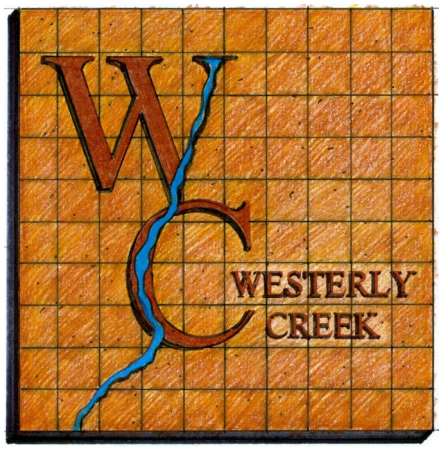

Westerly Creek Greenway Master Plan

June 23, 2011

Developed by the Westerly Creek Connection Planning Team
David Duclos, Ellie Horn, and Brian Hyde
Councilwoman Marcia Johnson
The Greenway Foundation

Funded by the Colorado Water Conservation Board,
Denver Public Works, and the Quick Foundation

Approved by Denver City Council on June 27, 2011

Preface

"A highway takes your car to the country, a greenway your mind."- Charles Little, Greenways to America, 1990

Westerly Creek originates in the rolling hills near Cherry Creek State Park, in a highly urbanized portion of southeastern Aurora, within the Denver metropolitan area. It travels four miles through Aurora, then through the former Lowry Air Force Base in east Denver, before entering urban neighborhoods in Aurora and Denver, between 11th Avenue and 23rd Avenue. Four and a half miles from its entry into Lowry, it joins Sand Creek at the site of the former Stapleton International Airport.

Between 11th and 23rd Avenue, the Westerly Creek corridor flows along the border between the cities of Aurora and Denver, where a major concentration of flood risk is located. It is in an area with several designated bicycle routes and RTD bus routes that intersect the creek corridor. This reach of Westerly Creek represents one of the last gaps in the greenway system serving northeastern Denver and northwestern Aurora. The Westerly Creek Greenway Master Plan was developed to close the greenway gap while respecting the importance of reducing flood risk and supporting ongoing efforts to improve circulation.

The vision of the Westerly Creek Greenway provides an opportunity to continue the Denver metropolitan area's tradition of open spaces. Parks and parkways have been a part of Denver's history since the city was first established. In 1859, a year after it was founded, Denver adopted a city plan that called for the inclusion of parks. Denver's first park, Curtis Park, was created in 1868. Many of Denver's earliest parks were conceived around the same time that well-known urban parks such as Chicago's Grant Park, New Orleans' City Park, and New York's Central Park were established. These early parks were part of a national wave of park-making that "fused social functionality with the emotional impact of landscape aesthetics." (Ethan Carr, 2009)

In 1907, landscape architect George Kessler prepared a "Map of the System of Parks and Parkways" for the Denver Park Commission. That plan was largely implemented over the next two decades, and served as the foundation for the 1929 "Denver Plan" by S.R. DeBoer. In 1986, these parks and parkways were accepted into the National Register of Historic Places.

Developing greenways that interact with and take advantage of creeks has long been a part of Denver's history, despite the fact that in an arid region, some streams are intermittent - alternately drying up completely or causing catastrophic flood damage. The Cherry Creek, for example, flooded in 1864, 1878, and 1885. When faced with efforts to divert Cherry Creek to reduce the flood risk to downtown Denver in 1907, Mayor Robert Speer successfully fought them off. As a result, Mayor Speer initiated Denver's history of greenways along streams, and created Denver's first greenway - the Speer Boulevard corridor along the Cherry Creek.

Denver and Aurora have certainly changed in the hundred years since Kessler's map was developed. A successful greenway design will need to adapt to new populations and the requirements of today. Changes notwithstanding, some functions of parks and open spaces remain intact. Basic human needs - appreciating landscape beauty, playing in open space, experiencing public life, and a sense of community - are still met by great parks and parkways. It is up to today's designers, artists, and residents to guide the making of new greenways.

The Westerly Creek Greenway Master Plan describes a framework for how a powerful greenway landscape can address a new generation of vital functional, social, environmental and aesthetic concerns. Although other plans have studied the area, this **Master Plan is unique in that it presents a single, defined corridor and route for both an open water channel and for bicycle and pedestrian paths.**

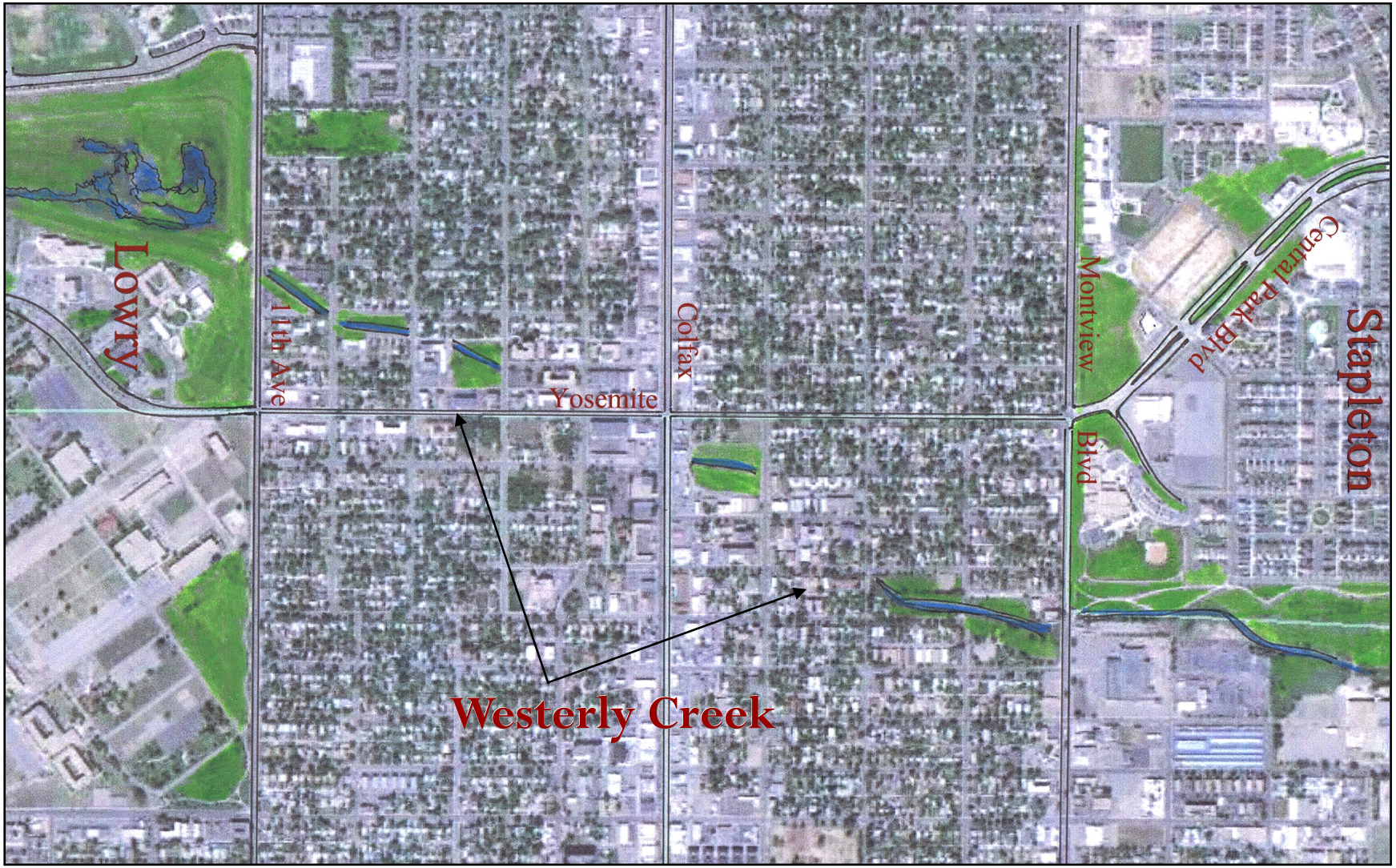

Fig. 0.1 - Illustration of green space in the Westerly Creek corridor

Westerly Creek Greenway Master Plan

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Chapter One - The Vision

"I chatter, chatter as I flow to join the brimming river, for men may come and may go, but I go on forever."
- Lord Tennyson, The Brook, 1887

The Westerly Creek Greenway Master Plan was developed through a collaborative effort by the Westerly Creek Connection team (landscape architect Dave Duclos, communications manager Ellie Horn, and watershed planner Brian Hyde), Denver's District 5 Councilwoman Marcia Johnson , the Greenway Foundation, the funding entities (Colorado Water Conservation Board, Denver Public Works, and the Quick Foundation), a Steering Committee, and staff from the Cities of Aurora and Denver.

Public input was gathered at two community-wide public meetings, as well as several meetings with the registered neighborhood organizations representing neighborhoods in Aurora and Denver that intersect or are adjacent to the creek corridor. Meeting dates can be found in *Appendix 1* of this document.

The Greenway Master Plan was envisioned as a means to build on the flood hazard reduction efforts begun by the Urban Drainage and Flood Control District (UDFCD), the City of Aurora, and the City & County of Denver for Westerly Creek between 11th and 23rd Avenue. The Westerly Creek Greenway presents an opportunity to support those flood mitigation efforts, while creating an attractive greenway connection between the existing open space facilities at Lowry and Stapleton. The goal is a unified system for mobility between the Westerly Creek Dam and Sand Creek, tying in possibilities for travel between locations as far away as Cherry Creek State Park or Waterton Canyon to the south and the Sand Creek Regional Greenway or the Rocky Mountain Arsenal to the north (see *Figure 1.1*).

The planning process began at the initial Steering Committee meeting, held on December 8, 2009. The input of the Steering Committee, as well as that of the public, guided the direction and refinement of the project every step of the way.

Mission Statement

"To develop a Greenway Master Plan for Westerly Creek that improves community well-being for the neighborhoods along the creek by explicitly supporting existing and future flood hazard improvements, enhancing the stream environment, developing bicycle and pedestrian trails, linking parks and open space, building social connections and improving public safety."

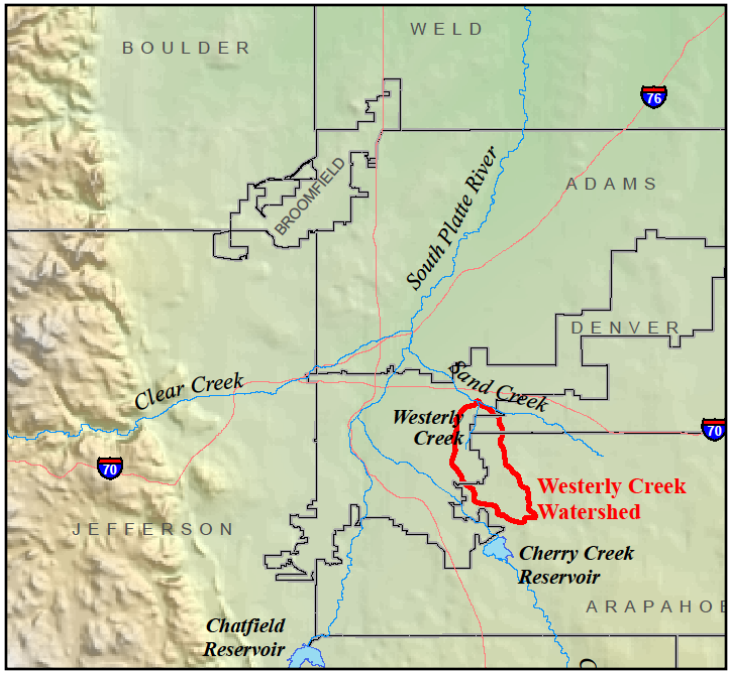


Fig. 1.1 - Location of the Westerly Creek Watershed

Vision

In 1933, much, but not all, of the Westerly Creek channel and its adjacent floodplain was open space, and the stream occupied a wide area (see *Figure 1.2*). The historic information displayed in this aerial photo can contribute to the development of the current greenway vision. Almost 80 years later, transforming the Westerly Creek corridor into an active space will include:

- A greenway that is consistent with ongoing flood hazard reduction efforts.
- Attractive options for bicycle and pedestrian trails to integrate circulation facilities in parks and open spaces into a connected system.
- Linkages between the greenway systems in the Lowry and Stapleton infill development communities, as well as for connections to the neighborhoods between.
- A greenway that provides an aesthetic element to the adjacent neighborhoods.
- A creek corridor that is a vibrant, lively, natural force providing escape from the urban world.
- An open, naturalistic channel system that acknowledges the original, underlying shape and alignment of the creek prior to human intervention.
- Recreational and health improvement opportunities in the watershed.
- A greenway corridor within the broader network of regional open space.
- A landmark that adds to our regional identity.
- An amenity that highlights opportunities to travel along an open channel.

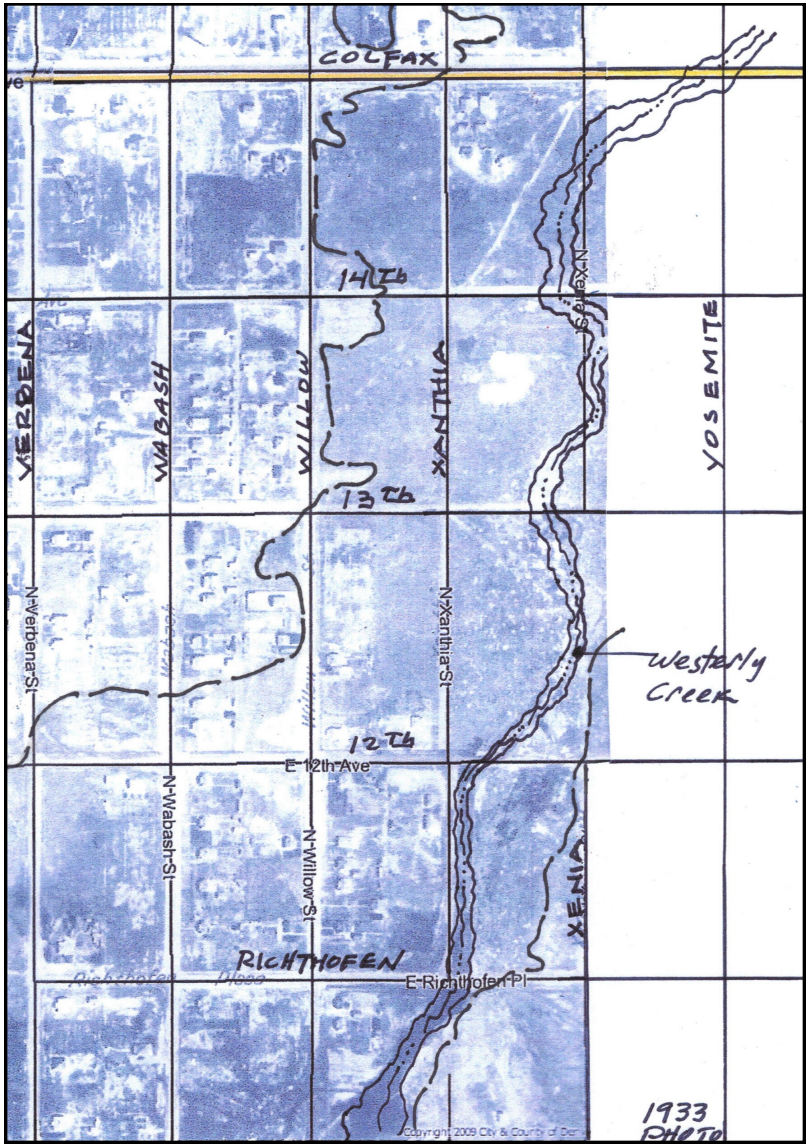


Fig. 1.2 - Aerial View of East Denver and Westerly Creek, circa 1933

Goals & Objectives

The Goals & Objectives state that the Greenway Master Plan will enhance flood protection, recognize circulation patterns, and develop an integrated system of greenway amenities.

1 - Support and enhance flood protection and public safety, while promoting daylighting of the stream channel wherever possible.

- Support implementation of appropriate, cost-effective flood control measures.
- Ensure safe passage of the 100-year flood when considering new open channel sections to replace existing culverts.

2 - Consider existing circulation patterns and needs in the area, for cyclists and pedestrians.

- Minimize conflicts with streets and highways.
- Connect bicyclists and pedestrians to paths, trails and mass transit systems
- Identify specific destinations within the study corridor and the entire watershed, and enhance the appeal of these destinations and the ease of travel to them for bicyclists and pedestrians.

3 - Transform the Westerly Creek corridor into an integrated system of individual amenities and open spaces.

- Provide opportunities for recreation, connection with nature, healthy living, and education, and incorporate elements conducive to improved access to the creek.
- Provide a connection to existing parks and open spaces from Lowry to Stapleton.
- Acknowledge and enhance the connection to greenway features within Lowry and Stapleton.
- Integrate the visual and performance arts into the planning process and the ultimate design.
- Contribute to the well-being of residents in the surrounding community.

Chapter Two - Setting

"Any river is really the summation of the whole valley. To think of it as nothing but water is to ignore the greater part."
-Hal Borland, This Hill, This Valley, 1957

Westerly Creek Watershed

The Westerly Creek watershed is located in the South Platte River basin in northeastern Colorado. Specifically, the watershed is in the eastern portion of the Denver metro area. Westerly Creek is a tributary of Sand Creek, which joins the South Platte River about 5 miles northeast of downtown Denver.

From its headwaters near Parker Road and Interstate 225, to the confluence with Sand Creek near the Central Park Boulevard interchange on Interstate 70, the Westerly Creek watershed is approximately eight and a half miles long and, on average, about three miles wide (see *Figure 2.1*). The creek originates in the hills forming the divide between the Westerly Creek watershed and the adjacent watersheds, including Cherry Creek, West Tollgate Creek, and Montclair Basin. Cherry Creek Reservoir is a short distance just southwest of this divide.

The watershed is urbanized to a significant degree. Land uses are principally a combination of residential and commercial development. The pre-development network of open channels and swales has been greatly altered as part of the urbanization process. Portions of the main stem of Westerly Creek exist only in storm sewers. Other reaches of the main stem are in trapezoidal concrete channels. Most of the tributaries have been replaced with storm sewers.

The portion of the Westerly Creek watershed below the Westerly Creek Dam on Lowry includes approximately half of the total watershed. Most of the Lower Westerly Creek watershed is within Lowry (formerly the Lowry Air Base), Stapleton (formerly Stapleton International Airport), or the neighborhoods of Aurora and Denver that lie between these areas of infill development.

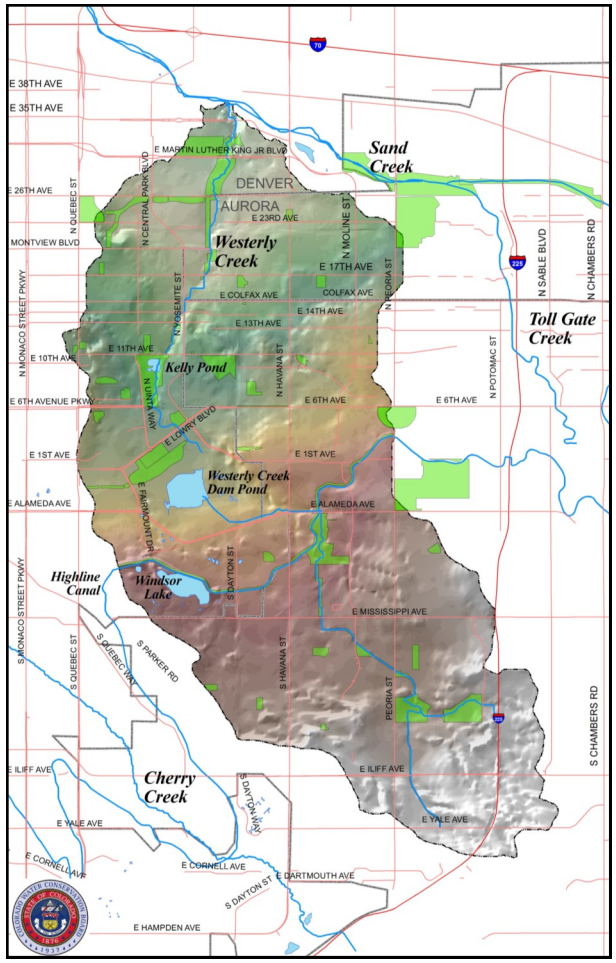


Figure 2.1 - The Westerly Creek Watershed

Project Corridor

During the years that Lowry was a military base and Stapleton was an airport, Westerly Creek was moved from its original alignment, buried in culverts, and sometimes made unrecognizable as a creek. Since the decommissioning of Lowry and Stapleton from their prior uses, a great deal of damage to the creek has been repaired. From the outlet of Westerly Creek Dam at Lowry to the confluence with Sand Creek at Stapleton, significant portions of the creek were restored in the redevelopment process. Culverts were replaced with segments of daylighted channel within parks and open spaces. Restoration projects have accomplished three significant enhancements:

- Reduction of flood risk to buildings and infrastructure (while flood hazards were substantial prior to decommissioning of both facilities, the two infill communities were designed to ensure that a 100-year flood would cause little harm).
- Creation of bike and pedestrian paths for recreation and transportation.
- Development of a linked greenway corridor consisting of open space and parks, accompanied by open channel, in each community.

The Project Corridor consists of the reach of Westerly Creek between Lowry and Stapleton, from 11th Avenue to 23rd Avenue, which has not yet been restored (see *Figure 2.2*). The creek flows through a trapezoidal open channel for approximately two-thirds of the 12-block corridor. Through the remaining third, it is buried in culvert segments. Flood hazards affect numerous buildings next to and on top of the creek, as well as street and alley infrastructure. Bicycle and pedestrian passage is dangerous and not continuous. There are several parcels of open space, but they are not linked into a continuous greenway. At the center point of the Project Corridor lies the intersection of Colfax Avenue and Yosemite Street, as well as the border between Aurora and Denver.

This 12-block section of the Westerly Creek corridor faces serious flood risk and a has a significant deficit in trails, open space, and park land. It is the focus area of the Westerly Creek Greenway Master Plan, and implementation will unify the eight and a half mile corridor from Cherry Creek State Park to Sand Creek.

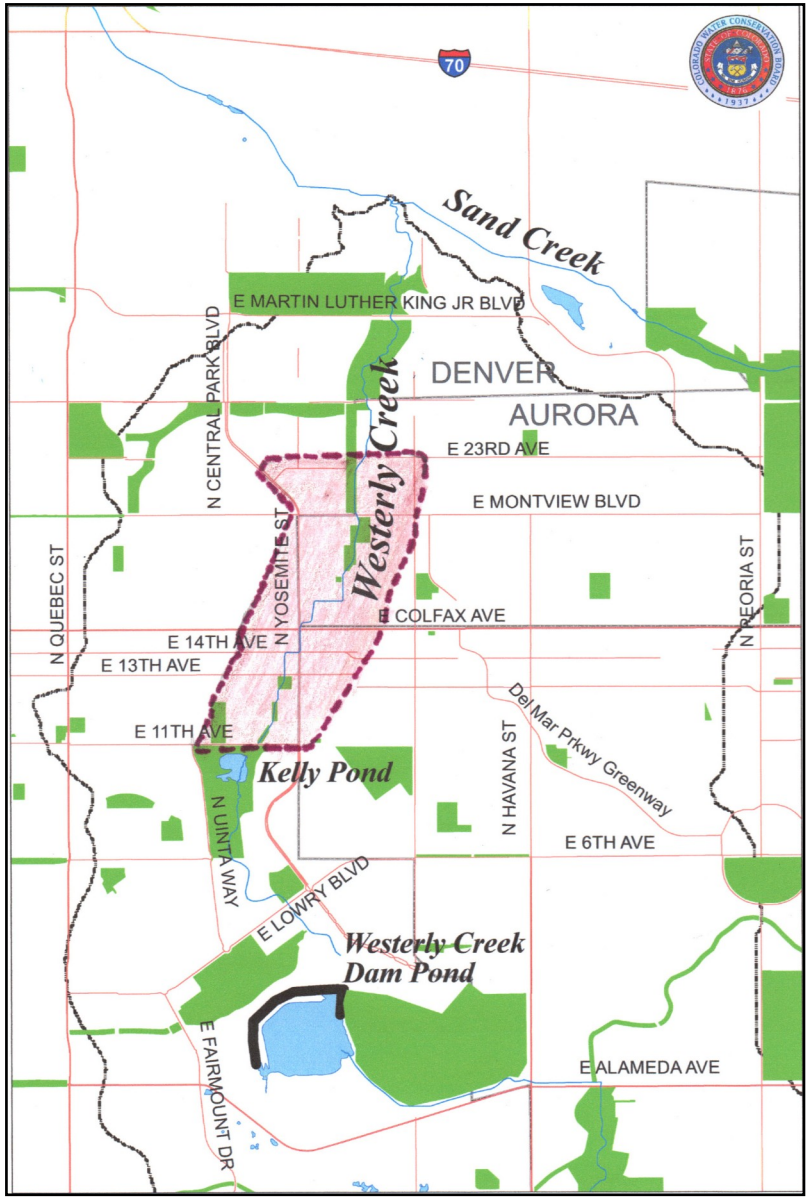


Fig. 2.2 - Project Corridor within the Watershed

Flooding in the Watershed

The portion of Westerly Creek below the 20-year old Westerly Creek Dam has faced more flooding problems than the portion above dam. This was true long before the dam was constructed, and was the primary reason for construction. There are more severe flood problems below the dam because:

- Flows tend to be higher in the downstream portion of the watershed.
- This area has a higher density of infrastructure and buildings.
- Some land use decisions made in the past ignored flood risks.
- Demand for housing and business sites near the military air base and the airport was high, particularly in the years after World War II.
- The urbanization of upstream areas caused flows to increase downstream.

Below the outlets of the Westerly Creek Dam, the creek flows through the Lowry community, home of Lowry Air Base from 1937. The Air Force Base dealt with the creek by confining it in pipes and acting as though it did not exist - the traditional way of addressing drainage "problems" at that time.

Westerly Creek also flows through the Stapleton area, where Denver's airport opened in 1929. From its opening, the airport perceived Westerly Creek as a problem as well, and buried it in pipes under the runways.

Damage-causing floods have been recorded on Westerly Creek in 1945 (twice), 1950, 1951 and 1973. Most of the damage from those floods was experienced in the portion of the corridor between Lowry and Stapleton, so did not lead to changes in the flood control approach *within* the base or the airport. Until their closure, flood problems at those facilities continued to be addressed by burying Westerly Creek in pipes.

Between 1953 and 1981, a series of flood control studies and projects brought changes to the creek between the north end of Lowry and the south end of Stapleton. The first of those projects, Kelly Road Dam, was a flood control structure built at the north end of the base near 11th Avenue, to protect the neighborhoods north of Lowry.

After serious flooding in 1973 and subsequent engineering analyses demonstrated the need for further protective measures besides Kelly Road Dam, Denver installed a system of flood control channels and storm sewers between 11th Avenue and Montview Boulevard in 1981 (described in *Appendix 3)*. Then, in 1991, the Army Corps of Engineers installed Westerly Creek Dam at the southern end of Lowry, greatly reducing flood flows entering Lowry and the area immediately north of the base.

When Stapleton Airport closed in 1995 and planning for the redevelopment of the site began, it became clear that a different approach to floodplain management should be considered. In 1997, the Westerly Creek Corridor Revitalization Master Plan was completed (see *Chapter 3*) by Wenk Associates, for the Cities of Aurora and Denver. The conceptual report focused on several benefits that could result from rehabilitating Westerly Creek, including "maintenance and enhancement of the creek's flood control functions."

At Stapleton, Westerly Creek posed significant flood problems for redevelopment efforts, largely because of the undersized culvert system under the former airport's runways. Using Wenk's Revitalization Plan as a starting point, in 2002 a new approach was implemented. The result was a stream restoration project that simultaneously reduced the flood hazard at Stapleton, provided a system of trails, and created a very wide and appealing greenway and wildlife habitat corridor. This transformative project, extending from Montview Boulevard downstream to 33rd Avenue, was the start of a significant greenway corridor for Westerly Creek.

A few years later, the same integrated flood control approach was followed in the flood hazard reduction and stream restoration projects at Lowry. The Great Lawn Park, through which Westerly Creek is a feature, has largely been completed. Between the Westerly Creek Dam outlets and Big Bear Ice Arena, the Lowry East Open Space stream restoration and trail project is currently under construction. The trail will be extended from 1st Avenue and Havana Street, near Expo Park in Aurora. Most recently, construction also began on a trail system at the Kelly Open Space wetlands, just south of 11th Avenue.

Flood Protection in the Project Corridor

At Lowry and Stapleton, new ways of thinking about flood control are in the final stages of implementation. However, for the neighborhoods in between Lowry and Stapleton, the Westerly Creek flows below ground in culverts, and residual flood problems still affect the Project Corridor.

In 2005, the Colorado Water Conservation Board and Denver Public Works jointly funded a Feasibility Study for the Westerly Creek corridor, completed in 2007 by Matrix Design Group (see *Chapter 3*). This follow-up study built upon Wenk's Revitalization Plan, the restoration work that had recently been completed at Stapleton, and on the work that had just started at Lowry. It focused specifically on the possibilities for a combined greenway and flood hazard reduction system within the portion of Westerly Creek from 11th Avenue to Montview Boulevard.

The Matrix study's stated purpose was to explore alternative corridor alignments and potential drainage solutions which are safe and attractive for open space, in harmony with the goal of reducing flood risk and the goal of meeting future regional traffic needs, ensure that the necessary modifications of existing buildings is done in a feasible manner, and provide future enhancements to the neighborhood. The results of the Matrix Study were incorporated into the development of the Westerly Creek Greenway Master Plan.

Later in 2007, the Urban Drainage and Flood Control District (UDFCD) began a major Drainageway Conceptual Design Report for Westerly Creek, completed in July 2010 (see *Chapter 3*). The purpose of this study was to revise the delineation of flood hazard areas between 11th Avenue and Montview Boulevard, and to develop approaches for lessening the impacts of those hazards.

While the UDFCD Report was being written, a community group called Westerly Creek Connection (WCC) was formed by Councilwoman Marcia Johnson and members of the advisory committee from the Matrix Study. WCC acted out of the belief that reducing flood hazards on Westerly Creek between Lowry and Stapleton would create an opportunity to "connect" the emerging greenways at Lowry and Stapleton with a continuous Westerly Creek greenway.

When work on the UDFCD Drainageway Report began in 2007, the restoration work at Stapleton had been finished, and the greenway was flourishing. Portions of the flood control greenway at Lowry had been completed. By 2010, a great deal of additional progress had been made in implementing the Lowry greenway system. Today, the areas affected by 100-year flood risk at Lowry and Stapleton are largely limited to open space and parks.

The examples at Lowry and Stapleton offer valuable guidance and inspiration. The "gap in the middle" faces significant flood hazards affecting buildings and infrastructure. While creating a wide green corridor between Lowry and Stapleton is an unlikely scenario, there are opportunities to put more floodplain into open space.

UDFCD and the sponsoring cities of Aurora and Denver recognized the value of those opportunities in preparing the Drainageway Report, and examined possibilities for daylighting the creek in select locations, as initially proposed in 1997. *Figure 2.3* shows the existing floodplain, and the floodplain proposed by UDFCD's recommendations. The proposed floodplain could be achieved through construction of a daylighted channel from 16th to 17th Avenue and the installation of a new bridge at Montview Boulevard, both of which will facilitate greenway enhancements.

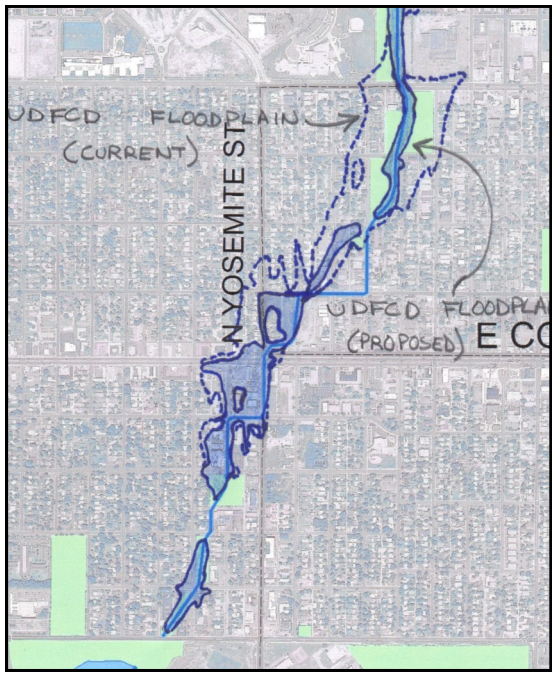


Figure 2.3 - Existing Floodplain vs. Floodplain Proposed by UDFCD's Drainageway Report

Circulation Infrastructure

The proposed greenway will provide an opportunity for cyclists, pedestrians, or rollerbladers to travel along or near Westerly Creek. The greenway will interact with and enhance the options for transportation that are already available through the existing circulation infrastructure, including: major streets, bus stations, light rail lines, and RTD stations. Two ongoing transportation projects - the I-70 and Central Park Boulevard interchange and the East Corridor commuter train from downtown to the airport - will add new components of major circulation infrastructure which will include new trails close to Westerly Creek.

Besides the major circulation infrastructure features, additional circulation features include: bus routes operated by RTD; bicycle routes and paths; pedestrian trails and walks. Local streets, alleys and sidewalks are also part of the circulation infrastructure.

Two recent studies by Denver Public Works address circulation needs and opportunities in and around the Project Corridor - the East Side Mobility Plan and Denver Moves (see Chapter 3 for more details about these studies).

In *Figure 2.4*, you can see the many existing bike routes that surround the Project Corridor. However, there is a significant "gap" for cyclists traveling north-south between the routes on Lowry and the routes on Stapleton. The Yosemite/Central Park Boulevard route is available but rarely used because tight conditions through the Project Corridor are not conducive to or safe for cyclists.

The Colfax-Yosemite intersection represents a special greenway opportunity as well as a redevelopment opportunity, in the center of the Project Corridor. Colfax Avenue, Yosemite Street, and the Westerly Creek Greenway all meet at this intersection, which is also where the cities of Aurora and Denver meet.

In addition to the existing bicycle trails and routes near the Project Corridor, both Aurora and Denver have developed proposals for additional bicycle and pedestrian trails and routes in the future. Some of these proposed facilities are illustrated in *Appendix 4,* along with existing and proposed major circulation infrastructure.

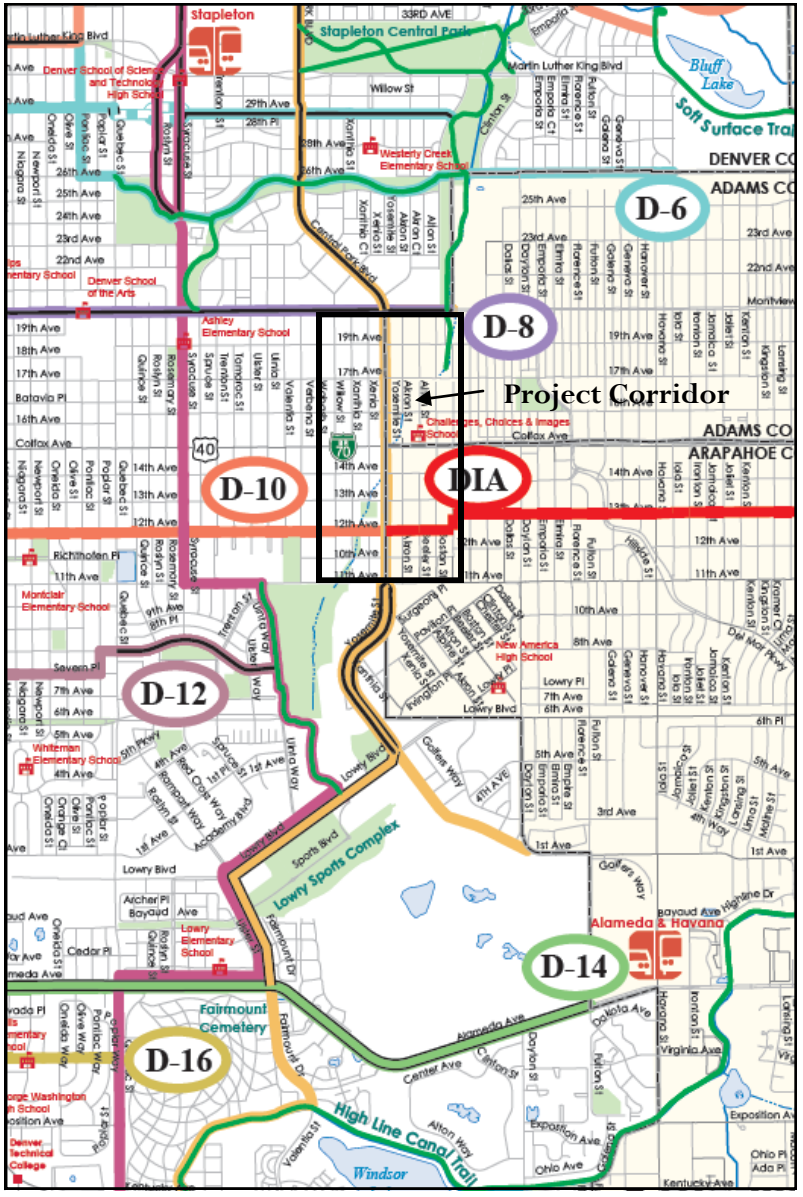


Figure 2.4 - Denver's Bike Map - Existing Routes

Connecting to Existing Greenways

An extensive system of pedestrian trails, and bicycle routes and paths exist in the Denver metropolitan area, including greenways along streams and canals. In the vicinity of the Westerly Creek watershed, from downtown Denver to northwest Aurora, there are four major greenways already in place. All these greenways provide opportunities for pedestrians and cyclists to travel into downtown Denver and farther afield. The Highline Canal, Sand Creek Regional Greenway, Platte River Greenway, and Cherry Creek Trail, complete a 50-mile loop of off-street trails. Westerly Creek bisects that loop.

Just upstream of Westerly Creek Dam, near Alameda Avenue and Havana Street, CommonGround Golf Course straddles the creek. As *Figure 2.5* shows, the north end of the Westerly Creek watershed is the Sand Creek Regional Greenway. Bluff Lake Nature Center is located along the Sand Creek trail, a half mile upstream of the confluence of Westerly Creek with Sand Creek.

Great Lawn Park, Kelly Road Wetlands Park, and Westerly Creek Park provide connectivity to other existing greenways in the area. The connection of the proposed greenway in the Project Corridor to these existing parks will tie directly into the existing regional greenway system.

Several greenway features already in place within the Project Corridor wait to be connected. In Aurora, Montview Park already features Westerly Creek, and in Denver, Verbena Park is only three blocks from the creek. A block-sized parcel of undesignated open space north of Colfax, in Aurora, surrounds the creek, and three smaller open space parcels on the creek can be found south of Colfax, in Denver. One of those parcels, near 13th Avenue and Xenia Street, is being developed as formal park space by the Denver Department of Parks & Recreation and the Trust for Public Land.

Appendix 5 provides some details on current and future connections between the Westerly Creek Greenway and other greenway features in and near the Project Corridor.

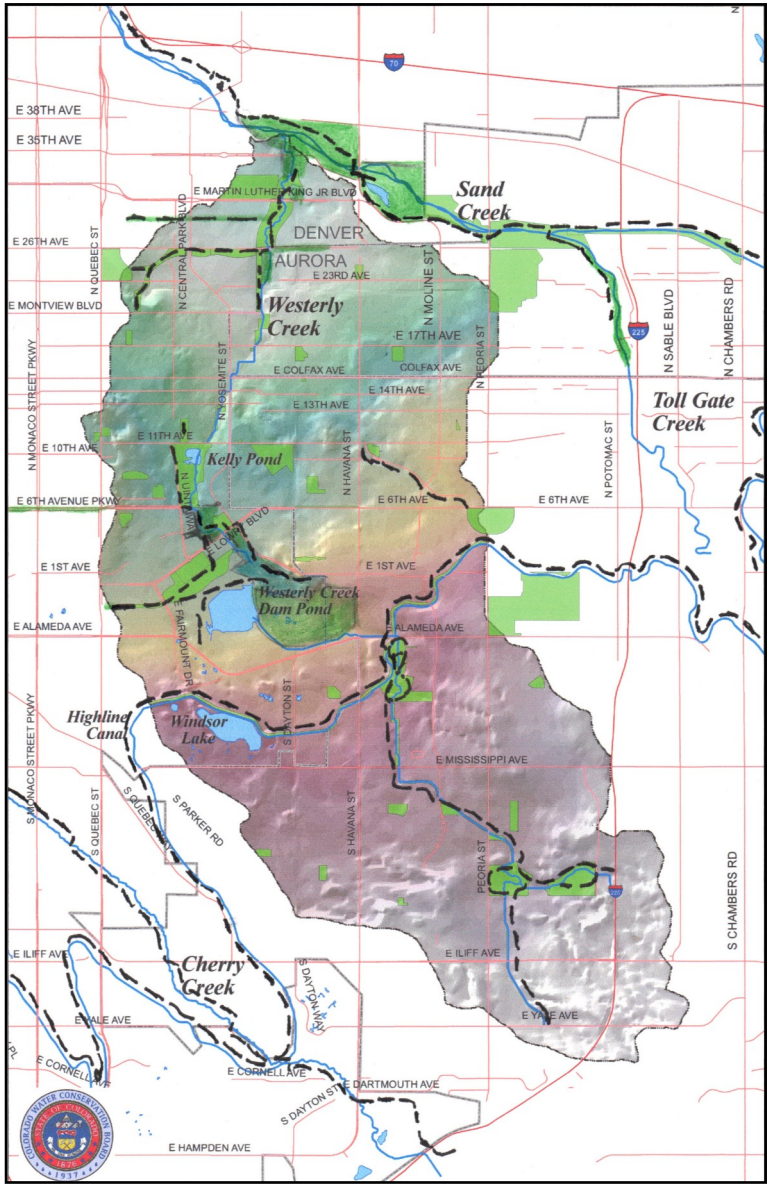


Figure 2.5 - Trails and Parks in the Westerly Creek Watershed

Project Corridor Planning Areas

Early in the process of developing the Westerly Creek Greenway Master Plan, the Project Corridor naturally split into three geographical planning areas, which emphasizes both the differences in existing conditions between each area and the amount and the type of work that lies ahead if the goals of the Master Plan are to be met.

The planning areas are distinguished from one another by differences in stream character, floodplain character, land form, and land use. *Figure 2.6* illustrates the division between each planning area.

South Segment (11th to 13th Avenues):
Prominent features in this planning area are the three parks (Kelly Wetlands Park, Verbena Park, and the new park under development at 13th and Xenia), the open channel linking the parks together, and Kelly Road Dam.

Stream Character - two short culvert segments, mostly open channel within public park land or open space.
Floodplain Character - narrow 100-year floodplain, very little additional work needed to reduce flood risk.
Land Form - terrain shaped primarily by Westerly Creek and its tributaries; slopes are steep, more tributary valleys that are sharply separated from each other by topography.
Land Use - few large buildings, small percentage of land devoted to buildings, intensity of human activity is moderate.

Middle Segment (13th to 17th Avenues):
The predominant element in this planning area is the meeting of the Colfax, Yosemite, and Westerly Creek corridors, in the center of the Project Corridor. Westerly Creek is largely invisible through this segment. Just northeast of the Colfax and Yosemite intersection is open channel and land that can be enhanced. From 16th to 17th Avenue is a potential opportunity to daylight the creek, creating a connection to the south and to the north.

Stream Character - two long culvert segments covered by streets with numerous large buildings adjacent to the streets, very little open channel, stream is largely invisible.
Floodplain Character - wide 100-year floodplain with many buildings, a great deal of work needed to reduce flood risk.
Land Form - few tributaries with less pronounced topographic divides and moderate slopes.
Land Use - numerous large buildings (especially along Colfax Avenue), high percentage of land devoted to buildings, intensity of human activity is high.

North Segment (17th Avenue to Montview Boulevard):
Montview Park, Montview Boulevard and Westerly Creek Park are the most significant elements in this planning area. The creek is in an open channel through the segment, except under Montview. The change between the large buildings and invisible creek south of 17th Avenue and the grass, trees and open space surrounding the creek, north of 17th Avenue, is pronounced.

Stream Character - one short culvert segment, almost entirely open channel within public park land or open space.
Floodplain Character - wide 100-year floodplain with many buildings to the east and west, a great deal of work needed to reduce flood risk.
Land Form - slopes are relatively flat with very few tributaries, terrain is homogeneous.
Land Use - few large buildings, small percent of land devoted to buildings, intensity of human activity is moderate.

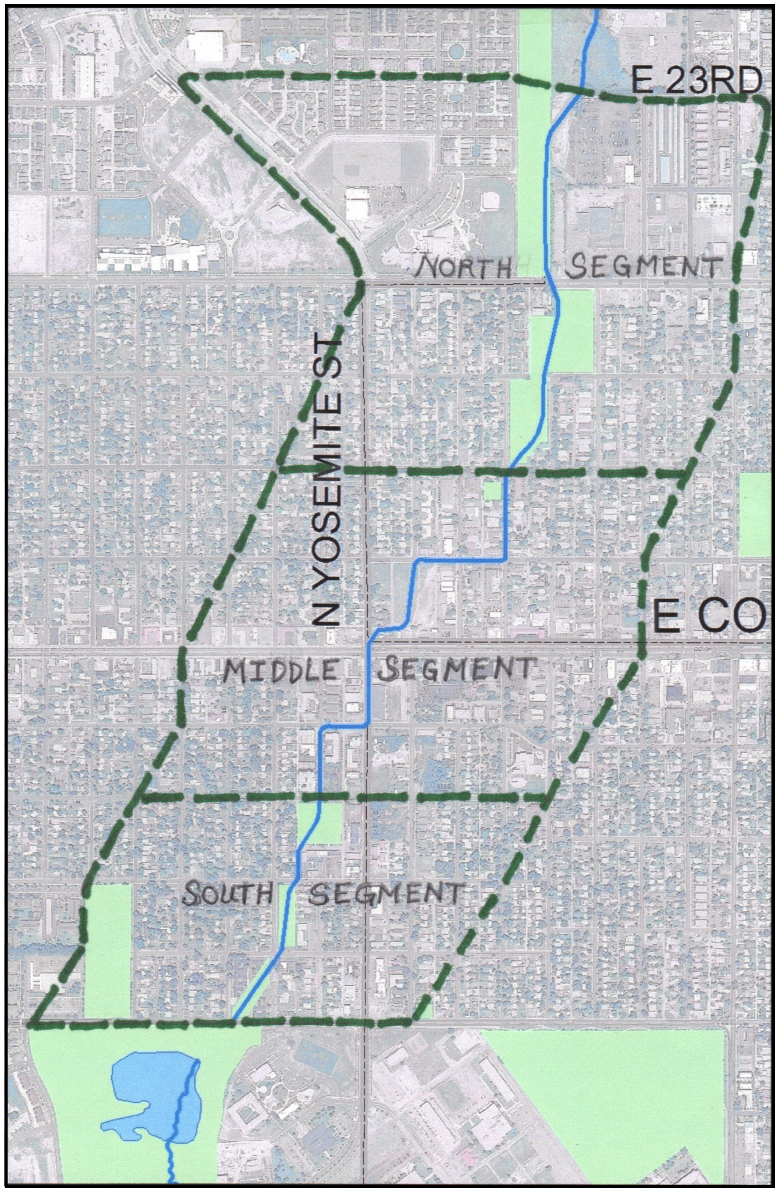


Figure 2.6 – The Three Planning Areas

Chapter Three - Review of Prior Studies

"Anatomically, greenways are long and skinny yet they can get fat when they go through a park. Emotionally, they return to a town the 'front porch' socializing rudely taken away by the car. Morally, they can stand as hometown environmental monuments for future generations. Greenways deserve to be anthropomorphized, for they're the country's healthiest brainchild since the conception of national parks." - Ann Lusk, "Stowe, Vermont, Builds a Greenway: A Multi-purpose Path Rejuvenates Community Life", Small Town," November/December 1989

Guidance from Prior Studies

Westerly Creek Major Drainageway Plan Conceptual Design Report (Urban Drainage and Flood Control District 2010)
The Westerly Creek Greenway Master Plan is based on the premise that greenway improvements must contribute to flood risk reduction in the Project Corridor. The UDFCD Drainageway Report specifically addresses flood hazard reduction in the watershed, and options for greenway alignments were examined to ensure the support and enhancement of the Report's goals.

The UDFCD Report demonstrated that the flood control greenway work at Stapleton and Lowry appropriately addresses flood risks, and the remaining flood risk to buildings and infrastructure is within the Project Corridor. UDFCD examined various flood hazard reduction options for Westerly Creek, including daylighting. In three of the five culvert segments, daylighting portions of the creek is an option.

Currently, the 100-year flood hazard area between 13th and 16th Avenue is significant. The floodway (the portion of the floodplain that faces the greatest flood risk) includes a large number of existing buildings, as well as the full width of Yosemite Street between 14th and 16th Avenues. The UDFCD Report proposes flood risk reductions that would greatly reduce the floodplain north of Colfax. From 13th Avenue to the outlet of an existing culvert north of Colfax, the Report proposes 50-year flood protection instead of 100-year protection, based on cost-benefit analysis. The Greenway Master Plan for the Middle Segment planning area focuses on creating a viable greenway circulation option and acknowledges the significant residual flood risk that will exist there, but it does not specifically address flood hazard reduction.

From 16th to 17th Avenue, the UDFCD Report offered an open channel option as one of two choices, which the Greenway Master Plan has incorporated. The Greenway Master Plan also supports the Report's recommendation for a new bridge at Montview Boulevard to replace the undersized culverts and to provide grade-separated bicycle and pedestrian access under Montview.

The additional progress in flood risk reduction that can be accomplished between Lowry and Stapleton by implementing the UDFCD Drainageway Report in the Project Corridor is impressive. If the Report were to be fully implemented, open space areas in the Project Corridor, at the south end (11th - 13th) and the north end (Colfax - 23rd), would absorb flood impacts to buildings and infrastructure, leaving some residual problems in the middle. Implementing enhancements to the open space from Colfax to 16th, daylighting from 16th to 17th, and installing the bridge at Montview would lead to striking progress in flood risk reduction and the provision of stream-side open space. It is conceivable that between the outlet of Westerly Creek Dam and the confluence with Sand Creek there would be only one culvert segment of consequence - from 13th to Colfax Avenue.

Denver Moves Initiative (City & County of Denver 2010)
The Denver Moves Initiative is a joint effort by Denver Parks & Recreation and Public Works departments, "to ensure that families, beginners, and those with disabilities can make safe and comfortable connections to parks, neighborhoods, and other destinations in all areas of the City…" and to "make the City's non-motorized transportation more visible and inviting."

The draft Facility Map for Denver Moves proposes a number of new or improved pedestrian and bicycle facilities within the Project Corridor:

- An upgrade to the bicycle boulevard on 12th Avenue, from Monaco Parkway to Yosemite Street.
- A buffered bike lane on Yosemite Street from 11th to Colfax Avenues.
- A paved shoulder/party parking bike lane on Yosemite Street from Colfax Avenue to Montview Boulevard.
- A bicycle boulevard on Uinta Street from 12th Avenue to the Stapleton greenway just south of 26th Avenue.
- A buffered bike lane on 23rd Avenue from Monaco Parkway to the Stapleton greenway just east of Syracuse Street.

East Side Mobility Plan (City & County of Denver 2010)
The East Side Mobility Plan completed by the Denver Department of Public Works recommends consideration of a new bus route on the Dayton Street alignment between Colfax and Mississippi; improvements and additions to the system of bicycle paths and routes in the Project Corridor, particularly Yosemite Street between 11th and Montview; and pedestrian improvements east-west on 11th Avenue and north-south across Colfax Avenue.

Fitzsimons Multi-Modal Transportation Study (City of Aurora 2009)
The Fitzsimons Transportation Study provided recommendations for travel by roadways, transit, bicycles, and foot to the Fitzsimons campus, one mile east of Stapleton. One recommendation is to "provide a bicycle lane connection along Montview Boulevard from Peoria Street to Yosemite Street" to promote bicycle connectivity between Fitzsimons, Stapleton and Denver. The study addressed ongoing problems with bicycle lanes on Montview and offered alternatives for resolution. A pilot bicycle connection project on Montview between Yosemite and Dayton Street could precede an attempt to resolve the problems.

Living Streets Initiative (City & County of Denver 2009)
The policy basis for Denver's Living Streets Initiative stems from three city-wide plans: the integrated land use and transportation vision for growth in Blueprint Denver, the multimodal approach to moving people from the Strategic Transportation Plan, and the environmental goals of the Greenprint Denver Climate Action Plan. The initiative explores how Denver's key arterials can better provide:

- Transportation options that work for drivers, transit riders, pedestrians and bicyclists regardless of physical ability or age.
- Development that creates destinations in a high-quality urban environment.
- Development that attracts investment, creates jobs and provides fiscal return.
- Public health benefits through greater opportunities for physical activity.
- Environmental benefits through the air-emissions reductions commensurate with reduced auto dependency.

The intent of the Living Streets Initiative is to help identified transit corridors perform better. Living Streets references San Francisco's "Better Streets Plan," which offers the following elements for better and more appealing performance:

- Distinctive, unified overall design
- Space for public life
- Pedestrian safety
- Pedestrian priority
- Universal design
- Creative use of parking lanes
- Ecology
- Extensive greening
- Integrated pedestrians and transit
- Reclaiming excess street space

Colfax Avenue is one of the candidate Living Streets corridors. Incorporating these elements on the portion of Colfax Avenue within the Project Corridor will enhance the Westerly Creek Greenway and emphasize the fact that the intersection of Colfax and Yosemite is a location where three corridors meet.

Feasibility Study, Westerly Creek Corridor (Matrix Design Group 2007)
In response to discussions between the Colorado Water Conservation Board (CWCB) and Councilwoman Marcia Johnson, she persuaded Denver Public Works to join CWCB in funding an in-depth study of potential alignments and drainage solutions by Matrix Design Group, to create a bike and pedestrian connection as part of an open channel corridor along Westerly Creek. The Feasibility Study made the following recommendations:

- Ensure the planned 2007 UDFCD "Outfall Systems Plan" incorporates the vision and goals of the Westerly Creek Connection
- Pursue funding for drainage projects in the corridor

Short-Term Trail Recommendation: A temporary bicycle route from 11th Avenue and Uinta Street to Verbena Park, north on Uinta Street to 16th Avenue, east to Beeler Street, north on Beeler Street to 19th Avenue, through Montview Park, across Montview Boulevard to Stapleton.

Future Trail Recommendations:
- Trail from the north side of 11th Avenue and Uinta Street to Verbena Park (by the U.S. Post Office).
- Richthofen Place improvements from Verbena Park to Westerly Creek.
- Trail improvements along Westerly Creek from Richthofen Place to 12th Avenue.
- A land swap with the apartment at 8805 E. 12th Avenue, to allow construction of a trail next to the alley.
- Park and trail improvements from the alley to 13th Avenue and Xenia Street (the new park).
- Trail improvements along 13th Avenue from the site of the new park to Yosemite Street.
- A trail along an undetermined alignment from 13th Avenue and Yosemite Street to Stapleton, subject to decisions by the City of Aurora, coordination with redevelopment, and potential road improvements on Yosemite Street.
- Grade-separated trail crossings at Yosemite Street, Colfax Avenue, and Montview Boulevard.

Northwest Aurora Bicycle and Pedestrian Master Plan (City of Aurora 2006)
In August 2006, Aurora completed a bicycle and pedestrian master plan for Aurora, north of Alameda Avenue and west of I-225. Recommendations pertinent to the Westerly Creek Greenway Master Plan include: on-street bicycle routes on 17th Avenue and 23rd Avenue to connect Denver's Stapleton and East Montclair neighborhoods to Fitzsimons and other destinations, and connectivity from Lowry to northwest Aurora via Yosemite Street and 1st Avenue. The plan also noted the importance of the 12th and 13th Avenue bicycle route, the importance of resolving longstanding difficulties with providing bicycle lanes on Montview Boulevard from Yosemite to Peoria Street and the Fitzsimons Campus, and the lack of well defined and dignified environments for the majority of bus stops in the study area.

Havana District Design Concepts Plan (City of Aurora 2005)
The Havana District Plan addressed the corridor along Havana Street, including areas within the Westerly Creek watershed upstream of Lowry. While the Greenway Master Plan focuses on the portion of Westerly Creek downstream of Lowry, it is important to connect the creek on either side of Westerly Creek Dam. The Havana Plan examined the portion of Havana from 6th Avenue to Dartmouth Avenue (near Parker Road and Hampden Avenue). Salient recommendations included: improving bicycle connections between the Havana District and Lowry via Yosemite Street and 1st Avenue, and consideration of art parks – "a publicly-accessible outdoor space devoted to the enjoyment of art, either as freestanding pieces or as an entire composition."

Game Plan (City & County of Denver 2005)
The Denver Department of Parks & Recreation's 2005 "Game Plan" offered a parks vision built on five themes. Two of those themes "chart new territory for DPR and Denver. They weave together land and the work of various city departments with new ideas about places to transform open space into green infrastructure and connecting the public realm.

Performance goals listed in the Game Plan measure the effectiveness of Green Streets in addressing the two themes described above:

- Provide continuous, safe connections on at least one side of each "green street," connecting parks to schools, recreation centers, and neighborhood centers. A green street has an adequate sidewalk and street tree canopy.
- Improve safety of pedestrian crossings at arterials and heavily trafficked streets.
- Ensure universal access for all ages and abilities.
- Provide continuous sidewalks that conform to city standards.
- Install a detached sidewalk with tree lawn where feasible; tree lawn should be at least 8-feet wide.
- Provide dedicated bike lanes where feasible.

Potential Green Streets in the Project Corridor are:

- Richthofen Place (Verbena to Yosemite Street)
- Montview Boulevard (Ulster Street to the crossing of Westerly Creek)
- Central Park Boulevard (Montview Boulevard to 23rd Avenue and beyond)

Westerly Creek Corridor Revitalization Master Plan (Wenk Associates 1997)
In 1996, the Lowry Redevelopment Authority, the Stapleton Development Corporation, Aurora, and Denver received a grant from Great Outdoors Colorado (GOCO) to develop a master plan for Westerly Creek, to examine how "rehabilitation of the stream can contribute to the livability of the communities it passes through." The Revitalization Master Plan proposed an approach that was very different from previous flood control projects on Westerly Creek, promoting integrated stream corridor management instead of single-purpose flood control. The Master Plan recommended a surface storm water channel north of Colfax to contain a 100-year flow and to act "as a multi-functional recreational and trail corridor."

- Connect all publicly owned parcels in the corridor into a series of small, stand alone neighborhood linear parks. Also explore "the opportunity for development of naturalistic landscape types at large outfalls…to improve water quality, and to create isolated pockets of habitat."
- Create a local on-street pedestrian trail on Beeler Street, in combination with Montview Park and a grade-separated crossing of Montview Boulevard.
- Link the individual parks through a trail and parkway system. Property acquisition and street vacations are needed to implement this recommendation:
  - Pursue land swap with the apartment at 8805 E. 12th Avenue to allow a trail adjacent to the alley; or acquire Xanthia Street properties as they become available.
  - Create a landscape buffer along Xenia Street from 13th to 14th Avenues, along 14th Avenue from Xenia to Yosemite Streets, and along Yosemite Street from 14th to Colfax Avenues.
  - Acquire office/warehouse properties on the east side of Yosemite Street between 14th and Colfax Avenues, to allow an off-street trail, limited development, and a multi-use flood control and recreational park.
  - Acquire the remaining portions of vacant interior parcels north of Colfax to 16th Avenues, between Yosemite and Alton Streets, to create a multi-use flood control and linear neighborhood park.
  - Vacate 16th Avenue between Akron and Beeler Streets to create a "16th Avenue Green," a multi-use neighborhood park that also provides flood control.
  - Acquire properties on the west side of Beeler Street from 16th to 17th Avenues, with the property at the southeastern corner of 17th Avenue and Beeler Street, to create a multi-use flood channel, linear park, and civic corridor, serving as an extension of Montview Park.

Chapter Four - Analysis *"Even the upper end of a river believes in the ocean" William Stafford*

Barriers and Solutions to Greenway Continuity

Greenway continuity issues include: connecting the greenway to Westerly Creek and its floodplain; connecting the greenway to paths, bus routes, streets, and other circulation features; and connecting the greenway to parks, open spaces, other greenways, and to the surrounding neighborhoods and communities. The Greenway Alignments suggested by this Greenway Master Plan will provide continuity improvements, remove or reduce the effects of barriers, and create new greenway features or linkages to enhance and expand the existing greenway network.

Barriers to Open Channel Flow

As is the case with all streams, the "valley" where the greenway is located was formed by the response of Westerly Creek to the local topography and geology. More recently, infrastructure was added, in part to address flooding and drainage issues. Through its alignment and design elements, the Greenway Master Plan will address the human facilities that serve as barriers to open channel flow at the followings points, where culverts are located:

- under Richthofen Place
- the segment under the alley north of 12th Avenue and east of Xanthia Street
- the long segment from 13th Avenue and Xenia Street to the open channel just north and east of Colfax Avenue and Yosemite Street
- the long segment from 16th Avenue and Akron Street to 17th Avenue and Beeler Street
- under Montview Boulevard

The 100-year floodplain mapped by UDFCD in 1977 (see *Figure 4.1*), before any of the flood control projects other than Kelly Road Dam were constructed, suitably represents the creek's geologic history. The greenway should be located within this floodplain.

The historic confluences of Westerly Creek with tributary drainages are another important component of the creek's history. Although they have been modified by

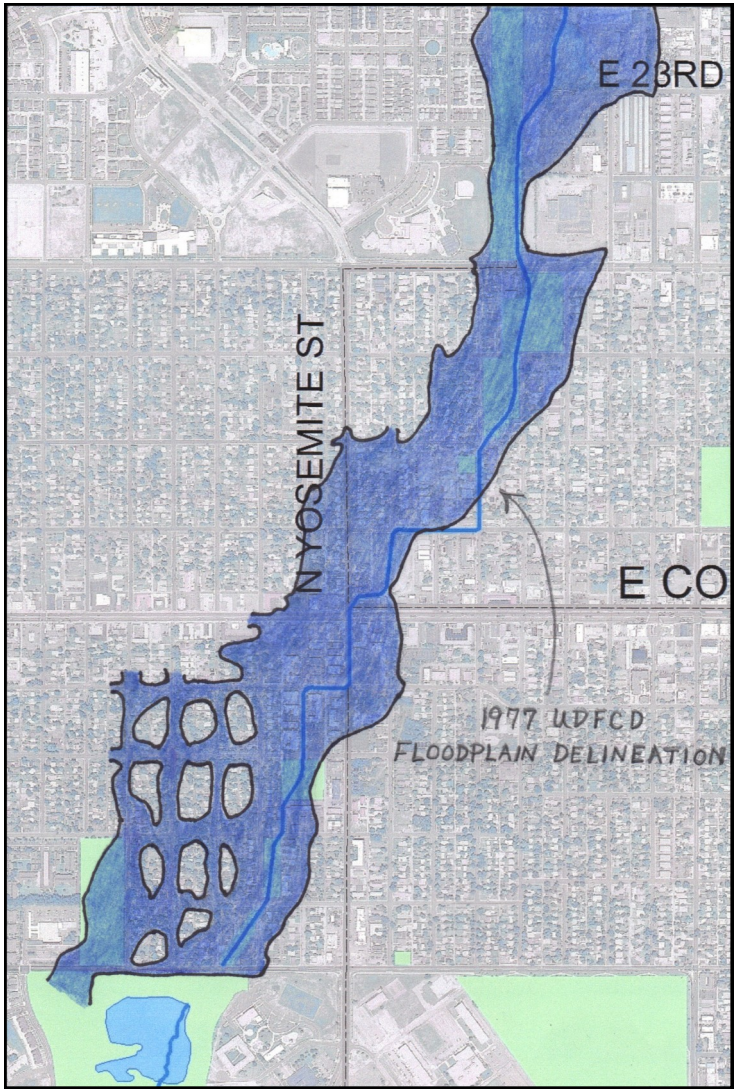


Figure 4.1 - Westerly Creek 100-year Floodplain, circa 1977

the storm sewer systems in Aurora and Denver, during large storm events these tributaries still experience local flooding. The geologic floodplains at the confluences of Westerly Creek with its tributaries and the geologic floodplains of the tributaries themselves provide opportunities to acknowledge natural history. *Appendix 5* provides a short discussion of options for the configuration of the creek channel, as well as a map showing six tributary drainages that join Westerly Creek within the Project Corridor and some of the features that divide the tributary sub-basins from each other.

Barriers to Circulation

The greenway will intersect existing streets, RTD bus routes, bicycle routes, and pedestrian paths at several locations between 11th and 23rd Avenues. The intersections include barriers to circulation where travel access and safety are compromised and they include opportunities for "circulation enhancement."

- 11th Avenue
- 13th Avenue
- 14th Avenue
- Colfax Avenue
- 17th Avenue
- Montview Boulevard
- Yosemite Street

The Greenway Alignment will address the safety issues associated with crossing those streets.

Visual and Aesthetic Barriers

Visual and aesthetic barriers make it difficult for visitors to experience a clear sense of connection from one park, one open space, or one greenway segment to the next. The greenway will intersect and connect existing and proposed parks and open spaces, as well as other greenways. These facilities and the greenway's interface with them will play a significant role in ensuring continuity, both within the Westerly Creek Greenway and to the existing greenway network.

- Kelly Road Dam at 11th Avenue presents an unusual visual barrier. It is both very high and very wide. Pedestrians and cyclists cannot see past it, from either direction. Way-finding cues such as signs, landscaping, art, and other greenway features between the intersection of 8th Avenue & Uinta Street and the crossing of Richthofen Place over the creek will assure travelers that the greenway continues beyond the dam.
- From 13th to Colfax Avenues, the visual barriers are distance (more than 2 blocks), busy streets, and large buildings.
- From 16th Avenue & Akron Street to 17th Avenue & Beeler Street, the visual barriers are distance (2 blocks), one busy street, and a number of large buildings.
- At Montview Boulevard, the obstructed distance is relatively short, but pedestrians and cyclists have difficulty seeing directly across Montview Boulevard. Again, way-finding cues will be needed to assure users that there is indeed connectivity.

Greenway Alignment Options

A range of potential Greenway Alignments was developed for the Project Corridor. These alignments represent potential geographic locations for the greenway rather than specific designs. The potential alignments were developed with an intent to address the barriers to greenway continuity and create new greenway linkages and facilities.

The following evaluation criteria were considered during the selection of potential Greenway Alignments, to determine how well they address the stated Goals & Objectives of the Westerly Creek Greenway Master Plan:

Goal 1 - Support and enhance flood protection and public safety, while promoting daylighting of the stream channel wherever possible.

- Utilization of open channel segments
- Horizontal proximity to creek
- Vertical proximity to creek

Goal 2 - Consider existing circulation patterns and needs in the area for cyclists and pedestrians.

- Ease of crossing major streets
- Enhancement of interface with circulation infrastructure
- Connection to specific travel destinations

Goal 3 - Transform the Westerly Creek corridor into an integrated system of individual amenities and open spaces, with public involvement.

- Provision of opportunities for greenway art, international culture, or features promoting healthy living
- Encouragement of economic redevelopment
- Connection to existing parks and green spaces
- Creation of new and unique greenway amenities

Greenway elements were integrated with the alignments to expand concepts represented by simple lines on a map. Art has been viewed as an integral component of the greenway, and could include functional pieces such as benches, bike racks, trash cans, and signage, as well as pieces for historical and inspirational purposes. Examples of greenway art from other communities and from the Denver metropolitan area are included in *Appendix 9*.

Activities that bring people in direct touch with the greenway are important to making it a *real* place for people, not just plans on paper. Programs and initiatives to engage neighbors and visitors in the greenway on an ongoing basis were researched. All of these components played a part in refining the Greenway Alignments.

Chapter Five - Proposed Greenway Alignment

"A sedentary life is the real sin against the Holy Spirit. Only those thoughts that come by walking have any value."
-Friedrich Wilhelm Nietzsche, Twilights of the Idols, 1888

Using the Goals & Objectives and comments from the public and the Steering Committee as guidance, the Westerly Creek Connection team evaluated potential alignment to determine which best addressed the Goals & Objectives (see *Appendix 7*). The alignments for each planning areas were assembled and elaborated, to create a unified Greenway Concept from 11th to 23rd Avenues.

Comments from the Public

Over two years, the Westerly Creek Connection planning team met with neighborhood groups near the creek corridor. Strong support was received for the general concept of a greenway on the creek. *Figure 5.1* shows some of the images shown at these meetings to garner feedback.

Additional Public Comments:

- Strong support for the idea of removal of the culvert at Richthofen Place.
- A desire for more trees along the creek.
- All culverts should be replaced with open water.
- Tear down the vacant building on the east side of Yosemite Street, between 14th and Colfax Avenues, and build a park.
- Something that draws attention to the creek flow under the intersection of Colfax and Yosemite, and stimulates economic development.
- Can we create park space at Colfax Avenue and Yosemite Street? It would improve Colfax Avenue immensely.
- Highlight with signage the significant history of Colfax Avenue.
- Channelization should be replaced with a series of interconnected ponds between Colfax and 16th Avenues.
- Close roads between 16th and 17th Avenues and open up the creek.
- Provides good opportunity at Montview Park to reconfigure the channel and widen the base. Incorporate riffles, pools, terraces, rock ledges, and some pools for emergent vegetation. Add native trees.

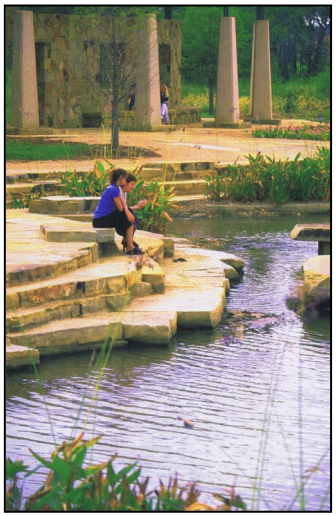


Figure 5.1 received many positive comments when presented in public meetings. Being able to sit on the edge of a channel and watch moving water is very important to residents. The edge can take many shapes and be made of a variety of materials, such as a step, a slope, or a bench.

Also important to the public was the idea of making the water accessible to those in wheelchairs through the use of ramps and landings.

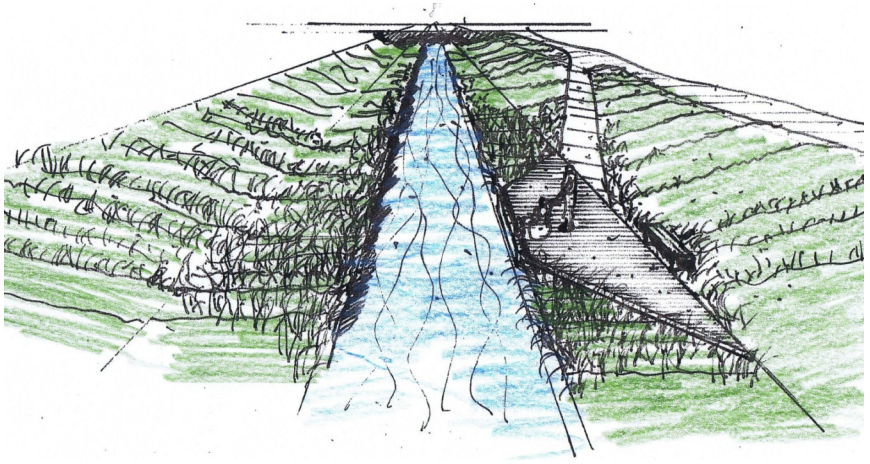


Figure 5.1 - Images shown at community meetings

Supporting and Expanding Upon the UDFCD Report

The UDFCD Drainageway Report organized its flood hazard reduction recommendations in a framework consisting of five geographic segments:

- Minor improvements between 11th and 13th Avenues
- 50-year storm sewer improvements from 13th Avenue to the alley just north of Colfax Avenue
- 100-year channel improvements from the alley north of Colfax to 16th Avenues
- The option of an open 100-year channel between 16th and 17th Avenues
- A 100-year bridge at Montview Boulevard with accompanying channel improvements from 17th to 23rd Avenues

The UDFCD geographic framework (see *Figure 5.2*) will guide the development of greenway improvements that explicitly complement and enhance the flood hazard reduction improvements. The result will be a greenway that simultaneously ties to the creek and the engineering design of the flood hazard mitigation features while meeting landscape architecture and urban design objectives.

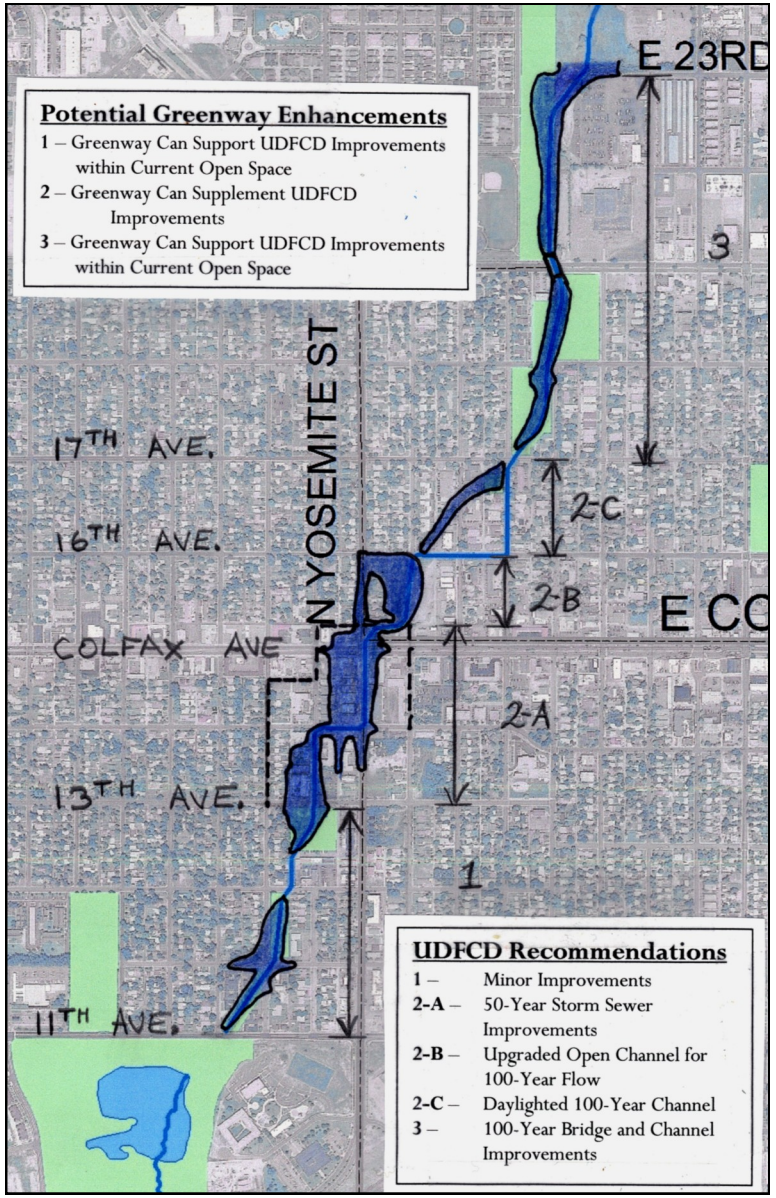
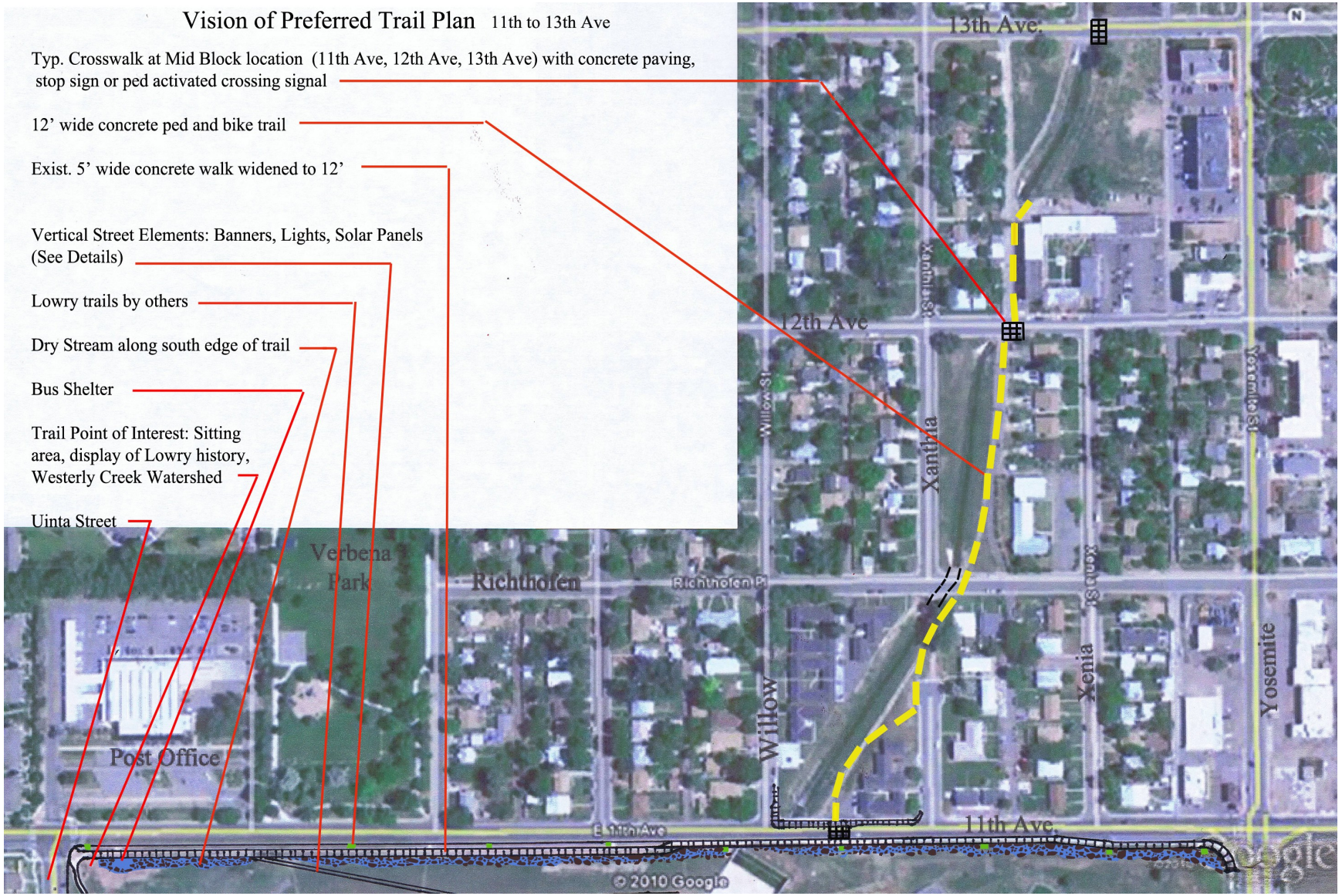


Figure 5.2 - Framework for UDFCD Recommendations

Preferred Alignment - South Segment (11th to 13th Avenue)



Overall Greenway Concept - 11th to 13th Avenue

11th Avenue and Uinta Way

The southeast corner of this intersection is the north end of the Lowry bicycle and pedestrian trail along Westerly Creek. The trail will connect to the new trails that are being built in the Kelly Road Dam Open Space.

From the perspective of improving health, this transition point offers a chance to let walkers and runners know where they are and to encourage them to go farther by telling them of the benefits of distance walking or running. There could also be exercise and stretching stations. Visitors can also be reminded of the Montclair Recreation Center about 5 blocks away and the opportunities it presents for health-promoting recreation. Public art will be essential to let travelers know that they have "arrived somewhere" and that they are "on their way to somewhere." In addition, there is an opportunity to tell the story of Lowry, Westerly Creek, and the Kelly Road Dam.

Figure 5.3 - Vertical elements on 11th Avenue

Continuing Along 11th Avenue

These photos show the existing 5-foot sidewalk on the south side of 11th Avenue, extending from Uinta Way to Yosemite Street. The Army Corps of Engineers has said that no trees are allowed within 50-feet of the dam, so vertical elements should be installed as a substitute for trees to give the street corridor more definition and to enliven the edge (see *Figure 5.3*).

The elements shown are meant to reflect the silhouette of a small tree, provide a place to display art work related to the creek, and act as a place holder for solar panels which could power night lighting. The strip between the curb and walk should be planted with native grass that only requires irrigation for the first 2 years of its life. The existing walk should be widened to 12-feet and shade structures installed. A "dry stream" along the edge could be used to educate trail users about the creek its flow through its watershed.

11th Avenue has extra width because of a parking lane which is not in use. *Figure 5.4* shows street trees further away from the dam. The existing walk could remain and a porous crusher fines path could be added to handle more traffic on the trail

Figure 5.4 - 11th Avenue, looking east with the Kelly Dam on the right.

11th Avenue Crossing at Willow Street

This point marks the beginning (or end) of the channel trail. A pedestrian crossing should occur at this location. *Figure 5.5* shows a pedestrian-activated signal. The new crossing could include concrete paving within the road surface, and a narrowing of the street to slow traffic and shorten the crossing distance. A new headwall for the channel sets the tone for other design elements.

Figure 5.5 (above) - 11th Avenue, looking west from the Westerly Creek channel, towards Willow Street

Figure 5.6 attempts to provide more usable space on top of the channel and a 6-foot pedestrian trail. Through careful design, walls can be incorporated into the channel cross-section while still allowing safe passage of the 100-year flood. Access to the channel could be provided by large steps down to the water's edge. A bike trail can be located on the east side of the channel (see *Figure 5.7*). Landscaping will soften the entire space.

Figure 5.6 - Westerly Creek channel, looking north from 11th Avenue

Figure 5.7 (right) - Overview of 11th Avenue to Richthofen Place segment

Richthofen Place Crossing

The idea of removing the existing box culvert at Richthofen Place got strong support from neighbors (see *Figure 5.8*). This would allow the channel to extend uninterrupted from 11th to 12th Avenues. The channel would be able to contain a 100-year flood. A pedestrian bridge would cross the channel to allow non-vehicular circulation. The very low volume of existing traffic on Richthofen can be easily rerouted.

Richthofen Place is a connection between Westerly Creek and Verbena Park. Denver Parks & Recreation's Game Plan identifies Richthofen Place as Green Street, from Verbena to Yosemite Street. The Green Street concept places importance on the width and continuity of sidewalks and tree lawns, and the spacing of street trees.

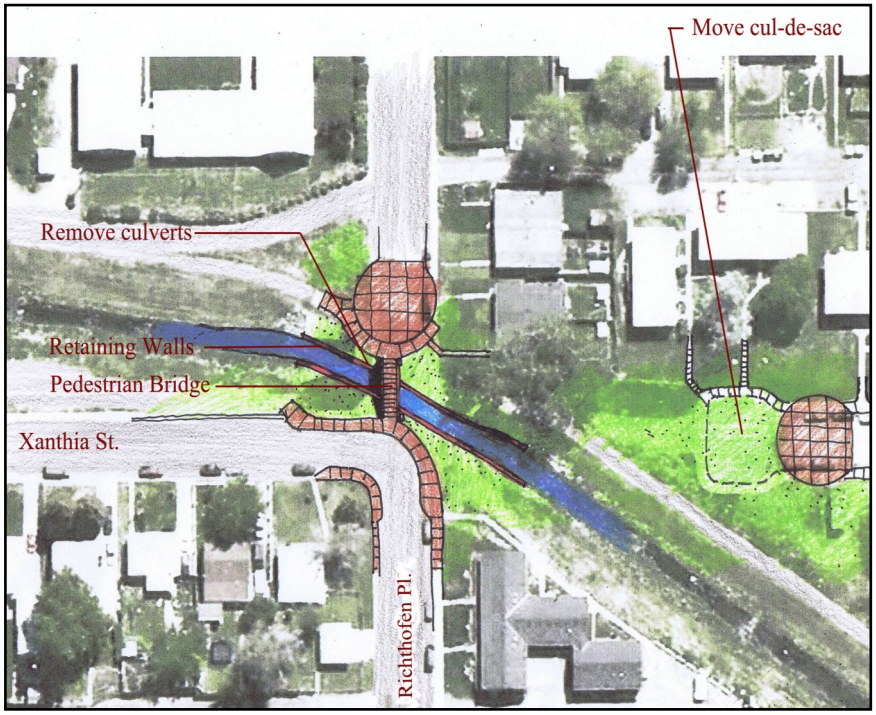


Figure 5.8 - Removal of box culvert at Richthofen Place

Figure 5.?? - Existing Culvert

Figure 5.9 shows that the Xanthia cul-de-sac can be moved south of its existing location to allow more area for the greenway.

Figure 5.9 - Xanthia cul-de-sac

Between Richthofen Place and 12th Avenue

The concept shown in *Figure 5.10* demonstrates gentle curves in the channel and vegetation, rather than the straight line edge of today.

The block from Richthofen Place to 12th Avenue could allow the trail to dip down to the water's edge for wheelchair access. This area provides an opportunity to create a small but unique park.

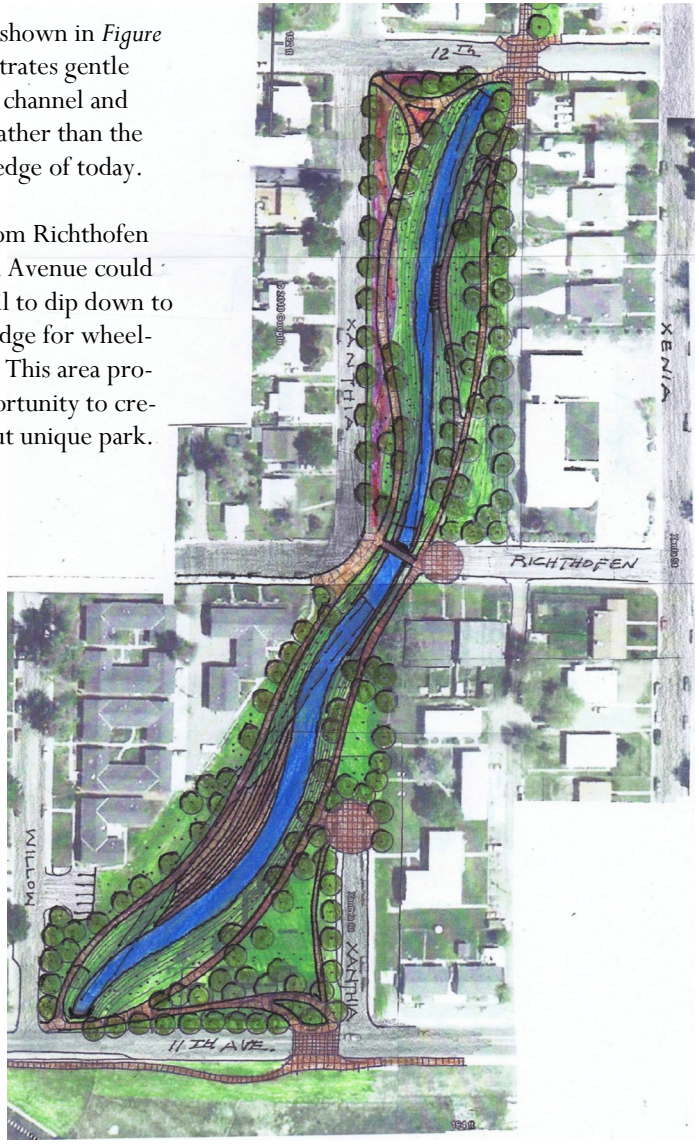


Figure 5.10 - Channel between Richthofen Place and 12th Avenue

12th Avenue Crossing

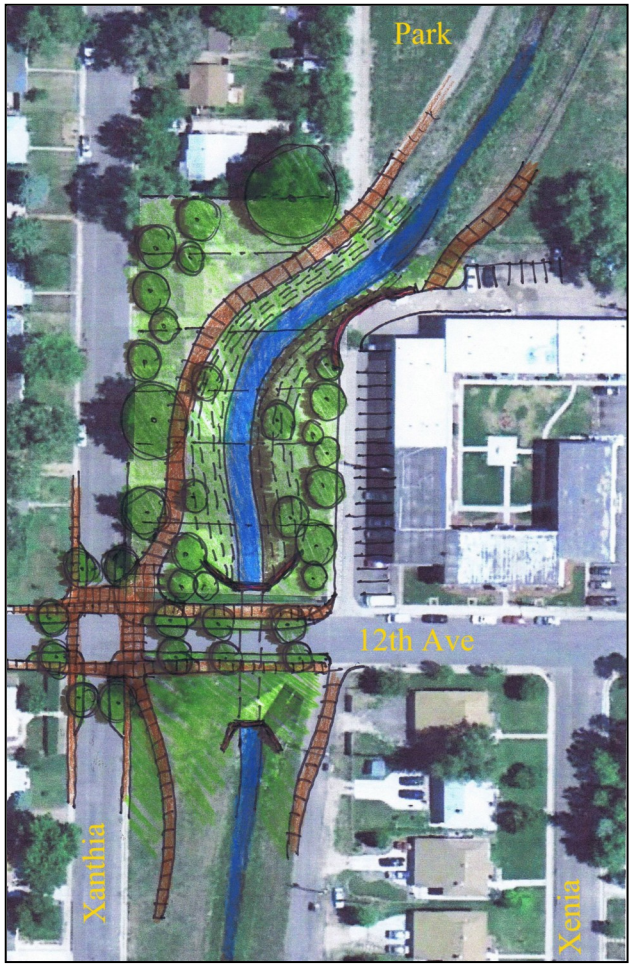


Figure 5.11 - 12th Avenue crossing into Park

Currently the creek is piped under the alley north of 12th Avenue. Then it opens up to the new park near 13th Avenue and Xenia Street, as shown in *Figure 5.11*. Using the alley north of 12th Avenue as a greenway route could involve conflicts with autos, trash trucks, and emergency vehicles. The alley will serve as the short-term greenway alignment. Eventually the creek channel can be extended from 12th Avenue to connect to the channel in the park, once 5 single family properties on the east side of Xanthia are purchased. The crossing of 12th Avenue will then occur at the corner of Xanthia and the greenway will be in the open space as well. Denver Moves designated 12th Avenue as a "Bike Boulevard." A demonstration bike boulevard installation on 12th Avenue from Uinta to Yosemite Street could be integrated with Westerly Creek improvements.

The creek channel could be exposed from 12th Avenue to connect to the channel in the park if the five single family properties on the east side of Xanthia Street were purchased (see *Figure 5.12*). The crossing of 12th Avenue could then occur at the corner of Xanthia Street and the greenway would be in the open space as well.

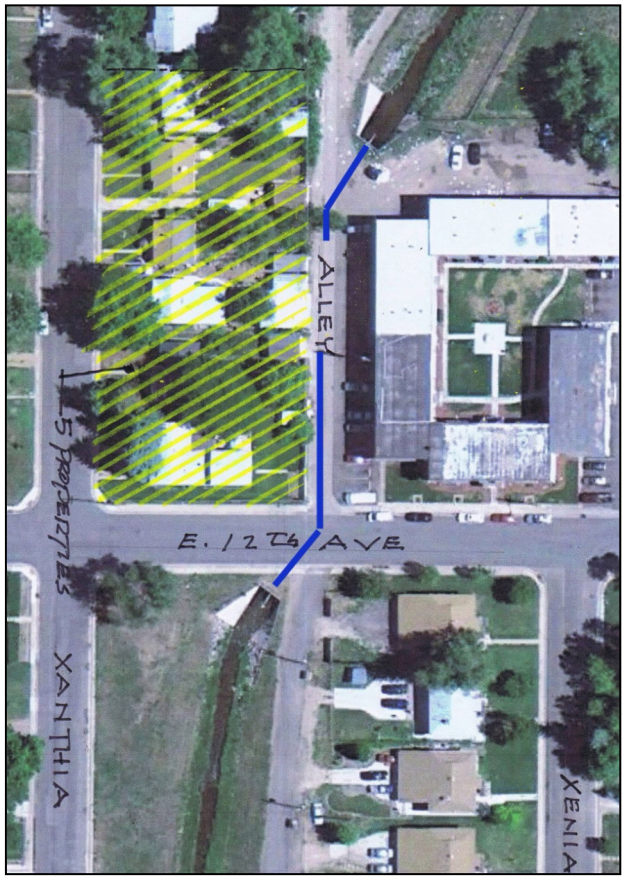


Figure 5.12 - Potential Property Purchase at 12th Avenue

Xenia Park at 13th Avenue

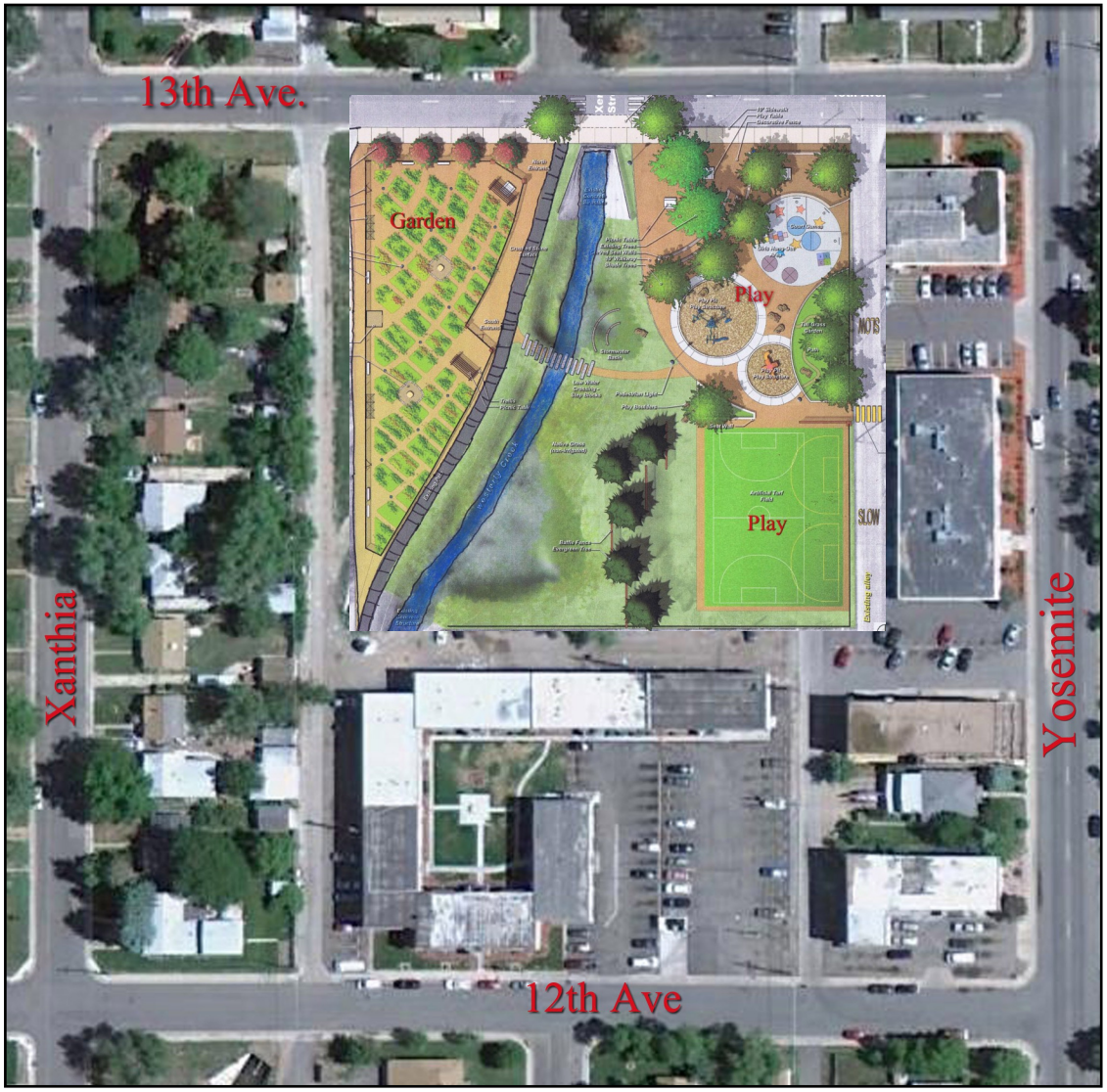


Figure 5.13 - Xenia Park at 13th Avenue

The vacant parcel of land that surrounds the creek at 13th Avenue and Xenia Street is already owned by the City of Denver. In conjunction with the Trust for Public Land and Mercy Housing, the land is being converted into a new park and urban garden, to be constructed in 2011 (see *Figure 5.13*).

The Westerly Creek Greenway Master Plan does not show any improvements to the existing trail, but additional funding may be needed to provide either a 12-foot wide trail or two trails (6-feet for pedestrians west of the channel and 8-feet for bicyclists on the east side).

The park will serve as the first "destination" for northbound travelers from Lowry and a connection to the commercial area two blocks north on Colfax Avenue. It will include a relocated urban garden, providing an opportunity to promote healthy eating. Play areas will provide safe, creative places for the many children in the adjacent low income and refugee housing populations. Art in the park will offer a means to tie the themes of healthy eating, community recreation, and the range of international cultures represented in the surrounding community.

People from more than 30 countries live in this area, and it is important that they and all other visitors to the park and this portion of the greenway feel a connection to the international nature of the site. The art, garden, play areas, and events in this park could create a home away from their native land for the residents of the area.

Preferred Alignment - Middle Segment (13th to 17th Avenue)

Redevelopment potential for the neighborhood between 13th and 16th Avenues and from Xanthia to Alton Streets is hard to miss. Likewise, the opportunity to reduce exposure to flood risk through greenway planning is hard to miss.

In context with the joining of the Colfax Avenue, Yosemite Street, and Westerly Creek corridors, redevelopment could transform this area into a vibrant community. A housing component that includes a multi-ethnic population, combined with the personality of Colfax and the amenity of a greenway conjures up images that could lead to a very exciting neighborhood!

From 13th Avenue to Colfax Avenue, the proposed 100-year floodplain will still be wide after the UDFCD improvements. The greenway concept for those two blocks acknowledges that fact and leaves currently open land (including parking lots and landscaping buffers) in that floodplain as future open space wherever possible. Careful greenway design can provide an open space corridor that weaves through new buildings while lessening the flood risk they will face.

Farther north, the creek daylighting project from 16th Avenue & Akron Street to 17th Avenue and Beeler Street will tie directly to the existing open space between Colfax and 16th Avenue, providing an extended segment of open channel very close to the urban core at the intersection of Colfax Avenue and Yosemite Street.

This area includes portions of both the City of Aurora and the City & County of Denver, where Yosemite Street is the dividing line between the two neighboring municipalities.

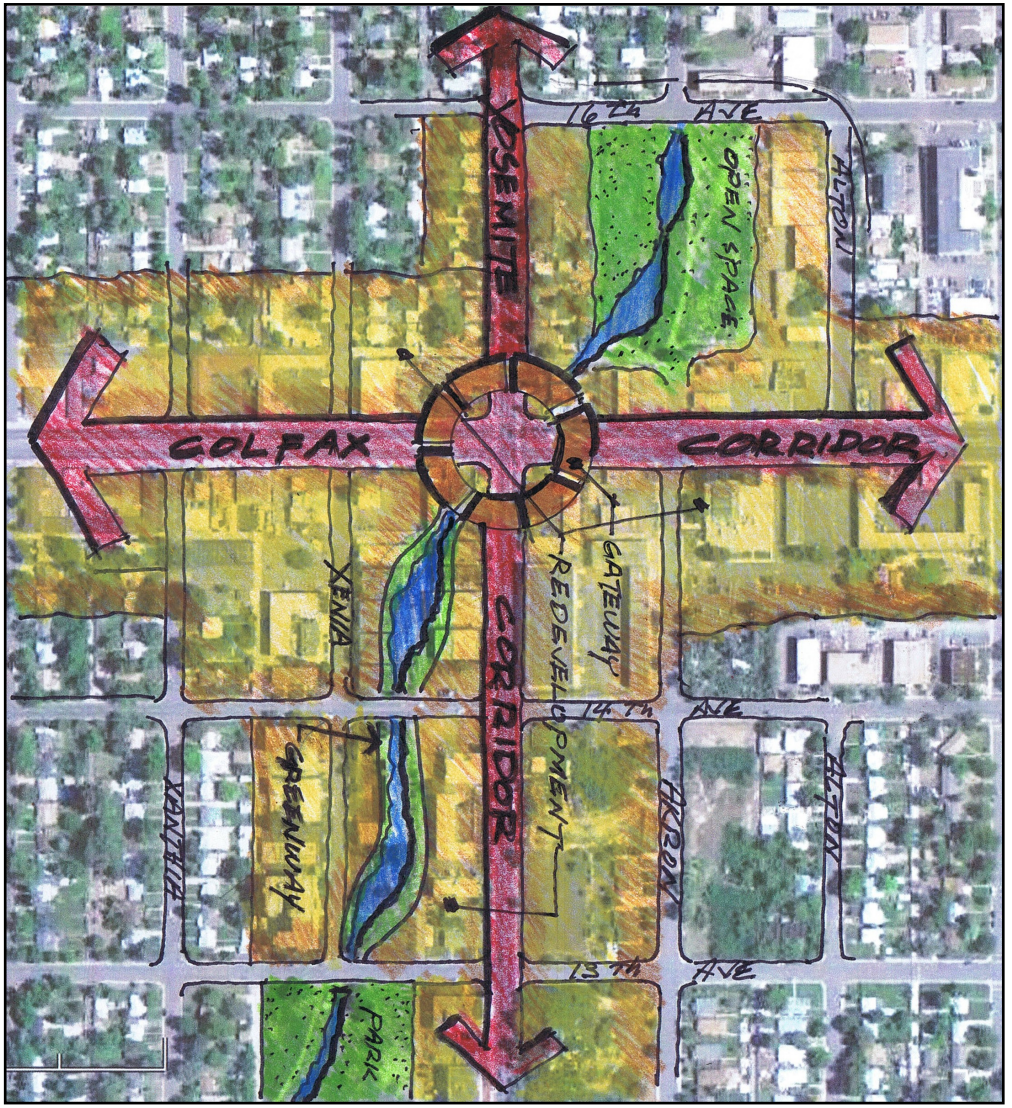


Figure 5.14 - Junction of Colfax, Yosemite and Westerly Creek Corridors

Overall Greenway Concept - 13th to 17th Avenue

13th to 14th Avenue

To the right, a concept showing new development, perhaps mixed use, on the west side of Yosemite. This concept would allow for a setback and front yard along Yosemite, and parking in the rear along the alley. The creek becomes the central amenity, while Yosemite gets much needed redevelopment.

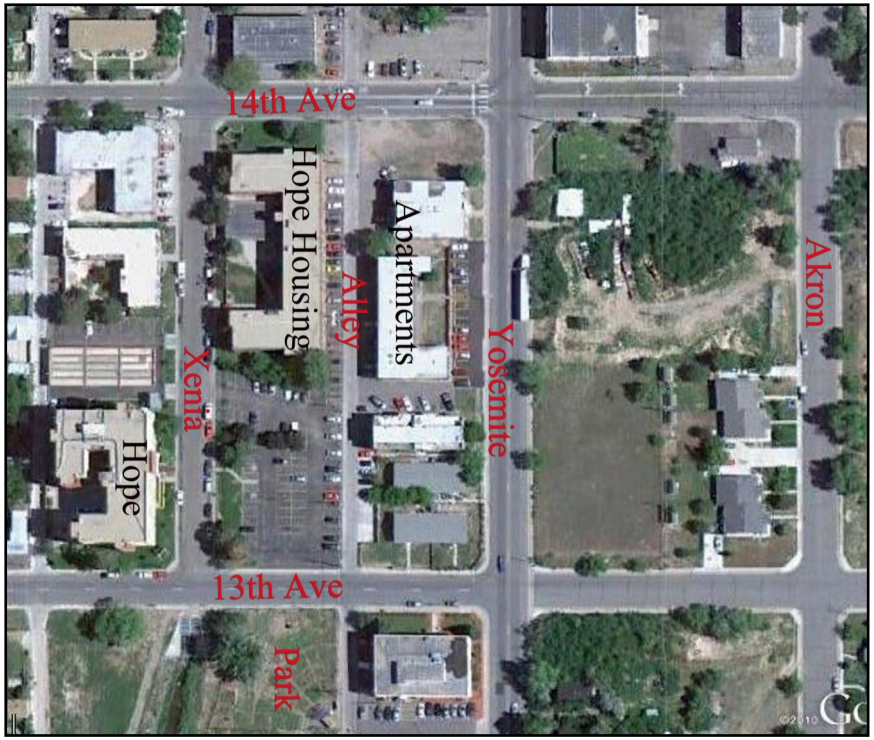


Figure 5.15 - Existing Conditions between 13th and 14th Avenues

Figure 5.16 - Potential Daylighting between 13th and 14th Avenues

14th to Colfax Avenue

Figure 5.17: Empty buildings are shown with a red X. If the vacant properties on the east side of Yosemite can be acquired and the creek is opened, it would allow an off-street trail, limited infill development, and a multi-use flood control and recreation park.

Figure 5.18: Redevelopment is vital to this section of Denver and Aurora. Several of the buildings in the area are empty and have been for years.

The plan to the right shows possible redevelopment in yellow, highlighting the intersection of Colfax and Yosemite.

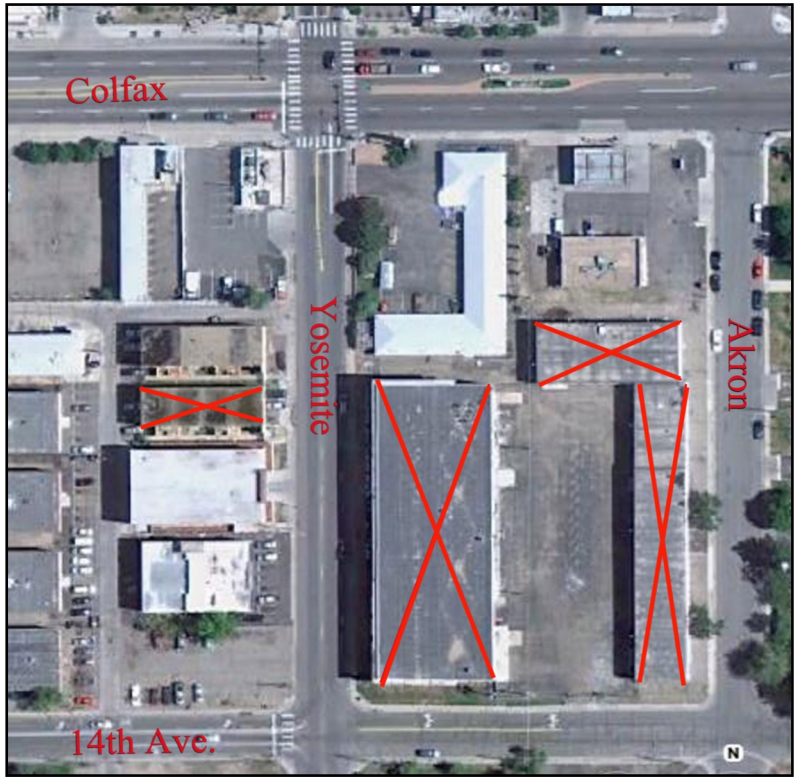


Figure 5.17 - Existing Conditions between 14th and Colfax Avenues

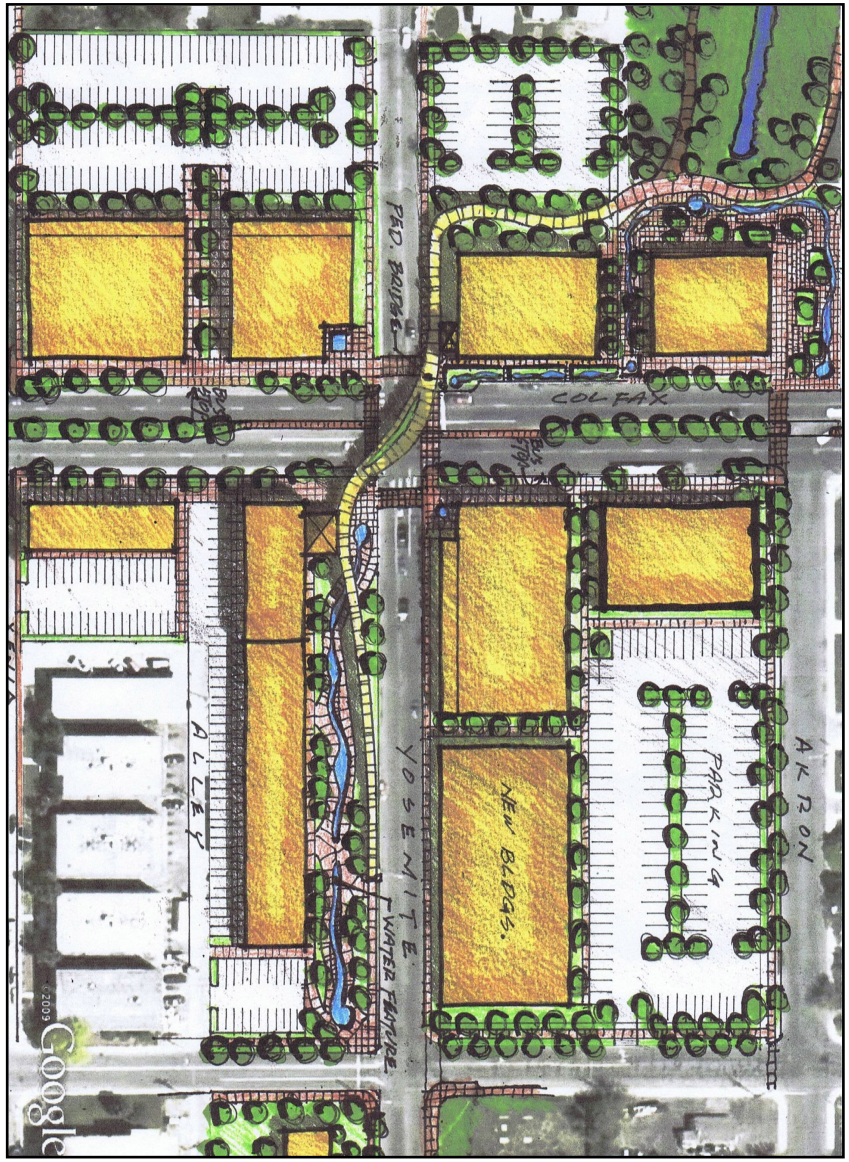


Figure 5.18 - Redevelopment potential along Yosemite Street between 14th and Colfax Avenues

By holding an appropriate setback on the west side of Yosemite south of Colfax, the concept of a creek can be highlighted by using a water feature to represent the actual creek

Figure 5.19 - Looking north from 14th Avenue, west side of Yosemite Street

Colfax and Yosemite Crossing

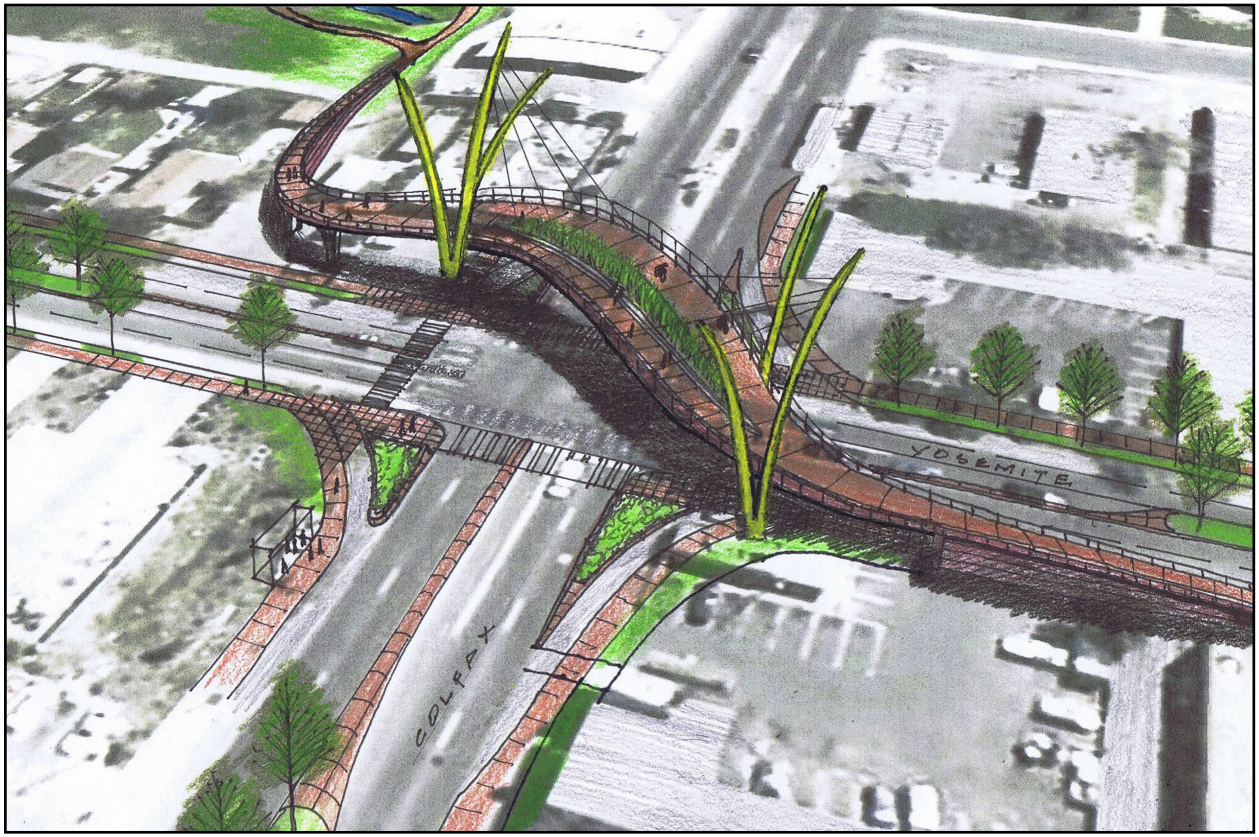


Figure 5.20 - Colfax and Yosemite Bridge concept

Today, Westerly Creek flows under the busy intersection of Colfax & Yosemite - not a traditional greenway location by any means. But an intersection with such a strongly urban character provides an invitation for a unique kind of greenway art, which can tell the story of historic U.S. Highway 40, the story of Aurora and Denver greeting each other, and the story of the various countries represented in the community. It can also connect Westerly Creek to the Aurora Arts District a few blocks east on Colfax. The intersection can potentially become a location where visitors can experience food, art, and entertainment from the diverse cultures that call this area home. Given the opportunity to combine these elements with the current Main Street zoning along Colfax in Denver and ideas such as the Living Streets Initiative, the impetus of three corridors meeting in one location can help promote economic redevelopment.

Traffic on Yosemite will increase over the next few years, as soon as the new Central Park Boulevard interchange at I-70 is completed. How then can a trail be safely developed through the area? One concept is to raise the trail as a pedestrian bridge, the shape of which would follow the original shape of the Creek, and make the trail wide enough to become a place unto itself. The vertical elements on either end of the bridge evokes prairie grasses that originally inhabited the area, and can act as a Gateway to each city. They can also be used as structural elements for the bridge. Since the bridge deck will be about twenty feet above Colfax, it provides a place for people to stop and enjoy the view of the Rocky Mountain Front Range.

Colfax Avenue to 17th Avenue

Staff from the City of Aurora directed the WCC design team not to delineate specific designs for the portion of the Westerly Creek Corridor in Aurora, from north of the intersection of Colfax and Yosemite. Aurora has received a grant from the U.S. Environmental Protection Agency to prepare a Community Plan for the Montview community, including the portion of Westerly Creek from 14th Avenue to 26th Avenue. intends to designate northwest Aurora as an urban renewal district, and a pedestrian and bicycle path should be constructed in Aurora from Colfax and Yosemite to Montview and Beeler. This goal will be taken to Aurora City Council for adoption and then incorporated into the Aurora Master Plan.

Aurora has open space assets along the route of the creek, including the land just north of the commercial establishments on Colfax between Yosemite and Alton Street. The creek is in an open channel through that property. The UDFCD Report did provide two alternatives (culverts or open channel). The goal of either alternative is to protect the housing in the 100– floodplain.

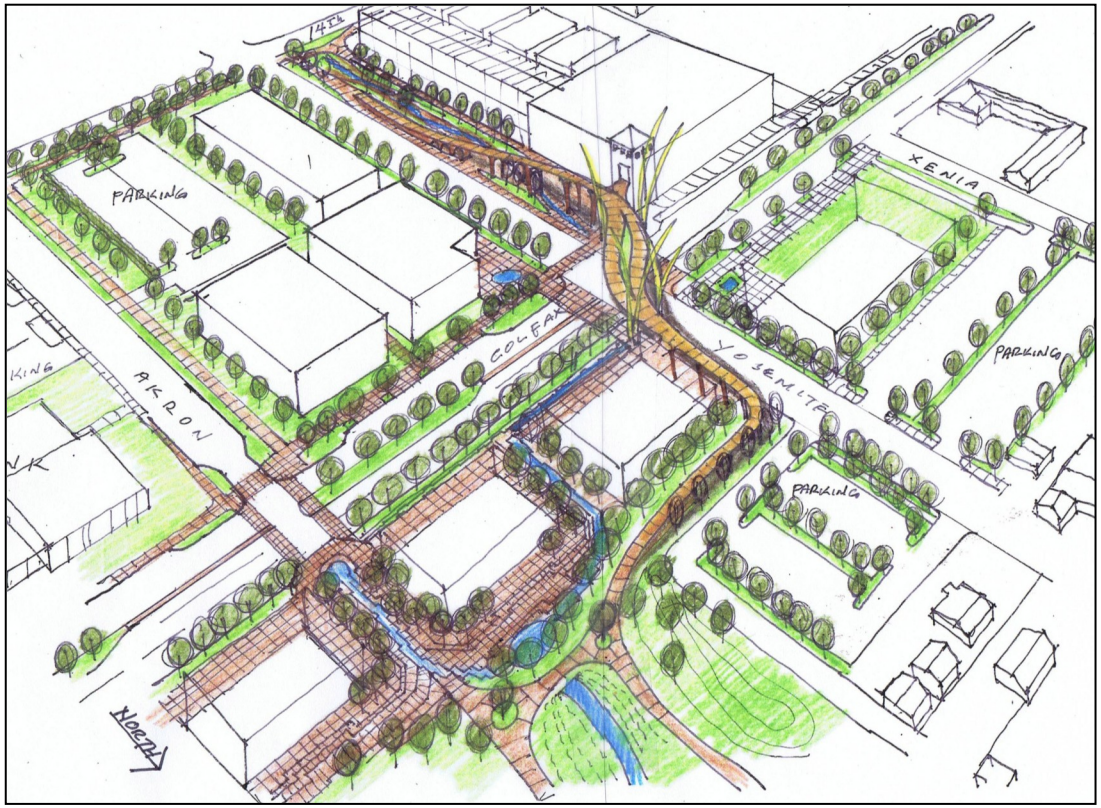


Figure 5.21 - Aerial View of Colfax and Yosemite Bridge concept

From 16th Avenue to 17th Avenue, the creek is currently contained in a culvert. Most of the buildings are older apartments, located within the floodplain. A concept is provided showing the creek in an open channel in the alignment recommended by UDFCD in their Drainageway Report. This is the historic location of the creek. The sketch is based directly on the UDFCD conceptual design, highlighting the potential amenity of the creek in this neighborhood. The City of Aurora has expressed an interest, not only in this concept, but also with the idea of redeveloping this area.

The creation of a greenway with a visible stream at its heart through this two-block area, tied to the existing open channel between Colfax and 16th Avenue, will represent an enormous step in the process of connecting the community to its stream and in connecting Lowry and Stapleton to each other and to the community between them. A series of urban gardens in this corridor, for example, could serve the immediate community and offer the lesson of healthy eating.

The UDFCD Report was less equivocal regarding Montview Boulevard from Yosemite to Beeler. This arterial would be overtopped in the case of a 100-year flood event. Because this is an emergency route east and west to the University of Colorado Anschutz medical center at Fitzsimons, Aurora plans to build a bridge to replace the undersized culverts currently in place at this location. The resulting bridge will create a grade separated pedestrian and bicycle crossing.

This sketch conveys the concept of redevelopment and extending the feeling of the creek throughout the neighborhood.

Figure 5.22 - Conceptual Sketch of UDFCD Daylighted Channel From 16th Avenue to 17th Avenue

Preferred Alignment - North Segment (17th to 23rd Avenue)

Figure 5.23 - Preferred alignment through North Segment

Infrastructure elements shown in drawings are not necessarily drawn to scale or to Public Works' accepted standards.

Montview Park - 17th Avenue to Montview Boulevard

The UDFCD Drainageway Report states that in order to convey a 100-year flood from the south side of Montview Boulevard to the north side, in addition to replacing the existing undersized culverts at Montview Boulevard by a bridge with 100-year capacity, the open channel in Montview Park must be widened and deepened . This will require the City of Aurora to redevelop portions of the park, which will be done by the Aurora Parks, Recreation & Open Space Department following a master planning process.

Montview Park is the largest existing park in the study corridor, and represents the first "destination" for southbound travelers from Stapleton. It and Westerly Creek Park to the north in Stapleton already provide open space immediately adjacent to the existing commercial space on the north side of Montview Boulevard and east of Westerly Creek. Figures 5.24 and 5.25 below represent the channel today, and some general concepts that the City of Aurora could consider as the park is redeveloped to accommodate the floodplain.

Figure 5.24 - Existing channel through Montview Park

Figure 5.25 - Concept of channel through Montview Park

Montview Boulevard to 23rd Avenue

The installation of a new bridge at Montview Boulevard, as recommended by the UDFCD Drainageway Report, can bring about an immediate change by connecting the greenway trail and the large open space corridor at Stapleton directly to Montview Park and the entire community to its south.

Montview is a primary route for travelers between east Denver and destinations in north Aurora like the Fitzsimons medical campus, and it can reflect that status through art and through economic revitalization of the businesses next to it. The greenway to the west of those businesses provides an attractive amenity on which to build.

The Montview Bridge is an opportunity for creating a strong greenway connection between northwest Aurora and Stapleton, including the corridor from 23rd Avenue north to Sand Creek. A sense of arrival or departure should be conveyed at that interface.

Figure 5.26 - Connection from Montview Park to Stapleton

Westerly Creek Greenway - Overall Concept

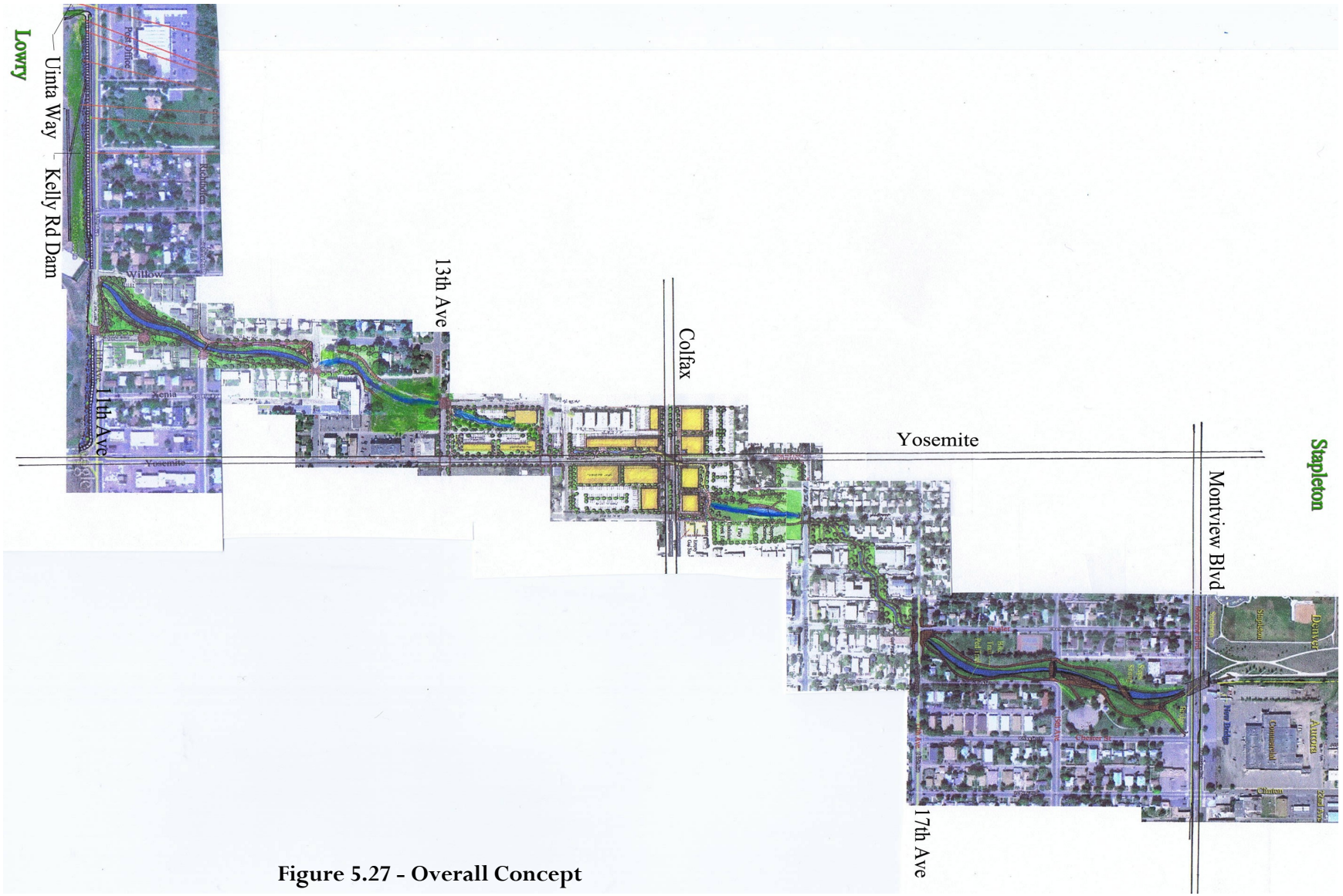


Figure 5.27 - Overall Concept

Chapter Six - Next Steps

The greenway concepts shown in this document are meant to stimulate conversation about the physical design of the Westerly Creek Greenway and all of its parts. They are meant to give a clearer understanding of the type, scale, and level of detail that the authors feel is relevant. The ideas have been presented to residents of the surrounding neighborhood and have been supported. These ideas have also been shown to the Steering Committee and they have been met with positive feedback. Several members of these groups have asked: "How can we keep moving forward?"

One of the most crucial steps that needs to be taken is the adoption of the Westerly Creek Greenway by the existing Sand Creek Regional Greenway Foundation. Westerly Creek is a tributary of Sand Creek, and the board of directors of the SCRG has acknowledged the importance of the connection between these two greenways. The ongoing support and oversight of this organization will be important to seeing the Westerly Creek Greenway Master Plan through to fruition.

Physical Needs

- An official bicycle route through the Westerly Creek corridor
- Construction of identifiable pedestrian crossings across streets and alleys
- Signage for the pedestrian trail and bike route
- Signage and identifiable themed features (such as benches or garbage cans) along the corridor
- Implementation of the recommendations of the UDFCD Report, including construction of the Montview Bridge
- Art installations at key locations
- Property acquisition

Policy Needs

- Adoption by the City of Aurora, to be incorporated into its city-wide Master Plan
- Adoption by the City & County of Denver, to be incorporated into its city-wide Comprehensive Plan
- Incorporation into the Sand Creek Regional Greenway Foundation

Figure 6.1

Westerly Creek Greenway Master Plan
List of Appendices

Appendix One - Public and Steering Committee Meetings

Appendix Two - Programs & Initiatives

Appendix Three - Previous Flood Control Efforts

Appendix Four - Circulation

Appendix Five - Connections to Greenway Features

Appendix Six - Options for Channel Cross-Sections

Appendix Seven - Evaluating Alternative Alignments

Appendix Eight - Greenway Elements

Appendix Nine - Art in the Project Corridor

Appendix 1 - Meetings

Steering Committee Meetings:
December 8, 2009
January 12, 2010
February 9, 2010
March 9, 2010
May 11, 2010
June 8, 2010

Public Meetings:
January 26, 2010
April 14, 2010

The 1st Public Meeting was held on January 26, 2010, at the Westerly Creek School. The Westerly Creek School is in Denver's Stapleton neighborhood at 8800 E. 28th Ave, Denver CO 80238.

The goal for this meeting was to give the community and interested parties the right information to assess the project, so they could give meaningful feedback. The project team presented to over 40 people and covered the mission statement, the geographic scope of the project, generic design concepts to consider and an overview of the planning project timeline. This group was attentive, gave valuable feedback and asked good questions.

On Wednesday, April 14, 2010, the 2nd Public Meeting was also held at the Westerly Creek School. In the back of the room large tables were covered with colorful, detailed designs and layouts showing alternative concepts and designs for the greenway between 11th and 23rd Avenues. Community members in attendance were presented with comments from January's public meeting and then WCC highlighted their position on property acquisition which is "only…willing buyer, willing seller". The entire WCC property acquisition statement is shown on this website.

The goal for this meeting was to present alternatives and give the public time to closely study options. Comments were invited by using Post-it notes that were affixed directly on the layouts. The Westerly Creek Connection planning team circulated around the group to answer questions one on one and encourage feedback. The plan was enthusiastically supported by the attendees and, at the end of the evening the planning team concluded that this project continues to receive positive support from the public.

Appendix 2 - Programs & Initiatives

This component of the Master Plan will center on Programs & Initiatives for the communities in the Westerly Creek watershed, between Lowry and Stapleton and including both Denver and Aurora neighborhoods. These programs will capitalize on the outdoor environment created by the new greenway. As a result of these initiatives, residents will be offered activities that contribute to their overall health and well-being. Residents will have access to informational, educational, leisure and the arts programs. Installations of profiles of the watershed's residents, past and present, along with opportunities for communication networking will help build social capital and social cohesion along the greenway.

This is a collection of ideas and suggestions that, when implemented, can activate the Westerly Creek and encourage community involvement and usage of the greenway. Activate means to set in motion, to make active or more active. This term is frequently used when discussing the desired usage outcome for a park or public area. The planning team views Programs & Initiatives as an integral step in the greenway planning process, to achieve the desired benefits of:

- Revitalizing Westerly Creek
- Engaging citizens in enjoying and recreating along the creek
- Inspiring community pride and social cohesion resulting in shared care and concern for Westerly Creek

The Programs & Initiatives will make full use of the new Westerly Creek corridor that will result from the implementation of the greenway improvements. However, they are not simply a set of activities to be added to the greenway after it has been constructed. They have been developed to help shape the greenway and insure that the resulting physical and aesthetic space provides the optimum benefit for those who live in the watershed.

Several of the Goals & Objectives for the Westerly Creek Greenway Master Plan (see *Page 7*) are relevant to the Programs & Initiatives:

- Enhance the Westerly Creek corridor to make it a more significant and appealing community feature, connecting a series of individual amenities.
- Serve alternative transportation needs in the area.
- Encourage recreation, a connection with nature and healthy living.
- Provide opportunities for education.

Additionally, a couple of specific Vision statements (see *Page 6*) relate to the Programs & Initiatives:

- Recreational and health improvement opportunities in the watershed.
- A greenway corridor within the broader network of regional open space.

How to use this Appendix

This list of programs contains ideas to select from and to implement when the greenway is built. This list of programs serves as a sample set to help those who build the greenway to gain a more complete visual of how the greenway will be used. The primary reader of this appendix is expected to be the implementation team.

Other readers of this Appendix will be residents, service providers, and those who work in the watershed ranging from municipal employees to business owners. Also, those who are interested in business and real estate development can look to this Plan as a guideline for the potential of the corridor.

When seeking money to build the greenway, the interrelationship of Programs & Initiatives with the physical aspects of the greenway can serve as a foundation for grant applications or funding discussions. For example, a donor may be interested in funding health programs for reducing obesity as well as the outdoor space that can actuate that program.

Community outreach for the Greenway Master Plan has indicated considerable support and need for Programs & Initiatives. To insure that initiatives are chronicled so that, as time and money allows, the community can benefit from these programs.

Categories for Programs and Initiatives

- Information and Education
- Westerly Creek Community Center - A "virtual" center
- Friends of Westerly Creek Watershed
- Profiles of Westerly Creek Residents
- Art Programs in the Watershed
- Health Education and Healthy Living
- For and About Bicycles
- For Persons with Disabilities
- Lists of Resources, Information and Interviews

Information and Education

There are several ways to provide informational programs and education classes in the Westerly Creek Greenway. Mostly, they require organizations that can develop and deliver the coursework. Examples of such organizations are: city-run recreation centers, neighborhood organizations, schools, non-profits, independent youth education groups such as Front Range Earth Force or SPREE, or independent adult education groups, like the Free University. Alternatively, programs and classes can be delivered by non-profit organizations with established coursework, like Bluff Lake Nature Center of Denver, using a site along Westerly Creek as a satellite classroom.

How might this concept work? A neighborhood organization has an opportunity to collaborate with a garden center to provide a composting class to their membership. The group develops, promotes and delivers the education in an outdoor classroom along Westerly Creek. Another example: Earth Force, in collaboration with a local school and community partners, creates a service learning project along Westerly Creek where students learn about the methods used to clean up the creek's water. This dovetails with a biology class where different water sources are tested and compared.

There is an existing education program that serves as a model, the Learn and Serve Colorado "Westerly Creek and Environmental Justice" Education Project. In 2009, Colorado's Department of Education funded three schools in the Westerly Creek watershed to complete a service-learning project. This project will be completed by 2012 and is expected to foster continued school-based service learning. Over 100 school age students, 14 faculty and staff and 15 adult volunteers worked in the 2009/2010 school year towards education and environment objectives including building skills in science, promoting positive interactions with adults who care about the future of the watershed and understanding the need for flood control management along Westerly Creek.

Differentiating between education and information is noted here because education programs are usually associated with earning a degree or certification, as in a school diploma. Information programs, like a video program showing the migration patterns of local birds, are less formal and usually have no certification involved. Informational programs tend to appeal to the adult-learner more than the school age-learner. In both education and information classes, a certification may be required to teach.

"Ad hoc" groups can operate in a cooperative way and need no organization affiliation. The space for outdoor events and classes can also be used by those who want to gather, and do not feel they need guaranteed space. Existing examples of these are new moms' exercise groups, or Tai Chi groups, both usually found in public parks and spaces.

Westerly Creek Community Center - A "virtual" center

Another way to deliver education and information is through establishing a community center that serves citizens in and along Westerly Creek from at least 11th to 23rd Avenues. As community centers are frequently created by municipalities, this could be a virtual community center, thereby avoiding city and county lines of distinction. No building would be required. A Westerly Creek website or blog would list an offering of classes and sessions that are submitted by other organizations.

Art Programs in the Watershed

Public art is intended to be a significant feature along the Greenway including functional pieces such as benches, sculptures, bike racks and trashcans. There are existing arts programs that can serve as models and provide inspiration.

The urban and natural trail environments, managed by Boulder Colorado's Outdoor Space Management Program (OSMP), administers an education arts program that is a collection of field workshops. Usually, four local artists are contracted for a given year. Local photographers, naturalist artists, painters and writers lead nature-based arts programs. For example, adults and children sign up for free art hikes, nature journaling workshops or walks that explore the relationship between human music and the music of the natural world. The goal of the OSMP arts programs is "to create the opportunity for OSMP visitors to experience and connect with the land in a creative, expressive, and ancient way."

A juried or non-juried art festival or exhibition could be developed and presented in the open space or parks along Westerly Creek. Given the close proximity of the Aurora Arts District on Colfax Avenue, the development of arts festivals and exhibitions would be a logical tradition to initiate.

Both the Denver Office of Cultural Affairs and the Aurora Public Art Commission are information sources for programming, grants and support.

Health Education and Healthy Living

The national "Let's Move" campaign for combating obesity in America outlined by First Lady Michelle Obama has helped to focus attention on more access to outdoor space. Health experts note that communities who promote physical activity by providing sidewalks, biking and jogging trails make an important step in helping to address overweight citizens. The Colorado Department of Public Health and Environment provides a comprehensive resource, including the 2009 report "The Weight of the State," which writes about obesity-related behaviors and outcomes in Colorado. The 2010 article titled "Colorado Obesity Rates Grew Faster than Nation's," suggests "that policymakers change land use policies so that more parks and trails are built and people have easier access to community gardens and farmer's markets." A place for physical activities are especially critical for low-income communities such as those in and around Westerly Creek, as generally low income populations have higher rates of obesity and fewer venues for activity.

Mercy Housing Mountain Plains provides low-income housing adjacent to Westerly Creek for refugee families. They report that they have noticed many of the families start experiencing obesity within a year of arriving in the U.S. This health trend can be attributed to lack of recreation activities as well as unhealthy eating habits. In addition, a Program Officer for Denver Healthy People 2010 commented that without easy access to safe places to be active both children and adults are less likely to meet physical activity requirements. The Westerly Creek Greenway will offer space for being physically active.

Walking, jogging, biking and gardening are some obvious exercise possibilities along the greenway. Activities like yoga and Tai Chi have also been found to provide health benefits.

Many books and articles have been written and much research has been conducted to delve into healthy living and its impact on our bodies, and our society. To underscore a few benefits: exercise can reduce the risk of heart disease, help control weight, and help build and maintain healthy bones, muscles and joints. Obviously it is not within the scope of this Appendix to focus on this aspect, but this document will address one point that is of particular interest to the planning team: the positive effect of exercise on those individuals who have rheumatoid arthritis, multiple sclerosis and Parkinson's disease.

Persons with rheumatoid arthritis, multiple sclerosis and Parkinson's disease benefit from walking jogging or bicycling. A study conducted by Dr. Athan Baillet found that "cardio-respiratory aerobic exercise is safe for patients with stable rheumatoid arthritis. The team found that rheumatoid arthritis patients who exercised regularly had improved function, less joint pain and greater quality of life." The New York Times reported that, "Scientists from the Harvard School of Public Health, University of Pittsburgh and University of Southern California discovered that exercise can slow the progression of Park-

inson's disease…The studies suggest that physical activity, performed at a moderate to highly intensive level, can help to reduce damage to neurons in the brain that causes Parkinson's Disease…"

In South Florida, Craig Marks, a physical therapist/personal trainer, said, "People with Parkinson's Disease must remain as physically active as possible. Research has proven that when people perform exercise at a moderate to high level of intensity, the brain can start to stimulate the development of dopamine, which is lacking in persons living with Parkinson's."

HealthONE runs a group of hospitals in the metropolitan area. They have installed a freestanding health kiosk in the Cherry Creek Mall of Denver. Here shoppers can measure their heart rate and learn about how the body works and its internal organs. HealthONE plans to install a simpler kiosk at Red Rocks Amphitheatre in Morrison, CO, where a user can learn about the impact of higher and lower altitudes and how to measure aerobic ability on the walking trails in and around the area. Similarly a free standing kiosk in the greenway could provide information about burning calories, measuring aerobic output, how to stretch before exercise, strength building exercises and other healthy living tips. Another kiosk installation might provide information on guidelines for healthy eating. The HealthONE group is open to future discussion about installing information kiosks in other locations including the Westerly Creek watershed.

Like the indoor walking route at Cherry Creek Mall in Denver, the greenway can install quarter mile markers to make it possible for someone to keep track of their walking or running distance. At regular intervals along the greenway, a cardio-vascular monitoring chart can be installed so a walker or runner can evaluate their aerobic effort.

Handouts or a simple brochure can be available at the kiosks or in the neighborhood buildings and businesses. All information provided will be developed with advice on "best practices" from health promotion experts such as the Denver Cooperative Extension Office or Live Well Colorado. Outreach programs developed by city and state health agencies and low income housing providers can involve the local community in helping to define healthy eating and active living behaviors.

The **Colorado Health Foundation** or **LiveWell Colorado** are two organizations that fund and support community health initiatives. For example, LiveWell Colorado is charged with leading the state's obesity prevention efforts. They are implementing a 5 year strategic plan and one of their priority goals is finding community coalitions throughout the state focused on healthy eating and active living strategies. The Westerly Creek neighborhoods with leadership provided by low-income housing groups, such as Hope Communities and Mercy Housing, may be an ideal location.

One on-going health initiative, the **BeWell Health & Wellness Initiative**, is operating in six Denver and Aurora neighborhoods, including northwest Aurora in the Westerly Creek watershed. Free to all residents within the target areas, programs, health care information, and tools are offered covering programs from new baby wellness classes to cholesterol screening to aerobics. One of the goals is to provide a walkable community and this fits right in with access to a greenway along Westerly Creek. This community-based initiative can serve as one model for healthy living programs.

Front Range Earth Force in Denver works with school-age children and their teachers in developing and implementing educational programs and service learning projects. They have recently added a project liaison that will develop programs for health and wellness in the community. One completed Earth Force service learning project titled "Food Waste in the Lunchroom" at Ellis Elementary had students look at what foods do kids like most, and what foods do kids waste the most. By partnering with schools in the Westerly Creek watershed, Earth Force can generate some student-based healthy living programs.

Another established food-based initiative that promotes healthy living is the national program, **Slow Food**. On their website they describe themselves as supporting good, clean and fair food. In 2010, Slow Food Denver worked with ten Denver public schools to integrate school gardens and taste education into the school curriculum. Each school's program is unique to meet the needs of the students. Activities include creative theme gardens, farmer's markets for kids, Taste Education workshops, restructuring school lunch, and wellness classes. Partners in these efforts include Denver Urban Gardens and numerous

This virtual center idea exists today at the local Fitzsimmons Life Science District. Called "fitz/bulletinboard", it is an on-line community and virtual bulletin board. Another parallel example is Michigan's Hillsdale County Community Center virtual community center, where citizens are creating the website with funds from a grant project called Information Technology for Community Intergovernmental Coordination Committee.

As an example for a Westerly Creek website listing, if a resident wanted to start a Tai Chi class for senior citizens, the resident would outline the class and list it on the Westerly Creek website. Social marketing could support these classes through Facebook and Twitter.

Friends of Westerly Creek Watershed

Interested citizens can join a support and advocacy group for the Westerly Creek watershed as a way to provide stewardship, and perhaps some funding, for the Creek. This "Friends" group could advocate for funding or programming along the greenway. Or it might simply be an organization that views the Creek as a whole, rather than the Denver portion and the Aurora portion, and provides the handshake needed for community events. Their stewardship could be in the form of a Creek clean up.

The new Denver public park currently being developed at 13th Avenue and Xenia Street is expected to include a "Friends of" organization to help solidify community support for the park.

Profiles of Westerly Creek Residents

During the course of developing the Greenway Master Plan, the planning team heard and gathered interesting stories about people or groups of people who have lived in the Westerly Creek watershed. To help create community spirit and identity, freestanding posters, telling these stories, could be positioned at various places along the greenway or all together near a natural stopping point. The posters would show a large photo with text telling a story. Four possible profiles are listed here. (Names have been changed for privacy reasons, but these are real stories.)

Aurora Senior Citizen - Mattie Caldwell
This woman raised her children near Westerly Creek. She remembers when they were following the creek on an afternoon walk, and when the Creek dipped underground, they followed. Blocks later, the children emerged after being underground, in the dark, the entire length of the Montview Shopping Center! She also tells the story of being quite overweight. "I weighed over 200 pounds," Mattie says, "I slowly lost the weight by exercising and walking." She is very supportive of the Greenway for herself and for her neighbors.

Teenager Remembers Montview Blvd Flooding - Dick Bailey
As a teenager Dick worked as a pizza deliveryman for a local pizzeria in northeast Aurora. One rainy night in 1967, he was to deliver a pizza near Montview Boulevard and Westerly Creek. Then, as now, it was a major street. He says, "I was surprised to see no cars on the road, and then I saw why - Montview Boulevard was flooded." The high water stopped his car and at that point Dick saw two kids float by on an air mattress.

Somali-Bantu Immigrant - Meesh Wantu
Members of the Somali-Bantu tribe struggled to live in war torn Somalia. Many fled and lived in African refugee camps hoping to immigrate to the U.S. Meesh lived in refugee camps for 13 years, waiting for her husband. "Life was very, very hard," she said. When she and her family finally came to the U.S., they settled in housing that backs up to Westerly Creek. She smiles widely when asked about their new life in Denver. Her children attended school in the area.

UTE TRIBE
The Ute Indian tribe lived in the watershed through the early 1900's. One option is to add a real life story of a Ute tribal member. Alternatively, the profiles area can showcase photographs of early Ute life in the area. There are some limited black and white photos available from the Western Collection of the Denver Public Library.

Community Gardens. This program lends itself to being adopted in the Westerly Creek corridor. Slow Food USA has programs in at least 4 other cities in Colorado.

Within the Westerly Creek watershed, there are already two gardens run b **Denver Urban Gardens**, one at 13th Avenue and Xenia Street and the other on Beeler St near 17th Avenue. Conceivably, the corridor could accommodate more sites for locally grown produce. Gardening is a recognized healthy living activity. Some reasons for promoting locally grown good are: food can be much healthier and better tasting, barrels of gas are not used in transporting the food, and local gardeners are likely to be better stewards of the land.

For and About Bicycles

There is likely no other Programs & Initiatives subject that has as many possibilities for the Westerly Creek Greenway than the support of a bicycle-friendly environment. Both Denver and Aurora as well as the State of Colorado have sizeable, active biking communities and advocacy groups with easy access to scores of biking events. Consider the bi-weekly group bike trips called the Denver Cruisers, the annual Moonlight Classic charity bike ride, or Aurora's Meet-Up Biking Groups. There are excellent bike trail maps produced by both Aurora and Denver. The opportunities are myriad, but it is not within the scope of this Master Plan to list them all. Rather, this Plan highlights some biking Programs & Initiatives that can naturally be adopted in the Westerly Creek watershed.

Bicycle Colorado is based in Denver. Although its mission includes increasing safety and improving conditions, it is focused on encouraging and promoting biking. Their on-going work in Colorado's Safe Routes to Schools (SRTS) program encourages schools and school-age children to bike and walk to school thereby increasing physical activity. Biking in the Westerly Creek watershed could be expanded through the SRTS program by working with the schools located in and around the greenway.

Trail Maps are probably the biggest and earliest opportunity to generate some interest within the community about the new greenway. Conversations with community bike contacts at both Stapleton and Lowry revealed that citizens do request a map showing a route for biking between the two communities. No map showing a recommended route is currently available. The Lowry Community Master Association indicated that there is a desire from the cycling community in Lowry for a trail map and they would consider helping this effort.

When does it make sense to develop a trail map? Is it before or after the greenway is built? From the standpoint of helping to activate the greenway, the answer is both. *Before* because it begins to answer the community need for traveling between the two communities and starts gathering interest in the future bike trail. *After* because citizens will want to use the trail efficiently, accessing and exiting at numerous points along the trail. The big pay off for long distance bikers is the connectivity from the High Line Canal Trail in the south, to the Sand Creek Regional Greenway in the north, made possible with the addition of the new Westerly Creek Greenway. Long distance bikers will benefit from a new trail map showing that metropolitan connection.

Maps can be made available on-line perhaps through a "virtual" community center or information outlets in the Lowry and Stapleton neighborhoods. There is a well-developed grassroots bike community that could also provide the new trail maps, for example, the Park Hill Bike Depot or the Derailer Bicycle Collective. After the greenway is built, a Westerly Creek Greenway Trail map could be approved and offered by both Denver and Aurora city bike departments.

It would be beneficial in developing users of the Greenway if the "Before" map was revised to match the changes in the Greenway, as the trail will likely be built in installments over several years.

To promote more bike usage, **services and events for bicycles** could be established in the watershed. The Park Hill Bike Depot is a model near the watershed, which offers tune-up and repair services, refurbish bikes, offer new and used parts and accessories and offer advice. They also accept bike donations. The Park Hill Bike Depot was given some seed money by Live Well Colorado to promote biking as a healthy activity that leads to reducing obesity and diabetes. This organization was purposefully located in a low-income neighborhood.

Another dimension to their operation is the monthly family bike ride for any form of bicycle "above training wheels." Up to 100 family bikers join in and travel the Park Hill neighborhood for four to five miles. This family event could also be organized along the Westerly Creek Greenway.

Denver's bike sharing program, **B-cycle**, was implemented in May 2010 and installed up to fifty kiosks and five hundred bicycles throughout downtown Denver and the immediately adjacent neighborhoods. Research from other bike sharing programs around the world has shown that kiosks need to be within a certain distance, and within a certain population density for the entire system to succeed. At the time of launch there were no stations planned for the east side, which includes the Westerly Creek watershed. By the time the entire Greenway is built, a bike sharing program through the establishment of a "satellite node" or sub-station for the east side of Denver could be implemented.

Recycle Bicycles is a nonprofit corporation and collective that accepts donations of used bicycles and related items, and then repairs and redistributes them at no cost. On a monthly basis, Recycle Bicycles gives away 15-20 bikes to recreation centers, schools, and housing projects. Families living in low-income housing in the Westerly Creek watershed could receive recycled bikes, generating interest in biking in the neighborhood.

If a large enough location could be identified along the creek, Recycle Bicycle might consider locating their annual large giveaway of bikes in the watershed. In May 2010, they gave away four hundred and seventy (470) bikes at a Denver public school. Also the Executive Director at Recycle Bicycle said that they regularly travel to a location with a bike mechanic, if a large enough group is gathered, to repair and teach about bikes.

In 2008, the Stapleton community began an initiative to develop the community into a "premiere biking" community. The initiative included producing a trail map, workshops on how to commute to work, family bicycle events, a list of bike racks in the neighborhoods and even a bike rental program.

The Stapleton **Transportation Management Association** (TMA), is committed to alternative transportation means. It works in the greater Stapleton neighborhoods to improve transportation alternatives and to improve bicycle and pedestrian connections. As the Westerly Creek Greenway will dovetail with the Stapleton trails, there can be some future program sharing for pedestrians and bicycles. For example, when the annual Bike To Work Day is held Stapleton's TMA supports the event with a water and food stop in the neighborhood. TMA suggested that this event could be duplicated in the Westerly Creek watershed and would offer help in setting this up.

In 2010, **Lowry** will be commencing the installation of pedestrian and bike trails that crisscross the Kelly Wetlands area. These trails will connect Lowry's Great Lawn to 11th Avenue, which is the location of the Westerly Creek Greenway trailhead.

The Executive Director of the Lowry Community Master Association (LCMA) commented that connectivity from Lowry to Stapleton is the "number #1 question" received from residents about biking. Lowry has a number of community events planned and has considered everything from family picnics to movies to bike races. Support for a bike trail map that includes detailing connectivity between Lowry and the Westerly Creek Greenway is something the LCMA would consider.

For Persons with Disabilities

It is anticipated that Americans With Disabilities Act (ADA) and guidelines will be adhered to in the final design of all trail segments of the greenway. In so doing access to the creek and the greenway will be easy for anyone on wheels: bicycles, baby strollers, children's wagons but in particular those who are assisted by wheel chairs, walkers and canes.

For persons with disabilities, ease of access to the greenway allows them to participate in a number of the proposed programs and initiatives, for example, information and education coursework, healthy living, and art programs. These programs contribute to the overall health and wellbeing of those who will use the corridor.

One of the goals of the Programs & Initiatives are to activate the Creek and encourage community involvement and usage of the greenway. With the adherence to ADA guidelines residents who use a wheelchair, walker, or a cane will be able to help activate the Creek.

Throughout this project, the planning team has discussed designing one or more viewing or sitting platforms where someone in a wheelchair can easily enjoy the creek. This platform would allow a person in a wheelchair, or those using a walker or a cane, to be cantilevered over the Creek, or to sit near or at the same level as the Creek so they can enjoy the water.

Within this greenway master plan there are several sections that deal with specific implementation of ADA standards, for example signage, accessible benches and accessible picnic tables.

Lists of Resources, Information and Interviews

- Steering Committee Members of Westerly Creek Greenway Master Plan, 2009 and 2010
- Sand Creek Regional Greenway Master Plan Report
- River North Greenway Master Plan, 2009
- Health Impact Assessment: Westerly Creek Connection. Healthy People Program 2010
- The Community Guide: What Works to Promote Health Website
- HealthONE Hospitals: Public Affairs, Marketing and Government Affairs
- Cherry Creek Mall Community Outreach Programs
- Front Range Earth Force, Denver
- SPREE, The Educational Arm of The Greenway Foundation
- Greenway Foundation

Westerly Creek Greenway Master Plan

Appendix 3

Previous Flood Control Efforts in the Project Corridor

1. Flood Control in the Project Corridor from 1953 to 1983

For 30 years (1953 – 1983), the U.S. Air Force, the City of Aurora, the City & County of Denver, and the Urban Drainage & Flood Control District utilized floodplain studies and flood control projects on Westerly Creek below the site of the present Westerly Creek Dam in an effort to address flooding problems in the area between Lowry and Stapleton.

Kelly Road Dam - 1953

The flood hazards downstream of Lowry were first addressed in 1953 when the Air Force had the U.S. Army Corps of Engineers (Corps) construct Kelly Road Dam "*to alleviate the runoff from the large paved areas of the AFB.*" The dam was constructed after the 1950 and 1951 flood events, to reduce the risk of flood damage in the neighborhoods immediately to the north in Denver and Aurora. The belief was that controlling the creek with the dam (or with pipe projects) would make the problems "go away".

Flooding and Initial Floodplain Study – 1973 to 1977

In 1973, 20 years after the completion of Kelly Road Dam, Westerly Creek flooded again. The 1973 flood was even bigger than the 1950 and 1951 floods. An engineering analysis prepared in 1976 stated that *"…the construction of Lowry Air Force Base has obliterated the historical Westerly Creek channel. … The Westerly Creek channel and floodplain between Kelly Pond and Stapleton Airport have been greatly altered by development and encroachment. Existing open channel sections and drainage structures have insufficient capacity to receive even local tributary flows.*" Kelly Road Dam alone was an insufficient facility to protect the area below 11th Avenue from a 100-year flood.

In 1977, four years after the 1973 flood, UDFCD completed a Flood Hazard Area Delineation (FHAD) for the area downstream of Lowry to Stapleton. The FHAD delineated very serious flooding problems from 11th Avenue to Montview Boulevard. It charitably characterized the stream channel as "*a combination of open channel and drainage structures of mixed construction*". From 11th to Montview there were only 2 pipes that had a capacity of more than 5% of the 100-year flow:

> (1) *A pipe extended from 16th Avenue just east of Akron Street to Beeler Street just south of 17th Avenue;*
>
> (2) *A short pipe carried some water across the intersection of Beeler and 17th;*

From a point just north of 14th Avenue to a point just north of Colfax Avenue (including the intersection of Yosemite and Colfax) there was no pipe at all, so the channel literally was Yosemite Street. There was no overall engineering design. From 11th Avenue to 16th Avenue floodwaters flowed through undersized open channel segments or they simply flowed overland.

The land use and street patterns in 1977 showed that the flood risk between 11th Avenue and Montview Boulevard had been considered inconsistently. Most of the buildings that are near the channel today on Xanthia and Willow from 11th to Richthofen and on Xenia from Richthofen to 12th had not been built at that time. There were no buildings within the current Aurora open space north of Colfax and there were no buildings in the area that is now Montview Park. In other locations (*along the informal channels between 13th and Colfax and in the 100-year floodplain between 16th and 17th*) buildings had already been constructed "in harm's way"; those buildings remain in place today. In 1977 there were four streets where single blocks had not been constructed – left instead as open space - in deference to the Westerly Creek channel: **(1)** Xanthia – 11th to Richthofen; **(2)** Xenia – 12th to 13th; **(3)** Akron – Colfax to 16th; and **(4)** Boston – 19th to Montview. On the other hand, by 1977 there were three blocks or segments of blocks where the street had been built where the creek channel stood (meaning that the street served as both a

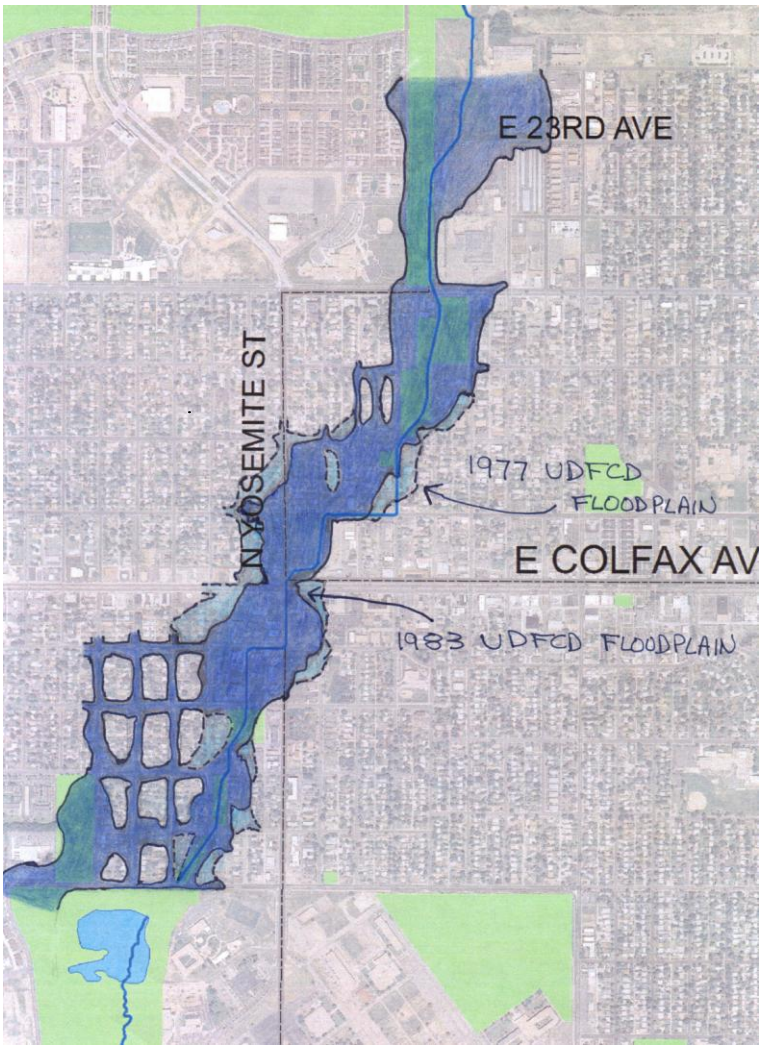
street and a creek channel: 1) Xanthia – Richthofen to 12th; (2) Xenia – 13th to 14th; and (3) Yosemite – 14th to Colfax.

In 14 of the 35 years between 1942 and 1977 Westerly Creek experienced flooding events "*of more than a nuisance level*". At an average rate of "*about once every 2.2 years*", there was a storm "*flooding premises…and impeding traffic*". Some floods stopped traffic on Colfax for up to 3 hours. Clearly it was time to do something about the dangers posed by the creek.

Flood Control Project and Revised Floodplain Study – 1977 to 1983

In 1977 UDFCD determined that simply completing their FHAD floodplain study was not enough. With the help of the Corps of Engineers, UDFCD and the two cities completed the design for a series of flood hazard reduction improvements. In 1981 the construction was completed, providing 10-year flood protection from 11th to Montview. The project consisted of engineered open channels and pipes sized according to accepted engineering standards and procedures.

In 1983 UDFCD delineated the "post-project" residual 100-year floodplain from 11th Avenue to Stapleton International Airport in an updated FHAD. While the 1983 floodplain from 11th to Montview was substantially narrower in several locations than the floodplain mapped in 1977, it was still very wide. Even with the improvements, it was more than 5 blocks wide in some locations between 11th Avenue and Colfax Avenue.



1977 and 1983 UDFCD Floodplains

2. Flood Control in the Project Corridor from 1983 to 2002

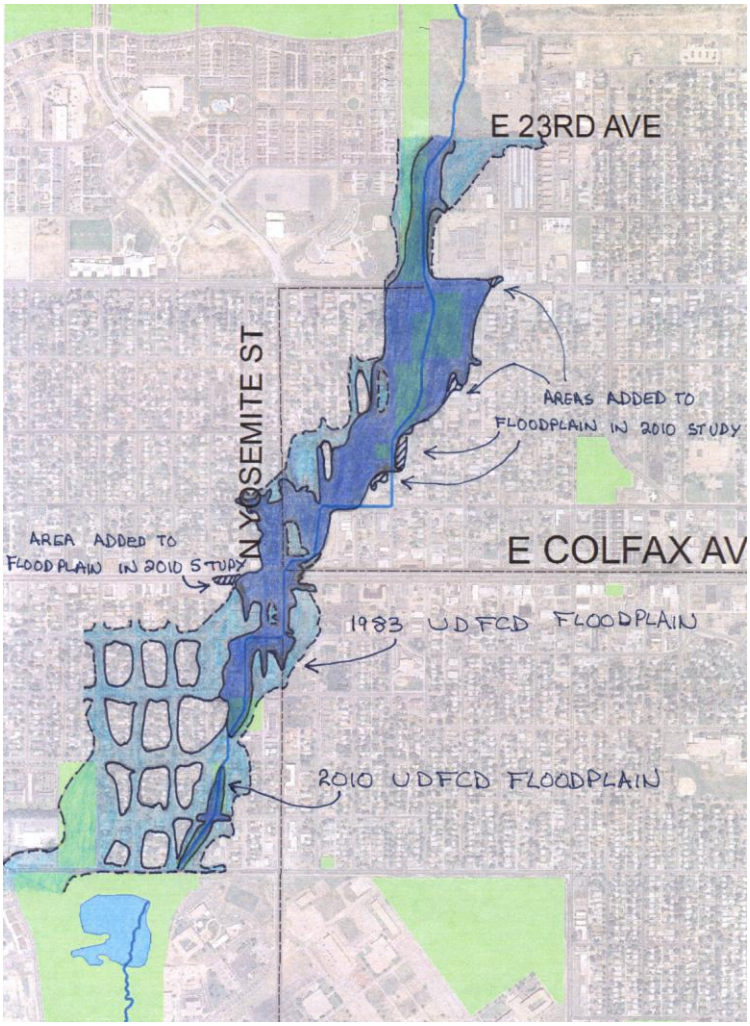
After the 1983 updated FHAD had been completed, UDFCD worked with the U.S Army Corps of Engineers to provide additional flood protection. After obtaining authorization, the Corps of Engineers designed a flood control dam and received funding to construct it. In 1991, construction of Westerly Creek Dam was completed at the upstream end of Lowry Air Force Base.

Westerly Creek Dam – 1991

Westerly Creek Dam was designed and built to supplement the performance of Kelly Road Dam. It greatly reduced flows leaving Lowry at 11th Avenue, eliminating much of the 100-year overbank flood hazard between 11th Avenue and Colfax. Even after the construction of that second dam, however, there were still flood problems downstream of Colfax. Because of large tributary flows that enter the creek downstream of Lowry (*at 11th, 16th,19th and Montview*), thereby missing the flood control facility, Westerly Creek Dam did not have as significant an impact on the flood risk downstream of Colfax as it did on the risk upstream of Colfax.

Stapleton Greenway and Flood Control Project – 2002

When Stapleton Airport closed in 1995 and planning for the redevelopment of the site began, the decision was made to consider a different approach to floodplain management on the sited. The 1997 Revitalization Master Plan developed and articulated a conceptual approach for integrating flood control, open space and recreation. Starting with that concept, Matrix Design Group, design consultants for the Stapleton redevelopment, prepared an engineering and landscape architecture design for recreating a stream corridor at the former airport. In 2002 the greenway/flood control project was completed. The airport runway culverts were removed, the stream corridor was re-graded from Montview Boulevard to 33rd Avenue, storm sewer outfalls were configured as confluences of tributary drainages, and riparian vegetation was planted along the creek channel and adjacent overbanks. None of the new residential or non-residential buildings adjacent to the greenway are within the 100-year floodplain, because the greenway explicitly addressed flood hazard reduction needs.



1983 and 2010 UDFCD Floodplains

Westerly Creek Greenway Master Plan

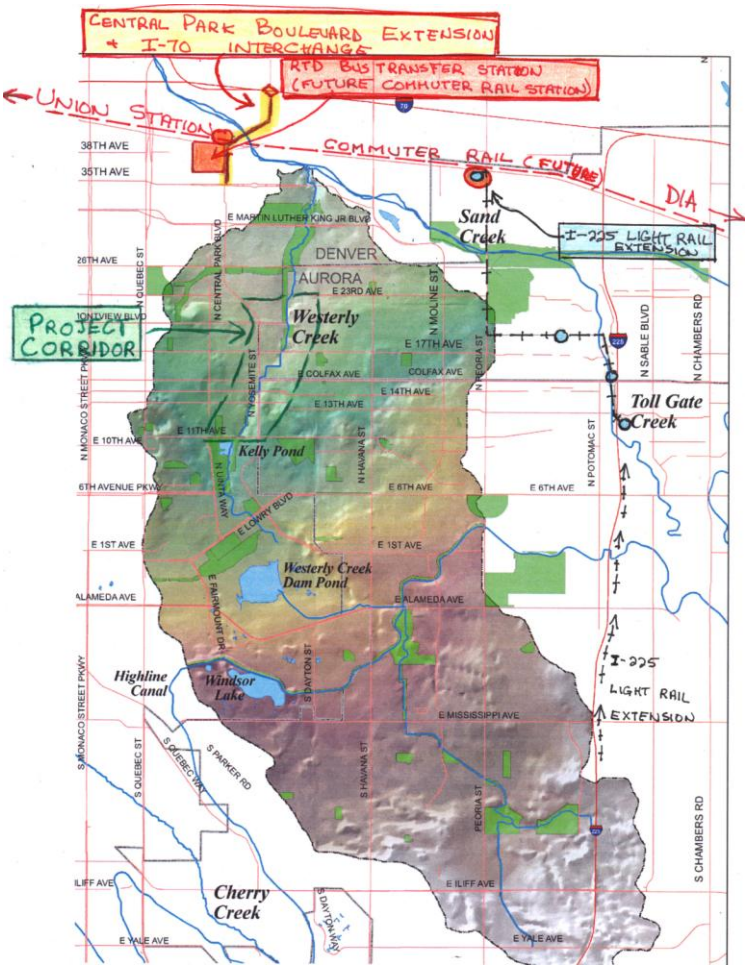
Appendix 4

Circulation near the Project Corridor

1. Major Circulation Infrastructure near the Greenway

The greenway will connect to and support the following major circulation infrastructure within and adjacent to the Westerly Creek watershed, shown on the map below:

- major streets;
- interstate highways;
- the extension of Central Park Boulevard from 36th Avenue north to Northfield Boulevard, including the new I-70 interchange - the project, located about ½ mile from the confluence of Westerly Creek and Sand Creek, will provide a new bicycle and pedestrian path next to the roadway (to be completed in the autumn of 2011), allowing direct bicycle and pedestrian from the south side of I-70 to the north side,;
- the Stapleton RTD bus transfer station and parking lots, recently relocated to the Central Park Station site (roughly 36th Avenue and Ulster Street - very close to the confluence of Westerly Creek and Sand Creek)
- the expanded I-225 light rail line and stations operated by RTD, to be extended from its current northern terminus at I-225 and Parker Road to the Fitzsimmons medical campus and then to the DIA commuter rail line near Peoria Street and Smith Road;
- the DIA commuter rail line and stations to be operated by RTD in the longer-term future (2015 – 2016) - the Central Park Station for the East Corridor commuter train from Union Station (*in downtown Denver*) to Denver International Airport will be built at the site of the new Stapleton RTD bus transfer station, accompanied by more trail work.



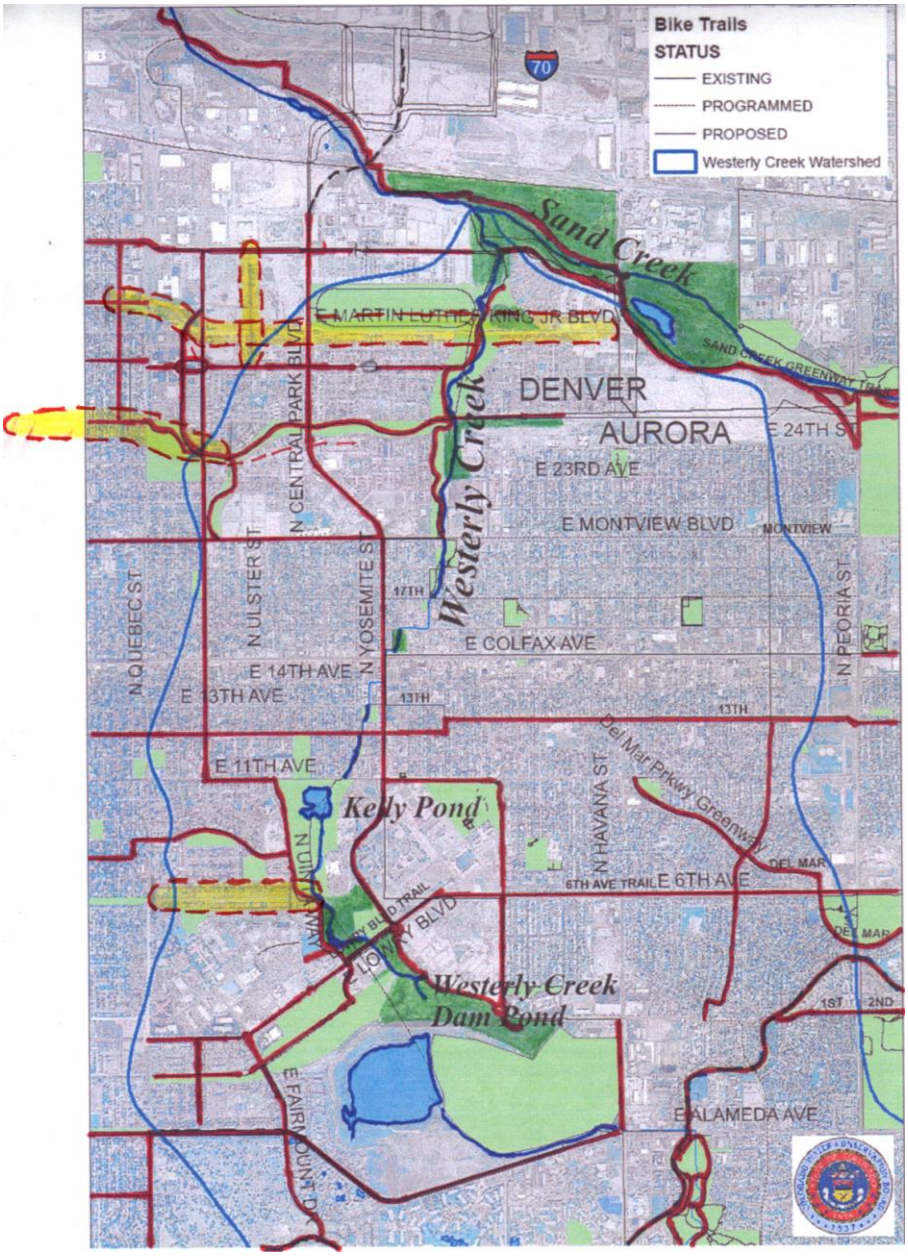
Major Circulation Infrastructure

2. Circulation near Westerly Creek below Westerly Creek Dam

The **Denver Moves** bicycle and pedestrian master planning study recommends some new/improved facilities that will be outside of the Project Corridor but in the immediate vicinity, to supplement the existing network:

- A bike lane on 6th Avenue from Quebec Street to Uinta Street (Lowry)
- A bike lane on 26th Avenue from downtown Denver to Uinta Street (ending at Stapleton)
- A bike lane on Martin Luther King Boulevard from Poplar Street to Havana Street (Stapleton)
- A bike lane on Uinta Street from 29th Avenue to Smith Road (Stapleton)

The map below shows bicycle routes (existing and proposed) in the portion of the Westerly Creek Corridor below Westerly Creek Dam. The Denver Moves recommendations are highlighted.



Existing and Proposed Bicycle Infrastructure below Westerly Creek Dam

3. Circulation Immediately Adjacent to the Project Corridor

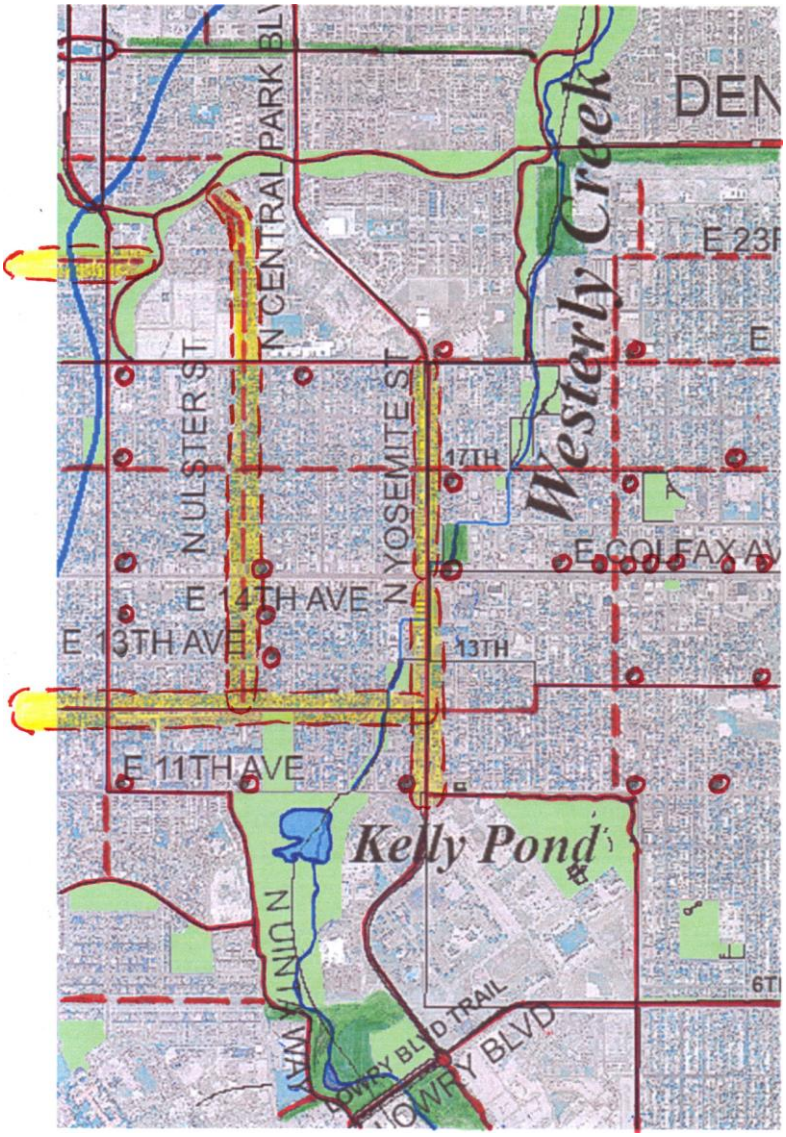
The additions and enhancements to the existing system of bicycle trails and routes within the Project Corridor proposed in the **Denver Moves** planning study are highlighted on the map on the following page.

- An upgrade to a "bicycle boulevard" on 12th Avenue from Monaco Street to Yosemite Street *(map shows from Rosemary to Yosemite only)*
- A "buffered bike lane" on Yosemite Street from 11th Avenue to Colfax Avenue
- A "paved shoulder/party parking bike lane" on Yosemite Street from Colfax Avenue to Montview Boulevard
- A "bicycle boulevard" on Uinta Street from 12th Avenue to the Stapleton greenway just south of 26th Avenue
- A "buffered bike lane" on 23rd Avenue from Monaco Street to the Stapleton greenway just east of Syracuse Street (Stapleton) *(map shows from Rosemary to just east of Syracuse only)*.

In the **Northwest Aurora Bicycle/Pedestrian Recommendations**, the following street segments are designated as "on-street proposed signed bike routes":

- 17th Avenue from Yosemite Street to Fitzsimmons
- Montview Boulevard from Yosemite Street/Central Park Boulevard to Fitzsimmons
- 23rd Avenue from Clinton Street to Fitzsimmons
- Yosemite Street from 13th Avenue to Montview Boulevard, continuing north on Central Park Boulevard in Stapleton
- Clinton Street from 11th Avenue to 23rd Avenue
- Dayton Street from 23rd Avenue to 26th Avenue

The locations of existing traffic signals are shown as well.



Existing and Proposed Bicycle Infrastructure near the Project Corridor

Westerly Creek Greenway Master Plan

Appendix 5

Connections to Greenway Features in and near the Project Corridor

The Westerly Creek Greenway will connect to other greenway features, existing and potential, in and near the Project Corridor. These features include **riparian nodes** (confluences with tributary drainages that can serve as greenway enhancements), **Low Impact Development street treatments** (curbside rain gardens and other streetscape water quality treatments), **circulations nodes** (streets that can serve as surrogate greenways), and **greenway nodes** (meetings with parks, open spaces, parkways and other greenways).

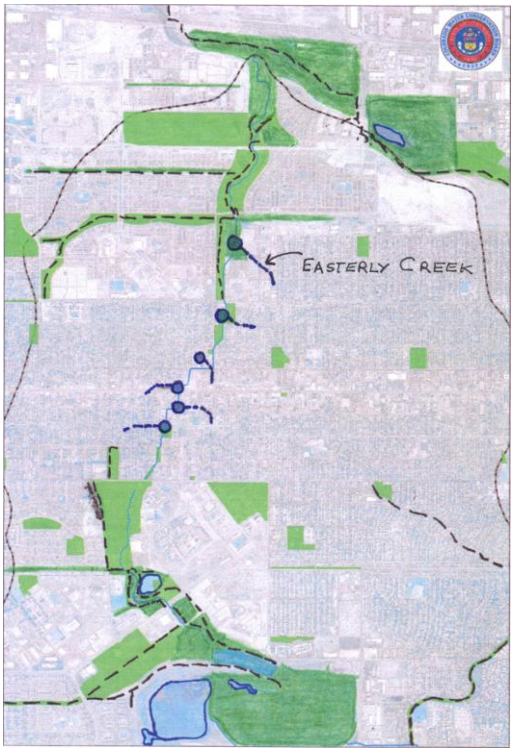
1. Riparian Nodes – Confluences with Tributary Drainages that Can Enhance the Greenway

Between 11th Avenue and 23rd Avenue Westerly Creek is joined by five (5) tributary drainages. At present, in normal circumstances flows in these tributaries are conveyed in storm sewers. When the storm sewers' capacities are exceeded, excess flows travel overland. The storm sewers meet Westerly Creek at 13th Avenue, 14th Avenue, Colfax Avenue, between16th Avenue and 17th Avenue, and between 19th Avenue and Montview Boulevard. In addition to these five tributaries, Easterly Creek *(discussed a little later in this Appendix)*, portions of which are in an open channel along Del Mar Parkway and other portions of which are confined to a storm sewer, has its storm sewer outfall into Westerly Creek a short distance north of 23rd Avenue. The NW Aurora Bicycle Recommendations propose that the bicycle path along Del Mar Parkway be extended two more blocks to the northwest, from 11th Avenue and Iola Street to 14th Avenue and Galena Street.

At Stapleton, outfalls of storm sewers with the creek channel have been designed to simulate natural confluences between tributary streams and a major creek. Large semi-circular drop structures with water quality ponds immediately below them create attractive and functional meetings of the smaller drainages and Westerly Creek. These confluences can serve as templates for similar confluences between 11th Avenue and 23rd Avenue. In addition, some tributary drainages could be candidates for "tributary mini-greenways" connecting to the Westerly Creek Greenway. The Greenway Park at Stapleton that meets Westerly Creek on its west bank at 26th Avenue is just such a tributary mini-greenway. It extends from Westerly Creek and 26th Avenue to Syracuse Street and Montview Boulevard, with a side connection to Fred Thomas Park at Quebec Street and 23rd Avenue.

Storm sewer outfall looks more like a tributary confluence, especially as vegetation matures

Greenway is both a water quality and drainage feature <u>and</u> a linear park with bike/ped trails



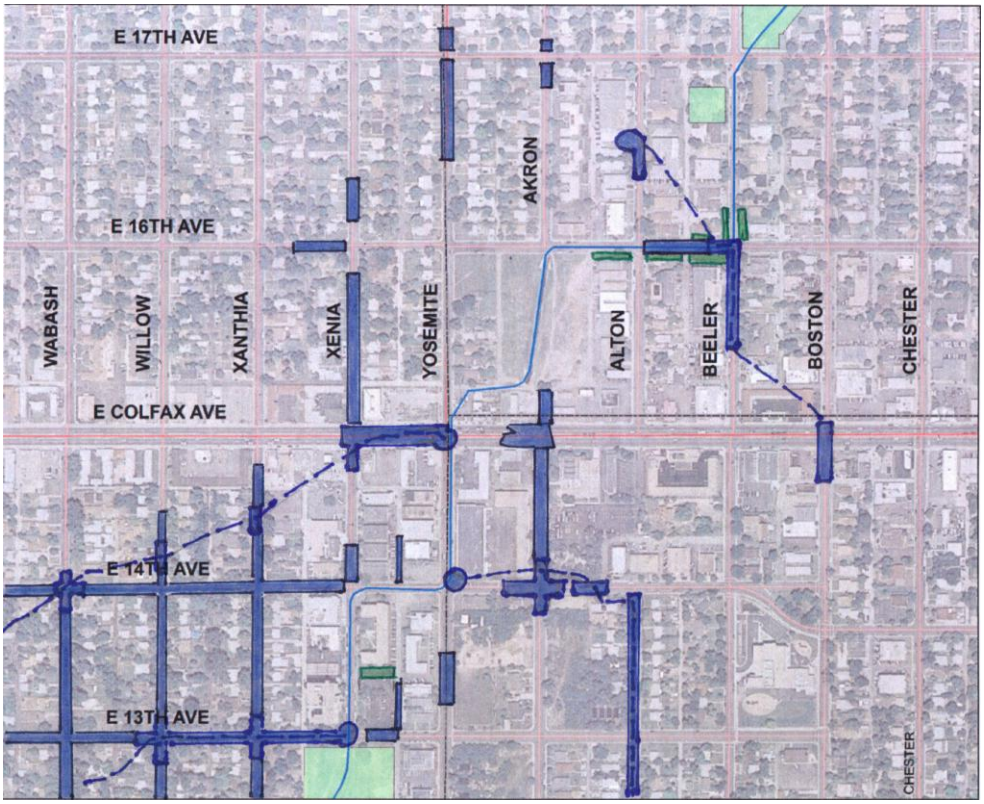
Riparian Nodes – Tributary Confluences Enhancing the Greenway

2. Low Impact Development Water Quality Treatments – Crossings of Streets by Tributary Drainages, Streets within the Approximate Geologic Floodplain, Potential Open Space Sites that Can Accommodate Low Impact Development Enhancements to Improve Water Quality Adjacent to the Greenway

Retrofitting of Low Impact Development (LID) water quality treatments such as rain gardens can improve water quality in street right-of-ways and open space sites (existing and future) adjacent to the greenway, thereby improving water quality in Westerly Creek. The five (5) tributary drainages that join Westerly Creek between 11th Avenue and 23rd Avenue Westerly Creek either cross or flow along several streets in the vicinity of the greenway corridor. Several street blocks are located within the geologic floodplain of Westerly Creek. There are sites within or immediately adjacent to the greenway corridor that are already publicly owned open space sites or that could be acquired for conversion to publicly owned open space sites, to accommodate LID water quality treatments as approximated by the 1977 UDFCD FHAD floodplain. The three maps below, one for each Project Corridor Planning Area, show the locations of all of those potential LID features between 11th Avenue and 23rd Avenue.

Examples of LID Street Treatments from Portland, OR

Locations of Potential LID Features – 11th Avenue to 13th Avenue



Locations of Potential LID Features – 13th Avenue to 17th Avenue

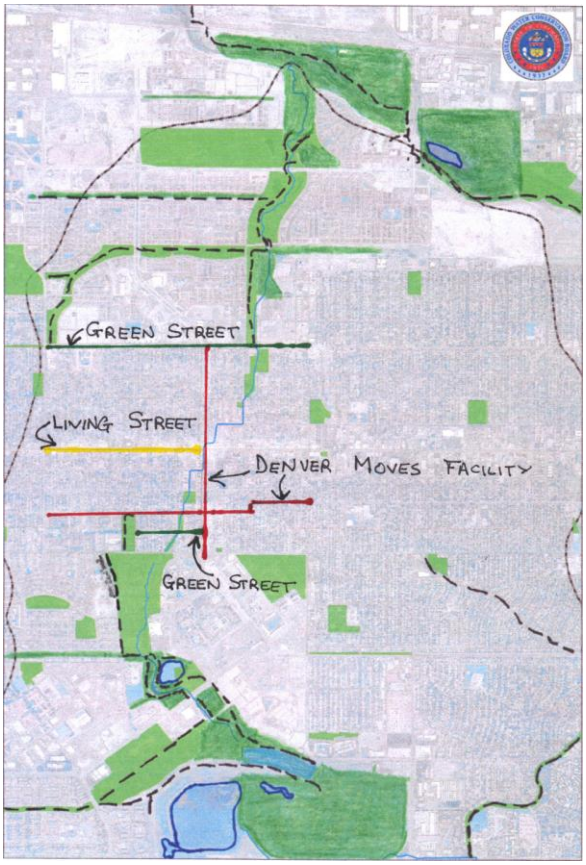
Locations of Potential LID Features – 17th Avenue to 23rd Avenue

3. Circulation Nodes - Connections to Streets that Can Serve As Surrogate Greenways

Between 11th Avenue and 23rd Avenue the greenway will intersect five (5) streets - Richthofen Avenue, 12th Avenue, Colfax Avenue, Montview Boulevard, and Yosemite Street - that can serve greenway functions. **Nodes** such as these intersections are characterized by the noted urban planner Kevin Lynch as "junctions and concentrations" or "connections of paths" that are "symbolic of the place where old men sit outside of a small village post office or where young people gather on a popular street corner." Lynch defines a **path** as "a place where the journey contains such a series of distinct events, a reaching and passing of one subgoal after another, the trip itself takes on meaning and becomes an experience in its own right." The alignment will take note of the potential these circulation nodes have to become meeting places to create positive experiences for visitors, whether they are travelling on the greenway or on the street.

- 12th Avenue and Yosemite Street are listed in Denver's 2011 Denver Moves Initiative as warranting improvement for bicycle and pedestrian travel. With specific regard to 12th Avenue, the Denver Moves plan shows that the bicycle/pedestrian connection from Lowry to 12th Avenue will be provided via the segment of 11th Avenue from Uinta Street to Verbena Street and the segment of Verbena Street from 11th Avenue to 12th Avenue. There is also a path within Verbena Park from the southwest corner of the park (*at 11th Avenue just east of the Post Office*) to the northeast corner of the park (*at 12th Avenue and Verbena Street*). 12th Avenue is also a designated bicycle route in Aurora; the route turns north at Boston Street and continues east on 13th Avenue.
- Colfax Avenue is a candidate Living Street, discussed in Denver's 2009 Living Street Initiative. It is highlighted on the map of circulation nodes from Syracuse Street to Yosemite Street.
- Richthofen Avenue and Montview Boulevard are listed as candidate Green Streets in Denver's 2005 Game Plan. Because Aurora is engaged in a planning effort for Montview Boulevard, it is highlighted on the map of circulation nodes as far east as Dayton Street.

The five circulations nodes are shown on the map that follows.



Circulation Nodes - Streets Serving as Greenways

4. Greenway Nodes - Connections to Parks, Open Space, Parkways and Other Greenways within the Project Corridor

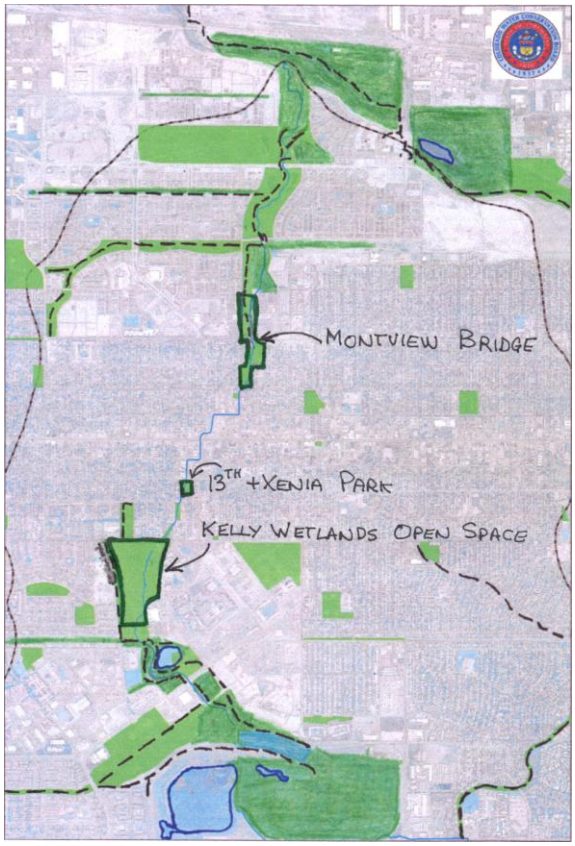
From 11th Avenue to 23rd Avenue, the greenway will intersect and connect existing and future parks, open spaces, and parkways, as well as other existing and future greenway facilities. These facilities and the greenway's interfaces with them will play a significant role in ensuring continuity from one location on the greenway to another location, and between the Westerly Creek Greenway and the existing greenway network.

11th Avenue – The northern end of the Westerly Creek Greenway at Lowry is 11th Avenue. It is also the southern end of the Westerly Creek Connection Greenway. Immediately south of 11th Avenue, significant improvements are currently under construction for the Kelly Wetlands Open Space at Lowry. Extending from 11th Avenue to 6th Avenue, the open space incorporates Kelly Road Dam, the wetlands immediately upstream of the dam, and trails along the top of the dam and at its base, adjacent to the wetlands.

13th Avenue and Xenia Street – A new park will be constructed by Denver Public Works on property owned by Denver Parks immediately south of the intersection of 13th Avenue and Xenia Street. Other partners in funding, planning and implementing the park include the Trust for Public Lands, Hope Communities, Mercy Housing and other housing providers. Funding has already been secured. Construction is anticipated to start in the spring of 2012.

17th Avenue to 23rd Avenue – Funding has tentatively been granted to the City of Aurora for a bridge over Westerly Creek at Montview Boulevard. Changes to existing trails in Montview Park south of Montview Boulevard and in Westerly Creek Park north of Montview Boulevard will accompany the replacement of the current culverts with the bridge. The bridge project will provide a grade-separated greenway crossing under Montview Boulevard between Aurora and Stapleton. The construction schedule has not been established at this time, pending environmental review of the project and resolution of the federal budget for FY 2011/2012.

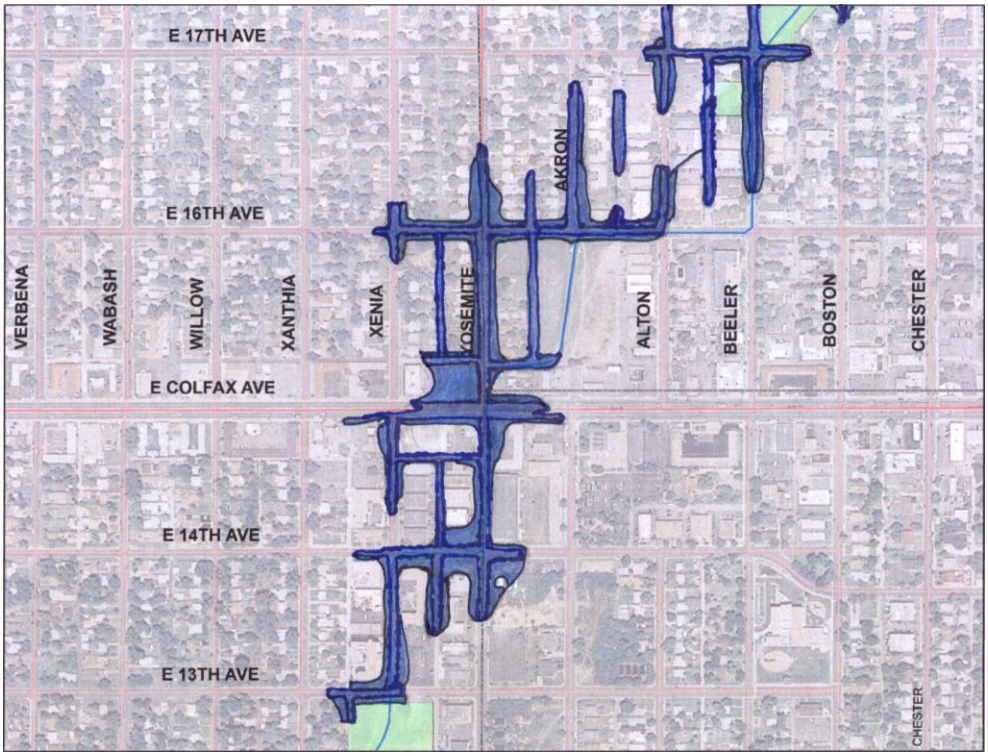
The map below shows the Greenway Nodes within the Project Corridor.



Greenway Nodes – Connections to Greenway Features within the Project Corridor

There is land located within the 2010 UDFCD existing conditions 100-year floodplain that is currently vacant, including strips and buffers of open land on privately owned sites. That vacant land has been identified as potential greenway open space on the three maps that follow, one for each Project Corridor Planning Area. Keeping this land vacant would ensure that flood risk facing existing and future buildings and infrastructure within the Project Corridor is not increased as a result of the implementation of greenway enhancements.

Locations of Potential Floodplain Open Space Features – 11th Avenue to 13th Avenue



Locations of Potential Floodplain Open Space Features – 13th Avenue to 17th Avenue

Locations of Potential Floodplain Open Space Features – 17th Avenue to 23rd Avenue

5. Greenway Nodes - Connections to Parks, Open Space and the Greenway Network beyond the Project Corridor - at Lowry and Stapleton

South of 11th Avenue is the Westerly Creek Greenway at Lowry and north of Montview Boulevard is the Westerly Creek Greenway at Stapleton. Within each of those infill developments there are connections between Westerly Creek and existing greenway features. In addition, there are connections to future greenway features.

Existing Greenway Features Near Westerly Creek at Lowry –

- CommonGround Golf Course
- Greenway path to top of Westerly Creek Dam
- Lowry Sports Complex
- Great Lawn Park
- 6th Avenue Parkway
- Montclair Recreation Center

Existing Greenway Features Near Westerly Creek at Stapleton –

- 26th Avenue greenway (west) to 23rd Avenue and Quebec Street and to Montview Boulevard and Syracuse Street
- 29th Avenue parkway
- Central Park Recreation Center
- Central Park

Future or Modified Features Near Westerly Creek at Lowry –

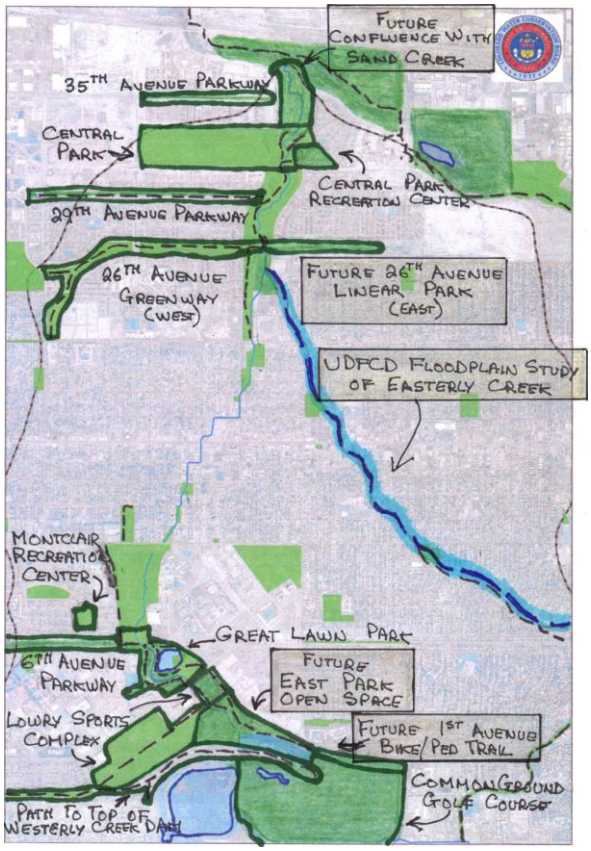
- Future 1st Avenue Trail from Dayton Street and 1st Avenue to Havana Street and 1st Avenue, terminating approximately ¾ mile from Expo Park in Aurora

- East Park Open Space – this open space, currently under construction, includes trails upstream of Big Bear Ice Arena to the outlets at Westerly Creek Dam, a dog park, open space along the improved creek channel, and stairs to the top of Westerly Creek Dam

Future or Modified Features Near Westerly Creek at Stapleton

- UDFCD floodplain study for Easterly Creek – Easterly Creek originates in the vicinity of Del Mar Circle in Aurora. The stream follows the alignment of Del Mar Parkway, crosses Colfax Avenue in a storm sewer, flows in a buried pipe near Aurora's City Park, and continues in that pipe to its outfall into Westerly Creek at the Stanley Aviation property south of 26th Avenue and east of Westerly Creek; the floodplain study was authorized at the 4/21/11 UDFCD meeting. This creek is the largest tributary to Westerly Creek in the vicinity of the Project Corridor. It is the only tributary drainage in the study area that is already partially in a greenway.
- 26th Avenue greenway and park (east) – this future linear park between 25th Avenue and 26th Avenue extends east from Westerly Creek; it includes a small drainageway flowing west into Westerly Creek, with its confluence in the same area as the confluence of Easterly Creek and Westerly Creek
- 35th Avenue parkway – this recently completed parkway joins the Westerly Creek Greenway immediately north of the boundary of current greenway improvements; it is not presently anticipated that 35th Avenue will cross Westerly Creek
- Confluence with Sand Creek – funding originally set aside for constructing a park at the confluence of Westerly Creek and Sand Creek was transferred to pay for the construction of a new elementary school; the schedule for designing and constructing the park has not been set at this time

The map below shows the Greenway Nodes beyond the Project Corridor - at Lowry and Stapleton. It also includes the alignment of Easterly Creek, part of which flows along Del Mar Parkway, before joining Westerly Creek at Stapleton.



Greenway Nodes – Connections to Greenway Features beyond the Project Corridor

Westerly Creek Greenway Master Plan

Appendix 6

Options for Creek Channel Cross-Sections Within the Project Corridor

Potential Variations in Cross-Sections of Open Channel Segments

The cross-section of most of the segments of Westerly Creek within the Project Corridor that are currently in an open channel is an engineered trapezoid. Depending on the specific location in the Project Corridor and the amount of space available, it may be possible to vary the cross-section of open channel segments from a strict trapezoidal design. Two options to provide variability that is similar the variability found in natural streams are: **(1)** designing a low-flow channel with a 2-year to 5-year capacity, with a bench transition to the 100-year channel/floodplain; and **(2)** designing overflow floodplains on the inside of channel meanders with higher banks on the outside of those banks.

For purposes of this Appendix, the Project Corridor has been divided into sixteen (16) numbered stream sections, including seven (7) culverts at street crossings. The map below shows those stream sections.

Stream Segments within Project Corridor

Option 1a - Low-Flow Channels Where There is Already an Open Channel

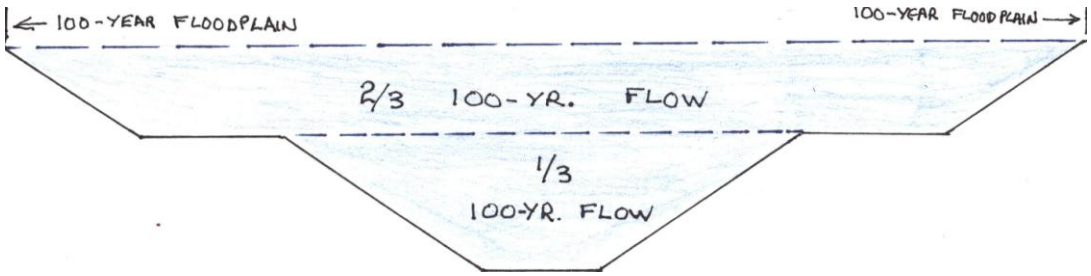
Between 11th Avenue and 23rd Avenue there are six (4) stream sections where the channel is already open. In those sections there is no additional culvert capacity, so the open channel must carry the entire 100-year flow, or out-of-bank flooding must be accepted during 100-year flood events. The stream sections where Westerly Creek is in an open channel, at least for a portion of the segment, are listed below.

Stream Sections with Existing Open Channel

Stream Section	Description

1	**11th Avenue to south side of Richthofen Place**
3	**North side of Richthofen Place to south side of 12th Avenue**
6	**New park south of 13th Avenue**
10	**Alley north of Colfax Avenue to south side of 16th Avenue**
14	**North side of 17th Avenue to south side of Montview Boulevard**
16	**North side of Montview Boulevard to 23rd Avenue**

Since the open channel in those segments must convey the full 100-year flow, it is likely that, if a low-flow channel is feasible, that low-flow channel should convey a 5-year flow. Generally in these particular segments the 5-year flow is approximately 30% - 40% of the 100-year flow. That means the low flow channel would convey roughly 1/3 of a 100-year flow and the channel and floodplain above the low-flow channel would convey roughly 2/3 of a 100-year flow.



Option 1b - Low-Flow Channels Where There is Currently Only a 10-Year Capacity Culvert and Where There Is a Possibility of Daylighting

There are three stream sections where there is currently a 10-year capacity culvert and where daylighting of the stream is a possibility. Those stream sections are shown below.

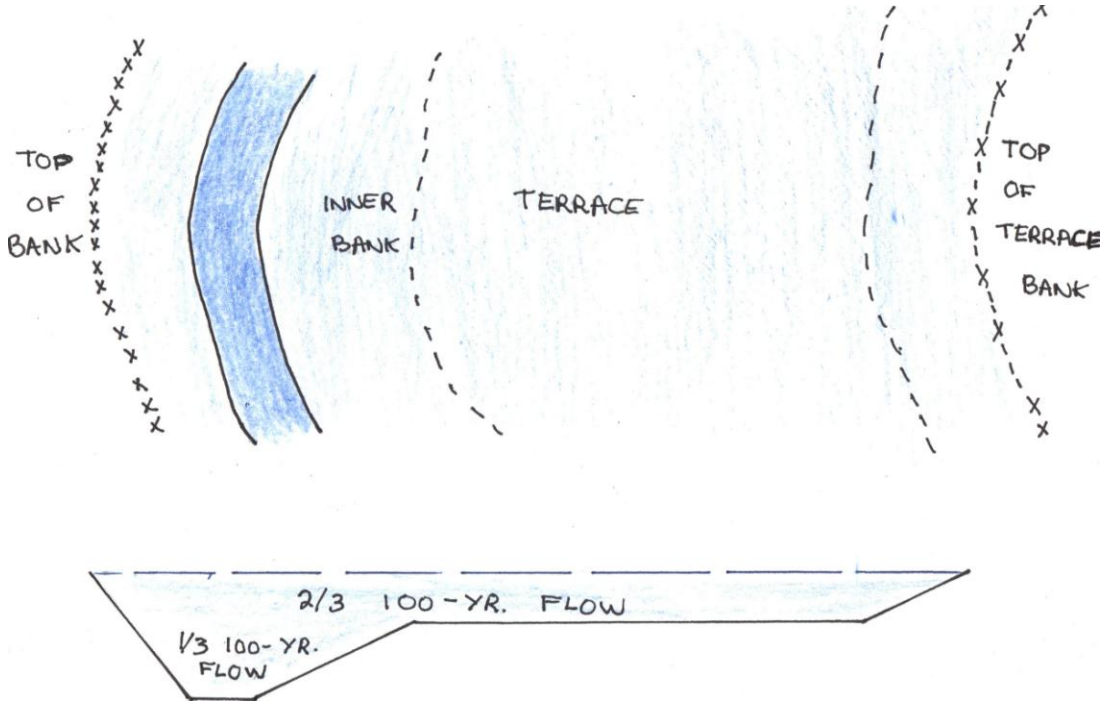
Stream Sections with Existing 10-Year Culvert where Daylighting Is Possible

Stream Section	Description
5	**North side of 12th Avenue to south end of new park south of 13th Avenue**
8	**North side of 13th Avenue to south side of Colfax Avenue**
12	**North side of 16th Avenue to south side of 17th Avenue**

A daylighted channel in any portion of those stream sections will be conveying only that portion of the 100-year flow not already conveyed by the existing 10-year culvert. Generally the excess flow (the flow capacity gap) is 100% to 120% of the 10-year flow, or approximately ½ of the **full** 100-year flow. In these segments, it seems reasonable that, if a low-flow channel is feasible as part of daylighting, that low-flow channel could convey a 2-year flow. Generally in these particular stream sections the 2-year flow is approximately 20% of the **full** 100-year flow, but approximately 35% to 40% of the capacity gap that actually needs to be conveyed. That means the low flow channel would convey roughly 20% of a 100-year flow, the channel and floodplain above the low-flow channel would convey roughly 35% - of a 100-year flow, and the existing culverts would convey roughly 45% of a 100-year flow.

Option 2 - Overflow Floodplains at Inside of Stream Meanders

Natural streams may include reaches with relatively straight channel alignments where the variability is mostly vertical (*drop, pool, drop, pool, etc.*) due to local topography and geology. Many natural stream reaches, including reaches with flatter topography and erosive soils, are characterized by horizontal meanders. Generally flood flows passing through those meanders will overflow to the inside of the meanders while the outside of those meanders will have steeper banks that flows generally do not overtop. This conceptual model can be used, as appropriate, on selected segments of open channel on Westerly Creek. It will provide variability in the channel cross-section that is potentially aesthetically pleasing and also consistent with the shape of natural stream systems. It may also allow for the installation of human-oriented features such as steps or mini-plazas.



Westerly Creek Greenway Master Plan

Appendix 7

Evaluating Alternative Greenway Alignments

Evaluating Alternative Greenway Alignments

For each of the three Planning Areas, the alternative Greenway Alignments were evaluated to determine how well they could address the Goals and Objectives. The Goals and Objectives served as a starting point for the development by the WCC team of ten (10) evaluation criteria. The scoring system allowed up to 5, 10, or 15 possible points for each criterion, depending on the overall importance of the criterion. The application of the scoring system led to the selection of the highest-scoring Greenway Alignment for each Planning Area. Then design details and concepts were added to the Greenway Alignments to arrive at "fleshed-out" Greenway Vision Concepts for each Planning Area.

Criteria for Selecting Greenway Vision Concepts in Geographic Segments

Criterion #	Criterion Description	Goal Addressed	Possible Scores
1	*Utilization of open channel segments*	**Support & enhance flood protection**	**15**
2	*Horizontal proximity to creek*	**Support & enhance flood protection**	**10**
3	*Vertical proximity to creek*	**Support & enhance flood protection**	**10**
4	*Provision of opportunities for greenway art, international culture, or features promoting healthy living*	**Integrated system of amenities and open spaces** (Community amenities)	**10**
5	*Encouragement of economic redevelopment*	**Integrated system of amenities and open spaces** (Community amenities)	**5**
6	*Connection to existing parks and green spaces*	**Integrated system of amenities and open spaces** (Open spaces)	**15**
7	*Creation of new/unique greenway amenities*	**Integrated system of amenities and open spaces** (Open spaces)	**15**
8	*Ease of crossing major streets*	**Consider circulation patterns and needs**	**15**
9	*Enhancement of interface with circulation infrastructure*	**Consider circulation patterns and needs**	**10**
10	*Connection to specific travel destinations*	**Consider circulation patterns and needs**	**5**

The selection criteria were applied in a scoring matrix to the **Greenway Alignments** for each of the three Geographic Segments. The criteria that were included in the matrix were selected to address the Greenway Master Plan Goals and Objectives.

Goal 1 - Support and enhance flood protection and public safety, while promoting daylighting of the stream channel wherever possible

- Support the implementation of appropriate and cost-effective flood control measures
- Ensure safe passage of the 100-year flood when considering new open channel sections to replace existing culverts

Criterion #1 - *Utilization of current open channel segments*
Criterion #2 - *Horizontal proximity to creek*
Criterion #3 - *Vertical proximity to creek*

Goal 2 - With the help of public involvement, transform the Westerly Creek corridor into an integrated system of individual amenities and open spaces

- Provide opportunities for recreation, connection with nature, healthy living, and education and incorporate elements conducive to improved access to the creek
- Provide a connection to existing parks and open spaces from Lowry to Stapleton
- Acknowledge and enhance the connection to greenway features within Lowry and Stapleton

Criterion #4 - *Provision of opportunities for greenway art, international culture, or features promoting healthy living*
Criterion #5 - *Encouragement of economic redevelopment*
Criterion #6- *Connection to existing parks and green spaces*
Criterion #7- *Creation of new/unique greenway amenities*

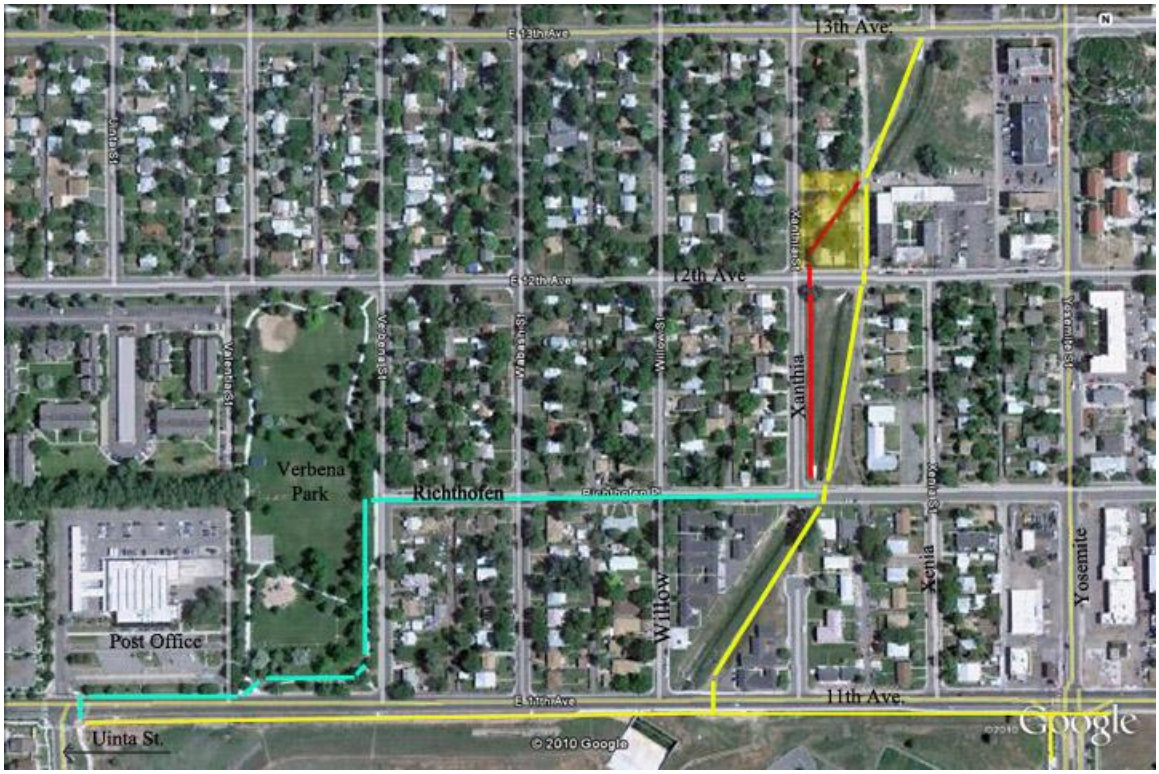
Goal 3 - Consider existing circulation patterns and needs in the area for bicyclists and pedestrians

- Minimize conflicts with streets and highways
- Connect bicyclists and pedestrians to paths, trails and mass transit systems
- Identify specific travel destinations within the study corridor and within the entire watershed and enhance the appeal of these destinations and the ease of travel to them for bicyclists and pedestrians

Criterion #8 - *Ease of crossing major streets*
Criterion #9 - *Enhancement of interface with circulation infrastructure*
Criterion #10 - *Connection to specific travel destinations*

The maximum possible score for a single **Greenway Alignment** was 110 points. In the Middle Planning Area the alignments were split into three parts (13th Avenue to Colfax Avenue; Colfax Avenue to 16th Avenue; 16th Avenue to 17th Avenue), each of which was scored separately. The actual scores ranged from 24 points to 88 points. The three **Greenway Alignments** receiving the highest scores, including the three separately scored parts for the Middle Planning Area combined as one alignment, were selected as the **Greenway Vision Concepts** for their respective Planning Areas.

POTENTIAL GREENWAY ALIGNMENTS: 11TH TO 13TH AVE.



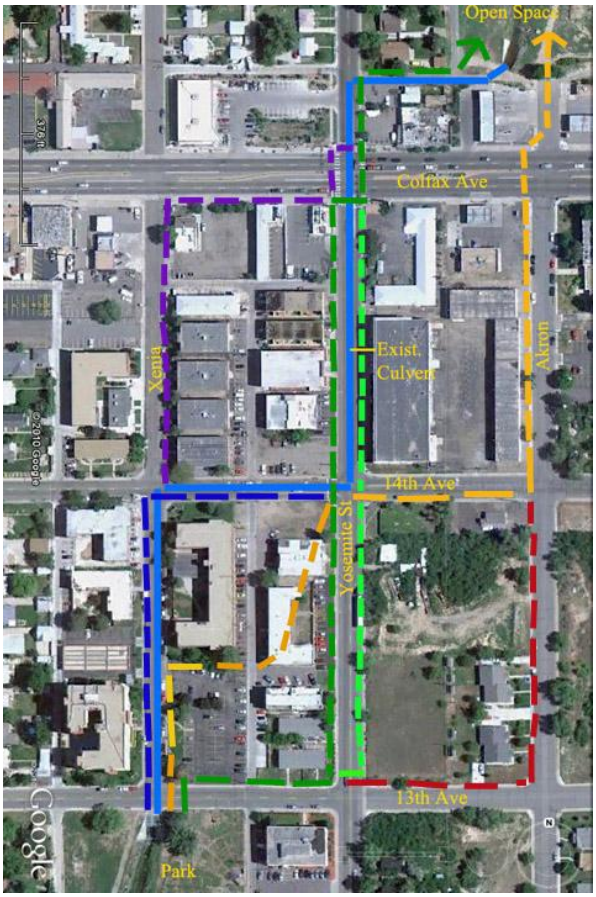
1: Cross 11th Ave at Uinta, (existing traffic light) then east in front of Post Office and through Verbena Park to Richthofen Place. Continue on Richthofen to Xanthia at the channel.

2: Along the south side of 11th Avenue from both Uinta and Yosemite. Cross 11th Ave between Willow and Xanthia (Stop sign or signal). Continue along the channel north to 12th Avenue. Cross at mid-block to alley, then go north on alley to park. Widen the existing 5' wide walk on the south side of 11th Ave to a 10' or 12' wide trail.

3: Along the south side of 11th Avenue. Cross 11th Ave between Willow and Xanthia (Stop sign or signal). Continue along the channel north to Richthofen, and cross to the west side of the channel to go to 12th Avenue. Cross 12th on east side of Xanthia at location of five or six houses where a future open space with an open channel is proposed (once houses are acquired). Go through open space to park.

4: ***(Additional alignment, not originally shown)*** Along south side of 11th Avenue. Cross 11th Ave between Willow and Xanthia (Stop sign or signal). Continue along the channel north to Richthofen, and cross to the west side of the channel to go to 12th Avenue. Cross 12th at Xanthia. Follow bicycle route on Xanthia to 13th. Turn east and continue on south sidewalk (widened from 3' to 10'), from Xanthia ½ block to northwest corner of new park.

POTENTIAL GREENWAY ALIGNMENTS: 13TH TO COLFAX AVE.



1: Street lawn of Xenia Street north ½ block, then east across alley, then northeast to the corner of 14th and Yosemite: (*requires two apartment properties at the west side of Yosemite, south of 14th Ave.*) North on west side of Yosemite to southwest corner at Colfax (*requires redevelopment of apartment properties on the west side of Yosemite, north of 14th Ave.*) - ***(Note that this alignment is shown incorrectly north of 14th on the map above)***

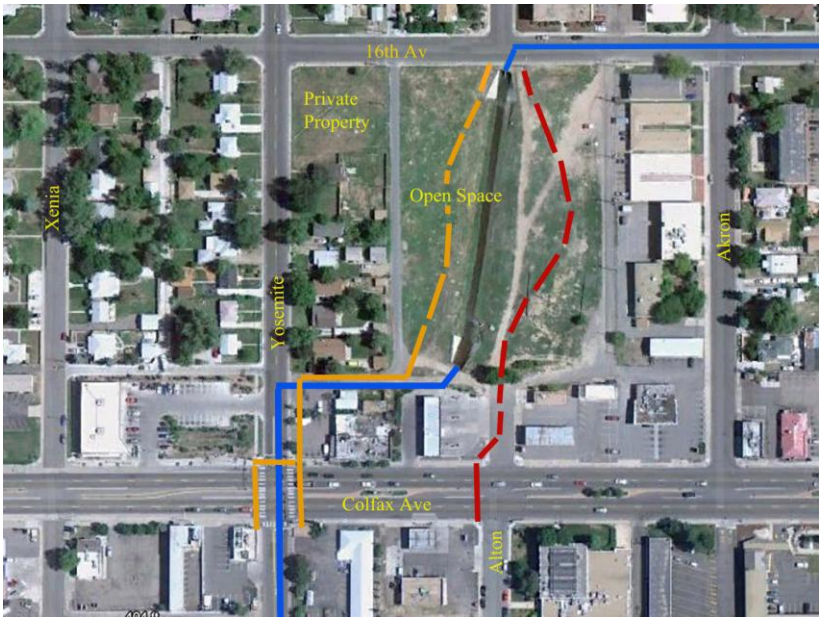
2: North on Xenia to 14th Ave. then east on 14th Ave to Yosemite. From here 3 options are available to continue north to Colfax: **(1)** West side of Yosemite, **(2)** East side of Yosemite, **(3)** Akron

3: North on Xenia across 14th to Colfax, then east to Yosemite, then two options are available at Colfax: **(A)** Cross Colfax first then Yosemite, **(B)** Cross Yosemite first then Colfax (using existing traffic lights)

4: Cross 13th Ave. at Xenia, east to Yosemite, then north on Yosemite to 14th Avenue. From here 3 options are available to continue north to Colfax: **(1)** West side of Yosemite, **(2)** East side of Yosemite ***(Note that this alignment is shown in the wrong color north of 14th on the map above)***, **(3)** Akron

5: East on south side of 13th Ave to Yosemite. From here 3 options are available available to continue north to Colfax: **(1)** West side of Yosemite, **(2)** East side of Yosemite, **(3)** Akron - ***(Note that this alignment is not shown on the map above)***

POTENTIAL GREENWAY ALIGNMENTS: COLFAX TO 16TH AVE.



1: Cross Colfax at Yosemite (using existing traffic light), then north on Yosemite, then east to the channel and open space; two options are available at Colfax: **(A)** Cross Colfax first then Yosemite, **(B)** Cross Yosemite first then Colfax

2: Cross Colfax at Akron (this would require a new traffic signal, synchronized with Yosemite), then north through the Akron Right-of-Way and into the open space (*or alternatively, backtrack on south sidewalk on Colfax to Yosemite and cross Colfax there*)

POTENTIAL GREENWAY ALIGNMENTS: 16TH TO 17TH AVE.

1: North on Akron from 16th to 17th Ave, then east on 17th to Beeler

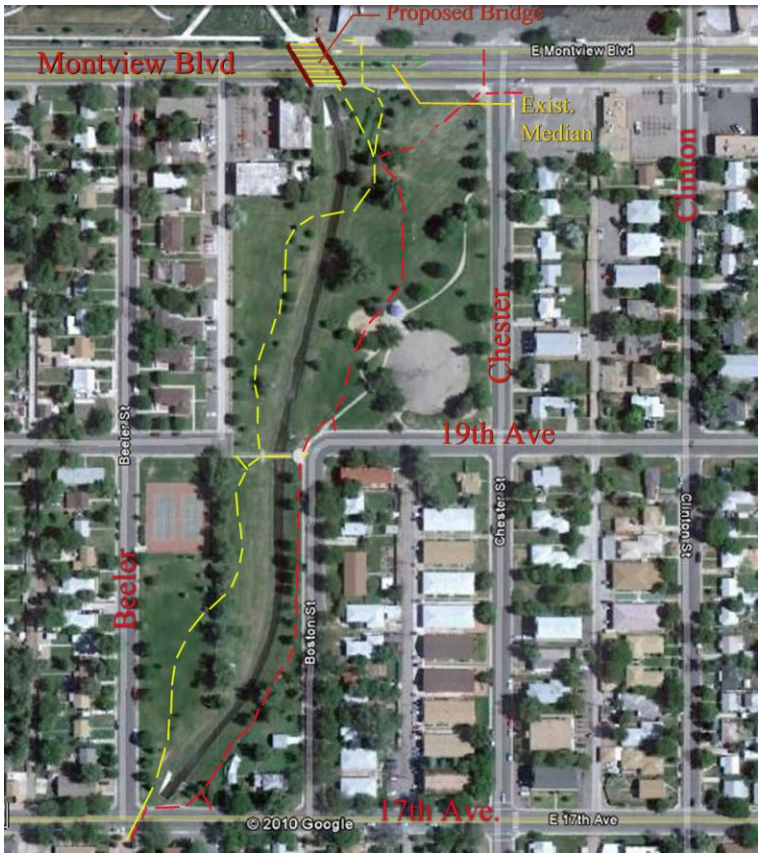
2: East on 16th Ave, then north on Beeler

3: East on 16th Ave. to Alton, then north on Alton to 17th Ave, then east to Beeler

4: Cross 16th Ave at Akron, then proceed diagonally north east along the new open channel to Beeler at 17th

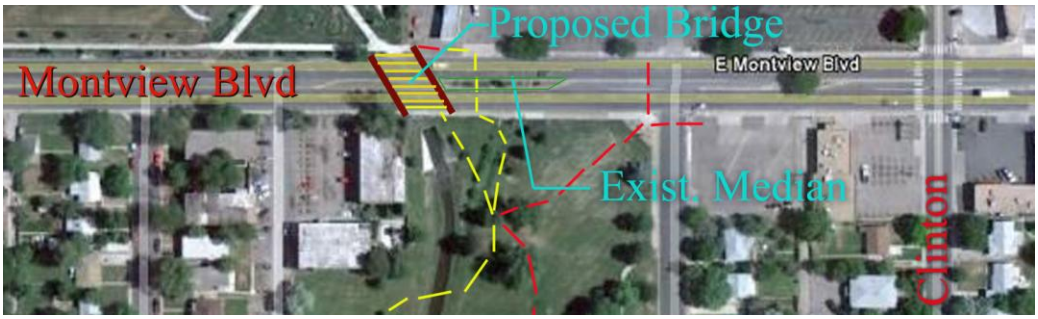
Existing Culvert

POTENTIAL GREENWAY ALIGNMENTS: 17TH AVE. TO MONTVIEW BLVD.



Montview Park is already a greenway, however, it lacks trails in a north-south direction. The 2010 UDFCD Report calls for the creek to be deepened and widened within the park. The flood control changes to the channel and the park offer the City of Aurora an opportunity to enhance the creek edge and integrate the creek with greenway trails and other amenities within the park.

POTENTIAL GREENWAY ALIGNMENTS: ACROSS MONTVIEW BLVD.



1: North from Montview Park at a point approximately 200 – 250 feet west of Chester Street, across the eastbound lanes of Montview Boulevard to the existing median; continue north across the westbound lanes to the sidewalk on the north side of Montview; turn west and proceed to the existing path in Stapleton's Westerly Creek Park, turn north and continue to 23rd Avenue – **4:** Grade-separated crossing (*new bridge)*

Northeast to the northeastern corner of Montview Park, at Montview Boulevard and Chester Street; two options are available at that corner: **(2)** Cross Montview at Chester, then turn west on the sidewalk on the north side of Montview and continue to Westerly Creek Park **(3)** Cross Chester and continue east on the sidewalk on the south side of Montview to Clinton Street; cross Montview at the signal, turn west on the sidewalk on the north side of Montview and continue to Westerly Creek Park.

Summary of Scores for Selecting Greenway Alignments

Alignment	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL
Maximum	***15***	***10***	***10***	***10***	***5***	***15***	***15***	***15***	***10***	***5***	***110***
South-1	*8*	*6*	*6*	*8*	*0*	*10*	*8*	*10*	*8*	*4*	**68**
South-2	*10*	*8*	*8*	*8*	*0*	*8*	*9*	*8*	*6*	*3*	**68**
South-3	*12*	*9*	*9*	*9*	*0*	*8*	*12*	*8*	*8*	*5*	**80**
South-4	*9*	*8*	*7*	*7*	*0*	*7*	*9*	*8*	*8*	*3*	**66**
Middle (S)-1	*0*	*9*	*9*	*4*	*6*	*6*	*11*	*5*	*3*	*3*	**56**
Middle (S)-2	*0*	*7*	*7*	*5*	*6*	*4*	*5*	*5*	*4*	*3*	**46**
Middle (S)-3	*0*	*6*	*6*	*5*	*6*	*4*	*5*	*5*	*4*	*3*	**44**
Middle (S)-4	*0*	*4*	*5*	*6*	*7*	*4*	*6*	*5*	*4*	*3*	**44**
Middle (S)-5	*0*	*4*	*5*	*6*	*7*	*5*	*6*	*5*	*4*	*3*	**45**
Middle (Colfax)-1	*8*	*6*	*7*	*6*	*7*	*8*	*12*	*9*	*7*	*4*	**74**
Middle (Colfax)-2	*8*	*4*	*5*	*6*	*5*	*8*	*9*	*6*	*5*	*3*	**59**
Middle (N)-1	*0*	*5*	*6*	*5*	*0*	*7*	*7*	*7*	*4*	*2*	**43**
Middle (N)-2	*0*	*5*	*6*	*4*	*0*	*9*	*6*	*9*	*4*	*3*	**46**
Middle (N)-3	*0*	*6*	*7*	*5*	*0*	*8*	*8*	*7*	*4*	*2*	**48**
Middle (N)-4	*0*	*9*	*9*	*8*	*0*	*11*	*14*	*9*	*5*	*5*	**70**
North-1	*8*	*7*	*7*	*7*	*3*	*9*	*8*	*4*	*5*	*3*	**61**
North-2	*5*	*5*	*5*	*5*	*2*	*5*	*5*	*7*	*5*	*3*	**47**
North-3	*4*	*4*	*4*	*4*	*2*	*4*	*4*	*10*	*7*	*3*	**46**
North-4	*12*	*9*	*9*	*9*	*4*	*12*	*12*	*14*	*8*	*5*	**94**

For each of the Planning Areas, the alternative **Greenway Alignment** that received the highest score in the scoring matrix was selected for further analysis and conceptual visioning. Those three **Greenway Alignments** are listed in the table below and are illustrated on the following pages.

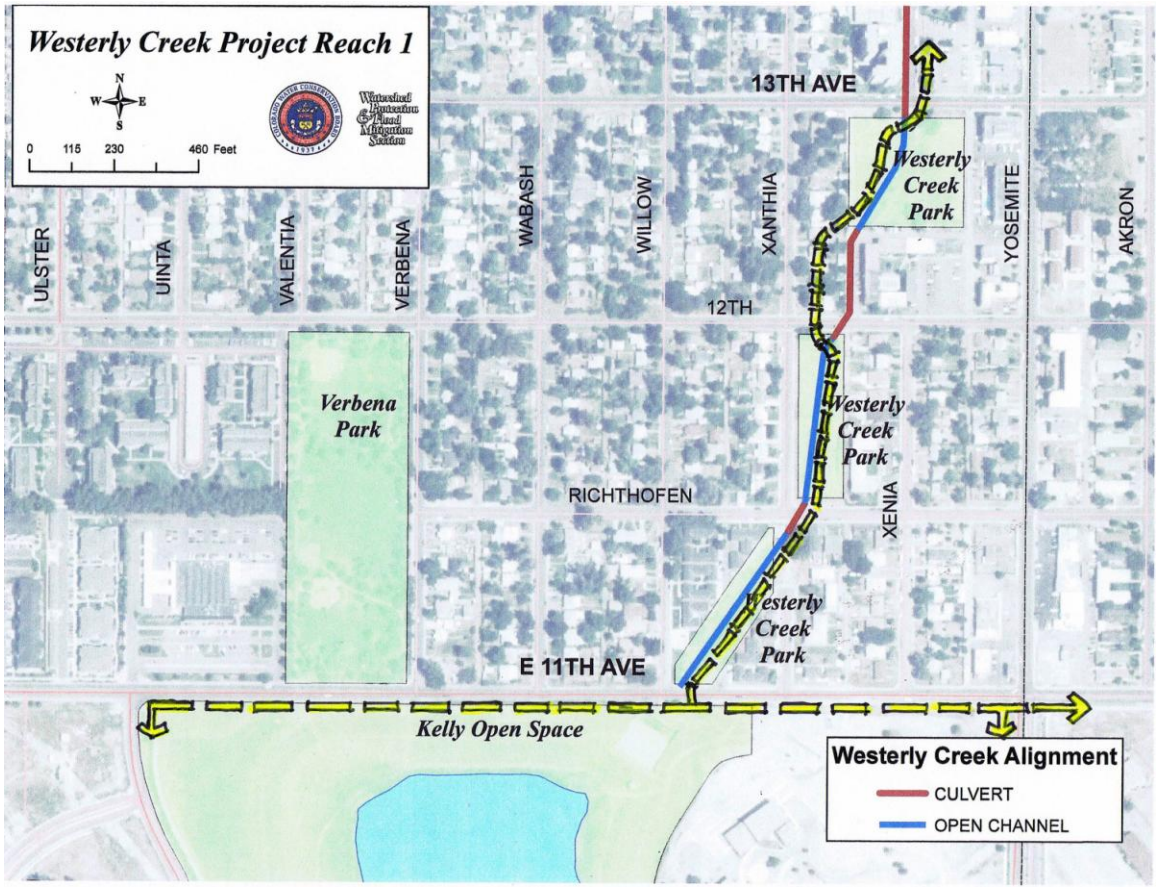
Highest Scoring Greenway Alignments

Alignment	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	TOTAL
Maximum	***15***	***10***	***10***	***10***	***5***	***15***	***15***	***15***	***10***	***5***	***110***
South-3	*12*	*9*	*9*	*9*	*0*	*8*	*12*	*8*	*8*	*5*	**80**
Middle (S)-2	*0*	*9*	*9*	*4*	*6*	*6*	*11*	*5*	*3*	*3*	**56**
Middle	*8*	*6*	*7*	*6*	*7*	*8*	*12*	*9*	*7*	*4*	**74**

(Colfax)-1											
Middle (N)-2	*0*	*9*	*9*	*8*	*0*	*11*	*14*	*9*	*5*	*5*	**70**
North-4	*12*	*9*	*9*	*9*	*4*	*12*	*12*	*14*	*8*	*5*	**94**

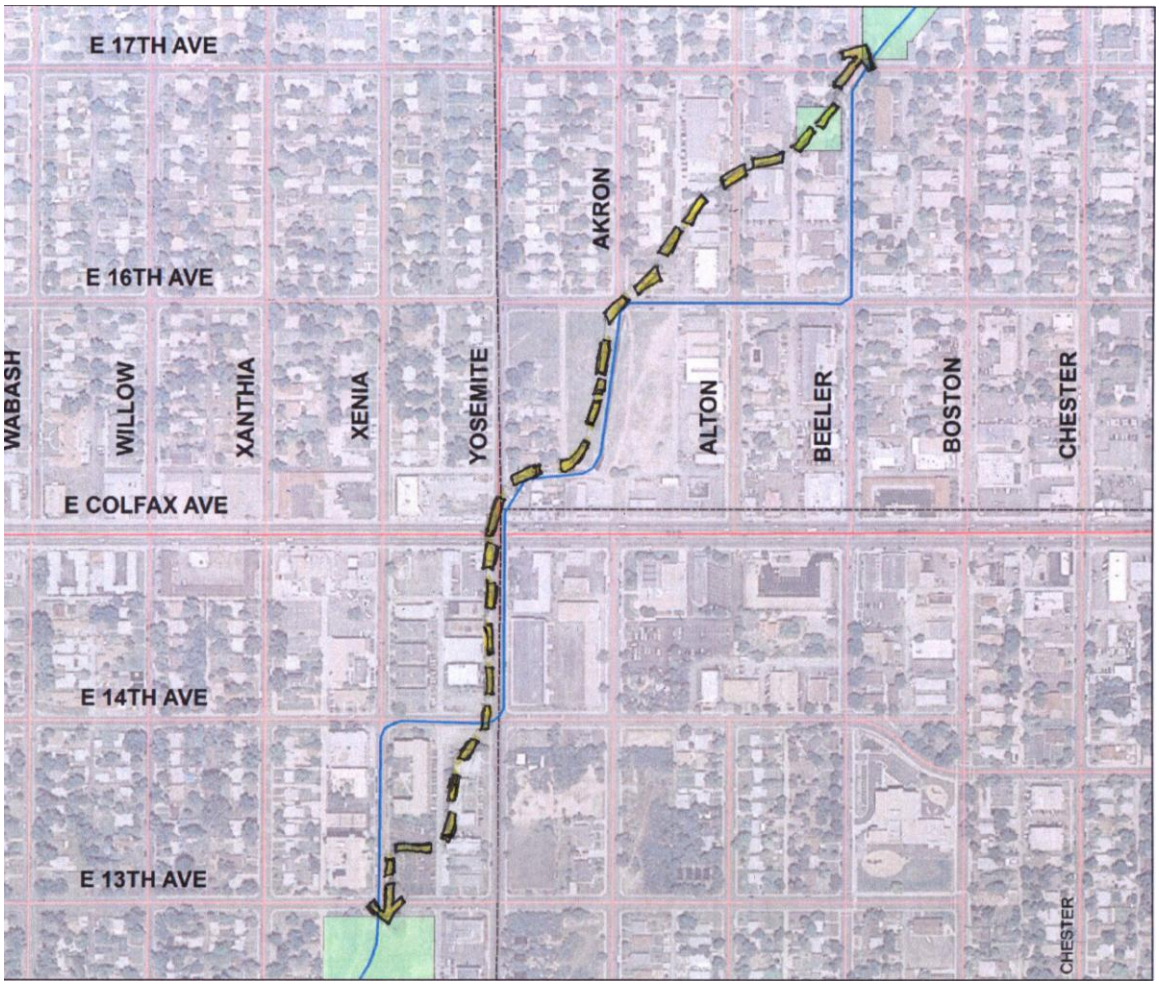
Highest-Scoring Greenway Alignment for Geographic Segment # 1

11th Avenue – 13th Avenue



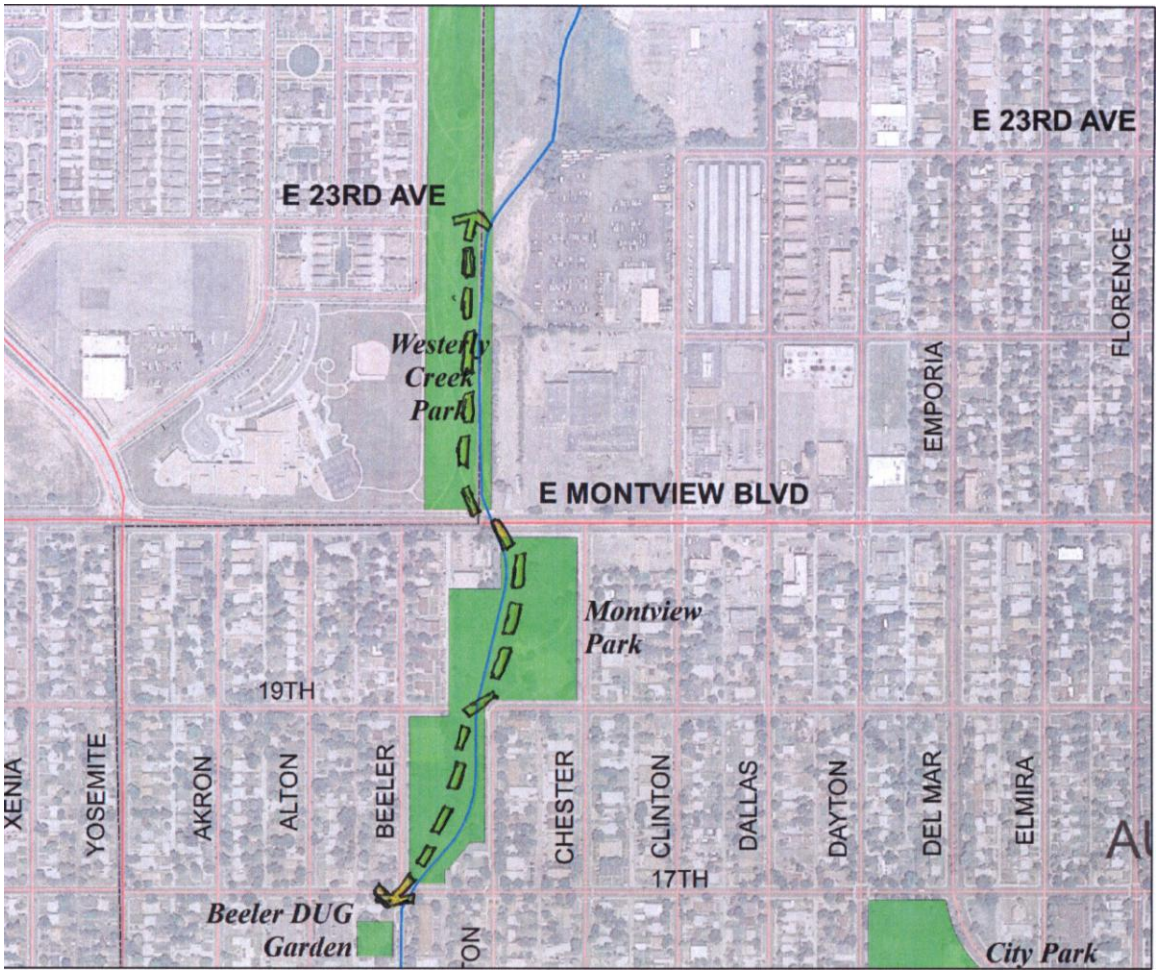
Highest-Scoring Greenway Alignment for Geographic Segment # 2

13th Avenue – 17th Avenue



Highest-Scoring Greenway Alignment for Geographic Segment # 3

17th Avenue – 23rd Avenue



Westerly Creek Greenway Master Plan

Appendix 8

Greenway Elements

Greenway Elements

Various elements were considered in refining Greenway alignments

Trail Width and Location

Above is the Boulder Creek Trail showing a trail that has been widened by adding pavement and by encroaching into the unpaved area. Make the trail wide enough to easily accommodate pedestrians and bikers.

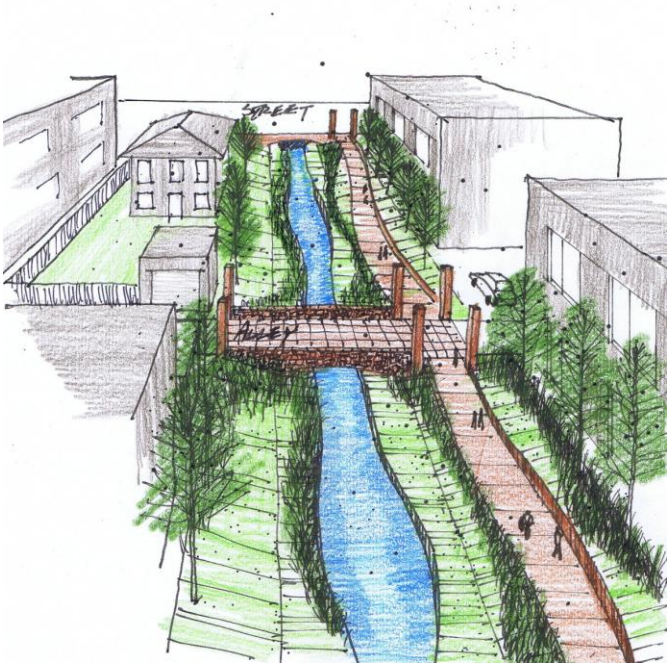
Since bikes are quiet and fast, they tend to sneak up on pedestrians from behind and give an uncomfortable feeling. A trail option is to provide two separate trails as shown above and right.

Trail / Creek Edges

Above: Provide open grass areas adjacent to the trail for informal play and sitting.

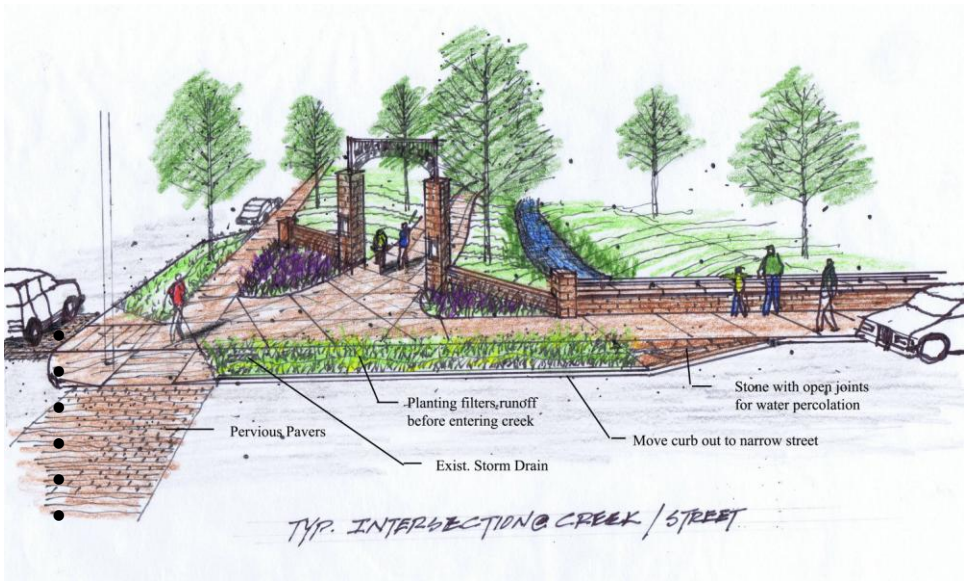
Above: Provide a few areas where the trail Edge is hard against the creek to allow sitting.

Above: Provide open lawn areas next to trail for play and sitting

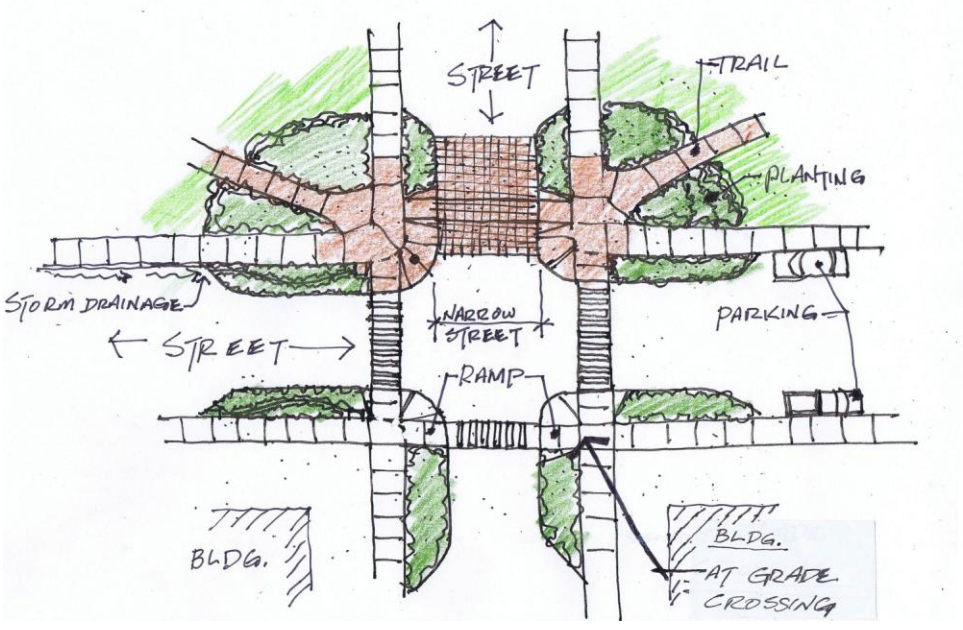


If strategic buildings are purchased from willing sellers, there will be opportunities to extend the creek between remaining structures. This concept provides a strong amenity for the neighborhood and introduces a new, safe trail system and also ties various areas together.

Connecting to the Creek and Greenway



Above: Since the Greenway is located within the urban corridor, there will be many street crossings required. This concept shows the idea of highlighting a typical street corner with a vertical element or gateway, improving the quality of channel headwall, and narrowing the street width.



Above: A plan view of the typical local street crossing at a greenway entry point: Narrow the streets by moving curb closer to street centerline; For better water equality within the creek, break curb to allow drainage through planted area; provide highlighted crosswalks to slow traffic

Pedestrian Signal Crossings

Pedestrian crossings are critical within this project, especially on collector streets where there are currently no traffic signals such as 11th Ave., 13th, 14th, Yosemite, Colfax, 17th., and Montview.

These photos show pedestrian activated signals across Broadway on the Boulder CU campus.

Signage

Various types of signage will be needed: Directional, Information and Educational.
The way this signage is presented adds to the quality of the greenway experience. At left is a bad example of presentation; photos at bottom of page are better.

Westerly Creek Greenway Master Plan

Appendix 9

Art in the Project Corridor

ART ON THE CREEK AND WITHIN THE GREENWAY

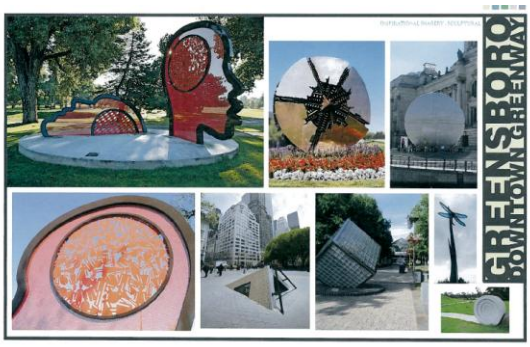
Public art will be a significant feature along the Westerly Creek Greenway, including functional pieces such as benches, bike racks, trash cans, and signage, as well as pieces for historical and inspirational purposes.

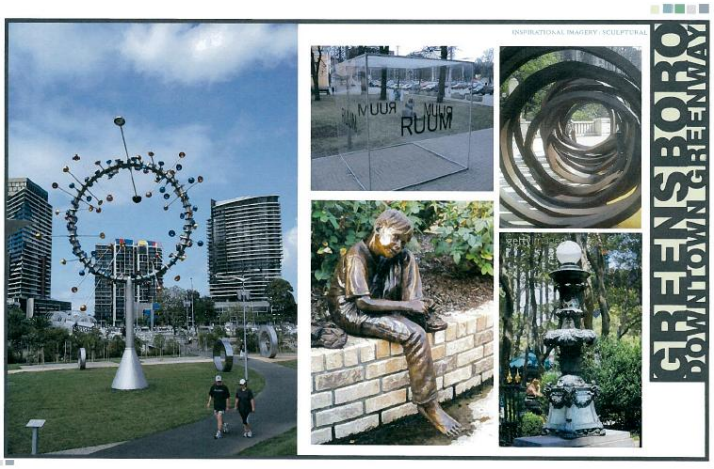
Stapleton and Lowry each have significant public art programs. The Stapleton Public Art Master Plan was adopted in 2005. It has as its stated goal "*to acquire a broad collection of unique and diverse public art for Stapleton that demonstrates the highest levels of artistic excellence, engages the community and creates a positive identity that promotes the quality of life at Stapleton and enhances the metropolitan Denver community.*"

Greensboro, North Carolina

The Downtown Greenway will run 4 miles around Greensboro's center city, passing through more than a dozen neighborhoods. This urban trail includes stretches through parklike green spaces, along the path of old railway tracks and alongside city streets and sidewalks.

Public art will be a significant feature along the Downtown Greenway, including functional pieces such as benches, bike racks, trash cans, and signage, as well as pieces for historical and inspirational purposes.





Memphis, Tennessee (educational, geographic, and scientific art installation)

The Riverwalk on Mud Island in Memphis is an exact scale model of the Lower Mississippi River flowing from its confluence with the Ohio River at Cairo, Illinois 954 miles south to the Gulf of Mexico

- Twenty cities are mapped along the Riverwalk showing the 1,000 mile journey of the river
- There are four watershed walls which map the entire drainage area of the Mississippi River
- The model empties into an acre size Gulf of Mexico The "1,000" mile journey on the Riverwalk concludes at the Gulf of Mexico, a one-acre enclosure that holds 1.3 million gallons of water. There, visitors can enjoy a leisurely pedal boat ride around the Gulf area with the Memphis skyline in the background.

New York City, New York

Former Talking Heads leader, David Byrne, an avid biker, designed nine bike racks that incorporate a theme/trademark of the particular part of New York City they were nailed into. The dollar sign bike rack stands in the Wall Street neighborhood. The high heel bike rack was installed uptown, near all the chic boutiques and department stores like Bergdorf Goodman.

Top row, left to right: MoMA, Olde Times Square and Villager

Middle row, left to right: Coffee Cup, Wall Street and Ladies' Mile

Bottom row, left to right: Hipster, Chelsea and Jersey

Chattanooga, Tennessee

The trail as art: a serpentine path and planters descending from the Chattanooga Art Museum to the greenway along the Tennessee River in downtown Chattanooga

Art Installations in Denver

Denver (*South Platte River*)

Heron Pond Natural

A wire nest with concrete eggs engraved with birds' names is hidden in a crevice of the wall made of broken sidewalk concrete, which serves as a wildlife watching blind

Denver (*A New Installation on Lower Westerly Creek*)

The latest commission for the Stapleton Public Arts Program was installed along Westerly Creek in September 2010. The artwork was dedicated on September 17, 2010. The artist selected for this particular installation was Thomas Sayre, a sculptor from Raleigh, North Carolina. Stapleton United Neighbors provided the following description of Thomas Sayre's project. "*Sayre's large earthcast vessels subtly imply water, balance, man and nature; a focusing device for the many functions performed by Westerly Creek. The vessels will be placed on their sides in five different configurations in Westerly Creek Park between the bridges at Martin Luther King Boulevard and East 26th Avenue.*" The artist noted, "*Just like Westerly Creek itself, this public art project intentionally plays with ideas about the relationship of human-built and nature-built: what are the differences and where should the balance between the two lie?*"