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# A Policy and Infrastructure Analysis of Bicycle Friendly Campuses: an Examination of Three Atlanta-area Universities

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**A Policy and Infrastructure Analysis of Bicycle Friendly  
Campuses: An Examination of Three Atlanta-Area  
Universities**

Virginia Kincaid

A Capstone Submitted to the Graduate Faculty  
Of Georgia State University in Partial Fulfillment

Of the

Requirements for the Degree

MASTER OF PUBLIC HEALTH

Georgia State University

Atlanta, GA

2014

## **Table of Contents**

Acknowledgements .....	3
Executive Summary.....	4
Chapter I - Introduction .....	5
Chapter II - Review of Literature .....	7
Chapter III – Methodologies .....	21
Chapter IV –Campus Photo Journal .....	22
Chapter V – Recommendations and Conclusions .....	24

## Acknowledgements

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## Executive Summary

With the rise of obesity rates and health problems associated with inactivity, communities are being challenged to find ways to promote regular exercise. This can be done through increasing opportunities for active transportation, or physical activity that is primarily done with the goal of moving from one place to another. Bicycling, both for recreation and commuting purposes, increases physical activity levels and improves environmental sustainability.

The purpose of this Capstone project is to provide background information on bicycling as it relates to physical activity and sustainability at college campuses. This includes an evaluation of built environments, programs, and policies that promote bicycling for active transportation and increase overall ridership. A comparison analysis was done using photos taken at three Atlanta-area campuses, the Georgia Institute of Technology, Emory University, and Georgia State University.

Based on the photo journal assessment of these three Atlanta campuses, recommendations are provided to improve overall quality of experience for bicyclists at these schools. Several future implications for the Atlanta area are also discussed, including the arrival of the Atlanta Streetcar, and the Cycle Atlanta Plan.

## Chapter I Introduction

Bicycling is a popular pastime in the United States and internationally. For decades, people of all ages have been using bicycles as a means of physical activity and as a way of commuting or transportation. The National Safety Council estimates that over 35 million Americans ride bicycles (NSC, 2008). Over 16 million bicycles were sold in the United States in 2011, and \$6 billion was spent on bicycles, accessories, and parts (National Bicycle Dealers Association, 2012). The United States Department of Transportation estimates that the number of bicycling trips increased from 1.7 billion in 1990 to 3.3 billion in 2001 (NHTSA). This number will increase as areas become more bike friendly- equipped with built environments conducive to bicycling, and as the nation continues to emphasize the importance of disease prevention through physical activity.

The National Highway Traffic Safety Administration divides bicyclists into three main categories. These categories include purposive riders, recreational riders, and children. Purposive riders are adults 16 and older that are "commuting, doing errands, or otherwise using the bicycle as a means to accomplish something" (NHTSA). Purposive riders are often taking the shortest and quickest route, and may be at greater risk for injury due to heavy motor vehicle traffic and non-ideal bicycling accommodations (NHTSA). Recreational riders are adults 16 and older that are riding for

exercise or entertainment (NHTSA). Recreational riders are more likely to use low-traffic roads or areas with bike-only facilities, and often avoid complex road environments (NHTSA).

The benefits of physical activity include reducing the risk of diabetes, obesity, cancer, heart disease, and osteoporosis, along with improving mental health and sleep patterns. However, according to the Centers for Disease Control and Prevention, only 20 percent of adults meet the recommended guidelines for physical activity (CDC, 2013). The Department of Health and Human Services recommends 60 minutes or more of moderate-to-vigorous activity daily for youth and 150 minutes weekly for adults (US DHHS, 2008). Community policies should increase opportunities for active transportation, where residents can get exercise by walking or biking as part of their daily routines. Active transportation is physical activity that is done primarily with the goal of moving from one destination to another. Bicycling improves overall quality of life by increasing the opportunity for physical activity and decreasing dependency on automobiles, which contribute to poor air quality and greenhouse gas emissions (Dannenberg, Frumkin, & Jackson, 2011).

The primary aims of this Capstone are to: 1- provide background information on bicycling as it relates to physical activity and the sustainability of college communities, 2- analyze barriers and promotional efforts for bicycling on campuses, with specific attention to policy and

infrastructure, 3- explore the current landscape of bicycling at three Atlanta-area campuses; the Georgia Institute of Technology, Emory University, and Georgia State University, through the use of photos to illustrate various features that promote cycling, and lastly, 4- provide recommendations for campuses to become more bicycle friendly.

## Chapter II Review of the Literature

### Physical Activity

The American College Health Association concludes that less than half of college student populations participate in regular physical activity (American College Health Association, 2011). "Strategies that encourage staff and students to commute using an active mode have the potential to not only reduce the demand for parking and the university's impact on the environment, but also to improve the health of staff and students" (Shannon, Giles-Corti, Pikora, Bulsara, Shilton & Bull, 2006). In order for this to be an option, communities must be designed with street connectivity, safety, density and other factors in mind.

The link between physical activity and built environments has become clearer in recent years. Attributes of the community design around us play a vital role in either promoting or hindering physical activity. Aspects like urban form, infrastructure and facilities become pertinent when discussing



cycling in various areas. Urban form includes distance, the network layout and mixture of functions. Distance plays one of the most important parts in determining an individual's decision to cycle or not (Heinen, Van Wee, & Maat, 2010). Several studies show that increases in cycling distance lead to an increase in time required for commuter trips and therefore decreases the likelihood of cycling as distance grows (Moritz, 1998; Zacharias, 2005; Pucher and Buehler, 2006). Because of this, commuters using a bicycle as a mode of transportation tend to live closer to their work (Cervero, 1996). Network layout can also impact total distance so it is also important in regards to bicycle utilization within urban areas.

Other indicators of bicycling include the presence of infrastructures like bike paths, designated bike lanes, and street markings as well as facilities like bike parking and shower and locker facilities (Heinen, Van Wee, & Maat, 2010). Natural environments, like landscape and hilliness, and weather play a role in bicycling. Changes in altitude can have a negative effect on bicycle use (Rietveld & Daniel, 2004). Some research suggests that socioeconomic factors influence bicycling patterns, but conclusions are mixed in regards to the relationship between cycling, age and income (Heinen, Van Wee, & Maat, 2010). Attitudes and social norms play a key role in whether someone chooses to bicycle or not. People's attitudes are generally more positive towards car use than bicycling, but having a positive attitude towards bikes increases the likelihood of commuting by bicycle (Dill & Voros, 2007). Social

network and connections impact an individual's decision to bicycle in that if coworkers use cycling for transportation, it is more likely that other individuals will cycle as well (Dill & Voros, 2007). Cycling for commuting purposes is also impacted by perceived importance of the health-related benefits of bicycling as well as negative perceptions of car use (Gatersleben & Appleton, 2007) (Stinkson & Bhat, 2005).

## Sustainability

Transportation policies on campus help shape the habits of students and faculty. As questions are raised as to what role humans play in environmental impact, communities are increasingly considering sustainability as a major topic of discussion- this considers the impact of current transportation systems. "A sustainable transportation system has been defined as one that satisfies current transport and mobility needs without compromising the ability of future generations to meet their own" (Black, 1997 and Richardson, 1999). Major environmental impacts include air pollution and energy consumption; however minor impacts such as land use, water pollution, wildlife disturbance, noise pollution and waste disposal are also considerations (Tolley, 1996). These issues ultimately play a role for those on a university campus because of teaching disturbance, loss of natural environments, a lack of pleasing aesthetics, and health impacts (Tolley, 1996). As urbanization and population growth continues, the idea of

city resiliency will become more important. Zhao et al. discuss the importance of developing policies that aim to enhance city resiliency through recognition of the human impact on climate change and the environment as well as natural resource shortages (Zhao et al., 2013). City resiliency can be improved through strategies that aim to reduce overall vehicle miles traveled (VMT) like increasing density and land use mix within urban areas as well as promoting alternative modes of transportation (Zhao et al., 2013).

It is common at many colleges and universities for a high percentage of students to be living on campus or within a reasonable distance of campus; therefore walking and bicycling are corresponding modes of transportation for getting to campus and traveling around campus (Balsas, 2003). Cycling is unique in that in addition to improving health, it can improve air quality through reducing greenhouse gas emissions. This is why increasing the proportion of trips made by cycling has been labeled a major objective within Healthy People 2020 (Ransdell, Mason, Weurzer, & Leung, 2013). Bicycles provide people an opportunity for speed and flexibility for short distances, while producing no pollution or noise, and can be accommodated with little space at a relatively low cost and are an option for those that cannot drive or don't have access to a motor vehicle (Tolley, 1996).

Cars create a significant economic, environmental and eventually major health burden (Tolley, 1996). In addition to air pollution, car

commuting causes congested conditions, which equal high levels of stress and less time for physical activity. Those commuting by car are more likely to have health problems, have higher absenteeism rates, are less punctual and are less productive (Shayler et al., 1993). In the article *Green Campuses: cutting the environmental cost of commuting*, Tolley summarizes the economic burden of car-centric universities:

“The most obvious cost, however, is the provision by the university of facilities that enable people to commute by car, particularly parking space. The costs of providing parking facilities include the salaries and associate overheads for car park attendants; the administration costs; the asset value of the land used for car parking; the taxes paid on the car-parking space; the capital costs of establishing the car parks and the maintenance and repair costs for them” (Tolley, 1996).

Reducing the number of students and faculty that commute by car creates environmental and health benefits and has potential to save money and ultimately makes attendance at the university more attractive which reaps other benefits as well. Campuses can reduce costs by focusing on policies that make a commitment to reducing environmental impacts associated with commuting, such as incentives for using other modes of transportation and utilizing speed controllers (Tolley, 1996).

## Bicycle Friendly Campuses- Barriers and Promotional Efforts

Only two percent of all trips in the United States are made by bicycle, which highlights the United State's emphasis on cars (Pucher et al., 2011). Multiple reasons contribute to why bicycling is not as popular in the U.S., but common barriers to cycling include difficulty carrying loads while biking, dealing with weather conditions, and increased travel times (Heinen, Van Wee, & Maat, 2010). Additionally, many people fear bicycling because of safety reasons. Insecurity can sometimes merely be perceived, but more often legitimate fears stem from a lack of built environment features to enhance the quality of a cyclist's experience. Because cycling for transportation is relatively uncommon, cultural barriers exist in the relationship between bikers and drivers which ultimately can contribute to the hundreds of fatalities and thousands of injuries that happen each year (National Highway Traffic Administration, 2010). Many cyclists do not follow traffic rules, which can cause resentment towards cyclists among drivers. Therefore, increased education and enforcement is needed to help all road users share the same space (Balsas, 2003).

Many college campuses lack adequate infrastructure including bike paths and lanes, intersection treatments, signage and parking. "Accidents can occur because of speeding, mixing types of traffic, poor right-of-way design, and college-age youth's propensity to ride outside the routes designated for bicycles and to ignore traffic rules and regulations" (Dober,

2000). The lack of bicycle parking or improper parking is a major deterrent for students and faculty for riding to and around campus.

Specific characteristics that have been shown to increase overall ridership include a mix of built environment features, along with programs, promotions and educational strategies. Physical environment features include on-road bicycle lanes, off-street paths, speed controllers, bike parking, and racks on public transit. Speed controllers and traffic-calming measures are features such as speed humps, traffic lights, and traffic circles that are strategically put in place to reduce speeds, change driver behavior, and improve overall conditions for bicyclists and pedestrians (Dannenberg, Frumkin, & Jackson, 2011). Cycling is encouraged through the implementation of programs that educate on bicycle safety; this includes how to ride and park, security measures and bike maintenance, as well as how to share the road with pedestrians and motorists (Corbett, Gilpin, & Renfro). Other programmatic efforts include bike share programs, group rides, ride to work or school days, and ciclovias. Bike share programs are “comprehensive mobility systems that use a fleet of bicycles and stations spread over an area to provide inexpensive and accessible transportation to communities” as well as provide individuals with a convenient option for multi-purpose trips (Corbett, Gilpin, & Renfro). Group rides and bike to work or school days help create a bicycling presence within communities, and promotes active transportation and an alternative to commuting by car.

Ciclovía events promote health, community, and active transportation by closing streets to cars and encouraging participation in walking and bicycling ([Atlantastreetalive.com](http://Atlantastreetalive.com)).

The League of American Bicyclists is an organization founded in 1880 and represents a movement towards safer roads, stronger communities and a more bicycle-friendly America ([bikeleague.org](http://bikeleague.org)). The League of American Bicyclists uses the “5 E’s” as a system to measure how bicycle friendly various cities and other areas are, including universities. These 5 E’s include engineering, education, evaluation, enforcement, and encouragement. Engineering refers to a connected network, bike parking, street ordinances and other policies that help accommodate cyclists. Education regards safe routes to school programs, and education for motorists and cyclists to use the road responsibly. Evaluation asks the question of whether a comprehensive plan exists to reduce motor vehicle traffic and increase cycling, as well as a bicycle advisory committee and bicycle program manager. The enforcement portion of the 5 E’s looks at police officers and other officials that are trained to help regulate the promotion of cycling within areas. Encouragement includes the availability of up-to-date bicycle maps, bicycle advocacy groups, and promotional events like ride to work days and community cycling events.

The National Association of City Transportation Officials (NACTO) has developed an Urban Bikeway Design Guide, which outlines various strategies

for creating bike-friendly communities. The Design Guide, which is part of the Cities for Cycling Initiative aims to give cities solutions for creating safe and enjoyable complete streets for bicyclist (NACTO, 2014). The NACTO Design Guide discusses multiple types of treatments that can be implemented in urban areas to improve the overall quality of cycling. The Design Guide does mention however, that these various types of structural strategies are based on an assessment of cities worldwide, and therefore would impact some urban areas differently, and might not be efficient or reasonable in some cities. Many of the treatments provided by NACTO can help existing campus roadways function better by providing more direct and quicker connections to and through campus (Corbett, Gilpin & Renfro). The following is a list of physical environment features included in the Urban Bikeway Design Guide:

Bike Lanes: specific portions of the roadway that are designated by striping, signage, and pavement markings for exclusive use of bicycles

-Conventional bike lanes: located adjacent to motor vehicle travel lanes and flow in the same direction as car traffic; typically located on the right side of the street between travel lane and road edge

-Buffered bike lanes: conventional lanes with an additional buffer space that separates the bicycle lane from the travel or parking lane



-Contra-flow bike lanes: designed for allowing cyclists to ride in the opposite direction as car traffic; typically these lanes make a one-way street into a two-way street

-Left-side bike lanes: conventional bike lanes located on the left side of one-way streets or two-way streets that are divided by a median

Cycle Tracks: physically separated from motor vehicle traffic and distinct from a sidewalk

-One-way protected cycle tracks: covers one-way on street level using a variety of methods for physical protection from traffic

-Raised cycle tracks: vertically separated from traffic; can be designed as one-way to two-way travel

-Two-way cycle tracks: physically separated track that allows for bicycle movement in both directions and on one side of the road

Intersections: through increased level of visibility, these treatments help to reduce tension between bicyclists (and pedestrians) and motor vehicles

-Bike boxes: designated area at the head of a signalized traffic lane that gives cyclists a safe way to become more visible during a red light

-Intersection crossing markings: markings through an intersection that indicate the path for bicyclists

-Two-stage turn queue boxes: these provide bicyclists with a safer way to make left turns at intersections with multiple lanes from a right side cycle

track or bike lane, or to make rights turns from a bike lane or cycle track on the left side

-Median refuge island: protected spaces in the center of the street to help bicyclists and pedestrians when crossing the street

-Through bike lanes: used for conventional bike lanes when cars must cross the bicycle area in order to make a turn

-Combined bike lane/turn lane: a bike lane within the inside portion of a dedicated car turning lane; designated by a dashed line

-Cycle track intersection approach: designated treatment for cycle tracks at intersection approaches to reduce conflict between turning cars and cyclists

Signals: provide clarification for bicyclists and other users of the road

-Bicycle Signal Heads: electronically powered device used in combination with conventional traffic signals used to identify safety for bicyclists

-Signal detection and actuation: used to alert signal controller of the demand for bicycle crossing

-Active warning beacon for bike route at unsignalized intersection: user-actuated amber flashing lights that supplement warning signs at unsignalized intersections or mid-block crosswalks

-Hybrid signal for bike route crossing of major street: also known as a high-intensity activated crosswalk (HAWK); this signal with two red lights indicates a crossing

Signing and Marking: the primary purpose of this treatment is to alert bicyclists, motorists and pedestrians of the presence of bicycle facilities

-colored bike facilities: colored pavement used to increase visibility of bicycle area and potential areas of conflict

-colored pavement material guidance: used for either a corridor treatment or as spot treatment; can be used either as an overlay or as part of the pavement mixture

-shared lane markings: also known as "sharrows," these road markings indicate a shared environment for bikes and cars

-bike route wayfinding: comprehensive signage and pavement markings to guide cyclists to destinations and to keep them on preferred routes

Bicycle Boulevards: streets with low motorized traffic volumes and speeds that are designed to give bicycles priority

- route planning: direct access to destinations

- signs and pavement markings: easy to find and follow

- speed management: slow motor vehicle speeds

- volume management: low motor vehicle volumes

- minor street crossings: minimal bicyclist delay

- major street crossings: safe and convenient crossings

- offset crossings: clear and safe navigation

- green infrastructure: enhancing environments

*Perspectives in Planning* developed an article formulating the best practices in university bicycle planning. The article discusses important components in helping develop a bicycle-friendly campus. These factors include everything from campus bicycle master plans, city coordination, innovative facilities, bicycle parking, bike sharing and other programs, and evaluation and monitoring (Corbett, Gilpin, & Renfro). Master plans regarding bicycling on campuses should stay consistent with other campus-wide planning, such as transportation plans, and other development plans (Corbett, Gilpin, & Renfro). In Tolley's article *Green Campuses: cutting the environmental cost of commuting*, he discusses strategies for adopting bicycle-friendly policies through the physical environment, administrative measures, promotional measures and economic measures. The following are specific strategies outlined by Tolley:

1. Restrain cars by introducing full-cost car parking charges and forgoing with car parking expansion projects
2. Provide abundant and secure bicycle parking, with an emphasis at residence halls
3. Ensure easy access to showers and changing rooms for commuters
4. Construct bicycle paths, or modify existing roads to make them conducive for safe and efficient cycling

5. Establish a bicycle advisory committee to prioritize bicycling needs
6. Run educational courses on safety and bike maintenance, and confident cycling
7. Provide on-campus bike repair facilities
8. Promote cycle initiatives through various channels of communication
9. Communicate with local authorities to link campus-related facilities with those off campus
10. Offer financial incentives to those that commit to commuting by other means than a car
11. Run a bike program to make low-cost bicycles available

The Bicycle Friendly University Program through the American League of Bicyclists exists to recognize higher education institutions that work to promote and provide a more bike-friendly campus. An online application that can be completed over several months is used to assess the 5 E's that were previously mentioned. After the deadline has passed, the applications are sent to reviewers in the local area. The applications then pass on to a panel of judges in order for status to be determined. The categories of award are Platinum, Gold, Silver, Bronze, and Honorable Mention. Platinum status signifies excellence across the board. These campuses offer a safe biking network, bike

parking, educational programs, and a significant police presence. Gold level campuses are bicycle friendly, and have developed a culture of biking, but could improve in areas like accessibility and education. Silver universities meet most of the "5 E" standards, but could put more effort into two or three of them to draw attention to the culture of cycling at their campus. Bronze colleges are taking important steps at becoming more bike-friendly in all of the five E areas, but mostly in one or two. Improvements in the bronze category could mean adding bikes lanes, bike racks, and increasing awareness through educational programming. Honorable Mention recognizes those colleges and universities that have just started working towards addressing cycling needs on campus. If no recognition is given then most issues revolving around cycling still need to be addressed. The Bicycle Friendly University Program provides a feedback report that can help universities establish goals for becoming more bicycle friendly ([bikeleague.org](http://bikeleague.org)).

### Chapter III Methodology

In the spring of 2014, three Atlanta-area campuses were examined for existing bicycle infrastructure and programmatic activities. Photos were taken at the Georgia Institute of Technology, Emory University, and Georgia

State University. Research was done prior to the campus visits, in order to understand specific features that would need to be captured, including programmatic representation and built environments. The photos were taken on different days over a span of four weeks. Bicycle suitability maps were used at Georgia Tech and Emory as a guide for understanding existing infrastructure that needed to be included in the photo journal. A campus map was used at Georgia State University as well as a map of bike rack locations. The maps provided a strategic guide for walking around campus to take photos. The photo journal is the product of one individual and all photos are original. No formal interviews were held at these campuses, although informal discussions occurred with students and staff regarding the presence of bike-related structures or programs.

Photos were taken and later evaluated for placement in the photo journal based on picture quality and how well they represented the concepts discussed within this paper. Photos of surrounding Atlanta areas, like Woodruff Park and Hurt Park, were taken at Georgia State University. Some photos were not used to avoid redundancies, for example, only some of the photos of bike racks were used as a sample of overall bike rack presence.

## Chapter IV Photo Journal

Three Atlanta-area college campuses, Georgia Tech, Emory University, and Georgia State University all have unique opportunities and challenges

related to bicycling. The League of American Bicyclists gave Georgia Tech the silver award for bicycle friendliness in the fall of 2013 and Emory was given a bronze award ([bikeleague.org](http://bikeleague.org)). Georgia State University does not currently have an official bicycle friendly status given by the League of American Bicyclists.





# Campus Photo Journal

A Picture Analysis of Three Atlanta Campuses

# Introduction

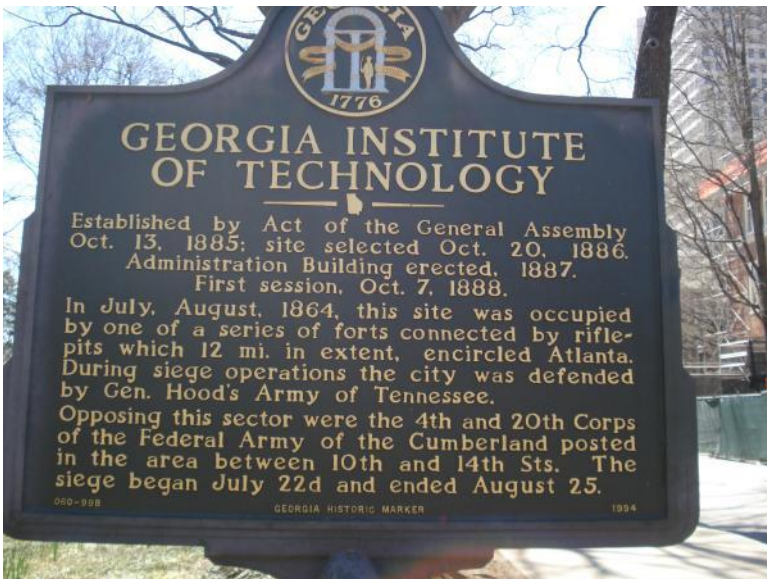
The Bicycle Friendly University Program through the League of American Bicyclists recognizes higher education institutions that work to promote and provide a more bike-friendly campus. This photo journal provides a visual analysis of the current state of cycling at The Georgia Institute of Technology, Emory University, and Georgia State University with specific attention to built environment and program features.

# Georgia Institute of Technology



## Georgia Tech At a Glance:

- Founded: 1885
- 21,500 students
- 1,000 full-time instructional faculty
- Current Bicycle Friendly University rating: Silver



# 2012-2013 Campus Bike Suitability Map

## Low Difficulty

- Generally has at least three of the following features:
  - Recommended by area bicyclists as alternatives to main roads
  - Slow-speed traffic
  - Low traffic volumes
  - Wide right lanes, bikeable shoulders, or bike lanes
  - Limited merge lanes, "right turn only" lanes, commercial driveways, and on-street parking

## Medium Difficulty

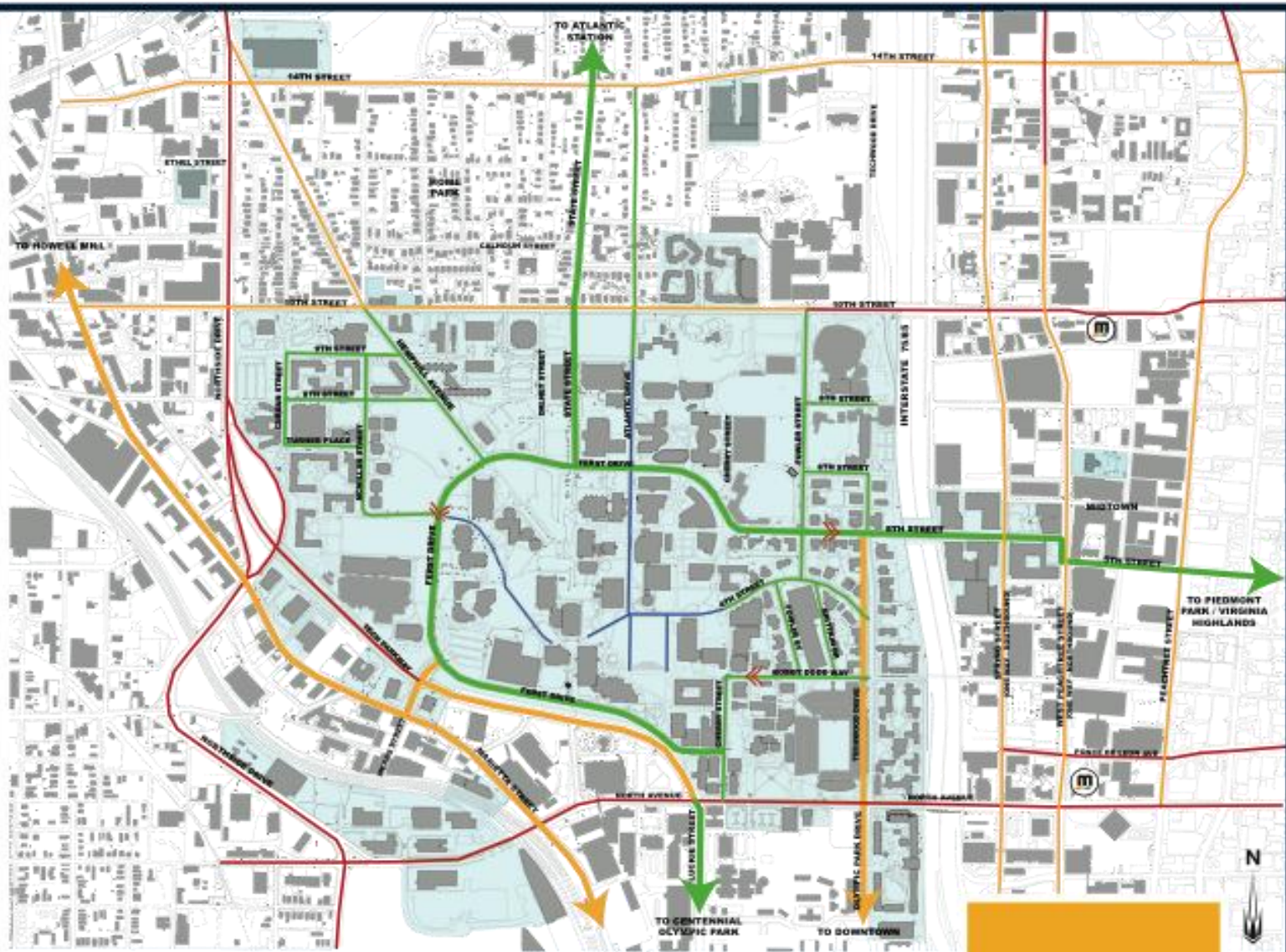
- Generally has at least three of the following features:
  - Recommended by area bicyclists as alternatives to main roads
  - Medium-speed traffic
  - Moderate traffic volumes
  - Wide right lanes, bikeable shoulders, or bike lanes
  - Limited merge lanes, "right turn only" lanes, commercial driveways, and on-street parking
  - Few blind curves or blind hills

## Higher Difficulty

- Generally has at least three of the following features:
  - High-speed traffic
  - Heavy traffic volumes
  - Relatively narrow lanes and no bikeable shoulders or bike lanes
  - Merge lanes, "right turn only" lanes, commercial driveways, and on-street parking
  - Blind curves and long, steep hills

## Georgia Tech Multiuse Pathways

- Travel slowly
- Give plenty of room to pedestrians
- If you are passing from behind, announce yourself ("passing on your left")
- If pedestrian density is high, dismount and walk your bike



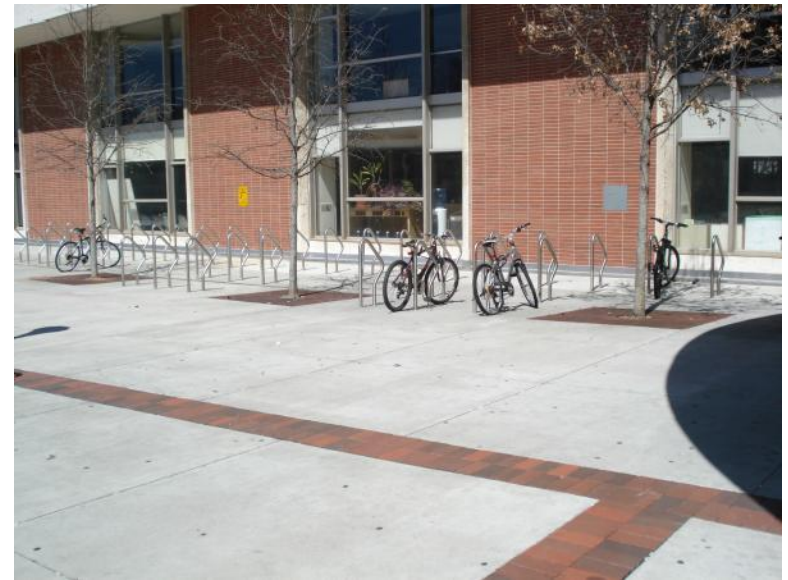
➤ Long or Steep Hills  
Uphill in Direction of Chevrons

MARTA Rail Station



# Bike Racks

An extensive number of bike racks are located at Georgia Tech. The racks are located in prominent areas and outside of most buildings.







# Multiple bike racks are located in student-housing areas







A shared-lane arrow, or “sharrow” is placed in the middle of a lane to indicate the presence of bicyclists and to notify motorists of their use of the full lane. Sharrows also help designate the direction cyclists should travel.

Sharrows are located on several streets on the Georgia Tech campus. One of the main streets, Techwood Drive, is lined with sharrow markings along with subsequent connecting streets.



Bike lanes help accommodate cyclists and create a safer and more comfortable riding experience. Bike lanes are located on the main road, Ferst Drive, through the Georgia Tech campus.







Georgia Tech implements the use of a bike stairway. These innovative infrastructures allow for easy transport of bikes up and down stairs. This staircase is located in the central part of campus.

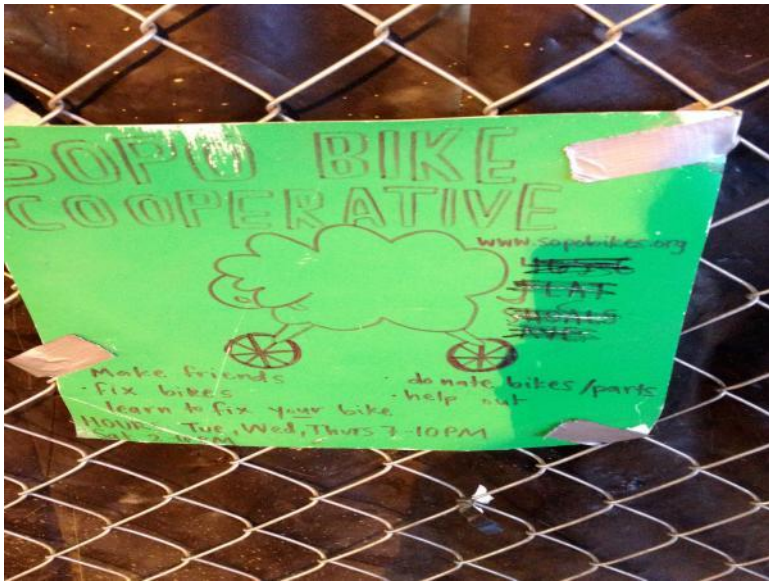
# Bike Maintenance

On-campus bicycle maintenance facilities provide cyclists with extra convenience. This bike fix-it station is located in the central part of the Georgia Tech campus.



# Bicycle Programs at Georgia Tech







Georgia Tech has multiple programs dedicated to biking around campus. The programs include the Bicycle Infrastructure Improvement Committee (BIIC), Starter Bikes, Outdoor Recreation Georgia Tech Mountain Biking, and a Bicycle Registration program. The BIIC formed in 2010 by the GA Tech Student Government Association in an effort to improve biking conditions around campus. The goals of the BIIC include evaluation of biking-related facilities, program implementation, and to increase funding for related projects.

Key mission points of the BIIC include:

- Create a Campus Bicycle Master Plan
- Recommend yearly project priorities
- Identify and pursue a diverse set of funding sources
- Coordinate bicycle education and outreach campaigns
- Promote interdepartmental coordination for improvement





Georgia Tech's Starter Bikes Program is a collaboration between the school's Students Organizing for Sustainability group and the Atlanta Bicycle Coalition. The main idea behind Starter Bikes is providing low-cost options for students and community members that need inexpensive, but reliable transportation. Starter Bikes also provides free access to tools for cyclists to fix their bikes, as well as offering bikes to people that would like to try cycling, but don't want to commit financially to the investment. The costs of bikes through Starter Bikes range from free to \$150 varying on quality and condition and these bikes can be bought back. Additional items such as locks, lights, and helmets can be sold through Starter Bikes as well.

# Georgia Tech's Bike Week



Georgia Tech's bike program holds Bike Week once a year. This initiative was created to encourage more people to ride their bikes and is promoted through events, competitions, prizes and additional incentives. The main focus of the week includes the "Commuter Challenge" which enables students and faculty to log miles biked to and around campus. Additional events during Bike Week include helmet decorating, a bike show, and a ride with the Georgia Tech President. Bike Week is a collaboration between several school organizations including the Bicycle Infrastructure Improvement Committee.

# Safety, Security, and Signage

Since security is often brought up in discussion around bicycling on college campuses, Georgia Tech has created a bicycle registration program that allows for students and employees to register their bikes with the Georgia Tech Police Department. This can help the police department locate bikes in the event that they are lost or stolen.



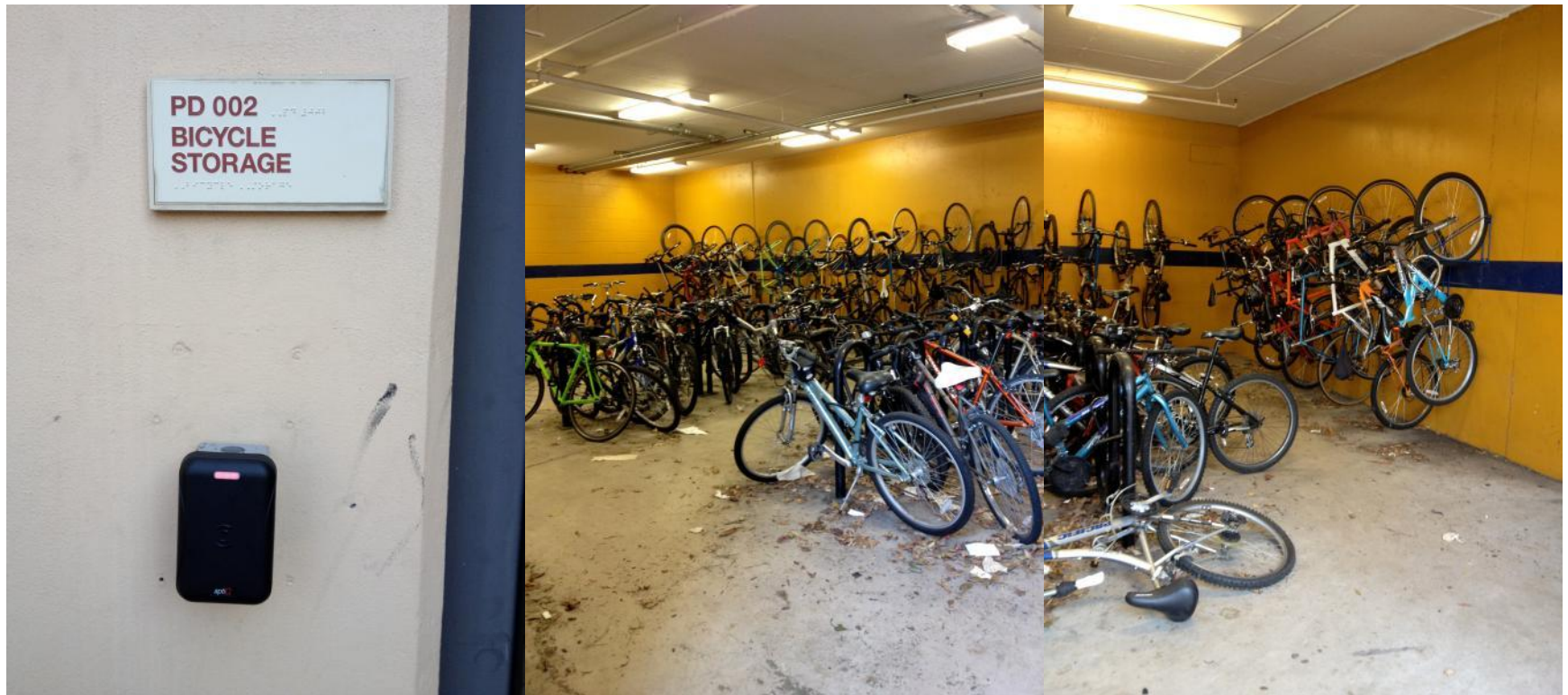


These U-LOCK signs are placed in a highly visible area near bike racks on campus. They serve as a security reminder for students and faculty.



This bicycle parking map provides the locations of additional racks on campus. This sign is located in high-traffic bike areas.

This mass bicycle unit is located near university housing and allows for secure storage. Georgia Tech gives riders or bystanders the opportunity to complete incident report forms in the event of an accident or other bike-related problem. This helps raise awareness to common problems as well as work towards a safer campus.



Biking is built into the culture of Bicycle Friendly Campuses, like Georgia Tech. The presence of utilized bike racks, and informational signage depicted here helps promote cycling to potential riders.





# Emory University



Emory at a glance:

-Established in 1836

-14,513 students

-13,023 employees

Current Bicycle Friendly University rating: Bronze

# Bike

# EMORY.

## Emory Campus/CDC Area Suitability Map



When entering a roundabout be sure to ride in the center of the lane and do not pass other vehicles. Riding in the center of the lane is the safest position for a bicyclist in a roundabout.



Clifton Road has shared lane or "sharrow" markings which reinforce law by reminding motorists that bicyclists should be expected on the road and in the center of the lane. On busy and narrow multilane roads cyclists should ride in the center of the lane.

THIS AREA OF DETAIL ON CAMPUS IS INDICATED ON NEXT TWO MAP PAGES

- Green routes = Best conditions for bicycling
- Yellow routes = Medium conditions for bicycling
- Red routes = Most difficult conditions for bicycling
- Green dots = paved and unpaved shared-use-paths; and other various short cuts (surfaces and access can vary)

# BIKE.EMORY.EDU

# Bike Emory

Emory University's bicycle program, called Bike Emory, was created in 2007 as a partnership between Emory University, Fuji Bikes, and Bicycle South. Jamie Smith is the Director of the Bike Emory program and the Manager for Strategic Business Solutions and Innovations at Emory University within the Finance and Administration Division. The overarching goal of Bike Emory is to build a great bike culture at Emory by enabling more people to travel on a bike and to do so safely. Emory has a formal bike parking policy in their Transportation Handbook that states regulations regarding illegally parked bicycles as well as bikes abandoned and parked for 30 days or more. Incentive policies include discounts for those that register as bike commuters which allow riders to obtain a pass for 20 or more car parking days in the event of inclement weather or for other reasons in which riding a bike to school or work is not possible. This allows cyclists to not feel restrained by being only a bike commuter, but can drive if necessary. Registering as a commuter also gives faculty members the option to use a ride home provided in the event of inclement weather or bike issue. These types of policies help to reduce possible barriers to cycling and increase overall ridership.

# Bike Racks







# Bike Lanes



Emory University's campus has a bike lane on North Decatur Road, which is a main street for Emory students and faculty, as well as the city of Decatur.

Emory University also has a bike lane on Eagle Row. This road runs next to campus housing and connects two main streets, Oxford Road and Clifton Road. Traffic-calming measures are used to help drivers recognize that bicyclists and pedestrians are sharing the area.





Sharrows run on Clifton Road through a central area of the Emory Campus. Clifton Road also acts as a main corridor for the Centers of Disease Control and Prevention's Roybal Campus and Children's Healthcare of Atlanta.



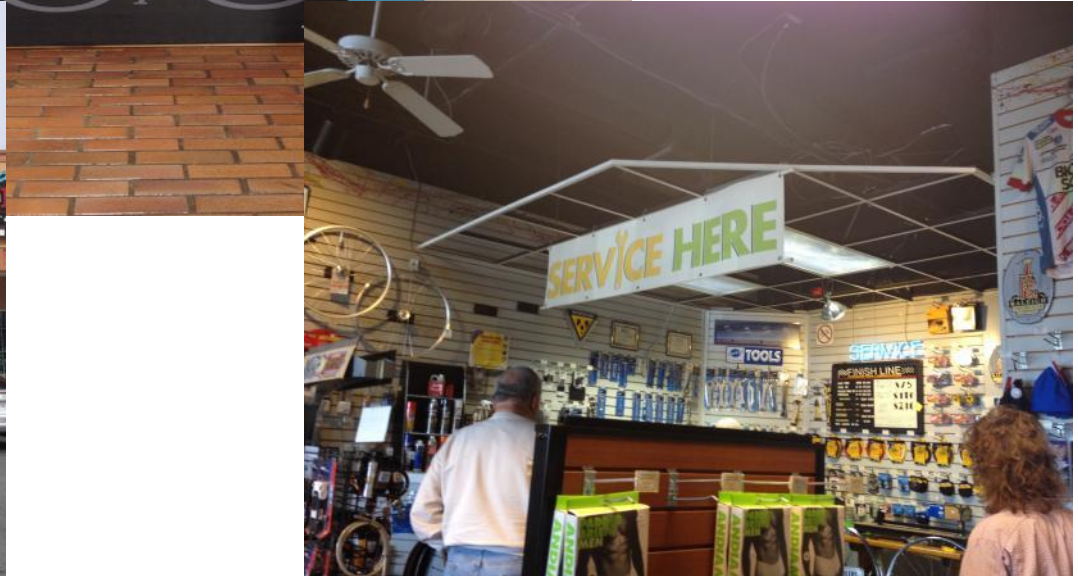
The Emory Campus has two bicycle maintenance stands.



# Safety, Security, and Signage







Through the Fuji partnership, Bike Emory currently offers the sale of five bicycle models and extensive accessories ranging from fenders, racks, helmets, bags, lights, locks, and other safety equipment. Bike Emory's repair shop, the HUB, is centrally located and operated by Bicycle South staff.



Fuji University is a project aimed at assisting universities around the United States to increase sustainability efforts through the promotion of healthy lifestyles, including the benefits of walking and cycling around college campuses. This partnership allows Emory University to offer cyclists with discounts of bikes, bike services and a bike share program. Emory's bike program slogan "why not?" helps contribute to a campus-wide culture centered around biking.

Signage and markings help contribute to the perception of bikes around campus, and can create appreciation through drawing attention to various programs and biking opportunities. Seen here is a banner promoting sustainability through cycling and an innovative way of bike map utilization.



Road maintenance is vital for creating a bicycle friendly environment. Potholes and travel areas with fading road treatments can contribute to incidents or to riders' fear of sustaining injury and can be a deterrent to bicycling. This pothole depicted was found on Clifton Road in a sharrow area.



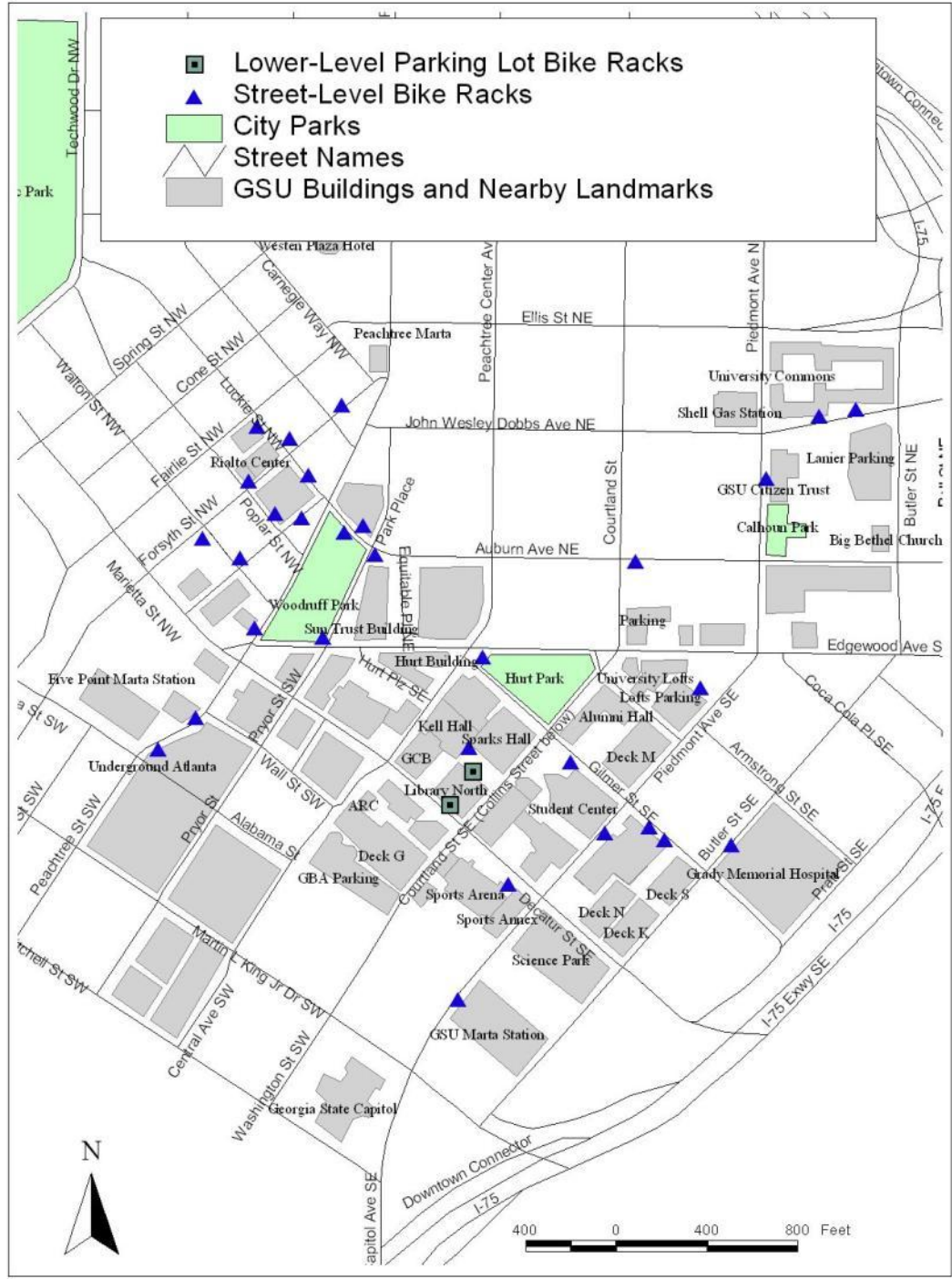


# Georgia State University



## Georgia State At a Glance:

- Founded: 1913
- 32,000 students
- 3,500 faculty
- Currently seeking Bicycle Friendly University award



# Bike Racks

Bike racks are located around the Georgia State campus. Additional racks could be a relatively inexpensive investment for GSU to become more bicycle friendly. Currently, GSU does not have a formal policy on bicycle parking, enforcement, or any type of bike registration. Developing a policy on bicycle parking should be a goal that will support, regulate, and help to monitor biking on campus.







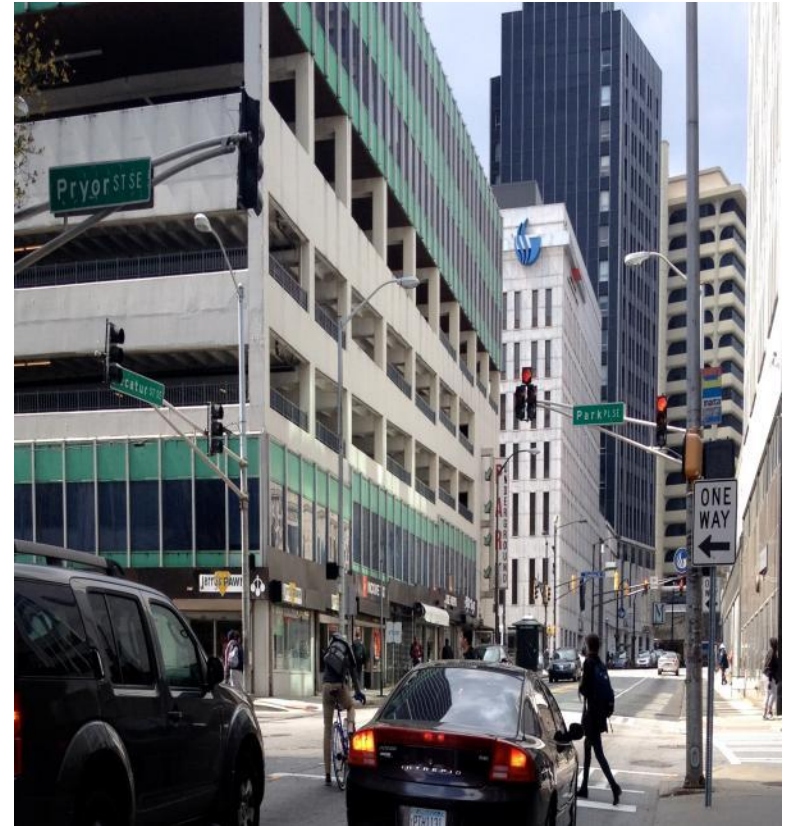
Bikes are often illegally parked to the fence at the intersection of Decatur Street and Central Avenue, near Classroom South and Langdale Hall. One benefit of a campus bicycle plan is to examine the placement of bicycle racks and add them in the areas of greatest need.



University Commons, which is the largest facility for student housing at GSU, is a popular area for bicyclists. Bicyclists would benefit from a protected bike lane that runs towards campus on Piedmont Avenue from University housing.



Road conditions near Georgia State are hazardous for bicyclists. Decatur Street, which is depicted below, has heavy pedestrian and car traffic. Bicyclists are subjected to high volumes and speeds and often use the sidewalks. This creates a major hazard for pedestrians.



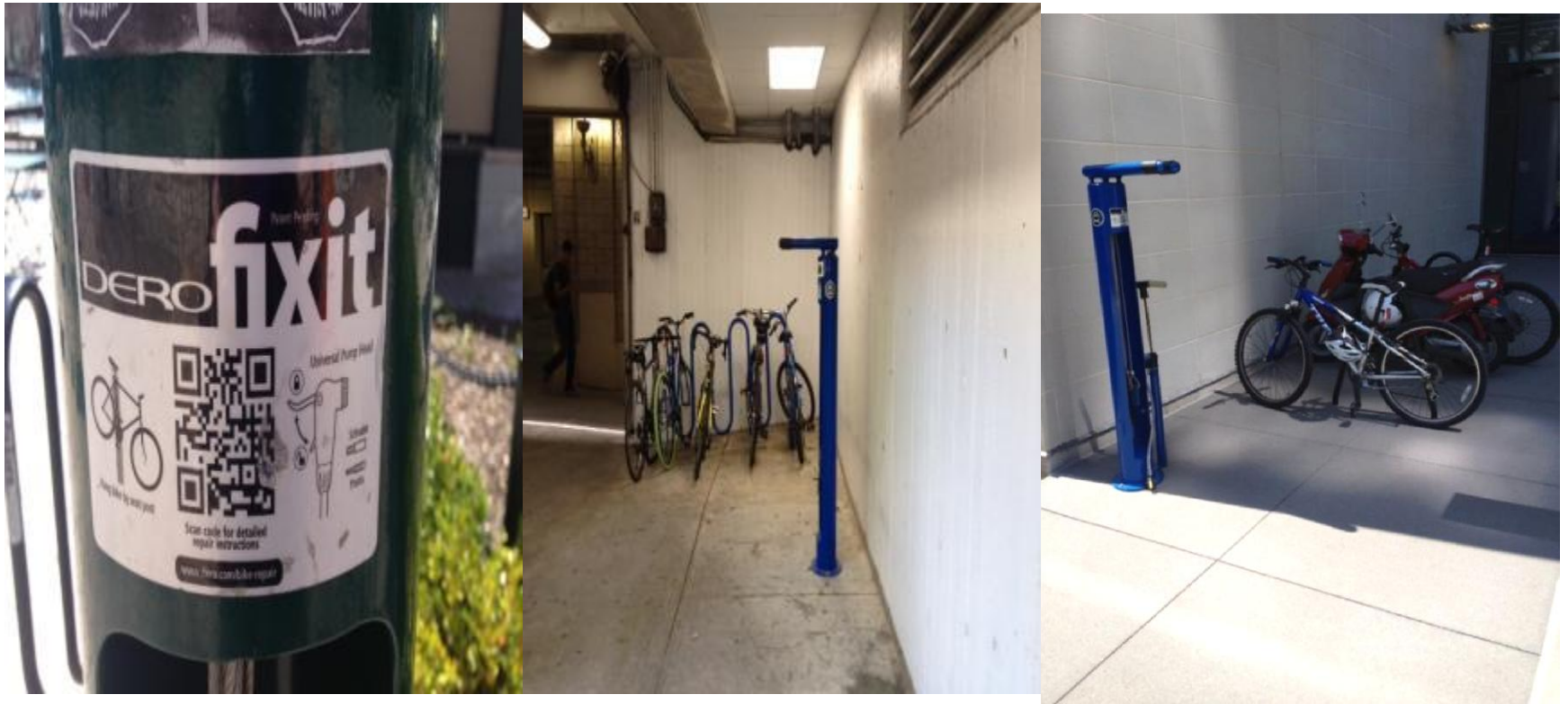


Construction is often a problem for bicyclists in urban areas.

Road hazards and changing routes can create stress or dangerous situations. Road projects can discourage biking and walking unless temporary conditions related to construction accommodate bicyclists and pedestrians.



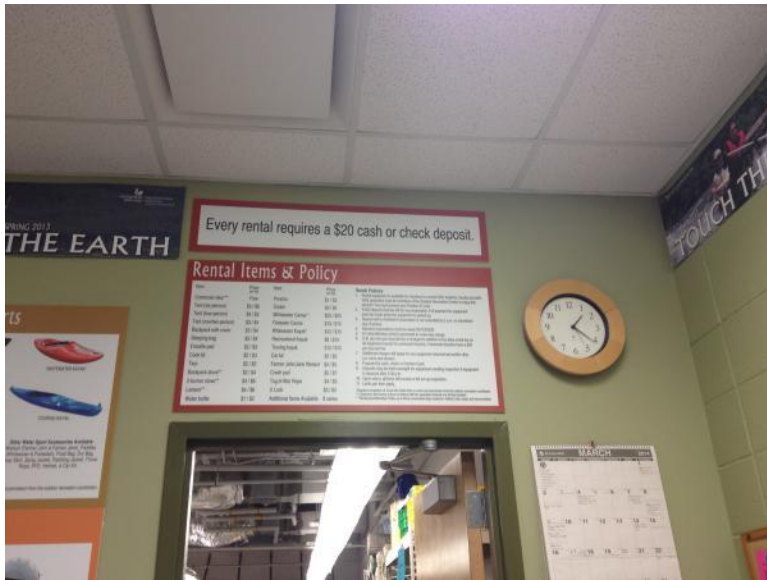
# Bike Maintenance



Bike fix-it stations are located behind the Petit Science Center and in the parking area at Collins Street. A Woodruff Park fix-it station can also be utilized by students, faculty, and other Atlanta-area bikers passing through.

# Panther Bikes at Georgia State University

A project known as GSU Bicycling for Transportation, or GSU Bikes, was formed in 2009 when GSU'S Institute of Public Health received a grant from the United States Environmental Protection Agency for a student-led project. The overall aim of GSU Bikes, now called Panther Bikes, is to shift Georgia State University from a car-centric campus to a more bicycle and pedestrian friendly area.



Georgia State implemented a bike-sharing program in 2010 which allows students and faculty to rent a bike for free through the student recreation center. Touch the Earth, a program through the student recreation center, also has a bike shop that allows for minor bicycle repair services. A current goal of the GSU bike program is to increase the number of bikes available and to raise awareness to the Bike Share program. The future Atlanta citywide bike share program will overlap with the Georgia State and has potential to increase student and faculty ridership.



In 2010, GSU Bikes held a bike-rack design competition. Student Spencer Murrill designed and built the bike rack that is located on Gilmer Street in front of the Student Center in Unity Plaza. The bike rack is located in a prominent area and helps promote bicycling around campus.

# Safety, Security, and Signage



The Bicycling for Transportation at Georgia State University project aims to understand trends and attitudes associated with cycling around campus. Students were surveyed in 2009, 2011 and 2013. At the time of this capstone, data from 2009 and 2011 has been analyzed through two student theses. The results of these surveys show that availability of information regarding bicycling around campus has improved from 2009 to 2011, but suggests that promotional efforts could be increased. Addressing safety concerns cited in these surveys and program expansion through group rides and events revolving around bicycle promotion can contribute to a more bicycle-friendly campus.

In 2014, Georgia State University collaborated with the Atlanta Regional Commission and the Atlanta Bicycle Coalition in order to begin the development of a campus wide bicycle plan. GSU also participates the Atlanta Bicycle Coalition's bike counts to better understand ridership around campus.





A campus-wide open house was held to better understand potential improvements for creating a better campus for bicycling. Student, faculty, and community members were invited to share recommendations as well as highlight areas where cycling is of concern.

Georgia State University Campus Bicycle Plan  
Identifying Major Barriers & Opportunities

What are *major issues* that deter bicycling to or within GSU campus?

Where are *locations* that make bicycling to or within campus difficult?

How could bicycling to or within campus be improved?

How could bicycling to or within campus be improved?

Multise Paths - See Embarcadero - San Fran. "Faster Bike traffic use green (road) slower bike traffic Allowed on Multise Paths (side walk)"

- Decatur St B/T  
Butler & Peachtree Center
- Piedmont Bt

**Georgia State University – Campus Bicycle Plan  
Comment Form – March 2014**

Do you ride a bicycle to or within the GSU campus:  Yes  No  
Would you like to ride a bicycle more frequently:  Yes  No

What do you see as the biggest barriers to cycling on campus?

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What improvements would you like to see for bicycling on campus?

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Other Comments:

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Contact Information (optional):

Name: \_\_\_\_\_

Email: \_\_\_\_\_

On-Campus Resident? \_\_\_\_\_

Home Zip Code: \_\_\_\_\_

# Next Steps for Georgia State University

- Develop a bike plan for the university
- Increase bicycle access and accommodations through bike racks, facilities, and signage
- Add a protected bike lane on Piedmont from university housing towards campus
- Affect culture change through additional bike programs and promotions
  - Apply for Bicycle Friendly University status

Proper bicycling environments must be developed and maintained in order to increase opportunities for active transportation and promote sustainability on college campuses. Georgia Tech, Emory, and Georgia State should continue their efforts to improve overall quality of life for students and staff through infrastructure, policy, and program development.



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## Chapter V Recommendations and Conclusions

With continued emphasis on the importance of physical activity, sustainability, and pollution prevention, creating opportunities for active transportation around college campuses will become increasingly important. Also, because of growing interest in sustainability, university officials will find it necessary to prioritize the environmental impact of decisions made around campuses. It is likely that the trend towards being bicycle friendly will continue to increase in coming years.

Although they are at different levels of bicycle friendliness, Georgia Tech, Emory, and Georgia State can all benefit from maintaining current infrastructure and increasing the number of bike racks to meet bike parking demand. These universities should maintain relationships with local jurisdictions and community partners, like the Atlanta Bicycle Coalition and the Atlanta Regional Commission, to create and maintain bicycling environments (Corbett, Gilpin, & Renfro). Even though collaboration among student groups and school administration is essential in creating bike friendly campuses, with so many players involved, establishing a bicycle advisory committee is vital (Tolley, 1996).

Georgia Tech and Emory fulfill many of The American League of Bicyclists' 5 E's and recommended physical infrastructures as well as programmatic policy implementations that help create an environment suited for cyclists. Georgia State University has created a strong foundation

for opportunities to grow as a bicycle-friendly campus in coming years. Georgia State University can look to Georgia Tech and Emory for guidance as well as recommendations from the League of American Cyclists to advance strategies revolving around the 5 E's that help make communities more bicycle friendly. Georgia State has unique challenges compared to the other universities in that the campus has no boundaries and is not set apart from major Atlanta roads quite like Georgia Tech and Emory.

Specific recommendations for Georgia State University to increase and improve bicycling on campus include adding bike parking. GSU should also add shower and locker facilities and educate cyclists on use, as the availability of these facilities is a strong preference for bicyclists (Heinen, Van Wee, & Maat, 2010). Adding a protected bike lane on Piedmont Road would benefit bicyclists traveling from GSU University housing to campus. GSU has a unique opportunity compared to Georgia Tech and Emory because of the proximity to public train transportation, MARTA. A part of the GSU bike plan can include promoting that bicycles are allowed on MARTA trains and buses to allow students, faculty and others affiliated with the university to commute via transit from greater distances than might be considered solely by bicycle, which may increase the potential for active transportation ([itsmarta.com](http://itsmarta.com)). Georgia State should add signage around campus that functions as directional and informational and promotes

bicycling as a commuting option. Bicycle signage helps reinforce bicycle priority within cities (Pucher & Buehler, 2011).

Upcoming years will see more changes at GSU including the development of a green corridor in the place of Kell Hall, which will be torn down (Georgia State University, 2013). Although currently there are no specific bicycle plans for this area; the plan includes improvement of the pedestrian experience and overall mobility throughout campus (Sasaki Associates, 2012).

As the city of Atlanta continues to grow and change, bicycling at Georgia Tech, Emory and Georgia State will change as well. The Cycle Atlanta project, which is collaboration among several Atlanta-area organizations, including Georgia Tech, that aims to implement strategies to develop high-quality biking environments, will impact these universities in upcoming years (atlantaga.gov). Other considerations include the Atlanta Streetcar, which will provide additional bike lanes on Edgewood Avenue and Auburn Avenue (Atlanta Bicycle Coalition). In 2015, the Atlanta Bike Share Program will provide 500 bikes at various Atlanta locations with the goal of increasing active commuting in the city (atlantaga.gov). These programs, along with the university programs already in place, create the possibility to significantly improve the state of cycling in Atlanta.

Sustained research is needed to understand more about the changing trends in the attitudes and patterns of cycling among college students and



faculty. Continued focus on cycling at these universities has potential to improve overall quality of life for students and staff through better health and a better environment.

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