

Trail Guide

Building multiuse trails and bridges

By Kyle Ryan

Every night, Matt Lebow sits in New York's municipal courthouse, guarding it while most people in the city that never sleeps, well, sleep. His night shift is part of stepped up security following Sept. 11.

"I have to make sure nothing's going on," Lebow says. "I also have a lot of time where I'm sitting there watching a door. It gives me time to work on proposals."

While watching that door, he came up with the idea to build the first multiuse trails in New York City. Just beyond the concrete canyons of Manhattan lie Wolfe's Pond Park and Long Pond Park on Staten Island, with 200 acres of unused wilderness (aside from some abandoned stolen cars and other trash).

It's not surprising, though, that the New York City Parks Department hasn't exactly been swift in responding. The most urban area in the United States isn't synonymous with mountain biking, a sport that at least requires soil.

But Lebow and his organization, the New York City Mountain Bikers, did their homework. He has plans, volunteers, designs and determination. With a similar set of ingredients, just about anyone can plan, design and build sustainable multiuse trails.

What's the point?

Why go through all this hassle for a glorified recreational sidewalk?



PHOTO COURTESY OF WHEELER CONSOLIDATED

Funded by the USDA Forest Service, the prefabricated steel truss recreation bridge spans 70 feet over the South Platte River in Eleven Mile Canyon near Lake George, Colo. The bridge provides access to picnic areas.

In some urban settings, trails and greenways are built on abandoned intracity rail corridors, providing pathways to urban settings for people who live outside them. This in turn leads to revitalization, both economically and aesthetically (rusty tracks vs. crushed limestone and foliage). The RTC also points out that, in addition to helping residents connect with places and each other, the trails help with conservation and easy transportation problems, all of which could save money.

Beyond economics lay the health benefits. It's no mystery that obesity rates in the United States are skyrocketing due to poor diet and lack of exercise. Walking is the easiest, most accessible form of exercise, especially for sedentary people. Trails give them a place to do it, with the perks of a natural setting instead of the dreaded treadmill.

Trail proponents also like to point out the social benefits. The



PHOTO COURTESY OF STEADFAST BRIDGE CO.

An equestrian bridge at Black River Reservation in Loraine, Ohio.

"The recreation viewpoint may be narrowly construed," says Ders Anderson, director of the Greenways Program for the Openlands Project in Illinois. "Everybody tends to forget that people walk. We don't need to live in cars or mass transit. The reason people are walking or biking is a lot deeper than recreational activity. That's why I think now, in the last five years, we're beginning to understand that a little better."

Trails, Anderson says, are open to all age groups and all ability (or disability) levels—unlike, say, a soccer field.

"A half-million dollars put into a trail services the community a lot more than a half million put into a soccer field," Anderson says. "Trails are very cost-effective."

They may even pay for themselves in time, according to the Rails-to-Trails Conservancy (RTC), a nonprofit organization based in Washington, D.C., that organizes and lobbies for the conversion of abandoned rail lines to multiuse trails.



RTC calls trails "America's new front porch." Anderson speaks of anecdotal evidence of trails becoming community centers. Michael Sands, who designed a trail system for a suburban Chicago development called Prairie Crossing, agrees.

PHOTO COURTESY OF WHEELER CONSOLIDATED
Spanning 46 feet, this timber lattice truss recreation bridge, funded with local support, was built by the National Guard in Elroy, Wis. The bridge is part of an extensive system of bike trails that connect numerous towns in Southwestern Wisconsin.

"They are in and of themselves an amenity in civic space," Sands says. "You don't really connect with a place by looking at it from a road or car window. It's really when you get out and walk through it that it becomes more real."

Planning and funding good trails and bridges

Trails come in various flavors, from mountain biking to equestrian, but multiuse trails and bridges, which combine numerous activities, are the most common. Using them are people from four main groups: hikers/walkers/runners, mountain bikers/cyclists, all-terrain vehicle (ATV) enthusiasts and equestrians.

Depending on the season and trail restrictions, though, the trails could be used for everything from bird watching to cross-country skiing to inline skating to snowmobiling. That's a lot of people doing a lot of different things, and, not surprisingly, sometimes it doesn't work so well.



PHOTO COURTESY OF STEADFAST BRIDGE CO.

A bridge at the Manela Bay Hotel in Lanai, Hawaii

Colo., just outside of Denver as an example.

According to Rob Holmes, director of marketing for Trails.com, hikers and cyclists coexist the best. Horses tend to tear up the trail the most. But with proper trail design, the challenges presented by multiple users can be minimized.

What makes a good trail depends on a couple of factors, according to Holmes: activity and audience. For example, a good walking trail would be smooth and mostly flat—not necessarily ideal for a mountain biker.

What's your audience? Young people? Middle aged? Elderly? Disabled? Youths would want the trail to be interesting. For older people, you'll need more benches to rest and amenities such as toilets or water. For the disabled, you'll want to avoid steps and use a hard-packed trail surface.

Combining those interests may sound daunting, but it's possible. Pete Webber of the International Mountain Biking Association (IMBA) offers the trails of Jefferson County,

The trails there routinely see more than 1 million users a year on fewer than 100 miles of trails, all of them shared use.

Besides good trail design and educational outreach, Webber says, it's the attitude: "The government officials said, 'Look, we have a limited number trails and a lot of people. Everyone needs to get along. The trails are going to be open for everyone, so we have to learn to share them.'"

Jeff Ciabotti of the Rails to Trails Conservancy has a couple in mind, too: the Pinellas Trail, a 47-mile asphalt rail-trail in central Florida and the Minuteman Bikeway, a 10.5-mile asphalt trail in Massachusetts. Both support a variety of activities (all wheelchair-accessible) and, importantly, go somewhere.

"They're useful because they connect so many things," he says, such as public facilities and other trails.

That was the idea when designers were planning Prairie Crossing, a neighborhood development in suburban Chicago. The 677-acre residential development and self-described "conservation community" has more than 10 miles of trails, which go to busy areas like train stations but also link to regional trails in a nearby nature reserve. Within the development, there are two circulation systems: one for cars (streets in front of the houses) and the other for people (trails behind houses).

The trails are funded through home sales, and they play a large role in the marketing of the community. Underwriting messages on the local NPR station focused solely on the trails as the development's selling point.

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becomes more real."

Funding that reality can be problematic, though. While Prairie Crossing has home sales to help, most trail developers look to Washington, D.C.

Every six years, the federal government re-evaluates the money it spends on transportation. Starting in 1991, the government began allocating money for pedestrian and bicycling facilities—trails were beginning to get a piece (however slim) of the \$6 billion pie shared among 12 transportation-enhancement categories. The money has increased with each successive reauthorization, with the next one set for this fall.

Federal money, when combined with funding generated locally by public agencies and private groups, can cover trail expenses.

"It's one of those things where you're always keeping your eyes open looking for grant money," says Sands, who has used such money to help pay for trail projects with local groups. "It's a matter of staying involved within the region and community so that you are constantly talking to people and keeping those things in the forefront of your mind and, to a certain extent, the forefront of conversation."

Design and construction

The successful trails Peter Webber of IMBA has been involved with typically are the ones with a "forward-looking" management staff and strong, well-organized volunteer groups. A supportive business community helps, too.

In general, though, there are 10 steps to planning and designing a sustainable trail, according to IMBA:

1. Get permission from the landowner and form a partnership. It goes without saying that you need to talk to whoever owns the land before constructing anything on it. Expect it to be a slow process and be willing to make concessions.

2. Identify ownership boundaries. Locate your boundaries and get in touch with any landowners within those boundaries. Present them with a well-designed idea, which, IMBA says, can sometimes lead to access beyond what you originally intended.

3. Determine who will use the trail and what they will want to do. Walkers usually take short trips on trails. Equestrians will need a wide trail with high clearance and water stops. Disabled users will mostly need a wide trail with a hard-packed material and a gentle grade (5 percent). ATVs need an open, flowing trail and can handle rough areas. Mountain bikers will want anything from gentle, short trails to steep, difficult backcountry paths.

4. Familiarize yourself with the area. Study maps, aerial photographs, master plans, Geographic Information System (GIS) surveys, anything that's available. Identify the control points, that is, the places that determine where a trail will go.

5. Make loops. Trail systems with loops offer the most variety and can offer varying distances and degrees of difficulty, presenting trail users with a number of options.

6. Use a contour route. Planning gets a little more technical here. The contour route will connect the control points. Draw it using a topographical map, making notes of areas to avoid and areas to use. Avoid fall lines, which allow water to take a direct, concentrated route from the top of a hill to the bottom. (You want water to pass over the area in sheets, not streams, which cause erosion.) Keep the trail grade to 10 percent or less. Also figure out where you might need bridges.

7. Determine trail flow. IMBA identifies trail users by their means of travel, but their speed is important as well. For example, cyclists, runners and equestrians will travel faster than walkers.

A trail's tempo, or flow, comes in three varieties: open and flowing, tight and technical, and a hybrid of the two. Open and flowing trails are just as they sound: gentle. Wide with sweeping turns and long sight lines, they're good for beginning cyclists, equestrians and ATV users.

PHOTO COURTESY OF INVISIBLE STRUCTURES, INC.

Garden of the Gods multipurpose trail in Colorado Springs, Colo., is a commercial horse trail through the scenic park with a view of Pikes Peak.



PHOTO COURTESY OF IMBA

Top 10 Trail-Building Mistakes

Defined by the International Mountain Biking Association

1. Not getting landowner/land manager approval
2. Creating excessively steep or graded trails
3. Not maintaining a sustainable, accurate grade
4. Going against the flow of a trail
5. Creating trails with no outslope, which causes excessive erosion
6. Having steep fall-line turns

Tight and technical trails have sharp turns and twists, which help minimize speed and reduce user conflict. Hybrid trails combine the two and are often good for urban areas.

8. Walk the trail corridor and mark it. Leave a trail of breadcrumbs to show where the trail will go by placing flags along its route. Be as comprehensive as possible.

9. Develop a construction plan. It takes a village to build trails and bridges. Trail users, land managers, volunteers/workers and landowners should all be involved in the planning.

10. Mark the exact trail location and get final clearance. Remark the trail after the construction plan has been finalized and double check that you have a green light to begin working.

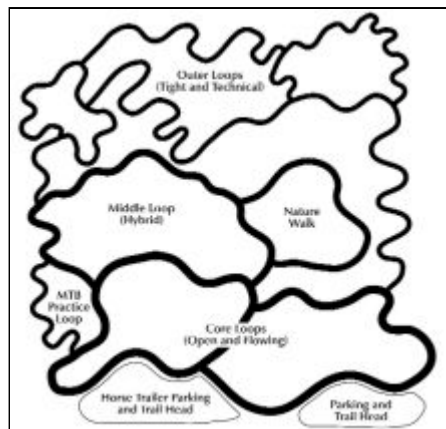
7. Using shoddy materials to build the trail
8. Not spending enough time constructing a trail
9. Using logs to line a trail, which can trap water and increase erosion
10. Not repairing or closing damaged trails

The ideas all sound simple enough: You want to make a trail. So go in, clear out the area, make the trail and use it, right? Sort of. In these times of hyper-environmental awareness, there are a dizzying number of things to keep in mind, all of which boil down to one word: erosion.

When trail users, water and gravity combine, they can undermine the trail and negatively affect the surrounding environment. A number of organizations can help you design a sustainable trail.

Even though "mountain biking" is in its name, 98 percent of the trails IMBA's involved with are shared-use trails. The organization has the Subaru/IMBA Trail Care Crew, a free resource of two full-time professional teams that travel throughout the country to help promote trail use. Beyond that, there are the IMBA Trail Consultants, who help design multiuse trails. The RTC contributes its resources in rail-trail situations. The Internet, of course, has plenty of trail-design info as well.

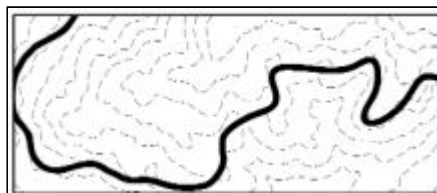
Stacked Loop Trail Systems



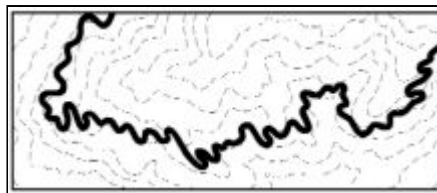
Loops provide options. The majority of the system can be shared use, with a few areas designed for single use. Keep core loops near trailheads open and flowing to accommodate the widest variety of users. Outer loops can become progressively more technical and strenuous for people who want challenge.

DIAGRAMS COURTESY OF IMBA

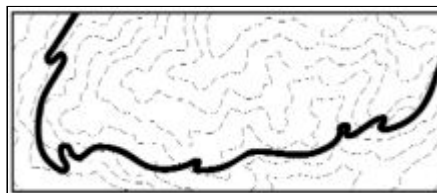
Trail Flow



Open and Flowing



Tight and Technical



Poor Design (abrupt transitions from one type of design to another)

Building bridges

Bridges, however, will be pricier and require more than just Internet research. It all depends on the situation to determine whether you need a simple, short wooden bridge to cross a small creek bed, or if you need a 200-foot steel suspension bridge to cross a river or highway.

According to Stan Elliott, a structural engineer with a trail



PHOTO COURTESY OF ENWOOD STRUCTURES LLC
Covered bridges can offer lots of design options for additional shelter and safety.

bridge company, span is the biggest factor in determining bridge type. A simple 30-foot bridge (which can cost about \$10,000) employs a straight beam system. Bridges in the 50- to 200-foot range (which can cost about \$225,000) use a truss style. Beyond that, you're getting into suspension bridges, which cost upwards of half a million dollars.

There are numerous companies who build prefabricated bridges and ship them to trail sites. All you have to do is anchor them into the ground once they arrive. For larger bridges, some manufacturers can arrange for subcontractors to take care of the foundation work and other heavy-duty construction.

Elliott's company specializes in 10-foot wide bridges, a standard width that can accommodate multiple users simultaneously, such as two snowmobiles going in opposite directions. Pedestrian bridges can be as narrow as six feet.

Other factors to keep in mind besides width, Elliott says, are the type of finish, clearances and wearing surface. The type of finish refers to the bridge's material, such as painted steel or weathering steel. Weathering steel develops a surface coat of rust that doesn't damage the structure or need to be painted. Clearances are obviously important when traffic, be it river or road, passes below. Everything must be high enough. Finally, the wearing surface, that is, what endures the wear and tear from trail users, varies depending on who uses the trail. For example, snowmobiles can destroy wood pretty quickly, so they need something harder like concrete or steel.

People power

Even though you might need heavy-duty construction when it comes to bridges, volunteers are your best bet for help with trails. Chances are there are numerous people in your community who would be more than willing to help lend a hand constructing a trail they will use.

Even though he hasn't gotten permission to build his trails yet, Matt Lebow easily signed up more than 100 people to help with construction. The American Hiking Society offers has a popular program called "Volunteer Vacations," where, for a minimal fee (around \$80), people visit backcountry locations to help rebuild trails, shelters and more.



PHOTO COURTESY OF ENWOOD STRUCTURES LLC

A trail bridge at Saluda Shouls Park in Columbia, S.C.

For the average citizen who thinks, "Hey, it'd be cool to have a trail here. I wonder what it takes to get one," one thing usually stands in his/her way: government bureaucracy. It can be a long, tedious journey to get a trail built.

Beyond that, though, there are a few obstacles trail enthusiasts routinely encounter: landowners/NIMBYs (not in my backyard), environmentalists and user conflicts.

NIMBYs often cite liability, privacy, crime and litter concerns. Webber says liability usually boils down to their opposition to having trail users near their house. But in the lawsuit-happy America, liability is an issue. Thankfully, most states have recreational use statutes that protect landowners from lawsuits so long as there isn't gross negligence.

In the past, Ciabotti says privacy concerns have been eased with creative landscaping, fencing and even changing the alignment of a trail. Crime is usually a nonissue as the trails are often patrolled by volunteer groups. Litter can be minimized by placing receptacles on the trail, and as Ciabotti says, "Most of these folks tend to pick up after themselves."



"Most of [NIMBY objections] can be dealt with during and design and planning phases," he says. "Typically, after they're through, built and functioning, [NIMBYs] are our most ardent supporters."

Environmentalists may take more convincing. Lebow couldn't even get a meeting with New York-area environmental groups to discuss it.

"They don't even want to start a dialogue about it," Lebow says. But Webber says their arguments can be easily addressed.

PHOTO COURTESY OF EXCEL BRIDGE MANUFACTURING CO.

Shady Canyon Bike Trail in Irvine, Calif.

"You can overcome the environmental impact of trails by planning," Webber says. "One thing we say is that trails can

actually lessen the impact of humans on open space by confining it to a specific area: the trail. If there is no trail, you might have off-trail use."

Such off-trail activity can be many times more damaging than regulated activity because nothing is protected.

Finally, user conflict can be alleviated with proper trail design. If designers plan the trail realistically, they can anticipate where there could be problems and address them before they start.

Still, overcoming opposition to trail-building can be a long process. When the developers of Prairie Crossing wanted to build a trail near some houses that had already been built, Sands encountered resistance from NIMBYs. How did he succeed?

"Lots of talking," he says, laughing. "People came around."

Especially once they realized trails typically increase the value of adjacent houses.

Even if you tame the NIMBYs, municipalities and all the red tape involved can be overwhelming. Building community support is key, and it helps to have a local political champion as well. Lebow, who admits he's surprised by how well his trail crusade is going, found that massive preparation helps get the wheels of government moving.

"The thing that has gotten the most doors open is that I have an answer," he says. "If you don't have the answers, they're not going to take the time and money to figure it out for you."

Who will design it? IMBA, for free. Who will build it? An army of waiting volunteers. Who will maintain it? Volunteers. He has one organization that will donate all the plants to rehabilitate the area's vegetation. Sponsors will provide food to volunteers during trail building. Cost to New York City: nothing. Work for New York City: minimal.

Lebow has already done numerous non-trail-related projects in the parks to set a good example. His group has removed abandoned cars, kegs and other detritus from what the parks department has called a "pristine environment."

"You gotta make them like you," he says.

Apparently they do like him. In mid-March, Lebow's trail plan received approval from the community board that controls the parks, a gesture the parks department is likely to follow. He also has the backing of IMBA, an adventure race that's taking place in the city this year and New York's 2012 Olympic Committee.

Right now, though, he waits, mainly for environmental groups to oppose his plan. Patience is not only a virtue in trail-building, it's a necessity.

"I want more park land too, but I want to be able to use it," he says. "Having a bunch of trees to look at as you drive by in your car doesn't really do any good."

Trail Guides

For more information, check out these resources:

U.S. Forest Service's Trail Construction and Maintenance Notebook and Hand Tools for Trail Work, order by calling 406-329-3900

International Mountain Biking Association, www.imba.com (you can download or purchase IMBA's 72-page trailbuilding manual, *Building Better Trails*)

www.trails.com (a guide to 30,000 trails and trips)

Rails To Trails Conservancy, www.railtrails.org

