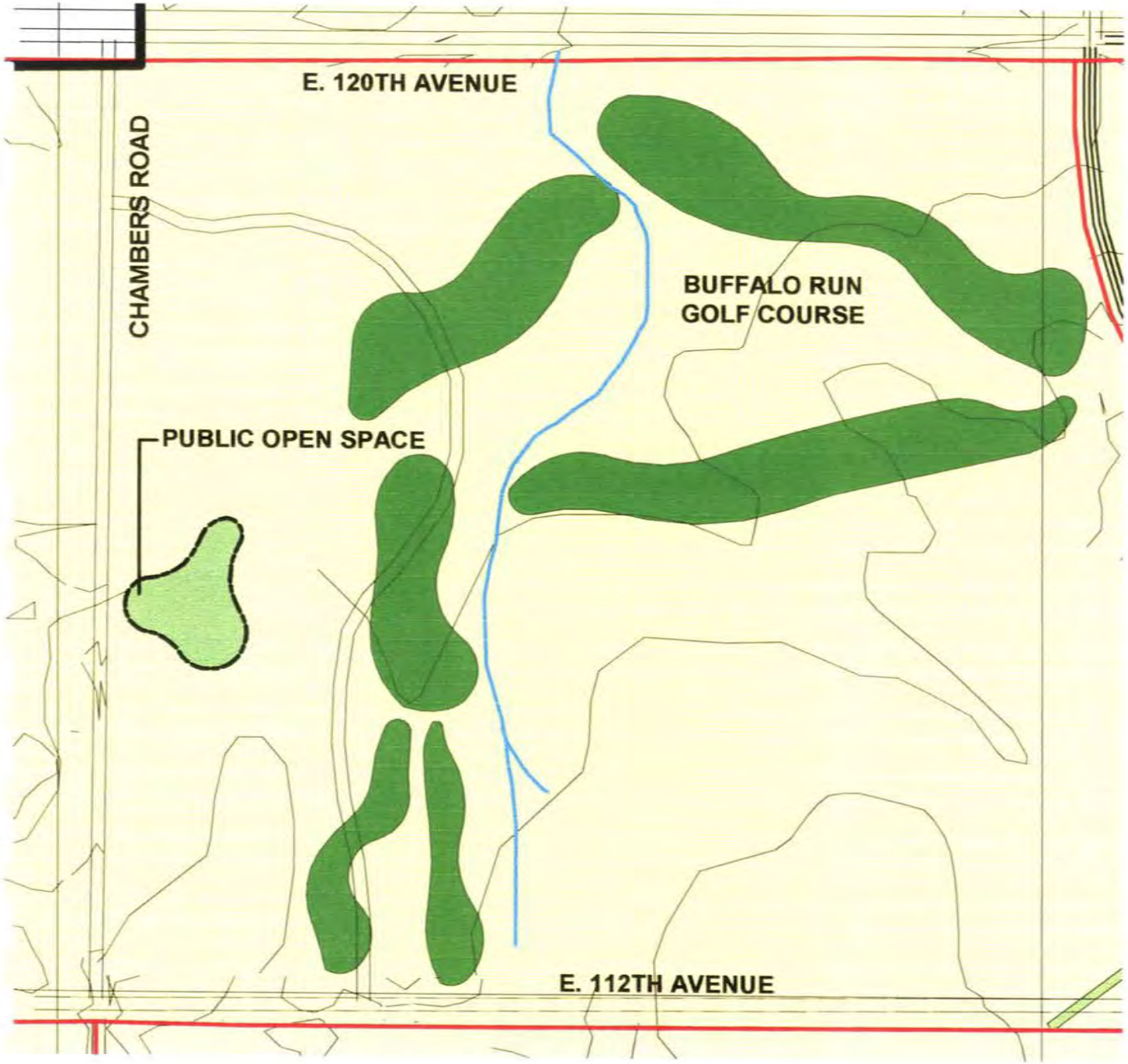


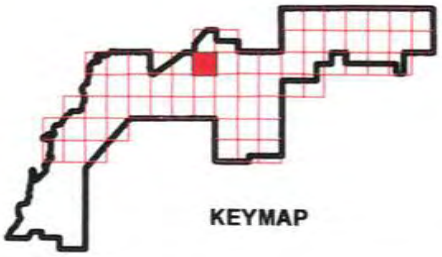
PLATE #21



Township 2 South, Range 66 West, Section 5

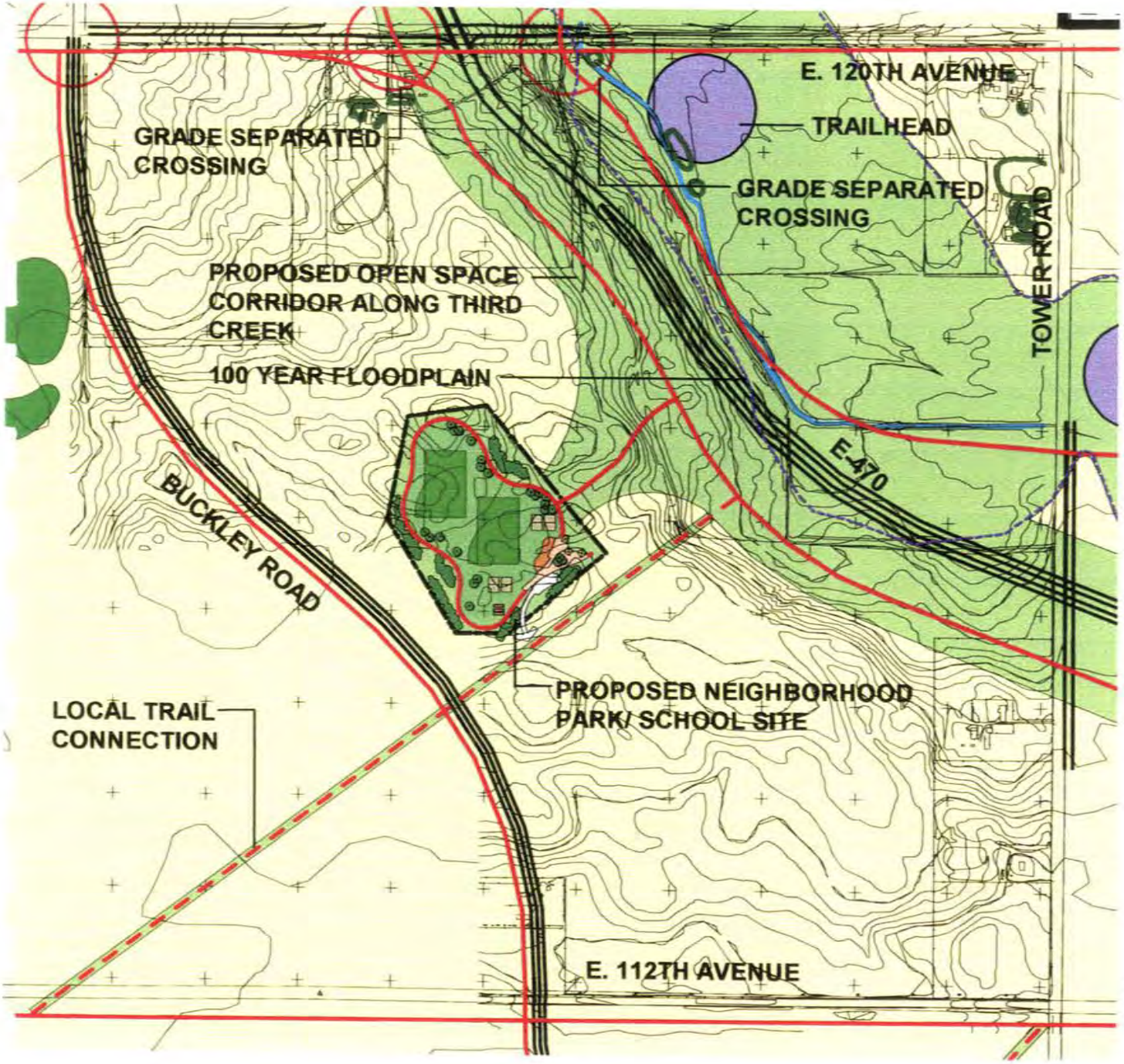
LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- ON-STREET ROUTES
- IN PARK/ LOOP TRAIL
- OPEN SPACE



0 400 800 1200

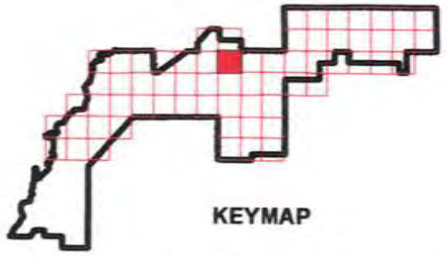
PLATE #22



Township 2 South, Range 66 West, Section 4

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



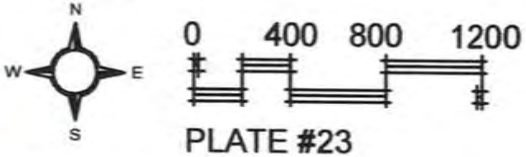
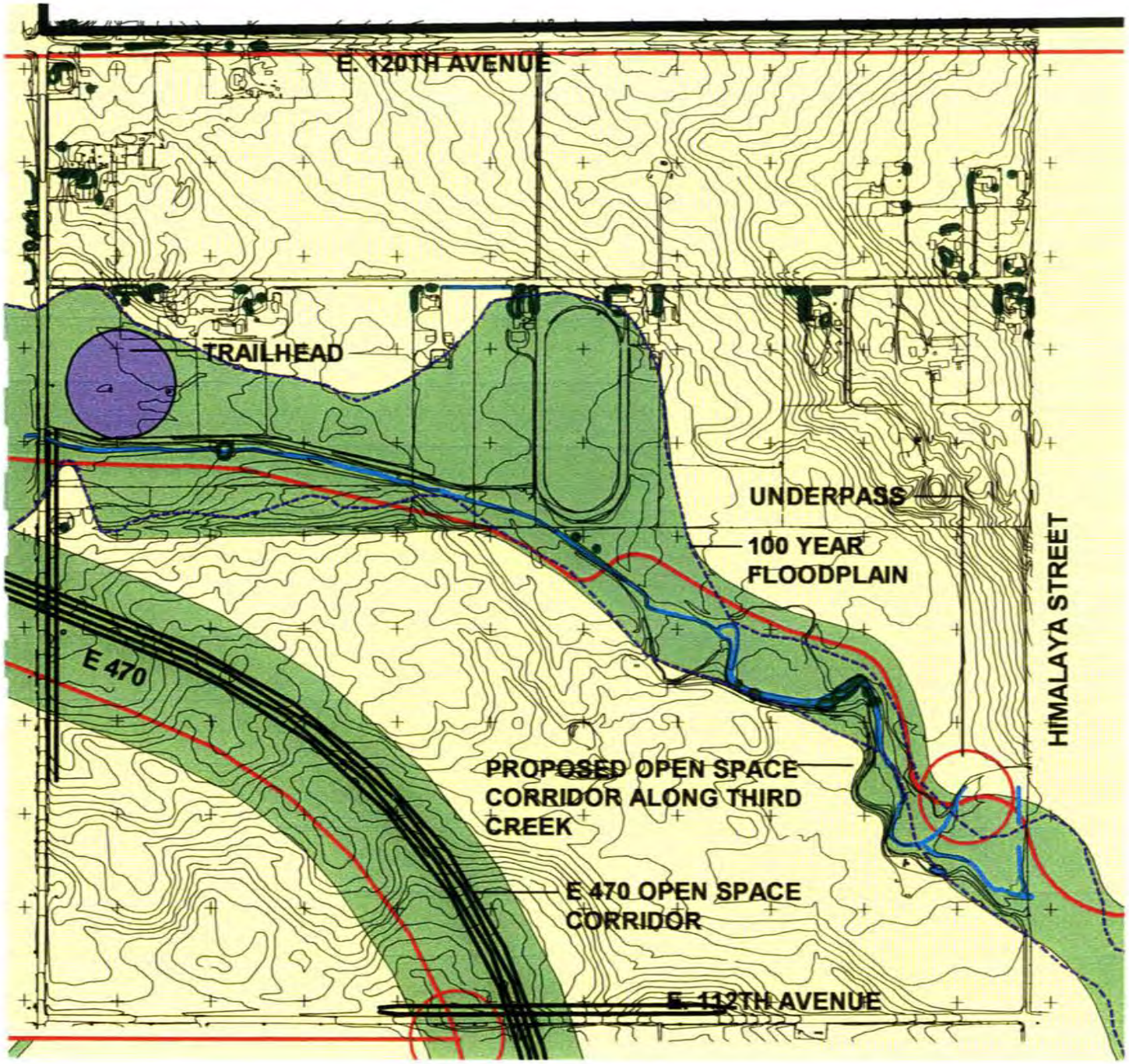


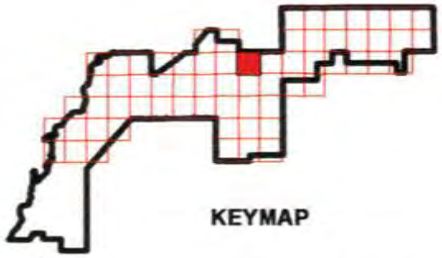
PLATE #23



Township 2 South, Range 66 West, Section 3

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



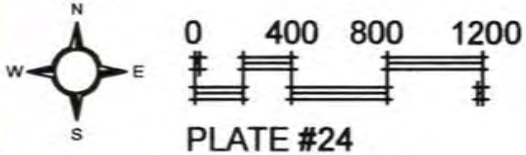
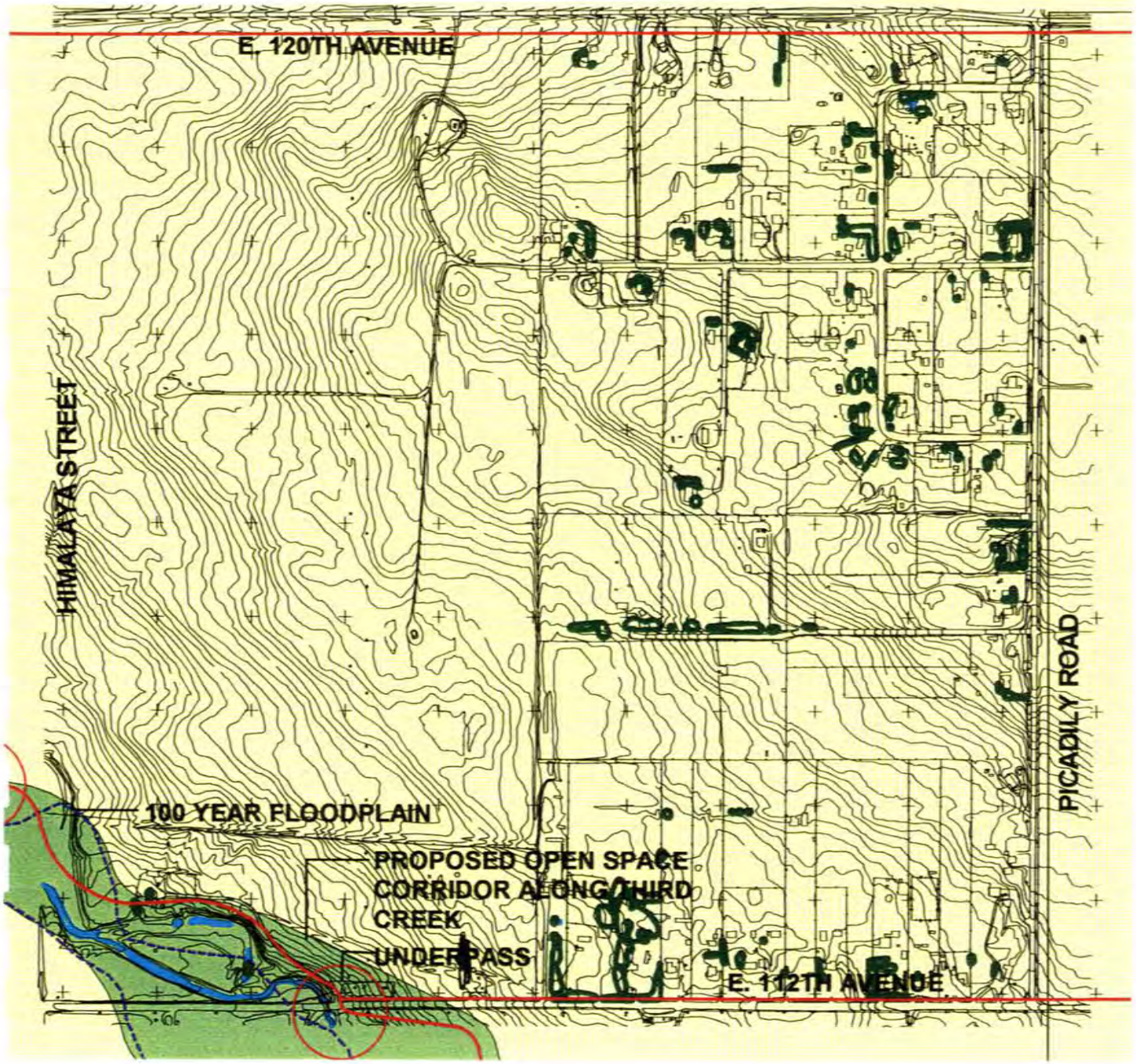


PLATE #24



Township 2 South, Range 66 West, Section 2

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

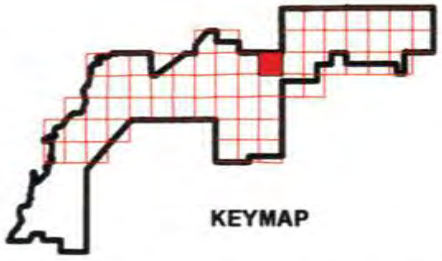


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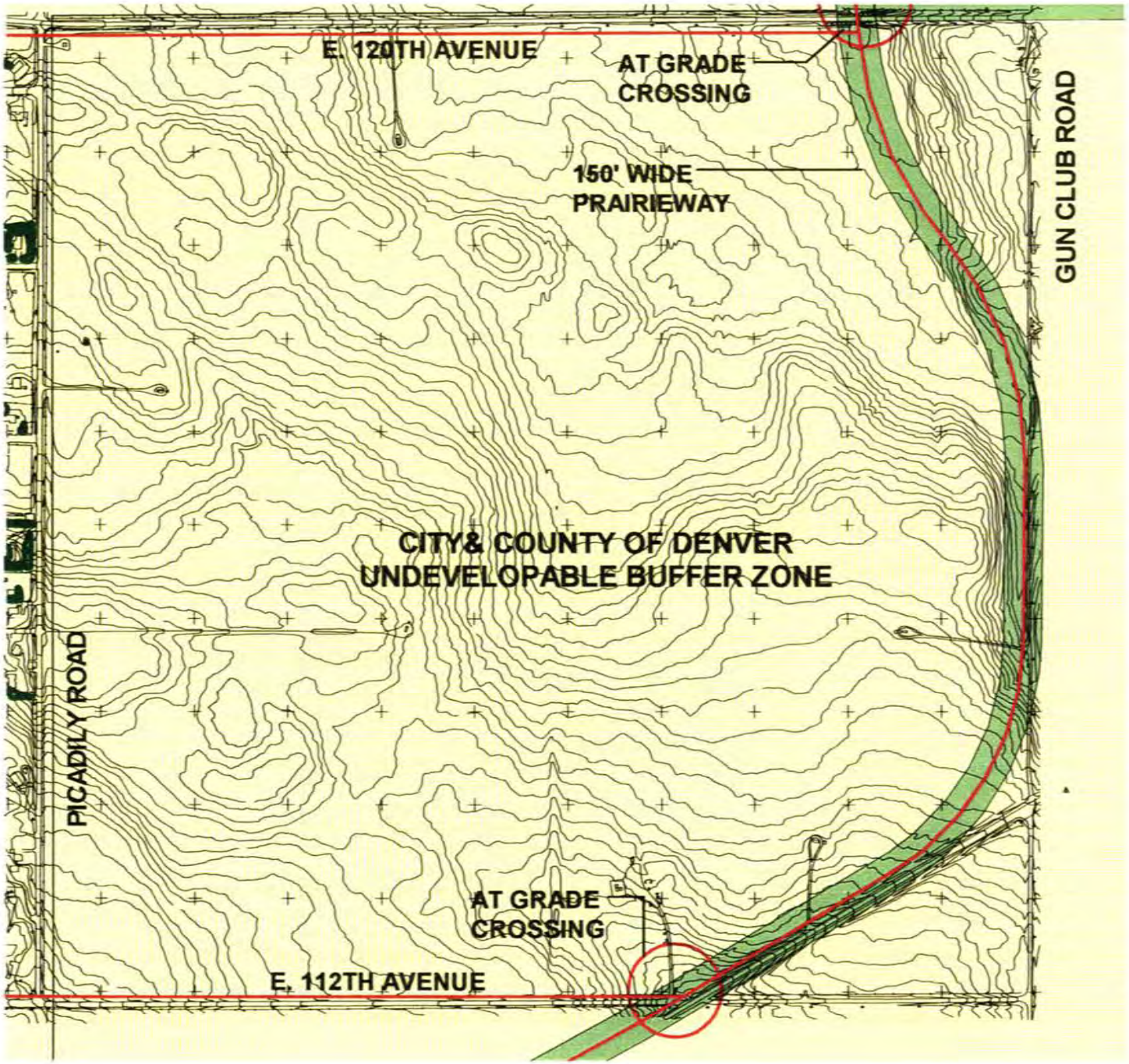
PLATE #25



Township 2 South, Range 66 West, Section 1

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

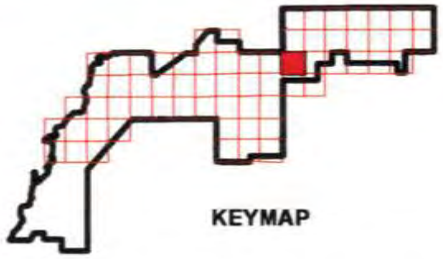
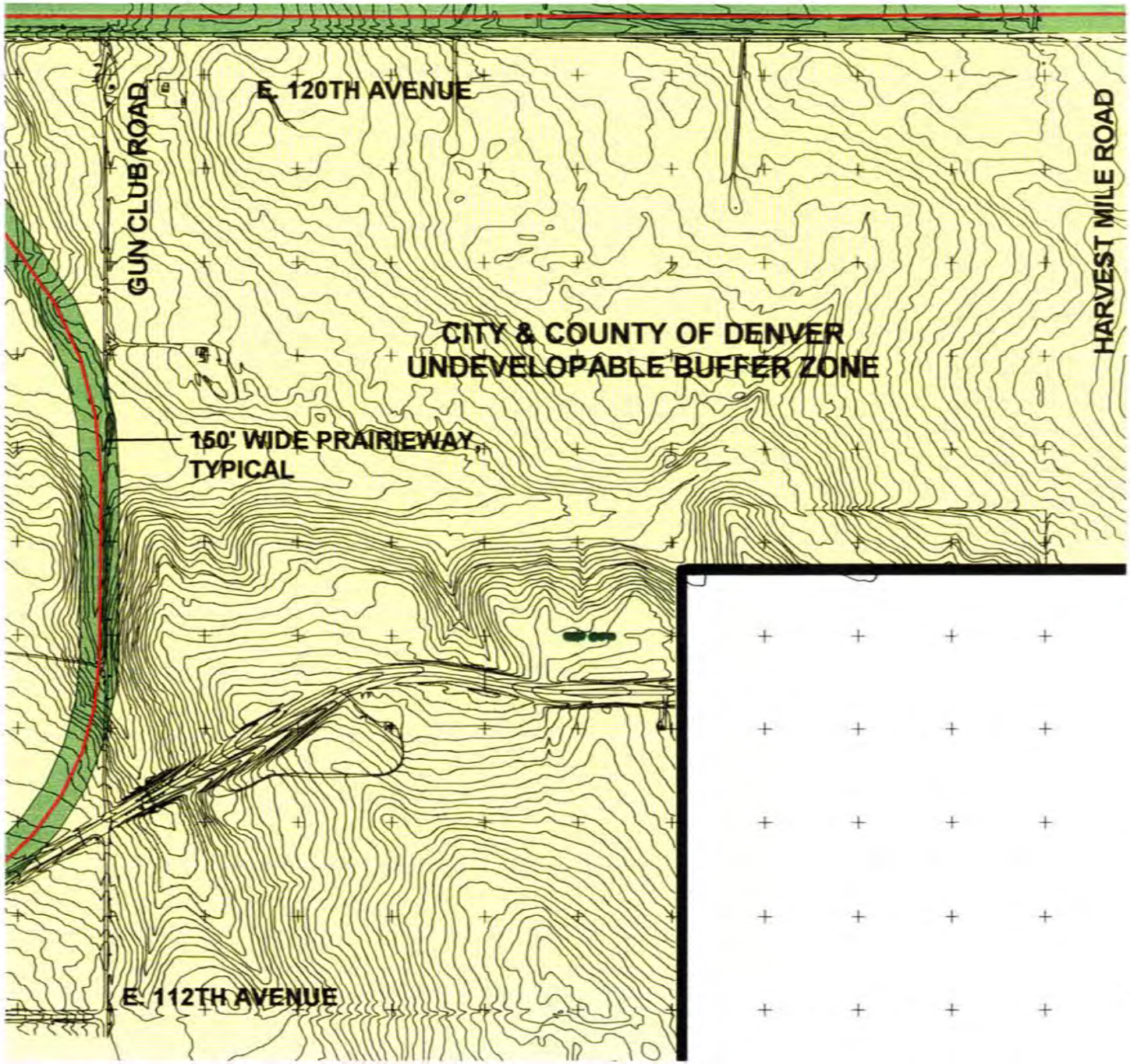


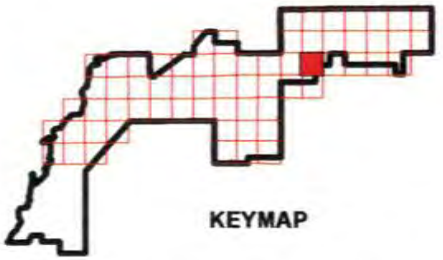
PLATE #26



Township 2 South, Range 65 West, Section 6

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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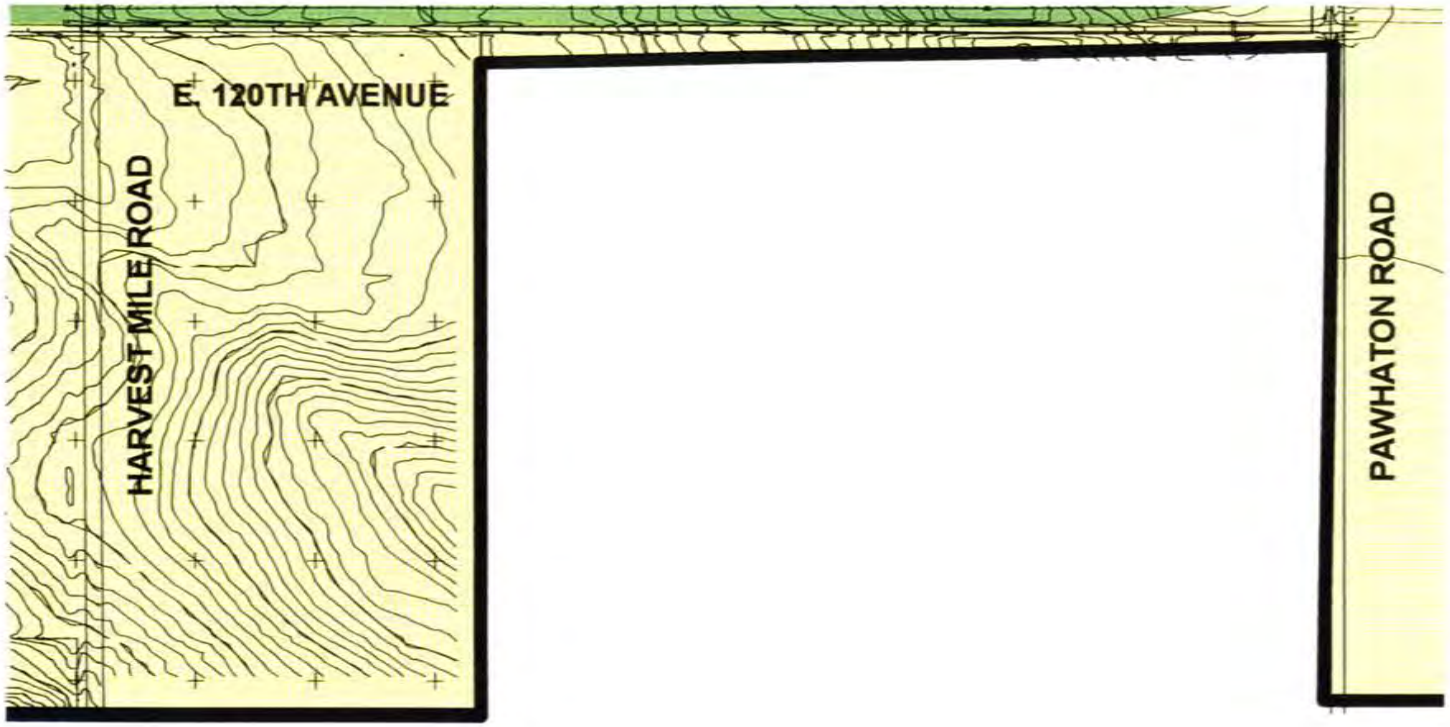
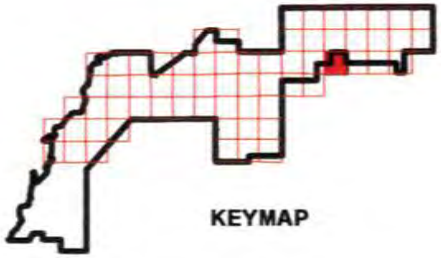
PLATE #27



Township 2 South, Range 65 West, Section 5

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



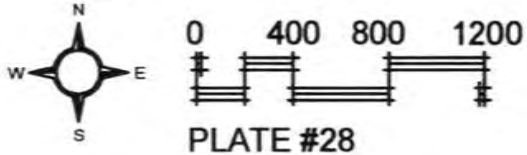
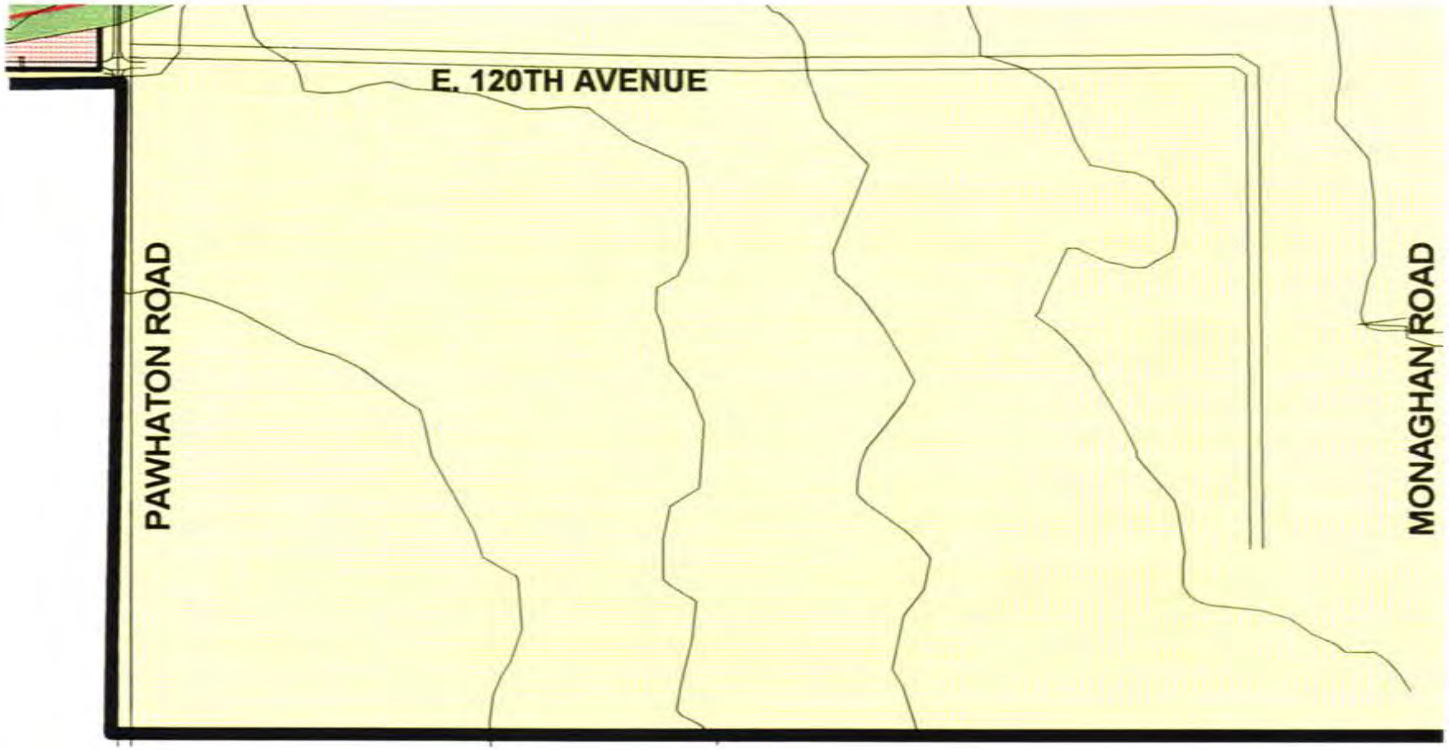


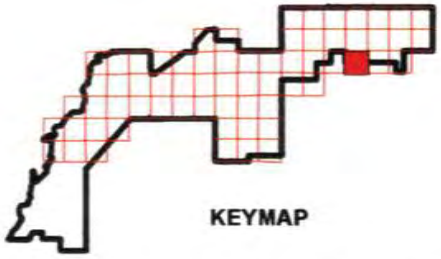
PLATE #28



Township 2 South, Range 65 West, Section 4

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



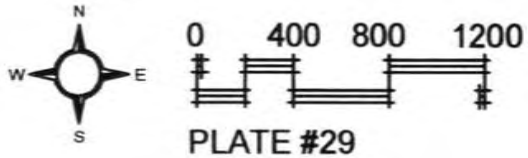
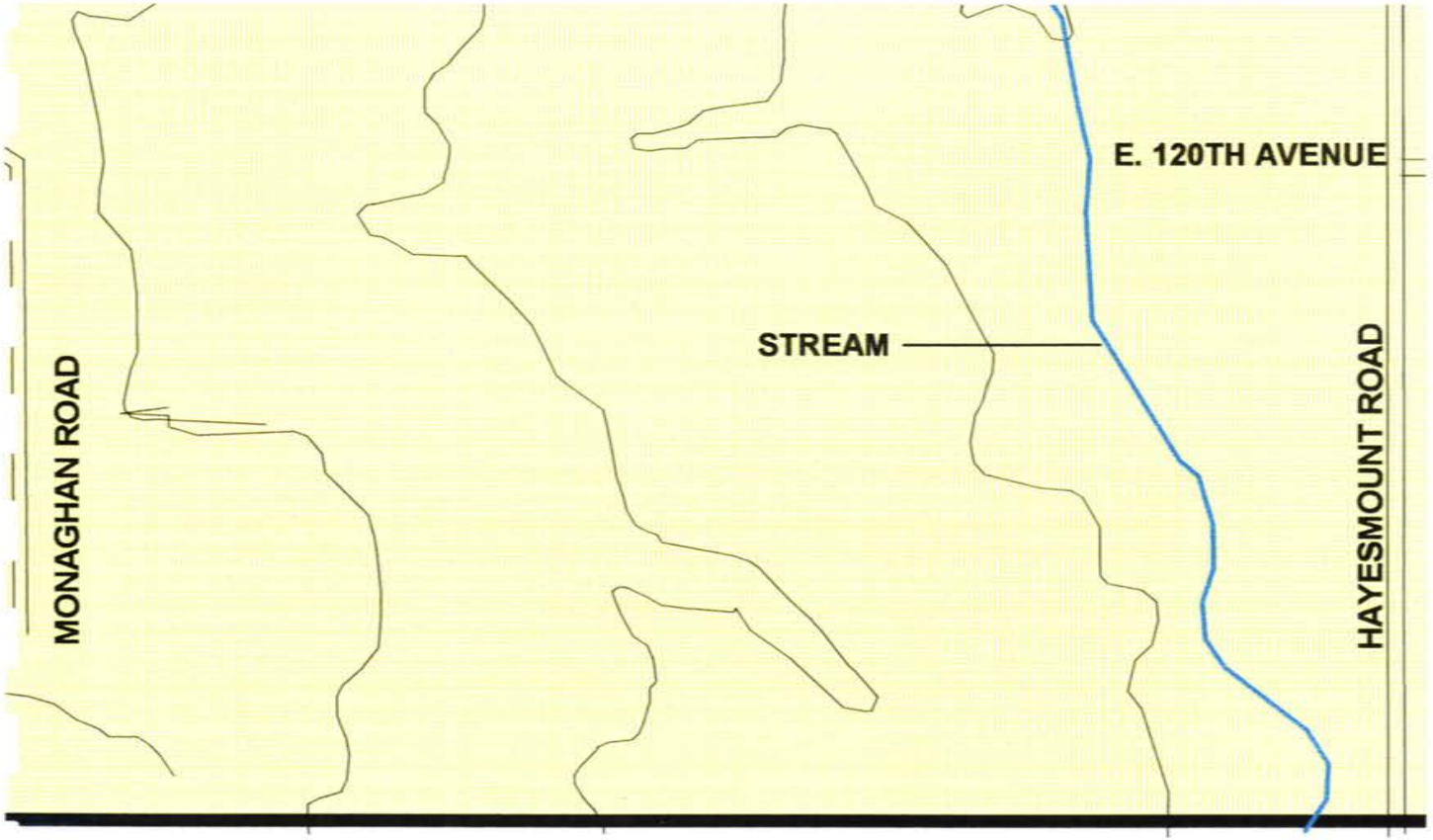


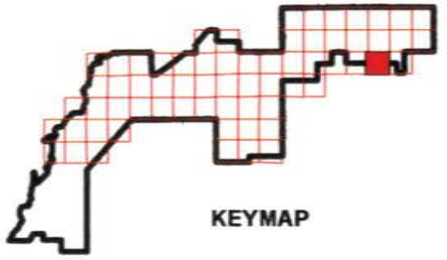
PLATE #29



Township 2 South, Range 65 West, Section 3

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



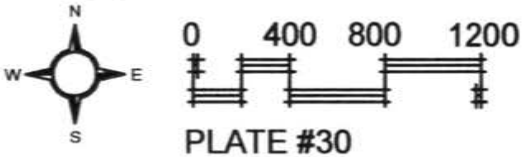
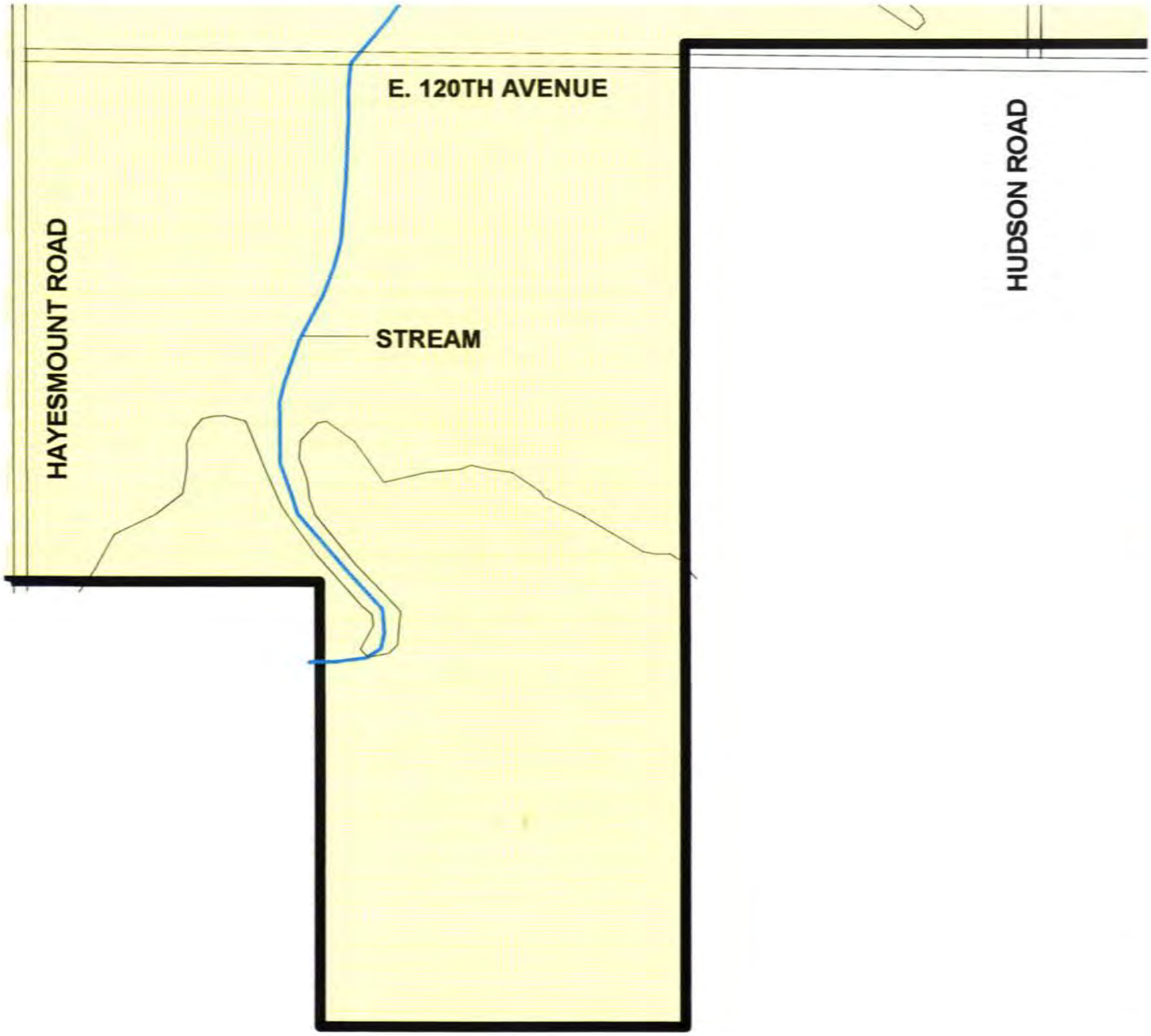


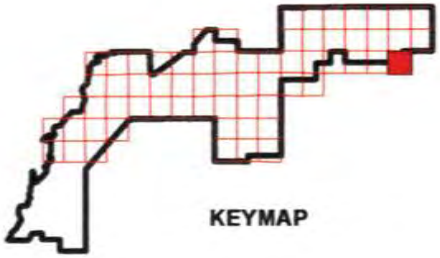
PLATE #30



Township 2 South, Range 65 West, Section 2

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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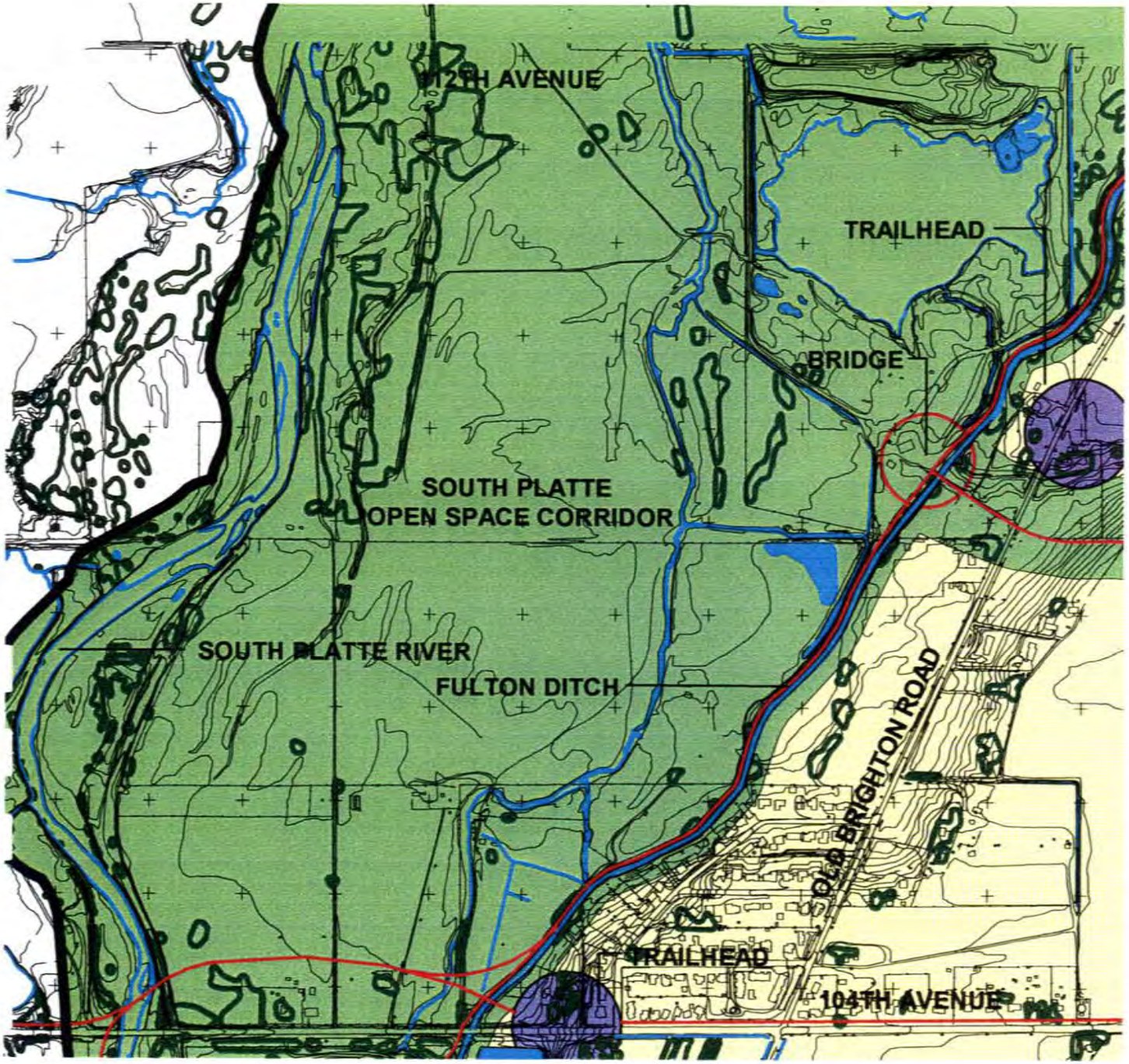
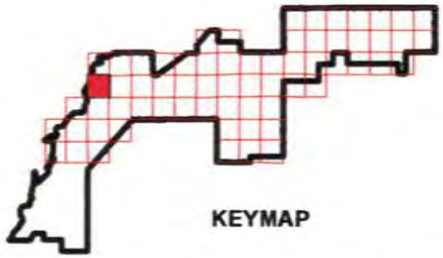
PLATE #31



Township 2 South, Range 67 West, Section 9

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



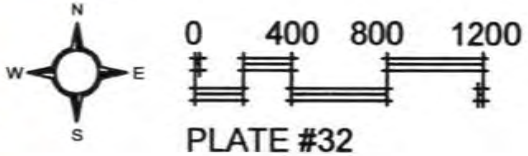
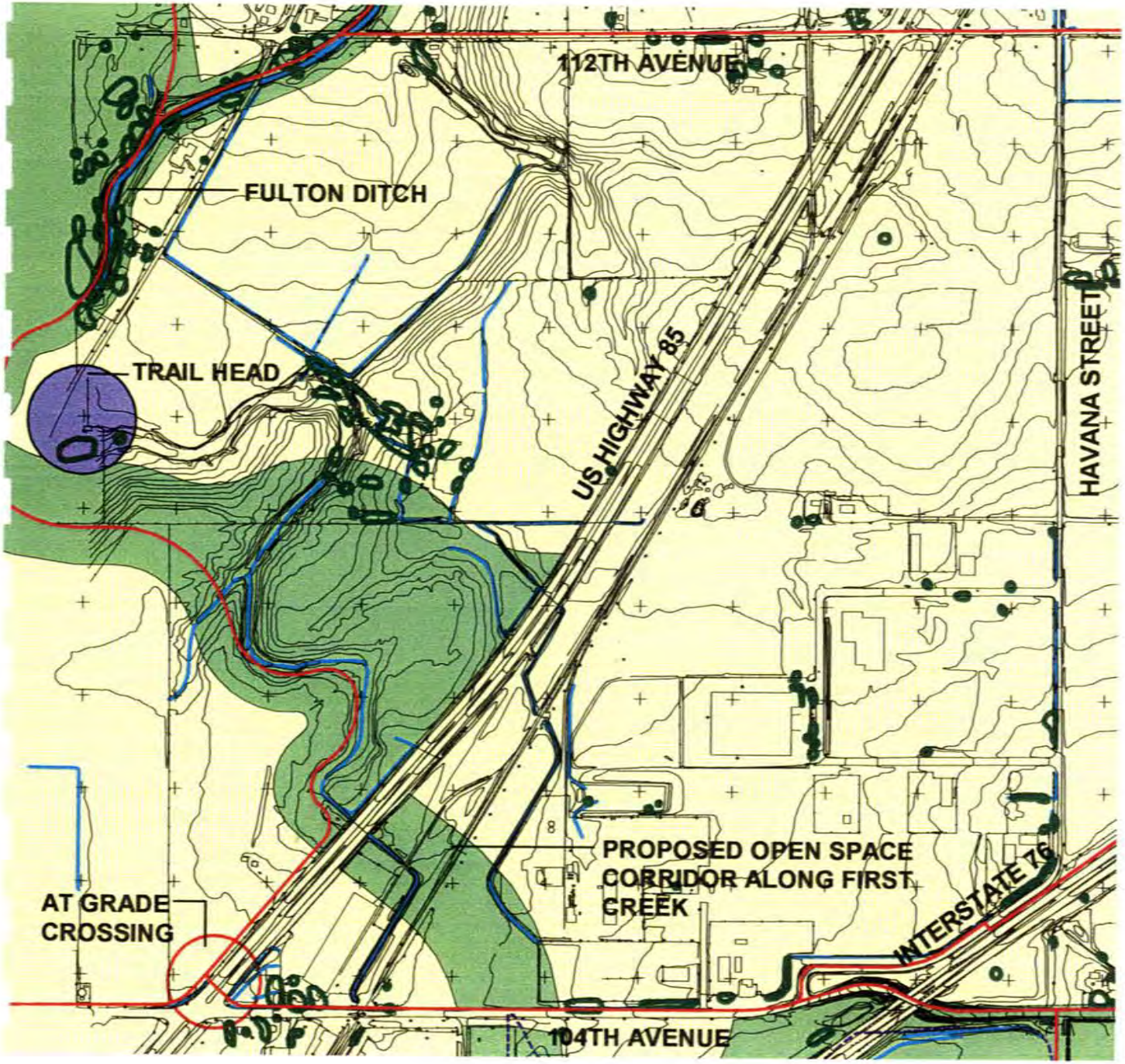


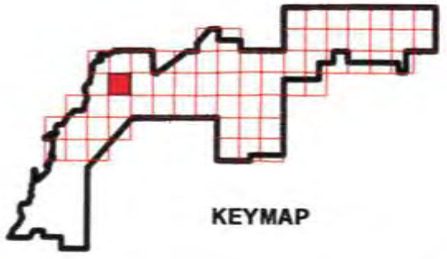
PLATE #32



Township 2 South, Range 67 West, Section 10

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



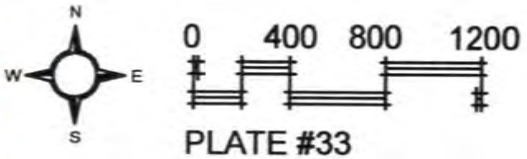
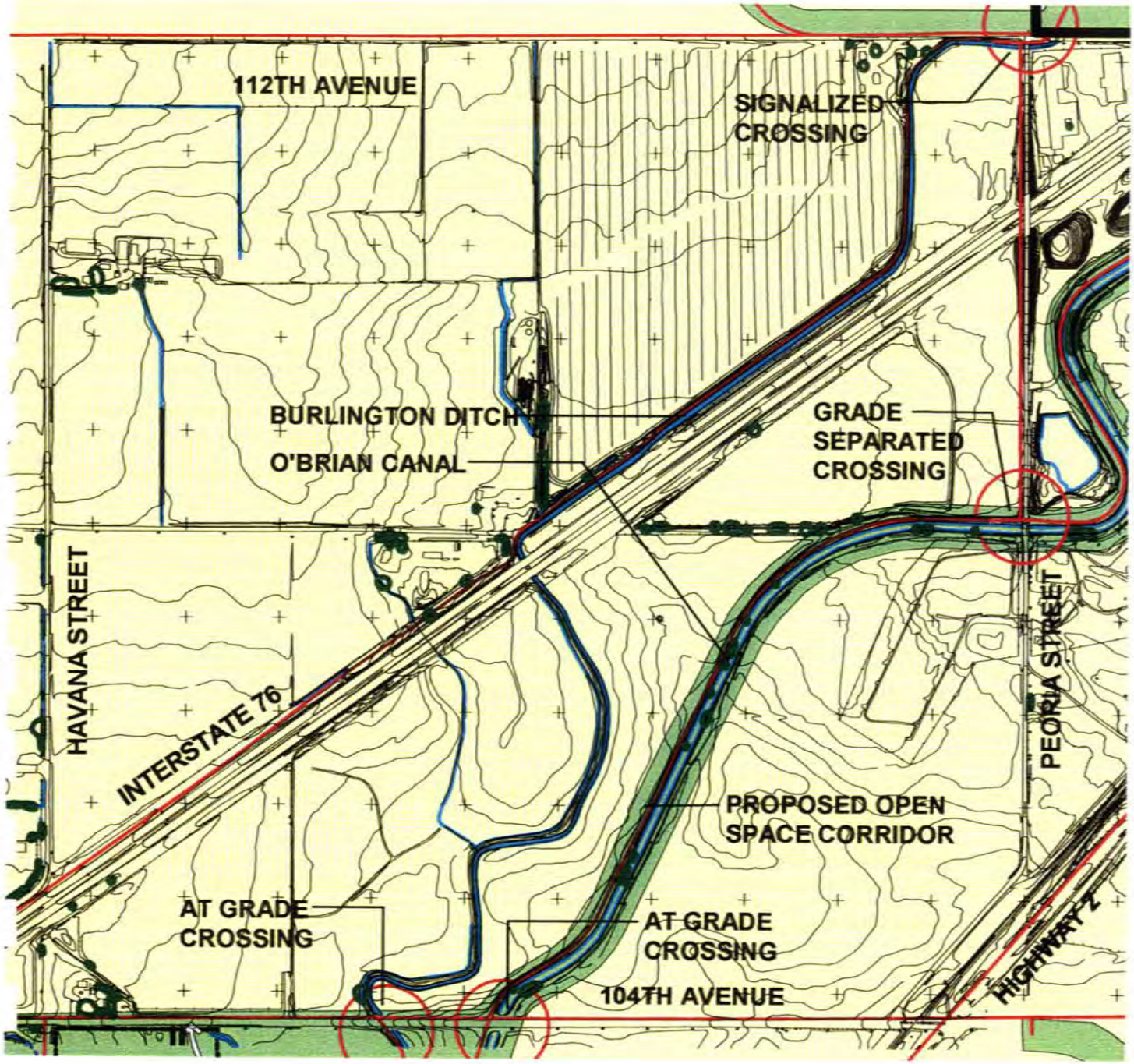


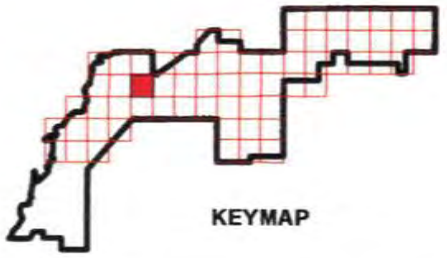
PLATE #33



Township 2 South, Range 67 West, Section 11

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



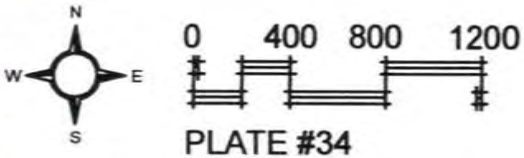
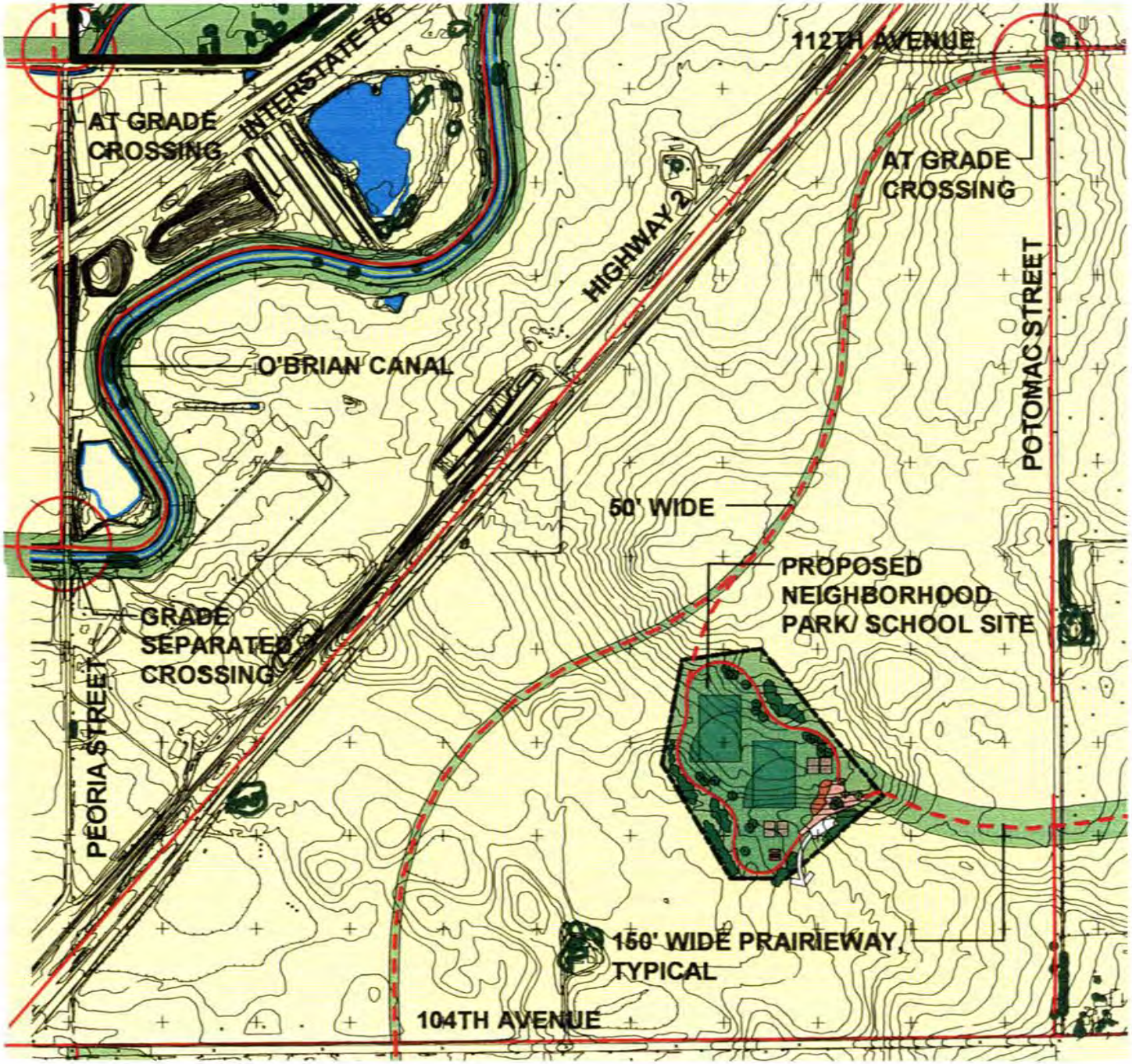


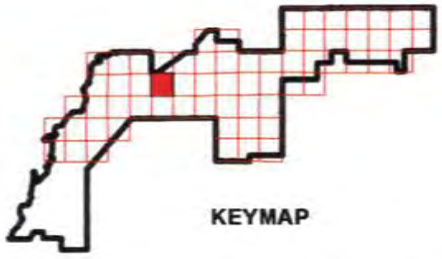
PLATE #34



Township 2 South, Range 67 West, Section 12

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



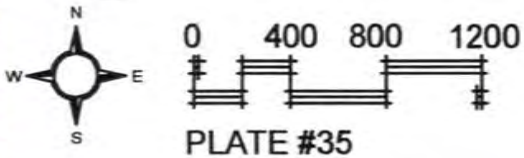
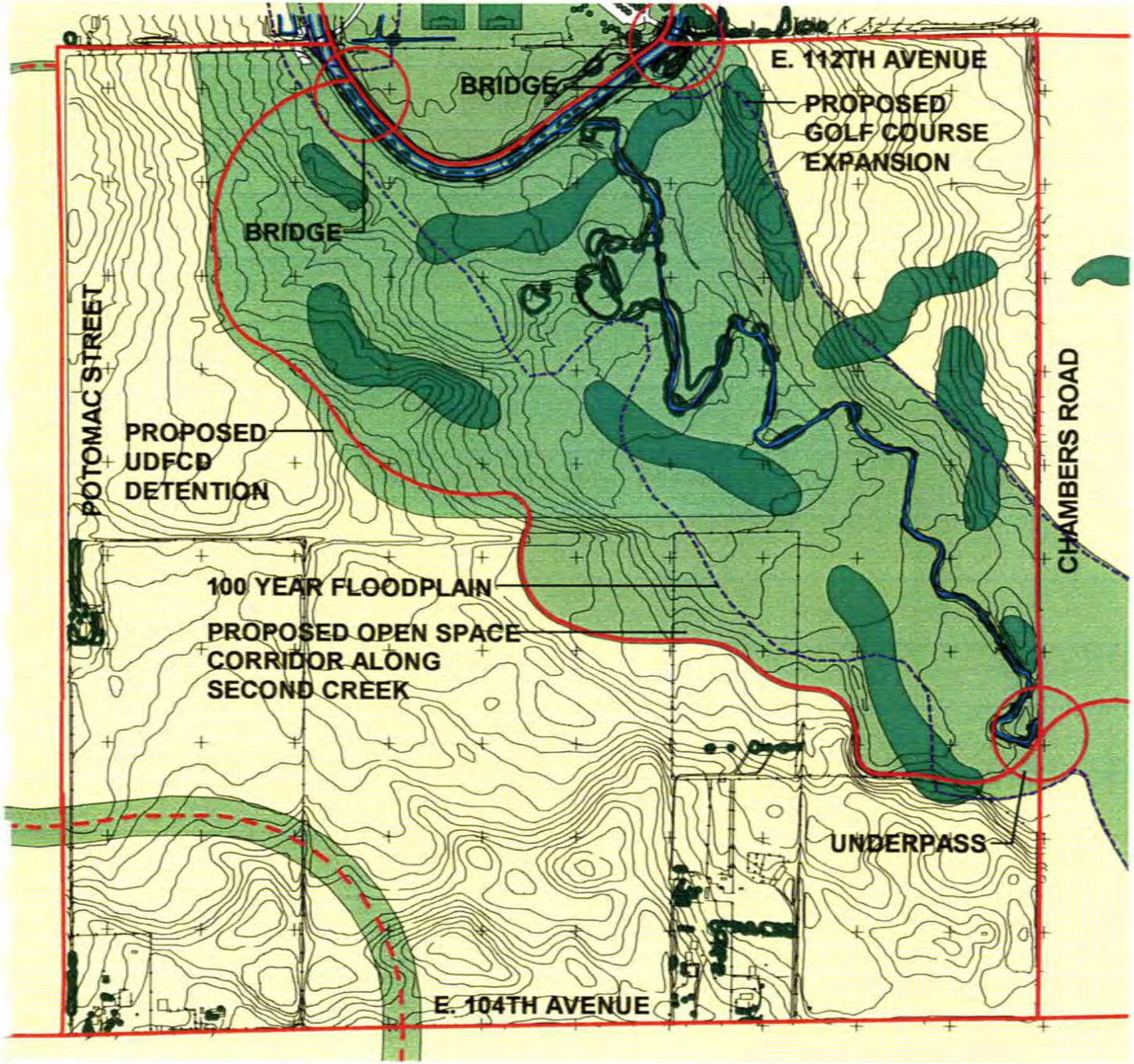


PLATE #35



Township 2 South, Range 66 West, Section 7

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE

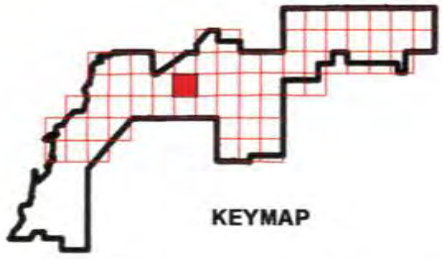
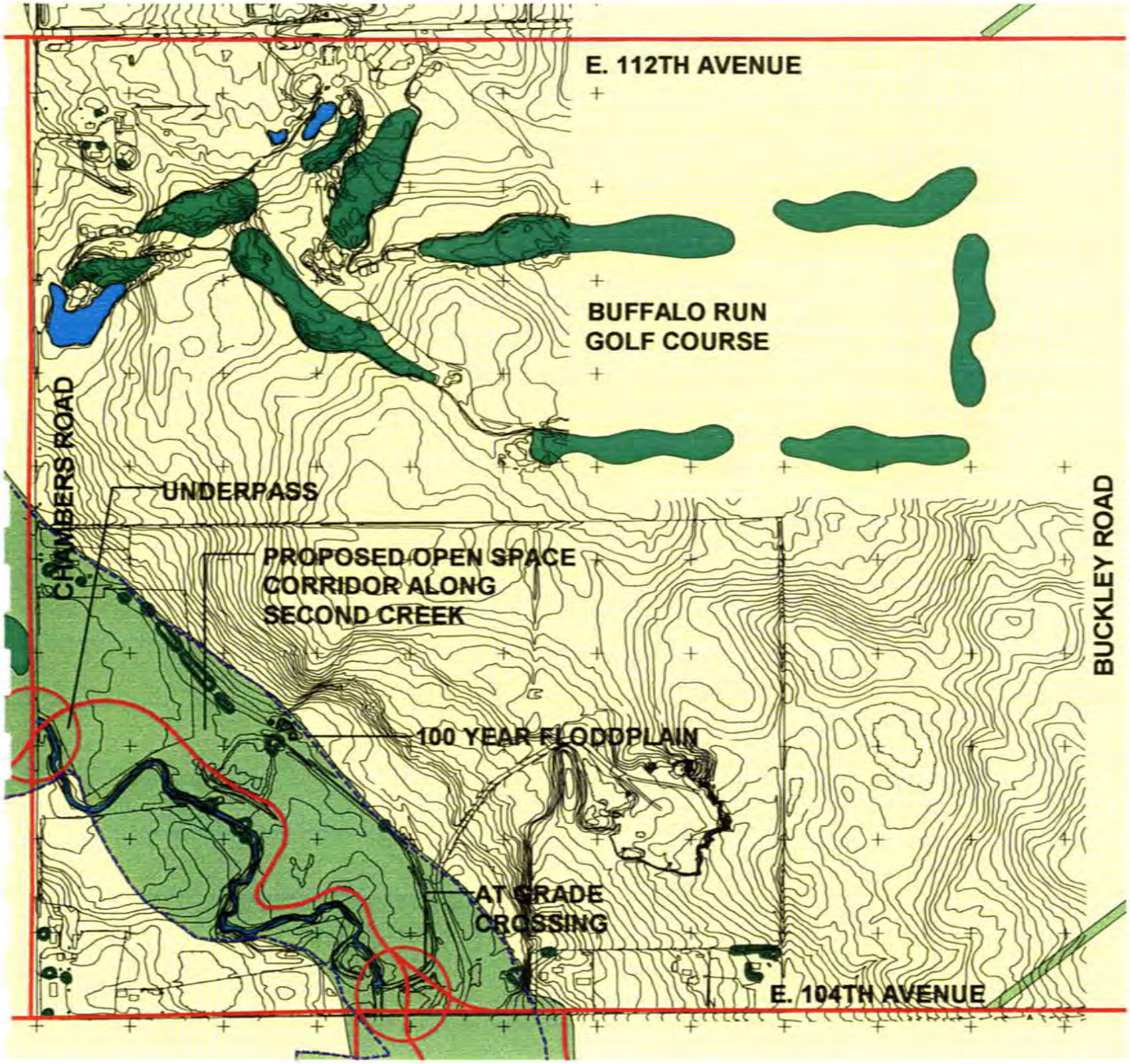


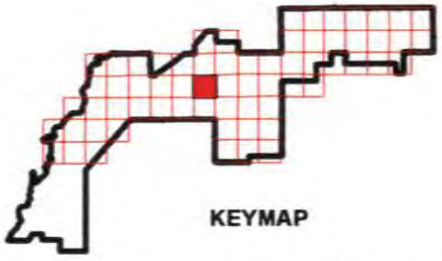
PLATE #36



Township 2 South, Range 66 West, Section 8

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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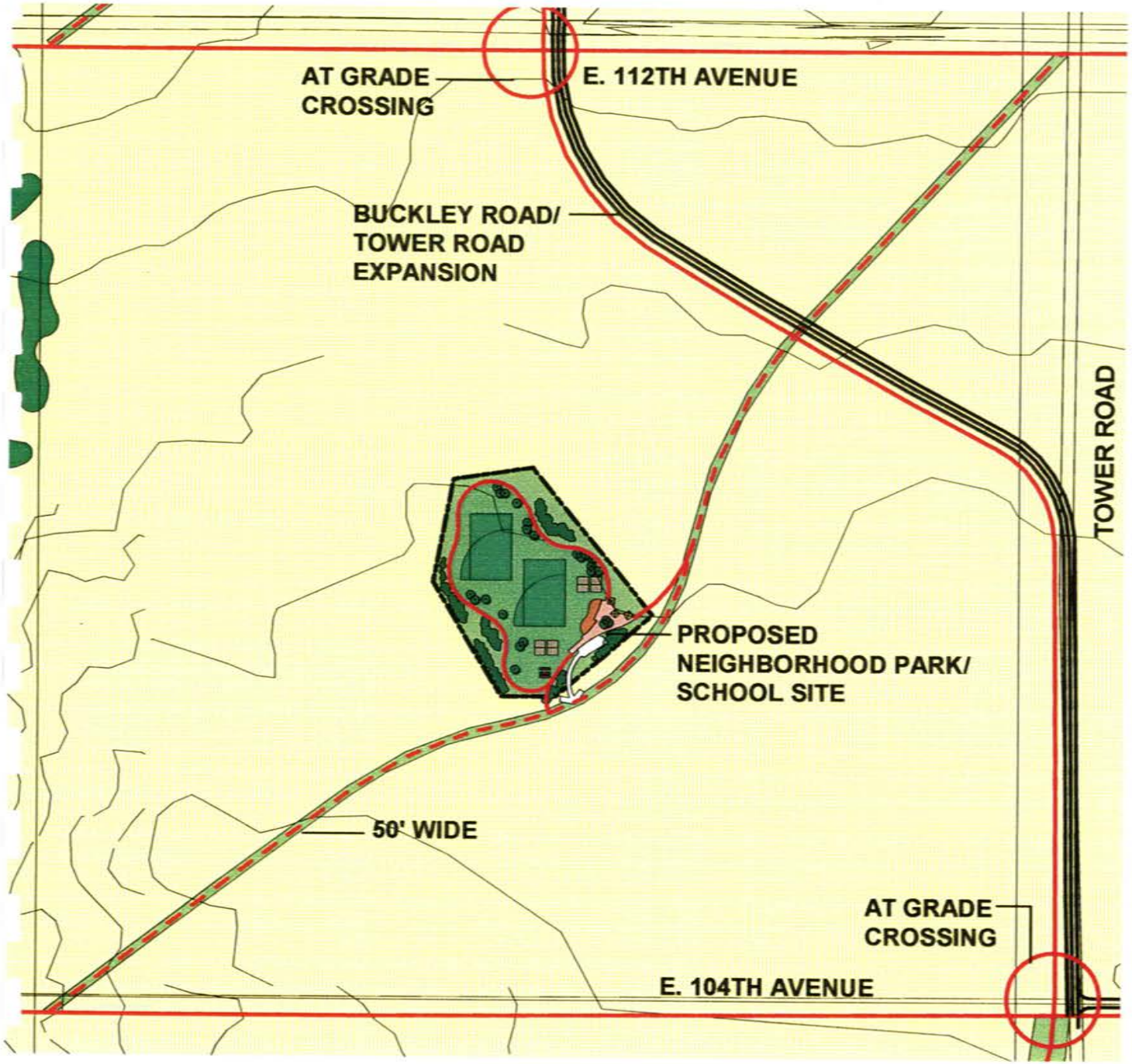
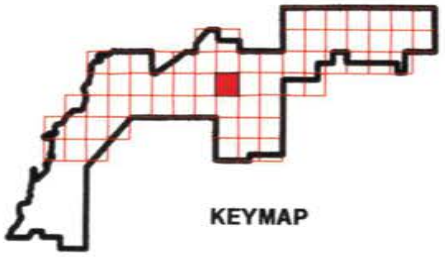
PLATE #37



Township 2 South, Range 66 West, Section 9

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



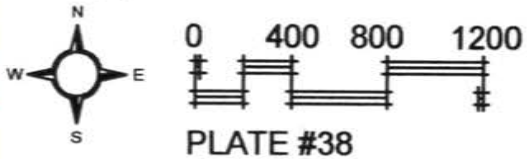
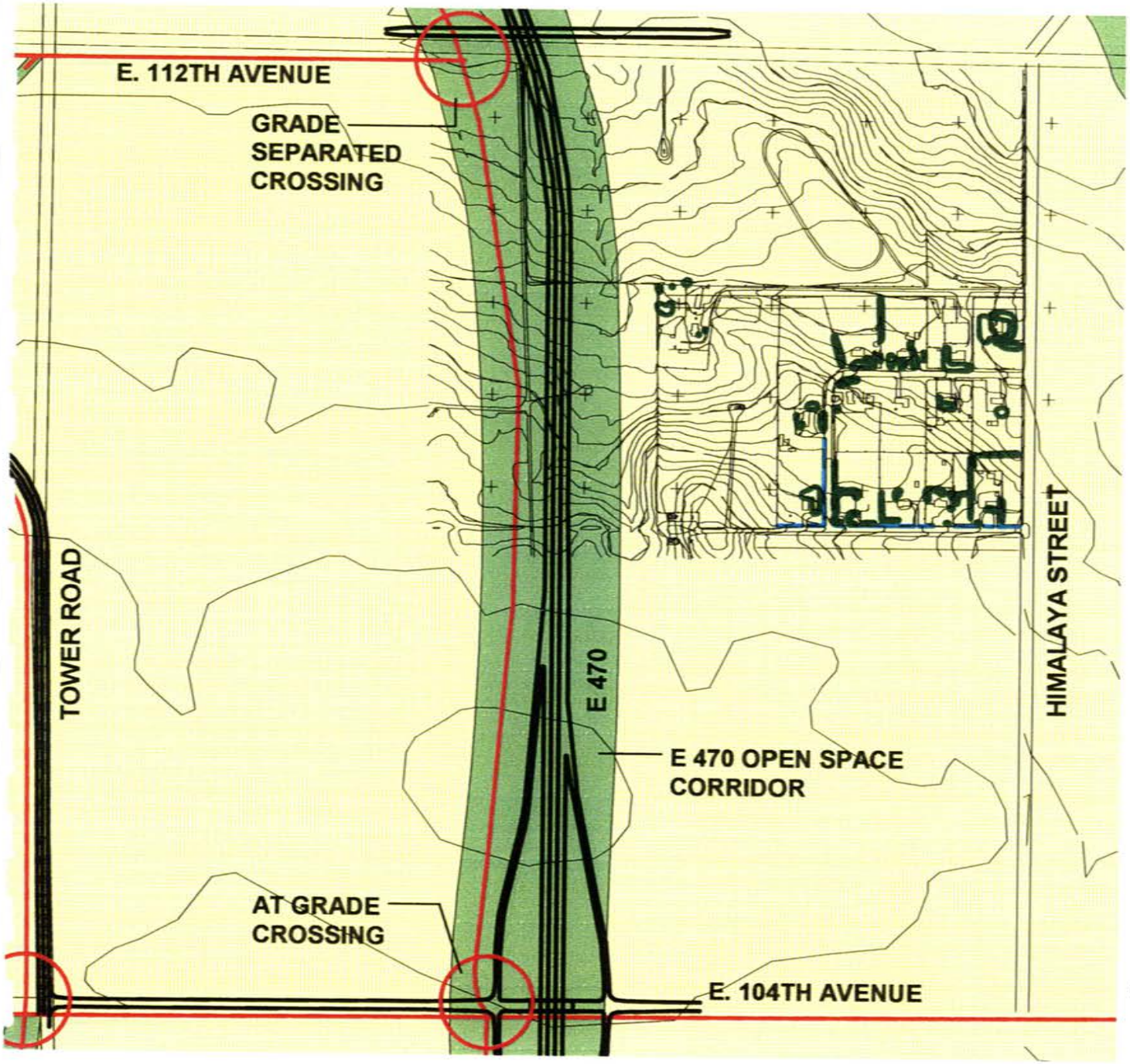


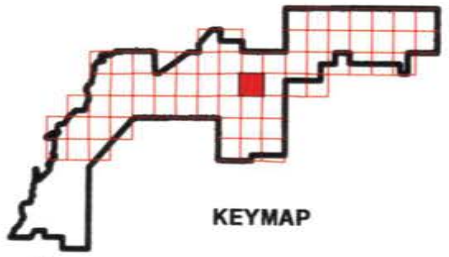
PLATE #38



Township 2 South, Range 66 West, Section 10

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



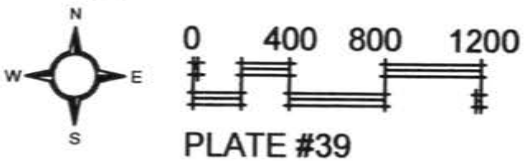
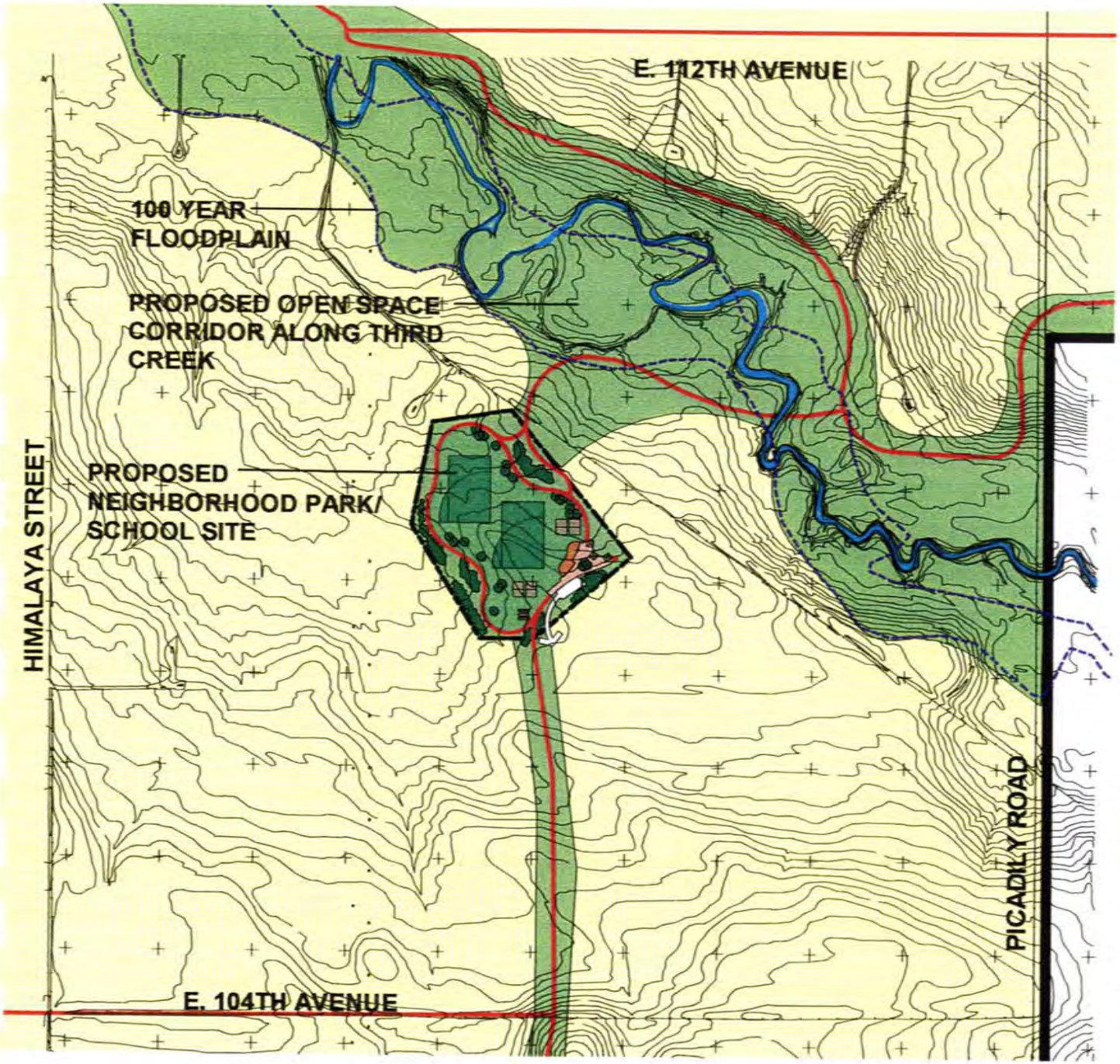


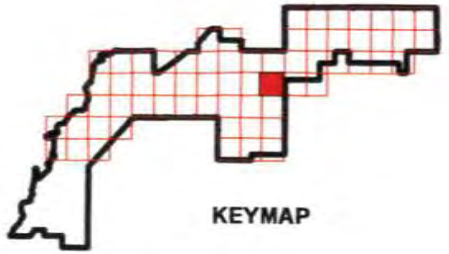
PLATE #39



Township 2 South, Range 66 West, Section 11

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



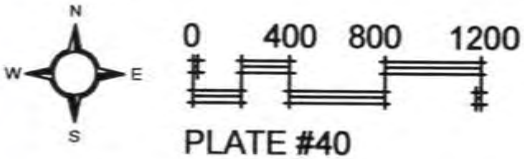
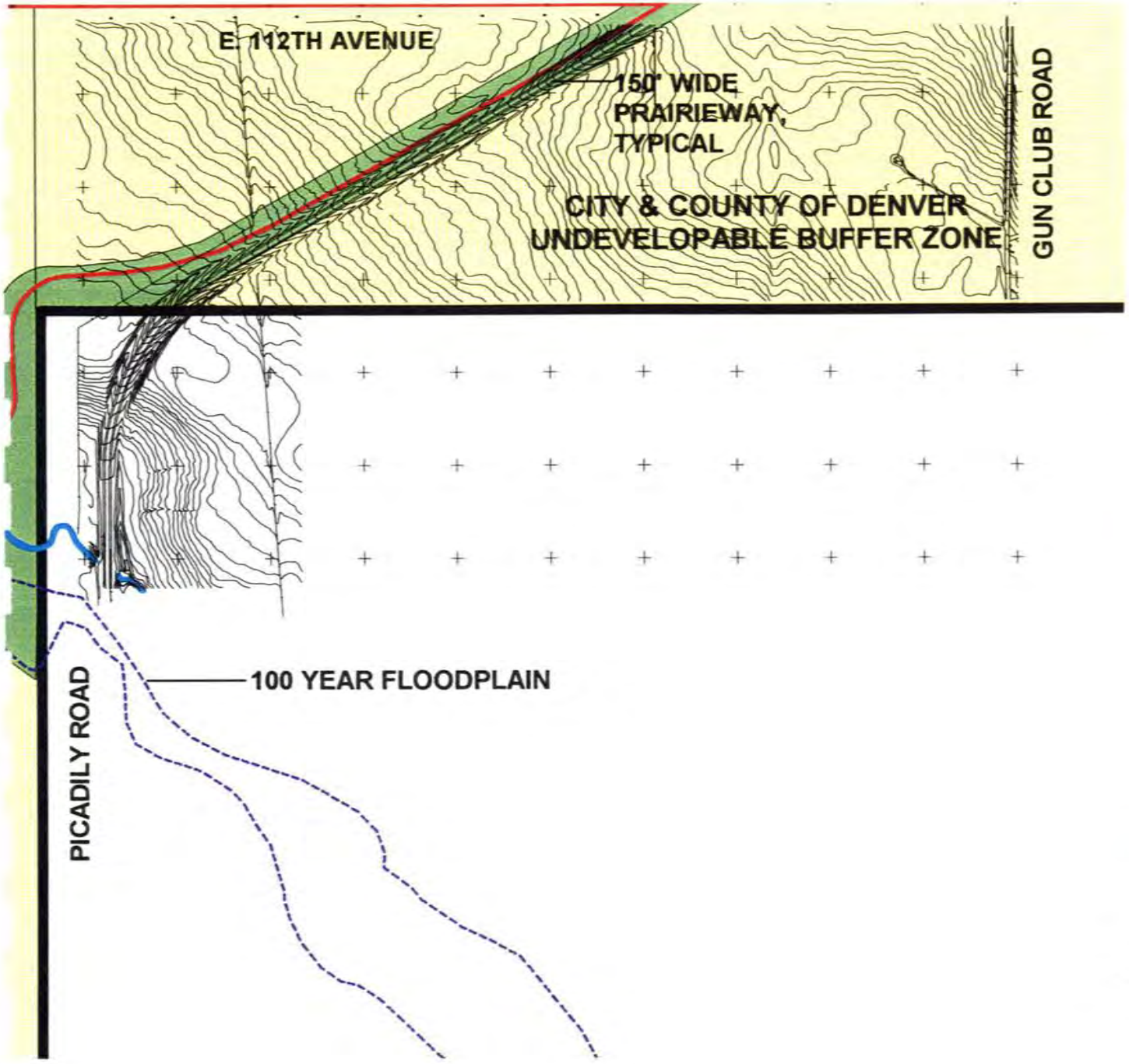


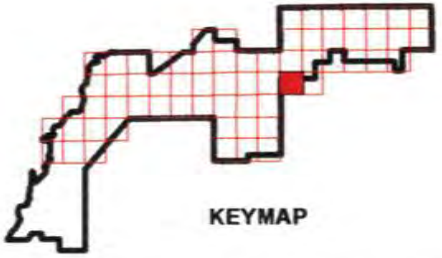
PLATE #40



Township 2 South, Range 66 West, Section 12

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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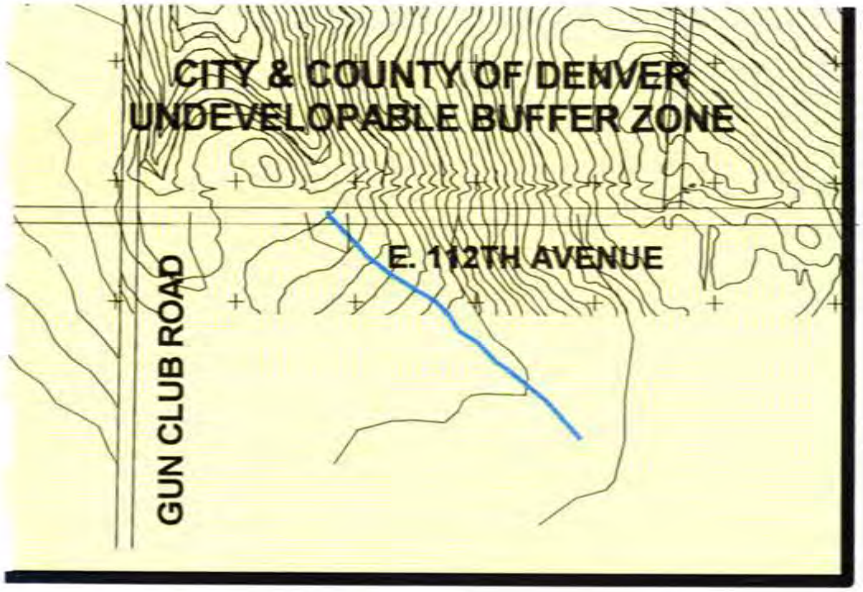
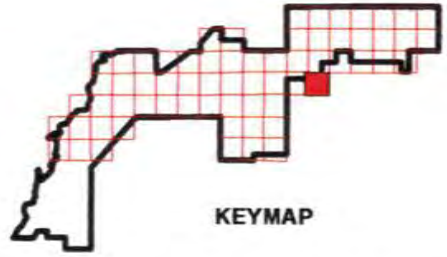
PLATE #41



Township 2 South, Range 65 West, Section 7

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



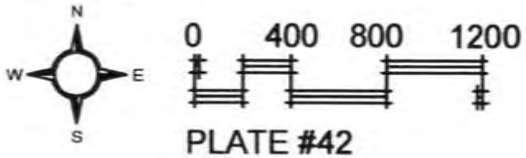
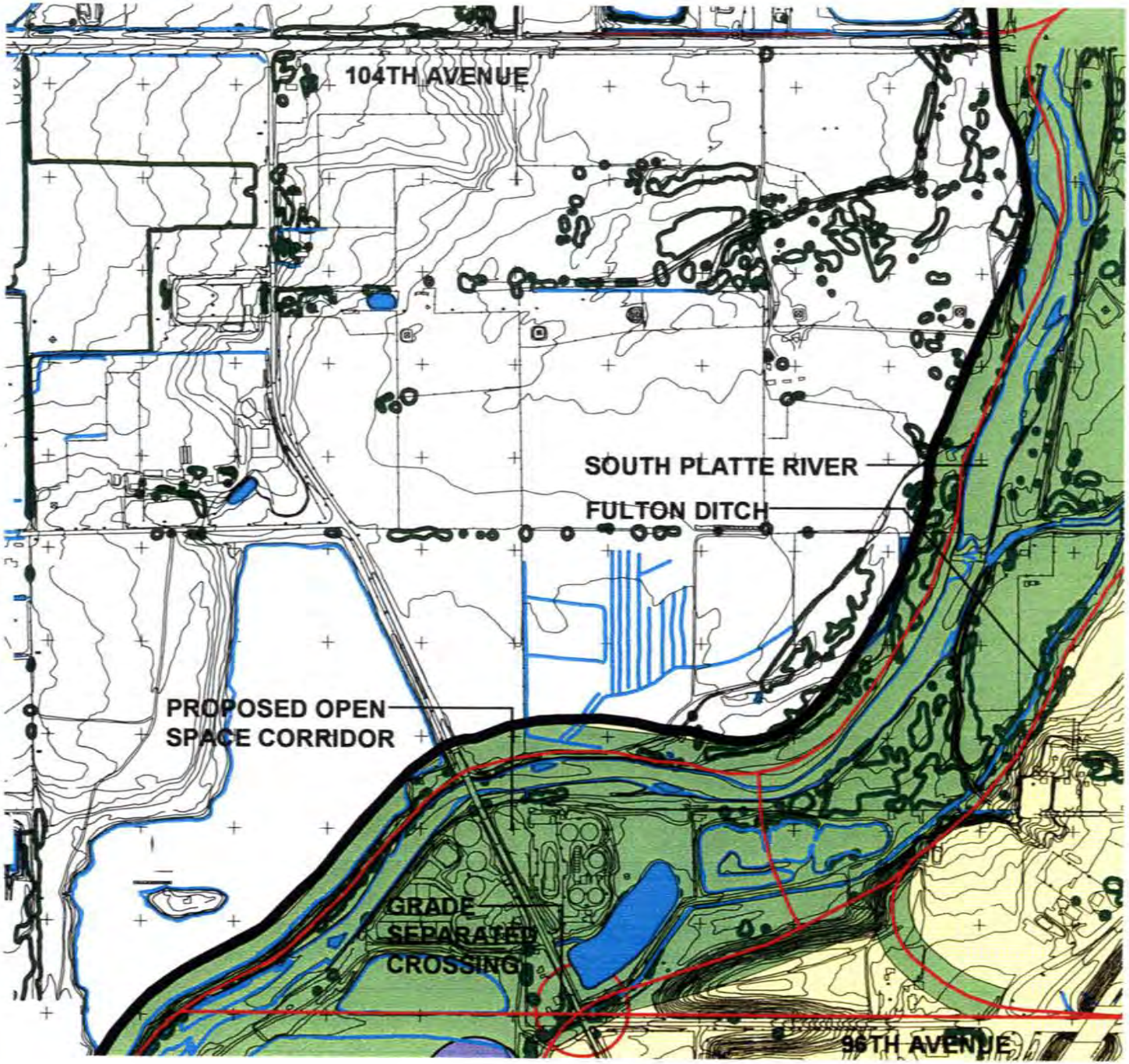


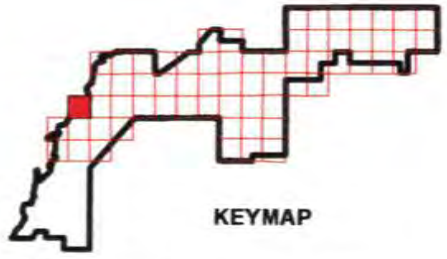
PLATE #42



Township 2 South, Range 67 West, Section 17

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



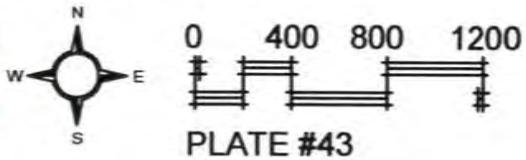
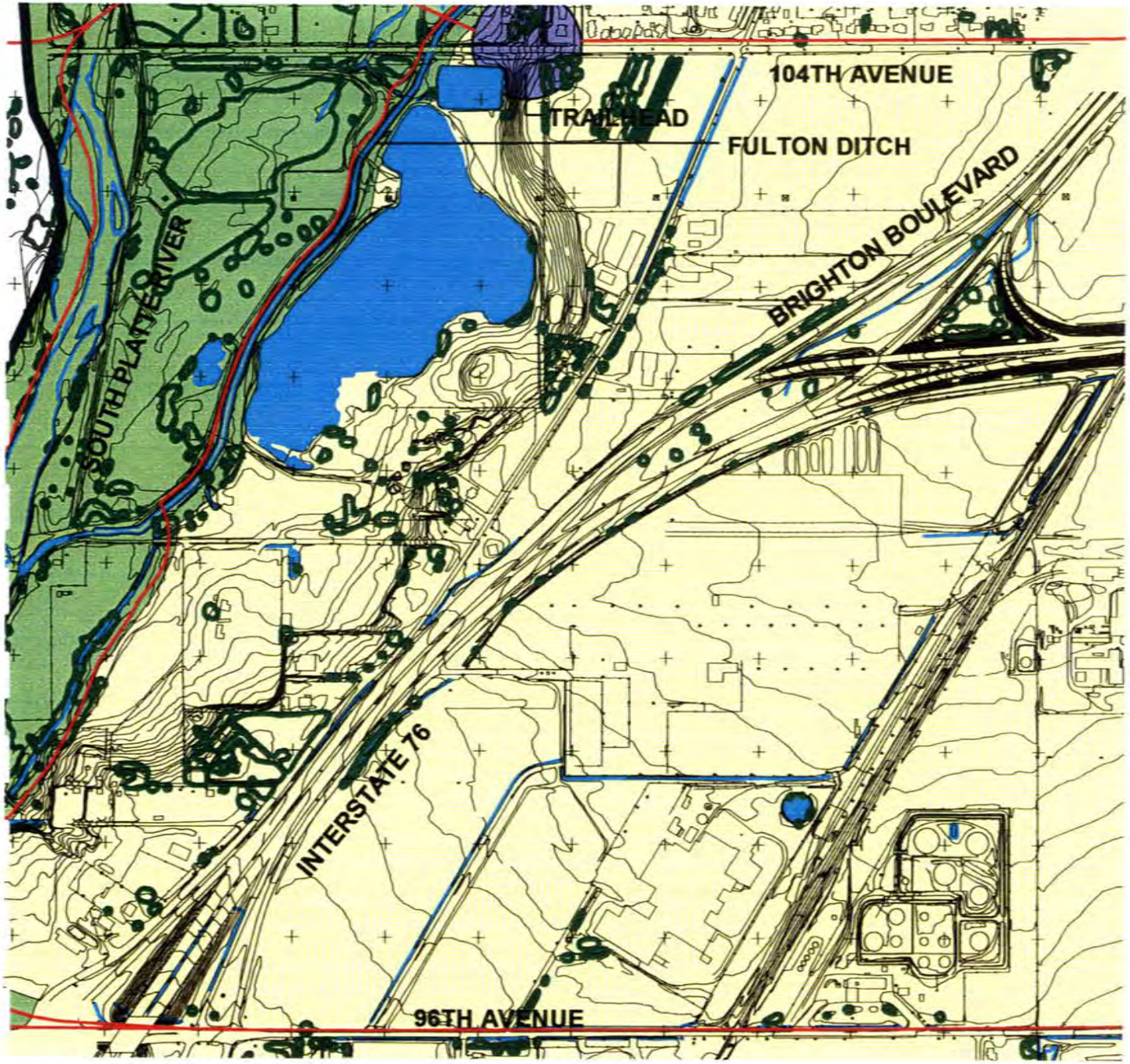


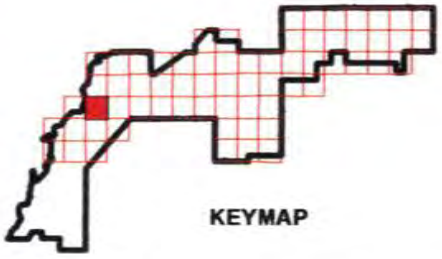
PLATE #43



Township 2 South, Range 67 West, Section 16

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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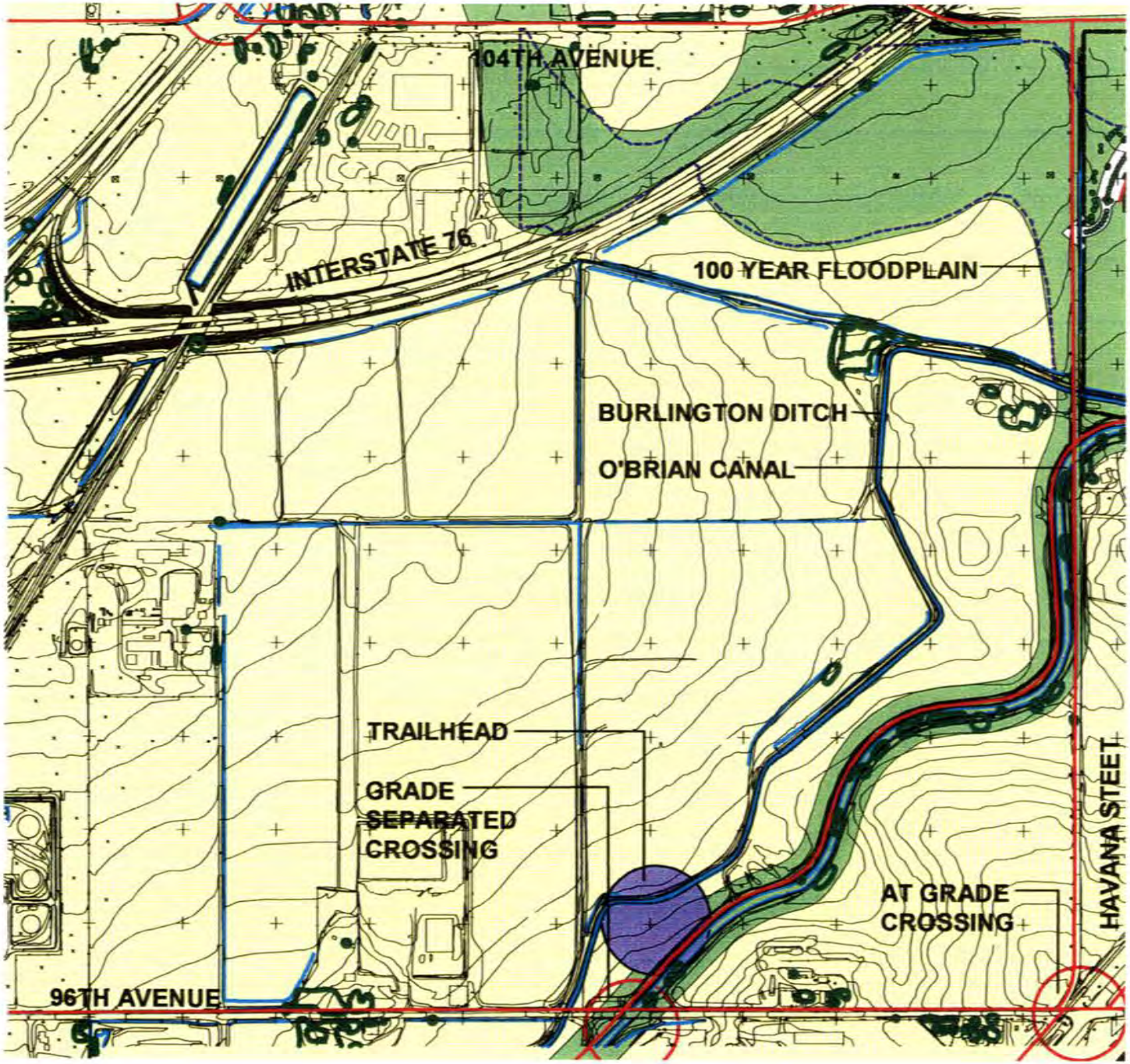
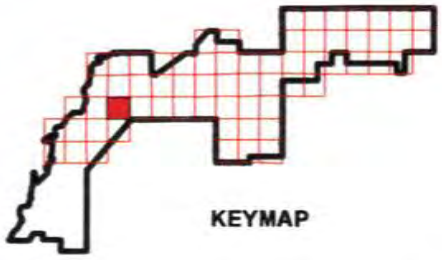
PLATE #44



Township 2 South, Range 67 West, Section 15

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



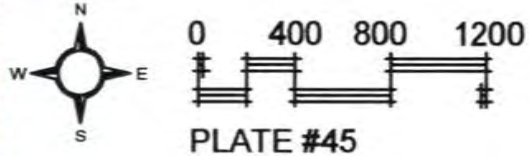
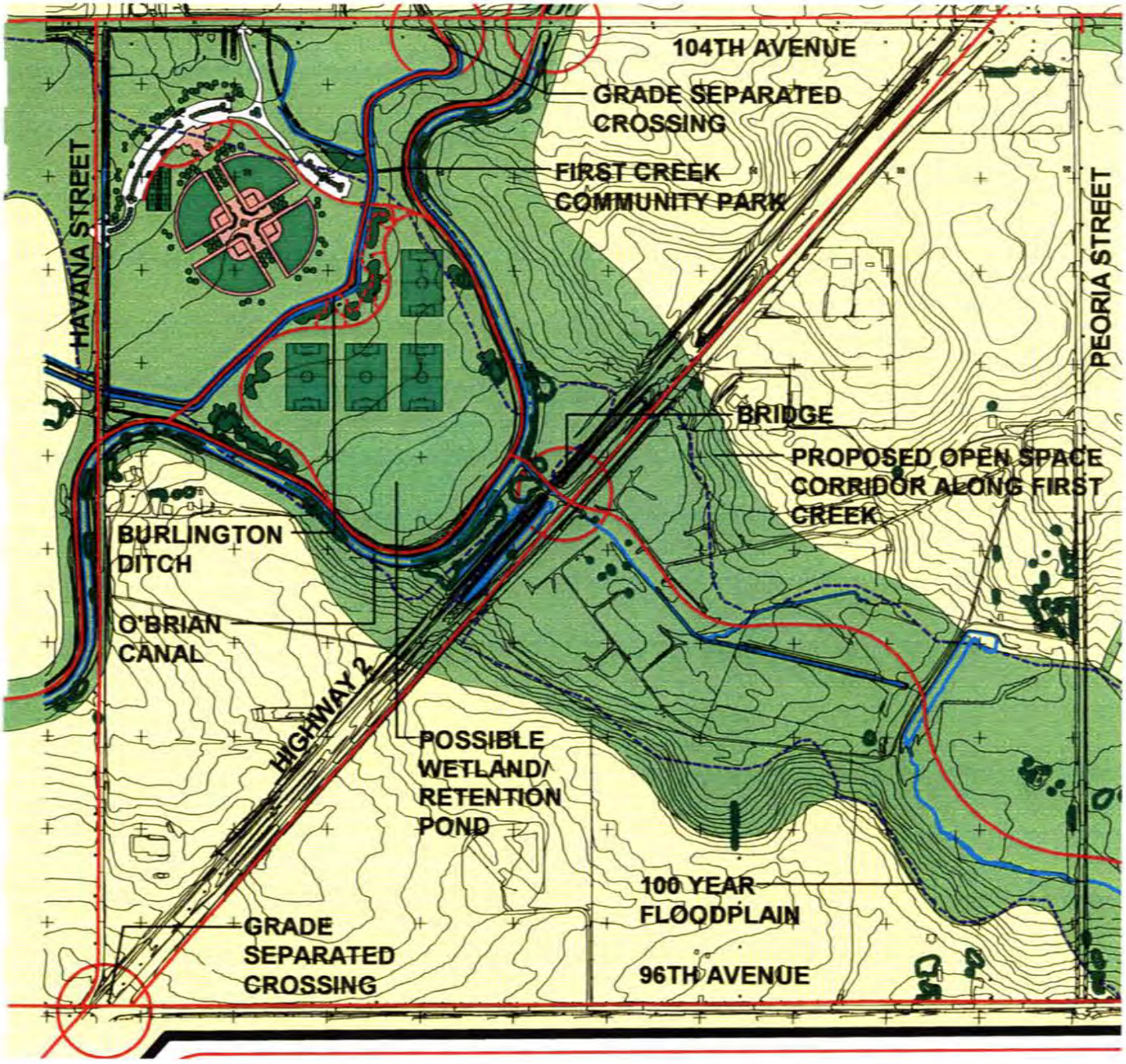


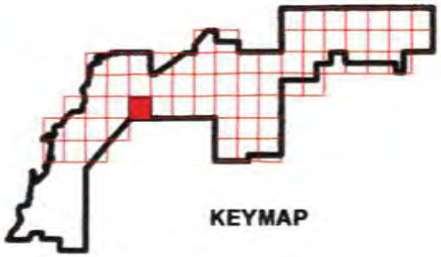
PLATE #45



Township 2 South, Range 67 West, Section 14

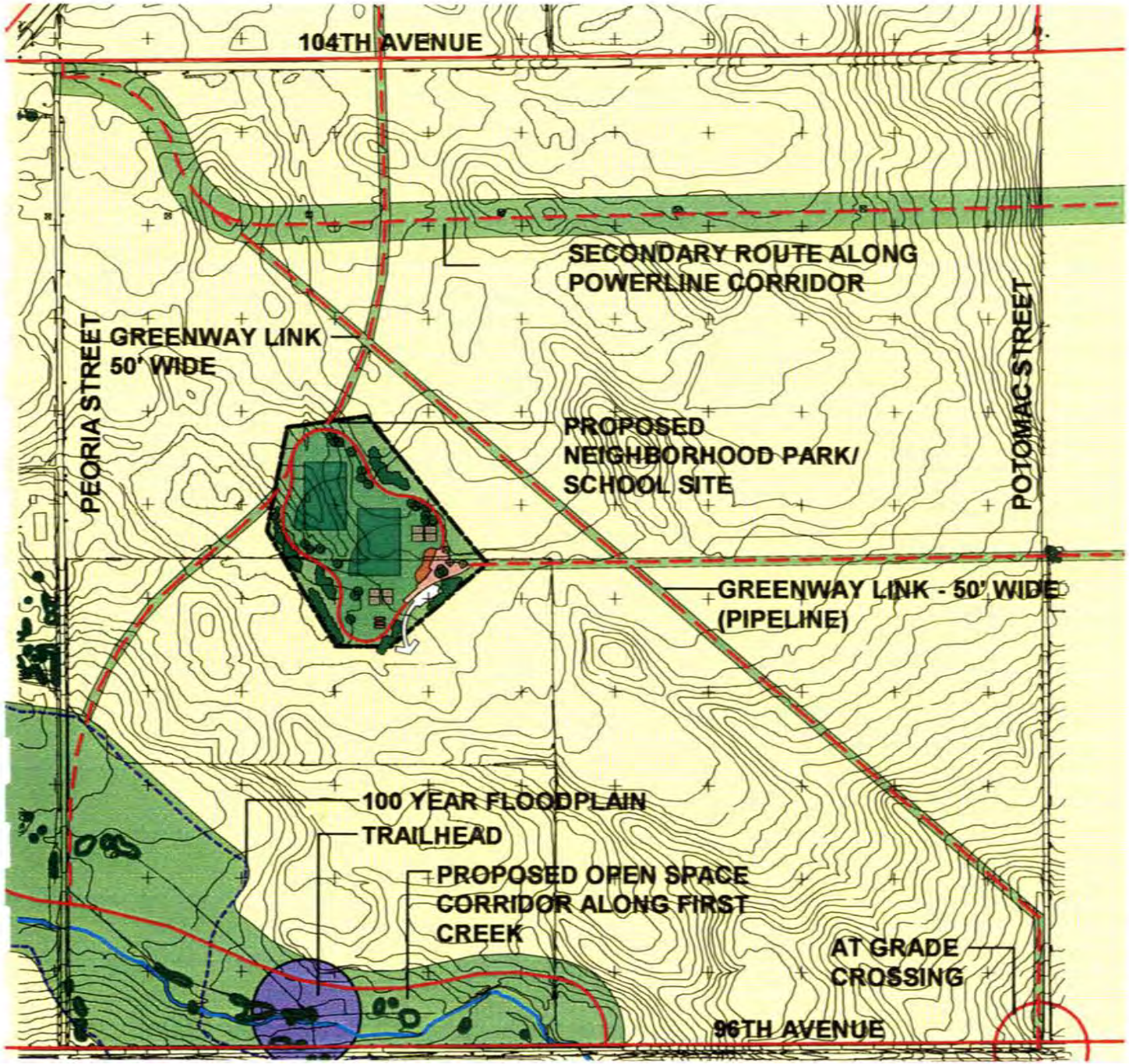
LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



0 400 800 1200

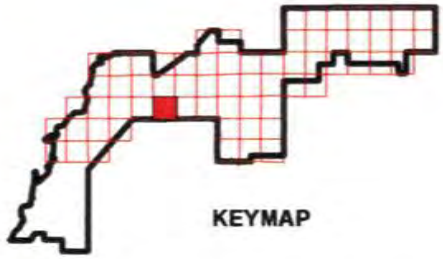
PLATE #46



Township 2 South, Range 67 West, Section 13

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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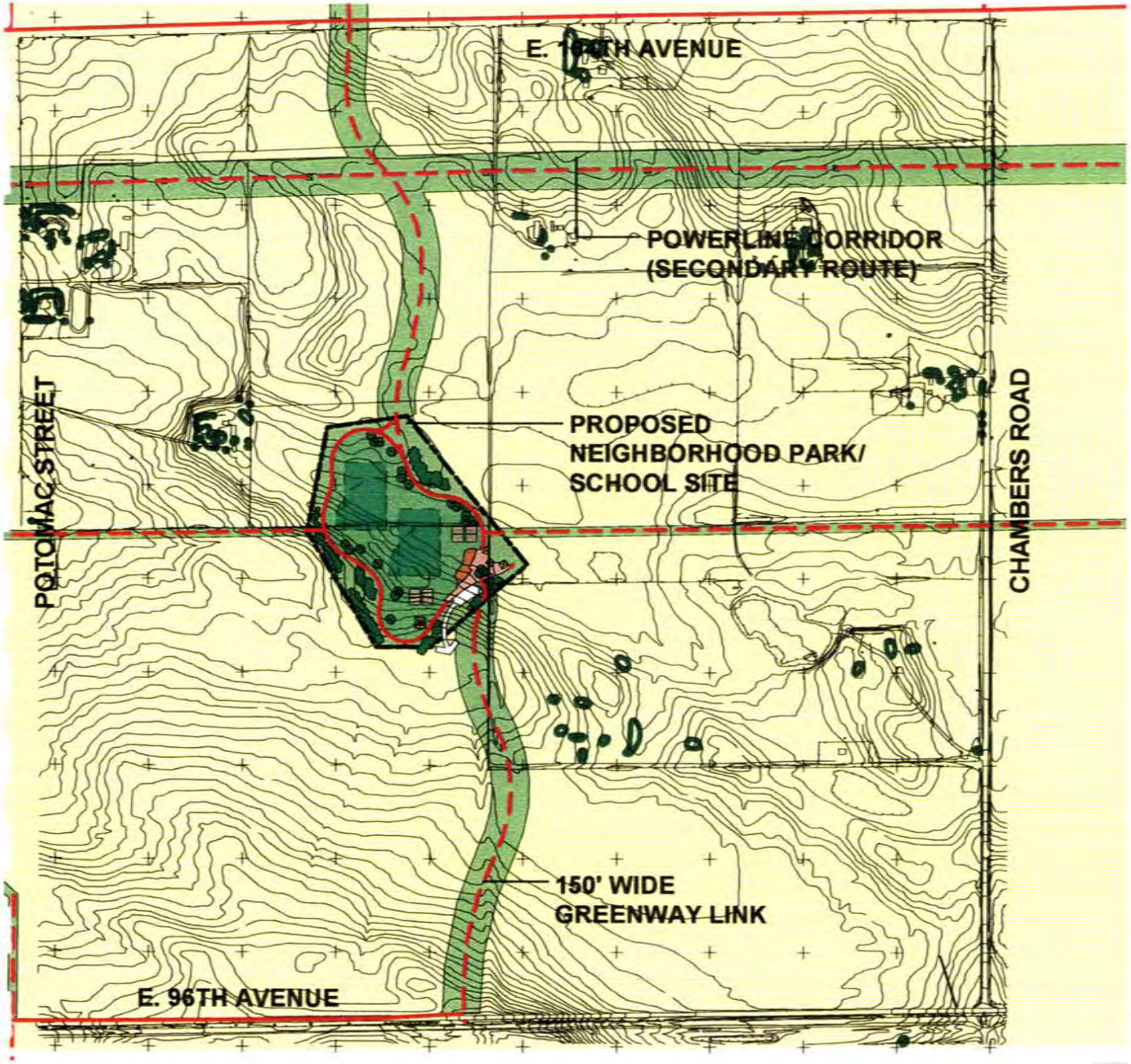
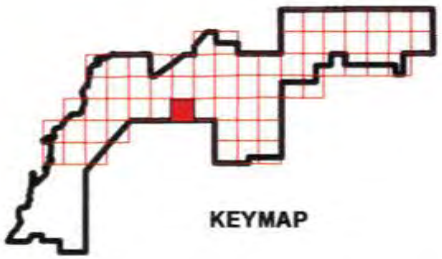
PLATE #47



Township 2 South, Range 66 West, Section 18

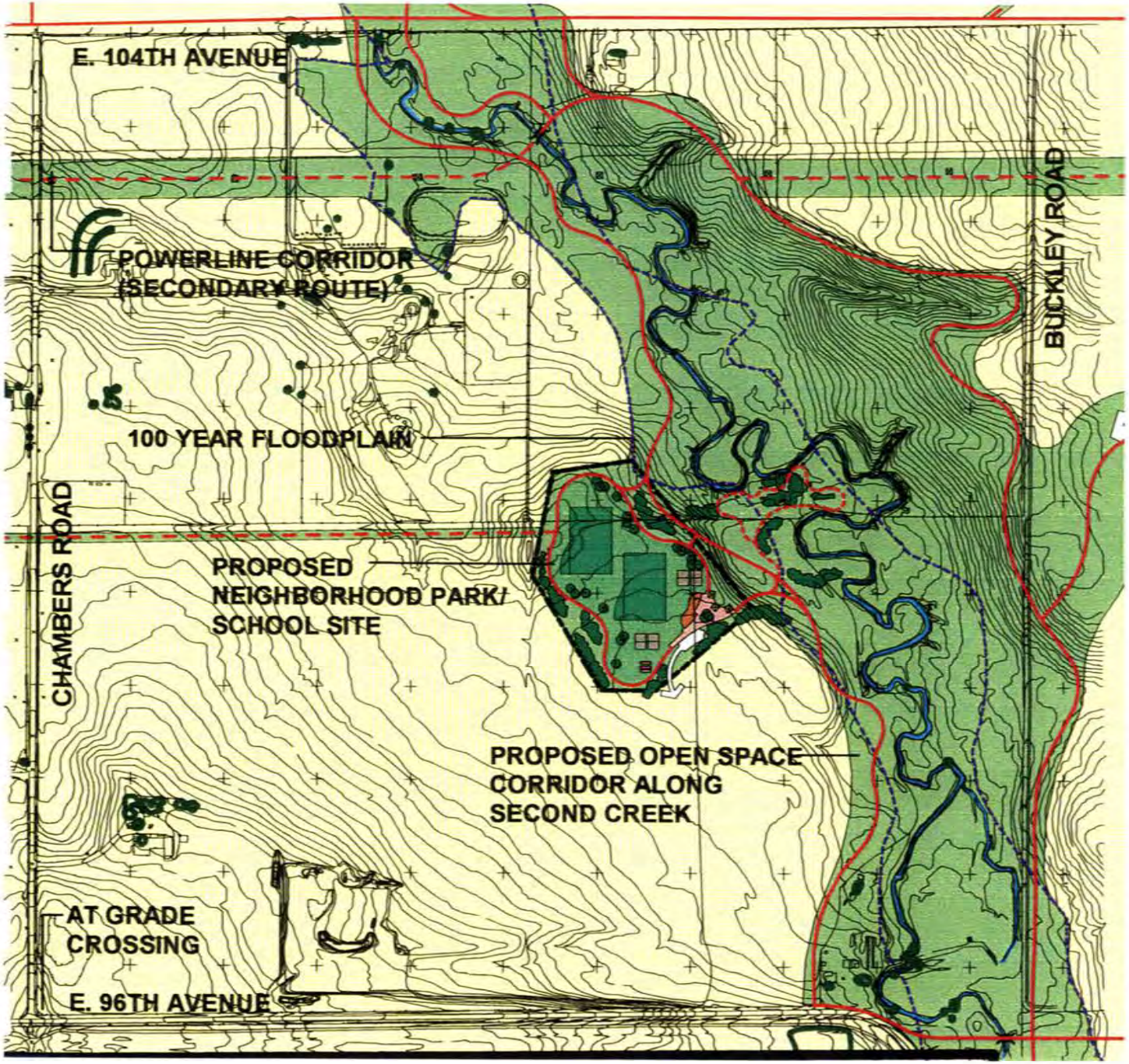
LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



0 400 800 1200

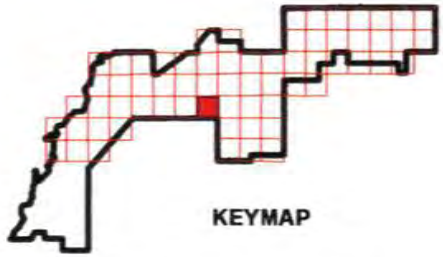
PLATE #48



Township 2 South, Range 66 West, Section 17

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



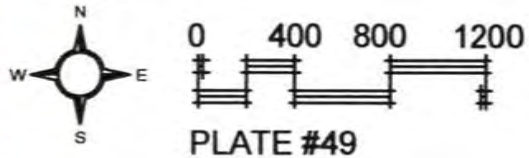
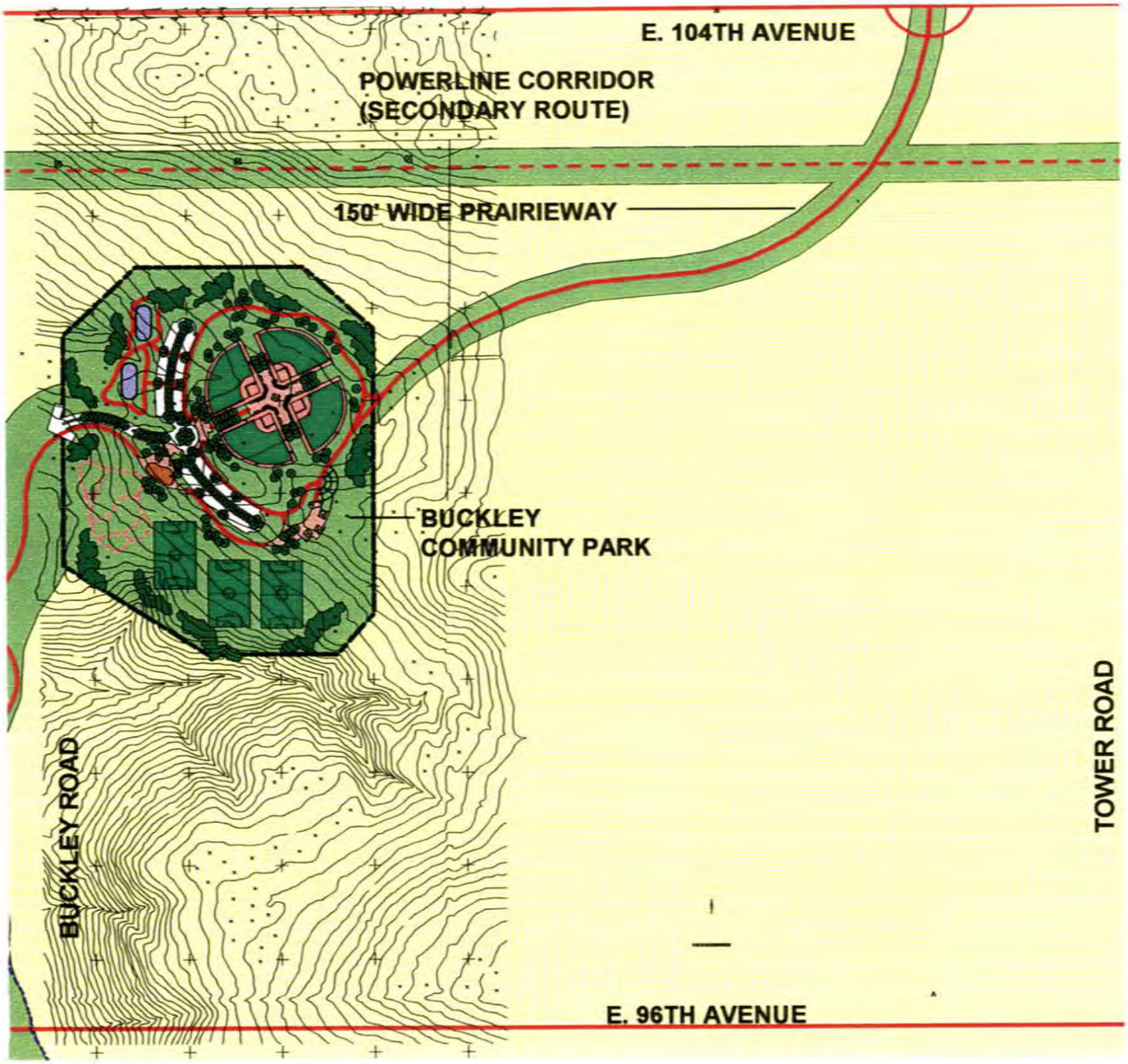


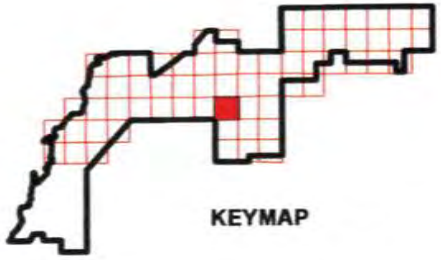
PLATE #49



Township 2 South, Range 66 West, Section 16

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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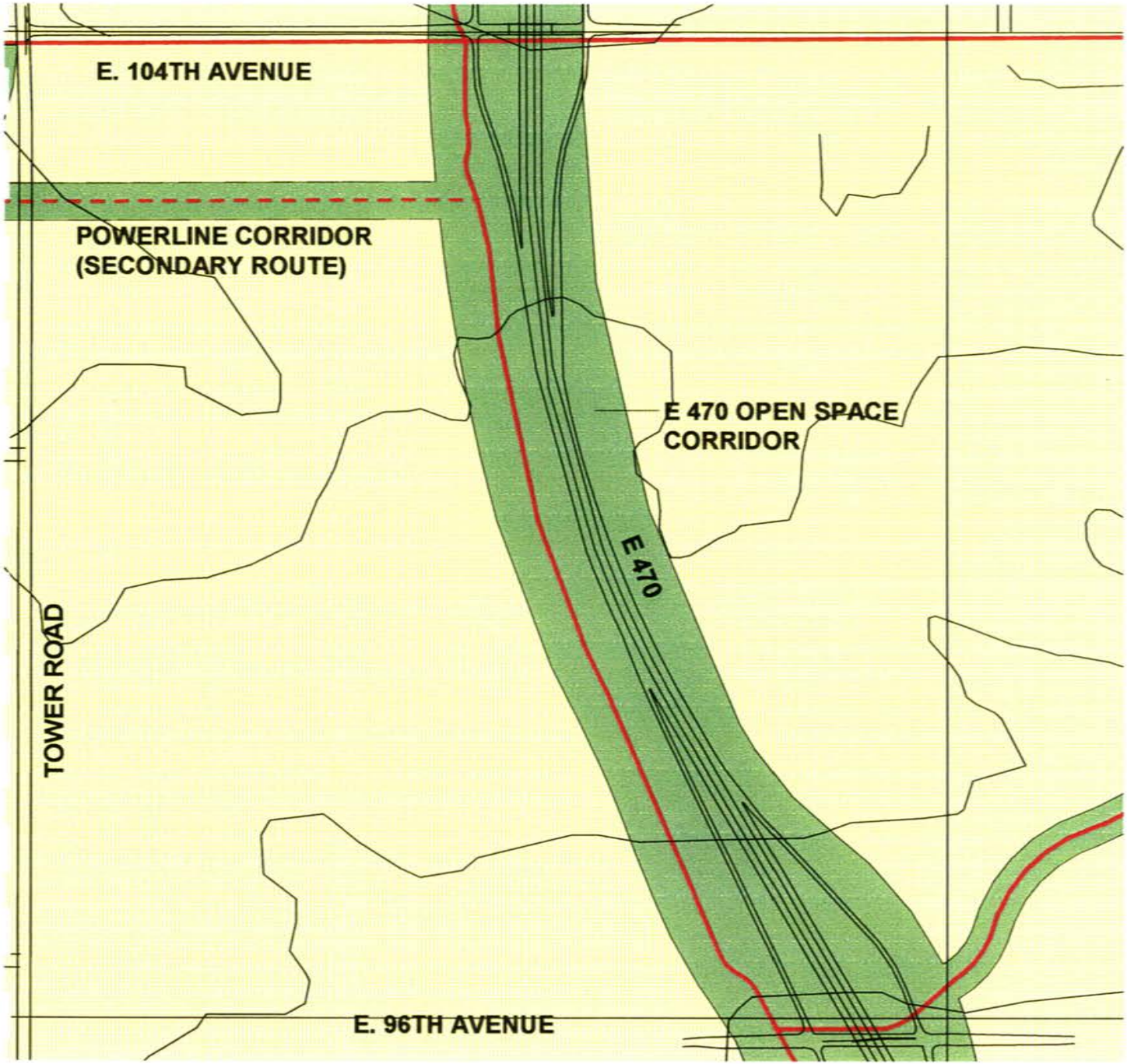
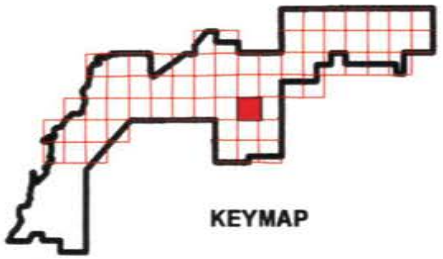
PLATE #50



Township 2 South, Range 66 West, Section 15

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

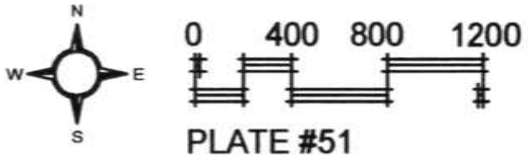
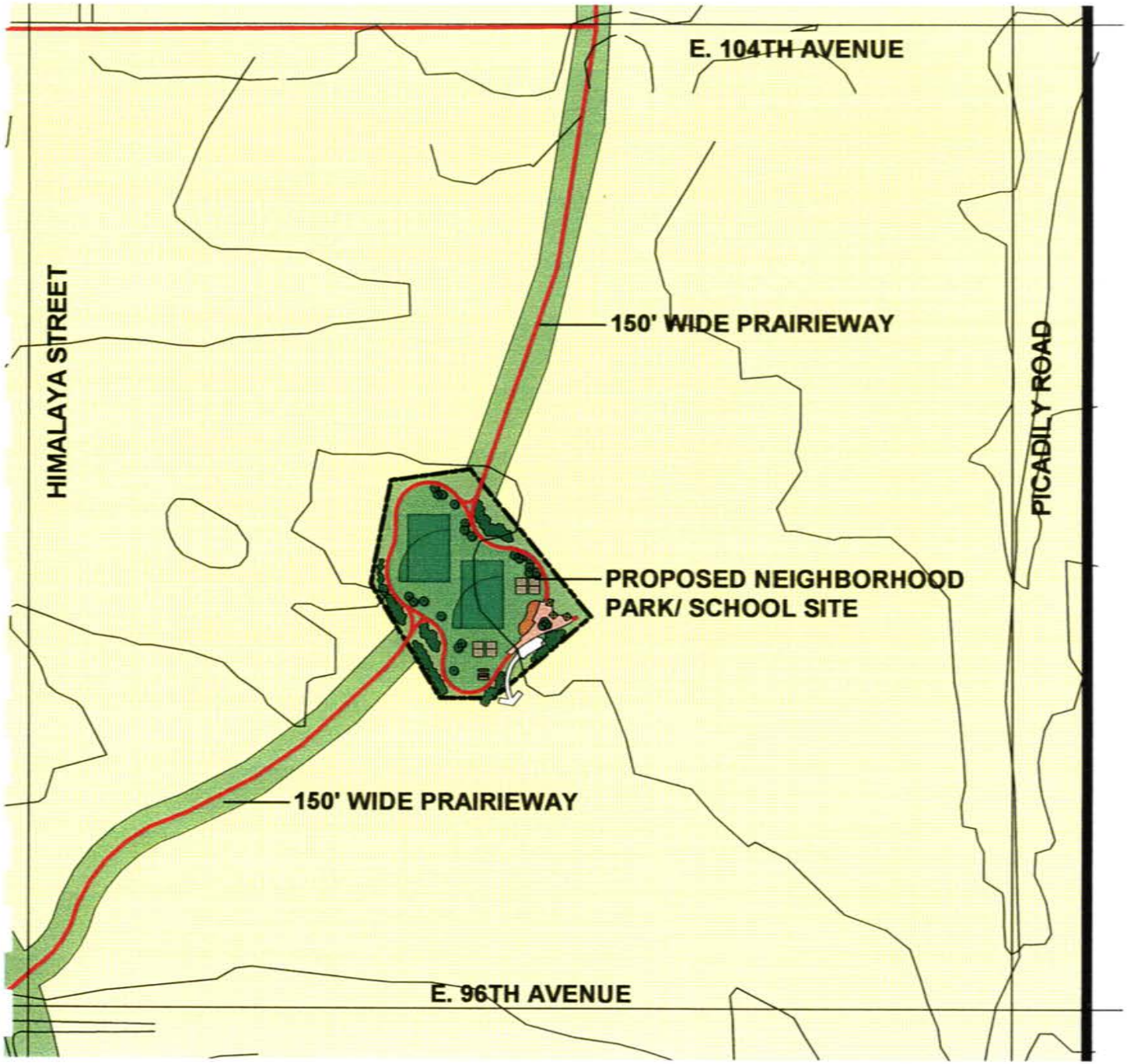


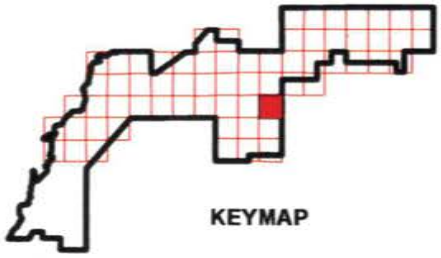
PLATE #51



Township 2 South, Range 66 West, Section 14

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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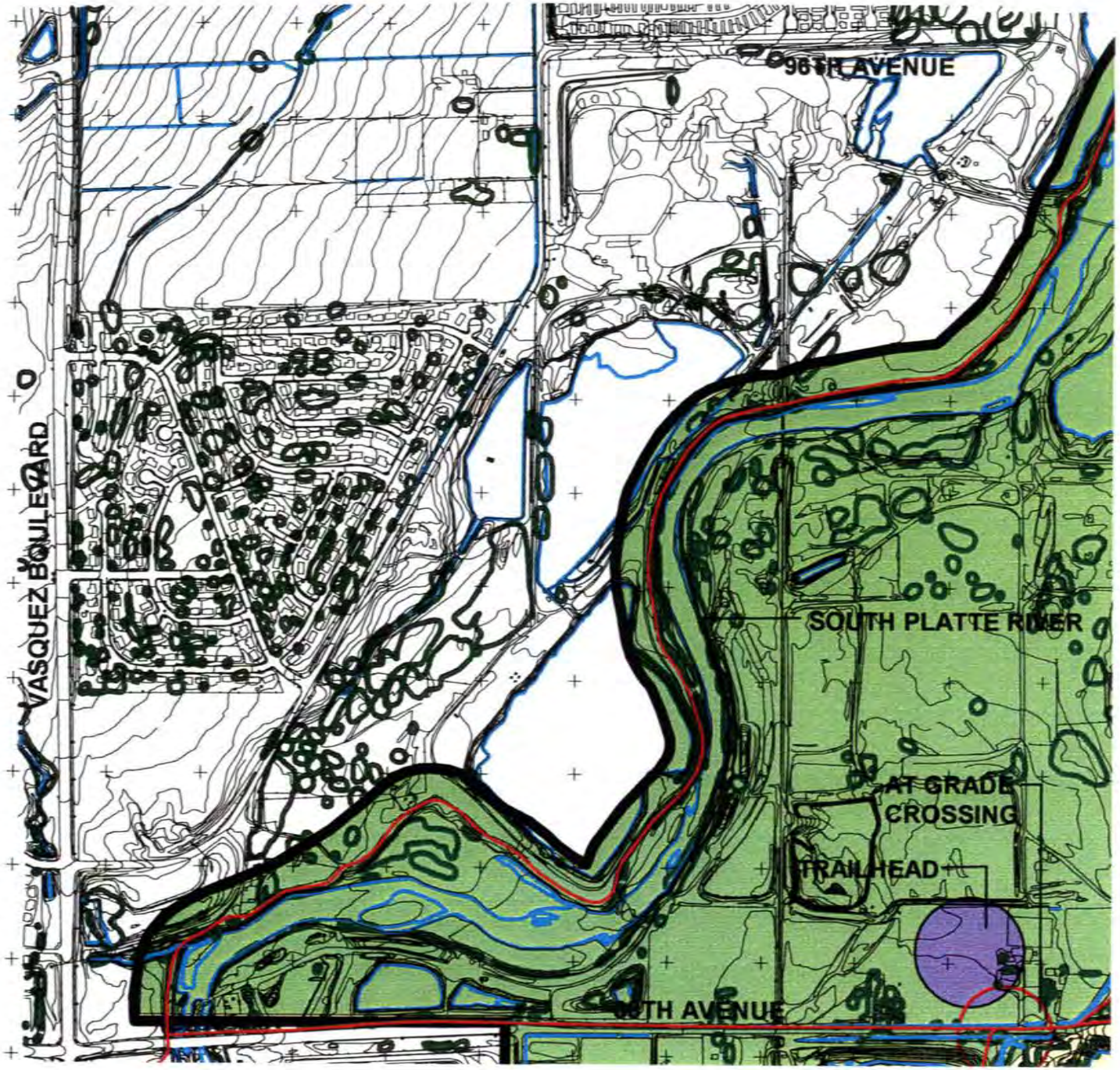
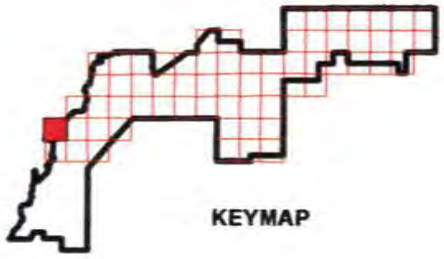
PLATE #52



Township 2 South, Range 67 West, Section 19

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



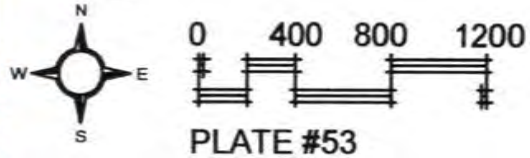
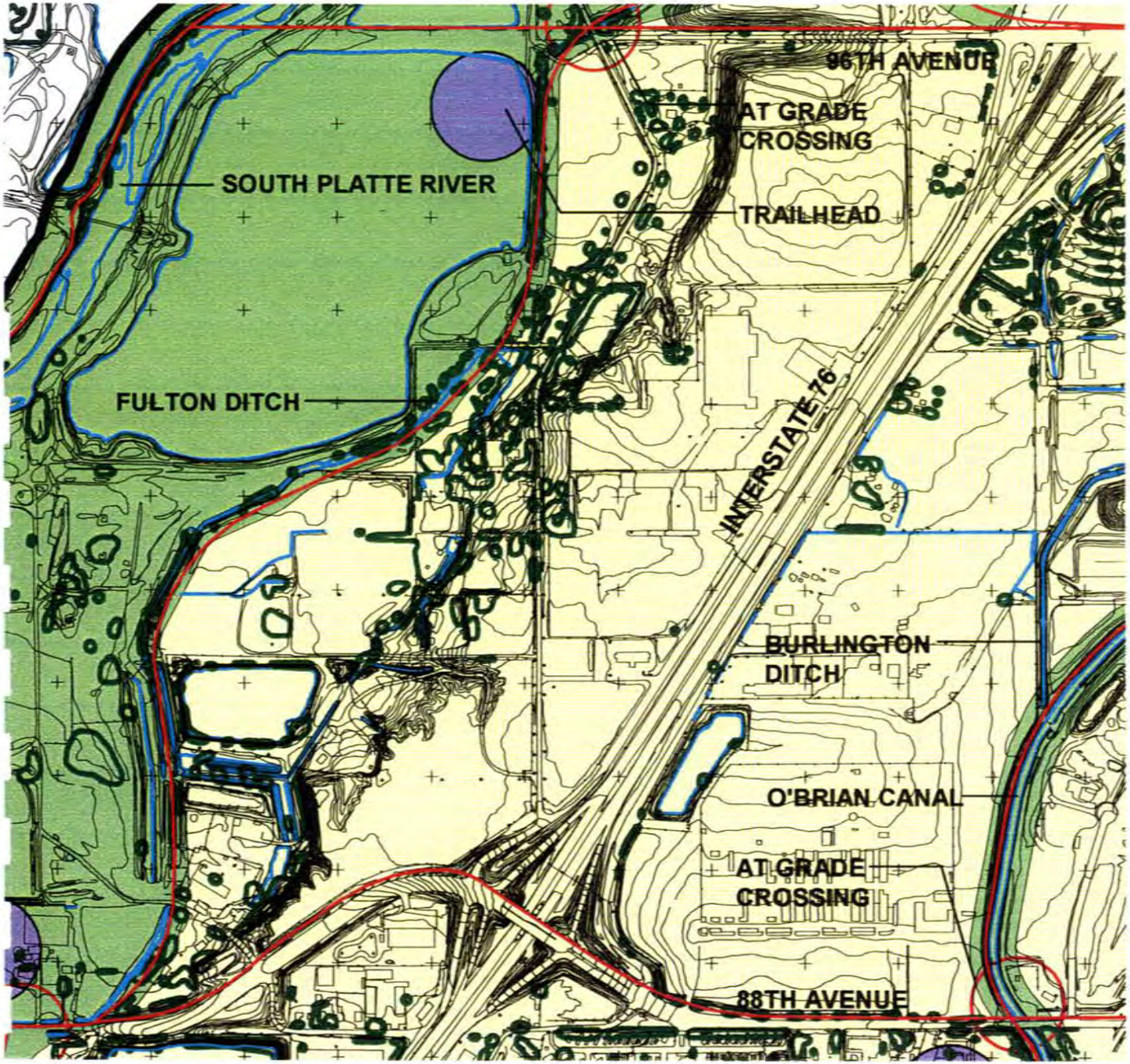


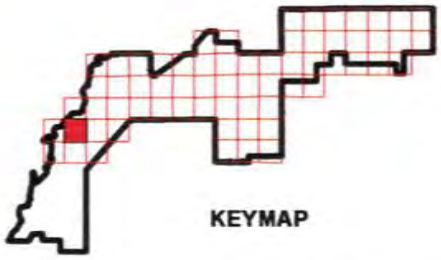
PLATE #53



Township 2 South, Range 67 West, Section 20

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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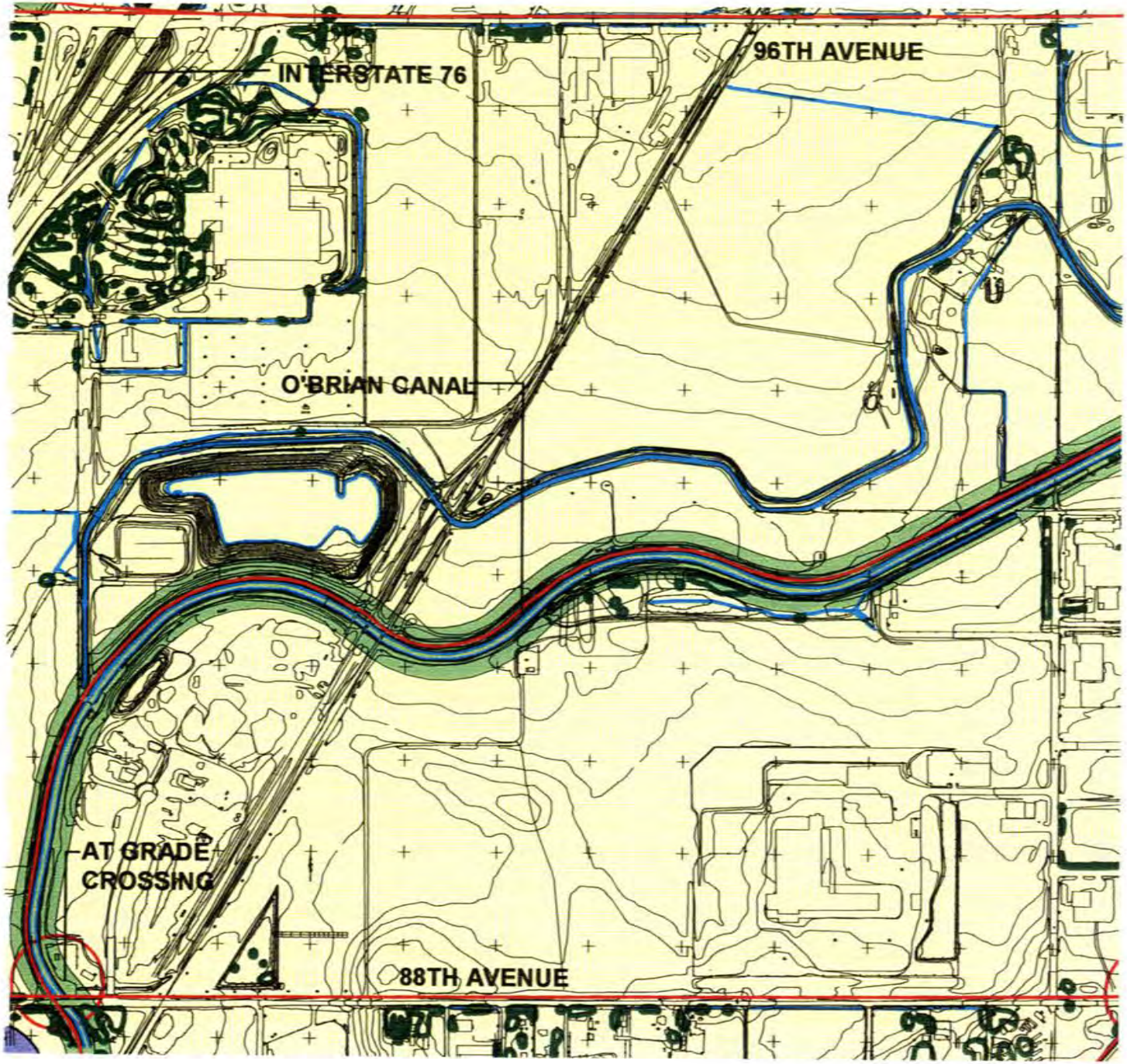
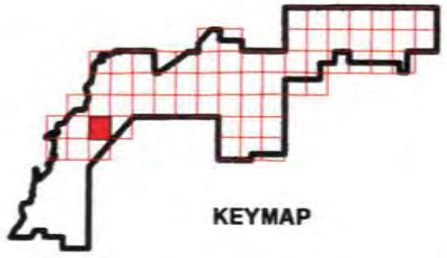
PLATE #54



Township 2 South, Range 67 West, Section 21

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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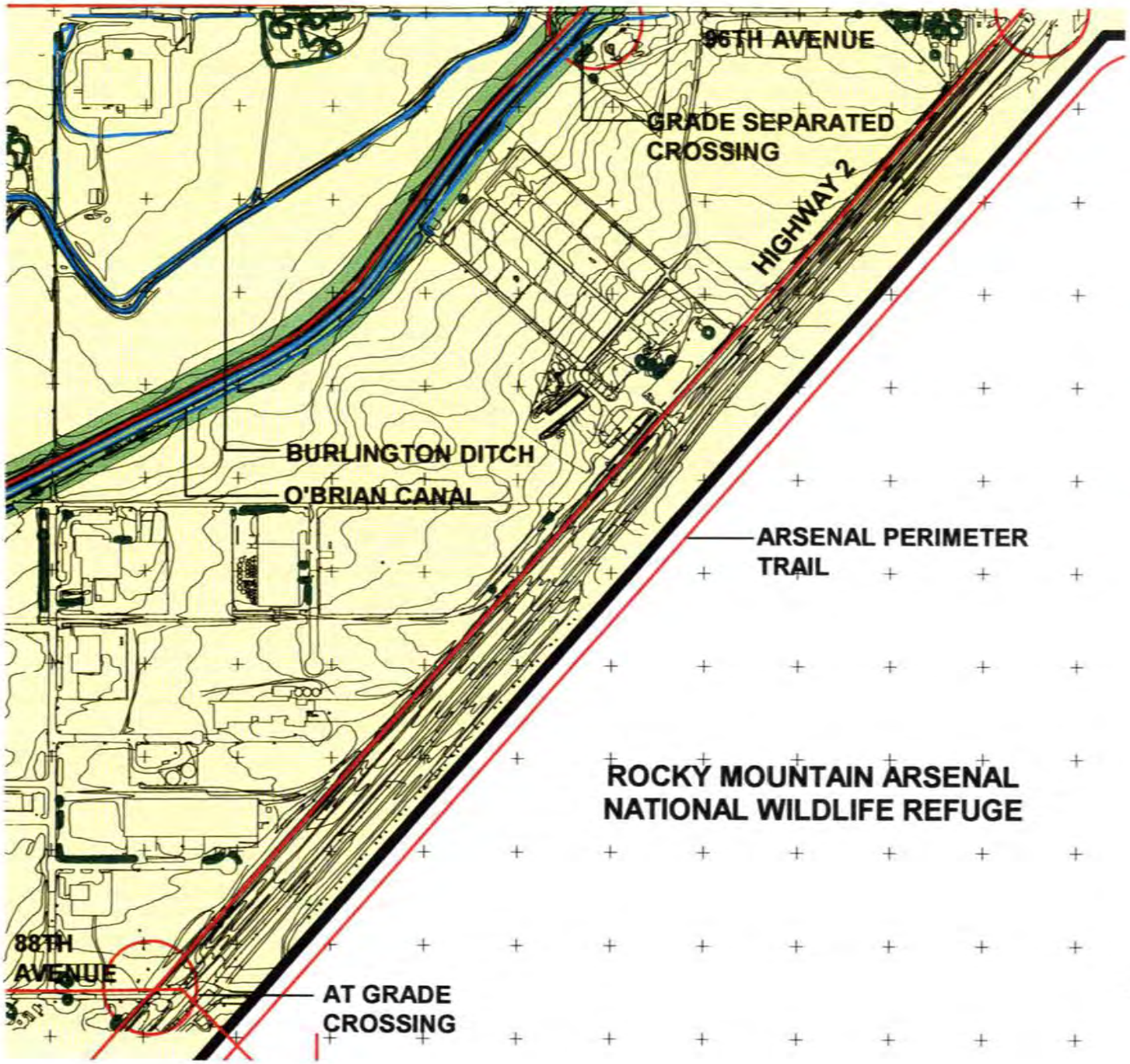
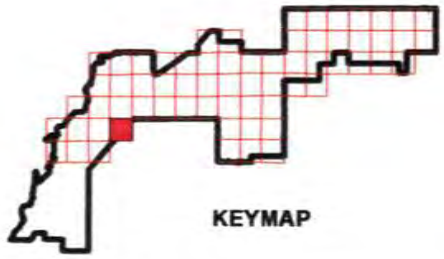
PLATE #55



Township 2 South, Range 67 West, Section 22

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



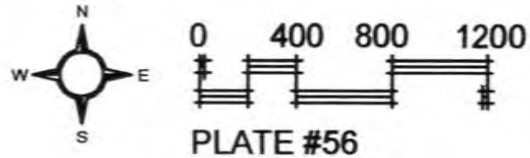
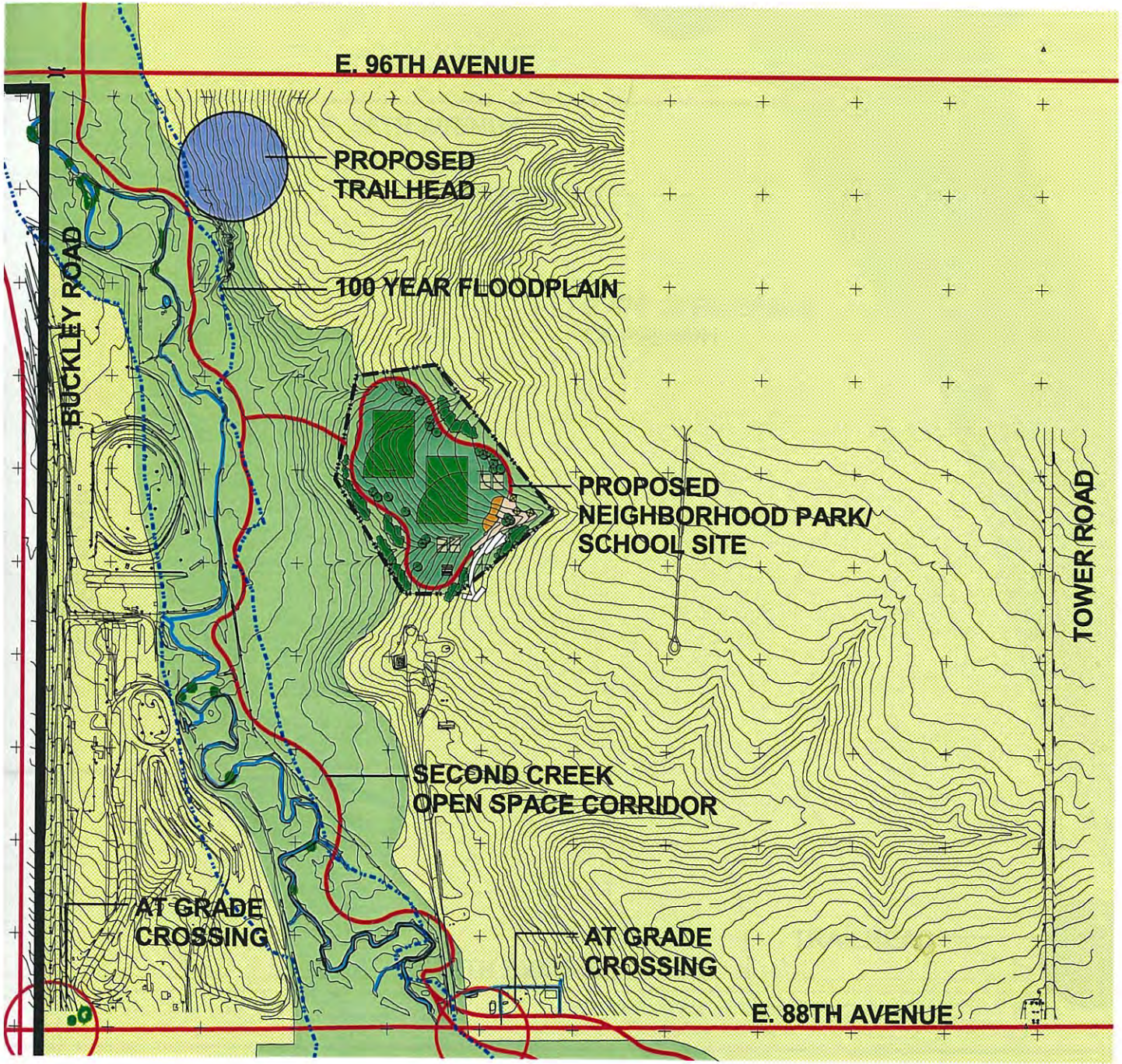


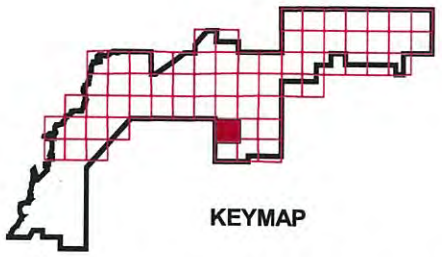
PLATE #56



Township 2 South, Range 66 West, Section 21

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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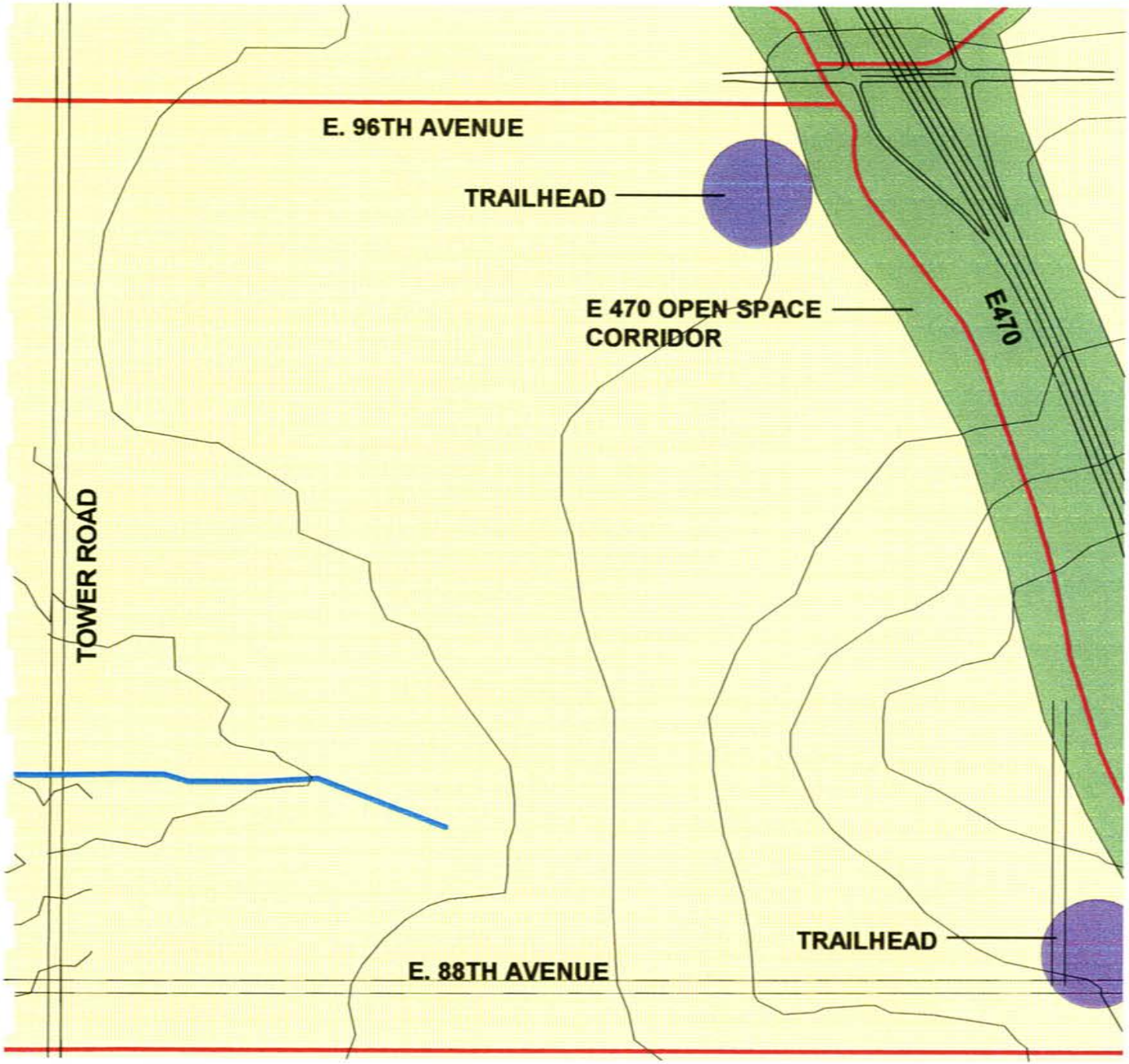
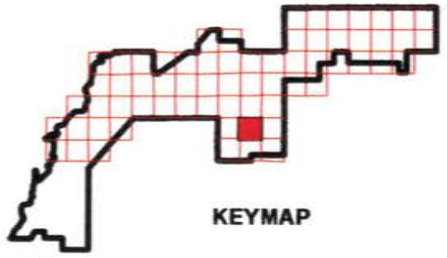
PLATE #57



Township 2 South, Range 66 West, Section 22

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



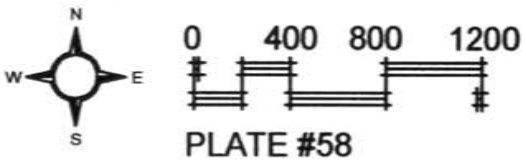
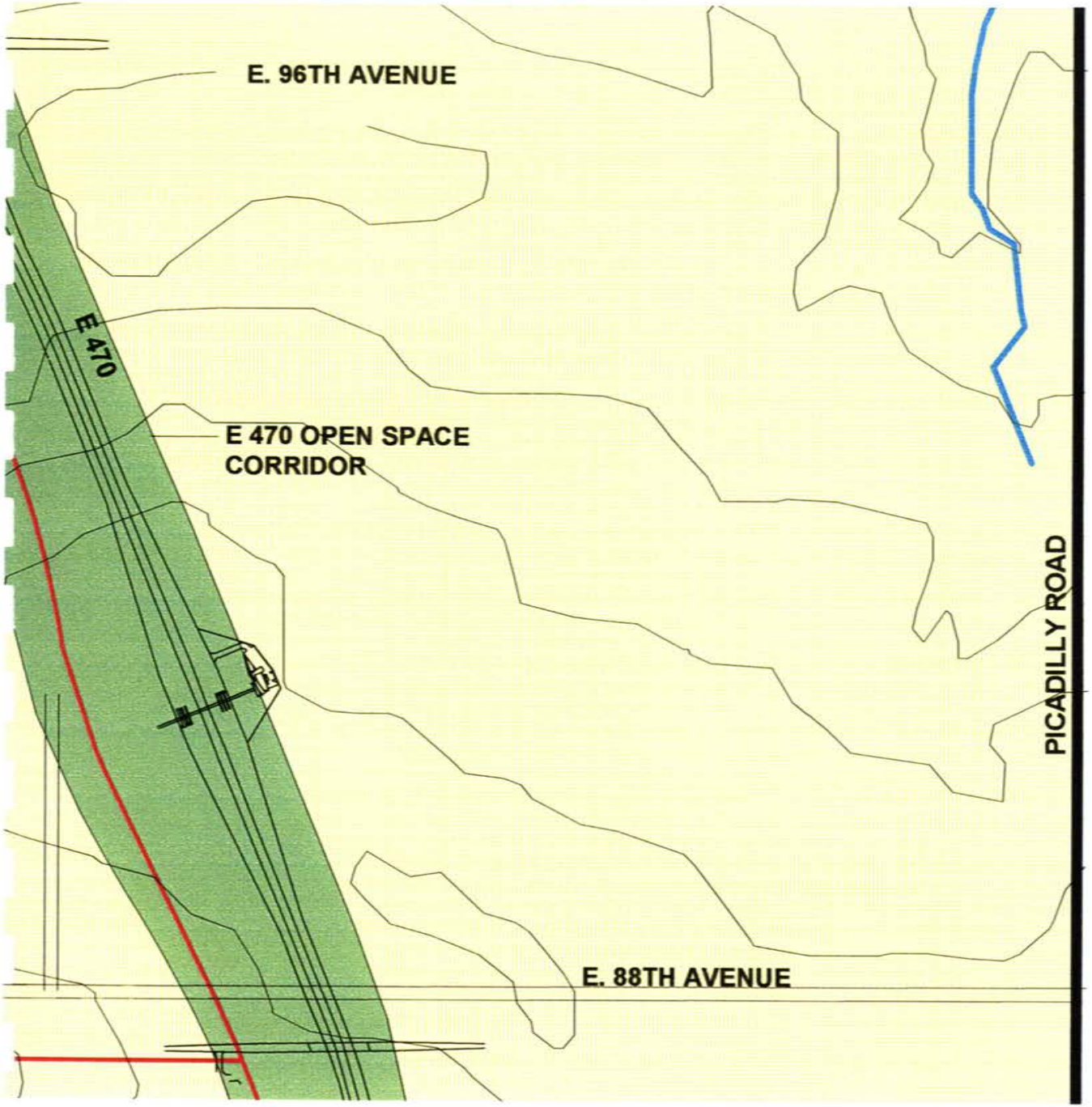


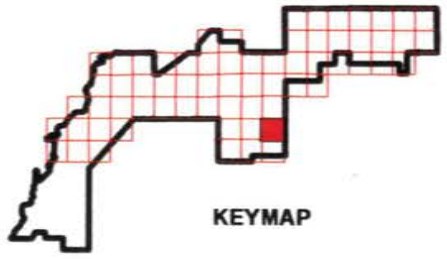
PLATE #58



Township 2 South, Range 66 West, Section 23

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



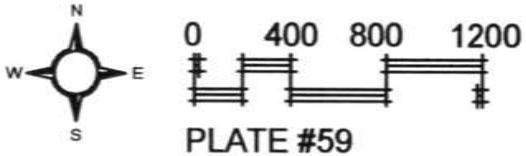
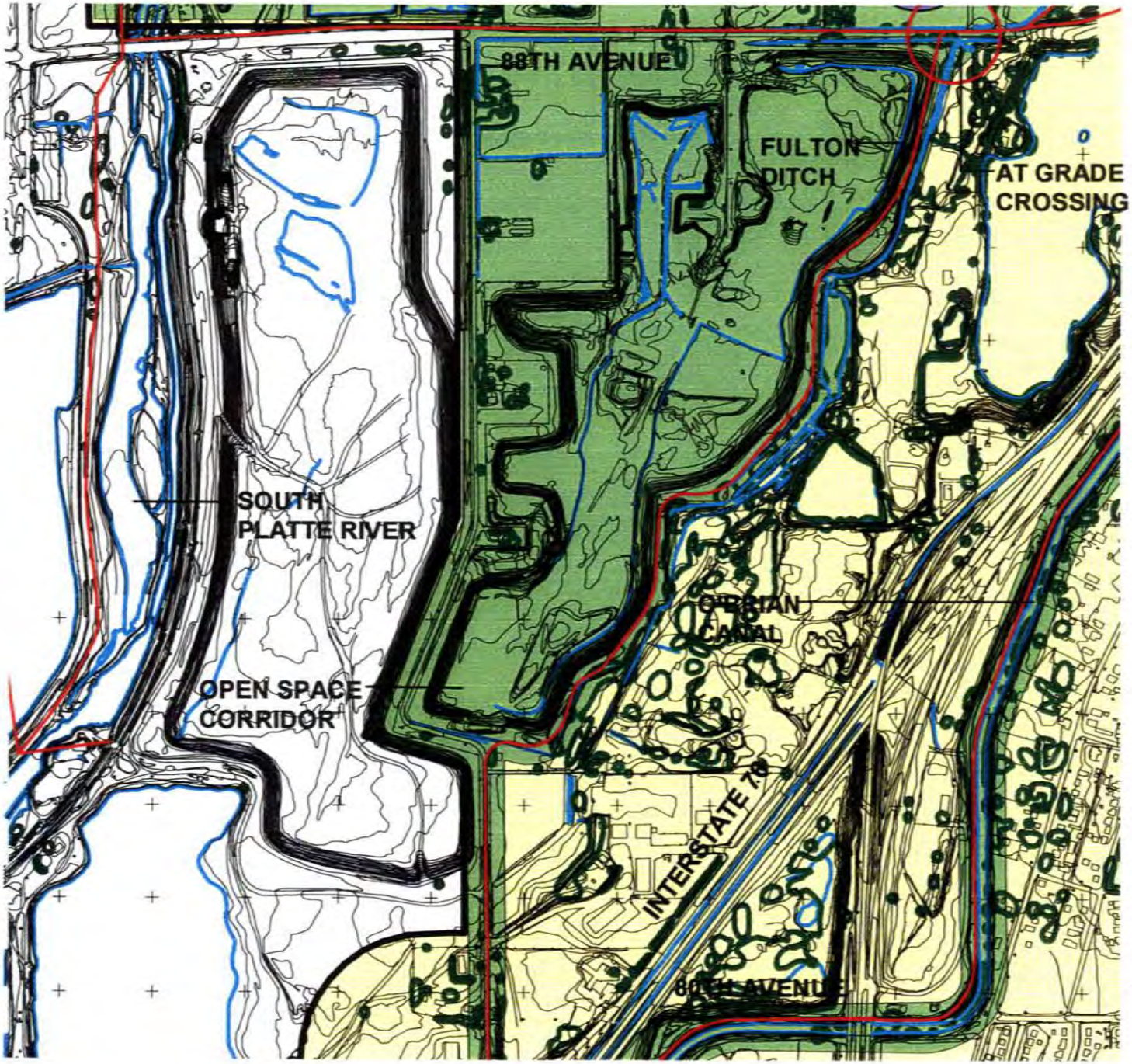


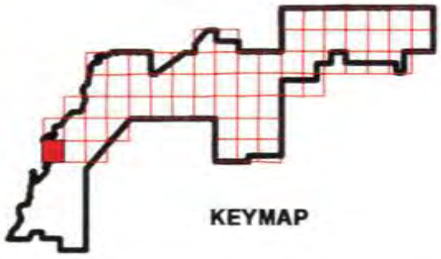
PLATE #59



Township 2 South, Range 67 West, Section 30

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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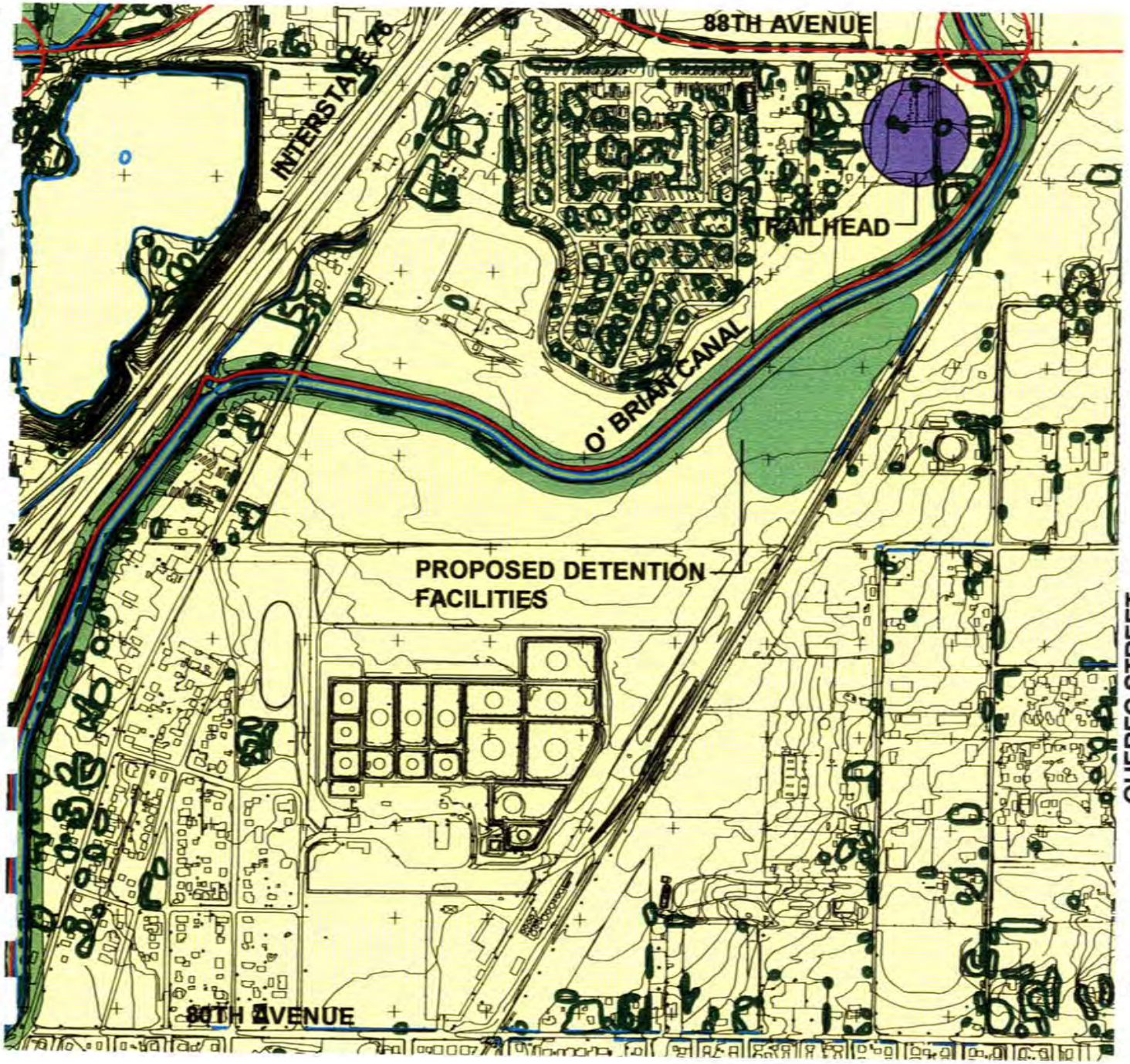
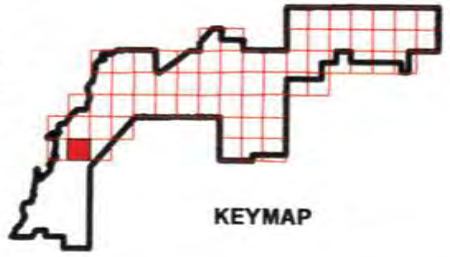
PLATE #60



Township 2 South, Range 67 West, Section 29

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



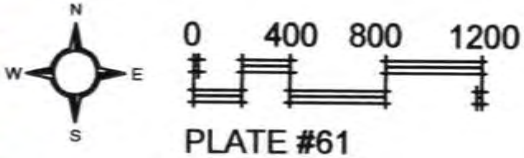
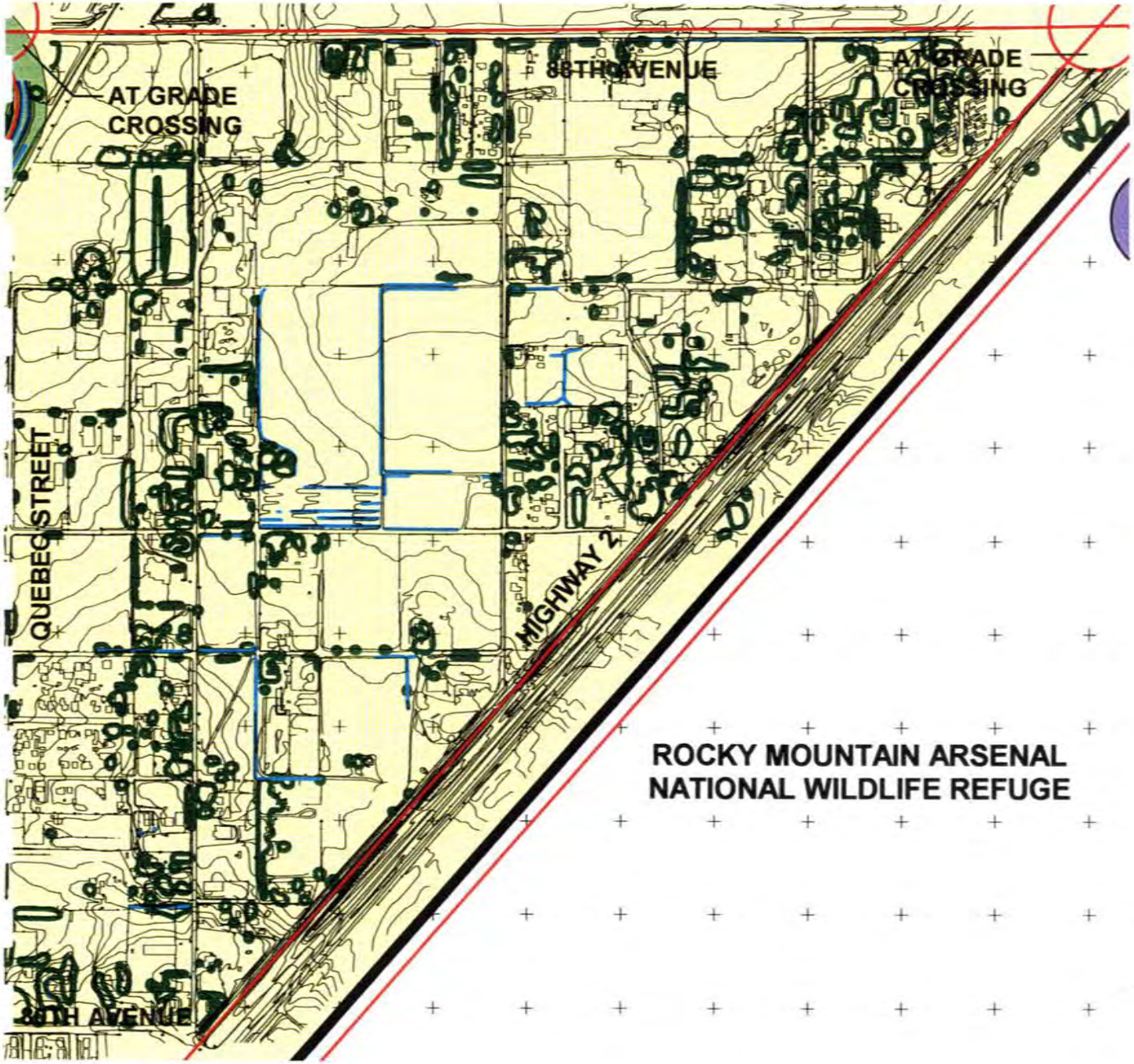


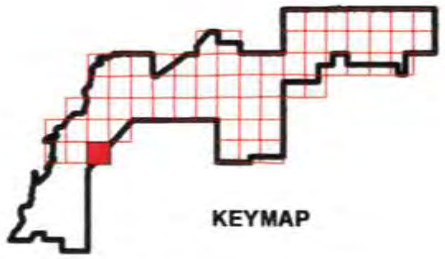
PLATE #61



Township 2 South, Range 67 West, Section 28

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

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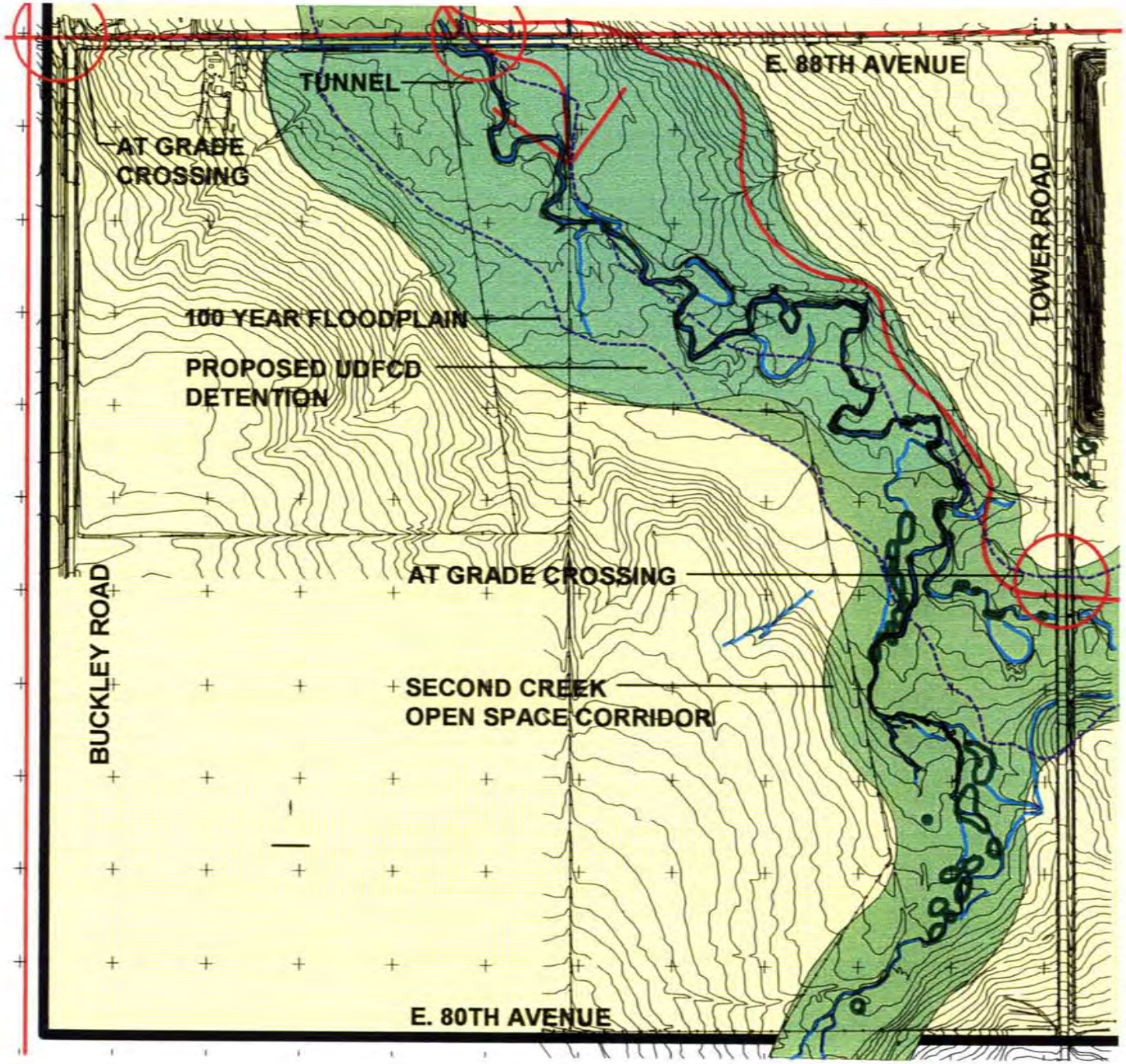
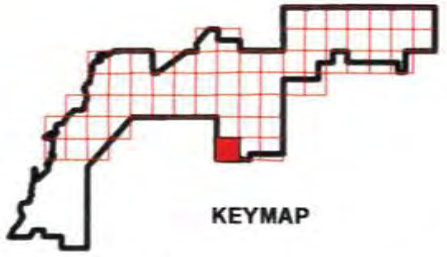
PLATE #62



Township 2 South, Range 66 West, Section 28

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



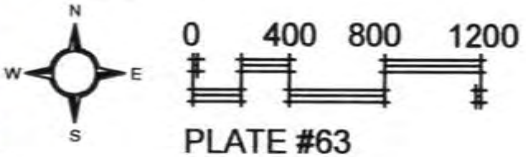
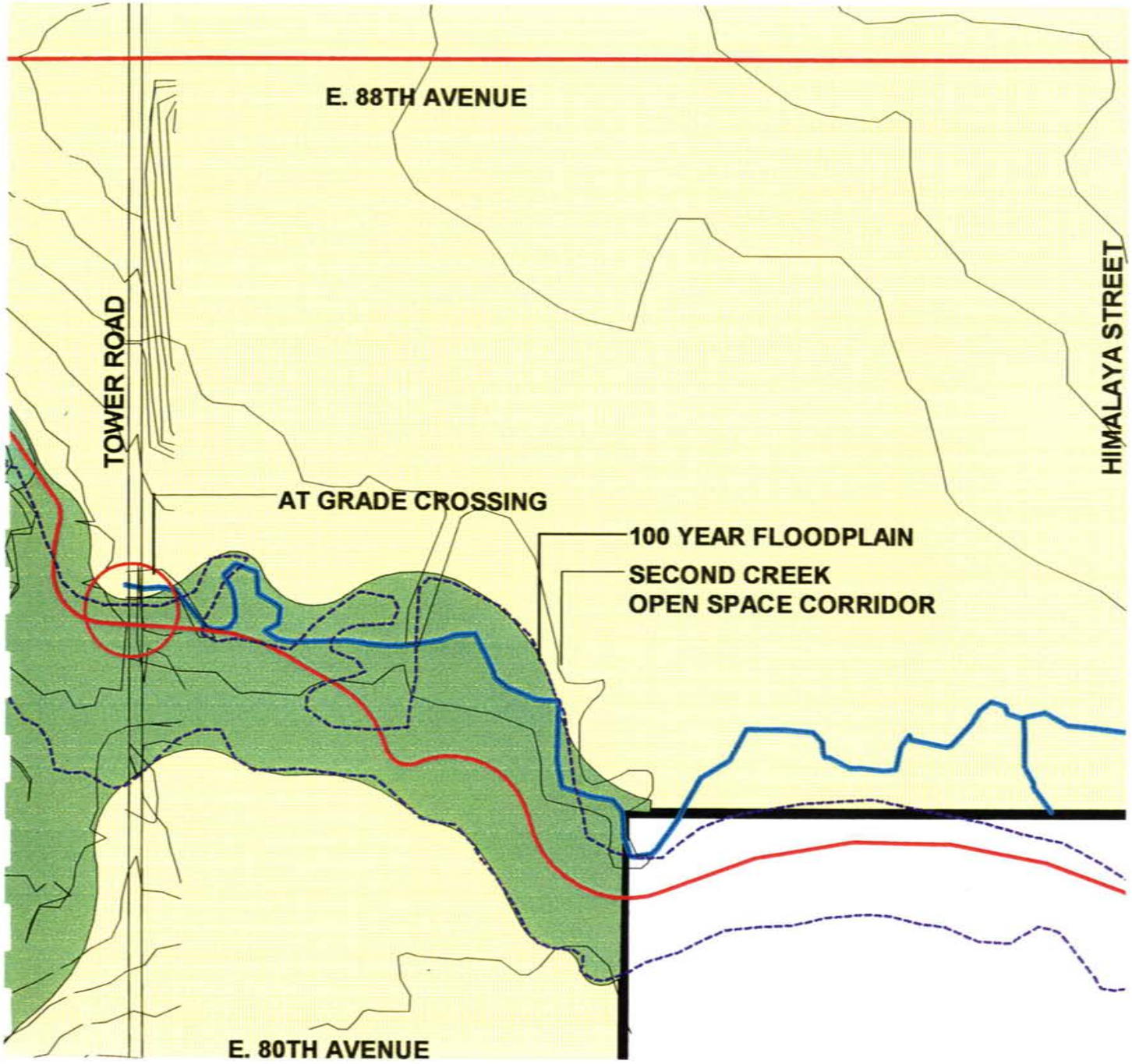


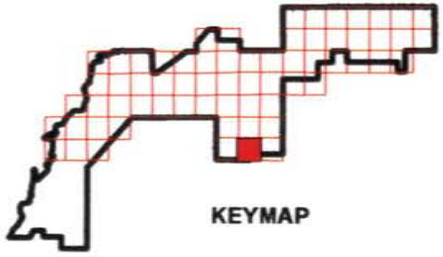
PLATE #63



Township 2 South, Range 66 West, Section 27

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



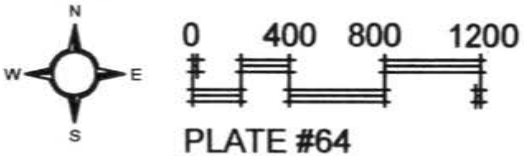
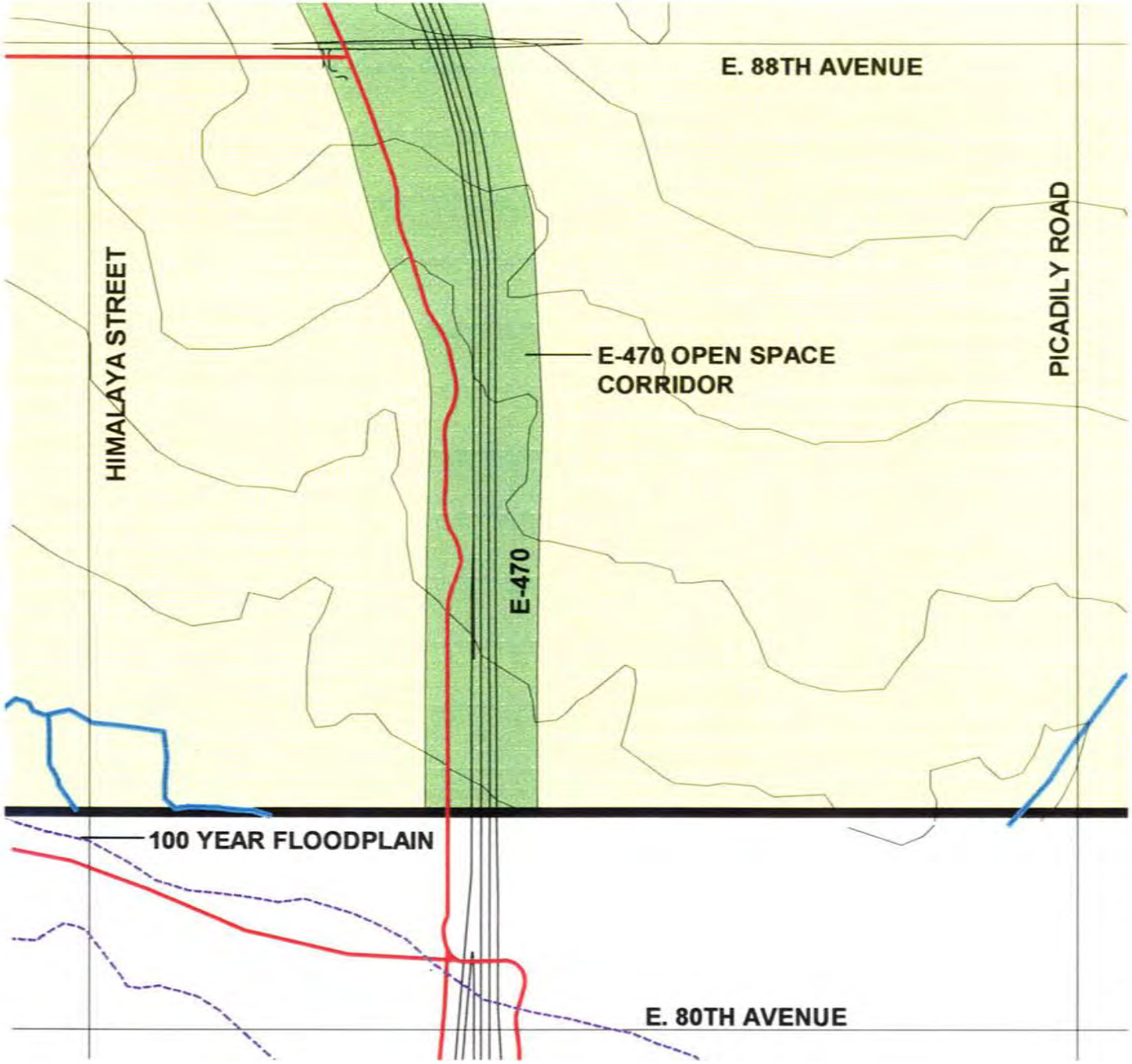


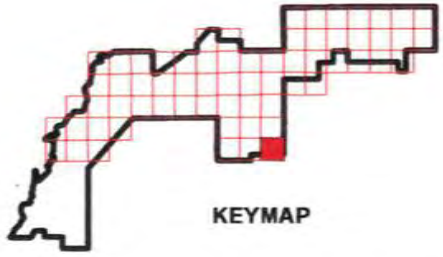
PLATE #64



Township 2 South, Range 66 West, Section 26

LEGEND

- STREAM
- REGIONAL MULTI-USE TRAIL
- PRIMATIVE/ NATURE TRAIL
- GREENWAY LINKS
- IN PARK/ LOOP TRAIL
- OPEN SPACE



KEYMAP

0 400 800 1200

PLATE #65