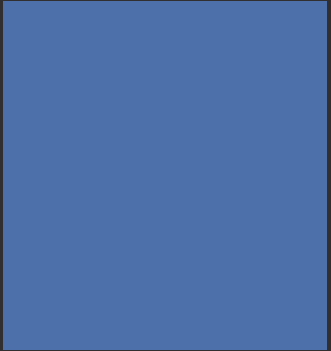




End-of-Trip

Facilities

A Planning Guide for the Houston-Galveston Region

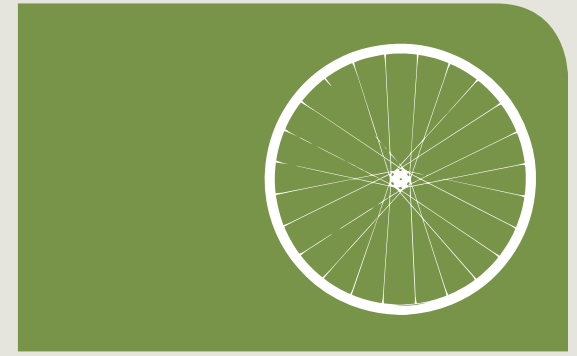


Introduction



To avoid traffic, more and more commuters in the Houston-Galveston area are leaving their cars at home and biking to work. Communities and transportation agencies are busy completing new bikeways and implementing other measures that make it easier for cyclists to reach everyday destinations.

Although more places are connected to the region's growing bicycle network, cyclists may be unable to store their bikes, fix a flat tire, or freshen up once they get where they are going. To create a complete network for cyclists, end-of-trip facilities need to be provided at businesses, government buildings, and other destinations. End-of-trip facilities are accommodations, such as parking and changing facilities, which make biking a more comfortable and convenient transportation option. When these facilities are provided, biking is more enjoyable. Employers are particularly interested in these amenities, since creating a bicycle friendly workplace helps recruit new talent and provide employees with an affordable (and healthy) transportation choice.



This guide identifies different types of end-of-trip facilities public and private entities can provide to encourage employees and visitors to arrive by bike.

What's in this guide?



LockUp

Provide secure bicycle parking at convenient locations.



CleanUp

Offer showers and changing facilities for bicycle commuters.



TuneUp

Provide tools cyclists can use to keep their bikes in working order.

Why Invest in End-of-Trip Facilities?

By investing in end-of-trip facilities, businesses and governments can:

Improve employee health

- Employees who bike to work incorporate physical activity into their daily routines, reducing obesity and improving overall health. Employers with healthier workers enjoy lower healthcare costs. For every dollar a business invests in employee wellness programs, such as bicycle commuting incentives, it enjoys \$3 in healthcare savings.¹

Reduce parking costs

- Bicycle parking accommodates more commuters and visitors using less space and at a lower cost per vehicle. Up to 12 bicycle parking spaces fit inside a typical parking space designed for a car.²

Recruit talented workers

- Many people are interested in working for employers that offer amenities that make biking a convenient commuting option. More than 80 percent of young workers (18 to 34 years old) think it is important to have opportunities to live and work without relying on a car.³

Create a positive image

- By investing in bicycle-friendly accommodations, businesses and governments can demonstrate their commitment to creating healthier environments for their employees and the surrounding community. About one-half of consumers will pay extra for products and services from companies committed to having a positive social and environmental impact.⁴

LockUP



Provide secure bicycle parking at convenient locations.



Cyclists need a safe and suitable place to store their bikes. Dedicated parking can be one of the quickest and easiest end-of-trip facilities to add. Well-designed bicycle parking benefits cyclists and others by improving:

Security

- Unlike cars, bicycles do not have self-locking mechanisms or anti-theft devices. Cyclists need to be able to secure their bikes, decreasing the likelihood of theft.

Convenience

- Biking is a more attractive option when parking is available in highly-visible locations near businesses, transit, public facilities, and other destinations.

Functionality

- Bicycle parking can help ensure bikes are stored in an orderly manner that does not interfere with pedestrian or automobile traffic.

Parking facilities can be grouped into two types: **Short-Term** and **Long-Term**.

Short-Term Bicycle Parking

Short-term bicycle parking is for shoppers and visitors who will be at their destination for less than two hours. These types of facilities include bicycle racks and bike corrals.

Bicycle Racks

Bicycle racks are the most common and economical type of bike parking. Each rack can hold one to four bikes in a relatively compact space. However, they offer less



security from theft and vandalism than other types of parking facilities. Unless cover is provided, bicycle racks do not shield bikes from the sun or inclement weather.

Bike Corrals

Bike corrals work in places where demand for bicycle parking is high. Bike corrals transform a standard car parking space or sidewalk area into parking for 10 to 12 bikes with a series of bicycle racks. While space efficient, bike corrals, like bicycle racks, are less secure than other types of parking facilities and offer no protection from the elements.

A positive aspect of bike corrals is that, by removing vehicle parking spaces and cars, they make storefronts more visible. Bikes parked in front of stores make businesses look popular, which can attract more customers.

Design Considerations

Bicycle racks and corrals come in many forms and styles. The most effective designs support the bicycle and are securely anchored to the ground.

Location

- Consider installing parking where bicycles are already being parked.
- Survey cyclists, bicycle clubs, and bicycle advocates for desired parking locations.

Access

- Locate bicycle parking close to building entrances.
- Avoid locations that impede pedestrian traffic.
- Avoid placing bicycle parking upstairs, along narrow passageways, or in other inconvenient locations.
- Place on flat surfaces.
- Provide signage to direct cyclists to bicycle parking, especially if it is not visible from nearby streets, sidewalks, or paths.
- Provide adequate clearance around bicycle racks (see table at right).

Security

- Place bicycle parking in highly-visible, well-lit locations to ensure user safety and discourage theft and vandalism.
- Ensure that bicycle racks are made of durable materials, such as powder-coated metal or stainless steel, which are able to withstand vandalism and exposure to the elements.
- Choose a rack design that allows users to secure bicycles with U-shaped locks. Cyclists should also be able to lock the frame and at least one wheel to the rack.
- Ensure bicycle racks are securely anchored to the ground.
- Protect bikes from the elements by placing parking under an awning, overhang, or other overhead shelter, where possible.
- Separate bicycle parking areas from automobile parking or install curbs, bollards, landscaping, or other barriers to prevent cars from damaging parked bikes.

Cost

Bicycle racks cost \$50 to \$200 per bike to purchase and install. Bicycle corrals are more expensive, accommodating 10 to 12 bicycles at a total cost of \$2,000 to \$4,000.

Bicycle Parking Design Standards Table

Distance between Bicycle Racks

Aligned End-to-End:	Minimum 96" apart
Aligned Side-by-Side:	Minimum 36" apart

Distance from Curb

Racks Perpendicular to Curb:	Minimum 36" from back of curb
Racks Parallel to Curb:	Minimum 24" from back of curb

Distance from Wall

Racks Perpendicular to Wall:	Minimum 48" from wall
Racks Parallel to Wall:	Minimum 36" from wall



Long-Term Bicycle Parking

Long-term bicycle parking is tailored to the needs of commuters, residents, and others parking their bikes for more than two hours. Bicycle lockers and cages provide secure, sheltered storage for bikes at workplaces, residences, transit facilities, and other locations.

Bicycle Lockers

Bicycle lockers are covered storage units that can be locked individually, providing secure parking for one bicycle, along with space for accessories such as helmets and air pumps. They offer the most security and protection from inclement weather, but are also the most expensive type of bicycle parking. Each locker requires a significant amount of space and additional room is needed to load and unload bikes. Bicycle lockers can be managed on a first-come, first-serve basis or can be rented to one cyclist for a specified duration. Because lockers are highly secure, cyclists are more comfortable storing their bikes for long periods of time.

Bicycle Cages

Bicycle cages are secure areas consisting of rows of bicycle racks with limited-access doors. Similar to lockers, bike cages provide a high level of security and protection from the weather while potentially costing less and requiring less space per bike.

Bicycle cages vary in size and amenities provided. Some are as simple as a secure enclosure containing bike racks while others provide repair stations, storage, and changing rooms, sometimes with on-site staff to assist users.

Bicycle Lid

A bicycle lid is a hard-cover shell, sometimes referred to as a “turtle shell,” that slips down over a parked bicycle to provide added security and protection from the elements, serving as an alternative to covered bike parking.

Location

- Consider locating parking where commuters are already storing their bikes.
- Survey bicycle commuters and/or residents for desired parking locations.

Access

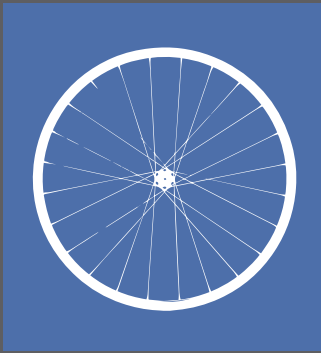
- Locate bicycle parking in garages, buildings, or other sheltered areas.
- Locate parking as close as possible to building entrances.
- If changing rooms or showers are provided on-site, locate bicycle parking near these facilities.
- Avoid locations that impede pedestrian traffic.
- Avoid placing bicycle parking upstairs, along narrow passageways, or in other inconvenient locations.
- Place on flat surfaces.
- Reserve three feet of clearance in front of locker door to allow bikes to be loaded/unloaded.
- Provide signage to direct cyclists to long-term parking, especially if it is not visible from nearby streets, sidewalks, or paths.

Security

- Place bicycle parking in highly-visible, well-lit locations to ensure user safety and discourage theft and vandalism.

Cost

Long-term bicycle parking is more expensive than short-term facilities. Lockers can cost \$1,000 to \$2,500 per bike depending on materials used. Bicycle cages vary in cost depending on the size and level of security. One way to reduce cost is by converting underutilized storage areas or automobile spaces in parking garages to bicycle cages. Bicycle lids cost approximately \$2,000 each.



Local Requirements for Bicycle Parking

Some municipalities require or encourage developers to install bicycle parking within new construction or redevelopment projects. For example, the cities of Houston, Pearland, Sugar Land, and Nassau Bay require bicycle parking to be provided at most commercial buildings. Some communities base the amount of bicycle parking required on building size. Others, Nassau Bay among them, require bicycle parking to be provided in proportion to the number of automobile parking spaces that will be constructed on-site. The City of Dallas allows developers to reduce the number of automobile parking spaces provided if bicycle parking, showers, and/or changing rooms are available to commuters and visitors. Nassau Bay authorizes its Planning Commission to make such reductions as an incentive for providing amenities for cyclists.



Bicycle Parking at Special Events

Concerts, festivals, and other events can draw large crowds. Some attendees may choose to bike to these events, avoiding traffic and parking headaches. To make arriving by bike easier, event organizers offer bicycle parking and bike valets, who will park bicycles for guests in designated locations. Ideally, bicycle parking and/or valets should be located in highly-visible places near main entrances, preventing cyclists from walking or riding their bikes through crowded areas. To deter theft and limit interference with pedestrian traffic, bicycle parking at special events should be placed within temporary barriers to direct cyclists to a single entrance and exit.



CleanUP

Offer showers and changing facilities for bicycle commuters.



In warmer months, cyclists may choose not to bike to work because riding even short distances results in a sweaty commute. Compared to individuals without access to end-of-trip facilities, commuters with showers, personal lockers, and bicycle parking are almost five times more likely to ride longer distances to work and/or other destinations.⁵

Personal Lockers

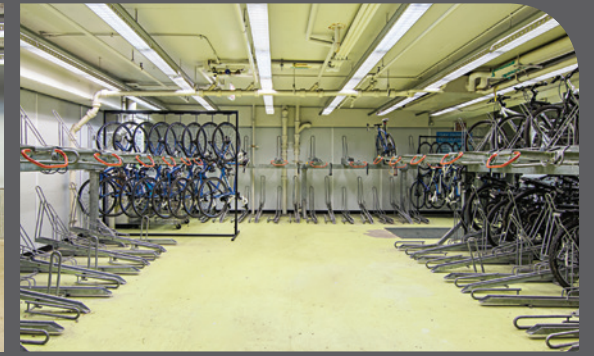
Personal lockers provide a secure place for cyclists to store helmets, other riding gear, and a change of clothes. When possible, personal lockers are best placed within changing or locker rooms, but they are also well-used when located near bicycle parking. Lockers come in a variety of sizes to accommodate cyclists' storage needs.

Design Considerations

- Provide at least one locker for each long-term bicycle parking space.
- Place lockers in a safe, secure area close to bicycle parking and other cleanup facilities.
- Include robust locking mechanisms to ensure security.
- Establish a maintenance routine so lockers remain clean and functional, and perform regular locker audits to gauge use.

Cost

Costs of personal lockers vary depending on size, security level, materials, and aesthetics. For a group of six lockers, costs range from approximately \$350 to \$1,100.



Changing Facilities and Showers

Adequate changing and shower facilities are a powerful incentive for people considering cycling to work. Showers require more management than bicycle parking or personal lockers but are essential if employees must meet a professional dress code after commuting long distances or in extreme weather.

Design Considerations

- Provide at least one shower for the first five long-term parking spaces on-site and an additional shower per 10 subsequent spaces.
- Place changing facilities and showers near bicycle parking and/or major building entrances.
- Ensure facilities are secure and lockable.
- Provide non-slip surfaces to improve safety.
- Install hooks and other accessories to keep belongings off the floor.
- Establish a regular cleaning and maintenance schedule to maximize the use of these facilities.

Cost

The cost of providing changing rooms and showers varies, depending upon the building modifications required to accommodate these facilities. Offering changing rooms is more economical than providing showers as plumbing is not required. An existing underutilized room could be converted into a changing area with only a few alterations. The best way to reduce costs and maximize functionality is by incorporating these facilities into the design of new construction or renovation projects.

Employers who face financial and/or space constraints may be able to negotiate with nearby buildings or gyms to allow their workers to use others' facilities. Some fitness centers offer reduced rates to bicycle commuters who only use the showers. Depending on demand, a changing room instead of a shower, or vice versa, may suffice.

Bike Hubs

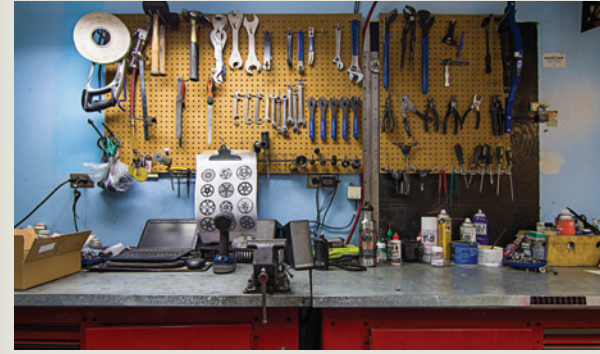
Cities nationwide are building *bike hubs* within major activity centers. Also known as *bike stations* or *bicycle centers*, these centralized facilities offer secure bicycle parking, changing rooms, showers, bicycle shops, and other accommodations for cyclists. Some allow patrons to park their bicycles for free while others charge usage fees or require long-term memberships.

The McDonald's Cycle Center, located in Downtown Chicago, is one of the country's oldest *bike hubs*. It includes showers, lockers, secure bicycle parking, and other amenities for commuters and recreational cyclists.

Up to 300 bicycles can be parked inside the McDonald's Cycle Center.



TuneUP



Provide tools cyclists can use to keep their bikes in working order.



A flat tire or loose bolts make it difficult or impossible to operate a bicycle safely. With the proper tools, most cyclists can fix these problems, allowing them to continue traveling with minimal delay. Bicycle repair stations allow employees and visitors to perform minor maintenance, helping to keep their bikes in good condition. These stations can include a variety of features:

- Air pumps for inflating tires.
- Wrenches and screwdrivers to tighten bolts and make other minor repairs.
- Hanger arms to hold bicycles off the ground, allowing users to move the pedals and wheels as they make adjustments.





A QR code or website visible on the repair station helps cyclists quickly access information about bicycle maintenance using their smartphones. Some businesses provide spare inner tubes, patch kits, and additional supplies employees can use. Large bicycle parking facilities and bicycle hubs often have on-site repair shops or vending machines with repair kits available for purchase.

Design Considerations

- Place repair stations in highly-visible and well-lit locations near bicycle parking.
- Use durable materials, such as galvanized or stainless steel, to help repair stations withstand wear and tear and harsh weather conditions or misuse.
- Provide cover so cyclists can work on their equipment rain or shine.
- Attach tools to the repair station with long, durable cords (such as stainless steel cables) to deter theft. To prevent tangling, use retractable cords or provide adequate spacing between each tool.
- Design the repair station to discourage people from locking bicycles to it.

Cost

Full-service repair stations, suitable for public use, cost \$600 to \$900. Businesses can make air pumps, tools, and other supplies available to employees for a much lower cost. For example, some businesses keep extra equipment stored in on-site bicycle cages so commuters have easy access to these supplies.

Bicycle Facilities at Transit Stations

Many transit users ride their bikes to nearby bus stops and rail stations. METRO and other transit providers have bicycle racks or other accommodations on their vehicles, which allow cyclists to bring their bikes with them. While some riders take bikes to their final destination, others choose to leave them at the station or bus stop. Bicycles parked at transit stations may be stored for long periods, so covered parking and/or bicycle lockers should be provided at secure locations. Repair stations allow commuters to fix flat tires or make other repairs before riding home.



Case Studies



1 Asakura Robinson

Houston, Texas

Creating a Bike- and Street-Friendly Business

Small businesses in the Houston-Galveston area are making it more comfortable and convenient for employees and visitors to arrive by bike. Asakura Robinson, a planning, urban design, and landscape architecture firm, embraces its urban location along Houston's Washington Avenue corridor. Employees cycling to work can park their bikes on an outdoor rack or inside, and they can use the office's shower to freshen up after their commute. The office is located along a city-designated bicycle route and is about ½-mile from shared-use paths. Several employees bike to work a couple of times each month. The company's investment in end-of-trip facilities helped it earn recognition from the League of American Bicyclists as a Bicycle Friendly Business (Bronze). One employee volunteers as the company's bicycle coordinator, helping Asakura Robinson explore additional programs to make cycling an even more attractive transportation option for its workers.

Asakura Robinson not only creates a bicycle-friendly workplace, but it also works with neighborhood organizations to make local streets more hospitable to cyclists, pedestrians, and transit users. The company placed planters along the sidewalk, added benches at bus stops, and encourages nearby businesses to install bicycle racks. It partnered with the First Ward Association to paint bollards along a nearby shared-use path, creating public art and enlivening the street. The company believes these "street-friendly" improvements will make the neighborhood more vibrant, encouraging visitors and new businesses to come to the area, while providing residents with a variety of safe transportation options.

End-of-Trip Facilities Provided

- Bicycle Racks (plus allowance for bicycle storage within the office)
- Employee Shower

Tip

When employees' schedules vary daily, provide a stipend or reimbursement that can be used for a cab ride or participation in a carshare program. That will allow employees working late to get home easily if they do not feel comfortable biking or walking after dark.

League of American Bicyclists: Bicycle Friendly Businesses



The League of American Bicyclists, a non-profit organization that promotes cycling nationwide, recognizes companies that provide exceptional end-of-trip facilities for employees, customers, and visitors arriving by bike. The League has four levels of recognition: Bronze, Silver, Gold, and Platinum. Businesses that received the highest recognition (Platinum) offer well-designed bicycle parking, showers, and lockers, as well as incentives and other policies that support employees commuting by bike. The League has recognized several businesses in the Houston-Galveston area as *Bicycle Friendly Businesses*. For more information, visit bikeleague.org/business.



2 BP: Westlake Campus

Houston, Texas

Making Biking an Attractive Commute Option

Bicycling provides a variety of economic, environmental, and health benefits to businesses, employees, and the surrounding community. Recognizing these benefits, BP is encouraging its employees to bike to work. To make biking a convenient transportation option, BP offers exceptional accommodations for cyclists at its Westlake Campus in Houston's Energy Corridor:

- Secure, covered bicycle parking is situated near the building's main entrance.
- A repair station is located within the secure bicycle parking area, providing commuters with access to air pumps, tools, and supplies to fix flat tires.
- Bicycle commuters are assigned lockers in the building's fitness center, allowing them to store clothes and other necessities overnight.
- Showers are available for use by employees.

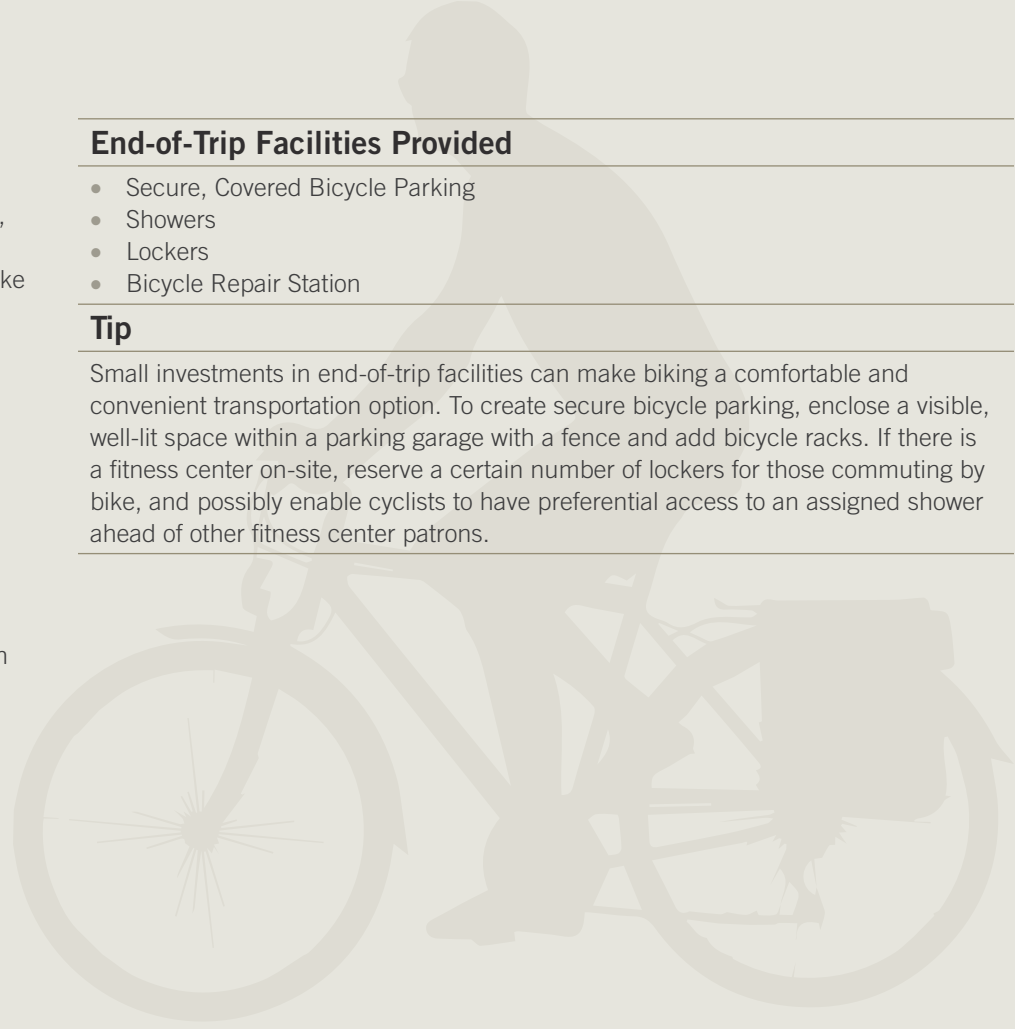
Almost 150 cyclists regularly commute by bike, traveling an average of nine miles from home to work (18 miles round-trip). To make commuting by bike enjoyable for beginners, BP helps interested employees map a safe, bicycle-friendly route to the office. New cyclists are assigned a route buddy, a more experienced rider who lives in the same area and can accompany the newer rider to work. BP supports the Energy Corridor District's annual Bike to Work Day, which provides new and experienced cyclists the opportunity to commute with those working at nearby offices.

End-of-Trip Facilities Provided

- Secure, Covered Bicycle Parking
- Showers
- Lockers
- Bicycle Repair Station

Tip

Small investments in end-of-trip facilities can make biking a comfortable and convenient transportation option. To create secure bicycle parking, enclose a visible, well-lit space within a parking garage with a fence and add bicycle racks. If there is a fitness center on-site, reserve a certain number of lockers for those commuting by bike, and possibly enable cyclists to have preferential access to an assigned shower ahead of other fitness center patrons.





3 Houston Permitting Center

Houston, Texas

Providing Accommodations for Cyclists at a Public Building

Public agencies nationwide, including the City of Houston, are providing bicycle parking and other accommodations at government buildings, encouraging employees and visitors to arrive by bike. When the City converted a historic warehouse into office space for the Houston Permitting Center, bicycle facilities were provided inside and outside of the building:

- Bicycle racks are located near two entrances, making them visible to visitors and passersby.
- Bike lids are placed in employee parking areas, providing commuters with covered, secure bicycle parking.
- Employees have access to large, private showers and lockers.

Incorporating these facilities into the building design provided unique benefits:

- Due to its urban location, the Houston Permitting Center has limited parking for cars. If more people arrive by bike, there is less demand for automobile parking – and more biking by employees will free up limited spaces for customers.
- Projects that include bicycle storage and other facilities may be awarded points as part of the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certification process. The Houston Permitting Center has received Gold-level LEED certification.

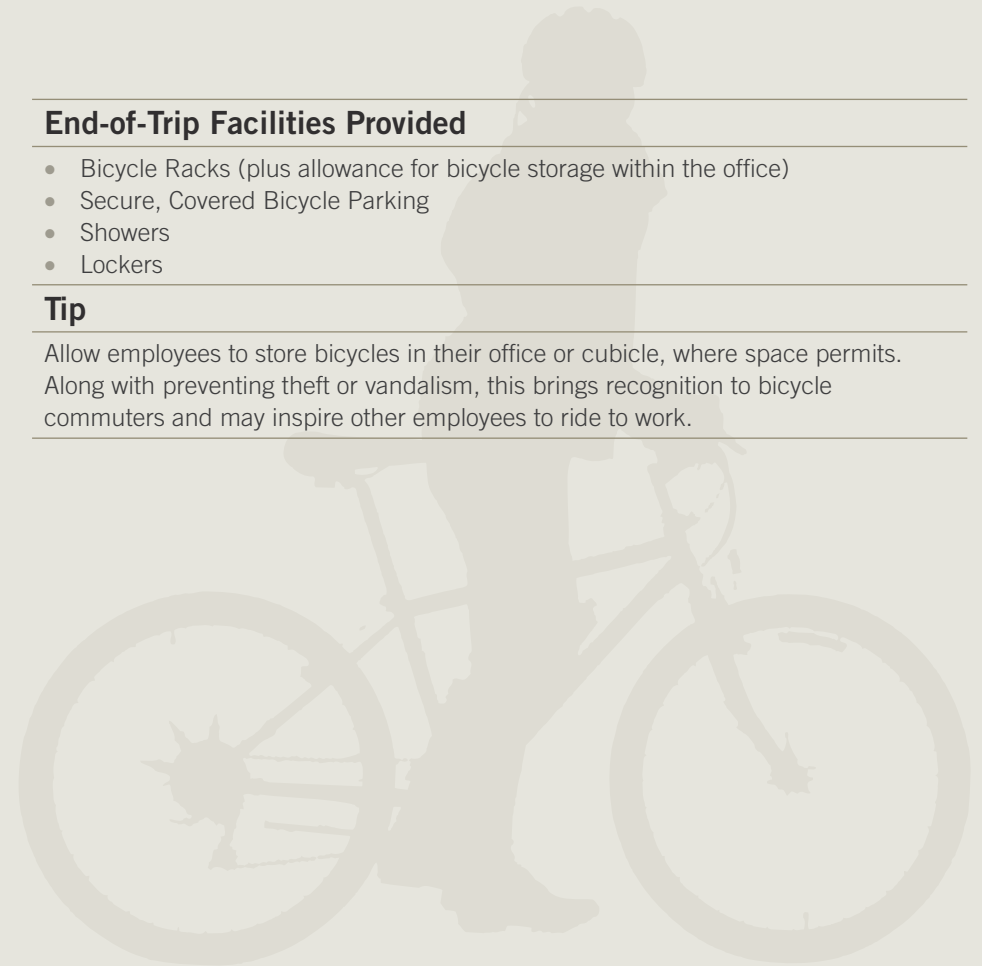
City-designated bicycle routes and shared-use paths are nearby, providing access to different neighborhoods. Several City employees use these routes to bike to work a few times each month. If commuters are uncomfortable parking their bicycles outdoors, they are allowed to store them in their workspaces.

End-of-Trip Facilities Provided

- Bicycle Racks (plus allowance for bicycle storage within the office)
- Secure, Covered Bicycle Parking
- Showers
- Lockers

Tip

Allow employees to store bicycles in their office or cubicle, where space permits. Along with preventing theft or vandalism, this brings recognition to bicycle commuters and may inspire other employees to ride to work.





4 Indy Bike Hub YMCA

Indianapolis, Indiana

Supporting Bicycle Commuters in a Major Business District

Many commuters are interested in biking to work, but their employers do not offer secure parking, showers, or other amenities. The Indy Bike Hub YMCA, a full-service fitness center, provides workers cycling to Downtown Indianapolis with a convenient place to store their bikes and prepare for the workday. The City of Indianapolis, the local YMCA, and bicycle advocacy organizations worked together to open the facility in 2011.

A variety of amenities are available to cyclists:

- Indoor bicycle parking (148 spaces) allows commuters to store their bicycles in a secure area protected from the elements.
- Large lockers are available for rent, providing commuters with a place to stow clothes and other belongings.
- A bicycle repair station outside of the building has tools and an air pump cyclists can use to fix their equipment.
- A bicycle shop offers accessories, repair services, and rentals.
- The local bikeshare program (Indiana Pacers Bikeshare) manages a station nearby.
- Bicycle advocacy organizations and the Indianapolis Metro Police Department's Bicycle Unit have offices in the building.

The facility is easily accessible to bicyclists traveling along the Indianapolis Cultural Trail, an eight-mile shared-use path in the downtown area. Having a centralized facility that provides a variety of services and amenities for cyclists makes commuting by bike an attractive option. Local officials hope the Indy Bike Hub YMCA and other investments aimed at improving pedestrian and bicycle mobility will draw talented professionals to Indianapolis.

End-of-Trip Facilities Provided

- Indoor Bicycle Parking
- Showers
- Lockers
- Bicycle Repair Station
- Bicycle Shop

Tip

Partner with multiple organizations (local governments, non-profits, etc.) to maximize the efficiency and impact of bicycle parking, showers, and other end-of-trip facilities.

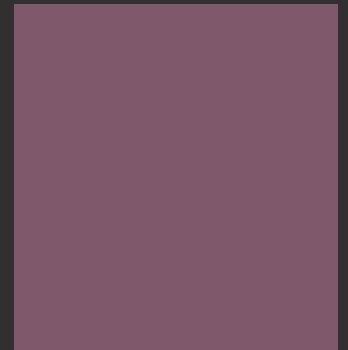
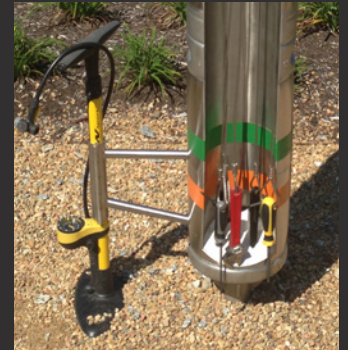


End Notes

1. Blue, Elly. *Bikenomics: How Bicycling Can Save the Economy*. Portland, OR: Microcosm, 2013. (No page)
2. Flusche, Darren. *Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure*. Rep. Washington, D.C.: Advocacy Advance, 2012 (p. 15).
3. Rockefeller Foundation and Transportation for America. *Access to Public Transportation a Top Criterion for Millennials When Deciding Where to Live*. New York: Rockefeller Foundation, 2014.
4. *Doing Well by Doing Good*. Rep. New York: Nielsen, 2014. (p. 2).
5. Buehler, Ralph, Andrea Hamre, Dan Sonenklar, and Paul Goger. *Trends and Determinants of Cycling in the Washington, D.C. Region*. Rep. no. VT-2009-05. University Park, PA: Mid-Atlantic Universities Transportation Center, 2011 (p. 35).

Photo Credits

Asakura Robinson, Dero, Indy Bike Hub YMCA, LADOT, and McDonald's Cycle Center.



Houston-Galveston Area Council
www.h-gac.com/go/pedbike
CE1115

H-GAC is the voluntary association of local governments in the 13-county Gulf Coast Planning region of Texas. H-GAC also serves as the Metropolitan Planning Organization (MPO) for the eight-county Houston-Galveston area. As the MPO, H-GAC is responsible for developing and maintaining the long-range Regional Transportation Plan (RTP). The RTP identifies and prioritizes transportation projects needed to improve mobility in the region, including bikeways.