



# INTRODUCTION

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The projected pace and scale of growth in Chambers County, and in particular, Mont Belvieu, reinforces the importance of strategic planning and capital resource investment into community connectivity. In order to be competitive and accessible, cities throughout the Houston-Galveston region have improved their connectivity across all infrastructure projects, particularly active transportation (e.g., trail, sidewalk, and bikeway) planning. Indeed, developing an interconnected network of trails can both enhance Mont Belvieu's quality of life and spur economic development opportunities. The goal of the Mont Belvieu Trails Master Plan is to provide policy guidance and direction for the gradual, phased development of a community-wide trail network.

Mont Belvieu's recent growth trajectory has placed an increased demand for higher levels of amenities. The careful planning and implementation of a well-designed trail system is a key ingredient to this enhancement strategy. The Mont Belvieu area, consisting of the City of Mont Belvieu and its extraterritorial jurisdiction (ETJ), is expected to grow from 6,041 to 30,115 residents by 2035. This represents an almost six-fold increase to the City's 2015 population, equating almost 25,000 new residents over the course of 20 years. Still, much of the land within the City limits and ETJ remains vacant. What is developed is largely single family detached residential subdivisions, with commercial, office, and institutional land uses primarily flanking Eagle Drive, and industrial development along the State Highway 146 corridor to the west. This anticipated development pattern means the City must have the appropriate design guidance, and in some cases regulations, to ensure a pedestrian- and bicycle-friendly approach to transportation and recreation infrastructure.

## CONTEXT

As depicted in Mont Belvieu's Parks and Recreation Master Plan, Chapter 1, Introduction, Context, and Vision, Figure 1.1, Regional Context, the City of Mont Belvieu is largely exurban; with the majority of development, both residential and nonresidential, occurring along State Highway 146 (S.H. 146) and Eagle Drive. Development flanking the S.H. 146 corridor is predominantly nonresidential, consisting of auto-urban commercial land uses immediately north of Interstate 10, transitioning to satellite industrial support services further north; with pockets of multi-family residential development. As depicted in Figure 1.1, Future Land Use Plan, south of the proposed Grand Parkway (State Highway 99) alignment the 146 corridor is flanked by predominantly industrial-based land uses; transitioning north of Grand Parkway into a large flex space / business park to the west of the 146 corridor; and large-lot, Estate Residential land uses interspersed with smaller-scale, Neighborhood Commercial uses flanking the eastern edge of the 146 corridor.

Development along Eagle Drive is primarily comprised of Residential land uses to the west, interspersed with Neighborhood Commercial land uses immediately flanking the corridor. To the east, and south of the Cedar Point Lateral Canal is the Barbers Hill Independent School District (Barbers Hill ISD) complex, consisting of elementary, middle and high schools. To the north of the Canal, up to Farm to Market (FM) 565 is the Mont Belvieu Office Complex and City Park to the east and miscellaneous Auto-Urban Commercial uses flanking the west side of the corridor. At the intersection of FM 565 and Eagle Drive is the City's City Hall Complex, Police and Fire Departments, and Senior Center. To the north of FM 565, land on both sides of Eagle Drive is largely vacant, though is intended for Estate Residential uses, as depicted on the Future Land Use Plan. The lands surrounding the City Hall Complex are slated for the City's future Town Center.

Developed residential areas are interspersed throughout the City and ETJ, and are characterized by subdivisions such as Cherry Point Subdivision, which is located in

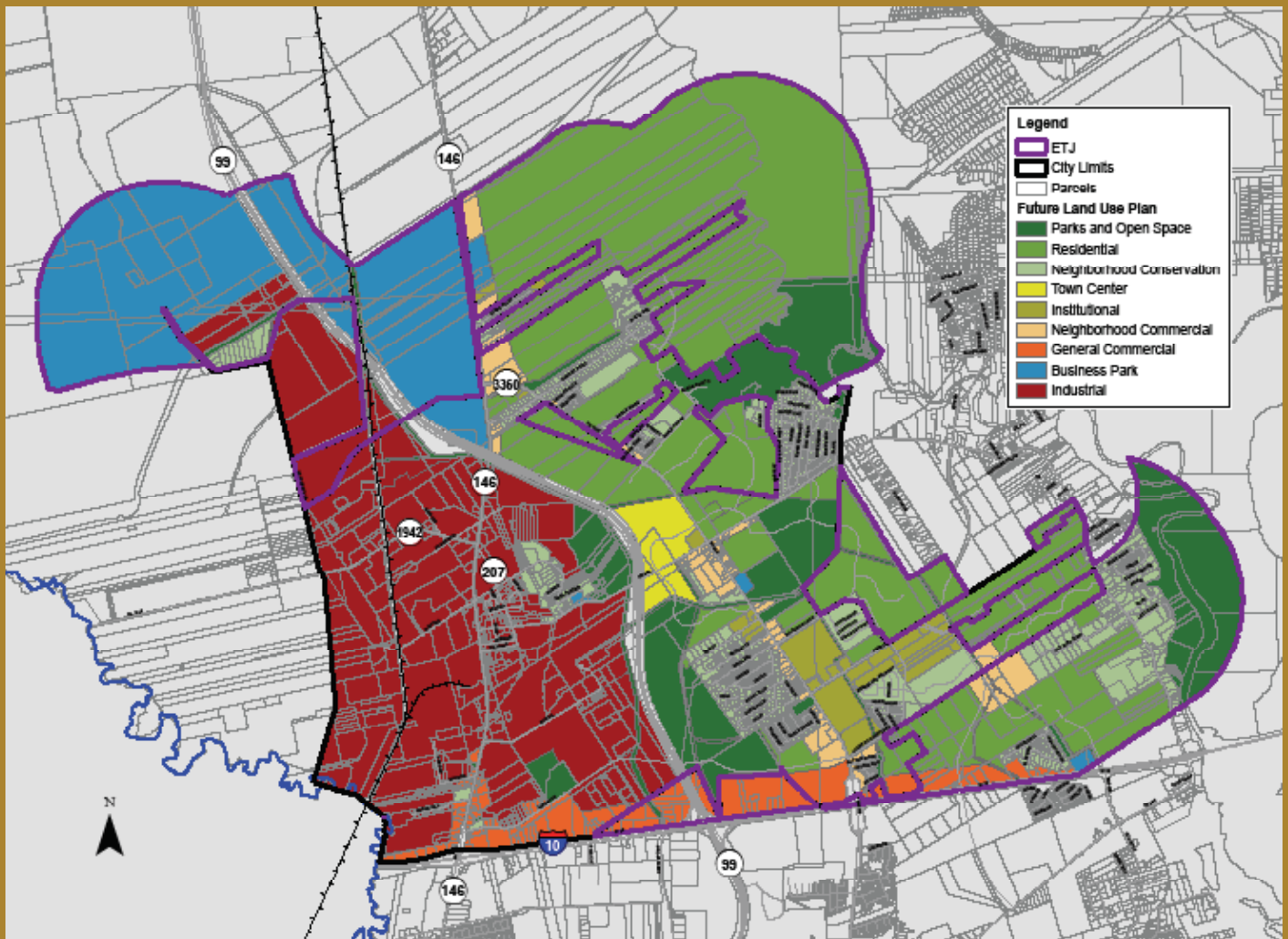


Figure 1.1, Future Land Use Plan

Source: Mont Belvieu Comprehensive Plan



proximity to the intersection of Eagle Drive and S.H. 146; and the Fisher's Landing subdivision along FM 565, east of the City Hall Complex

Significant park and open space destinations in Mont Belvieu include City Park, the Eagle Pointe Golf Club and Recreation Complex (just north of Eagle Drive), and the Chambers County-owned, McLeod Park on Langston Drive. The future Hackberry Gully Regional Park is a large park / stormwater detention facility to be constructed just north of Interstate 10, between Eagle Drive and S.H. 146.

## THOROUGHFARE DESIGN

Unfortunately, the thoroughfare design within Mont Belvieu's original neighborhoods is generally too narrow for affordable reconstruction of existing roads to accommodate bike lanes or, in some cases, even sidewalks. In recent years, however, new destinations such as the City Hall Complex have prompted the City and County to upgrade major thoroughfares. These types of improvements serve as economic catalysts by providing increased access to areas that would otherwise be less developable or desirable tracts of land. They also enhance what have been traditionally automobile-only thoroughfares into more "complete streets," or roadways that accommodate all modes of travel and user types. This regional approach to mobility has extended the conversation far beyond pure transportation objectives to having a direct influence on community character and economic development.

In partnership with public and private stakeholders throughout Chambers County, advance transportation planning will prepare the region for future travel demands and create a more efficient system of travel to, from, and within the Mont Belvieu area. The construction of a multi-modal and interconnected trail system is ultimately a shared cost and benefit across all community members. It is envisioned that, as Mont Belvieu gradually fills-in and grows, its trail system will be used both for recreational use and as an active transportation alternative that can reduce vehicular trips, provide a safe commuting option for individuals who live close to their workplace, and contribute to better air quality in the area.

## TRAIL SYSTEM VISION

The following descriptions characterize Mont Belvieu's Vision for the Community Trails Network:

1. Safe, inviting, and universally accessible to meet the needs of a wide range of present-day and future users.
2. A complete and integrated, multi-modal system of active transportation routes, including pedestrian sidewalks and recreational trails, on-street bicycle lanes, and canoe trails (blueways).
3. Convenient local and regional linkages within the City and to surrounding communities and destinations.
4. Unique and educational outdoor experiences that celebrate Mont Belvieu's environmental assets, rural heritage, and open space landscapes.
5. Cross-functional amenities that accommodate short- and long-distance trips, on- and off-street routes, and generalized and specialized uses.
6. Equitable distribution of and trailhead access to trail system facilities.
7. Self-sustaining, meaning the system can be constructed, operated, and maintained by the City and its community partners in a cost-efficient manner.

## PLAN OBJECTIVES

This Trails Master Plan is intended to establish sound but flexible guidelines for the location, type, and construction of individual trail and path segments. The objectives include:

- **Community Interest.** Verify the degree of interest and need for trail development given the general absence of trails in Mont Belvieu at this point in the community's development history. This involves identifying the aspirations of stakeholders, including elected and appointed officials, citizens, and established groups and organizations, regarding the possibilities for and potential characteristics of a community-wide trail network; and how the network of trails should be prioritized according to need.
- **Phased Development.** Offer strategic timing and direction for incremental investments that link the community's principal nodes – such as the City Hall Complex (and new future Town Center, the Barbers Hill ISD academic complex, residential neighborhoods, and municipal / county parks. This plan prioritizes improvements while taking into consideration readily available funds and other transportation projects that will reduce the overall cost to the City.
- **Geographic Distribution.** Consider geographic locations within the community where potential trail alignments would be cost effective, connect to the most frequently used destinations, and attract the most users based on population and development trends.
- **Policy Rationale and Guidance.** Establish the policy justification for securing land and/or easements for trail improvements, whether obtained through regulatory mechanisms, dedications, or donations. This plan will also serve as a reference document and provides useful information for local decision makers, advisory boards, trail and recreation enthusiasts, and Mont Belvieu residents regarding key considerations in trail system development and maintenance.

- **Funding Tools.** Provide a strategy for the use of City and County funds, pursue grants and other external funding sources, and solicit community support from philanthropic groups and private property owners. This plan proposes a multi-faceted implementation strategy involving public expenditures, private funding, and land dedications.

### COORDINATION WITH OTHER PLANS

Of all community planning elements, mobility is one of the most partnership-driven considerations given its multi-jurisdictional funding sources, level of connectivity between adjoining municipalities and residential areas, and regional growth influences. The following studies were incorporated into the findings of this plan:

- **City of Mont Belvieu Comprehensive Plan (2010).** The proposed thoroughfare improvements and trails system have implications for the City's current and future sidewalk system, as well as trail system and trailhead development.
- **City of Mont Belvieu Comprehensive Plan (2017).** The Comprehensive Plan provides the policy rationale and "big picture" recommendations to plan for and invest in a trail system network. Specific priorities from the plan include the following:
  - » Strengthening transportation connections and increase choices between ways to travel;

- » Leveraging public investments to enhance the existing community and promote growth;
- » Rehabilitating and preserving Mont Belvieu's existing neighborhoods and community assets; and
- » Enhancing and preserving Mont Belvieu's natural amenities.

- **H-GAC 2035 Regional Bikeway Plan (2007),** identified several bikeway facility needs regarding linking cities and centers of activities within Chambers County and to connect with adjacent networks. Figure 1.2, Bikeway Facilities in Chambers County, identifies several roadways as "shared-use path / trail" needed for bicyclists; and includes the use of shoulders along US Highway 90, State Highways 65, 124 and 146, FM 1405, FM 563 and 565. Adopting these roadways as bicyclist facilities would link the cities of Winnie and Stowell with Mont Belvieu and Anahuac, and provide connections to the communities of Dayton and Liberty within Liberty County. There is warrant for more thorough field work regarding the viability of utilizing S.H. 146 through Mont Belvieu, as this is a very industrial corridor with narrow shoulders, open drainage ditches, and a lot of truck traffic.
- **H-GAC 2040 Regional Bikeway Plan (2015/2007).**

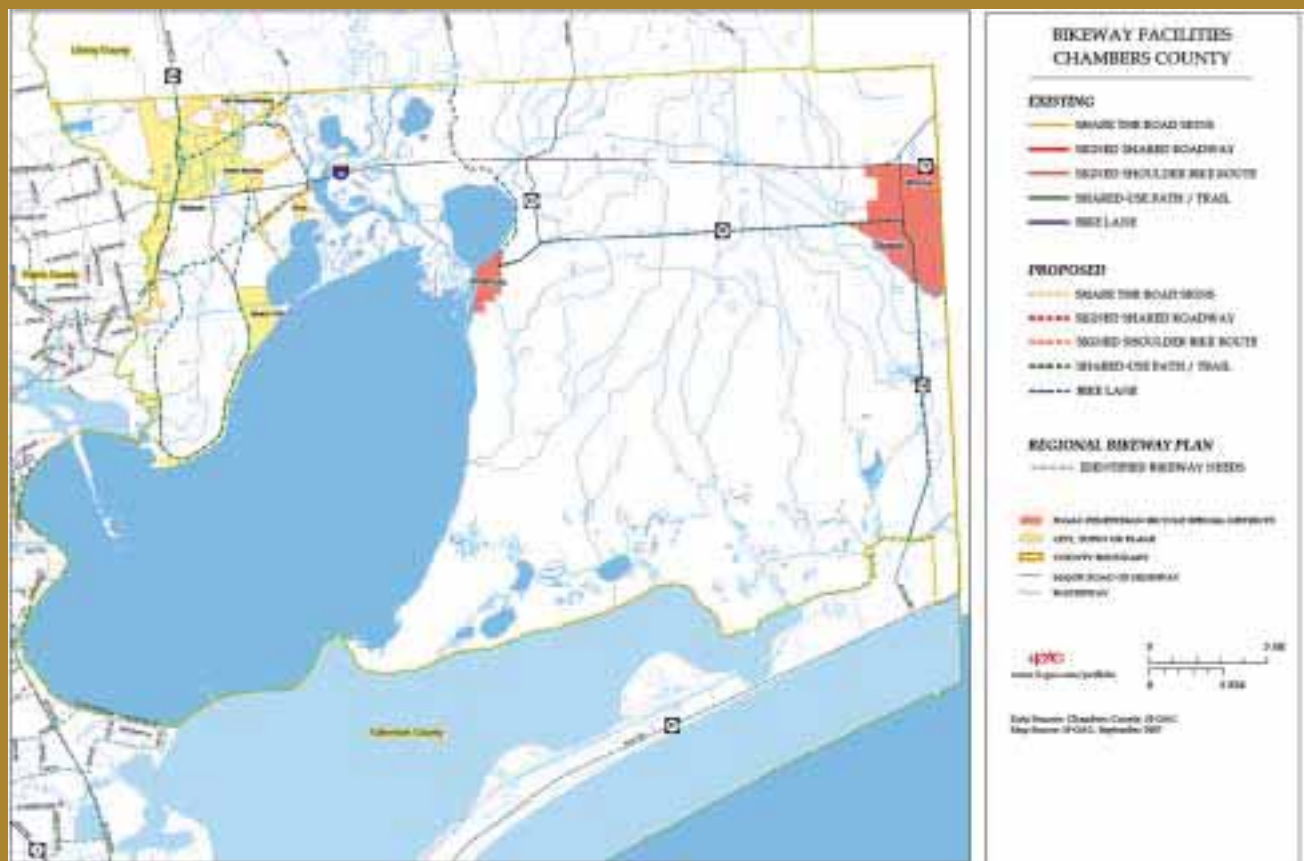


Figure 1.2, Bikeway Facilities in Chambers County

Source: H-GAC



The Houston-Galveston Area Council (H-GAC) is currently implementing the 2040 Regional Pedestrian and Bicycle Plan. The policy recommendations within the plan aim to secure commitments to develop planned bicycle facilities; and to add shoulders to roadways that enjoy significant bicyclist activity. According to the map, Bikeway Facilities in Chambers County (page 31), “there are no existing or proposed bicycle facilities within Chambers County.”

- Mont Belvieu Parks and Recreation Master Plan (2017). The Parks Master Plan, within which this plan is an appendix, calls for a series of recreational trails to link key park and recreational facilities. The Parks Master Plan also provides policy direction and implementation guidance for meeting both current and future parks and recreation needs in Mont Belvieu. The Parks Master Plan recommends developing a canoe route, or “blueway,” on the Old River, the put-in and take-out of which would be located at the Eagle Pointe Recreation Center grounds the Interstate 10 bridge over the Old River, and elsewhere.

## Key Considerations

Mont Belvieu has clear opportunities in front of it as well as obvious challenges to overcome in working toward its Community Trails Network:

### OPPORTUNITIES

- Cedar Point Lateral Canal, and other linear drainageways across the Mont Belvieu area, which are highly accessible from many neighborhoods and developed areas; and, if regarded as greenways and used for trail alignments, could readily connect a variety of community destinations.
- Storm water detention sites already built or planned in the area (e.g., Hackberry Gully Regional Park and Cotton Bayou), may provide loop trail opportunities, especially where the detention basin is well designed to serve as a community amenity.
- Utility and pipeline corridors throughout Mont Belvieu, which, in many cases, provide very open and visually unobstructed paths between neighborhoods and other nearby destinations such as schools, parks, community facilities, and commercial areas, could be converted to trails.
- Open space around the perimeter of many residential subdivisions and commercial developments in the Mont Belvieu area, due to the scattered nature of development in certain areas, which provides an “opening” for potential trail alignments close to existing development and in advance of additional development in the vicinity.



- The flat, developable terrain found in the Mont Belvieu area that keeps trail and landscape sitework construction costs to a minimum.
- Existing parks such as City Park, Eagle Pointe Golf Club and Recreation Complex and the proposed Hackberry Gully Regional Park are well-endowed with perimeter recreational trails, and offer opportunities for linkages.
- The City of Mont Belvieu currently remains very undeveloped and open, which provides a greater degree of latitude for establishing trail rights-of-way and easements.
- Within Mont Belvieu's Code of Ordinances, under Article IV. - Requirements for Improvements, Reservations and Designs; Sec. 32-85. - General Improvements, (b) (7) states that: "Proposed roads shall provide a safe, convenient, and functional road system for vehicular, pedestrian, and bicycle circulation; shall in the view of the city engineer, be properly related to the comprehensive plan; and shall be appropriate for the particular traffic characteristics of each proposed development."

## CHALLENGES

In order to accommodate the proposed Community Trails Network, the following challenges will need to be acknowledged, and addressed, albeit incrementally:

- Limited degree of pedestrian connectivity within the current system and the heavy reliance upon automobile travel to get everywhere.
- Narrow design of some local, collector, and arterial roads in the City and ETJ, and the presence of open drainage ditches will require modifications beyond restriping to accommodate on-street bicycle lanes.
- The presence of several drainage canals and the narrow bridges that cross over them may make it difficult to retrofit on-street bicycle lanes.
- Recent construction of new major roads lacking on-street bicycle lanes may be difficult to retrofit as shared use paths cannot be paired with other infrastructure projects in the near-term.
- Preservation of rights-of-way in rapidly developing subdivisions and growth areas within the City's ETJ.
- The need to cross busy arterial roadways in various locations to maintain the connectivity of the envisioned trail network.
- Most residential subdivisions lack sidewalks.
- Few City streets have designated crosswalks.
- Industrial land uses produce significant heavy truck traffic, which is often incompatible with active transportation.

## EXISTING CONDITIONS

Like many small- and medium-sized communities, the City of Mont Belvieu has a limited trail network that requires long-term development to connect major destinations. Before turning to future opportunities, this section considers existing conditions for walking and bicycling in the community.

### Public Trails

As mentioned, the City of Mont Belvieu has only a few existing trails for public use and include:

- Loop trails within City Park and Eagle Pointe Golf Club and Recreation Complex.
- Several future loop trails within the proposed Hackberry Gully Regional Park.
- A long sidewalk along Eagle Drive, which connects the Barbers Hill ISD complex to City Park and beyond to the Eagle Pointe Golf Club and Recreation Complex.

As will be discussed, Mont Belvieu's walking paths generally meet one or more criteria necessary to be considered true "trails," particularly in terms of their width, design, and/or type or quality of surface material so they can withstand significant public use and weather impacts.

### Private Trails

Although the Mont Belvieu community has reached a point of desiring greater investment in trails as a public amenity, trails have typically not been incorporated into recent subdivisions and master-planned developments that have been constructed in the area.

### Sidewalk System

In support of this plan, a community-wide sidewalk inventory was completed to document existing locations in the City limits and ETJ where sidewalks are in place, along public streets and thoroughfares.

Like many cities that had a more rural and suburban past, Mont Belvieu has extensive areas of the community where sidewalks were not installed along public roadways, including within many residential neighborhoods. However, newly-developing residential subdivisions (e.g., Cottonwood Estates off of Eagle Drive) and other areas of Mont Belvieu are being built to a higher standard as a result of the City's planning and development regulations.

## GUIDING PRINCIPLES

Many of the themes and guiding principles within the City's Comprehensive Plan also apply to the Community Trails Network Master Plan. Principles highlight such issues as community livability, promotion of recreation



and leisure opportunities, environmental resource protection, connectivity, and intergovernmental and public/private cooperation and coordination.

The following underlying themes are underscored in this plan, given their universal applicability from a planning and procedural standpoint:

- Availability of financial resources will be considered in all phases of planning, acquisition, development, operation, and maintenance of facilities.
- The public will be involved in the planning process so that facility design considers the needs, desires, and opinions of users.
- Facilities will be planned and coordinated to allow for flexibility in adapting to future community recreation needs and requirements.
- Other existing plans that affect the community will be integrated into the final recommendations and the implementation of this plan.
- The planning and implementation process will continuously offer opportunities for incremental evaluation and review.

This plan was prepared based on a set of guiding principles that reflect community values and priorities. These principles include:

- Trail system development should be coordinated with the City's other physical planning activities (land use, transportation, parks, etc.) so that trail corridors serve a buffering role between different development intensities, help to preserve "green space" amid suburban development, and offer protection to valued environmental resources such as riparian corridors and wetlands.
- The City should begin longer-term trail system development by focusing first on one or "signature" (demonstration) projects that highlight good trail design and utilization and will help to build public support for a sustained improvement program. A good example of this would include the sidewalk/recreational trail that extends from the Barbers Hill ISD academic complex to the Eagle Pointe Golf Club and Recreation Complex.

- Another prime consideration in initial trail system development should be locations with existing pipeline and/or utility easements. Otherwise, space for trail development may be minimal or will depend upon future property acquisition or securing of additional rights-of-way.
- The City's trail network should interconnect with and build upon trail systems and projects of surrounding jurisdictions, including neighboring cities (Baytown, Dayton, Houston) and special districts (municipal utility districts, levee improvement districts, water conservation improvement districts).
- The City should seek linear dedications of land from new developments along thoroughfares, drainage canals, bayous, and other natural features to begin to establish a continuous trail alignment along these key corridors.
- With the extent of current and planned drainage detention areas in the Mont Belvieu area, primary trail segments should be linked to side and loop trails, recreational areas, and nature preserves associated with such sites.
- Trailheads, furnishings (benches, waste receptacles, lighting, signage), and exercise equipment (e.g., parcourse stations) should be located and designed to be conveniently accessible to nearby space for trail development may be minimal or will depend upon future property acquisition or securing of additional rights-of-way.
- The trail system should be developed similar to a community's thoroughfare network, with primary and secondary alignments identified and designed according to their anticipated system role, utilization level, and financial feasibility.



- Trail connections between various community destinations and focal points should be highlighted and promoted (including parks, neighborhoods, schools, Senior Center, community facilities, commercial areas, etc.).
- Trailheads, furnishings, (benches, waste receptacles lighting, signage) should be located to nearby residents as an outdoor resource for physical activity and fitness opportunities, particularly walking, jogging, and bicycling.
- The City should promote universal design that maximizes disabled access to trail paths and amenities.
- Trail segments should be developed, potentially in coordination with local schools and community organizations, to provide “outdoor classroom” opportunities near education sites for environmental stewardship and instructional activities.

## OPPORTUNITIES ANALYSIS

Based on the vision and policies established in this plan and the City’s newly adopted Comprehensive Master Plan, the proposed trail network depicted in Map 2.1, Community Trails Network, illustrates proposed schematic alignments of a future Citywide trail network in Mont Belvieu. This proposed network has been informed by the following considerations:

- the location of major destinations;
- primary and secondary trails, bicycle lanes and blueways;
- safety considerations and barrier elimination; and
- future trailhead locations.

### Major Destinations

In keeping with the vision for a highly connected trail system, this section highlights the variety of key destinations that the proposed trail network depicted in Map 2.1, Community Trails Network, would connect. These include existing and proposed parks and recreation areas, neighborhoods, schools, major drainage detention areas with associated park and/or loop trail components; and major public facilities. In addition, the proposed trail system would greatly enhance walking and bicycle access to major commercial areas along Eagle Drive, and throughout the community.

## Safety Considerations and Barrier Elimination

Some of the most expensive trail alignments require safety improvements, ADA accessibility compliance, and barrier elimination. Ultimately, the final trail alignments may require new crossings over the Cedar Point Lateral Canal and other local drainage channels to maximize the connectivity of the trail network and link some strategic destinations, such as Cherry Point Park and the associated residential subdivision along Cherry Point Road with the Eagle Point Golf Club and Recreation Complex. Locations for major bridge or canal crossings are indicated by an orange circle in Map 2.1, Community Trails Network. Other major barriers include railroads and major thoroughfares.

## Future Primary and Secondary Trails, Bicycle Lanes and Blueways

The proposed trail network (Map 2.1, Community Trails Network) indicates a set of primary trails (green dashed lines) and secondary trail alignments (red dashed lines). This terminology is similar to the City’s Thoroughfare Plan for the City’s street system in that the primary trails are meant to be continuous over the longest distance (similar to arterial streets), connecting many destinations and linking with various other trail segments along the way. As a result, they are intended – and will be appropriately designed – to carry the most pedestrian and bicyclist “traffic” and are the highest priority. Trails labeled as secondary will operate like collector roadways, partly because they do not extend in many cases beyond a particular sub-area, but also because they will operate like “feeder” routes, providing a link for users between individual neighborhoods and destinations and the primary trail system.

As part of this hierarchy, it is important to note terminology for the purposes of this plan:

- Residential Sidewalks refer to concrete shared-use paths (required minimum four-foot wide per Chambers County Engineering Standards, recommended minimum five-foot wide); are to be located a minimum of four feet from the street curb (Sec. 32-91. - Sidewalks and ramps; required improvements, Mont Belvieu Code of Ordinances). Refer to Figure 1.4, Residential Sidewalk.
- Nonresidential Sidewalk refers to sidewalks that are used in more urbanized areas (required minimum 10-foot width (Sec. 42-164. - Off-street parking, Mont Belvieu Code of Ordinances); when narrower (five foot width), are to be located a minimum of four feet from the street curb (Sec. 32-91. - Sidewalks and ramps; required improvements, Mont Belvieu Code of Ordinances). A good example of a nonresidential sidewalk is the sidewalk that flanks the east side of Eagle Drive,



as it passes by the Barbers Hill ISD academic complex. Refer to Figure 1.5, Nonresidential Sidewalk.

- Off-street Recreational Trails refer to concrete or asphalt, multi-purpose paths (minimum 8-10 foot wide); and are typically located a minimum of four feet from the street curb (Sec. 32-91. - Sidewalks and ramps; required improvements, Mont Belvieu Code of Ordinances); constructed. Refer to Figure 1.6, Off-street Recreational Trail.
- Soft-Surface Recreational Trails are trails that are constructed of loose aggregate, such as gravel, are used primarily for walking and hiking and other recreational activities; and are not used for primary travel (e.g., getting from Point A to Point B). Examples of soft-surface recreational trails include the trail loops at both City Park (generally 4-5 ft. width) and at the Eagle Pointe Golf club and Recreation Complex. Refer to Figure 1.7, Soft-Surface Recreational Trail.
- On-street Bicycle Lane lanes refer to lanes adjacent to automobile travel lanes (minimum five foot wide travel lane). Refer to Figure 1.8, On-street Bicycle Lane.
- Blueways refer to designated navigational routes for non-motorized boating travel (canoes, kayaks, paddleboards); and feature accessible put-in and take-out areas, with directional and interpretive signage, and other improvements.

### Future Trailhead Locations

Trailheads are locations where trail users may conveniently and safely access the trail network. In some existing Mont Belvieu neighborhoods, residents may be able to easily access an abutting trail segment through the open, unfenced ends of cul-de-sacs and other local streets, via open and grassy pipeline and utility corridors, through unobstructed drainage swales between house lots (or, again, at the ends of cul-de-sacs in some cases), and where drainage detention areas were built at the edges of subdivisions and along the adjacent waterways.

While trailhead locations may be helpful to nearby residents, they are primarily aimed at trail users who will drive or bike there to begin using the trail system. Therefore, vehicular parking is a key feature, with the quantity of parking spaces dependent upon the anticipated level of user demand and what the site can accommodate. Other potential trailhead elements, furnishings, and amenities may include:

- Lighting;
- Benches (and/or picnic tables in some cases);
- Bike racks;

- Water fountains;
- Restrooms;
- Waste and/or recycling receptacles;
- Emergency telephones;
- Wayfinding signage;
- Fencing / gates
- Kiosk, display case and/or bulletin board with trail network map and other posted flyers and advisories;
- Box or stand with trail maps/brochures;
- Exercise/stretching equipment; and
- Shade structures and/or trees and other landscaping.

Many trailhead locations might be incorporated into an existing commercial area or new or existing park, such as City Park and Hackberry Gully Regional Park, which would avoid the need for dedicated trail user parking or other improvements. In some cases, the trail access point might be situated away from the park's primary use area and require some of its own facilities. Trailhead sites might also involve shared space through a cooperative effort with Barbers Hill Independent School District (BHISD), community organizations, other government agencies, churches, etc.

### DESIGN CONSIDERATIONS

As specific trail projects and improvements are authorized for detailed planning and design, the City will need to take into account the following considerations:

#### Neighborhood Character

- Minimizing impact on nearby residential areas, whether in terms of noise, lighting, litter, visual intrusion, etc. (which are all partly a function of how the trail is aligned relative to nearby homes and private properties).
- Designing consistent with the local setting in terms of materials, landscaping, types of amenities (lighting, benches, trash receptacles, etc.), and fitting in with the general "look and feel" of the surrounding area.
- Fencing, landscaped screening, or other physical separation and buffering to protect privacy of adjacent homes.

#### Accessibility

- Trail gradients no greater than five percent, in compliance with the Texas Department of Transportation (TxDOT) and Americans with Disabilities Act (ADA) requirements.

**Figure 1.4,  
Residential Sidewalk**



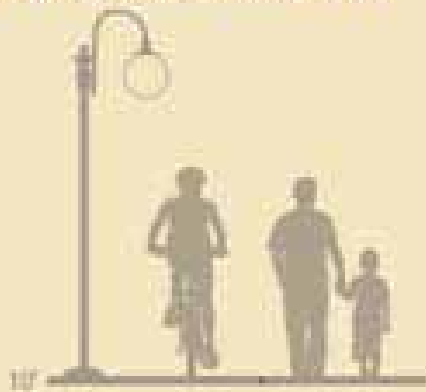
5 ft. to 8 ft. wide reinforced concrete with 4" to 5" thickness (emphasis on new development)

**Figure 1.5,  
Nonresidential Sidewalks**



5 ft. to 10 ft. wide reinforced concrete with 4" to 5" thickness (compatible with existing development patterns)

**Figure 1.6,  
Off-street Recreational Trail**



10 ft. to 12 ft. wide reinforced concrete typically located in areas that can accommodate wider trail alignments and bi-directional, multi-modal traffic

**Figure 1.7,  
Soft-Surface Recreational Trail**



8 ft. wide soft-surface trail and edging (decomposed granite)

**Figure 1.8,  
On-street Bicycle Lane**



5 ft. bicycle travel lane on both sides of street

Source: The illustrations are partially derived from the H-GAC Pedestrian Pathways and Building Better Bikeways publications.



- Design and installation of ramps which comply with ADA standards (generally at grades no greater than eight percent, with a level landing – minimum of three feet long – provided for every 30 inches of vertical rise). Also use of slip-resistant surfaces on ramps.
- Compliance with ADA standards whenever a new trail provides access between new parking lots and new public facilities, including recreation or institutional facilities, commercial or business sites, and any new transportation-related facility.
- Use of hard surfaces, or compacted, fractured, crushed stone (e.g., limestone or reconstituted granite) less than 3/8 inch diameter, on any trail segment anticipated for use by persons with disabilities. No loose, “river-washed” gravel surfaces in such cases.
- Handrails (32 inches high) installed on all ramps and bridges.
- Address access and circulation through, around, over, or under any major barriers for persons with disabilities.
- Eliminate any barriers along sidewalks and curbs and at intersections and street-crossing locations (including installation of curb ramps at each street corner).
- Stairs should not be incorporated in the trail system in any locations where wheelchairs, bicycles, or skaters will access or use the trail (ramps are preferred to stairs even where grades must exceed the five percent maximum).
- Where bollards or other barriers are installed at trail access points to keep out motorized vehicles, maintain at least 32 inches of horizontal clearance for wheelchairs.
- Rest areas every 300 feet on fully accessible trails, set off to the side of the main trail section, and with signs or information at the trailhead regarding the distance between rest areas.
- At least one accessible parking space in all trail-related parking areas.

#### Environmental Sensitivity

- Sensitive siting and design/construction methods in or near environmentally sensitive areas (e.g., limiting areas to be disturbed, construction fencing, erosion control measures, site-specific construction practices).
- Design and surface types that are appropriate for areas with high erosion potential.
- Protection of mature trees and associated root

zones, as well as riparian vegetation along stream corridors.

- Re-vegetation with native and/or self-sustaining plant materials, especially in non-irrigated locations.
- Development of aesthetically pleasing “greenways” along trails (rather than focusing only on the cross section of the trail improvement itself).
- Access to ecological features and observation points for trail users (e.g., along water features, wetland edges, habitat and vegetated areas, unique views, etc.).

#### Signage and Public Information

- Signage at trailheads and other access points regarding permitted trail uses, speed control, safety awareness on a shared-use path (e.g., rules for yielding, using a bell or signal to alert other users about to be passed), required or advised use of helmets for cyclists and/or skaters, and user courtesy policies (including respect for private property and owner privacy, no littering, dogs on leashes, etc.).
- More limited signage along trails for regulatory, informational, and wayfinding purposes, but to avoid adverse visual impacts.
- Use and placement of regulatory signs in accordance with standards set forth in the Manual on Uniform Traffic Control Devices (MUTCD). This includes: Stop signs wherever a paved multi-use trail will cross a public street (unless vehicular traffic is required to stop at trail intersections).
  - » Speed limit, slow, or danger/warning signs in areas with dangerous conditions ahead or limited sight distance.
  - » Curve signs where an upcoming curve in the trail has a small radius and/or limited sight distance, especially if a trail user could



potentially be forced off the trail if moving at a relatively high speed.

- » Dismount signs in areas where trail conditions or potential hazards warrant advising cyclists to dismount and walk these segments (such as areas with substandard trail width and/or vertical clearance, narrow bridges, busy street crossings).
- » School zone signs near school campuses for the safety of both school children and trail users.
- » Private property signs in appropriate locations on an as-needed basis.
- Placement of signs for maximum visibility and where they will not impede trail use or present a hazard.
  - » Consistency in sign design and placement to avoid public confusion (and sign sizes and letter heights appropriate for anticipated trail user speeds).
- Use of reflective coating and graffiti-proofing on all regulatory signs.
- Development of trail system guides and maps, to include:
  - » trailhead locations;
  - » description of trail segments and amenities – potentially with a trail rating system regarding length and degree of difficulty;
  - » information on wheelchair accessibility and any barriers;
  - » destinations and nearby services;
  - » user courtesy policies;
  - » major street crossings and crosswalk locations;
  - » location of drinking fountains and/or restrooms.

### Safety

- Appropriate width;
- Surface material;
- Slopes;
- Trail curvature;
- Sight distance;
- Adequate vertical clearance where trails go under bridges or other overhead structures/features (a 10-foot vertical clearance from the trail surface is generally recommended, with eight feet as a minimum at any point above the width of the trail).
- Use of drainage grates and other features that are safe for bicycle tires to pass over while also limiting potential injuries to walkers and skaters.
- Adequate setback of fences, landscaping, and other potential obstructions from the trail (fences should

generally be no closer than five feet from the trail edge, and fences that are necessary on both sides of a trail should not create a narrow “canyon” effect for long stretches).

- Shade and benches so trail users can rest and avoid overheating during the warmest months.
- Signage regarding potentially hazardous locations (e.g., water safety, wildlife).
- Marked crosswalks, signage, and potential pedestrian signalization and/or traffic calming measures where trail alignments must cross major roadways (and any railroad crossings must also be carefully designed).
- Bollards or other obstacles at trail access points to prevent unauthorized use by motorized vehicles, but of the type that can be removed or folded over in emergency situations.
- Public education on safe cycling and skating practices, use of safety equipment (helmets and padding, bicycle lights/reflectors, etc.), and other practices to increase user safety – and monitoring and police enforcement of trail rules and relevant City ordinances and laws.

### Security

- Lighting:
  - » Always in a tunnel or at overpasses;
  - » Trailheads;
  - » Bridge entrances and exits;
  - » Public gathering places;
  - » Along streets and at crosswalks; Where the path crosses another path or sidewalk.
  - » On signage.
- Trail and user visibility and elimination of potential “hiding” places (careful placement and design of fencing and landscaping, density, and trimming of natural vegetation, etc.).
- Emergency telephones or call box systems (with direct access to 911) in key locations, especially along more remote trail segments.
- Particular focus on police monitoring and security measures in parking areas.
- Ease of access for emergency personnel and vehicles.









# 2

## COMMUNITY TRAILS NETWORK

### INTRODUCTION

As depicted on Map 2.1, Community Trails Network, Mont Belvieu's proposed trails system is composed of a variety of trails types, including sidewalks, off-street recreational trails, on-street bicycle lanes, and canoe trails, referred to as blueways. As envisioned, the Community Trails Network will link existing neighborhoods with parks and open space areas; schools; commercial and employment centers; and semi-wilderness areas, accessible from bayous and sloughs flowing into the Old River; and other communities in Chambers and Liberty Counties. The Community Trails Network plan and the alignment of proposed trails builds off of what has already been constructed, anticipates the construction of new residential areas and parks, such as Hackberry Gully Regional park. Additionally, as outlined in Chapter 1, Plan Introduction, the plan is informed by numerous other local and regional plans, which conceivably extend the network to other communities within Chambers County and region.

## NETWORK COMPOSITION

As depicted on Map 2.1, Community Trails Network, Mont Belvieu's trails system consists of three categories of trails:

- trails, sidewalks (constructed of various materials, and various widths);
- on-street bicycle lanes;
- and canoe trails (blueways).

Each category will be characterized, with respect to construction materials, length, location of trailheads, connections to various areas of the community; and prioritized, regarding level of importance and timing of construction.

### TRAILS AND SIDEWALKS

The community trails, sidewalks and paths category consists of primary and secondary trails.

#### Primary Trail System

The Primary Trails provide the spine, or framework for the system, from which, secondary trails, sidewalks, and paths emanate and lead to additional neighborhoods, parks and amenities. Central to the Primary Trail System is the 10 foot wide sidewalk which runs parallel to Eagle Drive (FM 3360), identified as No. 1 on Figure 2.1, Primary Trails. The other primary trail identified as No. 2, on Figure 2.1, is a trail along the proposed alignment of Langston Drive; the portion from Eagle Drive to the proposed Hackberry Gully Regional Park has been completed.

#### Trail No. 1

The sidewalk begins at the entrance drive into the Cottonwood Estates subdivision, which is just north of Interstate 10. The sidewalk extends northward through town to Eagle Pointe Drive, which is the northernmost point; a distance of approximately 3.7 miles. Along the way, the sidewalk passes and connects several businesses and institutions (schools, banks, churches), and one park, including the following, beginning at the Cottonwood Estates (crosswalk):

1. Lakes of Champions Boulevard (FM 3180) and Lakes of Champions Estates subdivision (crosswalk);
2. Barbers Hill ISD - Middle School South entrance drive (crosswalk);
3. Barbers Hill ISD - Middle School South entrance drive (access to Barbers Hill Elementary School South) (no crosswalk);
4. Barbers Hill ISD - Elementary School North entrance drive / Central Administration (no crosswalk);
5. Barbers Hill ISD - Central Administration / Barbers Hill Middle School North entrance drive (no crosswalk);



Figure 2.1, Primary Trails

6. Barbers Hill ISD - Barbers Hill Middle School North entrance drive (no crosswalk);
7. Perry Avenue (crosswalk);
8. Mont Belvieu First Baptist Church south entrance drive (no crosswalk);
9. Mont Belvieu First Baptist Church north entrance drive (no crosswalk);
10. Barbers Hill High School south parking lot entrance drive (crosswalk);
11. Barbers Hill High School entrance boulevard (no crosswalk);
12. Barbers Hill High School north parking lot entrance drive (crosswalk);
13. Wilburn Ranch Drive (crosswalk);
14. The Sanctuary Church south entrance (no crosswalk);
15. The Sanctuary Church north entrance (no crosswalk);



16. West Chambers Courthouse / Branch Library (Trinity Drive) access road (no crosswalk);
17. West Chambers Courthouse / Branch Library south entrance (no crosswalk);
18. West Chambers Courthouse / Branch Library north entrance (no crosswalk);
19. Law Office (private) entrance drive (no crosswalk);
20. Cedar Point Lateral Canal Bridge;
21. City Park entrance south sidewalk;
22. City Park entrance boulevard (crosswalk);
23. City Park entrance north sidewalk;
24. Enterprise Products Mont Belvieu Office Complex south entrance drive (no crosswalk);
25. Enterprise Products Mont Belvieu Office Complex north entrance drive (no crosswalk);
26. Warm Beginnings and More (private business) entrance drive (no crosswalk);
27. M&T Auto Repair (private business) entrance drive (no crosswalk);
28. W. Chambers County Chamber of Commerce south entrance drive (no crosswalk);
29. W. Chambers County Chamber of Commerce north entrance drive (no crosswalk);
30. Private clinic (chiropractor) entrance drive (no crosswalk);
31. Private clinic (dentist) entrance drive (no crosswalk);
32. Five Star Dry Cleaners-Laundry south entrance drive (no crosswalk);
33. Five Star Dry Cleaners-Laundry north entrance drive (no crosswalk);
34. Barbers Hill Bank south entrance drive (no crosswalk);
35. Barbers Hill Bank north entrance drive (no crosswalk);
36. Wells Fargo Bank south entrance drive (no crosswalk);
37. Wells Fargo Bank north entrance drive (no crosswalk);
38. Buck's Pizza strip center entrance drive (no crosswalk)

North of Buck's Pizza, the primary trail tapers down to approximately five foot width and crosses the FM 565 turning lane to the concrete island; then crosses FM 565 to the other island; and then across the northbound turning lane. There are crosswalks for all traffic lanes. North of FM 565 the primary trail widens to the point of radius of the FM 565 turning lane, and then begins to taper back to a five foot width. From this point northward, to Eagle Pointe Drive, a distance of 0.79 miles along Eagle Drive, the primary trail remains five foot wide. From Eagle Drive, along

Eagle Pointe Drive, to the Eagle Pointe Golf Club and Recreation Center, a distance of 0.92 miles, the sidewalk remains five feet wide.

**Strategy 2.1:** Improve pedestrian safety along the primary trail adjacent to Eagle Drive.

#### ACTIONS AND INITIATIVES

1. Work with private business owners to stripe their access drives. Crosswalks will help to delineate what is within the public realm and what is not; and will identify for motorists where to stop when pulling out. This will ensure smooth bicycle flow.
2. Work with Chambers County to widen the primary trail to 10 foot width, from FM 565 to Eagle Pointe Drive.
3. Work with TxDOT, Beaumont District, to determine minimum footcandle requirements for street lighting along Eagle Drive. Develop a phased lighting plan which would extend from 1) Interstate 10 to Eagle Pointe Drive; 2) from the intersection of Eagle Drive and Eagle Pointe Drive to the Eagle Pointe Golf Club and Recreation Center; and 3) from Eagle Pointe Drive northward to S.H. 146.
4. Address trail drainage issues just north of the Cedar Point Lateral Canal.
5. Widen the sidewalk to 10 foot width from Eagle Drive to the Eagle Pointe Golf Club and Recreation Center.

#### Trailheads

As depicted on Map 2.1, Community Trails Network, the principal trailheads would be located at City Park parking lot and at the Eagle Pointe Golf Club and Recreation Center parking lot.

#### Trail No. 2

As mentioned, Trail 2 is proposed to be a 10 foot wide, off-street recreational trail, which will run along the north side of the proposed Langston Drive extension, a distance of 2.4 miles, from the Chambers County-owned, McLeod Park and Recreation Center, along the southern edge of the proposed Hackberry Gully Regional Park, to Eagle Drive, a distance of approximately 2.27 miles.

#### Trailheads

As depicted on Map 2.1, Community Trails Network, the principal trailheads would be located at the Hackberry Gully Regional Park parking lot and at the McLeod Park and Recreation Center parking lot.

## Secondary Trail System

Secondary Trails include a network of proposed active transportation trails, the alignments of which directly or indirectly (through the Primary Trails system) link future residential neighborhoods (refer to Mont Belvieu Comprehensive Plan Future Land Use Map) to the Barbers Hill ISD complex and significant parks within the community, including Cherry Point Park, Eagle Pointe Golf Club and Recreation Center, City Park, Joe Matthews Park, proposed Hackberry Gully Regional Park, and Macleod Park.

The development of the Secondary Trails system will likely occur during or after residential development occurs. A 15-20 foot easement should be set aside to enable the eventual construction of the Secondary Trails system. It should also be noted that the proposed alignment of the Secondary Trail system, as depicted on Map 2.1, Community Trails Network, is diagrammatic and will require further analysis as development occurs, to ensure that the trail system effectively links neighborhoods with community institutions and amenities.

### Trails No. 3 and No. 6

As depicted in Figure 2.2, Trails No. 3 and No. 6 Schematic Alignment, Trail 3 is 0.6 miles in length and is aligned to run parallel to FM 565, up to the existing residential neighborhood on the north side of FM 565. Trail No. 6 is 0.8 miles in length and would circumnavigate the property destined to be the site of the future town center, along the northern edge of the Cedar Point Lateral Canal, and would provide access from adjacent future neighborhoods to the north. As these trails will likely be located in a more “urban” setting, it is recommended that they be 10 feet wide and constructed of concrete.



Figure 2.2, Trails No. 3 and No. 6



Figure 2.3, Trail No. 4



### Trail No. 4

Trail No. 4 is perhaps the most ambitious trail in the system but could be the most feasible, as significant residential development will occur to warrant its construction. As illustrated in Figure 2.3, Trail No. 4, the trail effectively links the Barbers Hill ISD with areas designated for residential development, as per the Future Land Use Plan, and terminates at Joe Matthews Park. It is recommended that Trail No. 4 varies from 5 to 10 feet wide and is constructed of concrete.

As indicated in Figure 2.4, Trail No. 4, Cedar Point Lateral Canal Crossing, the crossing of the canal at this point will warrant additional analysis.

### Trail No. 5

Trail No. 5 is approximately 2.3 miles in length, and provides access from City Park to Joe Matthews Park, and is aligned on the southeast side of FM 565; and would cross the thoroughfare at Canal Street, along with Trail No. 4, as illustrated in Figure 2.5, Trail No. 5. It is recommended that the trail be improved as it circumnavigates City Park, but it should remain a, 8-10 foot wide, soft-surface recreational trail its entire length.

### Trail No. 7

As illustrated in Figure 2.6, Trail No. 7 is recommended to be an 8-10 foot wide, soft-surface recreational trail, approximately 1.3 miles in length, that would continue the soft-surface recreational trail that circumnavigates the Eagle Pointe Recreation Center and Wave Pool and would connect to Cherry Point Park.



Figure 2.4, Trail No. 4, Cedar Point Lateral Canal Crossing



Figure 2.5, Trail No. 5



Eagle Pointe Recreation Center



Figure 2.6, Trail No. 7





Figure 2.7 Trail No. 8

### Trail No. 8

As shown in figure 2.7, the trail will start at Hackberry Gully Park, and extend to the Cedar Point Lateral Canal. Once crossing the canal, Trail No. 8 will split into three separate trail appendages and provide a pedestrian access going north and south. The trail is approximately 1.30 miles in length and should be 10 feet in width to accommodate emergency vehicles.

Trail No. 8.1 is an extension of Trail No.8 and continues along the Hackberry Gully, eventually extending across FM 565. This trail will provide pedestrian access to the Hackberry Park to the south and the proposed Downtown Center to the north. The trail is approximately 0.90 miles in length and should be 10 feet in width to accommodate emergency vehicles.

Trail No. 8.2 is an extension of Trail No. 8 and continues along a pipeline corridor until reaching Eagle Drive. This trail will provide a pedestrian access from the sidewalks along Eagle Drive to the Hackberry Gully Park to the south. The trail is approximately 0.4 miles in length and should be 8feet to 10 feet in width.

Trail No. 8.3 is an extension of Trail No.8 and runs parallel to the Cedar Point Lateral Canal, until reaching City Park. The trail is approximately 0.4 miles in length and should be 10 feet in width to accommodate emergency vehicles. This trail will provide a pedestrian access and connectivity between the City Park and Hackberry Park.



Hackberry Gully Park Overview



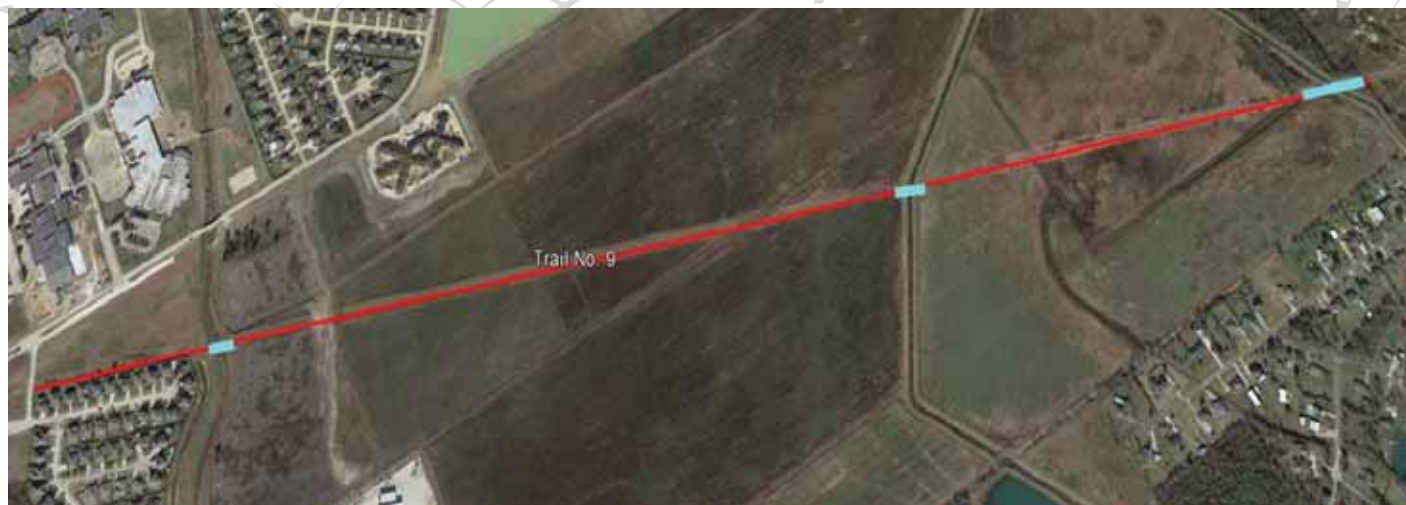


Figure 2.8 Trail No. 9

#### Trail No. 9

As shown in figure 2.8, Trail No. 9 will start near Cotton Rose Drive and will continue along a pipeline corridor, until connecting to Icet Creek Crossing subdivision. The trail will cross FM 1409, with the exact location and design to be determined. The trail is approximately 1.5 miles in length and should be 8 feet to 10 feet in width. This trail will connect neighborhoods to the east, with the commercial areas along eagle drive and a series of sidewalks leading to the Hackberry Park. This trail will require multiple raised pedestrian bridges in order to traverse the various channels and/or canals.



Figure 2.9 Trail No. 10

#### Trail No. 10

As shown in Figure 2.9, the trail will start at the south east corner of City Park and cross the Cedar Point Lateral Canal. It will extend south along Cotton Bayou drainage ditch until reaching Perry Avenue. The trail will cross Perry Avenue and continue to follow the Cotton Bayou drainage ditch directly behind BHISD, until reaching Lakes of Champions Blvd and Trail No.4.

After crossing Lakes of Champions Blvd, the trail will extend to the Wismer Distribution Center. The trail is approximately 1.95 miles in length and should be 8 feet to 10 feet in width. This trail will also require a pedestrian bridge (blue line) to help cross the Cedar Point Lateral Canal. This trail will better connect neighborhoods to both BHISD and the City Park.

Trail No. 10.1 & 10.3 are short stub-out trails that connect directly to the neighborhoods adjacent to trail No. 10. The trails will range between 200 feet 250 feet in length and should be 8 feet to 10 feet in width.

Trail No. 10.2 is an extension of Trail No.10 and runs along a pipeline corridor until reaching until reaching Lakes of Champions Blvd and Trail No.4. The trail is approximately 0.35 miles in length and should be 8 feet to 10 feet in width. This trail will connect Trail No.4 to Trail No. 10, as well as allowing pedestrians access without having to navigate through the adjacent neighborhoods.



Figure 2.11 Trail No. 10.4 Loop

#### Trail No. 10.4

As shown in figure 2.11, this trail is an extension of Trail No.10 and runs along the Cotton Bayou drainage ditch. It will create a 0.90 mile pedestrian trail, and forms a loop design. This trail should be 8 feet to 10 feet in width, and will require at least two pedestrian bridges for better connectivity. The proposed bridge locations are shown in light blue. The exact location of the bridge to the south is subject to change, since it will tie in with the pedestrian trail along the perimeter of the Wismer Distribution Centers Detention pond.

This loop will serve as a connection between Trail No. 9 and Trail No. 10. It will provide an neighborhood amenity to both Cottonwood Estates andn the Reserve of Chamions Estates.



#### Trail No. 11

As Shown in figure 2.12 , the trail will start just south of the Cedar Point Lateral Canal and continue along a pipeline corridor until meeting up with Trail No. 4 as well as the Wilburn Ranch Subdivision Neighborhood and loop trail. The trail will then continue along the pipeline corridor and commence at FM 1409. The trail is approximately 1.20 miles in length and should be 8 feet to 10 feet in width. The exact location and eastern terminus will need to consider BHISD's future development and its relationship to FM 1409.



Figure 2.12 Trail No. 11



### TRAILHEADS

As depicted in Map 2.1, Community Trails Network, all recreational trails would have trailheads at their point of origin and terminus. Trailheads would have adequate parking (typically existing parking lots in parks and elsewhere, and would be furnished with a family of furnishings, including ornamental street lighting, benches, waste receptacles, water fountain, and bike rack. Maps, wayfinding and interpretive signage would also be available.

**Strategy 2.2:** Develop a phased trails implementation program consisting of a well-formulated program, construction schedule and cost estimate for Primary and Secondary Trail Improvements.

### ACTIONS AND INITIATIVES

1. Revise the City's parkland dedication requirements to require that residential developers provide easements for recreational trails that would link new residential subdivisions to the Community Trails Network.

### ON-STREET BICYCLE LANES

As illustrated on Map 2.1, Community Trails Network, the community on-street bicycle lanes category consists of three segments: A, B, and C. Each segment shares a portion of an existing thoroughfare's right-of-way. In some cases it is the striped edge of the travel lane; in other cases the striped bicycle lane occupies the thoroughfare shoulder. There are also areas where the bicycle lane is an off-street recreational trail.

#### Segment A: Eagle Drive/State Highway 146, from Interstate 10 to Liberty County Line

The H-GAC 2035 Regional Bikeway Plan recommends an on-street bicycle lane to extend the length of S.H. 146, from Baytown to Dayton. Because S.H. 146 is such a heavily-trafficked corridor, this plan recommends shifting bicycle emphasis to Eagle Drive. As described within the State Highway 146 Corridor Revitalization Plan, the majority of traffic along S.H. 146 is between Interstate 10 and FM 1942. After which, the average daily trips decreases significantly, making S.H. 146 a viable bicycle route to the City of Dayton. This plan recommends utilizing the primary trail along Eagle Drive as a bicycle lane, through town. From Eagle Pointe Drive north, to S.H. 146, a two-direction, 10 foot wide recreational trail should be constructed on the east side of the road, within the thoroughfare right-of-way (a distance of 7,700 linear ft.). In subsequent phases, extend the off-street recreational trail from Eagle Drive to the City of Dayton, improve the S.H. 146 northbound shoulder, as necessary, including striping.

**Strategy 2.3:** Make the necessary improvements to Eagle Drive and S.H. 146 to create a safe bicycle route from Interstate 10 to the City of Dayton.

### ACTIONS AND INITIATIVES

1. Partner with Chambers County, Liberty County, the City of Dayton, H-GAC, and TxDOT to develop a safe bicycle travel route from Mont Belvieu to Dayton.

2. Work with third-party consultants to confirm the alignment and prepare construction document specifications, and cost estimate to construct a viable bicycle travel route.



Figure 2.13, Bicycle Lane Segment A; View South on Eagle Drive

#### Segment B: FM 1409, from FM 565 to Liberty County Line

On-street bicycle lane Segment B would include two five foot wide bicycle lanes within the existing shoulders of FM 1409; the first phase of which would begin at FM 565 and extend to the Liberty County Line; a distance of 1.85 miles. Subsequent phases would require additional partnerships with neighboring jurisdictions, and would extend shoulder improvements north to the City of Dayton.

**Strategy 2.4:** Improve the travel lane shoulders to function as a bicycle lane.

### ACTIONS AND INITIATIVES

Partner with the Chambers County, Liberty County, the City of Dayton, H-GAC, and TxDOT to improve the northbound and southbound shoulders as necessary, including striping, to function as a five foot wide bicycle lanes.

Work with Liberty County and the City of Dayton to extend the bicycle route to the City of Dayton.



### Segment C: FM 565, from Mont Belvieu to Interstate 10

Segment C of Mont Belvieu's on-street bicycle lanes may be the most difficult to retrofit into the FM 565 thoroughfare right-of-way, but it is perhaps one of the most important segments; because it provides access to areas of Chambers County south of Interstate 10; and connectivity to Segment B: FM 1409. It is also a very scenic route, worthy of active transportation. Segment C on-street bicycle lane improvements include five foot wide lanes on both sides of the thoroughfare, extending from Canal Road to Crawdad's Restaurant and Gas Station, just south of Interstate 10.

Strategy 2.5: Partner with local, regional, and state jurisdictions to construct a bicycle travel lane along the eastbound travel lane of FM 565.

Work with third-party consultants to verify the alignment, and prepare construction documents, specifications, and cost estimate to construct paved, five foot wide bicycle travel lanes and associated landscape sitework improvements adjacent to the eastbound and westbound travel lanes.

#### ACTIONS AND INITIATIVES

Partner with the City of Baytown, Chambers County, H-GAC, and TxDOT to support shoulder improvements south of Interstate 10 to FM 3180 and down Tri City Beach Road to Baytown.

Work with TxDOT's Beaumont District to accelerate the repaving schedule for FM 565, and include shoulder widening and drainage improvements, as necessary, within the scope of work.

### BLUEWAYS

The community blueways category consists of boat launch facility improvements along the Old River, for a variety of watercraft, including motorized boats, canoes and kayaks, and stand up paddle boards.

#### Put-ins and Take-outs

As indicated on Figure 2.10, Public Access Facilities along Old River, there are opportunities to develop public access points along the Old River, including potential put-in / take-out facilities at the Eagle Pointe Golf Club and Recreation Center, FM 1409, and FM 565, just south of Interstate 10, at Crawdad's Restaurant and Gas Station. Put-in and take-out facilities should include:

- ample parking for trucks with boat trailers;
- restroom facilities;
- fish cleaning station;
- regulatory, wayfinding, and interpretive signage;
- hardscape (preferably concrete) boat ramp, at no more than a five percent slope;
- floating docks for fishing and launching canoes and kayaks;
- waste receptacles (trash and recycling).

### Signage

Because the Old River has many sloughs, tributaries and distributaries which often lead deep into swamp areas of the Old River, including Lost Lake, it will be important to have directional signage posted to trees along various canoe routes, so boaters do not get lost.

Signage, such as the canoe launch sign below, should be erected along key thoroughfares leading to public and private boat launching sites.







Map 2.1  
Community Trails Network

- Trailheads**
- Type
- Trailhead Location
- Blueway Put-In/Take-Out

Mont Belvieu City Limits**Sidewalks**

Type

SidewalkProposed Sidewalk**Trails**

Type

Pedestrian BridgePrimarySecondaryBluewayOn-Street Bike LaneSidewalkProposed Sidewalk





# 3

## IMPLEMENTATION STRATEGY

### INTRODUCTION

The goal of the Mont Belvieu Trails Master Plan is to provide policy guidance and direction for the gradual, phased development of its Community Trails Network. Chapter 3, Plan Implementation, identifies funding sources for trail construction, and recommends strategies for land acquisition. The chapter also summarizes appropriate maintenance considerations, and provides a suite of unit and aggregate costs with which to estimate the costs of constructing the system of trails. In the future, as Mont Belvieu continues to grow, it will be very important to develop a phased implementation program that keeps pace with where residential and other development is occurring, so that new neighborhoods and subdivisions are connected to the trails network and thereby linked to the community's varied recreational, commercial and educational resources and amenities.

# IMPLEMENTATION FRAMEWORK

## FUNDING MECHANISMS

The planning, design, and construction of recreational trails is not an inexpensive enterprise. To implement the Mont Belvieu Community Trails Network in a manner that keeps pace with development may require capital resource partnerships from a range of sources. The following list of funding sources complements those that are provided in Appendix D, Funding for Implementation, within the Mont Belvieu Parks and Recreation Master Plan.

- **Multi-Modal Transportation Projects.** Future trail projects should be tied into all major roadway construction and reconstruction projects to minimize costs. This will require ongoing discussions with Chambers County, H-GAC, and TxDOT to ensure coordinated infrastructure efforts for major projects.
- **Pavement Management and Maintenance Program** via the City's Capital Improvement Program (CIP). As the comprehensive trail network is being developed, one option for the City is to adopt a pavement management and maintenance program. This long-range strategy for reconstructing and improving the appearance, function, and safety of the City's existing streets and sidewalks dovetails with the objectives of this plan.
- **General Obligation Bonds.** Many cities throughout the Houston-Galveston region have funded trail projects using general obligation bonds either paired with transportation projects or as trail-specific projects. For instance, the City of Houston is implementing a \$205 million Bayou Greenways Initiative funded by a \$100 million bond passed in November 2012. This is matched by private-sector contributions of land, design fees, and \$105 million in funding.
- **Public-Private Partnerships with Developers and Special Districts.** Many secondary trail segments may be partially or entirely constructed by private developers or special districts. The City can proactively partner with these entities to co-fund projects that enhance the most visible elements or create critical connections that are otherwise not required in the City's land development regulations.
- **Parkland Dedication Ordinance.** Sec. 32-93. - Public uses. (a) Parks, playgrounds, and recreation areas, within the City's Code of Ordinances summarizes the City's parkland dedication requirements. This ordinance may be revised to include the construction of recreational trails, that would link subdivisions and neighborhoods to public parks and open space areas.
- **Private Donors.** The City has a history of private donations from local industrial foundations, which have funded, in part, several of the City's landmark projects, and serve as essential funding mechanisms that may provide critical starting capital, matching funds, land, and design enhancements above and beyond the City's contributions. On a smaller scale, fundraising campaigns can be set up for specific individual contributions such as penny drives and brick donations. Similarly, trail amenities such as bike racks, benches, picnic tables, water fountains, restrooms, interpretive and directional signage, map/brochures stands, parcourse equipment, shade structures, and landscape enhancements could be donated by community organizations and businesses. In-kind donations of labor, materials, or property could also prove highly valuable to implementation efforts. "Hands-on" support, such as a Boy Scouts service project to help advance park and trail construction, can be undertaken by community organizations to reduce costs.
- **Grants.** Over time, the City's Community Trails Network will likely require supplemental funding from regional, state, and federal grants. It will need to use local sources of funds such as the City's Capital Improvements Program (CIP), institutional investors, and private donors to leverage outside funding and vice-versa - especially to tackle trails projects that require major infrastructure improvements, such as crossing any of the community's extensive system of drainage canals. Receiving one or two grants is a powerful way to build momentum for the initiative and catalyze additional investment from both public and private sources. The challenge in pursuing grants is the application process, securing matching funds, and the timing necessary to go through the process. Major grants include:
  - » Texas Parks and Wildlife Department's (TPWD) Small Community Grants. This grant was created to meet the recreation needs of small Texas communities with a population of 20,000 and under. The grant provides 50 percent matching grant funds to eligible municipalities and counties. Funds must be used for development or acquisition of parkland and/or easements for recreational trails. Eligible projects include ball fields, boating, fishing, and hunting facilities, picnic facilities, playgrounds, swimming pools, trails, camping facilities, beautification, restoration, gardens, sports courts, and support facilities.
  - » TPWD's Outdoor Recreation Grants. This grant provides 50 percent matching grant funds to municipalities, counties, municipal

utility districts (MUDs), and other local units of government with populations less than 500,000, to acquire and develop parkland or to renovate existing public recreation areas. Projects must be completed within three years of approval.

- » Federal Highway Administration's (FHWA) Recreational Trail Grants. TPWD also administers the National Recreational Trails Fund in Texas under the approval of the Federal Highway Administration (FHWA). This federally funded program receives its funding from a portion of federal gas taxes paid on fuel used in non-highway recreational vehicles. The grants can be up to 80 percent of the project cost with a maximum of \$200,000 for non-motorized trail grants. Currently there is not a maximum amount for motorized trail grants. Funds can be spent on both motorized and non-motorized recreational trail projects such as the construction of new recreational trails, improvements to existing trails, development of trailheads or trailside facilities, and to acquire trail corridors.
- » FHWA's Transportation Alternatives. Transportation Alternatives (TA), formally known as Transportation Enhancements (TE), are federally funded, community-based projects that expand travel choices and enhance the transportation experience by integrating modes and improving the cultural, historic, and environmental aspects of our transportation infrastructure. TA projects must be one of 10 eligible activities and must relate to surface transportation. For example, projects can include creation of bicycle and pedestrian facilities, streetscape improvements, refurbishment of historic transportation facilities, and other investments that enhance communities, connections, and access. The federal government provides funding for TA projects through the nation's Federal-aid highway transportation legislation.
- » FHWA's Congestion Mitigation and Air Quality Improvement. The purpose of the Congestion Mitigation and Air Quality Improvement program (CMAQ) is to realign the focus of transportation planning toward a more inclusive, environmentally sensitive, and multi-modal approach. The CMAQ program provides funding for traffic mitigation programs and projects which reduce transportation-related emissions. Pedestrian and bicycle facilities are included as measures to reduce vehicle use or improve traffic flow. However, bicycle and pedestrian projects are at a disadvantage compared to roadway or transit improvements

simply because they do not always score as well for emissions reduction or congestion reduction as other types of roadway improvements, such as, high occupancy vehicle lanes, traffic signalization and synchronization, and intersection redesigns. This program is administered locally through H-GAC.

- » TxDOT's Highway Safety Improvement Program (including Safe Routes to School). The TxDOT Highway Safety Improvement Program (HSIP) is for highway safety projects that eliminate or reduce the number and severity of traffic crashes. Funds may be used for projects on any public road or publicly-owned bicycle and pedestrian pathway or trail. The Texas HSIP identifies bicyclists and pedestrians as roadway system users that require special protections to enhance roadway safety. The HSIP identifies countermeasures for these users that include: public information campaigns to increase awareness of bicyclists and pedestrians; the construction of sidewalks; local ordinances for helmet usage; and improved signals, signs and crosswalk markings at intersections. The HSIP also recommends continued funding support for a comprehensive Safe Routes to Schools program in Texas. Safe Routes to School (SRTS) programs are sustained efforts by parents, schools, community leaders and local, state, and federal governments to improve the health and well-being of children by enabling and encouraging them to walk and bicycle to school.
- » H-GAC's Transportation Improvement Program. Through its regional transportation planning role and as the Metropolitan Planning Organization (MPO) for transportation planning in the eight-county Houston-Galveston area, H-GAC funds and administers a broad range of pedestrian and bicyclist projects in its Transportation Improvement Program (TIP). H-GAC is intent on assisting more area local governments, including the City of Mont Belvieu, to develop pedestrian and bicyclist plans and projects so they may be nominated for funding in future annual updates of the regional TIP. With a Trails Master Plan now in place, Mont Belvieu should pursue this opportunity and tap into the resources that are already benefiting other area cities.

## ACQUISITION TOOLS

Given the potential cost, timing, and complexity of developing a robust trail network, the City must set aside appropriate linear corridors for trail improvements; similar to the development of a major thoroughfare plan. The two primary means discussed



are: (1) land dedication requirements through the subdivision regulations (Sec. 32-93 of Mont Belvieu's Code of Ordinances), and (2) acquisition of easements for trail purposes.

### Linear Land Dedications

One way to plan for the future trail network is to include trail dedication requirements within the City's subdivision regulations. In this way, proposed trail alignments can be preserved so that rights-of-way will be available for future "public thoroughfares." A development applicant shall coordinate with City staff to interpret the Community Trails Network Master Plan and its relationship to the proposed development. This would also include consideration of how any internal trail concepts within the development might connect with the existing trail network. Dedication of associated rights-of-way and/or land for public use would be accomplished through final plat approval.

The National Park Service (NPS), in its publication, *Protecting Open Space: Tools and Techniques for Texans*, points out the advantages and disadvantages of municipal parkland and trail dedication requirements. Among the advantages, such dedication ordinances enable communities to ensure adequate land for public recreational purposes "in step with the pace of land development." The NPS points out that also having the developer construct the park or trail improvement can be cost-efficient because labor and heavy equipment will already be on site for other on-site infrastructure and improvements; so the costs associated with construction staging will be significantly reduced. On the other hand, the NPS points out the potential legal risks of exaction ordinances if their requirements can be demonstrated to be excessive through successful litigation. NPS recommends instituting parkland and trail dedication requirements in communities where:

- Significant growth and new land development is occurring;
- The local government has a strong park/trail master plan to guide the development of new park/trail facilities; and
- Developers have typically complied well with local development ordinances.

However, the NPS urges caution if:

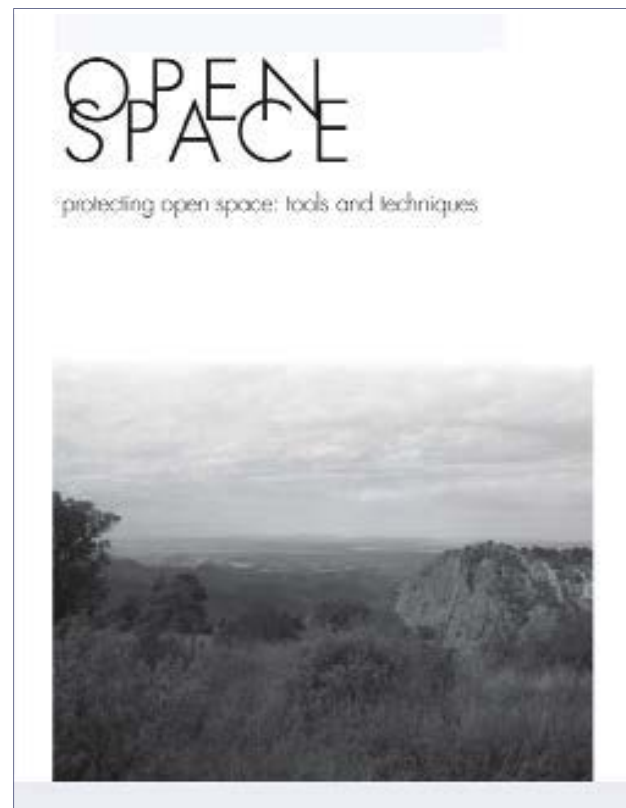
- The exaction ordinances could be difficult and costly to administer;
- The local government does not have adequate resources to pay for the maintenance of newly dedicated/acquired lands; and/or
- The cost of exactions could become a deterrent to any new development.

### Easements

The NPS also explores the option of trail easements, which "obtain the use of a corridor across another landowner's property for public access purposes at a cost less than outright purchase of the corridor or tract in fee simple." In other words, an easement represents a partial interest in a property, giving the easement holder the right to enter onto the property, develop a trail facility within a designated corridor, and allow others into that corridor to use the trail.

Such an easement could be acquired by a variety of public and/or private players and does not necessarily have to be held by the municipality. Another advantage of easements is that they are recorded in county deed records, meaning they run with the land and are legally binding on successive owners of the property. Some property owners may be willing to donate the easement to the community while others are interested in the income aspect.

The NPS points out that trail easements often grant access for a fixed number of years, which is different from many other easements that are established in perpetuity. However, property owners may insist on a less open-ended access commitment given concerns



The National Park Service (NPS) publication, *Protecting Open Space: Tools and Techniques for Texans*, is available for download at: <https://www.nps.gov/ncrc/programs/rtca/helpfultools/openspace.pdf>

| Table 3.1, Estimated Project Unit / Aggregate Costs   |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
|---|-------------------------------|---|--------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|-------------------------------|-------------------------------|
|   |                               | Primary Trails                              |                                | Secondary Trails              |                                |                                |                               |                                |                                |                               |                               |                               |
|   | Planning-level Cost Estimates | 1   | 2                              | 3                             | 4                              | 5                              | 6                             | 7                              | 8                              | 8.1                           | 8.2                           | 8.3                           |
| Facility Length   |                               | 19,536 lin. ft.<br>(3.7 miles)              | 12,672 lin. ft.<br>(2.4 miles) | 3,168 lin. ft<br>(0.6 miles)  | 15,840 lin. ft.<br>(3.0 miles) | 12,144 lin. ft.<br>(2.3 miles) | 4,224 lin. ft.<br>(0.8 miles) | 6,864 lin. ft.<br>(1.3 miles)  | 6,864 lin. ft.<br>(1.3 miles)  | 4,752 lin. ft<br>(0.90 miles) | 2,112 lin. ft<br>(0.40 miles) | 2,112 lin. ft<br>(0.40 miles) |
| Trails  |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Demolition and disposal of concrete or asphalt (per square foot)  | \$2.20                        |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| 5 ft. wide reinforced concrete one side of street with 4" to 5" thickness (per linear foot)   | \$36.67                       | (9,029 lin. ft.)<br>\$331,093               |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| 5 ft. wide asphalt shoulders, both sides of the thoroughfare. striped (per linear foot)   | \$50.44                       |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| 10 ft. wide reinforced concrete/ shared-use path (per linear foot)  | \$165.00                      |   | \$2,090,800                    | \$522,720                     |                                |                                | \$696,960                     |                                |                                |                               |                               |                               |
| 8 ft. wide soft-surface trail and edging (decomposed granite) (per linear foot)   | \$88.00                       |   |                                |                               | \$1,393,920                    | \$1,068,672                    |                               | \$604,032                      | \$604,032                      | \$418,176                     | \$185,856                     | \$185,856                     |
| Fine and rough grading allowances (per square foot)   | \$3.30                        | (135,435 sq. ft.)<br>\$446,935              | (190,080 sq. ft.)<br>\$627,264 | (47,520 sq. ft.)<br>\$156,816 | (237,600 sq. ft.)<br>\$784,080 | (182,160 sq. ft.)<br>\$601,128 | (63,360 sq. ft)<br>\$209,088  | (102,960 sq. ft.)<br>\$339,768 | (102,960 sq. ft.)<br>\$339,768 | (71,280 sq.ft.)<br>\$235,224  | (31,680 sq.ft.)<br>\$104,544  | (31,680 sq.ft.)<br>\$104,544  |
| Culverts (12 inch diameter maximum for local drainage only) (one every 240 ft.) (per unit)  | \$1,100.00                    | (17) <sup>3</sup><br>\$18,700               | (53)<br>\$58,300               | (13)<br>\$14,300              | (66)<br>\$72,600               | (50)<br>\$55,000               | (17)<br>\$18,700              | (28)<br>\$30,800               | (28)<br>\$30,800               | (20)<br>\$22,000              | (9)<br>\$9,900                | (9)<br>\$9,900                |
| Turf re-establishment (7.5 ft. on both sides of trail corridor via hydroseeding) (per linear foot, with establishment watering)   | \$0.75                        | (135,435 sq. ft.) <sup>2</sup><br>\$101,576 | (190,080 sq. ft.)<br>\$142,560 | (47,520 sq. ft.)<br>\$35,640  | (237,600 sq. ft.)<br>\$178,200 | (182,160 sq. ft.)<br>\$136,620 | (63,360 sq. ft)<br>\$47,520   | (102,960 sq. ft.)<br>\$77,220  | (102,960 sq. ft.)<br>\$77,220  | (71,280 sq.ft.)<br>\$53,460   | (31,680 sq.ft.)<br>\$23,760   | 31,680 sq.ft.)<br>\$23,760    |
| Bike Lane Conversions   |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Bicycle lane marking both sides of street (per linear foot)   | \$11.00                       |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Crosswalk Modifications   |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Intersection and mid-block crosswalk striping   | \$300.00                      | (27) \$8,100                                |                                |                               | \$300                          |                                |                               |                                |                                | \$300.00                      |                               |                               |
| Intersection accessibility ramps (per ramp up to 8 per intersection)  | \$1,300.00                    |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Signage, Lighting, and Safety Features(   |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Trail/bikeway directional and safety signage (every 500 ft.) (per unit)   | \$550.00                      | (39)<br>\$21,450                            | (25)<br>\$13,750               | (6)<br>\$3,300                | (31)<br>\$17,050               | (24)<br>\$13,200               | (8)<br>\$4,400                | (13)<br>\$7,150                | (13)<br>\$7,150                | (9)<br>\$4,950                | (4)<br>\$2,200                | (4)<br>\$2,200                |
| Pole lighting (every 100 ft.) (per unit)  | \$2,800.00                    | (90) <sup>4</sup><br>\$252,000              | (126)<br>\$352,800             | (31)<br>\$86,800              | (158)<br>\$442,400             | (121)<br>\$338,800             | (42)<br>\$117,600             | (68)<br>\$190,400              |                                |                               |                               |                               |
| Emergency call box (one per half mile) (per unit, cellular, solar-powered)  | \$11,000.00                   | (4) <sup>4</sup><br>\$44,000                | (5)<br>\$55,000                | (1)<br>\$11,000               | (6)<br>66,000                  | (4)<br>\$44,000                | (1)<br>\$11,000               | (2)<br>\$22,000                | (2)<br>\$22,000                | (1)<br>\$11,000               |                               |                               |
| Miscellaneous Improvements  |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| Trailhead Improvements (existing parking lot)   | \$7,500.00                    | (2) \$15,000                                | (2) \$15,000                   |                               |                                | \$15,000                       |                               |                                |                                |                               |                               |                               |
| Trailhead Improvements (incl. 10 vehicle asphalt parking lot)   | \$30,000.00                   |   |                                |                               | \$30,000                       |                                |                               | \$30,000                       |                                |                               |                               |                               |
| Boat Ramp (lump sum)  | \$750,000.00                  |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| TOTAL   |                               | \$1,238,854                                 | \$3,355,474                    | \$830,576                     | \$2,984,550                    | \$2,272,420                    | \$1,105,268                   | \$1,301,370                    | \$1,080,970                    | \$735,210                     | \$326,260                     | \$326,260                     |
| NOTES   |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |
| 1. These figures shall be used for long-range planning purposes only. A landscape architect and engineer should be consulted to determine exact specifications for infrastructure improvements and design specifications, which could dramatically influence the overall project budget.<br>2. Fine and rough grading estimate includes 7.5 feet on either side of trail.<br>3. Culverts are included the length of Eagle Drive (FM 3360) only.<br>4. From FM 565 to Eagle Pointe Golf Club and Recreation Center, a distance of 9,029 lin. ft.<br>5. Segment A Improvements include a 10 foot wide recreational trail, extending from Eagle Pointe Drive north to S.H. 146, a distance of 7,700 lin. ft.<br>6. Asphalt demolition includes the removal of outer 2.5 feet of asphalt shoulder.<br>7. Grading and stabilization improvements extend a distance of 7.5 feet from the outside edge of the recreational trail.<br>8. Street lighting improvements include lights 200 ft. on center. |                               |   |                                |                               |                                |                                |                               |                                |                                |                               |                               |                               |

| Table 3.1, Estimated Project Unit / Aggregate Costs   |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
|---|----------------------------------|-------------------------------|--------------------------------|------------------------------|------------------------------|------------------------------|-------------------------------|------------------------------|--------------------------------|--------------------------------|----------------------------------|--------------------------------|
|   |                                  |                               | Secondary Trails               |                              |                              |                              |                               |                              | On-Street Bike Lanes           |                                |                                  | Blueways                       |
|   | Planning-level<br>Cost Estimates | 9                             | 10                             | 10.1                         | 10.2                         | 10.3                         | 10.4                          | 11                           | Segment A                      | Segment B                      | Segment C                        |                                |
| Facility Length   |                                  | 7,920 lin. ft.<br>(1.5 miles) | 10,296 lin. ft.<br>(1.95miles) | 250 lin. ft.<br>(0.04 miles) | 1,848 lin.ft.<br>(.35 miles) | 250 lin. ft.<br>(0.04 miles) | 4,752 lin.ft.<br>(0.90 miles) | 6,336 lin.ft.<br>(1.2 miles) | 7,700 lin. ft.<br>(1.45 miles) | 9,812 lin. ft.<br>(1.85 miles) | 26,900 lin. ft.<br>(5.09 miles)  | 45,936 lin. ft.<br>(8.7 miles) |
| Trails  |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Demolition and disposal of concrete or asphalt (per square foot)  | \$2.20                           |                               |                                |                              |                              |                              |                               |                              | \$42,350 <sup>6</sup>          |                                |                                  |                                |
| 5 ft. wide reinforced concrete one side of street with 4" to 5" thickness (per linear foot)                                     | \$36.67                          |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| 5 ft. wide asphalt shoulders, both sides of the thoroughfare, striped (per linear foot)   | \$50.44                          |                               |                                |                              |                              |                              |                               |                              |                                |                                | \$1,356,836                      |                                |
| 10 ft. wide reinforced concrete/ shared-use path (per linear foot)  | \$165.00                         |                               |                                |                              |                              |                              | \$784,080                     |                              | \$1,270,500                    |                                |                                  |                                |
| 8 ft. wide soft-surface trail and edging (decomposed granite) (per linear foot)   | \$88.00                          | \$696,960                     | \$906,048                      | \$22,000                     | \$162,624                    | \$22,000                     |                               | \$557,568                    |                                |                                |                                  |                                |
| Fine and rough grading allowances (per square foot)   | \$3.30                           | (118,800 sq.ft.)<br>\$392,040 | (154,440 sq.ft.)<br>\$509,652  | (3,750 sq.ft)<br>\$12,375    | (27,720 sq.ft.)<br>\$91,476  | (3,750 sq.ft)<br>\$12,375    | (71,280 sq.ft)<br>\$235,224   | (95,040 sq.ft.)<br>\$313,632 | (57,750 sq. ft.)<br>\$190,575  |                                | (403,500 sq. ft.)<br>\$1,331,550 |                                |
| Culverts (12 inch diameter maximum for local drainage only) (one every 240 ft.) (per unit)                                      | \$1,100.00                       | (11)<br>\$36,300              | (43)<br>\$47,300               | (1)<br>\$1,100               | (8)<br>\$8,800               | (1)<br>\$1,100               | (20)<br>\$22,000              | (26)<br>\$28,600             | (32)<br>\$35,200               |                                |                                  |                                |
| Turf re-establishment (7.5 ft. on both sides of trail corridor via hydroseeding) (per linear foot, with establishment watering) | \$0.75                           | (118,800 sq.ft.)<br>\$89,100  | (154,440 sq.ft.)<br>\$115,830  | (3,750 sq.ft.)<br>\$2,813    | (27,720 sq.ft)<br>\$20,790   | (3,750 sq.ft.)<br>\$2,813    | (71,280 sq.ft.)<br>\$53,460   | (95,040 sq.ft.)<br>\$71,280  | (57,750 sq. ft.)<br>\$43,312   |                                | (403,500 sq. ft.)<br>\$998,662   |                                |
| Bike Lane Conversions   |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Bicycle lane marking both sides of street (per linear foot)   | \$11.00                          |                               |                                |                              |                              |                              |                               |                              |                                | \$215,864                      | \$295,900                        |                                |
| Crosswalk Modifications   |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Intersection and mid-block crosswalk striping   | \$300.00                         |                               | (3)<br>\$900                   |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Intersection accessibility ramps (per ramp up to 8 per intersection)  | \$1,300.00                       |                               | (6)<br>\$7,800                 |                              |                              |                              |                               | (2)<br>\$2,600               |                                |                                |                                  |                                |
| Signage, Lighting, and Safety Features  |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Trail/bikeway directional and safety signage (every 500 ft.) (per unit)   | \$550.00                         | (39)<br>\$21,450              | (20)<br>\$11,000               | (1)<br>\$550                 | (3)<br>\$1,650               | (1)<br>\$550                 | (9)<br>\$4,950                | (15)<br>\$8,250              | (15)<br>\$8,250                | (19)<br>\$10,450               | (53)<br>\$29,150                 |                                |
| Pole lighting (every 100 ft.) (per unit)  | \$2,800.00                       |                               |                                |                              |                              |                              |                               |                              | (77)<br>\$215,600              | (49)<br>\$137,200              | (134)<br>\$375,200               |                                |
| Emergency call box (one per half mile) (per unit, cellular, solar-powered)  | \$11,000.00                      | (3)<br>\$33,000               | (3)<br>\$33,000                |                              | (1)<br>\$11,000              |                              | (2)<br>\$22,000               | (2)<br>\$22,000              | (3)<br>\$33,000                | (3)<br>33,000                  | (10)<br>\$110,000                |                                |
| Miscellaneous Improvements  |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Trailhead Improvements (existing parking lot)   | \$7,500.00                       |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Trailhead Improvements (incl. 10 vehicle asphalt parking lot)   | \$30,000.00                      |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| Boat Ramp (lump sum)  | \$750,000.00                     |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  | (3) \$2,250,000                |
| ***Pestrian Bridge ***  | \$225,000                        | (3)<br>\$675,000              | (1)<br>\$225,000               |                              |                              |                              | (1)<br>\$225,000              |                              |                                |                                |                                  |                                |
|   |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |
| TOTAL   |                                  | \$1,943,850                   | \$1,856,530                    | \$38,838                     | \$296,340                    | \$38,838                     | \$1,346,714                   | \$1,003,930                  | \$1,838,787                    | \$396,514                      | \$4,497,298                      | \$2,250,000                    |
| NOTES   |                                  |                               |                                |                              |                              |                              |                               |                              |                                |                                |                                  |                                |



about potential liability, interference with their use of the land, and potential problems such as litter and vandalism.

Of particular interest to Mont Belvieu, the NPS notes that trail easements are a vehicle to enable one public agency (such as a municipality) to obtain certain rights related to another public agency's property, such as a municipal utility district or levee improvement district that does not have a recreational mandate or the capabilities or staffing to manage public use of a trail facility.

As with parkland/trail dedication requirements, the NPS points out both advantages and disadvantages of trail easements. The primary advantage is that easements typically cost less than outright land purchases, so the City's trail development funds can go further through the use of easements. Trails also occupy relatively narrow corridors, so they can be accommodated via easements within larger tracts of land that are used for various other purposes. The main disadvantage is that the easement puts the grantor (property owner) and grantee (municipality) in an ongoing relationship, which could prove tricky if disagreements emerge or certain expectations are not met. The landowner may also insist on certain restrictive terms to address concerns about the types of trail use and/or hours of public use, and these limitations may prove burdensome for the City (and trail users) over time. The NPS particularly warns about term-limited easements where a property owner could choose not to renew the agreement after the City has already constructed the trail.

The NPS concludes that trail easements are advisable in cases where:

- There would be substantial cost-savings in acquiring an easement rather than land in fee simple (full purchase);
- The easement is in perpetuity, and the terms and

conditions are defined well enough for future owners to conform to the original intent if the land changes hands; and/or

- The granting landowner is already a public entity, and adding public use would be easy.

The NPS does not recommend use of trail easements when:

- The granting landowner is leery of government and/or public use;
- The landowner's terms and conditions prove too restrictive to provide a reasonable amount of trail access and use; and/or
- The local government does not have adequate staff to effectively manage the trail easement to prevent negative impacts on the landowner.

## MAINTENANCE PROGRAM

One of the key considerations in developing an implementation framework is the cost of maintaining the trail system. The City must set aside adequate funding support for ongoing, routine maintenance, which is oftentimes a key criterion for grant applications. Example considerations include:

- Major and minor surface repairs caused by general wear and tear and root damage;
- Surface sweeping and clearing debris on a regular basis (particularly within on-street bicycle lanes) and after storms for user safety;
- Routine monitoring of lighting and signs to ensure safety and clear communication;
- Trash collection, litter removal, and graffiti removal;
- Cleaning of restrooms, drinking fountains, parking lots, and other trailhead and trail amenities; and

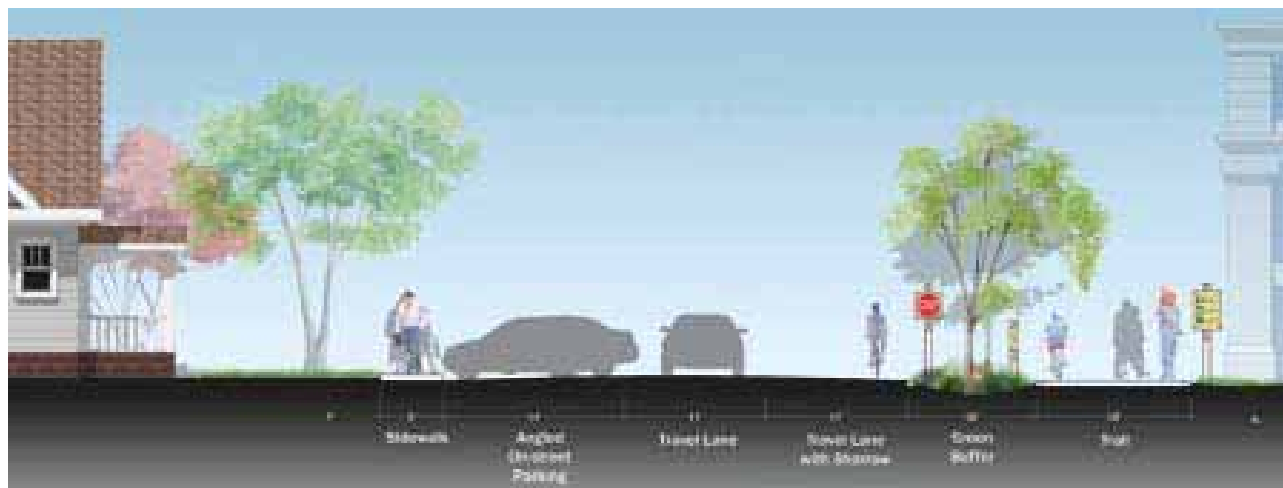


Figure 3.1 Proposed Town Center Cross Section

- Trimming of vegetation to ensure visibility (e.g., no higher than three feet for under-story vegetation and minimum vertical clearance of eight feet above trails).

In many instances along the proposed trail system, the path will connect City parkland or other City-maintained areas or rights-of-way where mowing already occurs and is covered by existing maintenance budgets. In other cases, a trail may be constructed along the edge of a school campus or in other locations where another agency or entity may already handle general mowing and maintenance. Given their proximity to neighborhoods or commercial areas, some trail segments may particularly lend themselves to volunteer mowing (“Adopt-A-Trail” initiatives) and upkeep assistance, which would ease the City’s maintenance cost.

For the purposes of this plan, the annual estimated cost of maintenance and operations along a trail, independent of existing right-of-way maintenance, is estimated to be an average of \$2,500 per linear mile for hard and soft surfaces, recognizing soft surfaces tend to require a higher degree of maintenance and more frequent resurfacing, which is factored into the lifespan of the surface. This estimate will vary based on the paving material used for the recreational trail. For example, the lifespan and maintenance costs associated with asphaltic concrete will be significantly higher compared to that of cementitious concrete; though the construction costs of the latter will be much greater.

## PROJECT PRIORITIZATION

### Cost Considerations

In order to develop a phased implementation strategy for the proposed trail system, the project team sought cost inputs from local design and contract professionals working in Fort Bend County and the Houston metropolitan area. The cost of building sidewalks and trails fluctuates from year to year and requires familiarity with the local terrain, drainage, and other environmental conditions that would increase the City’s design, labor, or material budgets.

The following “planning level” estimates use 2014 dollar values and include a 10 percent contingency increase since all proposed trails are at a pre-design stage. The contingency helps to account for unknown variables, such as multi-phase projects that would involve smaller trail sections constructed at higher per-unit costs. For planning purposes, an additional 15 percent fee has been added to account for project “soft costs,” including surveying, design, and construction administration associated with the improvements.

It is anticipated that the principal trails in the planned future trail network for Mont Belvieu will be primarily

designed with concrete surfaces given their expected utilization level, the durability and relative maintenance ease of concrete, and the need for hard surfaces near low-lying areas subject to periodic flooding and potential erosion. While a 10-foot multi-use trail costs nearly double the price of an eight-foot soft-surface trail, it is expected to have a 15- to 30-year life span. Crushed granite surfaces need to be replaced every 2 to 10 years and can require higher maintenance costs due to edging and sweeping.

Design features should generally be specified to minimize maintenance needs, including appropriate base design and materials to ensure sound construction results and careful drainage planning. Through the preliminary design process for specific trail projects, additional cost estimates would be needed for any trail-related amenities plus improvements at trailhead locations. Any necessary land and/ or easement acquisition would represent an additional added cost. Then, standard cost expectations for engineering, testing, construction administration, contingencies, etc. would round out the overall project cost.

### Potential Projects

This section focuses on prioritization of potential projects. The project tables list and prioritize specific tasks in the short- (1 to 2 years), mid- (3 to 5 years), and long-term (6+ years) to reflect multiple phases

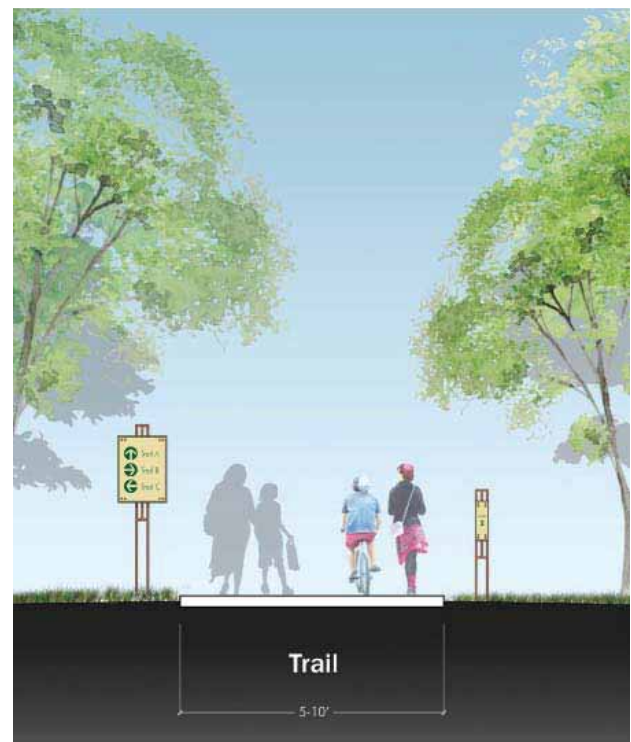


Figure 3.2 Proposed Trail Entrance, Varies from 5'-10'

The following is a Preliminary Feasibility Overview of a 1.4 mile section of Trail Segment No. 4, beginning just south of Barbers Hill Elementary School South along the existing northern sidewalk along Lakes of Champions Boulevard to second Trailhead location indicated on Map 2.1, Community Trails Network.

Based on implementation plan recommendations, the first mile (1.4 mile section) of Trail Segment No. 4 was determined to be a priority and selected for a preliminary feasibility assessment. The preliminary feasibility assessment will serve as the basis for future construction of Trail Segment No. 4. While this is just a cursory assessment, it is intended to help set the stage for immediate implementation, engineering, and construction of this pivotal segment.

Although the timeframe for construction of the entire length of Segment No. 4 is more of a long-range project and identified earlier as a secondary trail, the first mile of the Segment was later determined to be one of the more highly feasible and critical segments.

| Table 3.3, Benefits   | Trail Segment No. 1 | Trail Segment No. 2 | Trail Segment No. 3 | Trail Segment No 4 |
|---|---------------------|---------------------|---------------------|--------------------|
| 1. Importance to Citywide Connectivity                      | ✓                   |                     |                     | ✓                  |
| 2. Helps Overcome Barrier or Existing Gap                   |                     |                     |                     | ✓                  |
| 3. Connectivity to Local Destinations                       | ✓                   |                     |                     |                    |
| 4. Route with Prior Reported Bicycle or Pedestrian Incident | ✓                   |                     |                     |                    |
| 5. Potential Usage  |                     |                     |                     | ✓                  |
| 6. Potential Demonstration / Catalyst Project               |                     |                     |                     | ✓                  |

SUMMARY OF TRAIL ALIGNMENT AND PROPERTY OWNERSHIP

The segment begins on Lakes of Champions Boulevard, which is a public right-of-way. Since one of the key goals of the network is to connect public institutions and parks, Segment No. 4 was deemed as the secondary segment with one of the highest possibilities for future connections. It also provides an opportunity for connection between and around subdivisions.

One of the key factors in determining the feasibility of Trail Segment No. 4 is the existing sidewalk that follows a northerly direction along Lakes of Champions Boulevard. The sidewalk turns into a grade separation over Cotton Bayou. The existing conditions along the segment are not only amenable to a future extension of the sidewalk into a 10 foot concrete shared-use path, but sufficient future right-of way is available along the proposed connection/extension of Lakes of Champions Blvd. and Wilburn Ranch Road. The trail is also critical to connecting the growing population of Mont Belvieu, especially with platted future sections of Wilburn Ranch and Lakes of Champions Estates.

As seen on Figure 3.1, Proposed Trail Alignment for Segment No. 4, a large part of the proposed Trail Segment No. 4 is either along public right-of-way or on property owned by Barbers Hill ISD. The proposed trailhead locations are also ideally situated on either a proposed park or within easily accessible dedicated easements. The subject alignment north of Perry Avenue crosses City-owned property along Elevated Water Storage Tank No. 3, follows a northerly direction along the City limits boundary/proposed extension of Lakes of Champions Boulevard, and then continues and terminates along the proposed extension of Wilburn Ranch Drive.

Along the proposed alignment of Trail Segment No. 4, there are no proposed major structural improvements. While the future crossing at the intersection of Wilburn Ranch Drive and Lakes of Champions Boulevard will need further assessment, the future connectivity of these two roads further cement the feasibility and ultimate constructability of this 1.4 mile section of Trail Segment No. 4. Both of these proposed extensions are on the City's Thoroughfare Plan.



Figure 3.3, Proposed Trail Alignment for Segment No. 4

1.4 Mile Trail Segment Reviewed

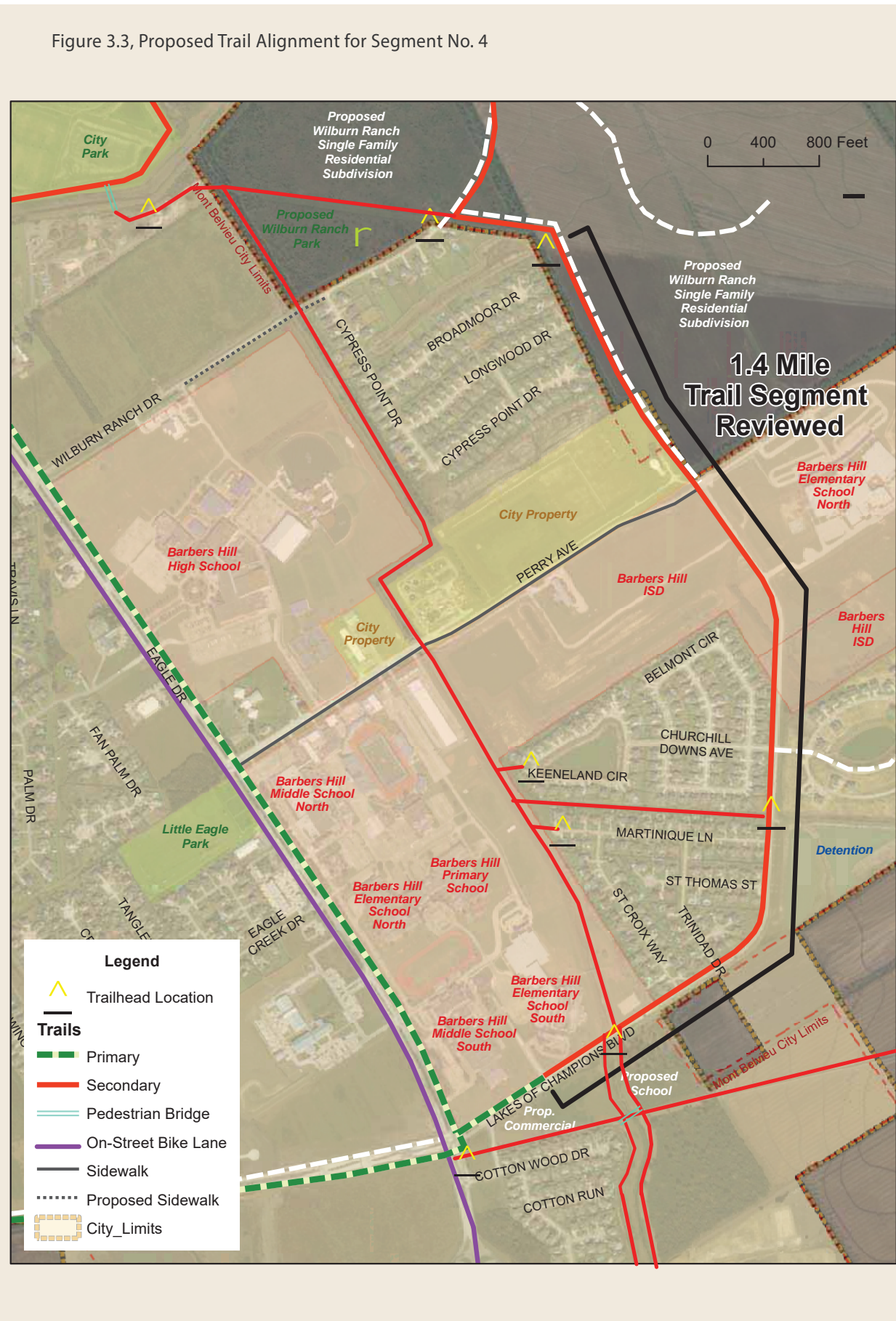
Legend

- Trailhead Location
- Trails
  - Primary
  - Secondary
  - Pedestrian Bridge
  - On-Street Bike Lane
  - Sidewalk
  - Proposed Sidewalk
  - City Limits

Scale: 0 400 800 Feet

Key locations and features on the map include:

- City Park
- Proposed Wilburn Ranch Single Family Residential Subdivision
- Proposed Wilburn Ranch Park
- Barbers Hill High School
- Barbers Hill Middle School North
- Barbers Hill Elementary School North
- Barbers Hill Primary School
- Barbers Hill Elementary School South
- Barbers Hill Middle School South
- Barbers Hill Elementary School South
- City Property
- Detention
- Streets: Broadmoor Dr, Longwood Dr, Cypress Point Dr, Perry Ave, Belmont Cir, Churchill Downs Ave, Keeneland Cir, Martinique Ln, St Thomas St, St Croix Way, Trinidad Dr, Lakes of Champions Blvd, Cotton Wood Dr, Cotton Run, Eagle Dr, Fan Palm Dr, Tangle, Eagle Creek Dr, Wilburn Ranch Dr, Mont Belvieu City Limits, Proposed School, Prop. Commercial.



### ADDITIONAL IDEAS FOR MAKING TRAIL CONSTRUCTION MORE FEASIBLE

- Provide a specific contact person for adjacent landowners to contact if any specific problems arise.
- Maintain trails on a regular basis and consider involving citizens in trail upkeep with volunteer work groups and/or “adopt-a-trail” programs.
- Promptly respond to problems, such as unauthorized motorized vehicles use, vandalism, theft of trail signs, and graffiti. Consistent quality upkeep of the trail will build community confidence in the ability to manage the trail.
- Consider scheduling regular meetings to receive input from users, residents and landowners.
- Invite landowners on a trail tour led by City staff or someone else who is involved with trail management or planning.
- Make sure adequate facilities, such as restrooms and drinking fountains, are provided so that adjacent landowners are assured that trail users will stay on the trail.

### STREET /BRIDGE CROSSINGS

Trail Segment No. 4 would involve the following crossings along Lakes of Champions Boulevard:

- St. Croix Way;
- Trinidad Drive;
- St. Thomas Street;
- Martinique Lane;
- Churchill Downs Avenue;
- Perry Avenue; and
- Wilburn Ranch Road.

The crossings will require highly visible reflective markers, particularly for safety reasons. Pedestrians are sensitive to out-of-the-way travel, and reasonable accommodation should be made to make crossings both convenient and safe at locations with adequate visibility. Although there are no existing signalized intersections along the proposed Trail Segment No. 4 alignment, future signalized intersections should have crosswalks at all four legs. If installing midblock crossings, the City will need to accompany them with signs or markings that alert motorists

of the upcoming crosswalk, because motorists generally do not expect midblock crossings. Many cities now use beacons such as the pedestrian hybrid beacon or the rectangular rapid flash beacon (RRFB) to alert motorists of pedestrians in the crosswalk.

It is especially important to ensure that crosswalk markings are visible to motorists, particularly at night. Crosswalks should not be slippery, create tripping hazards, or be difficult to traverse by those with diminished mobility or visual capabilities. Granite and cobblestones are examples of materials that are aesthetically pleasing, but may become slippery when wet or difficult to cross by pedestrians who are blind or using wheelchairs, walkers or other assistive devices. Some agencies have installed crosswalks with a marking-free channel in the middle that provides a less slippery surface for crossing pedestrians.

In Mont Belvieu’s case, particularly for Trail Segment No. 4, it is highly recommended to mark crosswalks with inlay tape, which may easily be installed on new or repaved streets. It is highly reflective, long-lasting, slip-resistant, and does not require a high level of maintenance. Although initially more costly than paint, both inlay tape and thermoplastic are more cost-effective in the long run. Inlay tape is recommended for new and resurfaced pavement, while thermoplastic may be a better option on rougher pavement surfaces. Both inlay tape and thermoplastic are more visible and less slippery than paint when wet.

Motorists may fail to yield to pedestrians at unmarked crossings. Marked crosswalks warn motorists to expect pedestrian crossings and indicate preferred crossing locations for pedestrians. Other crosswalk considerations include:

1. Crosswalk locations should be convenient for pedestrian access.
2. Crosswalk markings alone are unlikely to benefit pedestrian safety. Ideally, crosswalks should be used in conjunction with other measures, such as curb extensions, to improve the safety of a pedestrian crossing, particularly on multi-lane roads with average daily traffic (ADT) above about 10,000.
3. Marked crosswalks are important for pedestrians with vision loss.
4. Crosswalk markings must be placed to include the ramp so that a wheelchair does not have to leave the crosswalk to access the ramp.
5. The cost of striped crosswalks range from approximately \$100 to \$2,100 each, or on average approximately \$7 per square foot. A high visibility crosswalk can range from \$600 to \$5,700 each, or around \$2,500 on average.

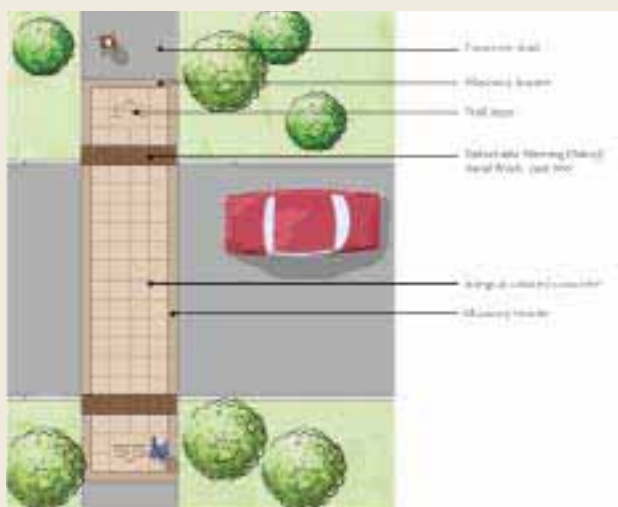


Figure 3.4 Proposed Urban Crosswalk

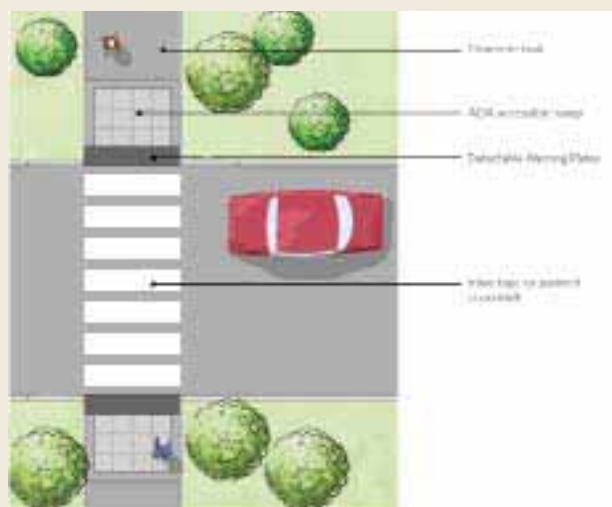


Figure 3.5 Proposed Segment No. 4 Urban Crosswalk on Budget

Table 3.4, Cursory Constructability for Trail Segment No. 4, Subject Section

The subject section length of Trail Segment No. 4 that was reviewed is approximately 1.4 miles, or 7,392 linear feet. (The complete facility length of Trail Segment No. 4 is approximately 3 miles, or 15,840 linear feet.)

|   | Cost Estimates | Segment No. 4      |
|---|----------------|--------------------|
| <b>Trails</b>   |                |                    |
| Demolition and Disposal of concrete or asphalt (per square foot)  | \$2.20         |                    |
| 5 ft. wide reinforced concrete one side of street with 4-5" thickness (per linear foot)   | \$36.67        |                    |
| 10 ft. wide reinforced concrete/shared-use path (per linear foot)   | \$165.00       | \$1,219,680        |
| Fine and rough grading allowances (per square foot)   | \$3.30         | \$360,676          |
| Culverts (12 inch diameter maximum for local drainage only) (one every 240 ft.) (per unit)                                      | \$1,100        | \$33,396           |
| Turf re-establishment (7.5 ft. on both sides of trail corridor via hydroseeding) (per linear foot, with establishment watering) | \$0.75         | \$81,972           |
| <b>Crosswalk Modifications</b>  |                |                    |
| Intersection and mid-block crosswalk striping   | \$350.00       | \$3,850            |
| Intersection accessibility ramps (per ramp up to 8 per intersection)  | \$1,300.00     | \$18,200           |
| <b>Signage, Lighting and Safety Features</b>  |                |                    |
| Trail/bikeway directional and safety signage (every 500 ft.) (per unit)   | \$550.00       | \$7,843            |
| Pole lighting (every 100 ft.) (per unit)  | \$2,800.00     | \$203,504          |
| Emergency call box (one per half mile) (per unit, cellular, solar-powered)  | \$11,000.00    | \$30,360           |
| <b>Miscellaneous Improvements</b>   |                |                    |
| Trailhead improvements (existing parking lot)   | \$7,500.00     |                    |
| Trailhead improvements (including 10-vehicle asphalt parking lot)   | \$30,000.00    | \$30,000           |
| Contingency   | 20%            | \$397,896          |
| <b>TOTAL</b>  |                | <b>\$2,387,377</b> |





Figure 3.6 Proposed Trail Sign Family



Figure 3.7 Proposed Trail Amenity - Restroom

#### NEXT STEPS FOR IMPLEMENTATION OF TRAIL SEGMENT NO. 4

1. Confirm that area characteristics, such as average daily traffic counts where Trail Segment No. 4 is proposed, are similar to those encountered during the master planning process;
2. Update project costs based on current costs and conditions, and confirm scope of the segment;
3. Determine if a Preliminary Engineering Report (PER) is needed to confirm costs and provide specific construction details for Trail Segment No. 4 (note that a PER for significant bicycle and pedestrian projects may be valuable to respond to funding opportunities as they occur);
4. Identify the funding source(s) for the subject segment;
5. Determine if additional citizen input is required, and communicate the intent of the project to area residents;
6. Prior to development, conduct "before" pedestrian and/or bicycle counts as a benchmark for the project;
7. Conduct area notification campaign to let area residents know that facility is available for usage; and
8. After development, conduct periodic counts to measure usage.



# COTTON BAYOU CONCEPT PLAN

CONCEPT DESIGN

SEPTEMBER 6, 2018



**DESIGNWORKSHOP**













**LEGEND**

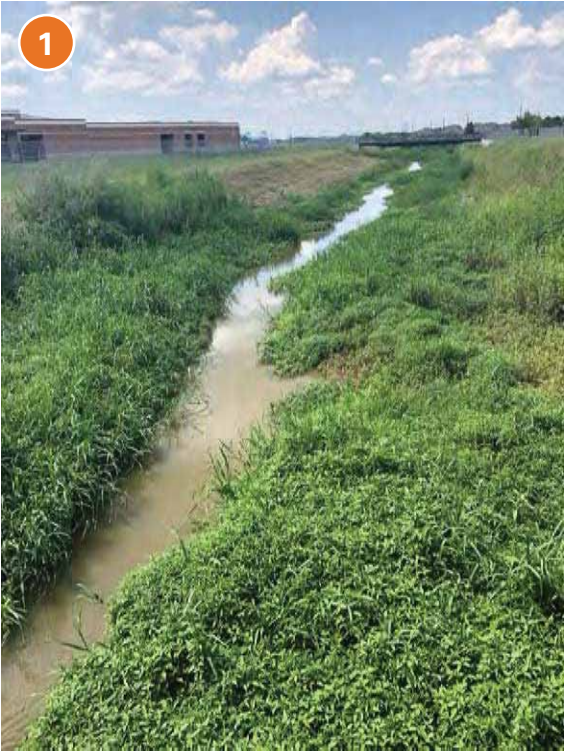
- LOST RIVER-OLD RIVER WATERSHED
- 100 YEAR FLOODPLAIN
- 2 FOOT CONTOUR
- DRAINAGE CANAL
- MONT BELVIEU CITY BOUNDARY
- SITE BOUNDARY











**COTTON BAYOU** Looking north from the Lake of Champions Boulevard bridge.



**DRAINAGE EASEMENT** Looking north from Lake of Champions Boulevard, the future trail will follow an easement along Cotton Bayou and eventually connect with City Park.



**LAKE OF CHAMPIONS BLVD** This is both a boundary to the project site and a key corridor connection. Although a sidewalk exists, traffic calming is needed for improved safety.



**DRAINAGE EASEMENT AND SWALE** Adjacent to the Barbers Hill Primary School, there is an existing drainage feature within what will likely be a future trail connection.



**REMNANT TREES** Just south of Lake of Champions Boulevard is a cluster of remnant large canopy trees preserved as part of the Champions Estates project.



**DRAINAGE EASEMENT** Looking south along the drainage easement adjacent to Cottonwood Estates, the wide and flat landscape will allow for trail and related program spaces.

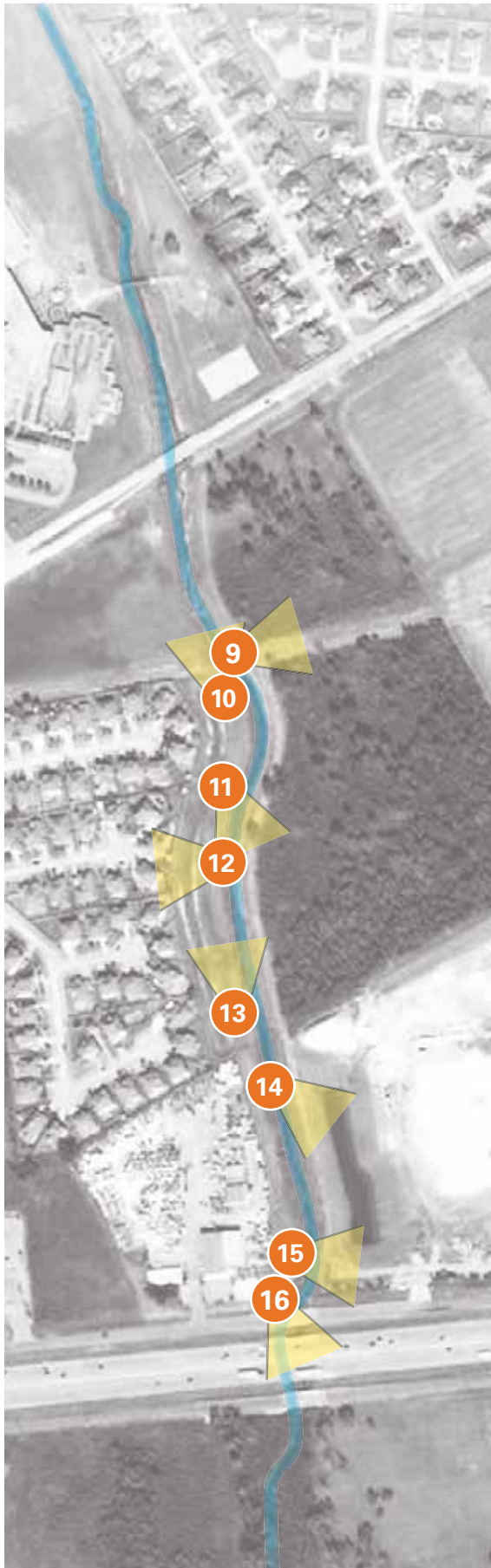


**DRAINAGE OUTFALL AND NEW CONSTRUCTION** This large outfall along the bayou will receive a significant portion of stormwater from the Champions Estates which is currently under construction.



**PIPELINE EASEMENT** Looking east, this pipeline easement is approximately 60' in width, and slated for a planned trail connection that will link to future commercial development and the HEB.





**PIPELINE EASEMENT** Looking west along the pipeline easement, a future bridge may be desirable to allow for a planned trail connection to link with the Champions Estates development.



**DRAINAGE EASEMENT** Looking north along the drainage easement adjacent to Cottonwood Estates, the wide and flat landscape will allow for trail and related program spaces.



**DRAINAGE EASEMENT** Looking south along the drainage easement, the view includes the overgrown vegetation of the bayou, a remnant pine tree, the detention basin, and the Wisner Distribution Center beyond.



**DETENTION BASIN AND EXISTING DEVELOPMENT** Immediately adjacent to Cottonwood Estates is a long narrow detention basin that separates the area of the future trail from the existing homes.



**DETENTION BASIN AND EXISTING DEVELOPMENT** Looking north along the detention basin adjacent to Cottonwood Estates.



**COTTON BAYOU, DETENTION BASIN AND WISNER DISTRIBUTION CENTER** Looking south near the southern end of the project site, the bayou is adjacent to the larger of the two detention basins, with a large exposed culvert connection.



**COTTON BAYOU AND WISNER DISTRIBUTION CENTER** At the southern end of the site, the Wisner Distribution Center serves as an anchor and project partner. Adjacent to the facility, a small open space is ideal as a program space and amenity for facility staff.



**COTTON BAYOU AND I-10** The project site terminates at I-10 where the bayou flows under a bridge and a riprap exists to minimize erosion.



Trail Surfaces



Concrete



Stabilized Decomposed Granite



Decomposed Granite



Asphalt



Pervious Concrete

Site Furnishings



Seating



Picnic Pavilions



Picnic Tables



Drinking Fountain



Trash Receptacles

Signage



Trail Wayfinding Signage



Interpretive Signage



Map Signage



Large Wayfinding Signage



Identity Signage

Planting



Wildflowers



Edge Grasses



Mowed and Unmowed Turf



Ornamental and Shade Trees



Active Recreation



Playground



Activity Stations



Nature Play



Natural Surface Sport Courts

Passive Recreation



Dog Park



Observation Areas



Outdoor Games



Outdoor Classroom

Events Spaces



Performance Space



Flexible Green Space



Pop-up Market Area



Small Gathering Space



Bridges



Metal Frame / Truss



Wood Frame with Metal Railing



Wood Frame and Railing



Wood Frame with toe railing



Box Culvert Land Bridge

Lighting



Pedestrian Lights



Tree Lights



Bollard Lights



Bench Lights



Wayfinding Lights

Public Art



Mosaic Mural



Monumental Sculpture



Landscape Installations



Functional Artwork



Play Sculpture

Custom Furnishings



Bike Rack



Seat Wall

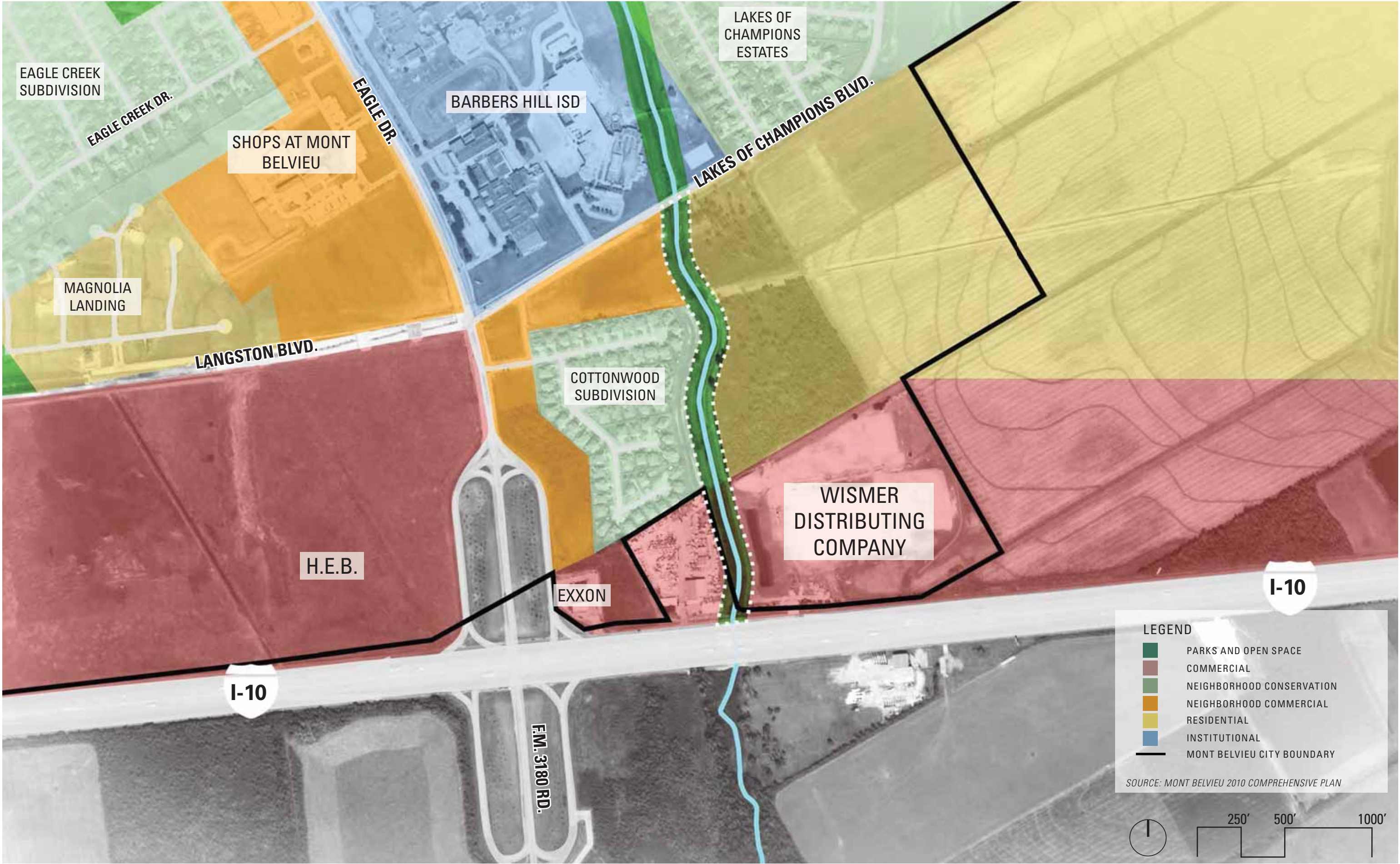


Picnic Table



Bench

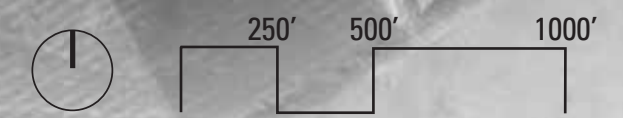




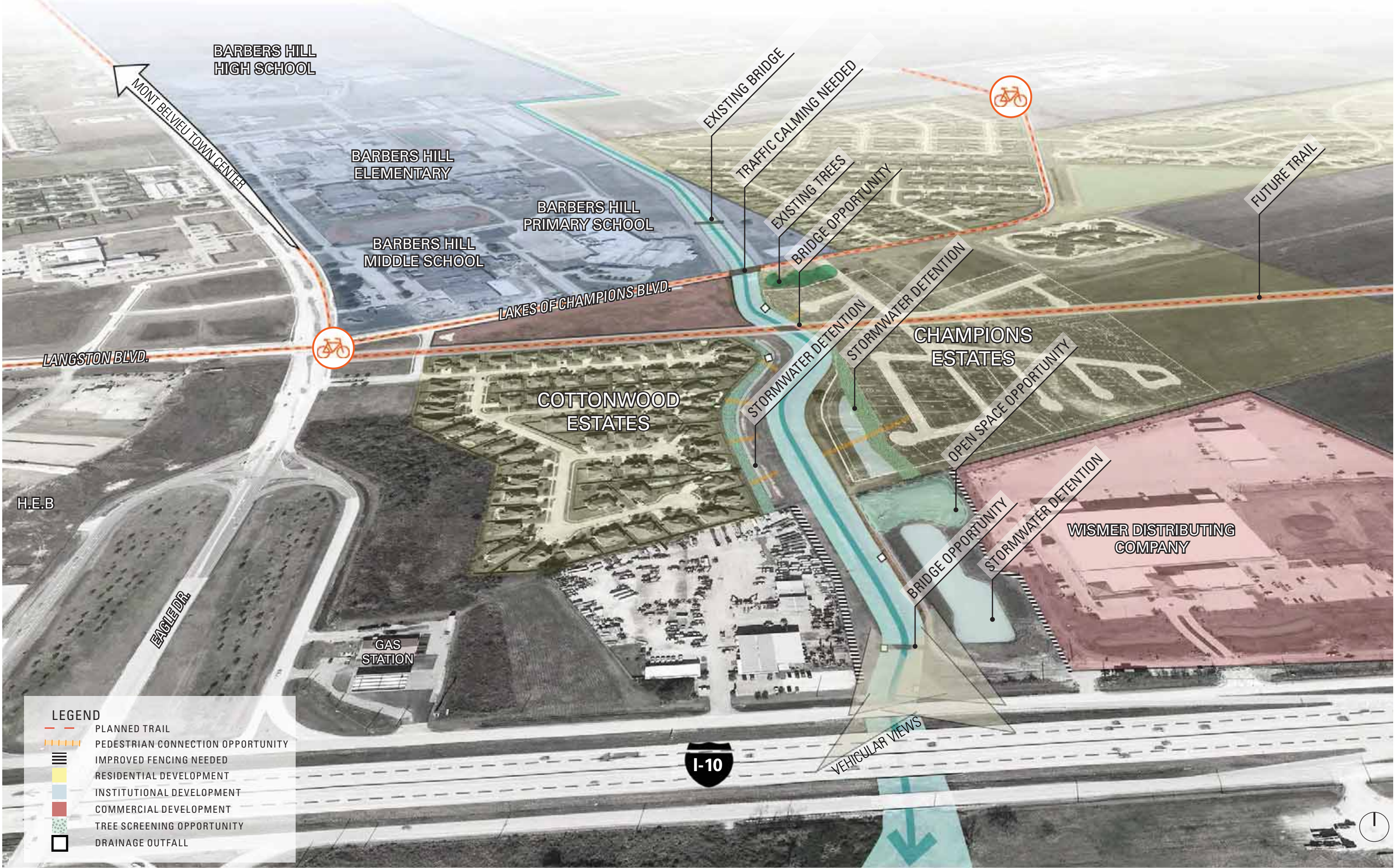
**LEGEND**

- PARKS AND OPEN SPACE
- COMMERCIAL
- NEIGHBORHOOD CONSERVATION
- NEIGHBORHOOD COMMERCIAL
- RESIDENTIAL
- INSTITUTIONAL
- MONT BELVIEU CITY BOUNDARY

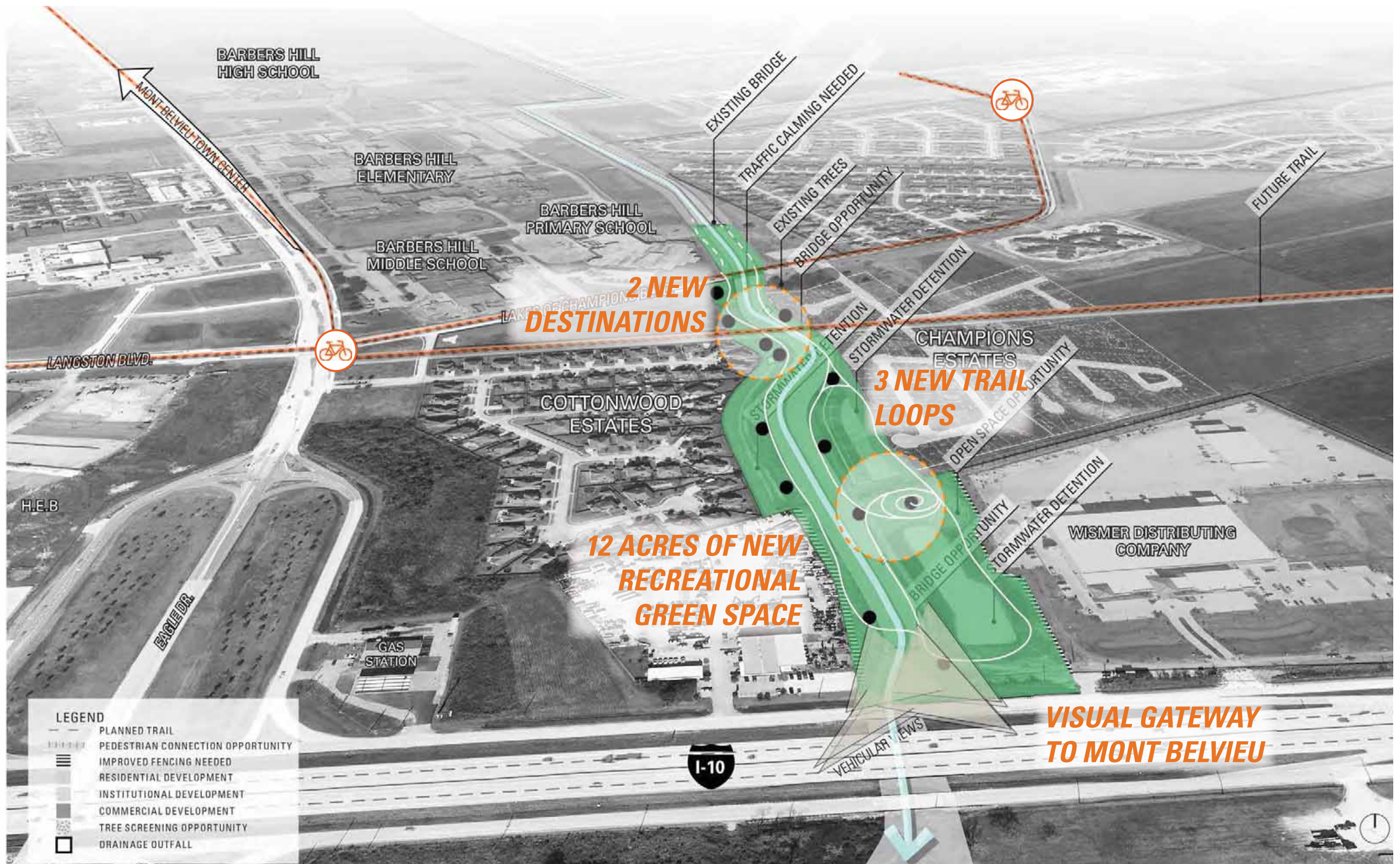
SOURCE: MONT BELVIEU 2010 COMPREHENSIVE PLAN



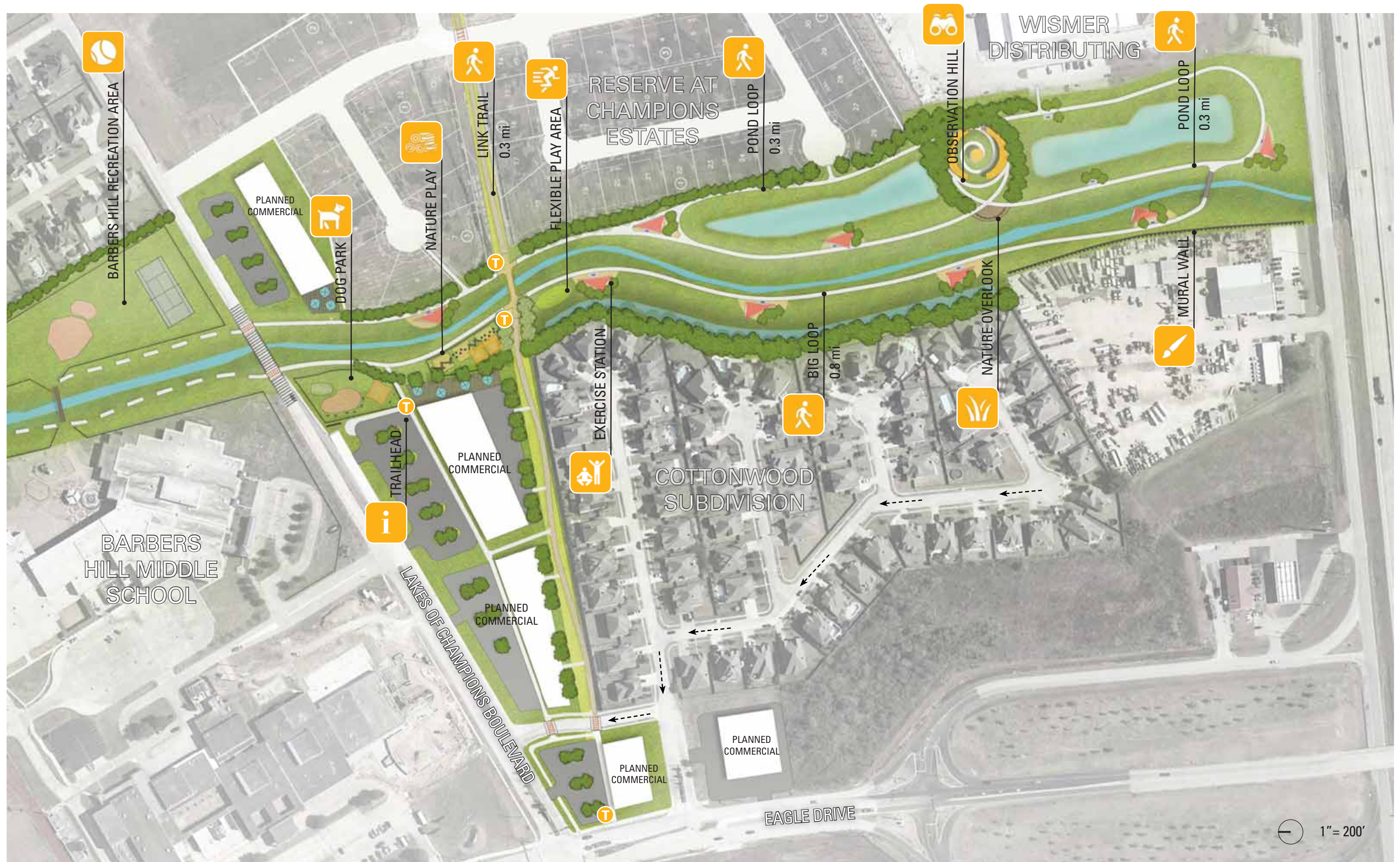
















## PRECEDENT IMAGERY



1 DOG PARK

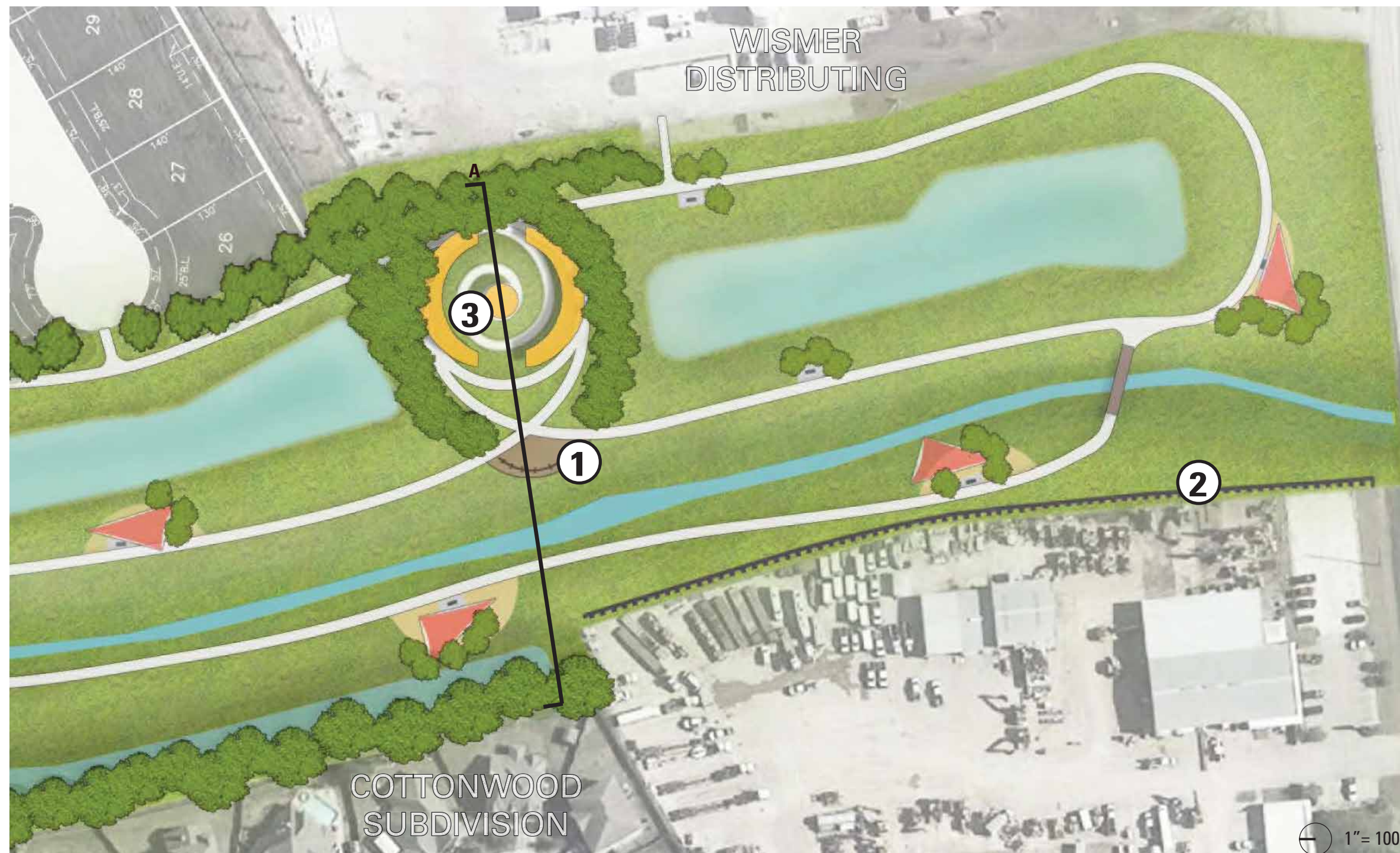


2 NATURE PLAY



3 FLEXIBLE OPEN SPACE





## PRECEDENT IMAGERY



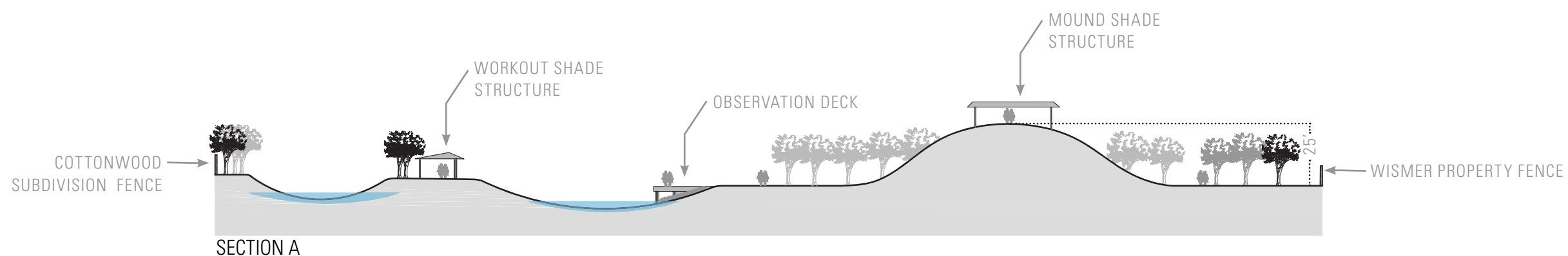
① OBSERVATION DECK



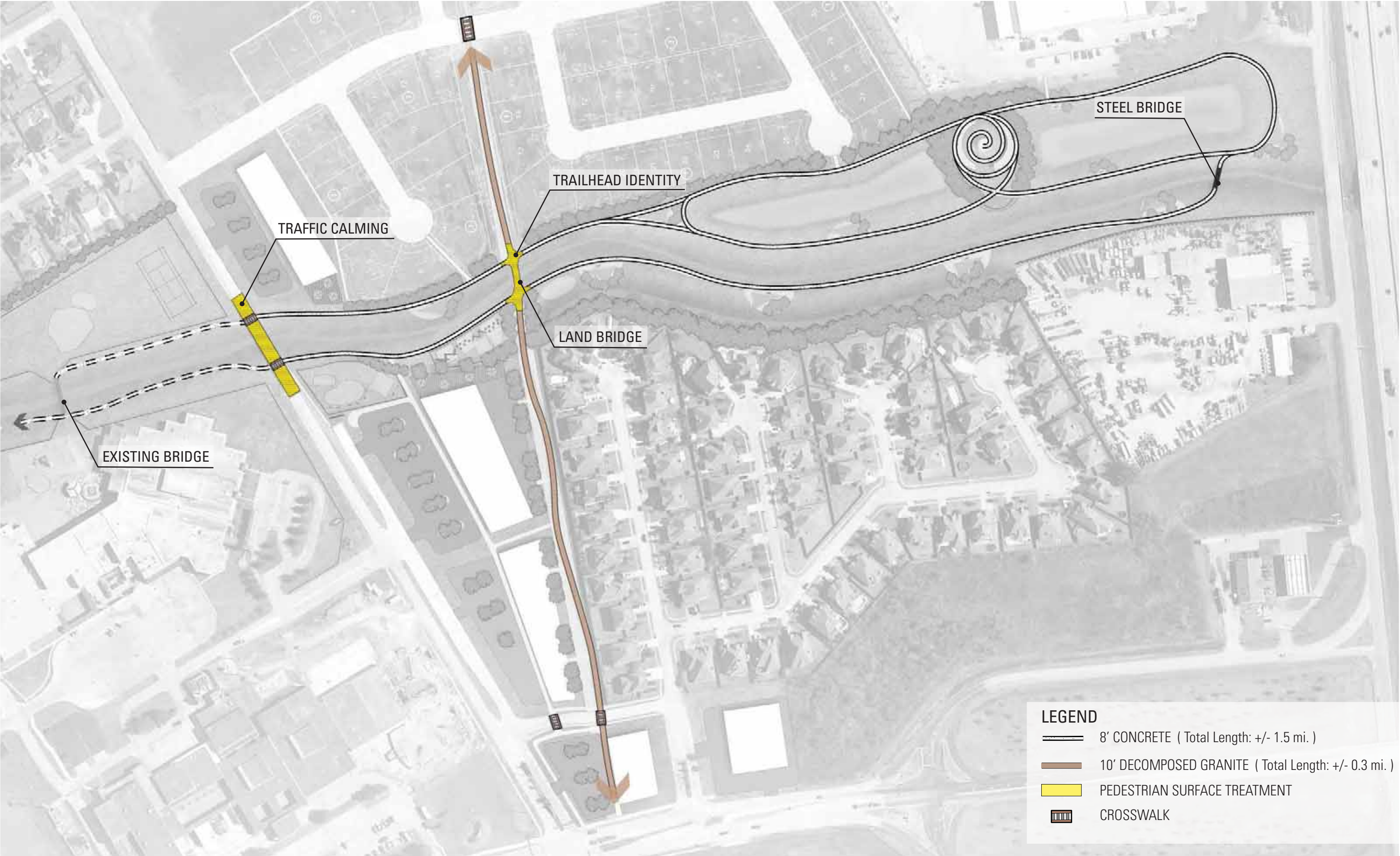
② MURAL WALL



③ PROSPECT POINT











Kevin Rathbun  
Steak House  
Beltline  
Atlanta, GA



Katy Trail  
Ice House  
Katy Trail  
Dallas, TX



Juice Land  
Heights Bike Trail  
Houston, TX



Sid Mashburn  
Boutique  
Katy Trail  
Dallas, TX

