

# Lenexa Trails Alignment Analysis

*FINAL REPORT*



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MARCH 2009*



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# Introduction

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The Lenexa Trails Alignment Analysis provides specific trail alignment guidance to be used by staff during their ongoing reviews of various development plans. It should be viewed as an updated supplement to the 2002 Bicycle and Pedestrian Study (Patti Banks Associates). As trail alignments along streets and utility easements are more easily identified, the Trails Alignment Analysis focuses primarily on stream corridor multi-purpose trail segments. Many of these trail segments are made possible by the City's Stream Setback Ordinance (2002) which protects stream corridors from urban development for the purpose of watershed management and accommodating stormwater runoff. These corridors also present a wonderful recreational opportunity for a network of trails and greenways connecting commercial nodes, parks, neighborhoods and adjoining cities.

The Alignment Study had a number of objectives including;

- Respect and protect the streamways and the natural resources through which they traverse and connect while ensuring trail alignments maximize scenic views and user enjoyment.
- Being more proactive with Developers on the quick provision of specific trail alignment data for their project.
- Ensure trail alignments are cost effective in their location with respect to slope (grading), stream crossings (bridges/culverts), trailheads and long term maintenance needs.
- Enhance grant applications and project cost estimates with inclusion of detailed information regarding length of specific trail alignments; number, location and size of bridge/culvert crossings; needed stream stabilization and/or re-vegetation and trailhead facilities.
- Updating of the 2002 Bicycle and Pedestrian Study with regard to general trail locations to reflect completed or proposed public and private sector improvements and projects.
- Identify appropriate locations and number of trail connections within new development to either existing or future city trails.
- Identify locations of trailheads and support facilities.

This document is in keeping with the goals of Vision 2020, the Rain to Recreation mission, the Stream Setback Ordinance and the 2002 Bicycle and Pedestrian Study, outlining future trail recommendations and integrating existing trails into a coherent city-wide natural resources, stormwater, transportation and recreation framework. The data from this document, in conjunction with the 2002 Bicycle and Pedestrian Study will be used to update the existing Trails Plan as currently reflected in the Lenexa Comprehensive Plan. Both documents will also be a part of the Comprehensive Plan's Archive Section, for those wanting to review those respective documents in their entirety.

# Planning Context



## Framework of Related Planning Documents Used in This Document

1. Future Land-Use Map - 2008 Draft
2. Transportation Plan - 2008 Draft
3. Lenexa Bike and Pedestrian Study
4. West Lenexa Road Alignment Study
5. Lenexa Stream Asset Inventory
6. Lenexa Stream Setback Ordinance
7. Johnson County Trails Plan
8. MetroGreen Plan
9. Utility Plans and Corridors
10. Destinations (Parks, Private Open Space, Schools, Historic / Cultural Resources)
11. Natural Resources Inventory
12. Black Hoof Park Masterplan

## Platted projects-not built, under construction and completed projects used in this Document

1. Coon Creek Trail
2. Falcon Ridge Meadows Development
3. Stoneview Development
4. Canyon Creek Residential Developments
5. Creekside Woods Development
6. Timbers @ Clear Creek
7. Patrician Village Development
8. Brampton West Development
9. Great Plains Church
10. Brampton Development
11. Cedar Niles Development
12. Desoto School
13. Gleason Glen
14. Manchester Park
15. City Center Developments



# Opportunities

Due to the natural valleys and rolling floodplain topography that has been preserved in Western Lenexa, the anticipated outcome of the proposed trail network will have many positive user opportunities. These include:

1. *Picturesque views*
2. *Gateways and rooms within the natural valley segments as users traverse stream valleys*
3. *Many possibilities for challenging trail segments or loops to enhance fitness of users and accommodate a broad range of users from recreation to sports enthusiasts*
4. *Distant views down valleys and over large drainage systems areas*
5. *Dramatic vegetated backdrops with native vegetation*

Excellent natural hydrology has been preserved for many of the valleys that have proposed trails. These preserved natural streams and associated lakes will provide:

1. *Multiuse destinations within the trail system*
2. *Bird watching*
3. *Fishing*
4. *Swimming (Shawnee Mission Park)*
5. *Boating*

Lenexa has developed a significant buffer system with adjacent housing for easy access to proposed trails which also provides a park-like separation between suburban areas and trail alignments. These buffer areas include native vegetation communities such as:

1. *Lowland hardwoods*
2. *Upland Oak-Hickory complex*
3. *Floodplain grasses and marshland*

All the above opportunities contribute to a high level of landscape matrix connectivity within a buffer system that will result in the long term sustainability of diverse vegetation and animal communities. Large lakes, wetlands and natural stream channels will preserve the surface and subsurface hydrology for aquatic and semi-aquatic species. Patches of preserved forest and grassland areas linked by preserved stream channels will allow habitat connectivity for birds, mammals and insects. With the sheer size of the connected matrix of waterways and vegetation patches, Western Lenexa, will ensure animal population stability over time.

At a regional level, the Lenexa Trails System connects to Olathe, Shawnee, Overland Park, DeSoto and Lawrence, and the regional MetroGreen network, ensuring a broad user base.



# Constraints

Although there are many opportunities and positive aspects within the Lenexa Trail System, there are several constraints that are important to keep in mind as Lenexa develops.

The extent of future development plans in the City may negatively impact hydrology through increased water volume, velocity and sediment / pollution carried by runoff. To preserve the current quality of natural resources the City should continue to enforce development regulations such as sediment and erosion control, tree preservation, stream protection, soil compaction limits, and careful management of construction equipment during development.

Although the steep narrow valley topography of many stream reaches creates enclosure and a park-like feel for the user, it also constricts the meander of ADA compliant trails. While no proposed trails are straight lines, a limited meander pattern is designed into many alignments. Many segments also tend to be uphill or downhill because many valleys in West Lenexa are upland tributaries that do not have broad wide floodplains like Mill Creek. Because of the steep bluffs in narrow valleys, switchbacks are sometimes applied to climb out of valleys and meet ADA requirements.





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# Methodology and Overview

## TRAIL OVERVIEW

The Alignment Analysis for Lenexa Trails focuses on recommendations to ensure the development of an integrated trail network linking the City of Lenexa along 11 stream corridors, 12 City parks, and many high quality uplands. More than 13 miles of trails are reflected in the analysis. The trail alignments are split into three groups:

### *PROPOSED TRAILS*

*1. FIELD VERIFIED FUTURE TRAILS* - These trails have been field verified by walking the alignment with a global positioning system (GPS) in the field. The GPS track was loaded into a georeferenced file within Autocad Civil 3D and overlaid with 2006 aerial imagery, 3-meter resolution DEM from USGS, 2-foot contours, city-owned property, stream buffers, wetlands, streams, roadway BMP's, future roadway alignments, all the future developments recommended in the the Planning Process section above, future parks, easements, railroads, future roads, parcels, 100-year FEMA floodplains, and rock outcroppings, as provided by the City. The field verified trail lines were carefully redrawn in Autocad ensuring all trail alignments had curve radii and grades as recommended in the American Association of State Highway and Transportation Officials (AASHTO) trail design guidelines. All proposed alignments are either within the stream buffer or on city-owned property. The Autocad layer was exported as a georeferenced .shp file and mapped in ArcGIS. These alignments are shown with a dotted red line on all maps.

*2. COMPUTER VERIFIED FUTURE TRAILS* - These trails were already given planned by the City as the base alignments from which to develop the field verified future trails layer. As an unverified future trails layer was field verified, that alignment was removed from the unverified layer and added to the field verified layer. The remaining unverified future trails were adjusted according to natural topography where possible and will either be designed as part of a future park design or a future roadway design. Additionally, these trails were aligned to meet ADA slope requirements where possible. This layer appears as a dotted pink line on all maps. This layer was edited in ArcGIS.

### *BUILT TRAILS*

This layer was provided by the City. During the project, this layer was updated to include newly constructed trails such as Black Hoof Park, Buffalo Meadows Park, Manchester Park, and Cedar Station Park, as well as several Multi-Purpose Trails along roadways. This layer appears as a dotted black line on all maps. This layer was edited in ArcGIS only.

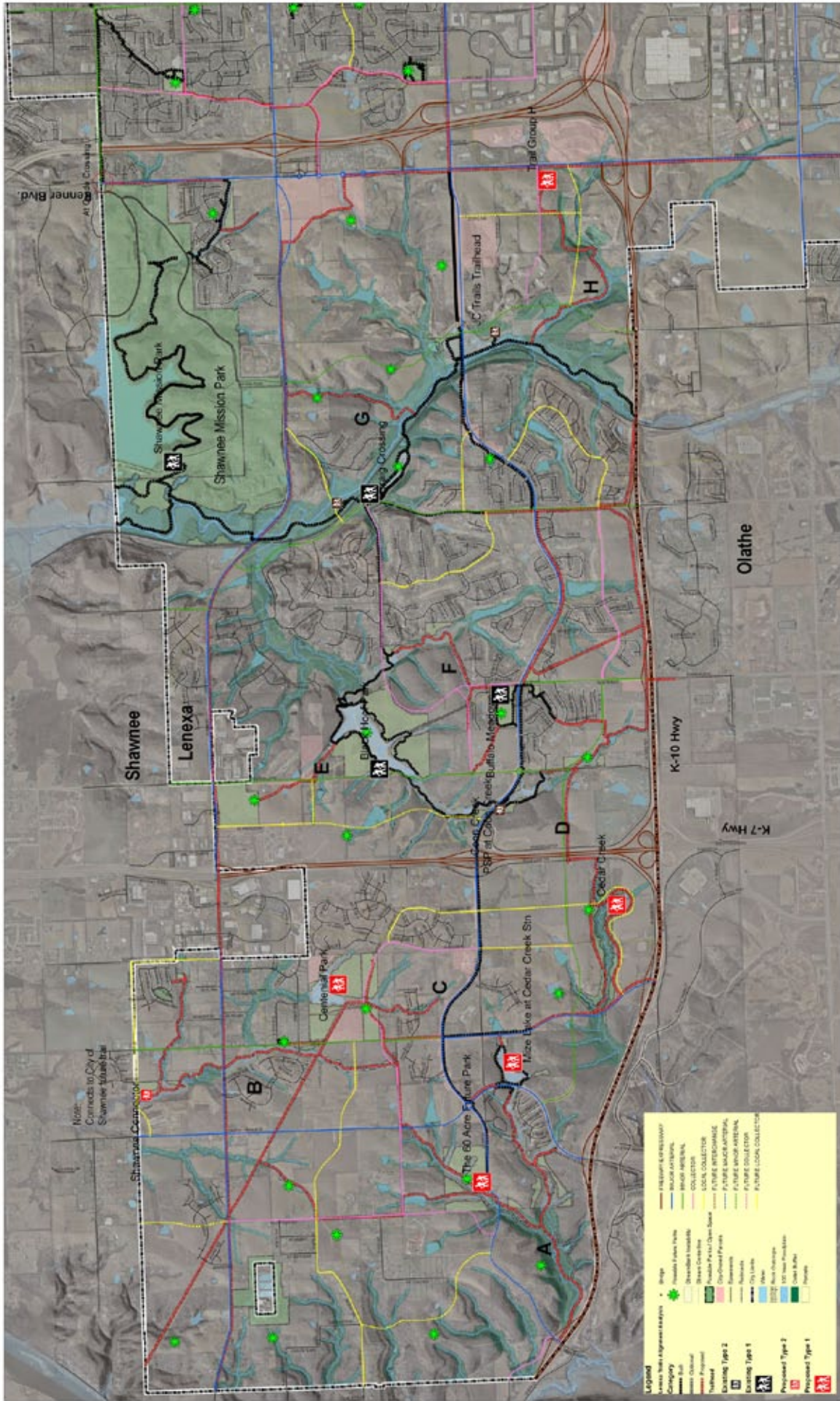
### *OPTIONAL TRAILS*

This layer includes a handful of alternative alignments and optional enhancements. The optional trails are documented here for the benefit of future planning or community design efforts. All optional trails are non-paved

## VOCABULARY

- *MULTI-USE PAVED TRAIL (MPT)*: 10 feet wide, asphalt or concrete. Refer to City of Lenexa, KS Bicycle & Pedestrian Study, May 2002.
- *MULTI-USE UNPAVED TRAIL*: 6-10 feet wide, compacted soft surface. Refer to City of Lenexa, KS Bicycle & Pedestrian Study, May 2002
- *FUTURE PARKS*: Green asterix markers referring to "Future Parks" generally refer to the City of Lenexa Parks Masterplan which is currently being updated.
- *POSSIBLE PARKS / OPEN SPACE*: These parcels are currently City-owned land or are within the stream buffer. They may or may not be developed into future parks.
- *BRIDGE SPANS*: Approximate bridge spans are included in the trail segment descriptions. The spans are approximate and are not intended for cost estimate as there were no floodplain studies or geotechnical studies included with the span estimates. They are "in the field" estimates.

# ALL ALIGNMENTS



**LENEXA TRAILS ALIGNMENT ANALYSIS**

**All Alignments**

6.26.08

1 inch equals 1,200 feet

0 700 1,400 2,800 Feet

Cartographer: PBA  
 Data Source: City of Lenexa,  
 AIMS, Johnson County, PBA,  
 USGS, MAFRC



# Recommendations

## TRAIL GROUP A

Trail Group A is located in Cedar Creek Valley, west of Canyon Creek Boulevard (Figures 1-5). The trail group loops from Mize Lake on the east through Cedar Creek stream corridor, and links into The 60 Acres at Cedar Niles and Prairie Star Parkway on the north. The trails physical setting is characterized by step valley topography, exposed limestone and shale regolith, mixed forest vegetation of upland oak-hickory complex and post agricultural grassland / cedar complex. Trail alignments A1, A2, A4, and A6 are recommended as 10-foot wide multi-use trails, and trail alignments A3 and A5 are recommended as foot traffic only multi-use unpaved trails. If all alignments are built, Trail Group A will be its own contained loop system of over 5 total miles of multi-use trails.

### ALIGNMENT A1

Alignment A1 multi-use trail begins at Mize Lake, via an at grade crosswalk, then continues down Cedar Creek Valley to the intersection of westbound K-10 Corridor Trail to Lawrence, KS along the north side of K-10. Total length of segment is 1.5 miles and the segment includes 9 bridges with approximate bridge spans ranging from 23 feet to 60 feet. Field verified.

#### *SIGNIFICANCE*

Alignment A1 serves as the main alignment of trail group A and is the longest alignment in the group. The trail trends downhill from east to west, is located entirely within the streambuffer, and is flanked on both sides by rocky forested hillsides that enclose the trail. Trail users will view native Kansas forests, grasses, and wildlife along the lower reaches of the alignment. At the time of trail development attention should be given to replanting native forest vegetation at the upper reaches of the alignment where the trail meets Canyon Creek Boulevard.

### ALIGNMENT A2

From the trailhead within Cedar Creek Park South and Prairie Star Parkway the trail follows along the eastern river bluff with distant views down the valley, then drops down into Cedar Creek Valley to join alignment A1. Total length of segment is 0.5 miles and includes 3 bridges with estimated spans ranging from 41-feet to 47-feet. Field verified.

#### *SIGNIFICANCE*

Alignment A2 serves as the Future 60 Acre Park connector, linking into alignment A1. When the Future 60 Acre Park is designed and the trail is extended northwards to future 91st Street, A2 will become the longest alignment in the group at over 2 miles of continuous downhill trending multi-use trail within wooded riparian valley. The opportunity to have a continuous 2 mile downhill or uphill trail is a great resource for recreation cyclists both from a fitness and entertainment standpoint. No other multi-use trail in Lenexa offers a sinuous and continuous 2 mile downhill or uphill experience for cyclists within a loop system at grades that conform to ADA slope



Image from bridge at Mize Rd. start of trail, looking west



Alignment A1 on an existing two-track road

standards. The alignment winds through lowland and upland forests and glades, and along gently flowing streams with rocky pool and riffle sequences.

### ALIGNMENT A3

This is a short segment diverging off of A1 that climbs up the southern side of Cedar Creek Valley along an existing gravel 2-track road, then descends down to merge back to A1. This section is an optional enhancement to the main trail and must be maintained as a foot-traffic only gravel or double track dirt trail due to the sensitive nature of the native understory vegetation. It is recommended that the trail be considered a multi-use unpaved trail. Interpretive signage is recommended for this section of trail to keep mountain bikers and horseback riders from damaging the trail, as this is part of a remnant glade identified by the Kansas Biological Survey with threatened and endangered species. Total length of segment is 1000-feet with no bridges. Field verified.



#### *SIGNIFICANCE*

Alignment A3 maximizes existing parkland within trail group A by utilizing an existing farm road. Often times, short diversions from the main paved multi-use trail offer frequent trail users needed variation and the chance to experience the valley from a new perspective. The high quality vegetation and historic nature of the old farm road also offers the user the chance to focus in on the vegetation and feel like they have a special place in the public park. This trail segment rises out of the floodplain and offers the user long views down the valley.

### ALIGNMENT A4

Alignment A4 multi-use trail links to the entrance of future development just off of Canyon Creek Boulevard. The trail passes a series of stormwater check dams then heads north to link into Alignment A1. There are no bridges on this alignment. Total length of segment is 1111 feet. Field verified.

#### *SIGNIFICANCE*

This trail serves to connect to future development. As development plans are received, this access should be discussed.





## ALIGNMENT A5

Alignment A5 is an optional trail that follows an existing farm road up a switchback on a steep wooded cliff to connect users to a small stormwater detention pond and two small, rocky tributaries, then descends back to alignment A1. This alignment has sensitive vegetation similar to alignment A3 and is recommended as a multi-use unpaved trail only. The segment is a windy 0.5 mile segment and has two small water crossings that may be either simple footbridges or low water crossings, similar to alignment A3. Interpretive signage is recommended for this section of trail to keep mountain bikers and equestrians from damaging the trail. Field Verified - Optional.

### *SIGNIFICANCE*

Alignment A5 was included to offer variation for frequent users and to connect them to the upland vegetation. The two small stream crossings would be excellent Eagle Scout projects.



## ALIGNMENT A6

Alignment A6 is a multi-use trail that follows on the south side of Prairie Star Parkway from Canyon Creek Boulevard to 60 acre future park. Much of this trail has been built. Total length of trail is 1500 feet and there are no bridges. Field verified.

### *SIGNIFICANCE*

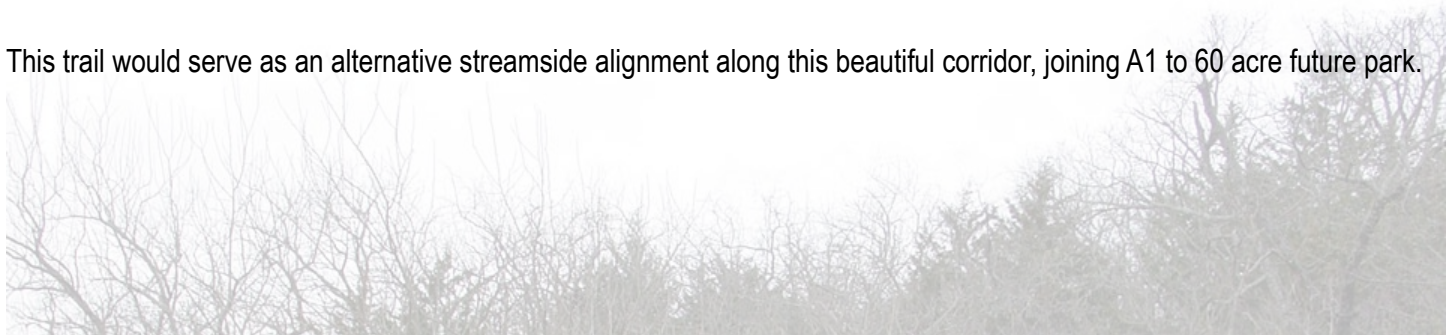
This trail serves to complete a loop of Trail Group A, joining A1 to A2 making a 5 plus mile circuit.

## ALIGNMENT A7

Alignment A7 is an Optional Enhancement Trail. Alignment A2 is the recommended alignment along this corridor because bridges will not be necessary and it will offer superior views to the southwest for trail users. However, if problems arise due to future roadway alignments or future development plans, the alternate alignment A7 is provided. Total segment length is 2010 feet with 3 bridges. Field verified - Optional.

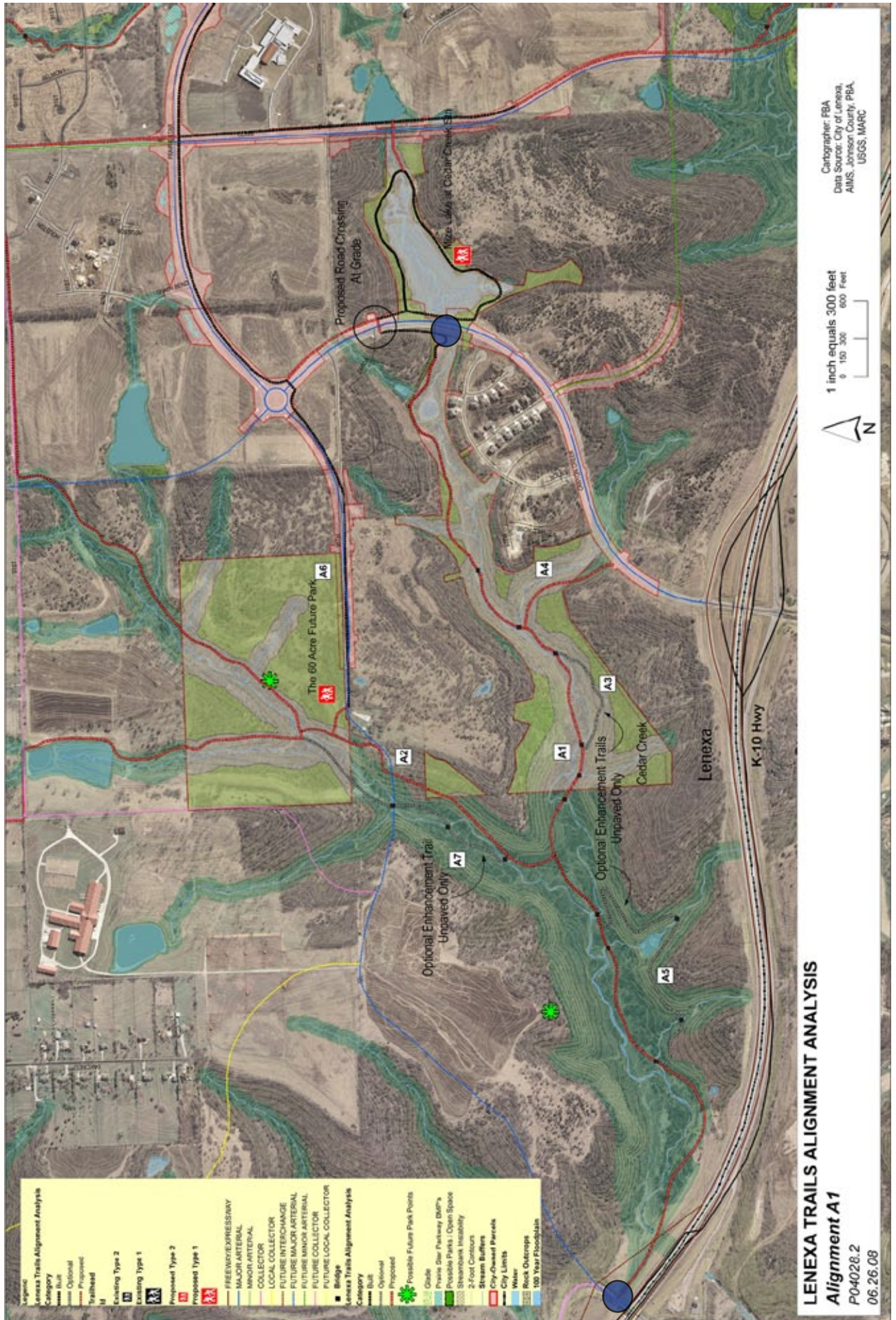
### *SIGNIFICANCE*

This trail would serve as an alternative streamside alignment along this beautiful corridor, joining A1 to 60 acre future park.



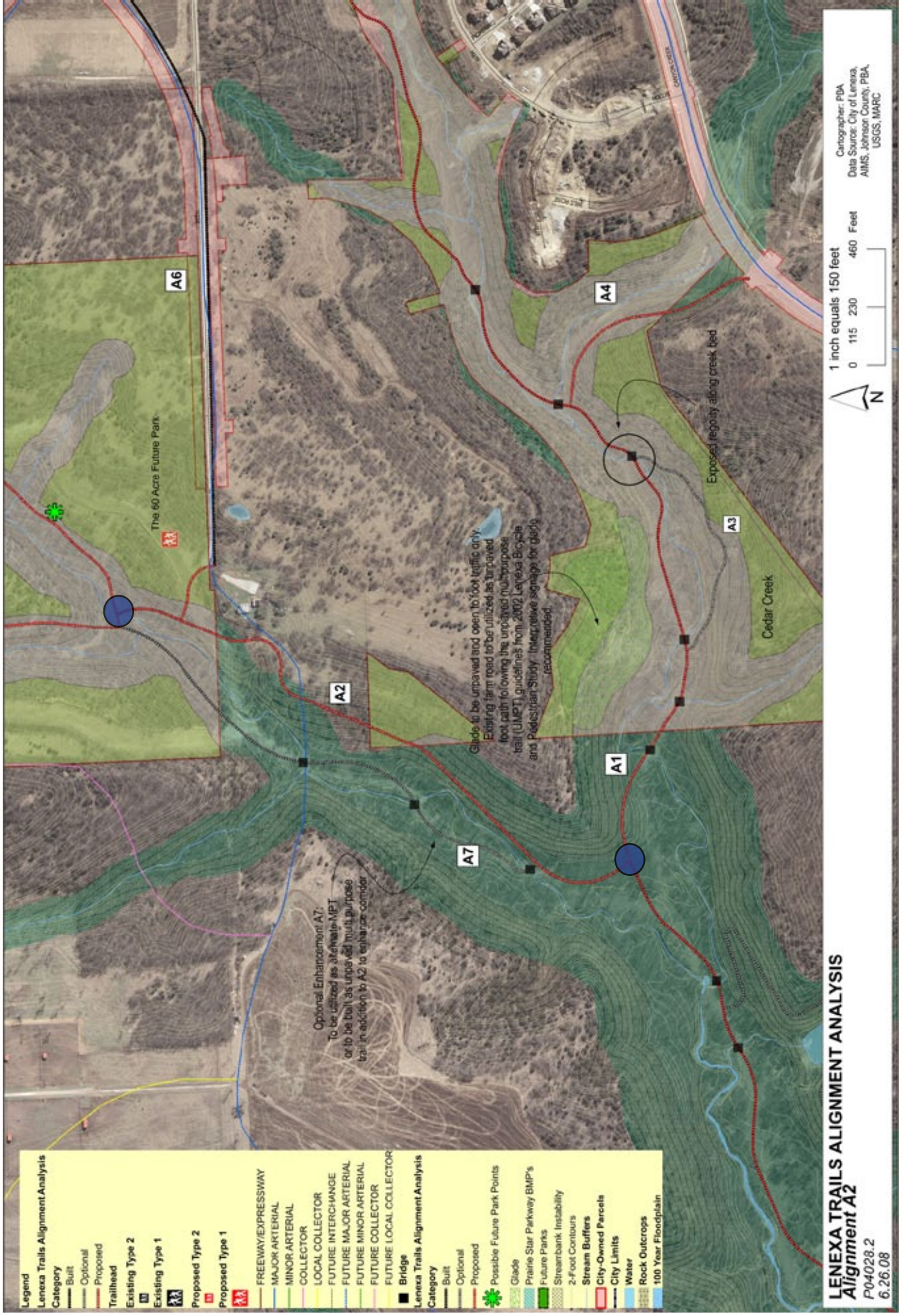


# ALIGNMENT A1



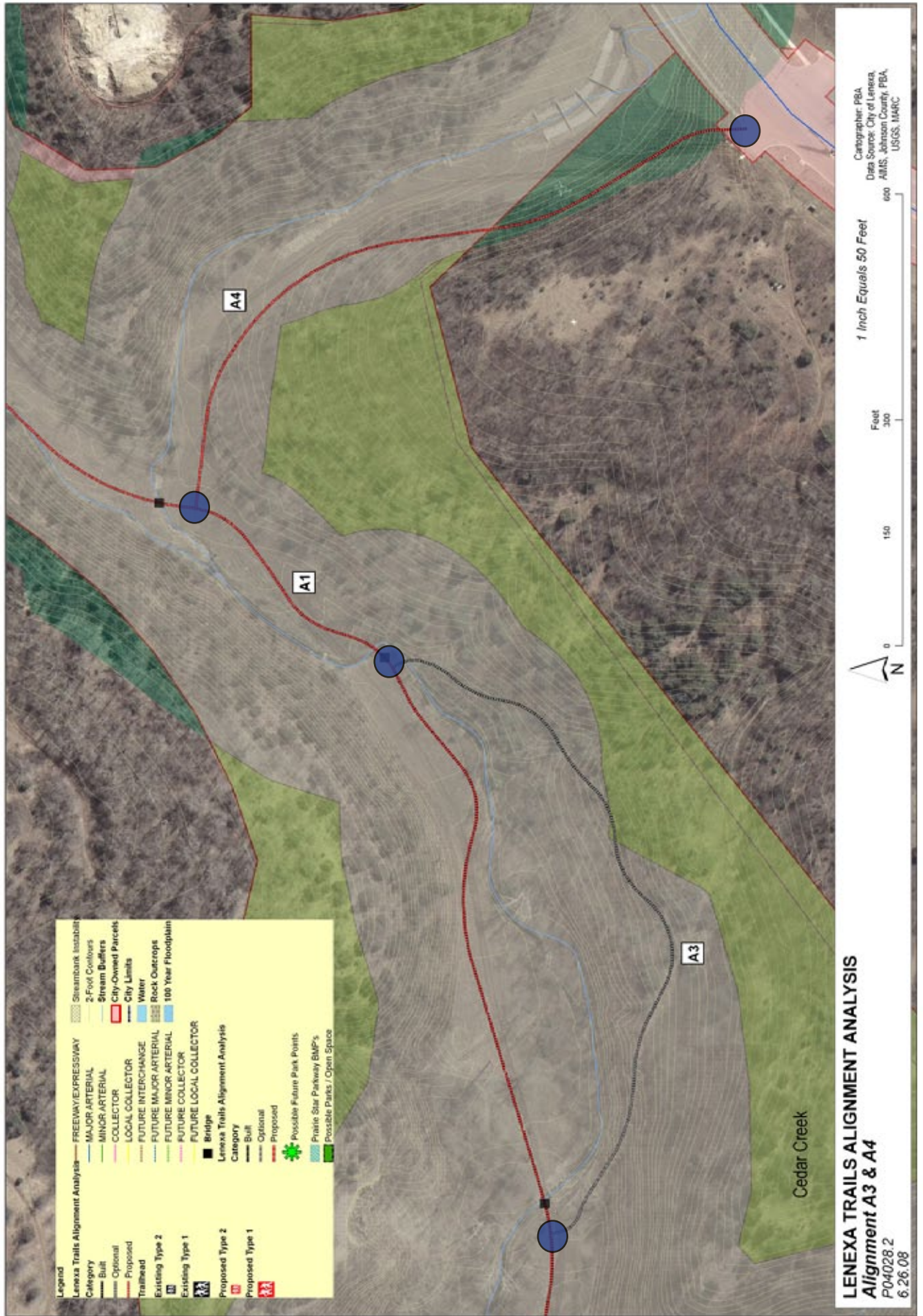


# ALIGNMENT A2



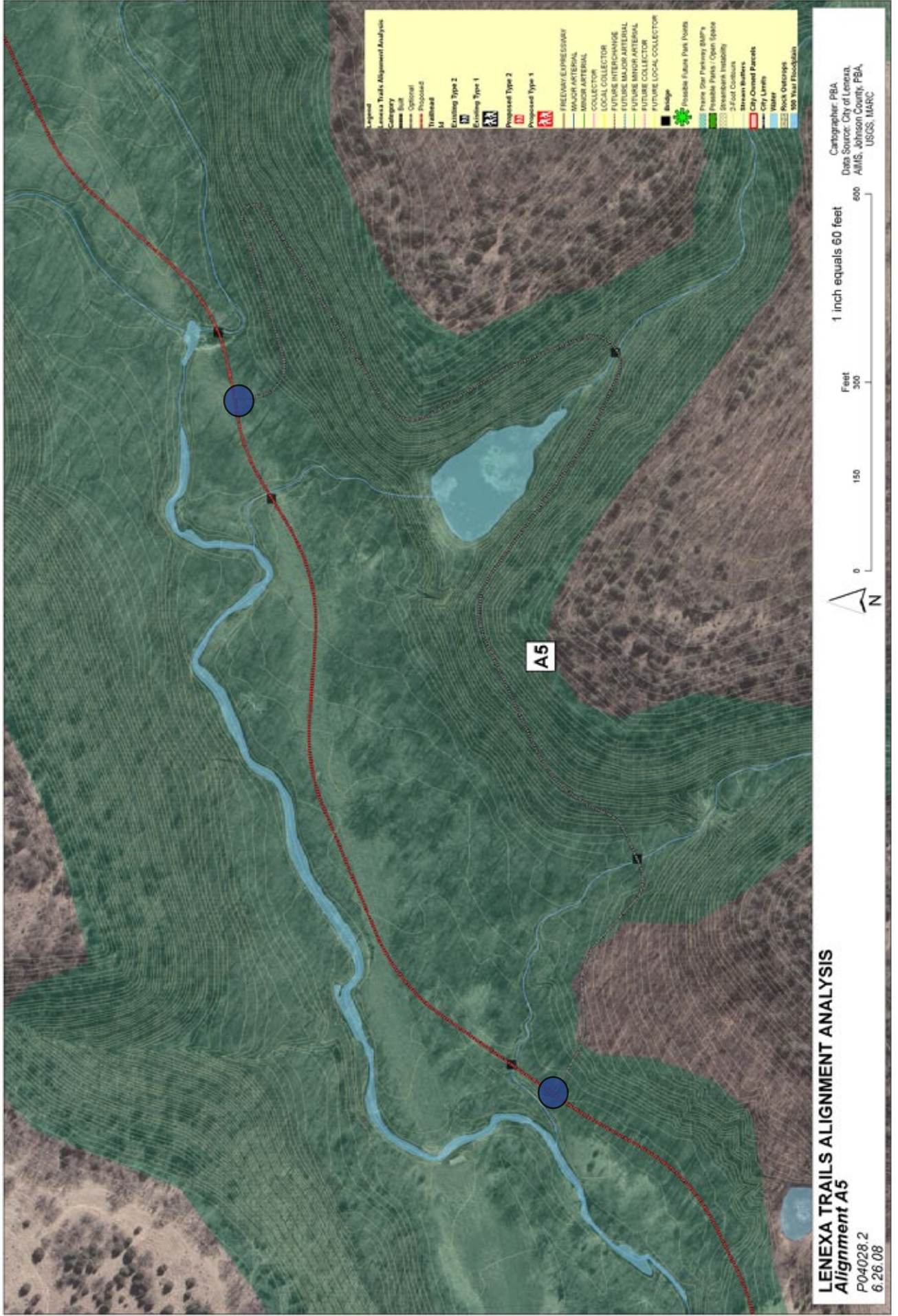


# ALIGNMENT A3 AND A4



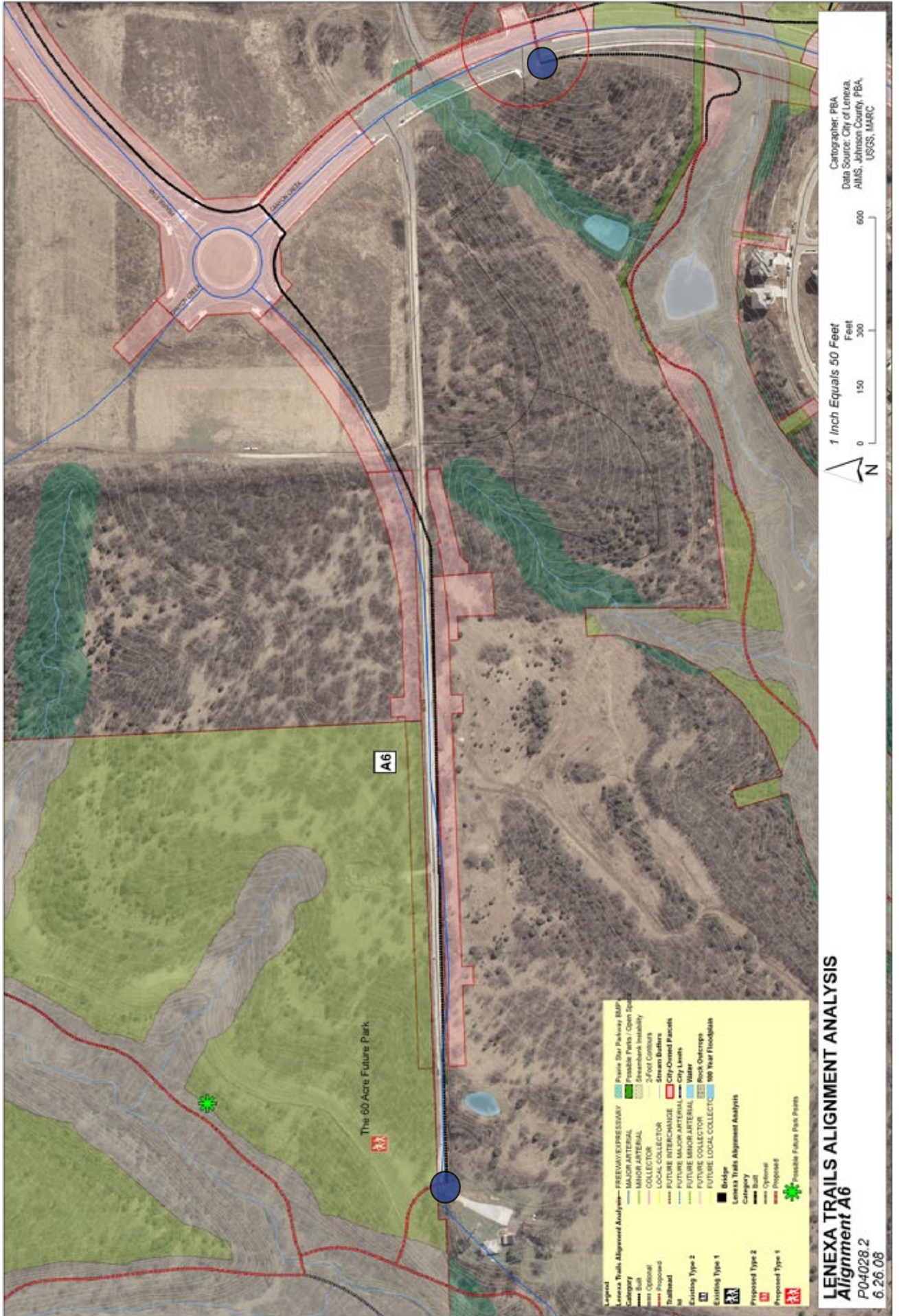


# ALIGNMENT A5





# ALIGNMENT A6



# Trail Group B

Trail Group B links Shawnee and Lenexa trail systems near 79th and Green along a second order stream. The land adjacent to the proposed alignments includes existing and future schools and residential land uses. When fully developed the trail system will provide a link to the Junior and Senior High Schools. The land in this trail group is characterized by gently rolling streamside topography adjacent to mature and immature lowland hardwood forest.

## ALIGNMENT B 1

Alignment B1 multi-use trail links to Shawnee on the east side of the stream at the Shawnee Connector Trailhead at 79th and Green then runs southward along the east side of the stream, crossing 83rd Street, 86th Street, under a powerline easement, and ends at 91st Street west of Clare Road. In the segment from 79th to 83rd Street there is a stream bank that needs stabilization and is noted as such on Map B1. Several housing developments are connected with B1, as well as Wild Bill Hickock Park and Centennial Park. A bridge and future trail are recommended as indicated on Map B1 to connect a future school to the trail. There are 4 bridges recommended in the alignment ranging from 20 feet to 76 feet. The total length of the alignment is 1.7 miles. Field verified.

### *SIGNIFICANCE*

This is the main alignment in Trail Group B. It serves to link the upper reaches of future trail north of the 60 Acre Future Park, which connect to Trail Group A, to the City of Shawnee. A short segment of multi-use trail along the future 91st Street roadway from Clare Rd. to Canyon Creek Boulevard will be needed to link trail groups A and B after the park and trail design of The 60 Acre Future Park is completed. Some stream bank re-vegetation is recommended along alignment A1 from 91st to 86th Street.

## ALIGNMENT B 2

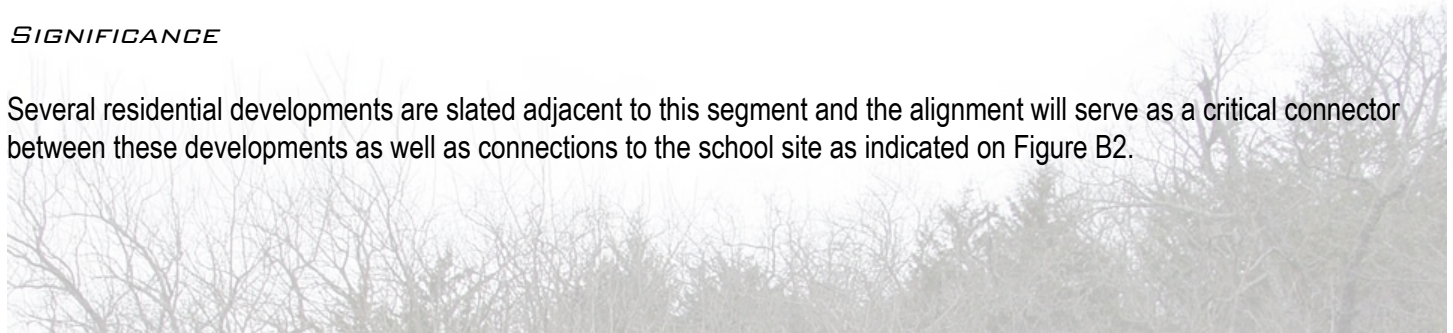
Alignment B2 is a short multi-use trail connector located within a powerline easement. This segment connects alignment B1 to Centennial Park. There are no bridges along this 417 foot segment. Field verified.

## ALIGNMENT B 3

Alignment B3 is an east west connector that serves to connect Alignment B1 to a future park at 81st and Gleason. The alignment follows within the stream buffer of the small first order stream and has no bridges. Total length of the alignment is 0.9 miles. East of the future park site in Shawnee, the stormwater from a large light industrial development is entering the stream, causing downcutting of the narrow channel. The consultant team recommends working with the City of Shawnee to stabilize this pipe outlet to stop downcutting and avoid the stream from becoming entrenched and losing contact with the floodplain. Field verified.

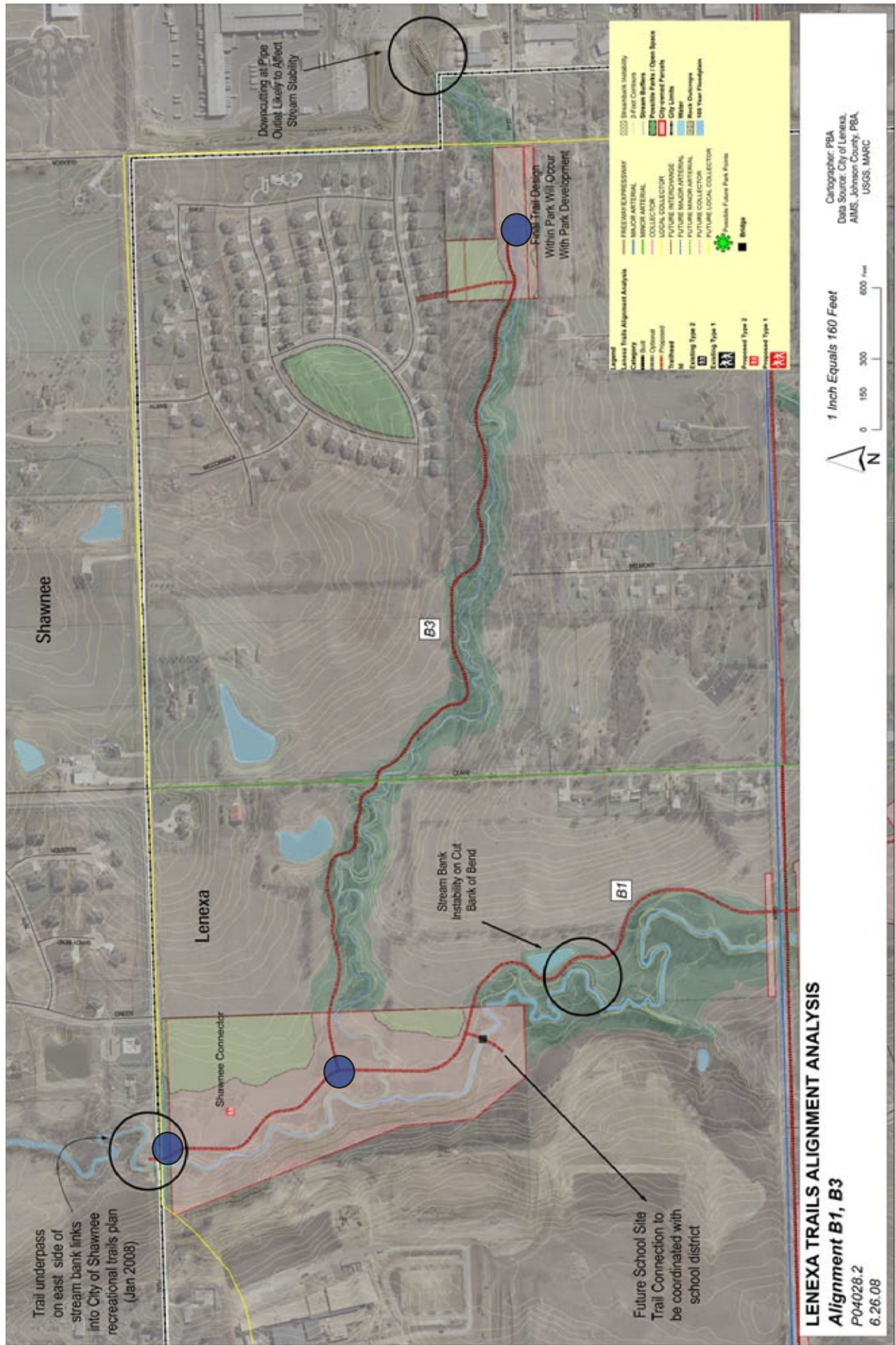
### *SIGNIFICANCE*

Several residential developments are slated adjacent to this segment and the alignment will serve as a critical connector between these developments as well as connections to the school site as indicated on Figure B2.



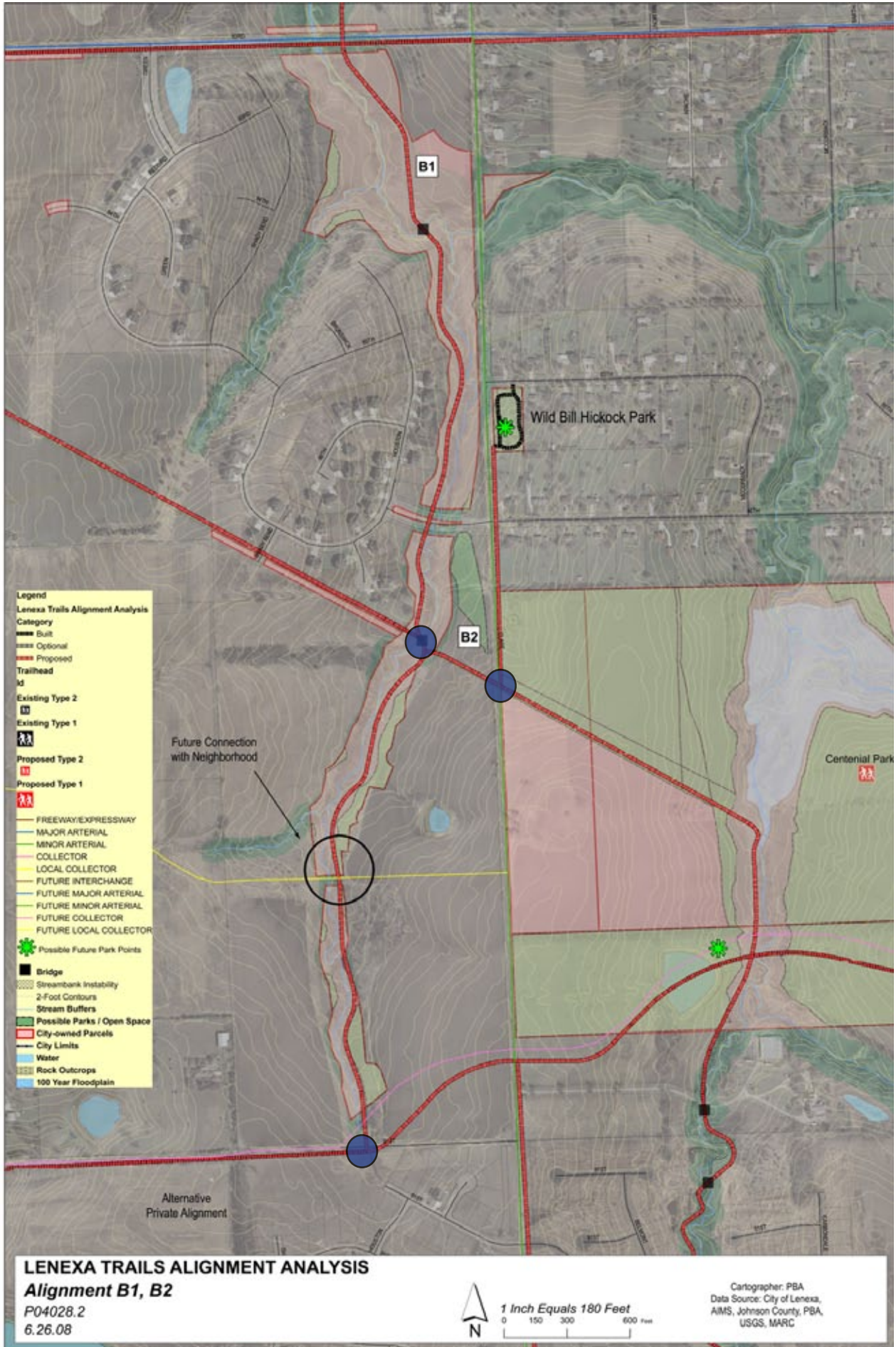


# ALIGNMENT B1, B3





ALIGNMENT B1, B2





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# Trail Group C

Trail Group C links Centennial Park to Prairie Star Parkway, crossing 92nd Street at its midpoint. Trail Group C is characterized by flat streamside topography with post-agricultural mixed hardwood / cedar complex and wet grasses on hydric soils. Several easement spurs connect adjacent Creekside Woods Subdivision. Two optional alignments connect a new school south of Prairie Star Parkway, and Firestation #3.

## ALIGNMENT C1

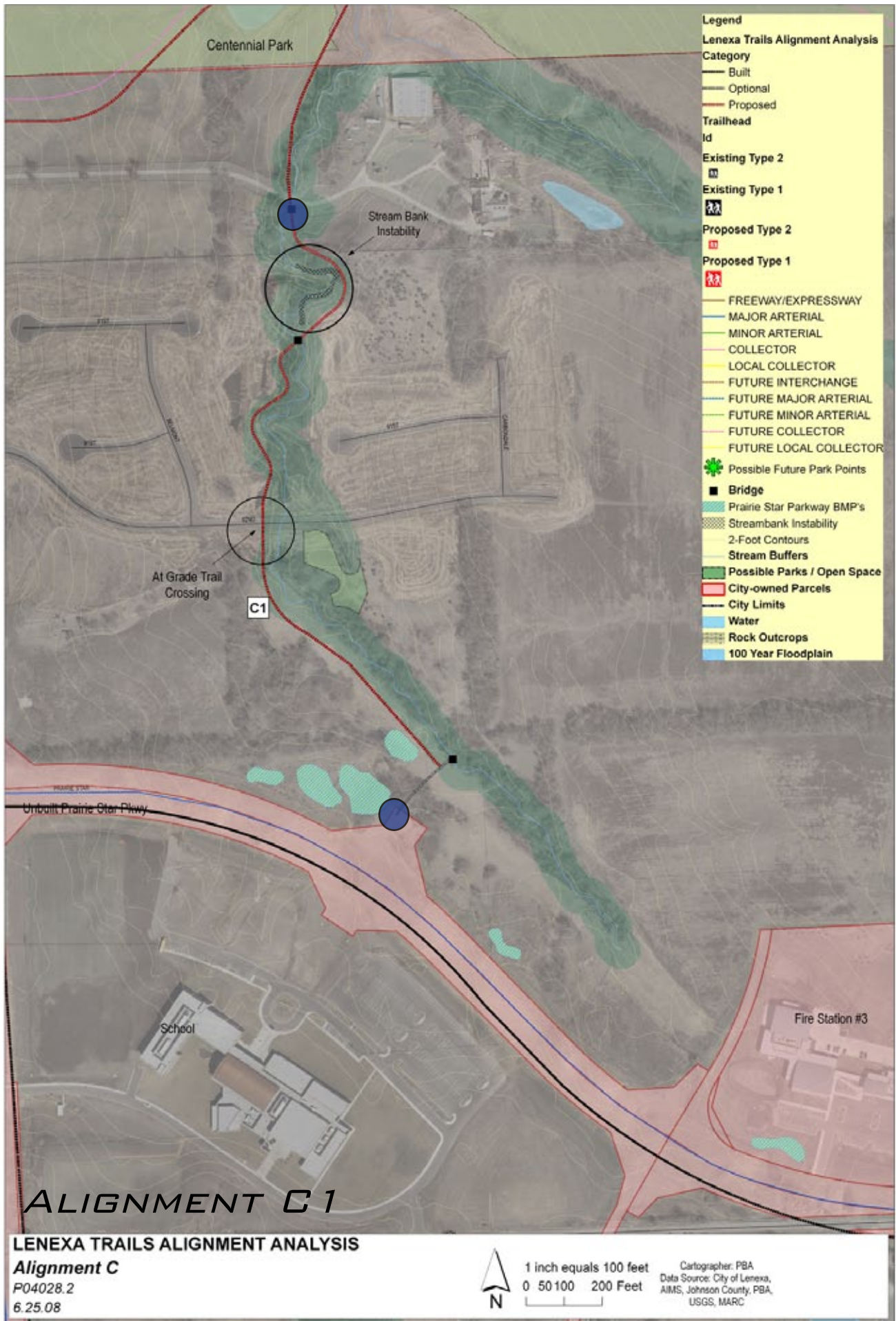
Alignment C1 is the primary multi-use trail alignment of this group, connecting Centennial Park on the north to Prairie Star Parkway through private agricultural property north of 92nd at Belmont. Total length of the alignment is 0.6 miles. There is one bridge with approximately a 30 foot span as indicated on Figure C. The trail continues south of 92nd Street on the west side of the stream to connect to Prairie Star Parkway. Field verified.

## SIGNIFICANCE

North of Creekside Woods development the consultant team identified a large area of stream bank instability, as indicated on Figure C which may need to be addressed by the City at the time of trail development. There is an optional alignment shown connecting the end of C1 to a future round-about where a retail center will be located. Also, a 50' span bridge is recommended at this connecting to facilitate pedestrian movement into and out of the future retail from future subdivisions that are planned on the northeast side of the stream, south of 92nd Street.







# Trail Group D

Trail Group D connects Clare Road to Monticello Road through the Clear Creek corridor. All trails are multi-use trails and alignments D2 and D3 are adjacent to roadways. The trail alignments in Clear Creek valley within the buffer are characterized by flat streamside topography with post-agricultural mixed hardwood / cedar complex and wet grasses on hydric soils. All other trails are either adjacent to new roadways or are in recently developed areas.

## ALIGNMENT D1

Alignment D1 multi-use trail runs from the intersection of future Clare road south of future Pickering St. eastward and uphill along Clear Creek streamside within the buffer zone and future parkland to intersect with Hedge Lane. An optional alignment is indicated on Figure D1 where a future loop within Clear Creek Valley may be developed as a corporate or office complex loop for employees. There is one bridge with an approximate 30 foot span on the alignment. Total alignment length is 1 mile. Field verified from Clear Creek Study (PBA and City of Lenexa).

### *SIGNIFICANCE*

Alignment D1 and the possible office / corporate loop are intended to contain the streamside vegetation and preserve a patch of remnant prairie that exists on the north side of the stream. Future development should be set back from the outer stream buffer and native grasses should be planted to help reduce velocity and contamination that will enter the Clear Creek from large parking lots typically associated with office or corporate developments.

## ALIGNMENT D2

Alignment D2 multi-use trail runs from the intersection of D1 and Hedge Lane northward along the west side of Hedge Lane to 99th Street where the alignment turns east and follows over a future K-7 overpass. The total length is 900 feet and there are no bridges on the alignment. Computer verified.

## ALIGNMENT D3

Alignment D3 multi-use trail runs from the K-7 overpass eastward over an open post-agricultural upland and down the valley to a proposed future park at Monticello and Pickering St. where the trail turns southward and uphill to end at 102nd terrace east of Monticello. Total trail length is 1.1 miles. There would need to be one bridge estimated at 30 feet in span. Field verified.

### *SIGNIFICANCE*

Special consideration should be given to the dedicated bicycle / pedestrian conduit afforded by this bridge when built. At Monticello road south of 99th Street, a future park should take the multi-use trail alignment into consideration at the time of park design. The southern end of this alignment is also an important connector for the K-10 trail which runs east-west on the north side of K-10 across Lenexa.





#### ALIGNMENT D4

Alignment D4 multi-use trail runs northward from alignment D3 to link Manchester park and an elementary school with this trail group. Field verified.

Total alignment length is 0.4 miles. No bridges are required for this alignment, but the alignment does cross 101st Street one time between D3 and Manchester Park. An at grade street crossing will be required, specific design to be addressed with trail design.

#### ALIGNMENT D5

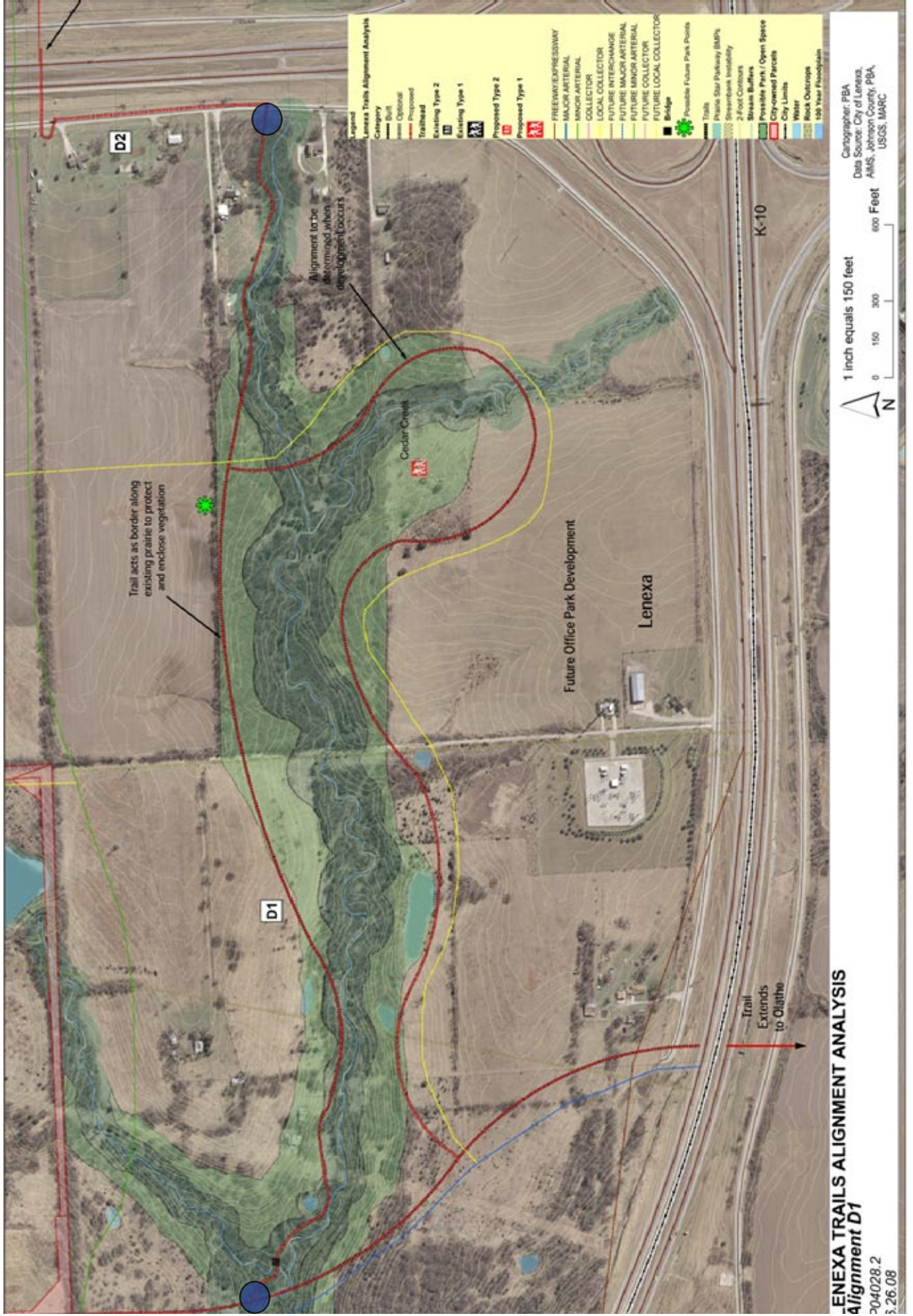
Alignment D5 multi-use trail is an optional alignment through Brampton West subdivision easement that will be determined upon development of the subdivision. This trail serves to connect Monticello road to Buffalo Meadows Park and utilizes a necessary power easement as planned greenspace for adjacent residents. Total alignment length is 500 feet and no bridges are required. Field Verified.

#### ALIGNMENT D6

Alignment D6 runs along the west side of Monticello Road, connecting the K-7 Overpass to Black Hoof Park. The west side of Monticello is the preferred alignment due to safety issues, although final determination will be made prior to constructon. Computer verified.

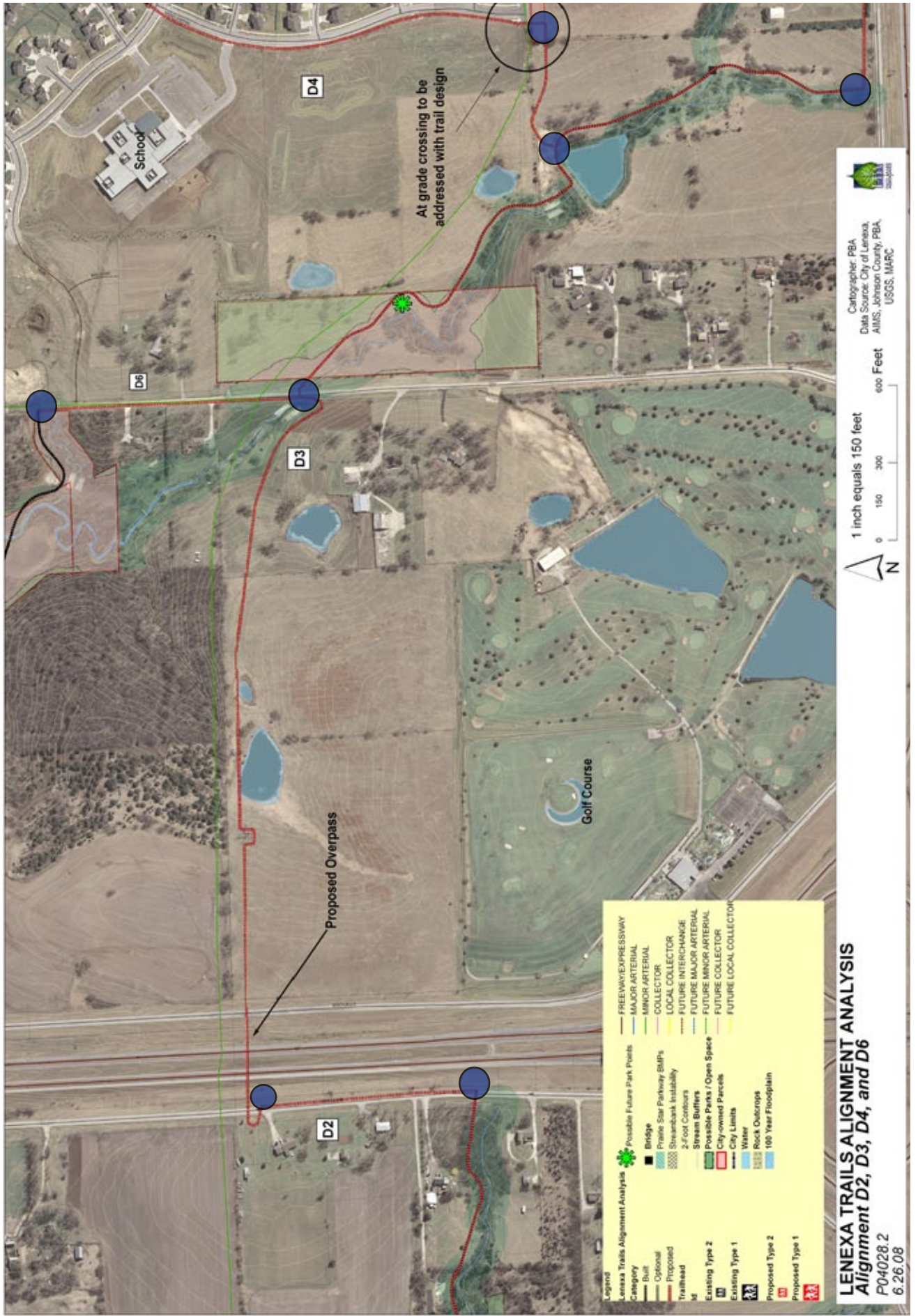


# ALIGNMENT D1



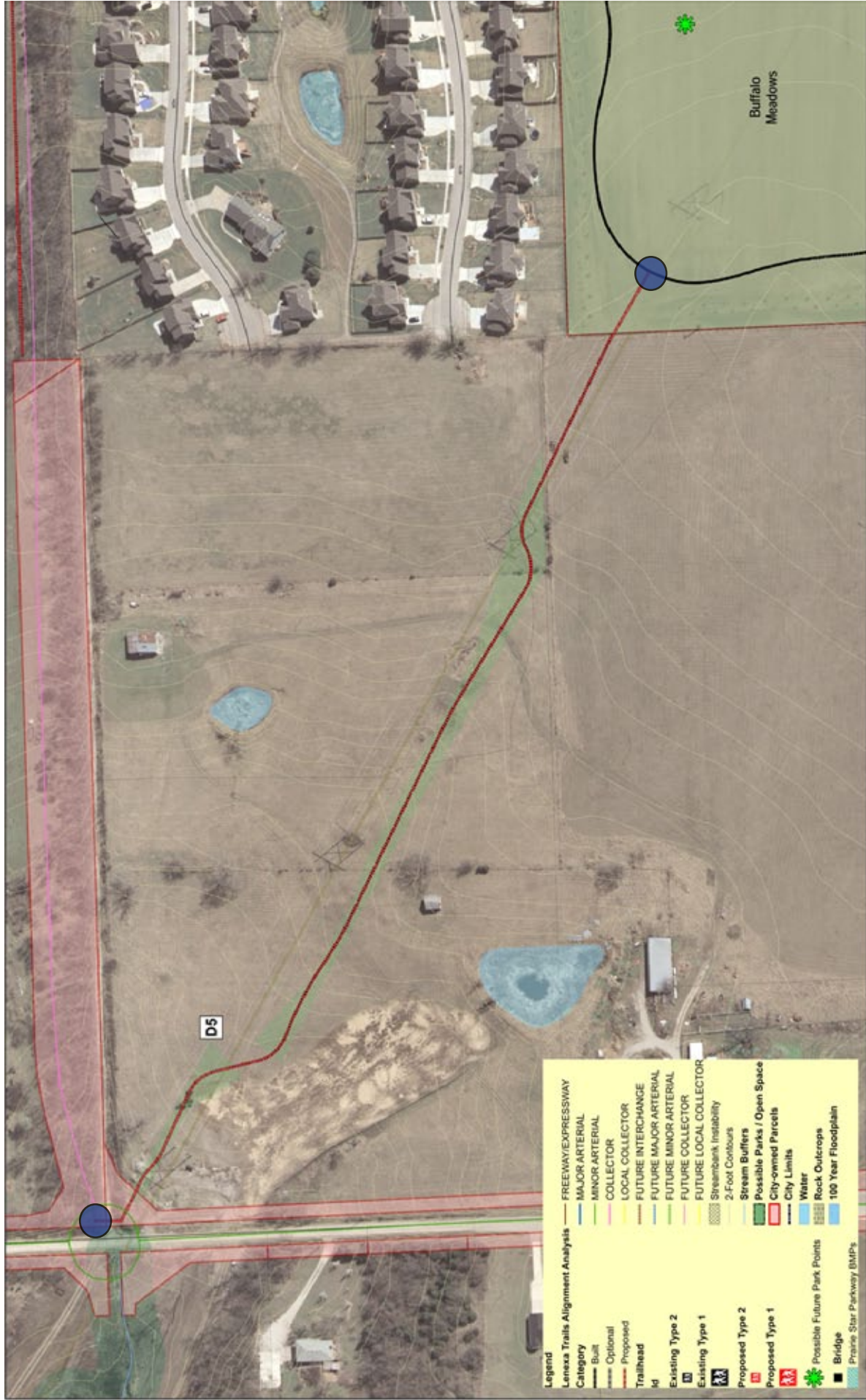


# ALIGNMENT D2, D3, D4, AND D6





# ALIGNMENT D5



Legend	
<b>Lenexa Trails Alignment Analysis</b>	<b>Legend</b>
Category	<ul style="list-style-type: none"> <li>— FREEWAY/EXPRESSWAY</li> <li>— MAJOR ARTERIAL</li> <li>— MINOR ARTERIAL</li> <li>— COLLECTOR</li> <li>— LOCAL COLLECTOR</li> <li>— FUTURE INTERCHANGE</li> <li>— FUTURE MAJOR ARTERIAL</li> <li>— FUTURE MINOR ARTERIAL</li> <li>— FUTURE COLLECTOR</li> <li>— FUTURE LOCAL COLLECTOR</li> </ul>
<ul style="list-style-type: none"> <li>— Built</li> <li>— Optional</li> <li>— Proposed</li> </ul>	<ul style="list-style-type: none"> <li>▭ Streambank Instability</li> <li>▭ 2-Foot Contours</li> <li>▭ Stream Buffers</li> <li>▭ Possible Parks / Open Space</li> <li>▭ City-owned Parcels</li> <li>▭ City Limits</li> <li>▭ Water</li> <li>▭ Rock Outcrops</li> <li>▭ 100 Year Floodplain</li> </ul>
<ul style="list-style-type: none"> <li>▭ Id</li> <li>▭ Existing Type 2</li> <li>▭ Existing Type 1</li> <li>▭ Proposed Type 2</li> <li>▭ Proposed Type 1</li> </ul>	<ul style="list-style-type: none"> <li>▭ Possible Future Park Points</li> <li>▭ Bridge</li> <li>▭ Prairie Star Parkway (BMP's)</li> </ul>

**LENEXA TRAILS ALIGNMENT ANALYSIS**  
**Alignment D5**  
 P04028.2  
 6.26.08

1 inch equals 60 feet

0 150 300 600 Feet

Cartographer: P&A  
 Data Source: City of Lenexa, AMIS, Johnson County, P&A, USGS, MWRG



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# Trail Group E

Trail Group E multi-use trail extends westward from the existing Black Hoof Park to Monticello Road. The short alignment is characterized by an open and grassy valley flanked by dense mixed un-traversable vegetation.

## ALIGNMENT E1

This is an optional trail alignment that may be coordinated with a future road to the dam. Total trail length is 800 feet. One low water crossing is required with the alignment indicated in Figure E1. Field verified.

## ALIGNMENT E2

Alignment E2 is a connector link from Monticello Road to 83rd Street. This trail follows under an overhead powerline in the powerline easement. The trail should be a paved multi-use trail. This alignment needs to be connected to the trail currently being built as part of the Service Center development on city-owned property at 83rd and Monticello. Computer verified.





# ALIGNMENT E1





# Trail Group F

Trail Group F connects Black Hoof Park to Prairie Star Parkway, closing a full trail loop around Black Hoof Park. Trail F1 follows a natural valley north out of Buffalo Meadows Park and trail F2 crosses Prairie Star Parkway to connect to a powerline easement running south. Trail F1 alignment is characterized with step valley topography, exposed limestone and shale regolith and mixed forest vegetation of upland oak-hickory complex similar to the character of Trail Group A.

## ALIGNMENT F1

Alignment F1 multi-use trail runs from Buffalo Meadows Park at West 96th Street and Lone Elm northward and downhill into a long narrow valley with a stream channel and exposed regolith on the north side and a gently sloping uphill on the south side that meets a broad steeply sloped and vegetated valley ending in a constructed wetland. The entire valley is flanked by excellent upland oak-hickory woodlands and gives the user a feeling of enclosure and escape. Three bridges ranging from an approximate 35 feet to 60 feet in length will be necessary for the alignment. Total length of the alignment is 0.9 miles. Field verified.

### *SIGNIFICANCE*

Alignment F1 is the final segment to complete a 5 plus mile loop around Black Hoof Park on the north, through Buffalo Meadows and Manchester Park on the east side, returning north through Coon Creek, then back into Black Hoof Park. All trails are sited within either stream buffer or city owned land. All alignments area designed with ADA compliant radii and slopes where possible. One segment of stream bank stabilization has been identified on F1 as indicated on Figure F1, and stream bank stabilization should be considered during final trail design.

## ALIGNMENT F2

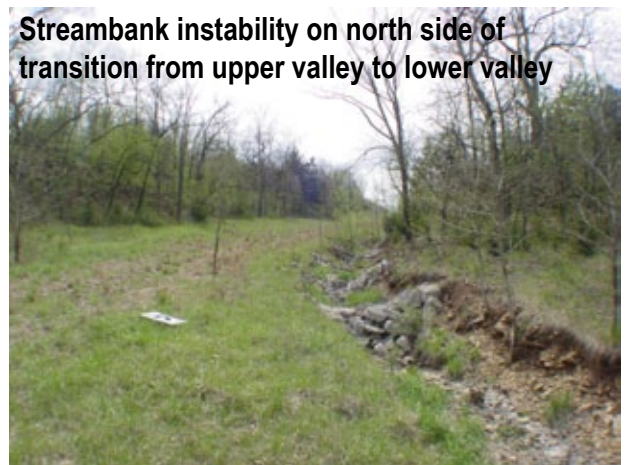
Alignment F2 multi-use trail begins at the northeast corner of Buffalo Meadows Park at W. 96th and Lone Elm following and existing trail around the park, following Praire Star Parkway on the south side, then entering a drainage easement trending uphill until the trail meets and continues south along a power line easement at a cul-de-sac on W. 98th St. No bridges are necessary for Alignment F2 and total length is 1900 feet. Field verified.

### *SIGNIFICANCE*

This segment connects Manchester Park to Buffalo Meadows Park, which in turn connects to Clear Creek Valley. Additionally, the powerline easement at 96th Street runs southeast to the K-10 corridor providing a route to Olathe, the Mill Creek Streamway Trails, and ultimately to Lawrence through the K-10 corridor.



Typical charactar of upper valley

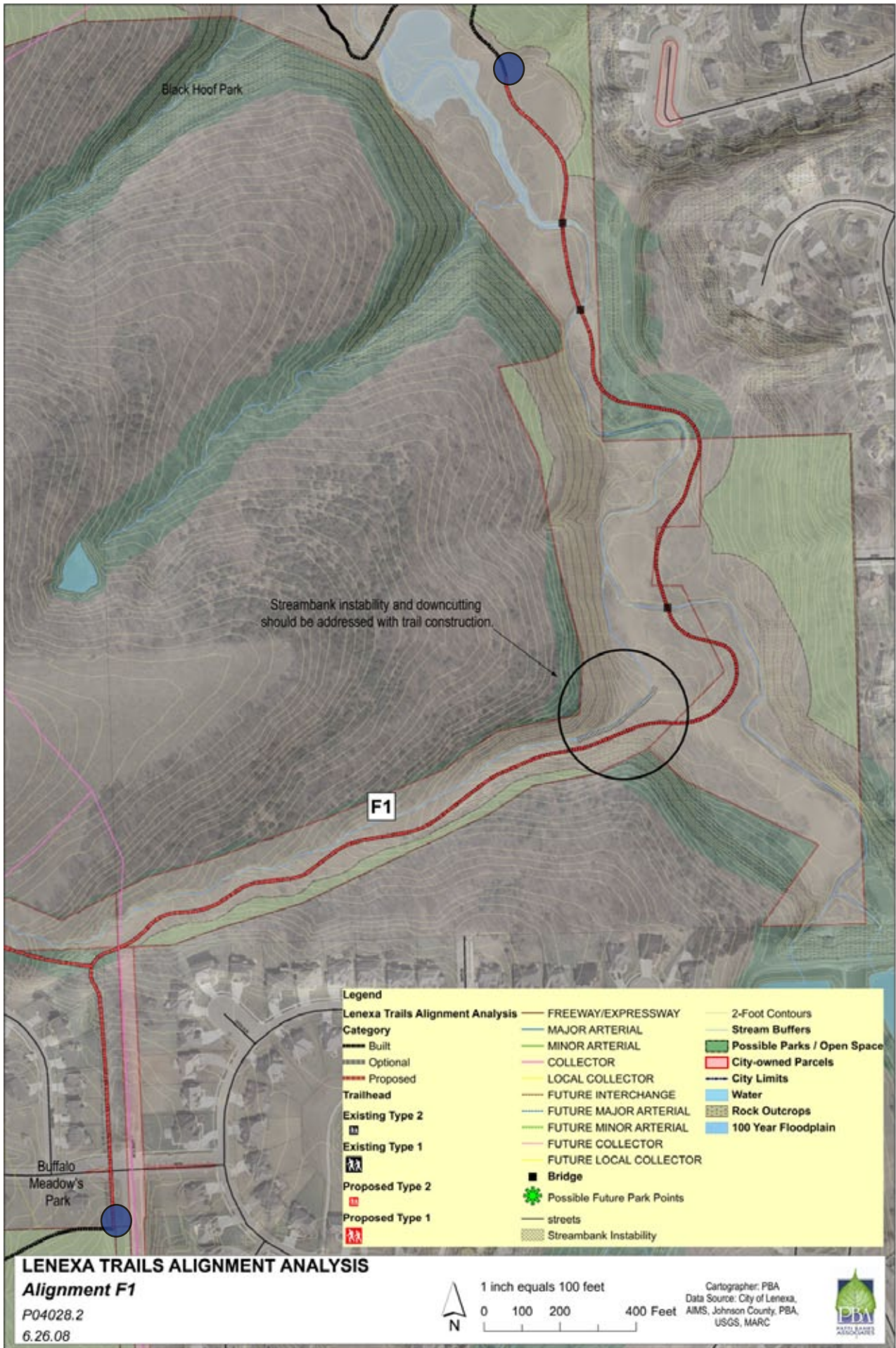


Streambank instability on north side of transition from upper valley to lower valley



Typical character of lower valley







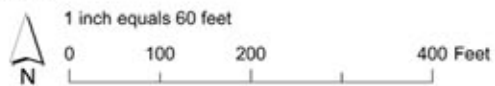


**LENEXA TRAILS ALIGNMENT ANALYSIS**

**Alignment F2**

P04028.2

06.26.08



Cartographer: PBA  
 Data Source: City of Lenexa,  
 AIMS, Johnson County, PBA,  
 USGS, MARC





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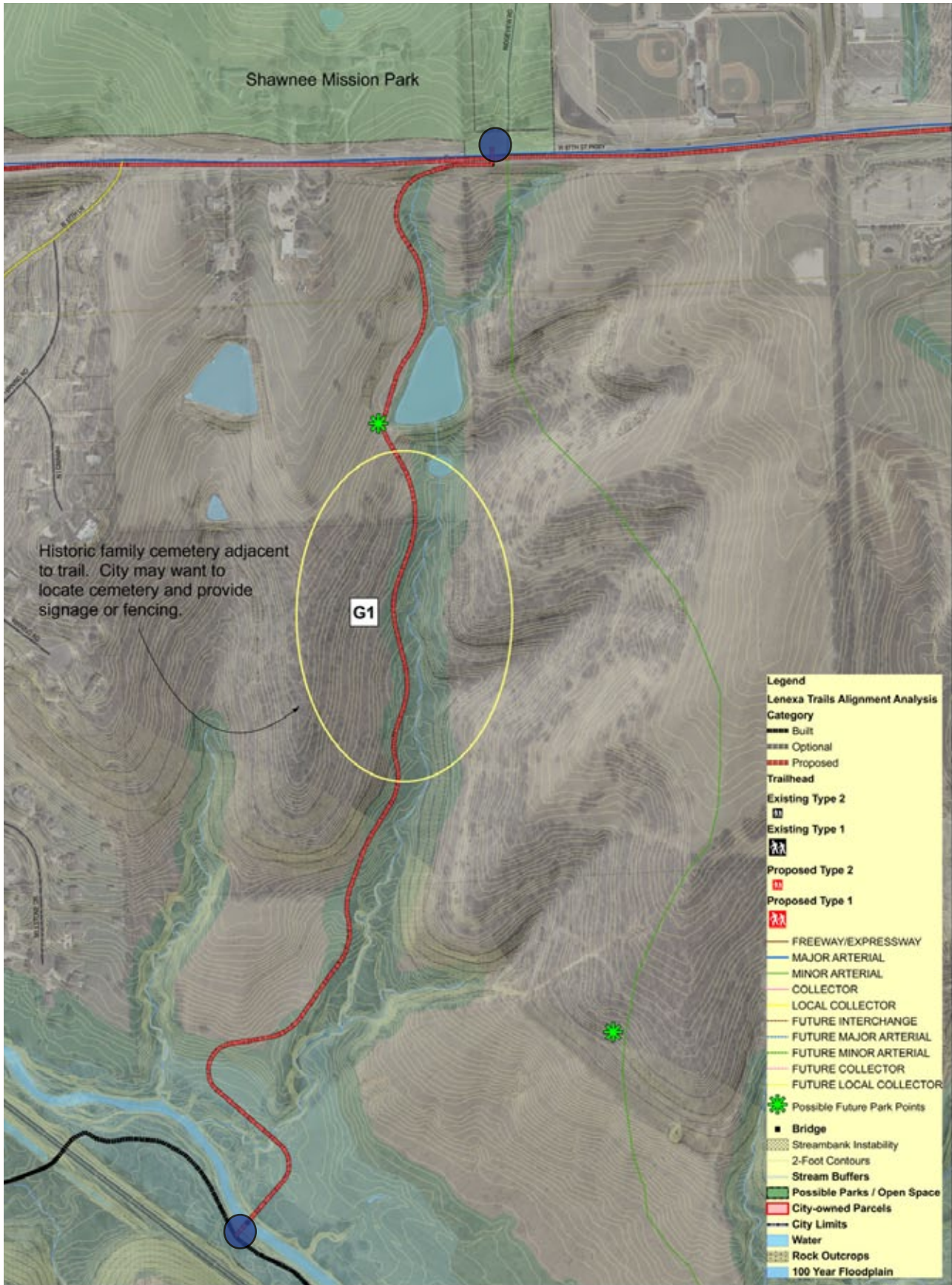
# Trail Group G

Trail Group G connects Shawnee Mission Park to the Mill Creek Streamway Trails. The alignment is characterized by gentle valley with excellent long views at the top flanked by post-agricultural mixed hardwood forest and rangeland, which terminates in bottomland floodplain at Mill Creek.

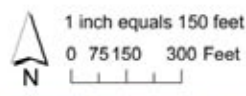
## ALIGNMENT G1

Alignment G1 multi-use trail begins south of 87th Street and Shawnee Mission Park then goes downhill on the west bank of small tributary passing a historic cemetery. The alignment crosses Mill Creek over a 120 foot span bridge to join the existing Mill Creek Streamway Trail. Total alignment length is 0.9 miles. Computer verified.





**LENEXA TRAILS ALIGNMENT ANALYSIS**  
**Alignment G**  
 P04028.2  
 6.26.08



Cartographer: PBA  
 Data Source: City of Lenexa,  
 AIMS, Johnson County, PBA,  
 USGS, MARC





# Trail Group H

Trail Group H serves to connect Renner Boulevard and K-10 to Mill Creek Streamway Trails. The alignment is characterized by an extensively mined surface landscape with very steep and winding topography with exposed regolith and high quality exposed rocky stream banks terminating at existing Mill Creek trail on bottomland floodplain along Mill Creek. A defined area of excavation impact is indicated on Figure H.

## ALIGNMENT H 1

Alignment H1 multi-use trail begins on the west side of Renner Blvd north of K-10 across Renner Blvd from a stormwater detention pond and corporate loop trail. The alignment follows a future roadway west and stays north of the extensively mined area. At midpoint of the alignment, the trail joins an old double track farm road in dense mature oak-hickory forest that emerges near a rock stream bank. The trail follows the stream west passing a very high quality bend with exposed limestone bluffs and riffles which would be an appropriate spot for a picnic shelter or passive recreation area. The trail follows west until it connects with the existing Mill Creek Streamway Trails. There are no bridges with this alignment and the total alignment length is 1.5 miles. Field verified.



Old pasture gate in upland

## *SIGNIFICANCE*

This is the most environmentally impacted trail group in the West Lenexa Trail System and careful attention will need to be paid to visual screening, trail placement and future alignment may be affected by development. Although the trail is sited in the stream buffer, the ownership of the land area around the buffer will need to be identified and it is recommended that the City work with the land owner to ensure the best possible development of the trail. In some cases this may mean petroleum mining remediation, metal reclamation or remediation or extensive plantings for visual screening. West of the mined landscape several agricultural remnants exist such as a limestone wall and old barbed wire fence with gate. These are indicated on Figure H but are outside of the stream buffer or city-owned property.

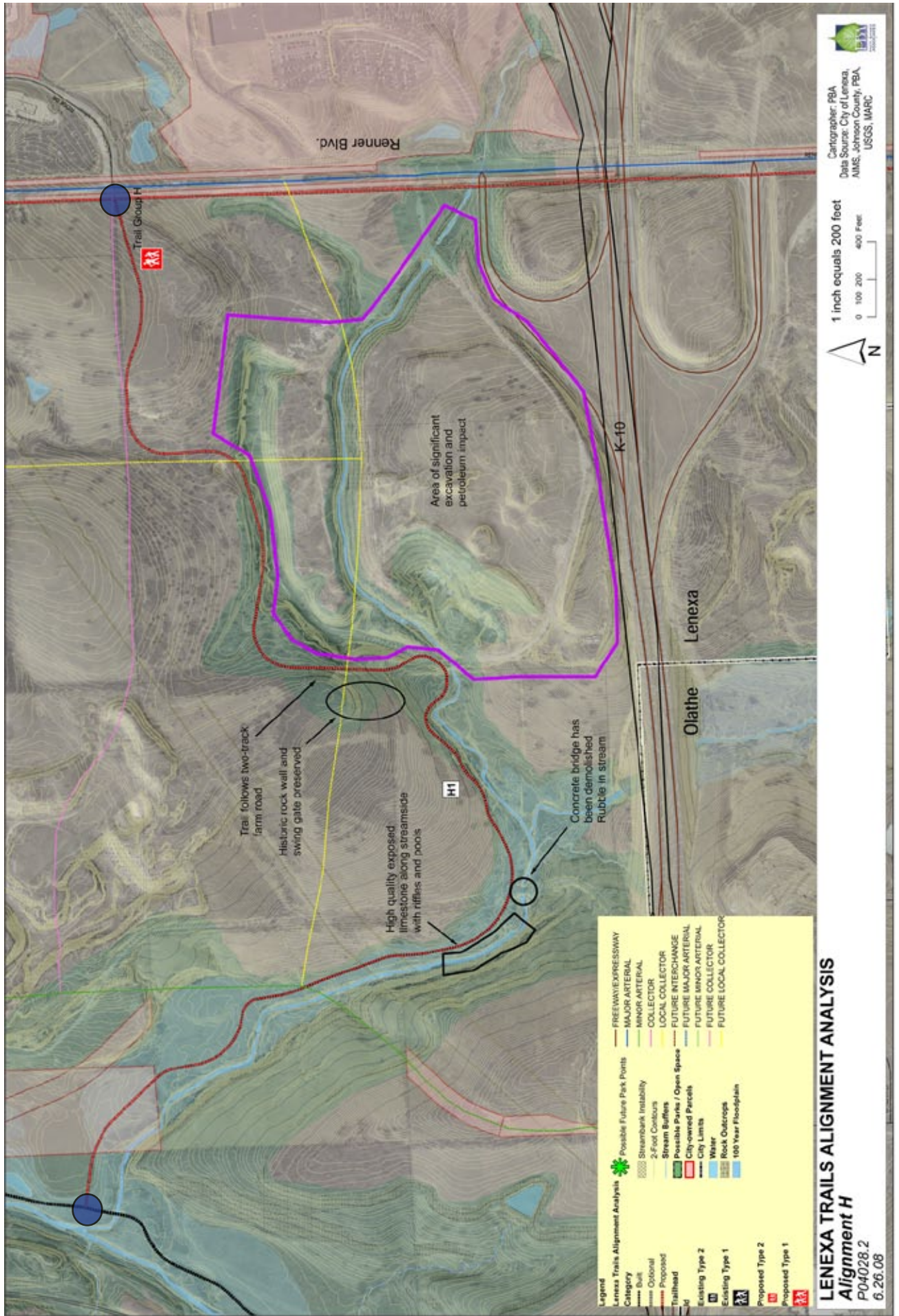
High Quality Limestone Streambank



Rock fencerow in upland



# ALIGNMENT H1





# Trailhead Types

## TYPE 1 TRAILHEADS

Type 1 trailheads are the largest trailheads defined in the Lenexa Trails Alignment Analysis. These facilities could include more than 10 parking spaces, potable water, trash receptacle, toilet and shelter. Type 1 trailheads are within park areas and serve not only trail users, but also park users by including significant parking stalls and possibly play equipment. They are both destinations and embarkation points. Type 1 trailheads may also incorporate design elements of the surrounding alignments or historic land use, such as TH2, where the historic rock wall and farm fence along the alignment are recommended as design cues for the trailhead design. The existing and proposed Type 1 trailheads are:

*BLACK HOOF PARK:* Existing

*BUFFALO MEADOWS PARK -* Existing

*CRAIG CROSSING :* Existing

*MIZE LAKE AT CEDAR CREEK STATION: PROPOSED*

*THE 60 ACRE FUTURE PARK:* Proposed multiple parking stalls, drinking fountain, several shade and seating structures, restrooms, and a play area. The layout and design of the amenities should include upland forest plants and prairie plantings to match the surrounding vegetation, and should include native limestone rock from the old rock quarry north of alignment A1 to match the character of the trail group. The design and layout of the trailhead shall be determined during design of the park.

*CENTENNIAL PARK:* Proposed multiple parking stalls, drinking fountain, several shade and seating structures, restrooms and play area. Design and layout of the trailhead to be determined during design of the park.

*K-10 CORRIDOR TRAILHEAD AT RENNER:* Proposed picnic facilities and porous pavement roads. Should match character of old farm fence and limestone rock walls found within the alignment as indicated on the Figure H

*CEDAR CREEK:* Proposed near 103rd east of Clare Road. The exact location of this trailhead shall be determined during design and development of the office/research uses proposed in this area.





## TYPE 2 TRAILHEADS

Type 2 trailheads are designed to be rests along the way within a trail system that serve users as watering holes with a drinking fountain, shade structure and bench seating. They are located in scenic areas that are conducive to having a brief rest and viewing the landscape, but are also near enough to a main road that a water line for drinking water can be added. Shade structures could include interpretive artworks that provide 2 separate seating spots with shade so that two individuals or families can have separated experiences while using the same trailhead. Restrooms are not included in Type 2 trailheads because they are located near enough to an existing trailhead with a restroom or in a trail group that already has a Type 1 trailhead proposed. Type 2 trailheads do not include impermeable parking, but may include a handful of permeable parking areas such as a small lots with pervious paving. Commercial centers can be type 2 trailheads if designed with the proper facilities and trail linkages. The existing and proposed Type 2 trailheads are:

*JOHNSON COUNTY TRAILS MILLCREEK TRAILHEAD (PSP AND MILL CREEK): Existing*

*PRAIRIE STAR PARKWAY AT GOON CREEK: Existing*

*SHAWNEE CONNECTOR : Proposed water fountain 2 shade structures with 4 pervious parking stalls*

*SHAWNEE MISSION PARK: Existing*



# Implementation with Funding and Land Acquisition

## OUTSIDE FUNDING OPPORTUNITIES

*TE FUNDS:* Submit applications to obtain Transportation Enhancement Funds (TE) for the development of bicycle & trail projects that fulfill a transportation function. The TE program is a state program that supports projects that expand travel choices and enhance the transportation experience through improvements to the cultural, aesthetic, historic and environmental aspects of the transportation network. It is a reimbursable program, not a grant. The Local Public Agency is required to provide a 20 percent match of the project cost. This proposal is already in the Bicycle and Pedestrian Study and the idea here is to determine what the criteria are for the T and E funding and which ones may be available for the City of Lenexa.

Submit applications to receive Land and Water Conservation Funds (LWCF) and Recreational Trails Program (RTP) for the development of specific recreation trail projects. Define which trails are appropriate for this funding.

*LAND AND WATER CONSERVATION FUND:* provides funds for the acquisition of parks, open space, forests, and wilderness areas. A state matching grant program is dependent upon federal appropriations. Communities must apply to the Kansas Department of Natural Resources for these funds. Possibly alignment A, D (west), and F.

*RECREATIONAL TRAILS PROGRAM:* provides funds to the states to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. These funds may be used to plan, acquire easements, construct trails, and restore and maintain trails and trail corridors. Communities must contact the Kansas Department of Natural Resources to determine available funding levels and apply for assistance.

Identify and search out grants from private charitable foundations and businesses to help fund capital improvements and/or educational programs relating to trails. Alignment D may be most appropriate for this cost sharing from private development. Parcel areas can be expanded to the stream centerline and the zoning is changed to conservation development requiring the buffer area to remain in conservation and the office development plans to include trails.

## CITY-REGULATED OPPORTUNITIES

Continued enforcement of the stream setback ordinance to preserve natural stream corridors that support trail development as surrounding land urbanizes.

Develop a “conservation” zone or easement in undeveloped areas to protect potential trail corridors from future development. Specifically, in large private land areas where natural corridors should be preserved.

Continue to incorporate on-Street bicycle improvements & multi-use trail along Streets as a routine part of scheduled roadway construction and retrofit projects.

Support and/or formulate Neighborhood Improvement Districts (NID) for open space preservation and trail development. Coordinate this with conservation easement as proposed above in the Regulatory section.

# Trail ROW

## Options

*FEE SIMPLE ACQUISITION:* Outright purchase of the full property rights at the value of the property on the open real estate market or receipt by donation of the property's full rights. This practice provides for the greatest protection and freedom of use of the acquired. It may also be expensive due to the cost of the land on the open market and the seller may want compensation for the value of their proposed development.

*DONATION:* The landowner gives their property and all associated rights, directly to the land trust and gains tax benefits depending on the market value of the land. The agency takes on all responsibilities for property liability and management.

*OPTIONS AND RIGHTS-OF-FIRST-REFUSAL:* Allows the potential buyer the right to make the first bid on a property without being obligated to purchase the land. The right-of-first-refusal is an agreement that provides that if a property owner decides to sell a specific piece of land, the agency with the right-of-first-refusal will have a certain amount of time to raise money to purchase the land before it is sold to another party.

*PURCHASE AND LEASE-BACK:* A buyer may purchase property and then lease it back to the seller with restrictions on use. This is most compatible with land which is being used as open space and is under threat of being developed.

*CONSERVATION EASEMENT:* an agreement with the landowner that restricts the usage and development of the property or a portion of it. It is a voluntary agreement between the owner of the property and the entity requesting the easement. Easements are usually donated but can occasionally be purchased if there are compelling reasons. Future buyers of the land will be bound by the easement's terms but they do not prohibit the sale, lease, mortgage, farming of or building on a property so long as the action is consistent with the terms of the easement. Landowners granting easements may be eligible for tax benefits, ranging from lowered property taxes to deductions for charitable donations.

*REMAINDER INTEREST WITH LIFE ESTATE:* The Landowner donates the property to a nonprofit or public agency and continues to live on/use the property. Upon the death of the donor or the death of specified heirs, the ownership of the property is transferred to the specified nonprofit or public agency. The act of making the donation now, to take effect after death, is called the gift of a remainder interest; the retained right of use is called a life estate. If the land is given for conservation purposes, tax deductions for the value of the land can be made at the time of 99 designation of the property as a donation to the nonprofit or public agency.

*CONTROLLED DEVELOPMENT:* An agency may purchase a large parcel of land and then sell off portions of it for development with specified limitations. This usually includes restrictions on the number of units to be developed, their siting, landscaping and the building materials used in construction. The cost of purchasing and maintaining the land is offset by the profits from selling the smaller parcels. The entire property is protected from future development by deed restrictions.

*TRAIL MAINTENANCE:* Per the City of Lenexa Comprehensive Plan, the City will maintain trails.