

Fort Tuthill County Park Bike Park Concept Plan

September 2013



Overview

The development of community bike parks has advanced rapidly in the past several years, with new facilities such as the 40-acre Valmont Bike Park in Boulder, CO, and several dozen smaller parks across North America. Bike parks are opportunities for the millions of mountain bicyclists who live in urban areas to partake in bike-optimized trails that appeal to a wide range of skills and abilities.

Fort Tuthill County Park, located three miles south of Flagstaff, AZ, has the opportunity to become the premier community bike park in Arizona. Coconino County's 413-acre flagship regional park is an outdoor destination, offering year-round recreation to approximately 150,000 individuals who live in the City of Flagstaff and Coconino County surroundings. Fort Tuthill is already developed with an archery range; campground; fairgrounds; equestrian activities; picnic tables; tennis courts; the Soldiers, Bridge, and Highlands Trails; and further access to the Flagstaff



Urban Trail System. In addition to the almost nine miles of singletrack multi-use trails, the park contains sufficient terrain and topographic relief to host a bike park that offers additional mountain biking opportunities such as a dirt jump area, pump track, flow lines, and a skills area.

At the request of the Flagstaff Biking Organization (FBO) and cycling stakeholders, staff from the Trail Solutions program of the International Mountain Bicycling Association visited the site in April 2013 to assess its potential for the development of a regionally significant mountain bike park. Trail Solutions staff spent two days meeting with FBO, stakeholders, and Coconino County staff to discuss the bike park, understand stakeholder priorities and concerns, attend a public meeting about the project, and perform the associated field work to develop this Bike Park Concept Plan.

The involvement of these stakeholders has been considerable, which bodes well for the ultimate success of the bike park. These stakeholders have supported the planning process and are likely to be present throughout the park's development.

This Bike Park Concept Plan presents a proposed path forward for the bike park's tracks and trails, describing in detail each planned area of the bike park. The park is designed to be a state-of-the-art community facility that meets a wide variety of the community's needs, providing a fun and safe place for riders of all ages and abilities to recreate, progress their skills while still be challenged, and spend time with their family and friends.



Tracks and Trails

Overview

During the April 2013 site visit to Fort Tuthill, Trail Solutions staff evaluated the property's values and suitability for a bike park. It was determined that the property is ideal for a bike park due to its downhill slope away from the identified main entrance, consistent grade, easily accessible entrance that is close to a parking lot, access on the west side to the Soldiers Trail and the stacked loop singletrack trail system in the park, well-spaced mature pine trees, little undergrowth, as well as relative proximity to other park amenities. In addition, the bike park is an easy bike ride away from downtown Flagstaff via the Sinclair Wash Trail (unpaved bike path) or the Ponderosa Trail (paved bike path), both within the Flagstaff Urban Trails system.

It is not anticipated that building this bike park will require substantial modification of the property, as the concept plan maximizes the available land and conforms to the existing terrain and its features, blending into the existing Ponderosa forest. While there is a formal entry to the park, the riders will quickly feel like they are in a forest, away from the built environment.



During the same site visit, Trail Solutions attended a public meeting where stakeholders indicated strong support for the bike park. Notably, stakeholders asked for a safe and fun place to ride bikes with a variety of mountain biking features, the top three being gravity flow trails, dirt jumps, and a skills area. These features can all be built within the existing grade without the need mass grading.

Entrance/Welcome Area/Ramada

The bike park would welcome riders and spectators through a main entrance located on the southeast side of the site. A ramada to the left of the entrance will offer shelter and a seating area, with a view of the entire bike park. The ramada will be a comfortable place for spectators to watch riders, or for parents to supervise children.

The park is designed so that the easiest features (beginner pump track, tot track, skills loops) are closest to the main entrance and the ramada, and the most difficult and challenging features (intermediate and advanced dirt jumps) are diagonal from the entrance, in the northwest corner of the site. This not only allows riders to progress through the park, starting with easy-to-access features and moving toward more challenge, but the easier trails and tracks serve as a filter that riders must accomplish prior to moving on to the next, more difficult feature. This improves risk management and provides an improved experience. The easier features are also close to the ramada and viewing areas so that those who are more likely to use them, such as children, can be easily supervised while still being allowed the freedom to engage in unstructured play time. The entrance will have clear signage and instructions for proper use and enjoyment of the park.

The bike park will be able to play host to bike-related events (e.g. cyclocross races that incorporate other features of the larger park property, or dual slalom races, strider bike races, short-track races or pump track events), with the ramada as the main staging area. The park already provides infrastructure for visitors, and the proposed layout will lend itself to local-level events and additional experiences for riders and spectators.

Pump Trails/Skills Loop

A pump track is a series of evenly-spaced small rollers and berms designed to allow the rider to coast through the course without pedaling by using weight shifts (pumping) and gravity.

There will be two main pump tracks: one for beginner skill levels and one for intermediate/advanced skill levels. The tracks will have a designed direction-of-use to allow for skills progression and fitness for riders coming from the tot track to the beginner track, or from the beginner track to the intermediate/advanced track.





The pump tracks will be located on the east side of the bike park, adjacent to the dirt jumps and the flow trails, on a relatively flatter section of the site. The pump track will be the first accessible area from the main entrance to the bike park. The pump track design will add approximately 137,500 square feet of bike-specific features to the park.

During the public meeting, many attendees expressed the desire for traditional skills features, which could be integrated into the skills loop adjacent to the pump track. The proposed skills loop will contain a combination of natural and wooden-decked features, such as rock gardens and ladder bridges, that allow a natural flow through the skills. The intention of the skills loop is to teach riders biking skills in a low-risk environment so that they will be more confident riders when out on a natural surface singletrack trail. The skills area will also be built in a way that allows for features to be modified based on changing community needs, or for additional features to be added.

Riders looking for a longer trail experience that integrates technical ability and endurance may combine the existing singletrack trails in the park with technical features from the skills loop and other bike park features. The bike park is meant to integrate with and enhance the existing facilities at Fort Tuthill.

Tot Track

The tot track is a pump track designed for smaller bicycles and users. It will feature reduced-sized rollers and swales as well as lower-angle bermed turns. It will have features that can accommodate strider-type bicycles as well as smaller-wheeled bikes with short wheelbases. The tot track is designed for the least skilled of riders.



The tot track will be located on the southeast part of the property, adjacent to the Ramada and entrance area. The tot track will add approximately 5,000 square feet of novice bicycle features to the county park. The track will be treated with a polymer to minimize maintenance.

Dirt Jump Area

The proposed dirt jump area will be designed for beginner, intermediate and advanced riders. There will be jump lines to encourage less-skilled riders to progress to the bigger jumps while the larger jumps will allow more-advanced riders to further their skills. At the end of each of the three dirt jump lines the trail will join the perimeter XC loop and allow the rider to bike back around the park to the top of the dirt jump line of their choice or to another feature of the bike park.

Some of the public meeting participants, especially more advanced features-based riders, asked that the jump lines have dirt lips and not wooden lips (the "lip" being the last portion of the jump itself from which the rider jumps their bike into the air). There could be a combination of dirt-lipped and wooden-lipped jumps in the park. Wooden features are generally more durable from a maintenance perspective, but at a cost, so they could be placed on the beginner and intermediate lines. In general, advanced riders tend to help maintain dirt lips, so the advanced lines could have dirt lips.



The dirt jump area will be located on the north central part of the property, with three lines each approximately 450 - 500 feet in length. The dirt jump area will add approximately 50,000 square feet of bike-specific features.

Flow Trails

Flow trails are designed with features such as banked turns and rolling, predictable surfaces, so that the rider does not need to pedal or brake as they "flow" down the trail.

The three proposed flow trails will be designed for beginner, intermediate, and advanced users. The trails will contain flow features such as rollers, dips, and berms, allowing users to transfer their pump track and jump park skills to trail use. Wooden-decked features could be integrated into the trails if desired. The flow trails will be located on the south central part of the property in three different lines. At the end, the lines meet up with the perimeter XC loop and return



trail, allowing riders the option of returning to the top of the flow lines or moving on to another feature of the park.



The flow trails will add approximately 50,000 square feet of bike-specific infrastructure to the regional park.

Dual Slalom Course

The dual slalom course is suited for intermediate to advanced riders looking to compete or practice on a closed, directional course. The slalom course will consist of two nearly identical tracks featuring rollers, tabletop jumps, and bermed turns, offering riders a short gravity-fed experience. Ideally, the dual slalom course will have a starting hill and gate where riders can start on a timed run. This course could also be used for events and races.

The dual slalom course will be located in the middle of the park. The two separate lines will create nearly 500 linear feet of additional trail to the park.

Perimeter XC Loop and Return Trail

The proposed singletrack trail that will surround the bike park will be suited for beginner to intermediate users looking to build fitness and confidence in a low-barrier environment. The trail will appeal to users looking for a trail experience,

with areas of shade, periodic technical features that add manageable challenge, and views of the flow trails and dirt jumps.



The proposed trail will also feed into the pump track and skills area where trail users can learn and hone technical bicycling skills in a low-risk setting.

The singletrack trail will be along the perimeter of the park, and will add approximately 2,200 linear feet of trail.

Cyclocross Training Circuit

The park will contain a cyclocross training circuit to allow riders with race-specific bicycles an area to practice their skills. This area will consist of one lap with trails, open field, and obstacles requiring the rider to quickly dismount and remount their bike. The cyclocross trail will be located on the northeast side of the park, close to the pump tracks and skills loop and easily accessible from the entrance.

Costs and Phasing

Construction Cost Opinion

The estimated construction costs are based on the conceptual plan and will change as the project scope is refined.

Mobilization

Mobilization will likely occur multiple times to complete the project, particularly if it is phased. Depending on crew size, mobilization origin, and equipment, each mobilization is anticipated to cost \$3K - \$7K.



Construction/development costs do not include the following:

- Fencing (construction and permanent)
- Extending a waterline to the site
- Landscaping
- Additional parking areas, lighting, restrooms, etc.

Irrigation of the site is recommended to keep the soil-based features and landscaping in optimal condition. Creating an irrigation plan is dependent on a detailed site plan and will require the services of a landscape architect. Bringing a 4" line into the site is significantly more expensive than a 2" line, but in consultation with Coconino County Parks & Recreation Department staff it was determined that a 2" line will be sufficient as there will be significant flexibility with watering regimen.

Annual maintenance and operating costs will be determined based on the actual constructed tracks/trails, but for bike parks they typically run 10% - 20% of capital costs. Proper construction will reduce the annual maintenance required.

Several strategies to reduce maintenance, most of which is associated with repairing wear-and-tear, can be deployed. One option is to develop a program where professionally trained volunteers can perform regular, quality maintenance. Another approach would be to have the mountain bicycling community fund regular professional maintenance to keep the park in optimal condition and reduce risk.

Approximate Costs by Track/Trail

<i>Item</i>	<i>Low</i>	<i>High</i>
Entrance Trail/Pump Trails/Skills Loop	\$ 87,111	\$ 145,186
Design/Permtting	\$ 10,559	\$ 13,199
Labor	\$ 56,160	\$ 70,200
Equipment	\$ 16,016	\$ 20,020
Materials	\$ 19,536	\$ 24,420
Expenses	\$ 6,178	\$ 7,722
Irrigation	\$ 7,700	\$ 9,625
Tot Track	\$ 12,413	\$ 20,689
Design/Permtting	\$ 1,505	\$ 1,881
Labor	\$ 8,640	\$ 10,800
Equipment	\$ 3,784	\$ 4,730
Materials	\$ 1,672	\$ 2,090
Expenses	\$ 950	\$ 1,188
Irrigation	\$ -	\$ -
Cyclocross Training Circuit	\$ 7,913	\$ 13,188
Design/Permtting	\$ 959	\$ 1,199
Labor	\$ 4,320	\$ 5,400
Equipment	\$ 1,276	\$ 1,595
Materials	\$ 2,640	\$ 3,300
Expenses	\$ 475	\$ 594
Irrigation	\$ 880	\$ 1,100
Dirt Jump Area	\$ 165,128	\$ 275,213
Design/Permtting	\$ 19,256	\$ 24,069
Labor	\$ 82,080	\$ 102,600
Equipment	\$ 23,584	\$ 29,480
Materials	\$ 77,862	\$ 97,328
Expenses	\$ 9,029	\$ 11,286
Irrigation	\$ 8,360	\$ 10,450
Flow Trails	\$ 116,103	\$ 193,505
Design/Permtting	\$ 13,313	\$ 16,641
Labor	\$ 69,120	\$ 86,400
Equipment	\$ 23,584	\$ 29,480
Materials	\$ 32,824	\$ 41,030
Expenses	\$ 7,603	\$ 9,504
Irrigation	\$ 8,360	\$ 10,450
Dual Slalom Course	\$ 53,495	\$ 89,158
Design/Permtting	\$ 6,084	\$ 7,605
Labor	\$ 28,080	\$ 35,100
Equipment	\$ 8,008	\$ 10,010
Materials	\$ 21,666	\$ 27,082
Expenses	\$ 3,089	\$ 3,861
Irrigation	\$ 4,400	\$ 5,500

Phasing

As it is likely to take several rounds of funding to complete the bike park the following phasing plan provides for a six-phase development approach. Each phase is anticipated to take 1 - 3 months and is intended to provide a valuable riding experience that builds upon the previous phase.

Each track or trail will need to have the requisite irrigation and signs installed with it. This will increase costs versus installing all of the irrigation and signs at once. This phasing plan assumes that water will be brought to the site concurrently with the first phase.

Phase 1	
	Entrance & Signage (east)
	Beginner Pump Track
Phase 2	
	Intermediate Flow Trail
	Advanced Dirt Jumps
	Perimeter XC/Return Trail
Phase 3	
	Intermediate/Advanced Pump Track
	Intermediate Dirt Jumps
	Beginner Flow Trail
Phase 4	
	Entrance & Signage (west)
	Pump Trails/Skills Loop
	Advanced Flow Trail
Phase 5	
	Beginner Dirt Jumps
	Central Return Trail
Phase 6	
	Dual Slalom Race Course
	Cyclocross Training Loop

Next Steps

If the concept plan is approved, then a detailed site plan should be created to refine the integration of the tracks and trails into the site, and determine the ideal configuration.

The detailed plan should contain a more specific layout with design information for each track/trail. This will facilitate a more accurate cost estimate and the creation of construction documents.

A draft operations plan and a risk management plan should also be developed for the construction phase so that these topics can be addressed when the bike park opens to the public.

