

CHAPTER 8

PUBLIC TRANSPORTATION AND PUBLIC BIKE SHARE

MULTI-MODAL TRIPS: PUBLIC TRANSPORTATION

Most transit trips begin and/or end with a walk or bike ride. A combination of bicycling and transit makes both modes more useful. Linking bicycles with mass transit — both bus and rail — overcomes barriers such as long distances or poor weather conditions. Transit can also be a supportive alternative when conditions cause a person to be less willing or able to bike, for example when an unexpected weather event or change in plans makes a bicycling trip more of a challenge.

During the past decade, there has been significant growth in bicycle and transit integration. Transit agencies are increasingly adding bicycle racks on buses, allowing bicycles to be brought on board trains, installing bicycle racks and lockers at transit stations, providing staffed bicycle parking facilities (also referred to as bike stations) at major transit hubs, and offering other bicycle services.¹ Bike share programs - where bicycles are made available for shared use to individuals on a short term basis (see the “Public Bike Share” section later in this chapter - generally ensure that bike share stations are well located to complete the bike-transit connection.

There are many reasons for the growth in bicycle and transit integration. Transit agencies have found that bicycle services can provide the following benefits:

- + **Bicycling extends the catchment area for transit services and provides greater mobility to customers at the beginning and end of their transit trips—a solution to the so-called “last mile problem.”**
- + **Bicycle-on-transit services provide bicyclists with the option to take transit to avoid riding after dark, up hills, in poor weather, or in areas that do not provide comfortable bicycle access.**

- + **Bicycle-on-transit is an option for bicyclists who experience mechanical problems or need to get home in an emergency.**
- + **Bicycle and transit integration helps with the goals of decreasing automobile traffic and associated negative impacts of air pollution and congestion by expanding the range and options for people to travel by means other than the car.**

All of these benefits help communities support sustainable travel and make transportation systems work more efficiently.

BICYCLES ON TRANSIT

Cambridge and the Boston area are served by the Massachusetts Bay Transportation Authority (MBTA) which operates four rapid transit rail lines and many bus routes throughout the region. Cambridge works collaboratively with the MBTA to provide better bicycle accommodations at stations and on transit vehicles. In addition, Cambridge works on its own to improve bicycle and transit integration in other ways, such as by providing additional bike parking near transit stations.



Figure 8.1: Bikes loaded onto MBTA buses.²

The MBTA has made significant improvements for bicycle access in recent years, both at transit stations and on transit vehicles. All non-electric³ MBTA buses now have racks to carry bicycles on the front of the bus. The current MBTA program, “Bikes on the T,” allows passengers to bring their bicycles on the Red, Orange, and Blue Lines, as well as on the Commuter Rail. However, access is limited at certain hours, stations, lines, and times. Folding bikes are allowed on all vehicles at all times when folded. The Newburyport/Rockport and Cape Flyer Commuter Rail lines run special high-capacity bike cars at certain times during the summer.

For current rules and regulations, as well as updates to the system, visit the MBTA’s [Bikes on the T](#)⁴ webpage.

PARKING AT TRANSIT STATIONS

In Cambridge, outdoor bicycle parking is available at all MBTA subway stations and covered parking is available by the Central Square Red Line station. Bike parking is also available at the First Street Garage near the Lechmere Green Line Station.

The MBTA has been expanding bicycle parking at major transit stations with Pedal & Park bike parking cages. Currently, these facilities exist at 14 stations and fit between 50 and 150 bikes each. There are three at the Alewife MBTA station, each accommodating up to 150 bikes.⁵

There is no charge to users for the parking. The cages are covered and enclosed with security fencing. Security cameras and controlled-access doors greatly enhance bicycle safety and security. To access the bike cages, bicyclists need to obtain and register⁶ a free plastic Charlie Card or Bike Charlie Card (Figure 8.2).



Figure 8.2: Bike CharlieCards allow users to access Pedal & Park stations.



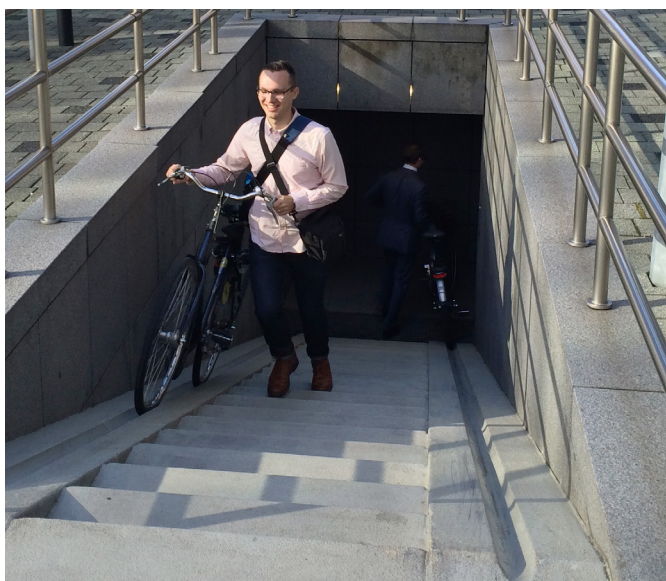
Figure 8.3: Pedal & Park at Alewife MBTA Station (photo: David Loutzenheiser)

In conjunction with the planned expansion of the Green Line to Somerville and Medford, Lechmere Station will be moved and a new station will be constructed, including a bicycle parking cage expected for completion in 2017.

IMPROVING BIKE ACCESS ON TRANSIT

Other enhancements to public transportation can help make the system friendlier to bicycles. As trains and buses are replaced or the system is expanded, additional improvements can be made, such as integrated bike racks in rail cars and buses or expansion of hours when bikes are allowed on board. Improvements that make it easier to carry bikes onto buses and trains can also support increased bicycling as well as support accessibility goals more generally.

These improvements include low-floor buses, elevator access, and stair channels for wheeling bikes up staircases. A stair channel (Figure 8.4) is a smooth channel(s) along the edge of a stairway that is used to roll a bicycle up and down the stairs. Since bicycles are not allowed on the escalators and elevators are often not conveniently located, stair channels are an enhancement that makes taking bikes up and down stairs more manageable.⁷



PUBLIC BIKE SHARE

Bike share is a public transportation system using bikes. Users are able to pick up a bicycle at any self-serve bike-station and return it to any other station located within the system's service area. Bike share is ideal for short distance point-to-point trips. Bike share programs are well positioned to connect people up with a bus or rail system, accommodating the last mile or so between home or work and transit.

The availability of bike share has encouraged more people to ride, as it eliminates some of the barriers that might otherwise exist for people to try out a bike. Bike share:

- + **Makes bikes available to those who don't own a bike**
- + **Eliminates worry about bicycle theft and the hassles of bike maintenance and repair**
- + **Takes care of details such as bike lights and baskets**
- + **Provides bikes for those who don't have bike storage at their home or office**
- + **Enables people who travel in from further out to use a bike in town**
- + **Offers an inexpensive option, with minimal capital investment**

Bike share also provides visitors with a great way to travel around the city easily.

The value of these systems is self-evident: they have proven to be wildly popular. By the end of 2014, 855 cities across the globe had bike share systems. That's compared to 703 one year earlier in 2013, and only 11 cities a decade earlier in 2004.

Figure 8.4: Stair channels allow people to easily roll their bicycles up and down stairs.

HUBWAY

Hubway is Cambridge's regional bike share system. The participating municipalities are Cambridge, Boston, Brookline, and Somerville. Through the public procurement process, managed by the Metropolitan Area Planning Council (MAPC), additional municipalities in the greater Boston region may also join. The system is fully integrated amongst the participating municipalities, providing a seamless experience for users taking the bikes across municipal boundaries.

In 2011, Hubway was launched in Boston, followed by Cambridge, Brookline and Somerville in 2012. The system is owned by the municipalities, who contract with a vendor to operate and manage the program. There is reciprocity across the system, meaning that a user can retrieve a bike in Cambridge and return it to a station in Boston, Brookline, or Somerville, or vice versa.

The growth of the Hubway system, both in size and ridership, has been dramatic since its launch, with continually increasing use on every measure. The Hubway system is being expanded on an ongoing basis; in 2015-16, Cambridge plans to add another 15 stations to the 33 existing ones in the city.

Funding for Hubway is provided through a combination of federal and state grants, municipal funds, and private sponsorships and donations. In Cambridge, as of 2015, several major partners have funded stations, including Harvard University



Figure 8.5: CambridgeSide Galleria Mall Hubway. The Mall was one of the first private partners to support a Hubway station in Cambridge.

(7 stations), MIT (4 stations), CambridgeSide Galleria Mall, Google, Biogen, BioMed Realty, and EF Education First. For the full list of donors and partners, please visit CambridgeLovesBiking.org¹⁸

Starting in 2013, Cambridge operated its Hubway stations year-round; the first two winters saw almost 81,000 trips during the seasonal operations.



A user survey was conducted in January 2014 to get feedback from members. Key findings include:

- + **45% of respondents take Hubway to/from work or school. 13% use it to access public transportation, 13% use it for errands or shopping, and 13% use it for social events or going to restaurants.**
- + **An overwhelming majority – 62% of respondents – use Hubway because it is the fastest way to get to their destination. 15% said they use Hubway because it is fun and they enjoy being on a bike.**
- + **61% of respondents said that, in a typical week, they replaced at least one motor vehicle trip with a Hubway trip. 29% replaced four or more motor vehicle trips with a Hubway trip.**

A forthcoming report on Hubway statistics and user surveys and will be available on the City of Cambridge's [Bikes in Cambridge](#) webpage.

Hubway by the numbers

- + **Busiest station in the system: MIT at Mass Ave/Amherst St - 68,660 total station visits in 2014. 6 of the top 10 busiest stations are located in Cambridge**
- + **Busiest day ever (through 1/1/15): Wednesday, July 30, 2014 - 7,020 trips**
- + **12,673 annual members and 88,779 casual passes (24-hr & 72-hr) in 2014**
- + **2.7 million trips made,⁹ 1.9 million lbs of CO2 offset, 2.7 million miles traveled, and 168 million calories burned between 2011 - 2014**
- + **The system has over 140 stations across all four participating municipalities**



THE BENEFITS OF BIKE SHARE

ACTIVE TRANSPORTATION AND HEALTH

- + Nice Ride, Minneapolis – 7% took a trip they would not otherwise have taken
- + Capital Bikeshare, DC – 16% of reported taking trips they wouldn't otherwise make.¹¹

REDUCING CAR USE

- + In Capital Bikeshare's 2011 Member Survey, more than 41% of users reported reducing their number of car trips after joining.
- + A 2010 survey for Nice Ride indicated that 20% of bike share trips replaced car trips
- + A 2014 Hubway survey indicated that 8% of users would have used a motor vehicle for their last trip had Hubway not been available and that two-thirds replace car trips with Hubway at least once/week.

ENCOURAGING BICYCLING¹²

- + A study of the BIXI system in Montreal, published in the *American Journal of Public Health* concluded that "The implementation of a public bike share program can lead to **greater likelihood of cycling** among persons living in areas where bicycles are made available."¹³
- + Bike shop owners in DC have seen an increase in bike sales in the two years since Capital Bikeshare began operating, and many new customers have said that they were inspired to **purchase their own bike** after using bike share.

Number of Cities Around the World with Bike Sharing Systems

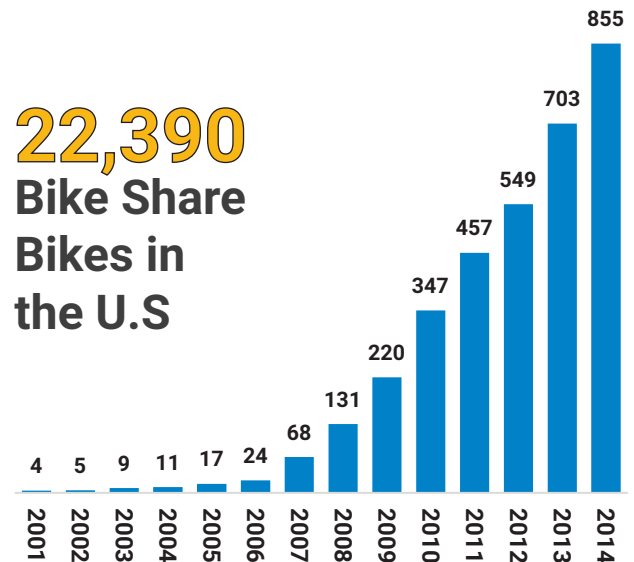


Figure 8.7: Table showing increase of bike-sharing around the world as of December 31, 2014.¹⁰

SAVING MONEY

- + Bicycling in general is an extremely inexpensive transportation choice, second only to walking. Bike share is very low cost, and is often **less expensive** than owning a bike, taking into consideration maintenance and wear and tear. A Hubway membership, for example, is only **\$7/month**.¹⁴
- + Capital Bikeshare users reported saving an average of **\$819 per year**. Most of these savings came from avoiding costs related to driving like gas, parking, and vehicle maintenance. Others reported saving money by replacing taxi trips with bike-share rides.¹⁵

SUPPORTING THE LOCAL ECONOMY¹⁶

- + Studies show that **local businesses benefit** from stations located nearby.

REFERENCES

- Janet Larsen, "Bike-Sharing Programs Hit the Streets in Over 500 Cities Worldwide" Earth Policy Institute (2013), http://www.earth-policy.org/plan_b_updates/2013/update112.
- Lisa Selin Davis, "Rolling Along the Last Mile: Bike-sharing programs blossom nationwide," Planning Magazine (2014): pp 11-12.
- Paul Demaio, "Bike-sharing: History, Impacts, Models of Provision, and Future" Journal of Public Transportation (2009): Vol. 12 No. 4 pp. 40-56.
- Daniel Fuller et al., "Impact Evaluation of a Public Bicycle Share Program on Cycling: A Case Example of BIXI in Montreal, Quebec," American Journal of Public Health (2013), <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2012.300917?journalCode=ajph>.
- Barbara Goldberg, "After 23 million rides, no deaths in US bike-share programs," Reuters, 2014, <http://www.reuters.com/article/2014/08/12/us-usa-transportation-bikes-idUSKBN0GC10T20140812>.
- 8 City of Cambridge, "Cambridge loves biking!" Hubway, 2015, <https://www.thehubway.com/partners/cambridge>.
- 9 The three million trip milestone was hit on May 28, 2015.
- 10 MetroBike, "The Bike Sharing World – 2014 – Year End Data," MetroBike, 2015, <http://bike-sharing.blogspot.com/2015/01/the-bike-sharing-world-2014-year-end.html>.
- 11 Dr. Ralph Buehler and Andrea Hamre, "Economic Benefits of Capital Bikeshare: A Focus on Users and Businesses," Mid-Atlantic Universities Transportation Center, 2013, <http://ntl.bts.gov/lib/51000/51900/51965/VT-2013-06.pdf>.
- 12 Erin Gustafson, "US Hits 30 Bike Shares in Just Four Years," Sierra Club Green Transportation, 2012, <http://sierraclub.typepad.com/compass/2012/08/us-hits-30-bike-shares-in-just-four-years.html>.
- 13 Daniel Fuller et al., "Impact Evaluation of a Public Bicycle Share Program on Cycling: A Case Example of BIXI in Montreal, Quebec," American Journal of Public Health (2013), <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2012.300917?journalCode=ajph>.
- 14 Hubway, "Pricing," Hubway, 2015, <https://www.thehubway.com/pricing>.

ENDNOTES

- 1 Transportation Research Board, "Integration of Bicycles and Transit: A Synthesis of Transit Practice, TCRP SYNTHESIS 62," Transportation Research Board, 2005, http://gulliver.trb.org/publications/tcrp/tcrp_syn_62.pdf.
- 2 Charles River Transportation Management Association, Image: "Bike and Walk Programs," Charles River Transportation Management Association, <http://www.charlesrivertma.org/bike-walk/>.
- 3 As of May 2015, electric buses are used on routes SL1, SL2, SLW, and 71. Massachusetts Bay Transportation Authority, "Sustainability Report." MBTA, 2015, http://www.mbta.com/about_the_mbta/environment/.
- 4 Massachusetts Bay Transportation Authority, "Bikes on the T," MBTA, 2015. http://www.mbta.com/riding_the_t/bikes/.
- 5 Massachusetts Bay Transportation Authority, "Bikes on the T."
- 6 Massachusetts Bay Transportation Authority, "Bike Registration," MBTA, 2015, https://www.mbta.com/riding_the_t/bikes/register/Default.asp.
- 7 Wilbur Smith Associates, "BART Bicycle Access Parking Plan," Volume 1: pp 1-11, Bay Area Rapid Transit, 2002, http://www.bart.gov/docs/bart_bicycle_access_parking_plan.pdf.
- 15 Erin Gustafson, "US Hits 30 Bike Shares in Just Four Years."
- 16 Dr. Ralph Buehler and Andrea Hamre, "Economic Benefits of Capital Bikeshare: A Focus on Users and Businesses," Mid-Atlantic Universities Transportation Center, 2013, <http://ntl.bts.gov/lib/51000/51900/51965/VT-2013-06.pdf>.