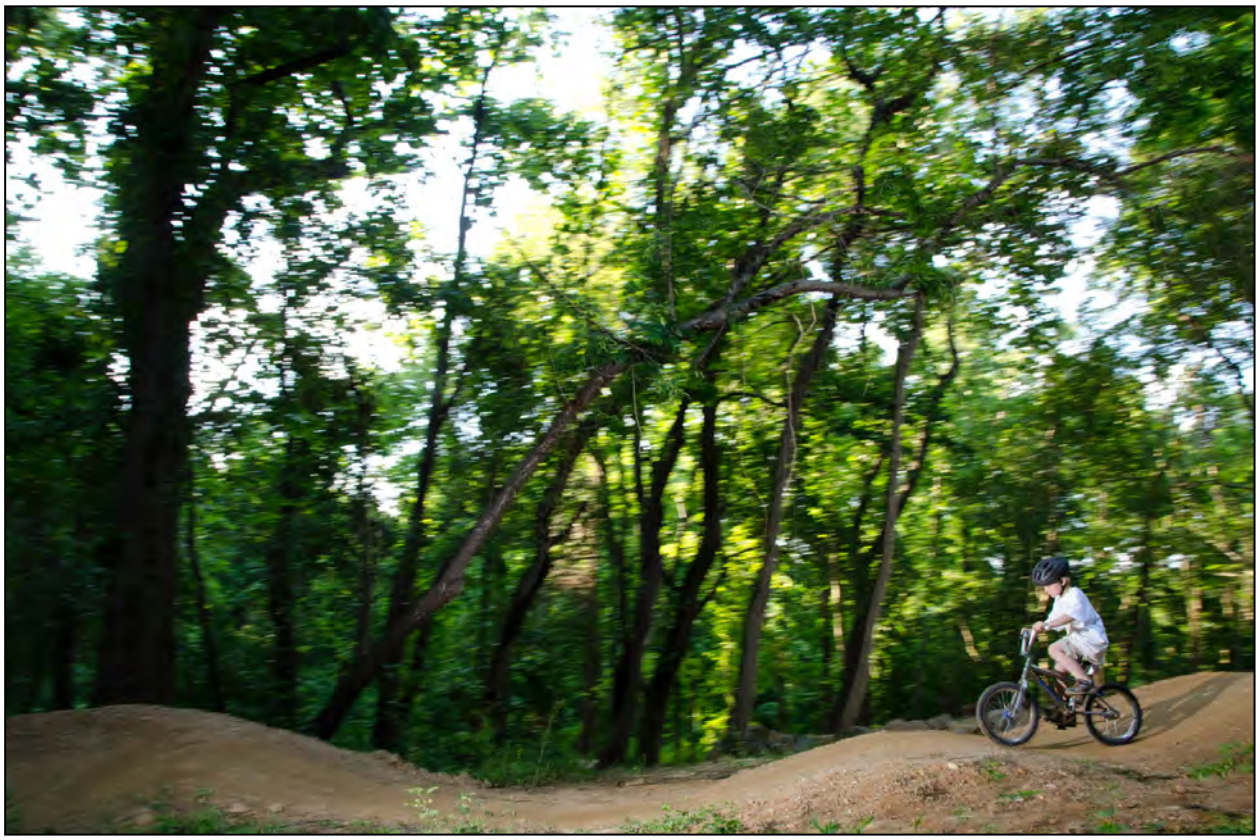
Sylvan Hill Bike Park
Conceptual Plan

Wausau, WI
November 2015



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I. Overview

The development of community bike parks has advanced rapidly in the past several years, with new facilities such as the Valmont Bike Park in Boulder, CO, complimenting several dozen smaller parks across North America. Providing a location for riders to partake in bike-optimized trails and appealing to a wide range of skills, bike parks become recreation centers and daily attractions for the millions of mountain bicyclists who live in urban areas.

On November 25, 2014, staff from the International Mountain Bicycling Association's (IMBA) Trail Solutions program visited Sylvan Hill Park in Wausau, WI, at the invitation of the Central Wisconsin Offroad Cycling Coalition (CWOCC) and Marathon County Parks, Recreation and Forestry Department, to determine the feasibility of developing a bike park on the property. This report contains the results of that investigation.

IMBA Trail Solutions had previously visited Wausau in 2013 to evaluate the region's parks and properties for the potential for a bike park. Of the several mountain bicycling opportunities identified during this initial visit, Sylvan Hill Park's varied terrain offers the greatest potential for a bike park facility, with its 200 vertical feet of elevation change and shuttle access, both desirable for gravity-oriented trails. The property's amenability for the construction of a destination mountain bike facility would also help modernize and augment the local trails infrastructure. CWOCC hopes that the bike park would help expand the variety of trails available in the region, and ultimately become an IMBA Ride Center, which is IMBA's Model Trail recognition for large-scale mountain bike facilities that offer something for every rider.

Sylvan Hill Park is also already a highly used winter recreation destination, and the City of Wausau is an aspiring outdoor city. There are 10 miles of mountain bike trails and 20 miles of cross-country ski/snowshoe trails at nearby Nine Mile Recreation Area, where many races and race series are held. Wausau also recently installed a whitewater kayaking facility in the downtown area, and hosts the popular 700-foot Granite Peak Ski Area, the third tallest ski area in the Midwest.

II. Bike Park Site Evaluation Criteria

The ideal community bike park site includes a variety of characteristics that combine to allow for a sustainable facility that integrates environmental, social, and economic aspects of development. The following list contains the site characteristics considered during the visit to evaluate the potential for a bike park at Sylvan Hill Park.

Landscape: Slopes

Different bike park facilities require different slope characteristics.

- A **pump track** requires a regularly shaped area with modest cross slopes between three and five percent. While the track itself does not require a cross slope, a modest cross slope facilitates proper drainage. Since most tracks are constructed of imported materials, a level site can be outsloped as part of construction. Sites with cross slopes greater than five percent can be used as long as the track area is brought to proper cross slope grade during construction. Depending on the characteristics of local soils, a leveling operation could generate all of the materials required for construction.

- Other bike park facilities such as **bike-optimized singletrack** are trail-based and have similar requirements to general sustainable natural surface trails, the primary difference being that side slopes greater than 40 percent are undesirable. While the "golden window" for traditional trails is 20 to 60 percent, bike park trails avoid steeper slopes and flat areas with no slope. Side slopes around 20 percent are ideal. It is possible to create facilities on flatter landscapes, with heavy manipulation of the terrain, utilizing fill during construction (either borrowed onsite or imported). This is required to create fun and playful terrain.

Landscape: Acreage

Depending on the range of facilities desired, a bike park can be sited on as little as 10,000 square feet and on as much as 40 acres and up. Successful pump tracks can be created on modest parcels, but it is important that the parcel be regularly shaped (i.e. not a narrow strip), to avoid compromising the flow of riders through the facility. Larger parks combine a range of slopes to host a variety of facility types.

Landscape: Soils

Most bike parks require additional imported soil.

The foundation of every bike park, no matter the facility type, is shaped ribbons of dirt. The right soil is essential for successful construction and maintenance, providing the combination of low rolling resistance and high traction that riders affectionately call "hero dirt." Another name for hero dirt is loam. Loam is formally defined as soil composed of 40 percent sand, 40 percent silt, and 20 percent clay. A rider's "hero dirt" falls roughly with these percentages. For bike parks, 40 percent clay content is the very minimum, as clay provides the structural strength to support steep lips and berm faces. A little clay goes a long way, though, so clay must be balanced with sand and silt, substances more porous than clay, to allow tracks and trails to carry riders quickly after rain passes. Ideal bike park dirt is also relatively rock-free. If a site has optimal soil that is mixed with rock and cobble, a screening operation is required.

Landscape: Shade

Shade is a desirable characteristic for both bike park tracks and trails, and users. The most common raw material for bike park facilities is soil, and one of the underappreciated characteristics of "hero dirt" is sufficient moisture. Trails sheltered under a forest canopy, or otherwise shaded, maintain more consistent moisture, which increases ride quality and reduces ongoing maintenance efforts.

Users also require shade. Bike parks have a social purpose, and are better enjoyed from a shaded table or bench than in the direct sun. In some areas, use happens individually, with riders queuing for their next run on a specific feature. In other more trail-oriented areas, use can happen as a group, as riders follow each other through the various twists and turns of the terrain. However, half the fun of a bike park is learning from one another, showing your friends and families a newly perfected skill, or simply enjoying the park's social scene.

Water

Proper soil moisture is a requirement for construction and effective park maintenance. Much like a potter working his wheel to make a new creation, water is the catalyst that makes it possible to transform mere piles of dirt into a berm or a jump.

Water is crucial element of a bike park's construction and maintenance.

Once a soil's moisture dips below a certain threshold, it loses its ability to hold its shape. Well-planned and properly managed irrigation systems are a must-have for certain types of bike park facilities in dry or exposed locations.

Irrigation systems for bike park elements, trail treads, and landscaping vary and should be budgeted separately. Using a single system would result in either withered plants or trail tread that is either too dry or wet.

Access

Bike parks commonly require large amounts of externally sourced soil, and moving this soil into its final position can take a large percentage of the development budget. The ideal bike park site offers easy-to-access vehicular routes that allow large trucks to drive directly to the project site, which saves time and costs.

It is essential to provide first aid access to a bike park as part of any effective risk management plan. Bike parks should also be located at a physical address recognized by the 911 system, and first responders should be able to drive as close to the facility as possible.

Synergies

The notion of "social gravity" should be addressed in the development of any facility. Does it provide a unique enough experience and/or opportunity to convince potential users to make the trip? Is it possible to create a bike park that by itself rises to this level? (Boulder, CO's 40-acre Valmont Bike Park and Sandy, OR's 15.5 mile Sandy Ridge Trail System being

the best examples). Most bike parks depend on synergy with other facilities to contribute to their ultimate success.

- The easiest synergy is **connection with a traditional or bike-optimized singletrack trail system,** especially if it is already a local destination. Even a modest system can be a good partner for a bike park, and combining a bike park with a small trail system can turn both into area destinations.

- **Connection to a paved and/or transportation trail network** provides good synergy as well. In many metro areas, the barrier to entry is an unsafe or too lengthy bike ride to the park. Safe and close connections from one's home to a bike park would turn an otherwise small development into an attraction.

- **Combining a bike park with a traditional recreation park** proves successful, especially for youth and families. It is not unusual for one member of the family to shun ball sports in favor of activities like skating and bicycling. At Maryland's Rockburn Branch Skills Park it is common to see parents set up chairs or sit at the tables where they can watch one child ride the pump track while the other's soccer team practices on the adjacent turf field.

III. Existing Conditions

In 2013, Trail Solutions staff reviewed the site and soils maps for the area and determined that the conditions appear to be favorable for this type of trail construction, which will help reduce the overall costs. During that preliminary visit in 2013, the following, which serves as the basis of this report, was determined:

1. Sylvan could host up to four gravity trails at the park, ideally two flow trails and two jump trails, from beginner to expert level skill levels.
2. A large, undeveloped space in the middle or on the south side of the park could easily accommodate a pump track and skills area.
3. A singletrack trail loop would fit well around the perimeter of the property, helping to provide a return trail for the gravity zone.

Sylvan Hill Park is a relatively small park, and already hosts facilities such as a playground, chalet, two shelters, picnic tables, play equipment, walking trails, a cross-country ski loop, snowshoe routes, and a winter tubing area with six runs. Although the park exists primarily as a winter recreation area and most of the associated infrastructure supports winter recreation (e.g. access road to maintain the tubing area), it is well suited to provide more diverse recreation in the summer months and adapt to mountain biking specific infrastructure. Parking already exists and there is room to expand if usage increases substantially.

The park sits on 70.6 acres of land in northeast Wausau. Approximately 7% of the park contains the parking lot and a chalet with an attached playground (both in the northwest corner of the park), which leaves a significant amount of extra acreage to develop mountain biking infrastructure.

Trail Solutions staff discussed optimal location to site mountain biking infrastructure with Matt Block, Vice President of Central Wisconsin Cycling Coalition and Bill Duncanson, Director of Marathon County Parks, Recreation and Forestry Department. Both Bill and Matt expressed a preference to locate the main trail parking lot and access on the south side of the park, adjacent to the Wausau East High School (instead of the main chalet in the northwest corner). Wausau City Council manages the park and chalet leases, and would prefer that the chalet not be the main focal point of the cycling infrastructure.

IV. Opportunities

Community

Many community members are uniting behind this project. The cooperation and collaboration between the Marathon County Parks, City of Wausau, Central Wisconsin Offroad Cycling Coalition, Marathon County Park Commission, Wausau United Ride (local high school mountain biking team), and many others bodes well for the successful development and ongoing maintenance of a community bike park.

Soil

Sylvan Hill Park's soil is a mix of silt and clay, and appears desirable for constructing bike park amenities and singletrack trails. However, there are multiple drainages on the side of the hill that will require boardwalks or culverts to be crosses, primarily on the north side of the park.

The park has some rocks but mostly small round glacial deposit and limited bedrock outcroppings, so trails would be constructed primarily of soil.

Terrain

Aside from the proposed beginner loop, there is ample space on the east side of Sylvan Hill Park to develop up to three more gravity based trails to accommodate all skill levels. Intermediate, advanced, and expert flow trails would provide a wide variety of features to keep even the most skilled riders entertained. It would be possible to add a trail in the northeast corner to provide access to a nearby community.

Vegetation

The trails would primarily run through large hardwood forests, and follow above a creek bottom on the north side of the park. This area also contains conifers and provides incredible scenery.

Space for Infrastructure

Off of the end of Coates Lane (south east corner of the park), there is plenty of room for developing a parking lot that could handle the traffic of the small park. Having the parking lot and trailhead facilities on the south side of the park would provide direct access from the Wausau East High School. Next to the main parking lot there is ample room to build a pump track, a desirable facility for this type of park, at whatever size the community desires. Soil may have to be imported for this facility.

Neighborhood Connectivity

Improvements to the park can increase neighborhood connectivity for summertime users, including cyclists and pedestrians.

V. Constraints

Existing Summertime Facilities

Residents use the winter trail corridors as summer pedestrian routes. The proposed mountain bike trail plan would redevelop the site in a manner that would eliminate use on some existing routes. This is likely not an acceptable solution.

Sewer Service

There is no sewer service to the site, which may negatively affect the ability to develop the trailhead at Coates Lane.

VI. Proposed Tracks and Trails

Trail Solutions' staff envisions an integrated facility that riders of all ages and abilities can use to improve their skills and enjoy active recreation. The elements proposed for community bike parks include an entrance/welcome area (which includes a parking lot and trailhead), pump track, skills area, and flow trails. A perimeter loop will allow riders to return to the beginning of the flow trails, which will primarily be downhill/gravity trails. These facilities would take up most of the available space for new recreation infrastructure.

A description of the tracks and trails that a user will encounter at the proposed Sylvan Hill Bike Park as well as recommendations for site selection follow.

Entrance/Welcome Area

The bike park would welcome riders and spectators through a main entrance located on the southeast side of the park, which includes a parking lot and trailhead. The entryway will be a comfortable place for spectators to watch riders, or for parents to supervise children. The pumptrack and the skills area would be adjacent to the proposed parking lot, directly to the west.

The park is designed so that the easiest features are closest to the main bike park entrance, and the most difficult and challenging features are further away and back in the property. This not only allows riders to progress through the park, starting with easyo too 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 trail. This improves risk management and provides an improved experience. The easier features are also closer to the entryway 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.

Pump Track

A pump track is designed to allow cyclists of all abilities to learn and perfect their riding skills. Pump tracks generally have direction of use and allow users to "roll" through the rollers, berms and features. Riding a pump track is an extremely aerobic activity so it is recommended that officials consider the installation of benches or other suitable furniture to allow for users to rest between sessions.

The proposed pump track at Sylvan Hill would be a beginner/intermediate configuration of rollers, berms, and jumps.

Typical construction costs are approximately $10,000 to $30,000 for a natural surfaced pump track and $45,000 to $100,000 for a prefabricated pump track.

Skills Area

Users looking to practice technical riding skills in a low-consequence environment can utilize the skills area. This area would feature numerous optional skill stations and development features for beginner progression. Users can practice riding on features designed to teach basic mountain bicycling skills.

Riders can practice their skills in a low risk environment before taking them to the trail.

Typical construction costs are highly dependent upon the quantity and quality of desired skills stations. The number and style of skills stations can be determined during the detailed design phase and based on stakeholder input. Skills station construction costs are approximately $3,000 to $10,000 each and skills trail construction costs are approximately $5 to $10 per linear foot.

Bike-Optimized Flow Trails

Bike-optimized singletrack trails are purpose-built or modified singletrack trail, the majority of which contain a high density of specific features to enhance the experience and provide challenge, such as berms, rollers, consistently wide turn radii, technical features, rock gardens, jumps, and drops. These trails are directional, in order to promote optimal circulation patterns and maximize the user experience. Directional trails maximize flow and experience in one direction, rather than compromising design by having to consider riders traveling in both directions.

The trails are designed to provide a floating sensation to users by maximizing the efficiencies afforded by a bicycle and by counteracting forces that direct a user off of the trail. Berms and cambered tread surfaces, for example, promote traction, safety,

sustainability, and enjoyment. These trails are never extreme, dangerous, or steep; challenge is provided by rewarding progressive skills development and incorporating features that can always be rolled but may be jumped. While a flow trail is singletrack, the tread surface itself should be wider in areas where it is that anticipated less-experienced visitors may need a greater margin of error.

The main trail system in Sylvan Hill Park would center on a one-mile perimeter loop in the park. The east side of this loop would be directional (the beginner flow trail) , while the west side of the loop would be bi-directional (allowing users to ride up or down the trail) as a return to the top of the flow trails, as well as provide a beginner flow experience for the more novice user. The east side of the trail would be more gravity oriented, featuring beginner flow features such as berms and combinations of rollers. This trail should be constructed 48 inches wide to accommodate traffic from both directions and serve as a connector from the park to communities. The additional width would also allow this trail to also be groomed in the winter for fat biking.

Three additional gravity flow trails, each about a quarter mile in length and varying in difficulty level from intermediate to advanced and expert – all downhill only – are also proposed. These flow trails may contain some alternate rock and wooden features to match the skill level of the trail (including expert-level jumps and features) .

Typical construction costs are approximately $6 to $12 per linear foot.

Revised Interior Circulation Trails

If the proposal is implemented as designed it will require modification of the existing winter and summer trails to retain the current range of trail based recreation opportunities. While all current winter use trails may not be available for summer use due to anticipated mountain bike trail locations, a summer pedestrian trail will form a perimeter loop outside of the mountain bike trail system and will connect the parks three pedestrian entrance points. This summer pedestrian trail system will also serve general public bike traffic except along the east side of the park due to slope constraints.

Typical construction costs are approximately $3 to $6 per linear foot.

VII. Cost and Phasing

Construction Cost Opinion

The estimated costs are based on the conceptual plan and will change as the project scope is refined. The following costs are excluded from the cost opinions noted in the previous section:

- Design
- Permitting
- Signs
- Temporary and permanent fencing
- Erosion control
- Construction administration

Mobilization

Mobilization may 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 $1,000 - $2,500.

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.

Phasing

Since this is a relatively small project, it is recommended that all of the proposed infrastructure (entrance/welcome area, pump track, skills area, and flow trails) be completed at the same time for efficiency purposes. It is possible to construct all the trails in one build season.

However, if the project were to be completed in phases, it is recommended that the parking lot, perimeter loop trail, pump track and one other flow trail be completed first, followed by the remaining two flow trails and skills area. The revised pedestrian trails should also be in the first phase.

VIII. Next Steps

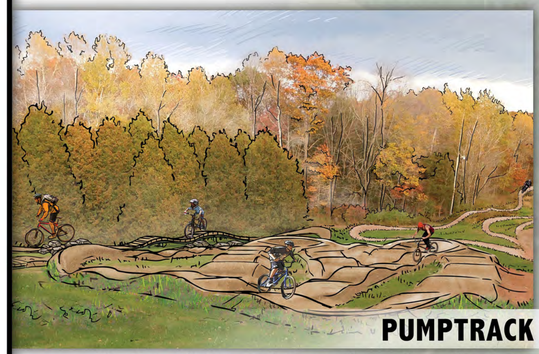
If the concept plan is approved, then a detailed site plan should be created to refine the integration of the tracks and trails into the site, and determine the ideal configuration. The detailed plan should contain a more specific layout with design information for each trail. This will facilitate a more accurate cost estimate, the creation of construction documents as well as permitting requirements.

Concurrently, a pedestrian circulation plan should be developed for summertime use.

A draft operations plan and a risk management plan should also be developed.

IX. Site Plan

PROPOSED PARKING ①

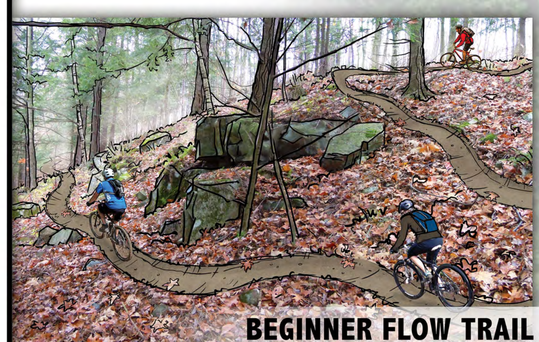


PUMPTRACK ②

Beginner/intermediate configuration of rollers, berms and jumps.

SKILLS AREA ③

Network of skills development features for beginner progression.



BEGINNER FLOW TRAIL & RETURN LOOP ④

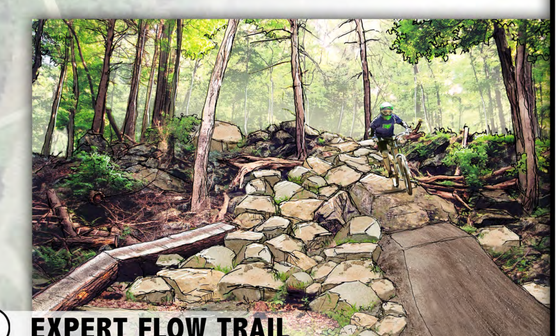
Green Trail will serve as beginner flow trail on east side of park and then as a return for all other flow trails. Potential grooming for fat bike access in winter.

⑤ INTERMEDIATE FLOW TRAIL

Descending direction only with intermediate flow features.

⑥ ADVANCED FLOW TRAIL

Descending direction only with more advanced flow features.



⑦ EXPERT FLOW TRAIL

Descending direction only trail with expert level jumps/features.

⑧ FUTURE TRAIL ACCESS TO COMMUNITY

Potential link for community access in the Northeast corner of the park.

SYLVAN HILL BIKE PARK CONCEPT PLAN - 2.18.15

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0 200′ 400′
SCALE

TRAIL SOLUTIONS IMBA