

Green Infrastructure Plan

Tinker Air Force Base

Acknowledgements

Maryland-National Capital Park and Planning Commission, Prince George's Planning Department, for use of materials and information from *The Countywide Green Infrastructure Plan*. June 2005.

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INTRODUCTION

Purpose for Plan

The Green Infrastructure (GI) Plan is a comprehensive vision for interconnecting environmental systems on and adjacent to Tinker AFB to ensure the sustainability of our environment and the military mission. Sensitive environmental resources (e.g., floodplains, wetlands, creek systems) have been identified across the Base, and this plan is intended to guide development to support current and future military mission needs while not degrading sensitive environments. The basic tenet is to sustain a green infrastructure network to provide optimal military operational sustainability and promote societal, economical, and ecological benefits for Tinker Air Force Base and its neighboring communities in concert with the desired development pattern of the Base General Plan.

Developable land is very limited on Tinker AFB; therefore, every piece of land is extremely valuable and important for future mission needs. The Green Infrastructure Plan recognizes and supports this reality by encouraging development where it is most appropriate and setting forth recommendations to direct it away from areas where it is not appropriate. The majority of the green infrastructure network is not on developable land – it lies within the 100-year floodplain which inherently has many development limitations. Therefore, this plan does not greatly reduce development potential on Tinker but rather significantly enhances the final development product with a view toward national security.

Definitions:

The following definitions describe the fundamental areas which comprise the GI Plan. These areas can be viewed graphically on the GI Network map (Map 3) at the rear of the plan.

Green Infrastructure – An *interconnected* network of waterways, wetlands, woodlands, grasslands, and other natural areas of *base-wide significance*.

Gray Infrastructure – buildings, roads, runways, ramps, utilities, and other man-made features in the landscape.

Regulated Areas – areas that contain environmentally sensitive features, such as waterways (and their associated buffers), 100-year floodplains, and wetlands [National Wetland Inventory (NWI), and jurisdictional] that are regulated (i.e., protected) during the land development process. This includes environmentally sensitive areas that have been designated in the Base General Plan as Urban Greenway or environmental buffers. Regulated areas (if in a natural native state) should be preserved, as they are today, with impacts recommended for approval only where necessary for construction of such things as utilities or road crossings and airfield operations. Regulated areas that are not in a natural native state should also be preserved, but activities may be accomplished to restore these areas to a natural native condition where appropriate.

Evaluation Areas – areas that contain environmentally sensitive features (or are adjacent to environmentally sensitive features) such as native grasslands/woodlands, sensitive wildlife species, or rare plant species that are not regulated (i.e., not protected) during the land development process. Evaluation areas will be considered during the review process as areas of high priority for on-going conservation. These are developable areas; however, consideration must be given to natural resources that exist on the site and their priority for preservation and long term conservation.

Network Gaps – areas either inside or outside regulated areas that are critical to the connection of fragmented natural areas. These have been included in the GI Plan to provide areas of possible connectivity. These areas should be evaluated during the land development review process for possible restoration opportunities to enhance the ecological functioning of the network and/or to make critical connections in the green infrastructure network.

100-year floodplain – the lowland and relatively flat areas adjoining waters, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Wetlands – areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does and would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.

Tinker’s GI Plan is comprised of 1083 acres, or 22% of the base land area. Regulated areas comprise 51% of the GI network; evaluation areas comprise 34%; and network gaps comprise 15%.



A BALANCED APPROACH – Preservation and enhancement of green infrastructure amidst gray infrastructure fosters a more sustainable and livable community.

Plan Benefits

Investments in green infrastructure preservation and enhancement produces tremendous dividends. This section describes some of these benefits and why this plan is needed for Tinker and its surrounding communities.

Pollution Control/Environmental Compliance

Heavy industrial activities can be very taxing on the surrounding environment. At times over the years Tinker has experienced difficulties in meeting regulatory standards. The GI Plan would move Tinker in a direction which would lessen the chances of environmental violations such as exceedances of quantified water quality permit limits and discharge allowances. Also, implementation of the plan would enhance proactive compliance with floodplain and wetland executive orders and Air Force Instructions.

This would reflect favorably on the Base and ensure continued unencumbered availability of land for military operations.

Military Readiness

The Glenwood Area on the north end of Tinker and the Leased Training Area at the SE end of the Base provide natural areas for realistic training of area military units. The GI Plan would ensure that these areas remain in an appropriate natural condition to provide a setting for realistic training. For example, much of the northeast quadrant of Glenwood is being



invaded by eastern red cedars. Although these would typically be removed for ecological reasons, in this case environmental staff will meet with military units to determine if the cedars are necessary for realistic training. If so, GI management actions will be adjusted accordingly to ensure the appropriate natural setting is available to support military requirements while not further degrading the surrounding environment.

MILITARY READINESS – Gray and green infrastructure of the Glenwood Exercise Area provide site for realistic training.

Disaster Preparedness

A significant portion of Base facilities, roadways, aircraft ramps, and other areas will be flooded when Tinker experiences a 100-year flood event (Figure 1). This plan aims to

reduce and in many cases eliminate these future costly flood-related disruptions to military operations.

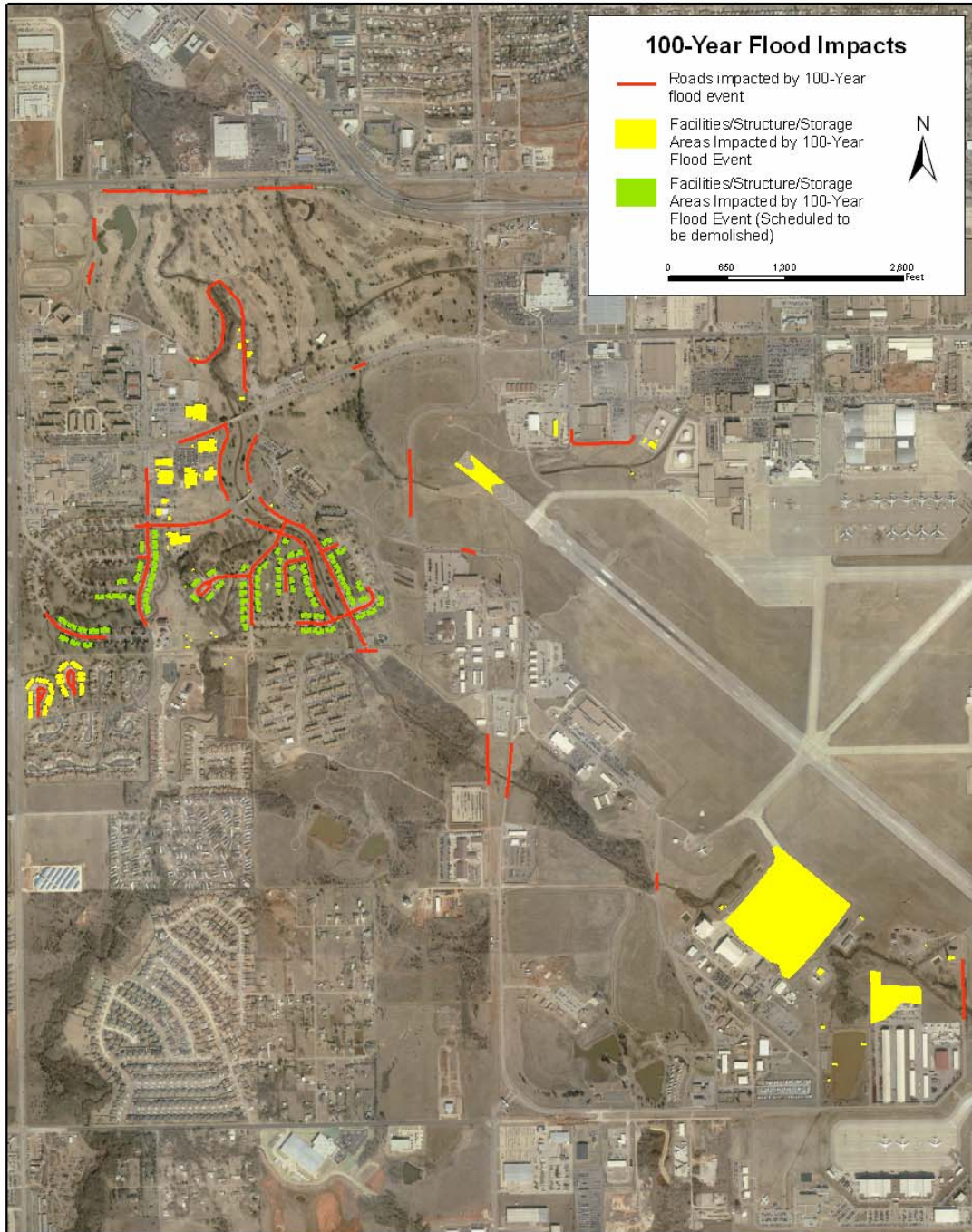


Figure 1. This figure shows facilities, roads, ramp areas, and other structures that would be flooded to some degree during a 100-year flood event on Tinker.

Good Neighbor/Community Partner

For Tinker to continue to develop its land without addressing the associated cumulative environmental impacts (e.g., flooding) would have significant negative consequences on downstream communities such as Del City and Midwest City. Tinker AFB has implemented limited flood control measures and avoided development in the floodplain in the past. Implementation of the GI Plan will ensure Tinker continues to act responsibly in its development decisions, thereby doing its part to not exacerbate already critical-level flooding problems in these off-Base communities.

Ecosystem Management

Much of Tinker's existing urban ecosystem, particularly its waterways, is impaired because of past inappropriate development or management practices (e.g., removal of riparian woodlands; mowing to the water's edge on creeks). This has resulted in loss of many ecosystem functions and values and the degradation of land and water quality. In the long term, the GI Plan will improve water quality, promote wildlife movement, enhance fisheries, stabilize eroding creek banks, and restore other lost functions and values.

Holistic Planning

At this time, natural resources conservation is typically done in a reactive, piecemeal, project-by-project fashion which leads to inefficiencies and conflicts. Implementation of the GI Plan would be a more proactive holistic planning approach which gets away from isolated, haphazard conservation/development actions. It brings development and natural resources conservation under the same umbrella. This integrated approach reduces or eliminates environmental-related obstacles and setbacks during the latter stages of project approval. The plan provides an up-front picture of where to focus environmental restoration, enhancement, and preservation and defines areas where development is appropriate to ensure long-term integrity of the local urban ecosystem.

Cost Savings

It is far cheaper to preserve green infrastructure now than to recreate it later. Tinker's facility development patterns historically have been to clear a site, build the building, and then rebuild the landscape around the building. By not considering sensitive environmental resources up front, it costs the Base more in the long-term by the added cost of rebuilding what was destroyed and by eliminating the resources that provided natural services. For example, American Forestry Association estimates that a 50-year-old urban tree saves \$75 a year in air conditioning, \$75 a year in storm water and soil erosion control, and \$50 a year in air pollution control.*

**Urban Forestry News*, Vol. 10, Issue 2, Autumn 2003, page 7

Enhanced Natural Aesthetics

Tinker is heavily developed to the point that much of the outside urban and industrial environment has the potential for natural aesthetic improvements. The GI Plan would restore select woodland and grassland areas substantially enhancing visual attractiveness.

Warfighter Health and Wellness

The GI Plan fosters warfighter wellbeing by providing a more livable community for his or her family members and by providing quality areas for troop exercises/runs, biking, jogging and other activities and events that support important fitness programs such as Fit-to-Fight and Fit-for-Life.



WARFIGHTER HEALTH – Green infrastructure supports warfighter PT activities

Consistency With Other Plans, Policies, and Warfighter/Community Needs

Tinker Air Force Base General Plan

One of the goals adopted in the 2005 Base General Plan was to:

- *Strengthen the warfighter and surrounding community by building a healthy native urban ecosystem.*
 - *Actively conserve and rehabilitate the installations natural infrastructure...to support mission accomplishment, enhance readiness, reduce future funding*

needs, prevent pollution, prevent illness and injury, ensure cost effective compliance, and maximize existing resource capability.

The GI Plan is aimed directly at achieving this goal by encouraging the conservation and rehabilitation of Tinker's impaired natural systems. Numerous beneficial floodplain functions would be realized under this plan.

- protection of banks from erosion,
- attenuation of flood peaks,
- fish and wildlife habitat,
- flora and fauna migration corridors,
- nutrient/non-point source pollution filtering,
- water quality maintenance by acting as sediment repositories,
- ground water recharge

Human-derived values gained from Tinker's floodplain include:

- recreational sites/opportunities (e.g., golf course, wooded trail systems),
- natural military training sites,
- flood storage,
- cost savings provided by natural services,
- natural beauty,
- compliance with NPDES permit limits, Oklahoma Water Quality Standards, and storm water permit requirements thereby ensuring continuance of Base mission

Crutcho Creek Initiative

In 2005 a local steering group was formed consisting of local, state, and federal government officials, business owners, and others. The group began exploring development of a master plan for the Crutcho Creek riparian system, including the portion on Tinker AFB. This plan is called the Greenprint: East Metro Watershed. The GI Plan supports the basic tenets of this



SUSTAINABLE WILDLIFE POPULATIONS –The Glenwood deer herd did not exist 15 years ago. Today it thrives as the result of the off-Base green infrastructure migration corridor that extends from Draper Lake northward to Glenwood.

initiative by providing floodwater control (e.g., Tinker golf course functions as a flood detention area during flood events, lessening flooding north of SE 29th Street) and developing areas for passive/active recreation and education. The GI Plan also supports establishing a continuous natural linkage from the Crutch Creek headwaters to the North Canadian River within the security requirements of Tinker AFB.

DOD Policy

The GI Plan supports DOD policy to *maintain readiness by cost-effectively providing adequate natural infrastructure to support mission completion and sustainable living and working environments.* – DOD Directive 4715.1E

The GI Plan supports this policy by fostering a *greener* vision for Tinker AFB. Many areas within Tinker's green infrastructure are stressed systems with few trees, eroded creek banks, and little natural vegetation. Restoration of these areas would create a more livable and sustainable community by recapturing the free services (e.g., erosion control, improved water quality, air pollution control) provided by natural systems and providing a more comfortable and visually attractive working and living environment. A better quality environment translates to a stronger community and warfighter.



ENHANCED WORKING ENVIRONMENT – Green infrastructure (foreground) east of B-3001 softens the harsh surroundings and provides quality location for a ½ mile fitness trail in the heart of the industrial side of the Base

Secretary of the Air Force (SAF) Goal

In 2005, the Secretary of the Air Force identified seven goals. One of the goals which pertains to this Plan was:

- “Continue to improve the Total Force Quality of Life.” – Letter to Airman, Nov 2005

The development of a green infrastructure network would be one of the most impacting steps Tinker AFB could take to improve quality of life on Tinker AFB. In Tinker’s recent base-wide Natural Resources Marketing Research Survey which assessed natural resources-related use patterns and needs, when trail users were asked what type of trail environment (i.e., urban, rural, natural grassland/woodland) they preferred, 77% ranked natural grassland/woodland as their top preference. Ninety-three percent indicated the trail systems improved quality of life.

AFMC Focus Areas

In the Jan 2006, the Air Force Materiel Commander outlined focus areas for 2006. One focus area was *people*, part of which was to *strive to create a wellness-focused workforce* – Commander’s Log, Jan 2006



The GI Plan focuses on people and promotes health and wellness. In the 2006 Natural Resources Marketing Research Survey, over 59% of the respondents said they used the Base trail systems, much of which is located in the Base’s existing green infrastructure areas.

Furthermore, in the Sep 2005 edition of *Redbook**, an article was published on the benefits of walking which included an inset entitled *Walking Makes Being a Military Wife Easier*. The caption described how these wives of military husbands benefited from Tinker’s trail systems located within the base’s green infrastructure.

QUALITY OF LIFE -- Shaded multi-use trails through green infrastructure make outstanding recreation areas for Base families

2 IMPLEMENTATION STRATEGY

Objective 1: By 2016, promote on- and off-base awareness of GI plan benefits and requirements and institutionalize conservation planning principles and philosophies in all applicable Base projects.

Activity 1: By 2007 establish a Green Infrastructure Team to facilitate a coordinated approach to proactive conservation planning; provide a forum for dealing with green infrastructure and development issues; and foster implementation of the Green Infrastructure Plan.

Activity 2: By 2007, develop/update internal and external planning checklist(s) to facilitate incorporation of conservation planning principles, floodplain/wetland executive order requirements, and other pertinent GI guidelines and policies into requirements documents (RD) and other early design documents. Supplement with briefings to target audiences as needed to meet intent of objective.

Activity 3: By Feb 2007, update/modify as appropriate Base contract boiler plate sections (e.g., Section 0700, 0720), Architectural Compatibility Guide, grounds maintenance statements of work (e.g., Trace, Kira, AAFES), and other documents to reflect new requirements outlined in GI Plan.

Activity 4: By 2007, coordinate Tinker's GI Plan with Midwest City, Del City, Oklahoma City, and Oklahoma County to encourage continuation of connected green infrastructure beyond the Base boundaries.

Activity 5: By 2009, attend conservation development training course (e.g., Environmentally Sensitive Development).

Activity 6: By 2011, Natural Resources staff shall continue floodplain/wetland related training and become Certified Floodplain Managers.

Metric 1-1: NA

Objective 2: By 2011, manage green or natural infrastructure in training areas to provide optimal military operational sustainability without degrading the environment.

Activity 1: By 2007 evaluate military use of natural areas for training activities.

Task 1: Determine military operational requirements of all units utilizing the Glenwood and Leased Training Areas.

Task 2: Determine corresponding adequacy of GI to support units' training needs.

Task 3: Identify natural resources related trends that negatively impact the mission and corrective actions necessary to sustain green infrastructure resources to support current and future mission needs.

Task 4: Develop action plan to meet any identified needs and mitigate encroachment.

Metric 2-1: No status or trend data exists for this objective. The objective will be measured by annual standardized surveying (i.e., report cards) of units who will rank the degree to which the GI is meeting their military operational needs.

Objective 3: By 2031, restore and maintain Tinker's GI network's lost floodplain functions and values to the maximum extent practicable.

Project 1: By 2007, execute *Inventory, Baseline NR (Herptofauna & Mammals) (WWYK071005)** to include determination of occurrences, densities, distributions, and life histories (baseline biological surveys of all green infrastructure areas to aid in measuring future improvements in floodplain/wetlands functions and values)

Project 2: By 2008, execute *Inventory, Baseline NR (Birds) (WWYK081033)* to include determination of occurrences, densities, distributions, life histories, and migratory trends for sensitive avian species.

Task 1: By 2007, complete USFWS course: Non-game Bird Survey Techniques.

Project 3: By 2008, execute *Inventory, Baseline NR (Invertebrates) (WWYK081035)* to include determination of occurrences, densities, distributions, and life histories.

Task 1: By 2007, initiate baseline invertebrate survey and develop entomological reference collection (volunteer).

Task 2: By Oct 2008, complete USFWS course: Freshwater Biomonitoring Using Benthic Invertebrates.

Project 4: By 2008, conduct baseline study/assessment to define and classify current floodplain health, identify/quantify floodplain functions and values lost, identify areas and appropriate projects that will restore sustainable functions and values, and establish metrics that will demonstrate actual functional improvement of the floodplain (refer to Fauna Implementation Strategy – Fish to view interrelated survey needs).

Metric 3-1: No baseline or trend data currently exists for this objective. Upon completion of class baseline inventories/censuses and floodplain baseline study/assessment, metrics will be established to track progress towards objective.

Objective 4: By January 2007, implement Urban Greenway Master Plan (see Chapter 3 of Green Infrastructure Plan – refer to project/activity schedules in Sections 1 and 2.)

Metric 4-1: For this planning period, this objective will be measured by determining progress toward select Urban Greenway guiding principles.

- Principles 1 and 3 will be measured by periodic (5 year) surveys of Greenway system users as compared with the 2006 Natural Resources Marketing Research baseline.

- Principle 2 will be measured in conjunction with the metric for Objective 3 above.

Objective 5: By 2010, develop Soldier Creek Greenway Master Plan.

Metric: NA

POLICIES:

The following policies have been developed to ensure Tinker AFB progresses toward sustainability of our environment and the military mission.

Policy 1: Encourage sustainable development and military operational support by balancing gray infrastructure development with green infrastructure enhancement, restoration, and preservation.

Policy 2: Tinker AFB shall observe a “no net loss of floodplain capacity” policy. Tinker will ensure no increase in the 100-year floodplain boundaries using the 2002 U.S. Army Corps of Engineers TAFB Floodplain Study as the baseline.

Policy 3: In developing future facility plans and as opportunities arise, all facilities located within the 100-year floodplain should be relocated to areas outside the 100-year floodplain (Appendix N, Map 7).

Policy 4: Employ conservation management principles when developing areas:

- Practice compact development to the maximum extent practicable.
- Focus on designing projects to “fit” the existing landscape or natural community as opposed to designing projects which require clearing and leveling the entire site and subsequently attempting to rebuild the landscape.

Policy 5: Excluding the airfield, restore and maintain network gaps to create natural corridor connectivity wherever possible throughout the GI network. It is desired that these gaps be converted to native grasslands/woodlands a minimum of 300’ wide (e.g., 150 feet on each side of a creek/trail) where practicable. In developed areas, any width of natural connectivity is encouraged. Where contiguous connectivity is not possible, the following guidelines shall apply:

- Develop smaller natural areas (i.e., patches) which serve as stepping stones for wildlife movement.
- Decrease distance between stepping stones wherever possible.
- Emphasize larger patches over smaller ones.
- Prioritize restoration by focusing first on higher order streams versus lower order streams and gaps away from roads as opposed to close to roads.

* Must-fund projects are shown in *green italics*

3 URBAN GREENWAY MASTER PLAN

Introduction

Part of Tinker’s green infrastructure, the Urban Greenway (Figure 2), has been under conservation and rehabilitation since 1990. The area currently consists of approximately 110 acres of fragmented grasslands, woodlands, parklands, water features, and some highly urbanized land. There are three core reserve areas interconnected by a 3.3 mile asphalt multi-use trail. Each core reserve is surrounded by split-rail fencing. Within the reserves are a family camp area (FAM Camp), ponds, creeks, picnic pavilions, fishing piers, nature trail with trilside exhibits, boardwalk, wildlife observation blind, and other amenities. Reserve 3 has been designated as a registered natural area by the Oklahoma Biological Survey for protection of the Texas horned lizard, a state-protected species.



Trailhead of Tinker AFB Urban Greenway

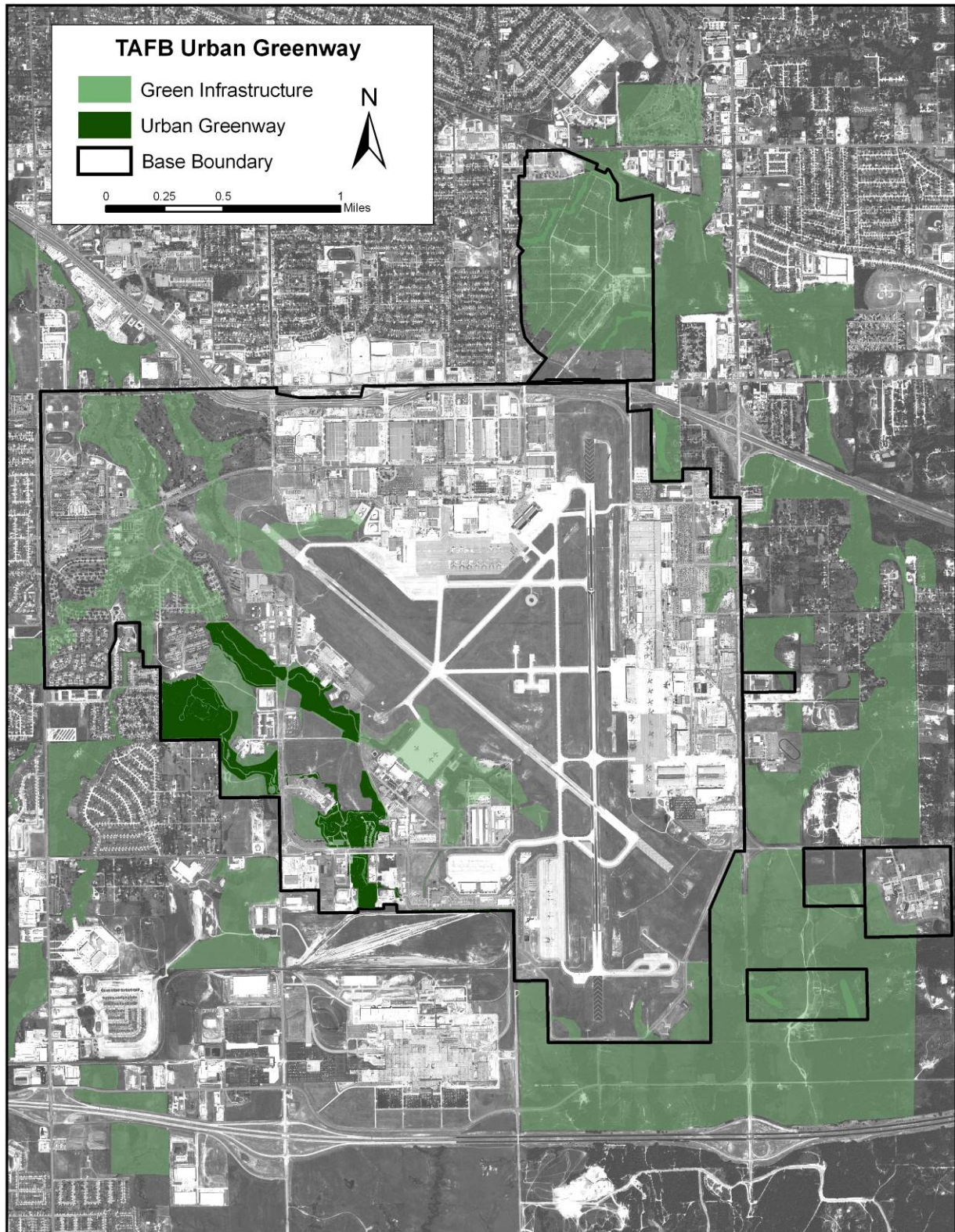


Figure 2. Urban Greenway shown in relationship with surrounding green infrastructure.

Within the desired development pattern of the Base General Plan, the Urban Greenway Master Plan aims to layout short (5-year) and long term (25-year) direction for continued quality development and enhancement of the base's Urban Greenway. The basic tenets of the Urban Greenway fall under three categories:

Recreation

Promote warfighter and community wellness through a quality outdoor recreation experience on Tinker AFB. Recreational activities include jogging, bicycling, walking, rollerblading, fishing, wildlife viewing, PT training, and other outdoor activities in the natural environment.

Conservation

Encourage sustainable development by balancing gray infrastructure development with green infrastructure enhancement, restoration, and preservation. The gray infrastructure is defined as buildings, roads, runways, and other man-made features. The green infrastructure is defined as an interconnected green space network (e.g., waterways, wetlands, woodlands grasslands, and other natural areas and their associated fish and wildlife) needed for institutional (including military mission), ecological, social, and economic sustainability.

Education

Provide a platform for community environmental education and awareness. The primary aim is to promote a culture which recognizes the importance of interconnected green space networks and their associated functions and values within urban areas.

Plan Organization

The plan is framed by six guiding principles. Each principle is followed by examples of improvements that were considered in the development of this plan.

PRINCIPLE 1: To maximum extent practicable, develop an element of natural solitude to foster a relaxed atmosphere while enhancing aesthetics and promoting user safety.

- Screening (visual, wind, and noise buffers)
- Minimize use of obtrusive signage; where signs are necessary and as possible, use standardized signage throughout greenway system
- Minimize man-made features
- Encourage unmowed areas of native vegetation
- Eliminate/minimize man-induced erosion
- Plant sustainable wildflower populations
- Maintain lines-of-sight, particularly on trail curves for safety reasons
- Employ permanent 300-foot buffer zone standard where practicable
- Plant flowering native trees such as Mexican plum and eastern redbud for visual interest
- Establish routine trash pickup program
- Control vehicular access to all greenway areas
- Use a combination of open grassland, closed woodland, and wetland/water features where appropriate
- Layout trails and planting of vegetation to create a sense of mystery through a curvy path alignment.

PRINCIPLE 2: Create and maintain a permanent healthy native prairie/savannah upland & wooded bottomland system that enhances fish and wildlife diversity.

- Increase habitat complexity and structure
- Convert turf grass to native grasses/forbes
- Remove non-native grasses, forbs, vines, shrubs, and trees
- Plant a diversity of native aquatic plants in ponds (e.g., GW entrance)
- Restore and maintain natural corridor connectivity wherever possible
- Employ natural vegetation patch stepping stones if continuous connectivity cannot be achieved
- Decrease stepping stone distance wherever possible
- Prioritize restoration by focusing first on higher order streams versus lower order streams and gaps away from roads as opposed to close to roads.
- Emphasize larger patches over smaller ones.
- Provide both interior area and edge diversity
- Establish wetland mitigation banks within Greenway system for Fuel Control Facility and CNG jurisdictional wetlands.
- Clear up pond turbidity
- Place/anchor artificial snags (standing tree stumps) and other natural log/root structures in ponds
- Stabilize shorelines
- Reintroduce native wildlife
- Burn/mow in blocks, always leaving some unburned

PRINCIPLE 3: Improve user satisfaction compatible with sound natural resources stewardship

- Conduct base-wide market research to determine natural resources use patterns and needs
- Permanent restroom facilities
- Construct trailside comfort stations (stretching/rest areas with benches, water fountains, misters, storm canopy, and emergency phones)
- Widen trail (main loop 8' wide; secondary branches 6' wide; rubberized trail surface)
- Create shade in select areas (along trails, ponds, FAM Camp)
- Light trails as feasible considering possible negative ecological impacts and detracting aesthetics.
- Add trail linkages to improve connectivity with primary user groups and enhance trail diversity (3rd Combat Communications Group, Navy, AWACS Alert, 507th)
- Promote Fit-to-Fight and Fit-for-Life objectives
- Promote selective angling opportunities
- Promote wildlife viewing opportunities
- Promote safety
- Seek expansion opportunities (e.g., add marsh filter as an extension of Reserve 2 surrounded by split-rail fencing)
- Promote loop trail system so users don't have to retrace their paths
- Accommodate disabled users where possible

PRINCIPLE 4: Comply with E.O. 13195, Trails for America in the 21st Century

- Participate in National Trails Day (1st Saturday in June) – tie to completion of new achievements/dedications

PRINCIPLE 5: Decrease maintenance requirements to the maximum extent practicable.

- Plant low-growing buffalo grass along trail sides
- Limit mowed areas
- Where possible, develop reserve boundary vegetative screening such that in time it will serve as a living fence, and the existing split-rail fencing, as it deteriorates, can be permanently removed.

PRINCIPLE 6: Develop and promote outdoor education and awareness opportunities

- Develop and encourage self-guided environmental education tours

- Recruit volunteers who could conduct routine greenway field tours for school, scouting, and other groups
- Design and develop select areas within the Greenway to support and supplement environmental education curriculum and initiatives at local educational institutions such as Tinker Elementary, Rose State College, Mid/Del schools, and base child care development centers.

The mapping sections which follow illustrate planned improvements and maintenance requirements scheduled . Mapping is arranged in three sections:

SECTION 1 General Improvements: This section provides basic descriptions and locations of various improvements planned for the Greenway. The improvements are not in priority order on the maps. Refer to the annualized schedule at the beginning of the section for project priorities.

SECTION 2 Native Grassland/Woodland Restoration and Maintenance: This section illustrates plans and schedules for restoring and enhancing native grass and woodland areas within the Greenway. The intent is for all unimproved grasslands and some improved turf grass areas to be converted to native grasses and forbs consistent with flora of the local Central Oklahoma/Texas Plains and Central Great Plains ecoregions [*Oklahoma's Biodiversity Plan: A Shared Vision for Conserving Our Natural Heritage, 1996*]. To the maximum extent practicable, all non-native vegetation will be removed from these areas. Special attention will be given to ensure grassland restoration and enhancement efforts do not appreciably disturb native wildlife, particularly sensitive species that currently inhabit these areas. Permanent vegetation sampling transects will be established with baseline and periodic follow-up surveys to measure progress toward established goals.

SECTION 3 General Maintenance: This section itemizes general maintenance requirements and schedules needed to keep the Urban Greenway safe, clean, attractive, healthy, functional, and long-lived.

Areas on maps designated as "Evaluation Area" are scheduled for development (e.g., new building, parking lot, etc.) or are problematic as far as meeting the aforementioned guiding principles. Designers of facilities in these areas shall consult the Environmental Management Division early in the design process to evaluate and determine how the project may be designed consistent with the guiding principles. It is anticipated that all guiding principles will not be able to be fully met in these areas. However, the designer shall make a good faith effort to incorporate as many of the principles into the design as possible. Within these evaluation areas, if impacts to the greenway system cannot be avoided, they should be minimized. If minimization is not possible, the designer shall provide mitigation alternatives for consideration.

Section 1

General Improvements

Urban Greenway Master Plan

General Improvements Schedule

2007

Reserve 1 West

1. Relocate jurisdictional wetland signs (16)*
2. Request relocation of SW Bell sign (1)
3. Relocate overhead power lines to underground in conjunction with 31st CCS Ops facility construction (19).
4. Install split-rail fencing (21)
5. Remove structure if abandoned (18)

Reserve 1 East

1. Remove old split-rail fencing (7) and install split-rail fencing (8)
2. Correct erosion issue (11)

Reserve 2 North

No improvements planned this FY

Reserve 2 South

1. Install trail connection from Navy/AWACS to Greenway Trail (12)

Reserve 2 – Reserve 3 Connection Corridor

No improvements planned this FY

Reserve 3

No improvements planned this FY

2008

Reserve 1 West

1. Conduct woodland assessment (11)
2. Plant cottonwoods from tree farm (20)
3. Remove old road surface and prepare and seed to native grass in conjunction with 31st CCS Ops facility construction (18)

* Numbers in parentheses correspond to label numbers on General Improvements Maps

Reserve 1 East

1. Conduct woodland assessment (13)
2. Plant cottonwoods from tree farm (4)
3. Adjust/route drainage under trail (15)
4. Install trailside comfort station (21)

Reserve 2 North

1. Plant cottonwoods from tree farm (8)
2. Install trailside comfort station (37)
3. Relocate cedars (6 & 25)
4. Plant tree groves (29)

Reserve 2 South

1. Conduct woodland assessment (13)
2. Plant cottonwoods from tree farm
3. Plant mesophytic/hydrophytic plants in marsh (5)

Reserve 2 – Reserve 3 Connection Corridor

1. Conduct woodland assessment (14)
2. Install trailside comfort station (18)
3. Upgrade fire break with Base recycled crushed concrete (4)
4. Install split rail fencing (north side of trail)

Reserve 3

1. Conduct woodland assessment (6)
2. Install split-rail fencing and remove old fencing (23)
3. Upgrade fire break with Base recycled crushed concrete (7)
4. Design, fabricate, and install signs (4)

2009

Reserve 1 West

1. Plant approximately 240 Eastern red cedars from tree farm in proposed screen areas
2. Remove topsoil from stockpile area in preparation for 2010 herbiciding of area (see 2009 Reserve 2 North/South planned improvements below).
3. Selectively remove ash/elm along trail (13)
4. Flush mount/close monitor wells where feasible (9)

Reserve 1 East

1. Flush mount/close monitor wells where feasible (9)

Reserve 2 North

1. Plant approximately 190 Eastern red cedars from tree farm in proposed screen areas
2. Construct berms at FAM Camp RV area for 2010 tree planting (34)
3. Flush mount/close monitor wells where feasible (3)
4. Plant trees around pavilion (11)
5. Plant tree groves at James Hill Conf Ctr (29)

Reserve 2 South

1. Plant shade trees along trail (11)

Reserve 2 – Reserve 3 Connection Corridor

1. Flush mount/close monitor wells where feasible (7)
2. Install split-rail fencing (south side of trail)

Reserve 3

No improvements planned this FY

2010

Reserve 1 West

1. Install artificial snags (26)
2. Stabilize shoreline (6)
3. Enhance wetland (7)

Reserve 1 East

1. Remove cedars (9)
2. Standardize signage (10)
3. Relocate powerlines (16)

Reserve 2 North

1. Stabilize shoreline (Redbud Pond – 1000')
2. Remove sign frame (20)
3. Enhance low lying area with mesophytic plants (27)
4. Remove and reinstall grill (31)
5. Remove old picnic tables, grills, and benches and replace with new (33)

Reserve 2 South

1. Rehabilitate gravel storage area (7)
2. Install split-rail fencing
3. Install gravel parking area (3)

Reserve 2 – Reserve 3 Connection Corridor

No improvements planned this FY

Reserve 3

No improvements planned this FY

2011

Reserve 1 West

No improvements planned this FY

Reserve 1 East

No improvements planned this FY

Reserve 2 North

1. Install split rail fencing
2. Stabilize shoreline (Redbud Pond – 1000')

Reserve 2 South

No improvements planned this FY

Reserve 2 – Reserve 3 Connection Corridor

1. Construct cell in marsh filter (2)

Reserve 3

1. Remove abandoned tower/fence (1)
2. Remove abandoned power poles (3)

URBAN GREENWAY

Reserve 1 West

General Improvements



Label	Improvement Description
1	Request relocation of SW Bell sign
2	Remove entrance area lawns and replace with native deciduous holly
3	Remove entrance area pipes as they decline and replace with eastern red cedar "Canter" as backdrop to deciduous holly
4	Install large bollards to accent entrance
5	Landscape around informational sign and update entrance informational sign to reflect new trails when complete
6	Stabilize shoreline with mesophytic plants (e.g. bushy bluestem, bowland spatterdock) and enhance by planting hydrophytic plants (e.g. lotus, spatterdock, poverty thistle, arrowhead)
7	Enhance wetland with a diversity of native mesophytic plants
8	Remove stockpiled topsoil from reserve area (~50 dumptruck loads)
9	Flush mount an existing well where feasible
10	Identify and remove cedar's natural vials
11	Conduct woodland assessment with Oklahoma Department of Agriculture/Klahoma State University and develop management strategy
12	Remove all non-native plants (e.g. locust bark elm, Siberian elm, bush honeysuckle, Johnsongrass, Calery pear, sericea lespedeza, etc.) reserve-wide
13	Salvage and remove ash and elm to encourage larger growth of select trees and eliminate straight line effect
14	Widen trail to 8' and resurface with recycled rubber material which will be suitable for diverse users including joggers, bicyclists, rollerbladers, skateboarders, and others
15	Install vehicular gate
16	Relocate jurisdictional wetland signs to ensure they are visible
17	Remove all existing split-rail fencing along old Air Depot Blvd upon deterioration
18	Remove section of road and live stop signs and seed to native grass (as needed for potential floodplain mitigation)
19	Relocate overhead power lines to underground along road shoulder
20	Plant cottonwoods (cottonwoods cultivar)
21	Install new split-rail fencing
22	When trails are upgraded to 8' wide, install removable bollards in center of trail to control access of larger vehicles
23	Lower pedestrian sign from 7' to 4' and add sign to match GVI and Base sign standard (i.e., 3M brown...) & traffic safety standards
24	Screen with narrow cedars (8-10' max width)
25	Parking lot, restroom facility, and trailside comfort station (stretching area, storm canopy, water fountain, mister, emergency phones). Access to lot from proposed north-south boulevard per Base General Plan
25	Install artificial snags

N

- Woodland
- Grassland
- Water Feature
- Evergreen Screen (Proposed)
- Mow Zone
- Future Facilities
- Road Improvements

- Evaluation Area
- Parking Lot (Proposed)
- Crutcho Creek
- Fencing (Proposed)
- Trail (Existing)
- Trail (Proposed)
- Shoreline Stabilization

0 125 250 500 750 1,000 Feet

URBAN GREENWAY
Reserve 1 East
General Improvements



Label	Improvement Description
1	When trails are upgraded to 8' wide, install removable bollards in center of trail to control access of larger vehicles
2	Widen trail to 8' and resurface with recycled rubberized material suitable for diverse users including joggers, bicyclists, rollerbladers, and skateboarders
3	Flush mount monitoring wells where feasible
4	Plant cottonwoods (cottonless cultivar)
5	Plant mesophytic and hydrophytic vegetation at ponded area
6	Plant bottom of ditch in lowland switchgrass
7	Remove all existing split-rail fencing upon deterioration
8	Install new split-rail fencing
9	Remove two cedars adjacent to new B-1055 trail segment
10	Standardize and update all signage within the greenway (wide range detour signs, Fido-Fights, etc.)
11	Fill gap in berm to redirect water flow and stop erosion
12	Plant narrow cedars or Virginia creeper at corner of fence to screen B-1049
13	Conduct woodland assessment with Oklahoma Department of Agriculture/Oklahoma State University and develop management strategy
14	Remove all non-native plants (Larchbark elm, Siberian elm, Austrian pine, bush honeysuckle, etc.). Replant resulting larger openings with bur oak
15	Adjust drainage such that it flows under trail and not across the top. Plant lowland switchgrass in gully to prevent erosion and screen culvert
16	Relocate overhead power lines to underground along road shoulder
17	Install vehicular gate
18	Determine function of locked four-legged steel structure and remove if no longer needed
19	Remove pedestrian (D) and yield (Y) signs when Vanaman Road is demolished
20	Trailside comfort station (stretching area, benches, mister, storm canopy, water fountain, emergency phone)

Legend

- Woodland
- Grassland
- Water Feature
- Evergreen Screen (Proposed)
- Mow Zone
- Evaluation Area
- Road Improvements
- Future Facilities
- Cutocho Creek
- Fence Line (Proposed)
- Trail (Existing)
- Trail (Proposed)



URBAN GREENWAY Reserve 2 North General Improvements



Label	Improvement Description
1	Widen trail to 8' and resurface with recycled rubber material which will be suitable for diverse users including joggers, bicyclists, rollerbladers, skateboarders, and others
2	When trails are upgraded to 8' wide, install removable bollards in center of trail to control access of larger vehicles
3	Flush mount monitoring wells/PVC casings where feasible
4	Install new trail segment/crosswalk/culvert crossing to connect with Fitness West
5	Establish buffalo grass mow zone rest area among boulders
6	Relocate cedars to form new screen to the east
7	Move boulders to Greenway entrance
8	Plant cottonwoods/subur oaks in select areas along entire length of drainage ditch and other select locations
9	Remove all non-native trees and shrubs (lacebark elms, pines, crapemyrtle, Russian olives, mulberries, callery pears, Japanese honeysuckle, bush honeysuckle, hawthornes) and undesirable volunteer cedars reserve-wide
10	Install new trail segment from parking lot to trail and pavilion
11	Plant shade trees around pavilion
12	Cedar screen (narrow variety)
13	Remove fence when new fence has been installed and vegetative screen has been established
14	Action cancelled
15	Action cancelled
16	Expand restroom facility for dual use by FAM Camp and Greenway Trail users and remove all portable restrooms
17	Relocate Fit-to-Fight signage
18	Remove trail (replace in corridor to north) & construct drive-through RV area
19	Relocate dumpsters to screened concrete pad
20	Remove old sign frame

N

Woodland	Road Improvements
Grassland	Evaluation Area
Evergreen Screen (Proposed)	Family Camp Expansion (Proposed)
Water Feature	Shoreline Stabilization
Mow Zone	X - Shoreline (Proposed)
Redbud/Mexican Plum Groves (Proposed)	Landfill Fence
Sumac (Proposed)	Trail (Existing)
Future Facilities	Trail (Proposed)

0 50 100 200 300 400 500 Feet

URBAN GREENWAY Reserve 2 North General Improvements



Label	Improvement Description
21	Close access road/gate to landfill; remove gravel/flag/flat area
22	New trail segment to restrooms
23	Replant removed lacebark elms with native hackberry, soapberry, redbud
24	Stabilize shorelines with mesophytic/hydrophytic plants
25	Relocate cedars to form new screen to the west
26	Maintain vehicle access corridor
27	Enhance low lying area with mesophytic plants
28	Place/anchor large dead trees in pond for fish and wildlife structure
29	Plant tree groves around James E. Hill Conference Center parking lot
30	Install new James E. Hill Conference Center entrance sign
31	Remove and reinstall three-chambered grill in concrete pad
32	Update trail informational sign when new trails have been completed
33	Remove all outdated/deteriorated picnic tables, benches, grills, and other amenities. Install new at designated picnic areas
34	Construct grassed berms and selectively plant trees throughout RV parking area
35	Consolidate all FAM Camp area signage into two primary informational signs at the two main entrances to the Camp
36	Tent camping parking area
37	Trailside comfort station (stretching area, benches, water fountain, mister, emergency phone)

N

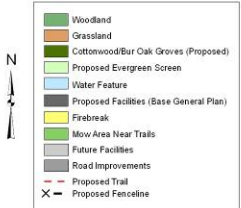
Woodland	Evaluation Area
Grassland	Family Camp Expansion
Evergreen Screen (Proposed)	Shoreline Stabilization
Water Feature	Fence Line (Proposed)
Mow Zone	Landfill Fence
Redbud/Mexican Plum Groves (Proposed)	Trail (Existing)
Sumac (Proposed)	Trail (Proposed)



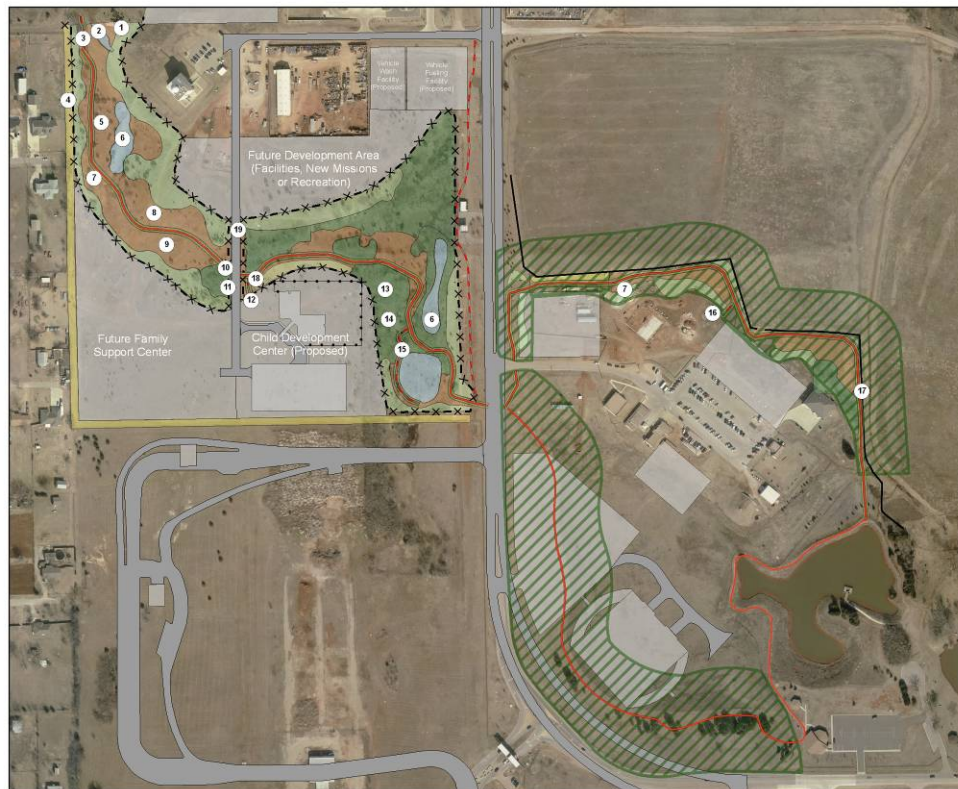
URBAN GREENWAY
Reserve 2 South
General Improvements



Label	Improvement Description
1	Plant willows and other trees and shrubs to stabilize drainage and create vegetative patch to fill Green Infrastructure network gap
2	Install removable bollard in center of trail to control access of larger vehicles
3	Construct gravelled parking area
4	Remove all non-native plants (e.g. Siberian elm, Japanese honeysuckle, bush honeysuckle, callery pear, etc) reserve-wide
5	Plant mesophytic and hydrophytic plants beneficial to fish and wildlife
6	Plant cedar screen (narrow variety on east side of separator)
7	Rehabilitate gravel storage area
8	Install pedestrian bridge
9	Construct barrier in creek bed to prevent access under the fence onto the base
10	Remove all refuse from reserve-wide
11	Plant shade trees along trail
12	New trail connection to Navy and AWACS Alert area
13	Conduct woodland assessment with Oklahoma Department of Agriculture/Oklahoma State University and develop management strategy



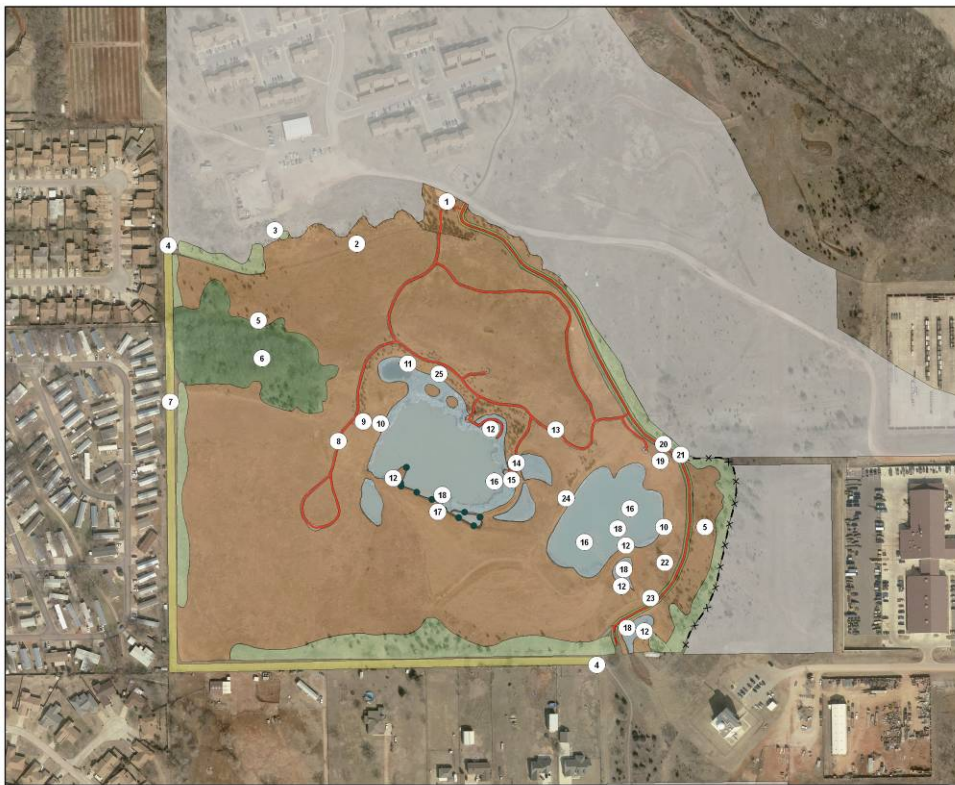
URBAN GREENWAY
Reserve 2 - 3
Connection Corridor
General Improvements



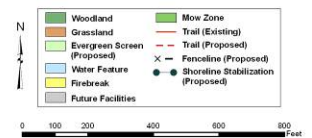
Label	Improvement Description
1	Remove abandoned tower and chainlink fencing
2	Construct cell in marsh filter area to sustain inundation at upper (south) end
3	Relocate trail to permit screening of off-base houses
4	Upgrade fire break (i.e., gravel) for vehicular access to monitoring wells and other IRP sites
5	Remove all cedars in areas proposed as native grass
6	Construct wetlands to be used as banks for future mitigation of Fuel Control Facility jurisdictional wetland
7	Flush mount monitoring wells where feasible
8	Close existing dirt road
9	Remove all non-native trees and shrubs (e.g., Japanese honeysuckle, multiflora rose, Siberian elm) corridor-wide
10	Widen trail to 8' and resurface with recycled rubber material which will be suitable for diverse users including joggers, bicyclists, rollerbladers, skateboarders, and others
11	New trail segment to proposed Child Care Development Center
12	When trail is upgraded to 8' wide, install removable bollard in center of trail to control access of larger vehicles
13	Remove select cedars in deciduous woodlands
14	Conduct woodland assessment with Oklahoma Department of Agriculture/Oklahoma State University and develop management strategy
15	Educational nature trail and pond/marsh outdoor classroom tailored to meet Child Care Development Center curriculum
16	New trail link connecting Security Forces complex
	Evaluate possible aesthetic enhancements along landfill chainlink fence: Option 1: Test plot of trumpet vine on chain fence for screening Option 2: Move fence 20' east to widen planting (screening) zone Option 3: Replace fence with 4' high chain link fence or spill-rail fence to enhance view Option 4: Remove fence
17	
18	Trailside comfort station (storm canopy, benches, water fountain, mister, emergency phone)
19	Vegetative screening in compliance with gas line corridor standards



URBAN GREENWAY Reserve 3 General Improvements



Label	Improvement Description
	Scissortail Trail Entrance - Treat entire entrance for Bermuda grass, bindweed, dyflower, and other invasive plants and replant where needed with native plants - Remove drip tubing - Remove T-posts and guy wires - Spray non-native undergrowth and install fabric mulch and 4" of woodchip mulch under trees/succa on east and west sides of entrance to include immediate trail sides up to gate
1	
2	Remove fence upon deterioration when evergreen screen functions as barrier to vehicular traffic
3	Remove abandoned power poles to enhance aesthetics
4	Fabricate and install signs at vehicle gate entrances to prohibit driving off established fire break/roadways
5	Remove invasive and non-native trees and shrubs (e.g. Siberian elm, calery pear, multi-flora rose, Japanese honeysuckle) and cedars where unwanted (e.g., on open prairie) / reserve-wide
6	Conduct woodland assessment with Oklahoma Department of Agriculture/Oklahoma State University and develop management strategy
7	Construct gravel fire break
8	Resurface Scissortail Trail with new compactable gravel to reduce/eliminate trail erosion
9	Develop new series of roadside panel exhibits
10	Establish buffalograss on angler trails around ponds
11	Level soil in marsh on north side of Prairie Pond
12	Plant cottonwoods on shoreline at select locations
13	Remove dead trees at exhibit locations and replant with new trees if feasible
14	Construct camouflage cover over wildlife viewing blind access boardwalk
15	Revitalize cattle feeding/viewing program at observation blind
16	Install artificial mounds in ponds
17	Stabilize shoreline with native hydrophytic and mesophytic plants beneficial to wildlife
18	Plant aquatic plants beneficial to fish and wildlife (e.g., lily, spatterdock)
19	Plant deciduous trees in this zone (savannah)
20	Widen trail to 6' and resurface with recycled rubber material which will be suitable for diverse users including joggers, bicyclists, rollerbladers, skateboarders, and others
21	When trail is upgraded to 6' wide, install removable bollard in center of trail to control access of larger vehicles
22	Prune up trees to create savannah
23	Remove section of split-rail fence along east side of Primrose Pond once new fence has been installed to the east
24	Seed native primrose wildflowers around pond
25	Extend subsurface drains



Section 2

Native Grass/Woodland Restoration and Maintenance

Urban Greenway Master Plan

Native Grass/Woodland Restoration & Maintenance Schedule

General

1. As applicable, AFI 32-7064 requires installations which utilize prescribed burning as a land management tool to develop and implement a Wildland Fire Management Plan. Because Tinker has no wildlands and the prescribed burning that is planned is on a very small scale, individual burn plans will be developed for each burn in coordination with the USDA Natural Resources Conservation Service and Tinker AFB fire department prior to initiation of burning.
2. All chemical usage will meet HazMat Cell requirements to include the following:
 - a. Pesticides will be Oklahoma-registered and DOD-approved pesticides
 - b. Chemical MSDS's will be submitted to the Haz Mat Cell
 - c. Coordination sheet (AF Form 214) will be submitted to the Haz Mat Cell
 - d. FAX sheet will be submitted to the Haz Mat Cell
 - e. Pesticide usage will be tracked and recorded on annual pesticide usage report. The total amount of pesticide active ingredient (AI) in pounds/acre applied will be submitted to CE by 15 Oct each year.
 - f. All pesticides will be applied per label instructions.

2007

1. Obtain prescribed burning training by Dec 2007. As required, all personnel scheduled to participate in prescribed burning on Tinker in 2008 and out-years shall attend appropriate training and obtain necessary certifications, if required.
2. By Sep 2007, research and develop custom grass/forb seed mix specifications that coincide with Tinker's remnant native prairie species composition. Include species that appear to have been lost by activities such as past livestock grazing (e.g., compass plant) and species specifically beneficial to the Texas horned lizard. Work with regional seed companies to ensure availability by 2009 planting season.
3. By Sep 2007, research and develop custom native wildflower seed mix for trailsides
4. By Sep 2007, design and fabricate vehicle access information signage for reserve areas to ensure vehicles requiring access into reserves remain on paved surfaces.

Reserve 1 West and East

1. As needed mow all areas of Japanese brome before it sets seed (~April/May)
2. As needed, spot seed Areas 1a, 1c, 1d, & 1f with native tall grasses; spot seed trail side mow zones with Buffalograss 1-15 Mar.
3. Monitor erosion control in pond area and western drainage swale and eastern drainage ditch and remediate as necessary
4. Mow (brush hog) established native grass Area 1d to 6-8" height 1 April
5. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A7)**:
 - a. Herbicide – control broadleaf and grassy weeds in native grass Areas 1a, 1c, 1d, 1f. Special attention shall be given to spot treating Bermudagrass, Johnsongrass, and sericea lespedeza as needed in these areas (May- Sep).

- b. As needed spot spray for Johnsongrass and sericea lespedeza along trailside between Areas 1a and 1c (May-Sep)
 - c. Herbicide – kill Bermuda grass in area 1e (between B-1049 boundary fence and B-1024 boundary fence). Install native grass restoration awareness signs prior to herbiciding.
 - d. Cut back/flag all marked exotic trees and shrubs in areas 1g and 1i by 1 May.
 - e. Herbicide all woody plants at flagged locations in Areas 1g and 1i.
6. Develop storm water management plan if required.

Reserve 3

1. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A7)*:
 - a. Herbicide – control broadleaf and grassy weeds in native grass stand in Area 3a. Special attention shall be given to controlling fescue and plains bluestem before it sets seed (spot treatments are probable)
 - b. Herbicide – spot treat in native grass area (3c) to control Johnsongrass, Bermudagrass, plains bluestem and other non-natives as identified
 - c. Herbicide – kill all herbaceous and select woody vegetation in Area 3d. Install awareness signs prior to herbiciding.
 - d. As needed, spot seed Area 3a with native grasses
2. Mow (brush hog) Area 3e as necessary to prevent plains bluestem and fescue from setting seed
3. Develop storm water management plan if required.

2008

Reserve 1 West and East

1. As needed mow all areas of Japanese brome before it sets seed (~April/May)
2. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burns for all native grass areas (1a, 1c, 1d, 1f) to control annual warm season weeds and woody seedlings
3. Seed Area 1e (between B-1049 boundary fence and B-1024 boundary fence) with native grasses and trail sides with buffalograss.
4. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A8)*:
 - a. Herbicide – control broadleaf and grassy weeds in native grass area (1e) (between B-1049 boundary fence and B-1024 boundary fence) . Special attention shall be given to spot treating Bermudagrass and Johnsongrass as needed in these areas (May-Sep)
 - b. Cut back/flag all marked exotic trees and shrubs in area 1h by 1 May.
 - c. Herbicide all woody plants at flagged locations in Area 1h.
5. Seed wildflowers on trailsides

Reserve 3

1. As needed, spot seed Area 3a with native tall grasses
2. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A8)*:
 - a. Herbicide – kill all herbaceous and select woody vegetation in Area 3e. Install awareness signs prior to herbiciding
 - b. Herbicide – spot treat for plains bluestem and fescue in native grass area (3c).

- c. Herbicide – control all broadleaf and grassy weeds in Area 3d which has been seeded to native grass. Special attention shall be given to controlling plains bluestem before it sets seed (spot treatments are probable)
 - d. Herbicide – spot treat in native grass stand of Area 3b for plains bluestem and fescue
 - e. Herbicide – control broadleaf and grassy weeds in native grass area (3a).
3. Seed Areas 3c and 3d with native grasses
 4. Develop storm water management plan if required.

2009

Reserve 1 West and East

1. As needed mow all areas of Japanese brome before it sets seed (~April/May)
2. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burn on Area 1a
3. As needed, spot seed Area 1e (between B-1049 boundary fence and B-1024 boundary fence) with native grasses and trail sides with buffalograss 1-15 Mar.
4. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A9)*:
 - a. Herbicide – control broadleaf and grassy weeds in native grass area (1e) (between B-1049 boundary fence and B-1024 boundary fence). Special attention shall be given to spot treating Bermudagrass and Johnsongrass as needed in these areas (May- Sep)
 - b. Cut back/flag all marked exotic trees and shrubs in Area 1j by 1 May.
 - c. Herbicide all woody plants at flagged locations in Area 1j.

Reserve 3

1. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burn on Areas 3a and 3b aimed primarily at controlling plains bluestem. Following burn, monitor Area 3b for sericea lespedeza and spray in 2010 if necessary
2. Seed Area 3e with native grasses
3. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138A9)*:
 - a. Herbicide – control all broadleaf and grassy weeds in Area 3e which has been seeded to native grass. Special attention shall be given to controlling plains bluestem before it sets seed (spot treatments are probable)
 - b. Herbicide – spot treat for plains bluestem and fescue in native grass area (3c)
 - c. Herbicide – control all broadleaf and grassy weeds in native grass of Area 3d. Special attention shall be given to controlling plains bluestem before it sets seed (spot treatments are probable)
4. Seed Area 3e with native grasses.

2010

Reserve 1 West and East

1. As needed mow all areas of Japanese brome before it sets seed (~April/May)
2. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burn on Area 1c & 1d
3. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B0)*:
 - a. Cut back/flag all trees in Area 1b.

- b. Herbicide – kill all herbaceous and select woody vegetation in Area 1b.
4. Develop storm water management plan if required.

Reserve 2 North/South

1. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B0)*:
 - a. Cut back/flag all marked exotic trees and shrubs in areas 2c, 2d, 2e, 2f, 2g, 2h, 2i, 2j, 2k, 2l, 2m, 2n, and 2o by 1 May.
 - b. Herbicide all woody plants at flagged locations in areas 2c, 2d, 2e, 2f, 2g, 2h, 2i, 2j, 2k, 2l, 2m, 2n, and 2o.

Reserve 3

1. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burns on Areas 3c and 3d.
2. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B0)*:
 - a. Herbicide -- control all broadleaf and grassy weeds in native grass area (3e). Special attention shall be given to controlling plains bluestem before it sets seed (spot treatments are probable)
 - b. Herbicide – if necessary, spray native grass area (3b) for sericea lespedeza
 - c. Cut back/flag all marked exotic trees and shrubs in area 3g by 1 May.
 - d. Herbicide all woody plants at flagged locations in Area 3g.
3. Seed wildflowers on trailsides of Area 3d.

2011

Reserve 1 West and East

1. As needed mow all areas of Japanese brome before it sets seed (~April/May)
2. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burn on Area 1f
3. Seed Area 1b with native grasses and install erosion control fabric on steep slopes as necessary
4. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B1)*:
 - a. Herbicide – control broadleaf and grassy weeds in Area 1b which has been seeded to native grass. Special attention shall be given to spot treating Bermudagrass, Johnsongrass, and fescue

Reserve 2 North

1. Cut back/flag all marked exotic trees and shrubs in area 2a by 1 May.
2. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B1)*:
 - a. Herbicide – kill all herbaceous and select woody vegetation in Area 2a
 - b. Herbicide – spot treat native grass area (2b) to control Johnsongrass, Bermudagrass, and tall fescue
3. Develop storm water management plan if required.

Reserve 2 – Reserve 3 Connection Corridor

1. By 31 Mar execute *Mgt, Native Ecosystem (WWYKOS0138B1)*:
 - a. Cut back/flag all marked exotic trees and shrubs in Areas 2-3a, 2-3b, 2-3c, 2-3d, 2-3e, 2-3f, 2-3g, 2-3h, 2-3i, 2-3j, 2-3k, 2-3l, and 2-3m by 1 May.

- b. Herbicide all woody plants at flagged locations in Areas 2-3a, 2-3b, 2-3c, 2-3d, 2-3e, 2-3f, 2-3g, 2-3h, 2-3i, 2-3j, 2-3k, 2-3l, and 2-3m.

Reserve 3

1. Develop approved site-specific burn plan and conduct early summer (1-15 Jun) prescribed burn on Area 3e.

* Must-fund projects are shown in *green italics*

URBAN GREENWAY

Reserve 1 West/East
Native Grass/Woodland
Restoration & Maintenance



	Woodland
	Grassland
	Evergreen Screen (Proposed)
	Water Feature
	Mow Zone
	Crutcho Creek
	Trail (Existing)
	Trail (Proposed)
	Area 1a (1.22 acres)
	Area 1b (7.17 acres)
	Area 1c (2.10 acres)
	Area 1d (5.15 acres)
	Area 1e (0.63 acres)
	Area 1f (3.07 acres)
	Area 1g (2.43 acres)
	Area 1h (8.33 acres)
	Area 1i (4.30 acres)
	Area 1j (14.05 acres)

Note: Acreage figures include adjacent hatched evergreen screen areas



URBAN GREENWAY

Reserve 2 North

Native Grass/Woodland
Restoration & Maintenance



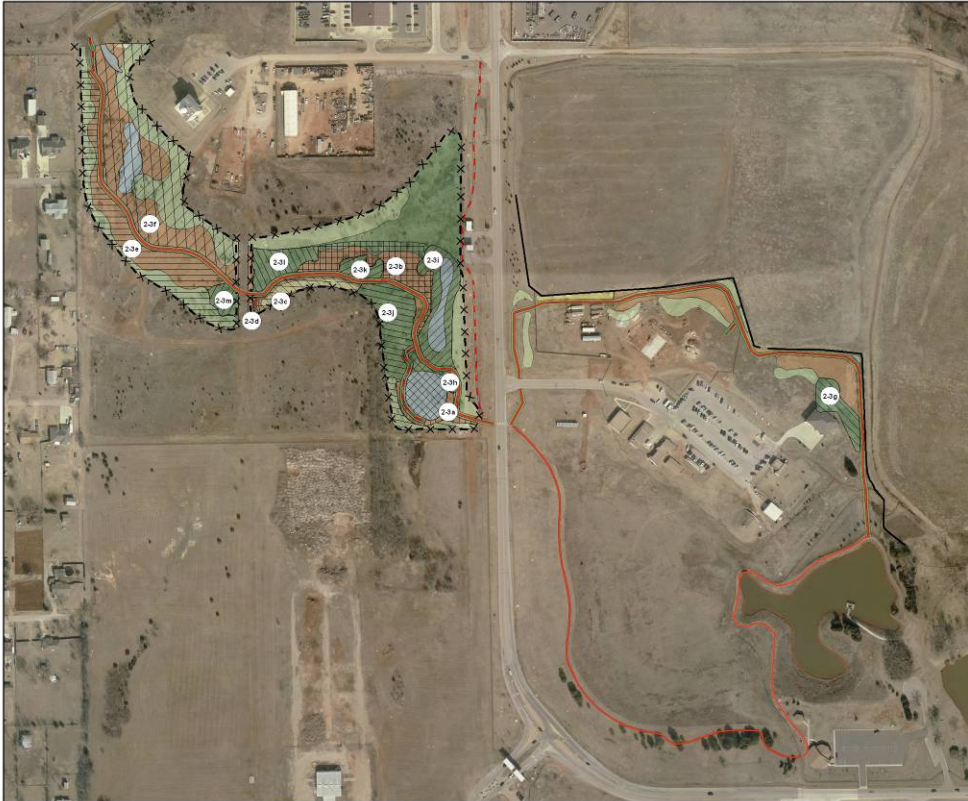
URBAN GREENWAY Reserve 2 South Native Grass/Woodland Restoration & Maintenance



- Woodland
 - Grassland
 - Evergreen Screen (Proposed)
 - Water Feature
 - Cottonwood/Bur Oak Groves (Proposed)
 - Mow Zone
 - Firebreak
 - Trail (Proposed)
 - Fence Line (Proposed)
 - Area 2e (0.12 acres)
 - Area 2f (1.16 acres)
 - Area 2k (0.92 acres)
 - Area 2l (1.59 acres)
 - Area 2m (4.47 acres)
- Note: Acreage figures include adjacent hatched evergreen screen and cottonwood/bur oak groves.



URBAN GREENWAY Reserve 2 - 3 Connection Corridor Native Grass/Woodland Restoration & Maintenance



- Woodland
 - Grassland
 - Evergreen Screen (Proposed)
 - Water Feature
 - Mow Zone
 - Sumacs (Proposed)
 - Trail (Existing)
 - Trail (Proposed)
 - Landfill Fenceline
 - X-X Fenceline (Proposed)
 - Area 2-3a (0.16 acres)
 - Area 2-3b (0.92 acres)
 - Area 2-3c (1.04 acres)
 - Area 2-3d (0.07 acres)
 - Area 2-3e (1.99 acres)
 - Area 2-3f (3.35 acres)
 - Area 2-3g (0.35 acres)
 - Area 2-3h (0.55 acres)
 - Area 2-3i (0.87 acres)
 - Area 2-3j (1.13 acres)
 - Area 2-3k (0.19 acres)
 - Area 2-3l (0.44 acres)
 - Area 2-3m (0.21 acres)
 - Area 2-3p
- Note: Acreage figures include adjacent hatched evergreen screen and water feature areas

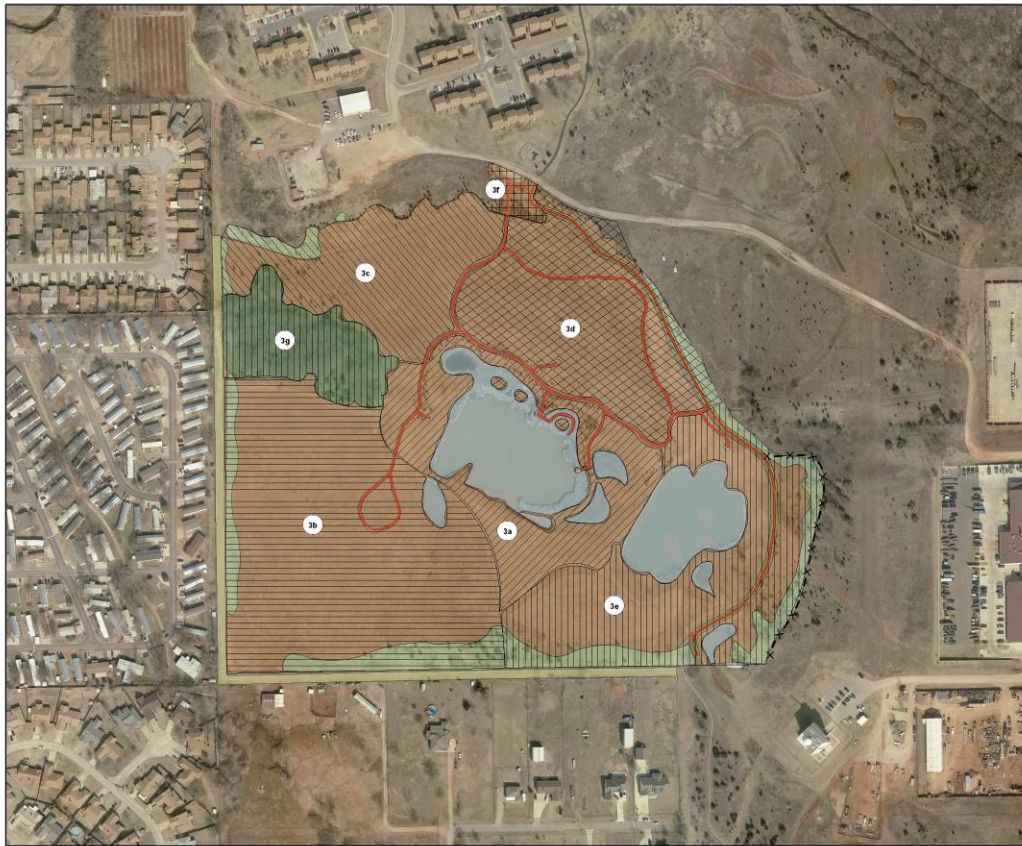


0 100 200 400 600 800 Feet

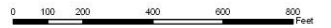
URBAN GREENWAY

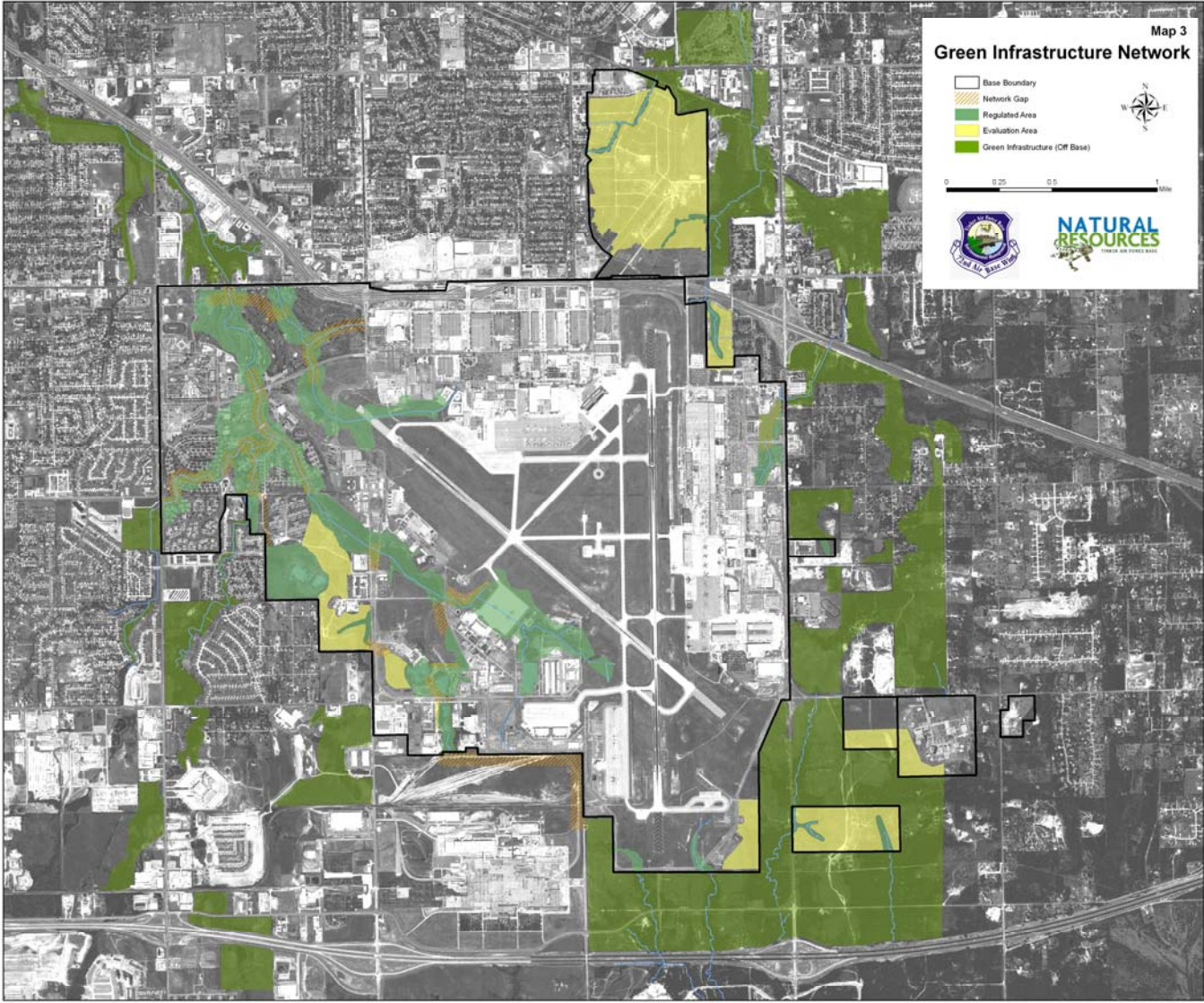
Reserve 3

Native Grass/Woodland
Restoration & Maintenance



- Woodland
 - Grassland
 - Water Feature
 - Evergreen Screen (Proposed)
 - Firebreak
 - Mow Zone
 - X - X Fenceline (Proposed)
 - Trail (Existing)
 - Trail (Proposed)
 - Area 3a (4.29 acres)
 - Area 3b (12.03 acres)
 - Area 3c (4.73 acres)
 - Area 3d (6.43 acres)
 - Area 3e (7.42 acres)
 - Area 3f (0.41 acres)
 - Area 3g (2.55 acres)
- Note: Acreage figures include adjacent hatched evergreen screen areas





URBAN GREENWAY General Maintenance



Label	Maintenance Activity/Task
M1	Remove weeds
M2	Trim vegetation off bridges (annually)
M3	Remove weeds/vegetation along south side of fence line
M4*	Inspect all bridges and culvert crossovers and as necessary replace deteriorated bridge piers and/or abutments. Inspect weirs where asphalt adjoins concrete bridge abutments to patch asphalt as needed to eliminate tripping hazards (annually)
M5	Remove any debris that has accumulated in crossover culverts (annually)
M6*	Whenever mowed turf and fence lines meet, install protective guards on all fence posts to prevent damage from weed-eaters
M7	In mowed areas, install tree guards on all smaller trees
M8	Install fence posts where needed
M9*	Remove rocks and concrete curbs or foot-cure corner of pond
M10	Remove vegetation on trail edge
M11	Prune and maintain shrubs (annually)
M12*	Spread topsoil and install sod on eroded areas on west side of pond
M13	Remove old Wilson's railing gas line all fencing
M14*	Trim tall trees with selective herbicide as needed where fence encroaches trail
M15	Provide observation blind wood on Beck, Sandhawk, and wildlife observation blind
M16	Trim deck, boardwalk, observation blind, railroad signs, benches, and replace educational exhibits with wood preservative once every 3 years
M17	Provide repair rail at Greenway Trail drainage drop down to ensure adequate water flow
M18	Trim select plants every 3 years
M19	Refresh ST entrance once a month year round
M20	Remove Chinese lanterns at ST entrance
M21	Put damaged signage on ST entrance sign and white observation blind
M22	Repair sign at west entrance
M23	Remove fire break of 2' minimum (Greenway Maintenance Contractor)
M24	Remove rocks on fence line west of ST entrance
M25	Wash/trim all landscape shrub surfaces
M26	Prune shrubs and trees in Prune Pond area
M27	Prune up trees at all bench locations
M28	Spread 2" drainage pipes to pond edge if pipes
M29	Inspect drainage entrance sign every 2 years, or as needed
M30	Remove and dispose of old catch basins
M31	Trim back plastic edging and build up mulch on outside of bed
M32	Scrape and reseed surface (and install pavement location markers)
M33	Remove loose blocking access gate
M34	Repair sloughing asphalt at pond edge
M35	Repair railing by vehicle crossover
Greenway	Weekly trash cans (Contract Maintenance Contractor)
Greenway	Remove road spraying along tree-lined trail sides to prevent cracking and heaving of asphalt (once every 5 years, or as needed)
Greenway	Trim trees/shrubs causing hazards along trail (annually)
Greenway	Remove trailers (weekly)
Greenway	Fill cracks and seal trail surface (minimum of once every 5 years)
Greenway	Inspect (EM) and repair (contractor) all Greenway signage (annually)
Greenway	Inspect (EM) all split-rail fence lines, including stone posts, a minimum of once annually and repair (contractor) as necessary
Greenway	Sweep trail of all soil, small stones, and other debris (once every 2 months)
Greenway	Remove any all trailers, including tractor segments, with herbicide wherever Bermuda grass is the trailer lot (annually)

— Existing Trail
--- Trail (Proposed)
x-x Fenceline (Proposed)
 Evergreen Screen (Proposed)
 Suncup Grove (Proposed)
 Redbud Grove (Proposed)
 Woodland
 Cottonwood Grove (Proposed)
 Native Grass
 Pond

