VI | THE OVERALL DEVELOPMENT GOAL AND SPECIFIC COMMUNITY IMPROVEMENT OBJECTIVES

Building upon the significant physical, economic, and social assets and clear local stakeholder visions for an improved community identified during the first phase of the planning process, local residents, institutional leaders, and municipal officials adopted the following overall development goal to guide their economic and community development efforts during the coming fifteen years.

To position Brownsville as West Tennessee's most desirable city recognized for its natural beauty, rich cultural history, artistic attractions and musical heritage, abundant agriculture, exceptional architecture and unique town square, quality public services, faith-based traditions, and love of learning, with a central location bounded by the scenic Hatchie River – a thriving community where small town values, quality of life, diversity, and entrepreneurial spirit are honored daily.

Having selected this statement as their overall development goal, local stakeholders met several times before selecting the following six improvement objectives to help the City make progress towards achieving its overall development goal of becoming "West Tennessee's most desirable city".

Objective 1 | To preserve and enhance the City's built environment and public spaces through the skillful application of advanced **historic preservation and urban design** principles and methods;

Objective 2 | To expand the City's economic and tax base by **expanding local employment, entrepreneurial, and investment opportunities** for current and future residents and business owners;

Objective 3 | To connect the City's areas of public spaces, community facilities, and historic districts through a **proposed greenway system** utilizing the existing floodplain to improve access to the City's neighborhoods and the Hatchie National Wildlife Refuge;

Objective 4 | To strengthen the City's competitive position within the region and nation through strategic investment in **public education, arts, and culture**;

Objective 5 | To facilitate the movement of people and goods by **enhancing the City's existing infrastructure and way-finding systems**; and

Objective 6 | To insure quality **housing choice and security** for current and future residents through creative approaches to neighborhood preservation and enhancement, and expansion of the City's housing stock.

VII | THE BROWNSVILLE ON THE MOVE ACTION PLAN

The Brownsville on the Move Plan contains specific near, mid, and long-term economic and community development projects designed to enable the City to achieve each of the above mentioned community improvement objectives. The project proposed for the near-term (first five years) of the plan are modest efforts than can, for the most part, be carried out through the cooperation of existing City personnel and community volunteers and limited amounts of new public and private funding. Momentum generated by the successful completion of these projects is expected to broaden the base of community support and external funding for this plan so as to enable the City to undertake the more ambitious and potentially transformative initiatives presented as mid and long-term projects.

The following chart presents a small sample of the more than sixty concrete development projects featured in the Brownsville on the Move Plan.

	Near-Term Project	Mid-Term Project	Long-Term Project
Historic Preservation and Urban Design	**Main Street Brownsville, Inc.** Build upon the current Tennessee Downtowns Program and recently executed Court Square Master Plan to preserve and revitalize Downtown, complete and celebrate "Brownsville's Looking Up", as the foundation for achieving the next level - National Main Street status for Downtown Brownsville.	**Brownville Urban Trails** Establish at least two urban trails highlighting Brownsville's art and history, with the aim of encouraging pedestrian use of Brownsville's urban core while exposing visitors to the City's Downtown and historic neighborhoods.	**The School Back to the City Core** Abandon campus-based school complexes at the City's periphery in favor of the adaptive re-use of infill sites closer to the town center.
Expanding Local Employment, Entrepreneurship, and Business	**Digging Downtown Project** A systematic effort to bring people back to Court Square to enjoy art, music, culture, food and shopping, that builds upon the excitement generated by the City's recent upgrading of the Court Square. This project would feature a Friday evening Music series, Saturday Farmers Market, Sunday Classic Outdoor Movie Program and an end-of-the-school year social history arts, and drama festival to attract residents and visitors.	**What's Cooking/Baking** A coordinated and strategic effort by local business leaders to recruit a successful restaurateur and/or baker from within the region to establish a quality family or fine dining restaurant and/or bake shop in a currently underutilized first floor location on or near Court Square.	**4H Home Base** Make Brownsville the location of a new regional 4-H Education and Training Center in West Tennessee to be built by the State Cooperative Education Service.
Creating a City-Wide Greenway	**Let's Move** Establish a Greenway Conservancy to coordinate the planning and development of a	**Trailhead Design** Organize an international design competition for the creation of a "green" trailhead information, education,	**To the Hatchie** Design and construct a public hiking and biking trail connecting the City's proposed

	circumferential greenway that will serve as a central feature of the City's flood control system and an important regional recreational amenity.	bike rental and repair facility.	greenway to the Hatchie National Wildlife Reserve.
Promoting Public Education, Art, and Culture	**AP on the Advance** Increase the number and variety of Advanced Placement courses available to Brownsville and Haywood County secondary students thereby improving their college admissions profiles and completion times.	**Engagement Brownsville** The City, in cooperation with the Haywood County Schools and the Brownsville Public Library, would work to contract with service-learning experts to formulate a developmental approach for involving school-age children in ongoing public service, community-building and problem-solving efforts within the community.	**The New Haywood County High school** The design and construction of a new Haywood County High School near the center City using green design principles that will allow students to actively study sustainable approaches to architecture, engineering, and planning.
Enhancing the Movement of People and Goods	**Roundabout** Work with TDOT to determine the most appropriate treatment of the intersection of the Bypass and Highway 76 (Anderson Avenue), including a roundabout to create an attractive gateway into the City, while providing an efficient, streamlined traffic flow.	**Gateway/Corridor Enhancements** Work with TDOT, local businesses, and the Chamber to improve the Anderson Avenue/Main Street corridor from I-40 to Downtown which serves as the primary entrance into the City, create attractive gateways for travelers/tourists, and residents while addressing safety and accessibility issues. Critical infrastructure items, include: unsafe sidewalks, intrusive utility poles, unattractive parking lots, and the absence of landscaping. To further complement these improvements, Downtown will serve as a primary connection point for those seeking to use the new greenway system. Over time, these consumers might attract a trail-related business such as a bike shop, sports store, coffee shop or eatery.	**Alternative Fuels Initiative** Studying the extent to which the City, School District, and County could achieve energy efficiency and environmental benefits by changing the mix of fuels they use in their respective motor fleets.
Improving Housing Quality and Choice	**Christmas-in-April** An initiative aimed at organizing local volunteers to undertake small repairs and cosmetic improvement projects for low to moderate income homeowners who cannot, for a variety of financial and physical reasons, complete these projects.	**Brownsville Assisted Living Project** Recruit a recognized non-profit senior housing provider to develop an assisted living complex offering a range of housing hypes and supportive services.	**Bradford Square Revisited** Redevelop Bradford Square as a mixed-income, mixed-use, mixed-finance project to include housing, neighborhood-oriented retail services, including a grocery, and various educational and civic uses.

8.3 | OBJECTIVE 3: CITYWIDE GREENWAY SYSTEM

Table of actions needed to connect the City's major public spaces and facilities and historic districts by means of a proposed greenway system utilizing the existing floodplain, thereby, improving access to the city's neighborhoods and community facilities and the Hatchie Wildlife Refuge, while mitigating storm water runoff and reducing the threat of future flood damage.

Near-Term (1-5 years)	Mid Term (6-10 years)	Long-Term (11-15 years)
NT1 | Let's Move Establish a Greenway Conservancy to coordinate the planning and development of a circumferential greenway that will serve as a central feature of the City's flood control system and an important regional recreational amenity.	**MT1 | Securing Resources** Implementation of a multi-pronged development strategy focused on securing public and private resources to complete segments of the greenway	**LT1 | To the Hatchie** Design and construct a public hiking and biking trail connecting the City's proposed greenway to the Hatchie Wildlife Refuge.
NT2 | Concept Complete conceptual drawings and construction documents related to the establishment of a fully-developed greenway around the City incorporating existing parks and a potential second passive park in the Sugar Creek area.	**MT2 | Securing Easements** Secure land and utility easements needed to complete the greenway, as well as a public hiking and biking trail along Sugar Creek thereby strengthening the City's connection to the Hatchie National Wildlife Refuge.	**LT2 | Link with other Trails** Integrate the Brownsville greenway and Sugar Creek trails into the region's rapidly expanding urban and rural trails and scenic byways network.
NT3 | Retention Plan Complete a storm water retention plan and design reflecting international "best practices" for the entire City, focusing on flood prone sections of the City located around Sugar and Nixon Creeks	**MT3 | Trailhead Design** Organize an international design competition for the creation of a "green" trailhead information, education, bike rental and repair facility.	**LT3 | Operation Bird-watch** Every year the Audubon Society, in cooperation with Cornell University's Ornithology Laboratory, mobilizes local volunteers to organize a Census of local bird life throughout the United States. Brownsville's location in the middle of a major north/south avian flyway along parts of the Hatchie River Wildlife Refuge makes it an ideal location to engage in this low impact recreational activity.

NEAR TERM ACTION #1 | LET'S MOVE

Description | Establish a Brownsville Greenway Conservancy, a public-private park planning and development non-profit, to assume overall responsibility for the design, development, and management of the greenway.

Rationale | In recent years, a number of cities have encouraged the formation of non-profit organizations to raise public and private funds to redevelop existing open space and public park assets or to create new recreational facilities. Nationally, one of the most successful examples of this type of is the Central Park Conservancy. In our region, the Shelby Farms Park Conservancy has generated millions of dollars to transform this regional park facility into a world-class public park with the assistance of famed landscape architect – James Corner of the University of Pennsylvania.

Steps |

a) Research "best practices" in the use of non-profit conservancies to either establish or expand a public open space and/or park facility;
b) Visit the Shelby Farms Conservancy to benefit from the experience of this nearby park development and maintenance organization;
c) Solicit the assistance of a local attorney, with non-profit incorporation experience, to develop the charter, by-laws, and 501c3 application for the organization;
d) Identify local civic leaders interested in participating in the further development of the greenways system to serve on the board of this new organization; and,
e) Conduct an initial scan of potential funding resources to support the Conservancy's activities.

Lead agency | Office of the Mayor

Partnership | Local neighborhood association leaders and Storm Water Management Board Members

NEAR TERM ACTION #2 | CONCEPT

Description | Develop the conceptual drawings to illustrate the vision for a greenway system that would circle the City in order to better manage storm water and provide Brownville residents and visitors with an important new recreational amenity. Over time, this greenway system would connect Brownsville residents to the Hatchie River by means of a southern extension that would be planned and built in the future.

Rationale | In recent years, significant numbers of Brownsville families, many poor and working class, have watched as flooding from violent summer storms have damaged and destroyed their homes and neighborhoods. This greenway would be created by expanding the public right along the historic drainage canal system that currently surrounds the City and making needed physical improvements to enable it to be used as an attractive and pleasant active and passive recreation area.

Steps |

a) Secure current base maps for the area with natural features, topography, drainage patterns, flood plain boundaries, street designations and building footprints;
b) Engage residents from the areas adjacent to the current storm water drainage canal in an inventory of local community assets and a discussion of preferred design features for the proposed greenway system;
c) Conduct a quick review of the existing "best practices" literature regarding the re-naturalization of flood prone areas within urban communities;
d) Prepare a set of alternative conceptual designs for Phase I of the greenway development process;
e) Present these alternative proposals to local stakeholders to elicit their preferences; and,
f) Execute a preliminary design plan for the Greenway and the Brownsville- to - Hatchie Extension.

Lead agency | Brownsville Public Works Department

Partnership | Haywood County Public Works Department

NEAR TERM ACTION #3 | RETENTION PLAN

Description | Prepare a detail storm water retention plan to reduce the volume of water flowing into the City's existing storm water drainage system in order to reduce flooding especially in the Sugar and Nixon Creek areas of the City.

Rationale | Residents, property owners, and business owners in the neighborhoods adjacent to the City's existing storm water drainage system live in near-constant fear that intense storm water events will exceed the current systems capacity resulting in serious property losses.

Steps |

a) Conduct research on traditional and non-traditional approaches to improving storm water management in urban areas, with special attention being paid to the work of MIT Professor Anne Spirn, a landscape architect, who emphasizes above-ground, naturalistic solutions;
b) Collect and study maps describing the city's topography, flood history; and existing drainage systems;
c) Contact local agencies involved in storm water management planning in Brownsville to learn about their future plans for the system; and,
d) Engage an experienced landscape architecture and/or civil engineer to prepare a innovative approach to reducing the flow of storm water into the drainage system through a combination of traditional retention ponds and culverts and an "above ground" system utilizing plant materials and swales. Policies reducing the percentage of impervious surfaces within new developments will be aggressively pursued.

Lead agency | Brownsville Public Works Department

Partnership | Haywood County Engineering Department

MID TERM ACTION #1 | SECURING RESOURCES

Description | Develop a comprehensive fundraising plan and campaign to secure the resources needed to acquire the land and make the needed improvements to establish an attractive, functional, and intensively-used greenway to meet the future storm water and recreational needs of the Greater Brownsville community.

Rationale | In the context of more limited federal and state funding for local infrastructure projects, there is a need to develop innovative public/private funding strategies to pay for such projects. It is also advisable to look for opportunities to engage in multi-objective programming to secure funds normally not available for narrowly conceived storm water projects. In this project, local residents and leaders are seeking to use the greenway promote environmental education, health and wellness, and tourism while addressing the City's storm water management problems. By addressing a number of planning needs through one project, additional funding sources may come available to cover the significant costs related to this project.

Steps |

a) Consult local and regional planners engaged in storm water management projects to identify typical funding sources available for Tennessee projects;
b) Investigate non-traditional approaches to storm water management presented as "best practices" in the literature to identify additional sources they have been able to access;
c) Explore possible funding that might be available to the project in light of its significant commitment to environmental education;
d) Research possible funding that might be available to the project given the important health and wellness contribution the project will make towards encouraging more active lifestyles among youth and adults;
e) Probe possible funding sources that might be available to the project through state and federal Safe Routes to School Programs; and,
f) Seek possible funding sources that might be available to the project given its potential contribution to agro-tourism, eco-tourism, and heritage tourism.

Lead agency | Office of the Mayor

Partnership | Haywood County Community Development Agency

MID TERM ACTION #2 | SECURING LAND AND EASEMENTS

Description | Haywood County, the City of Brownsville, the Haywood County School District and other public agencies have historically owned property adjacent to the existing storm water drainage system. Efforts should be made to secure either title or easements to their surplus properties and to do the same from those properties held in private hands to fully develop the circumferential greenway for flood control, recreational, and educational purposes.

Rationale | The successful development of the greenway requires considerable land acquisitions. A significant portion of the land to be acquired is within the flood zone and, therefore, can be acquired at affordable prices .

Steps |

a) Review the conceptual design for the greenway and determine the land parcels required to fully realize its full potential;
b) With the assistance of the County Assessor, identify which public and private entities own the land;
c) With the assistance of a local realtor experienced with public land acquisition, approach these landowners regarding their interest in either selling the land or the rights to use it for public purpose through carefully constructed easements;
d) Identify public and private sources available to support acquisition of land for flood control, park development, health and wellness, ecological education, and tourism purposes which the greenway will serve; and
e) With the support of the City Attorney acquire the needed property to fully implement the greenway plan.

Lead agency | Office of the Mayor

Partnership | Haywood County

MID TERM ACTION #1 | TRAILHEAD DESIGN

Description | Organize an international design competition for the creation of a "green" trailhead information, education, bike rental and repair facility, if possible, at a location on the trail close to the Court Square Historic District.

Rationale | This facility would give local residents, visitors, and tourists another reason to come Downtown. It would serve as an education center for those interested in exploring the trail as well as the city's other Ecotourism and Agritourism sites. The building's green building design would be an attraction and education site by itself.

Steps |

a) Invite local architects, landscape architects, and civil engineers to a meeting to discuss their ideas regarding alternative approaches to designing a green "trail head" building and store;
b) Elicit their participation in preparing an initial "call for submissions" for an international design competition for this structure;
c) Approach local and regional business regarding their interest in underwriting the costs of the competition;
d) Contact the local chapters of the American Institute of Architects, American Society of Landscape Architects, American Institute of Certified Planners, the Green Building Council, and the Urban Land Institute to seek their assistance in staffing the jury for the competition;
e) Hold the competition exhibiting all of the submissions in a public place where local residents can record their perceptions of the work; and
f) Announce the winners of the competition and commence the fundraising campaign to raise the funds needed to construct the building.

Lead agency | Brownsville Arts Council

Partnership | Haywood County Board of Realtors and the University of Memphis Department of Architecture

LONG TERM ACTION #1 | TO THE HATCHIE

Description | One of the City and County's greatest assets is its proximity to the Hatchie National Wildlife Preserves. This plan proposes the development of a walking, hiking, and biking trail connecting the City of Brownsville and this remarkable recreational resource.

Rationale | While many of the local stakeholders we interviewed identified the Hatchie National Wildlife Preserve as an important community asset, they acknowledged that few residents currently take advantage of this resource. The design and completion of the Brownsville Greenway offers a perfect opportunity to provide an important physical connection to the Preserve by means of hiking and biking trails. This trail will encourage users of the greenway to travel to the Preserve; it will also encourage visitors to the Preserve to include a side trip to Brownsville in their vacation plans.

Steps |

a) Work with local civil engineers, landscape architects, and planners to devise a preliminary conceptual design for an "extension" of the greenway connecting the City to the Hatchie;
b) Collaborate with the Haywood County Tax Assessors' Office to identify the property owners along the route;
c) Approach these property owners requesting easements for a modest but well designed hiking/biking trail across their properties;
d) Secure the funds to develop a preliminary design for the trail; and,
e) Hire a landscape architecture firm to assist with the final design and implementation of the trail.

Lead agency | Brownsville Planning Commission

Partnership | Local naturalists and recreational enthusiasts

LONG TERM ACTION #2 | CONNECTING TO OTHER TRAILS

Description | Local officials and planners will work together to connect the soon-to-be built Brownsville Greenway and Hatchie Extension to the region's rapidly growing regional hiking and biking trail system which is also connected to the ten-state Mississippi River Trail system.

Rationale | There is a growing awareness throughout the region of the importance of promoting more active lifestyles among children and adults in order to advance health and wellness. The recent investment in local hiking and biking trails is also being promoted to advance local economic development. Companies seeking new locations are increasingly asking about access to local trails and park facilities and health conscious tourists are increasingly seeking to incorporate hiking and biking activities into their vacation plans. This has led to several recent efforts to promote local trails within the Tri-State Memphis Region connecting these new public open spaces to larger regional and national trail networks.

Steps |

a) Contact nearby counties to secure maps presenting their existing and planned hiking and biking trails;
b) Examine the City and County's existing greenway system to identify ways to connect local trails with this rapidly expanding network;
c) In the development of new maps and promotional materials highlighting the new Brownsville Greenway incorporate these complimentary regional trails and encourage local trail users to take advantage of this system;

9 | SIGNATURE PROJECTS

Signature projects are complex transformative actions that address multiple objectives within the same framework, helping various actors involved in the implementation strategy of the plan to collaborate at various scales and levels. Those projects, as described in the previous section, comprise more than one near, short, and long-term objectives that elicited the most interest from the community.

9.1 | SIGNATURE PROJECT #1 - BROWNVILLE GREENWAY

Project background and purposes | The City of Brownsville is located on the ridgeline separating two watersheds, the Hatchie river watershed to the south, and the South Forked Deer watershed to the north. The County river ecosystems, and especially the Hatchie, are among the best-preserved in terms of biodiversity and stream quality. The Hatchie is today a protected area by virtue of its federal designation as the "Hatchie Wildlife Refuge".

In spite of Brownsville's strategic location, large sections of the its poorest neighborhoods surrounding or in the historic center, including the College Hill Historic District and the Downtown, flood on a regular basis. The most recent of these was the 500-year flood that hit mid Tennessee during the month of May (2010) seriously damaging large sections of the city. This convinced city leaders of the need to review the flood histories of other US cities and their responses. Among those responses was the San Antonio river restoration concept, consisting of systems of swales and levees that are both protective of the natural systems and the built environment while providing important recreational amenities for the nearby Low-income neighborhood and other city residents living farther away.

In Brownsville, the idea is to establish a greenway that surrounds and bisects the city while also connecting existing and new parks in the flood plain to be created in strategic areas within the damaged neighborhoods. In order to do so, the City has already used FEMA funds to acquire the most at-risk properties within the flood zone.

The re-design of the ground water system and the design of the proposed greenway system will have to address:

- The re-location and re-housing needs of families whose properties flood on a regular basis;
- The perception of some residents that such a large linear park around the city would be hard to maintain, and would attract and encourage crime (lack of eyes on the street) and would, in the end, become an eyesore.

Contribution to the Plan's Objectives | While providing a more natural and sustainable (low maintenance) storm water management system, the greenway is conceived as a multi-purpose infrastructure contributing to all 6 objectives of this plan**.** These are to:

a. **Preserve and enhance historic built environments**. The trail/floodplain section will connect urban paths to the major historic attractions of the city, while appropriate signage and way-finding systems will encourage tourists and locals using the overall trails to experience the city's historic heritage, enhancing their awareness of the cultural significance of the City's historic heritage. The urban trails and paths **[see Obj1-ST3 "Brownsville Urban Trails" Project]** will also be part of the overall project of improvement of specific sections of the historic district.

b. **Support economic development in the City.** More generally, the Greenway will help establish Brownsville and Haywood County as attractive destinations for eco-tourism, especially for residents of the region who want to take a day-trip (or more) to enjoy/explore the rare natural vistas of the of the Hatchie National Wildlife Refuge. At the same time, new retail businesses related to outdoor activities can also be located along the trail **[see Obj2-NT1- Branding Brownsville]**.

c. **Promote healthy living**. The trail will promote health and wellness among residents of all ages (walking, biking, running, etc.) while also including spaces and physical infrastructure for outdoor activities (bike and running trails; yoga and stretching spaces, etc.). Specific sports can be promoted along the trail by non-profit organizations and special-interest groups.

d. **Education and culture.** Different segments of the greenway can be converted into outdoor classrooms where children can play while landscaping, growing food, composting and recycling, etc**. [see Obj4-LT2 "The Greenway Ecological Education Center" Project]** This will help populate the trail and offer children an occasion to play an active role within the community, contributing practically to the collective landscape, recreation and events promoting the greenway.

e. **Increase recreational opportunities.** The greenway system can be promoted through periodical events and festivals that will not only attract people from outside, but also offer local residents enhanced recreational opportunities and local recreational amenities.

Planning and Design guidelines | Further details on how the system should be planned and designed are to be developed through an in-depth planning process that will engage the local community. In this way, the system's design can incorporate every form of local knowledge and community material and non-material resources while also promoting a sense of ownership within the community.

Each section will connect two major nodes of attraction and/or significance (a tentative map is attached).

Different sections can also imply different levels of community *engagement*, while the implementation of specific sections can be promoted by targeted community actors, such as: youth groups or schools promoting a linear community garden; local cultural or philanthropic organizations promoting urban sections crossing historic districts; etc.

Suggestions for storm water management improvement | The city has already initiated a plan to conduct a detailed study on how to improve and retrofit the existing storm water management system. This study should take into account the fact that costs for retrofitting existing elements of the system and for implementing new ones can be reduced by reducing the area of impervious surfaces within city boundaries. This can be done adding specific design guidelines to the city building code, and starting pilot projects for public spaces (court square, streets, etc.).

Among the various example of sustainable and storm water management systems, **the case of Woodland, in Texas** (see Best Practice Table #1) has been selected as example of advanced techniques on how to address storm water management through the use of greenways and special rules embedded in building codes and zoning.

d) Consider developing a Haywood County Trail Logo that can encourage users to consider using the entire local network; and,
e) Install appropriate signage at key intersections where major local and regional trail systems intersect to encourage users to travel seamlessly from one to the other.

Lead agency | Brownsville Planning Commission

Partnership | Greater Memphis Greenway Alliance, Shelby Farms Conservancy, Mississippi River Corridor – Tennessee, and Mississippi River Trail

LONG TERM ACTION #3 | OPERATION BIRDWATCHING

Description | Each year the National Audubon Society, in cooperation with the Cornell University Ornithology Laboratory, conduct a national census of birdlife throughout the nation using local citizen volunteers. In light of Brownsville's critical location on an important north/south avian flyway, local residents should be organized to participate in this important national research effort.

Rationale | Participation in the Audubon Wildlife Census will generate improved data on the City, County, and Region's extraordinary birdlife. It will also introduce a wider range of residents and tourists to the beauty of the Brownsville Greenway. Finally, it will highlight the Greenway as an ideal location for a wide variety of passive and active recreation activities.

Steps |
a) Determine the dates and local organizational requirements to participate in the upcoming Audubon/Cornell Survey;
b) Contact local student, environmental, nature, and sportsmen organizations regarding their interest in participating in the census;
c) Organize an information and training session for potential volunteers;
d) Participate in the event providing data to the national effort; and,
e) Evaluate the effectiveness of this first effort tin order to identify ways to improve subsequent local efforts.

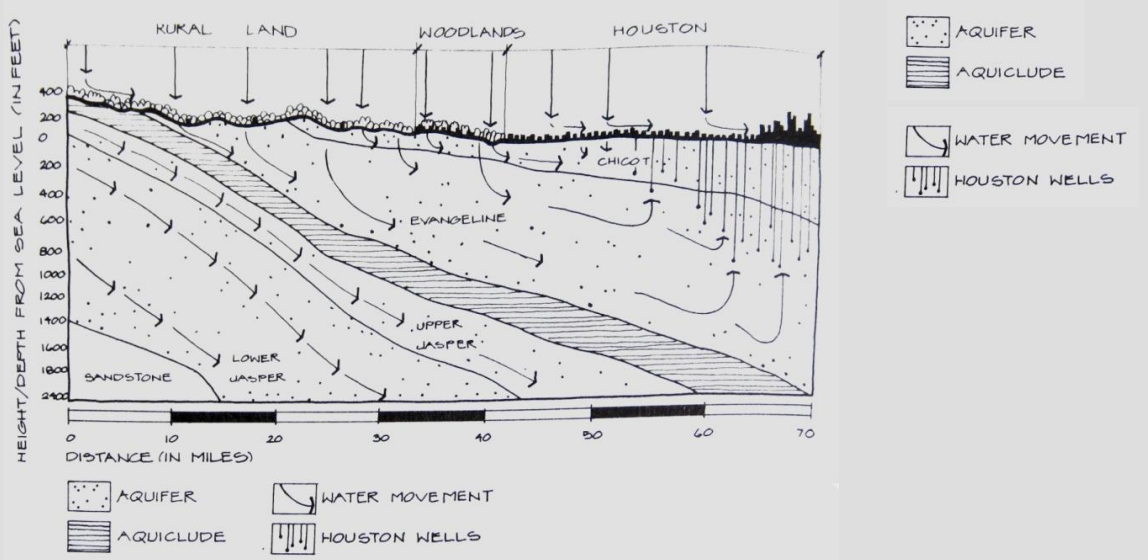
Lead agency | Local Chapters of the Audubon Society

Partnership | Sierra Club, Conservation League

BEST PRACTICE #1 | A natural drainage system that serves as linear park: the case of Woodlands, Texas

[from Spirn A. W. (1984), *The Granite Garden. Urban Nature and Human Design*. Basic Books. pp. 163-166]

One of the most successful examples of using multifunctional linear parks to enhance ecological stormwater management is Woodlands in Texas, a new town planned to host 150,000 people on 20,000 acres of pine-oak woodland north of Houston. By 1971, when the preliminary ecological planning study and the parallel market research were complete, and the general plan for the city was underway, water had emerged as the critical factor. The Woodlands' "natural drainage system" exploits the capacity of natural, wooded floodplains to accommodate stormwater runoff and of well-drained soils to soak up and store rainfall. It reduces the combination of increased flooding and lower streams flows normally associated with urbanization, it maintains water quality, and recharges the aquifer below neighboring Houston (See figure A). The wooded floodplain, drainage channels, and recharge soils form a town-wide open-space system of natural drainage that offers substantial savings over the cost of constructing a conventional storm sewer system. When it was originally proposed, engineers compared the cost of the natural drainage system to that of a conventional storm sewer system and estimated that the natural drainage system would save the developer over $14 million.



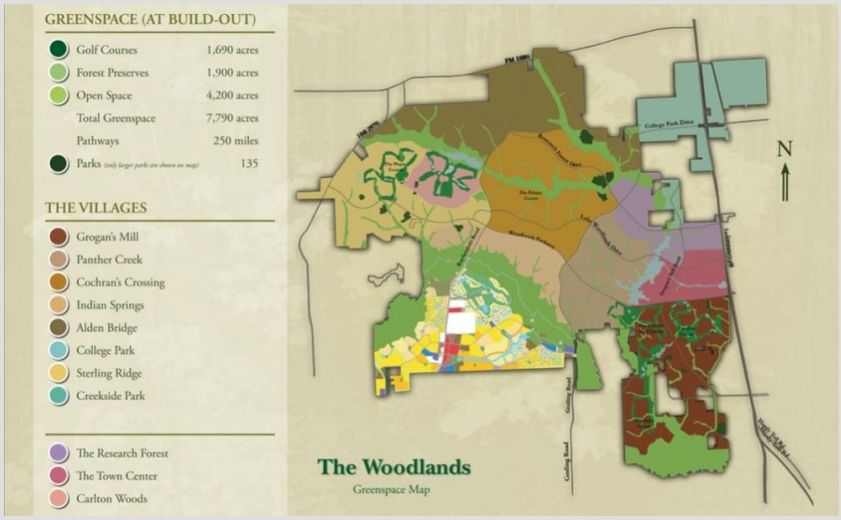


Figure A (up): Aquifers underlying Houston and Woodlands, Texas. Figure B (bottom): The Woodlands greenspaces map.

The natural drainage system comprises two subsystems: one stores and absorbs rainfall from frequent storms; the other drains floodwater from major storms (see figure C). The general plan responded to the major drainage system by locating large roads and dense development on ridge lines and higher elevations, while preserving the floodplains in parks and open land, and allocating low-density housing to the intermediate area. The use of floodplains and drainage channels as open space works well from both ecological and social standpoints. Most of the spectacular trees on the site occur within the floodplains of the major creeks. These same floodplains also harbor a diverse and abundant native wildlife, including white-tailed deer, opossum, armadillos, bobcats, and many birds, and provide the corridors along which they move. The continuous system of hiking, biking, and equestrian trails runs along the drainage network, linking places in town.

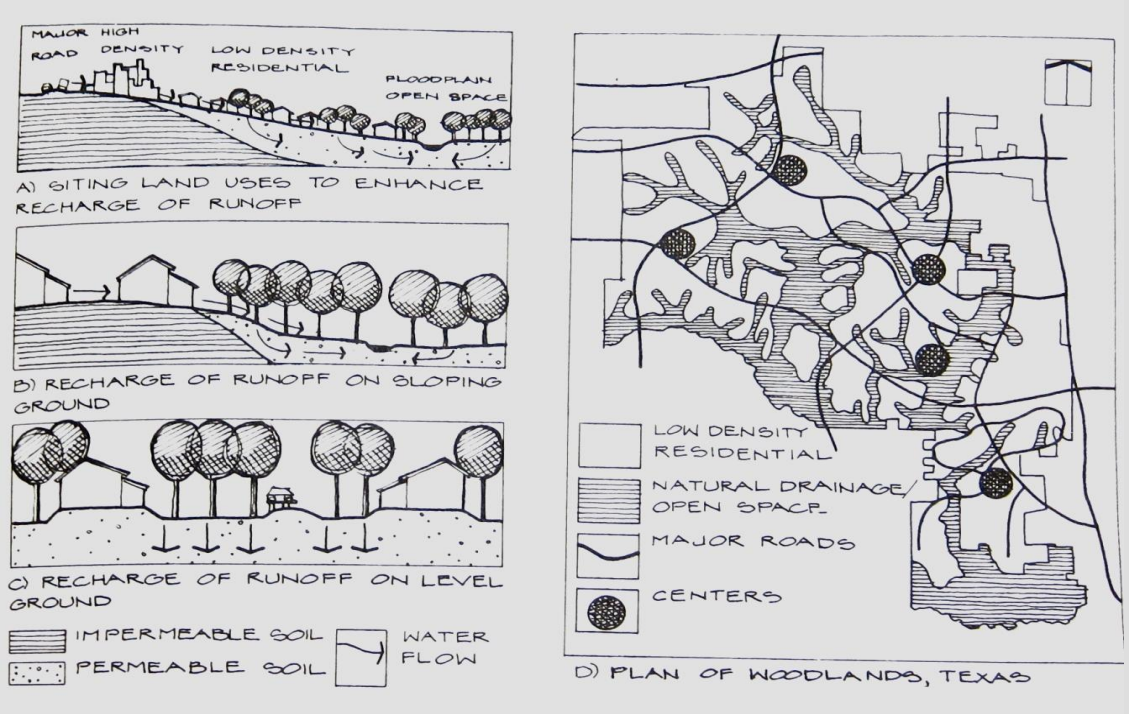
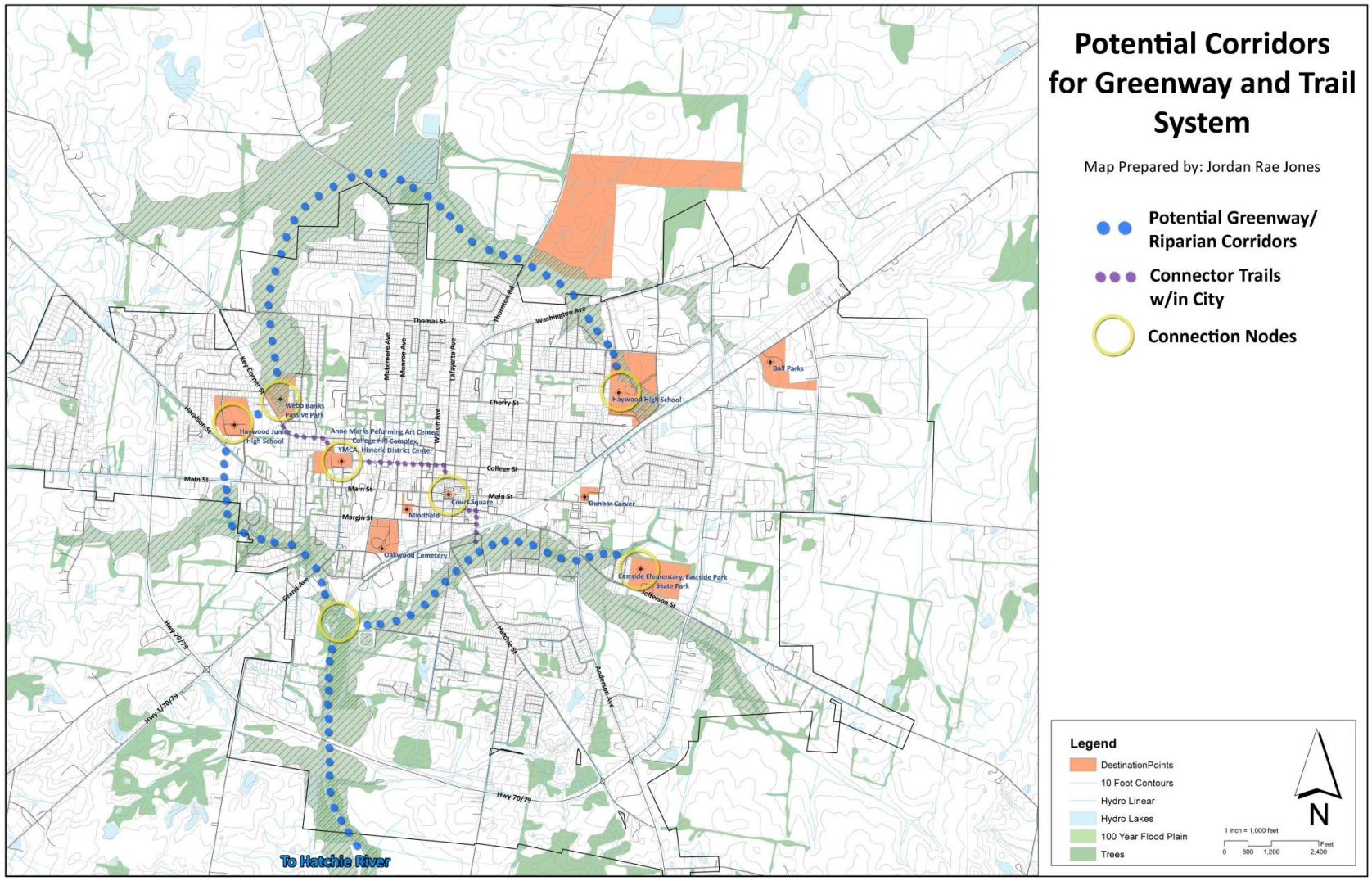


Figure C – The natural drainage system at Woodlands, Texas.

Although this larger floodplain network drains run-off from major storms, well drained soils and ponds absorb or store rain close to where it falls, either in private yards or in nearby parks. This local drainage system responds to subtle changes in topography and soils. Roads, golf courses, and parks are designed to impound storm water and enhance its absorption by well-drained soils.

Maintaining the structure of these soils, so essential to their ability to absorb water, requires strict regulation of construction activities. Areas designated as "recharge soils" are left wooded and specifically marked in the zoning ordinance. In some cases building construction has proceeded within a fenced-off zone that extended only a few feet on all sides from the building foundation.

Possible structure of sections and nodes to be connected through the system



Sections Typology

description | intensively vegetated floodplain, accessible or not accessible to humans, that help to restore wildlife, enhance urban landscape; vegetation can be entirely flooded without great damage.

context | non-urban areas, often including open-air streams, where specific environmental hazards (flooding or other phenomena) are dangerous for people; areas difficult to be acquired and/or used by the public, whose treatment can be determined through land use and codes.

description | public linear parks that combine recreational bike and pedestrian trails and environmental functions (ecological corridors), furnished with signage.

context | non-Urban areas that can include streams characterized by low environmental risk and are or can easily become public property.

description | public linear parks that combine recreational (bike and pedestrian trails) and environmental functions (ecological corridors); can be characterized by the presence of thriving vegetation, especially tree canopy, street furnishing and lighting, etc.

context | urban areas that usually include streets, urban creeks and green buffers that can be transformed to pursue re-naturalization and furnishing.

description | dedicated trail for bikers and pedestrians, with appropriate signage and design.

context | portions of streets that are large enough to be able to accommodate them.

description |horizontal street signage, indicating a dedicated space for bikers.

context | portions of streets that are large enough to be able to accommodate them.