

FINAL DRAFT



BICYCLE DISTRICT STRATEGIC PLAN

2015

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1

Bicycle Friendly University Vision, Goals & Objectives

This chapter presents a Project Vision Statement and recommended goals and objectives for the Texas A&M Bicycle District Plan. Recommendations in this section were developed from research of existing national, state, and university goals, policies, and objectives.

Vision Statement

It is important to have a vision statement to guide the development and implementation of the Texas A&M Bicycle District Plan. A vision statement is designed to outline the overall view of the University's policies, physical network and supporting programs. It focuses on the future and is intended to be a source of inspiration. The Vision Statement is supported by Goals, Objectives, and Performance Measures designed to guide presented below have been designed to guide the University towards fulfilling its Vision. The following vision statement is proposed for the Texas A&M Bicycle District Plan:

Vision:

Texas A&M will be the most bicycle friendly university in Texas and be one of the nation's leading bicycle friendly universities. We will be leaders in setting policy, developing programs and increasing facilities to support and safely attract people bicycling to, from, and within the campus.

Goals, Objectives & Performance Measures

Goals, objectives, and performance measures should support Texas A&M's overall mission and help guide the implementation of future bicycle facilities and programs. In addition, they aid in directing resource allocation, program operation, and project prioritization.

The proposed goals, objectives, and performance for the Texas A&M Bicycle District Plan are organized by the essential elements identified by the League of American Bicyclists across five categories — known as the Five E's — that are consistent in making great places for bicycling:

1. Engineering
2. Education
3. Encouragement
4. Enforcement
5. Evaluation & Planning

1: Bicycle Friendly University Vision, Goals & Objectives

1. Engineering	
Goal: Providing and promoting safe and accessible routes and accommodations for biking as a daily form of physical activity, such that 15% of all trips to campus are by bicycle by 2020.	
Objectives:	<ul style="list-style-type: none"> a. Provide an efficient, safe, and well-connected network of bicycle facilities and accommodations on campus that minimize conflict between bicyclists and pedestrians through appropriate facility selection and design. b. Develop and install consistent campus bikeway signage to increase awareness of bicyclists on campus. c. Develop and install consistent campus bicycle wayfinding and regulatory signage on campus. d. Provide convenient, covered, and secure bicycle parking at focal points on campus such as parking garages, residence halls, instructional buildings, and major campus employment centers. e. Provide bicycle racks throughout campus appropriate to facility type and use. f. Implement mandatory bicycle registrations and other strategies to free up bicycle parking spaces for “active” bicyclists g. Identify and eliminate major hazards and barriers to bicycling.
Performance Measures	<ul style="list-style-type: none"> h. Percentage of bicycle network completed annually i. Percentage of wayfinding, safety, and regulatory signage installed annually j. Increase in # of bicycle parking spaces utilized by “active” bicyclists k. Decrease in # of abandoned bicycles

2. Education	
Goal: Implement comprehensive education programs targeted at students, faculty, and staff.	
Objectives:	<ul style="list-style-type: none"> a. Educate students, faculty, and staff on safe operation of a bicycle. b. Provide bikeway route maps both online and in hard copy form. c. Coordinate with nearby agencies and groups on annual bicycle events such as “Bike/Walk to Work Day,” “Bike/Walk to School Day,” and bicycle safety courses. d. Promote safe bicycling and walking through the use of encouragement, incentives, and bicycle-friendly programs.
Performance Measures	<ul style="list-style-type: none"> e. Number of Traffic Skills 101 (or other comprehensive training) offered annually f. Total number of university community members attending training g. Decrease in number of reported incidents of unlawful, inconsiderate, or dangerous bicycling on campus

3. Encouragement	
Goal: Implement comprehensive encouragement programs targeted at students, faculty, and staff.	
Objectives:	<ul style="list-style-type: none"> a. Encourage non-motorized transportation with programs that target pedestrians, bicyclists, motorists, and public transit users. b. Encourage student body to use a bicycle for daily travel to campus instead of driving. c. Provide incentives and support facilities for individuals that commute by bicycle. d. Promote walking and bicycling through Texas A&M sponsored events
Performance Measures	<ul style="list-style-type: none"> a. Growth of other bicycle amenities on campus such as a bicycle repair center, safety classes, and other bicycle activities and events b. Number of bicycle program web site hits; number of flyers, printed and distributed; number of news items about bicycle transportation in various media; Bicycle Share system usage levels and others c. Recognition of bicycling as a viable and preferred transportation mode (proposed source: survey results).

4. Enforcement	
Goal: Maintain positive enforcement programs for safe walking and bicycling behaviors and increase positive enforcement during periods of peak public awareness.	
Objectives:	<ul style="list-style-type: none"> a. Reduce negligent behavior among drivers, bicyclists, and pedestrians through enforcement. b. Encourage bicyclists to report all crashes to University the Texas A&M Police Department so that crashes are accurately recorded into a crash database for future analysis and monitoring c. Reduce the number of bicycle thefts on campus. d. Encourage students to register bicycles to aid in returning recovered bicycles if stolen.
Performance Measures	<ul style="list-style-type: none"> a. Decrease in annual collisions between motor vehicles and bicyclists (proposed source: UPD crash data) b. Decrease in annual collisions between bicyclists and pedestrians (proposed source: UPD crash data) c. Decrease in reports of bicyclists-pedestrian conflicts, real or perceived

5. Evaluation & Planning	
Goal: Monitor implementation of the Texas A&M Bicycle District Plan.	
Objectives:	<ul style="list-style-type: none"> a. Establish a Bicycle Advisory Committee that includes students, faculty, and staff to set annual goals and performance measures. b. Create a sustainable, dedicated source of bikeway and walkway funding within the annual budget. c. Avoid missed opportunities by ensuring all campus construction projects address projects and non-motorized paths of travel and related projects as recommended in the Bicycle District Plan. d. Implement less-complicated and inexpensive projects first for efficiency. e. Institutionalize non-motorized transportation in all campus transportation planning, design, and construction activities. f. Track the success of the Bicycle District Plan as a percent completed of the total recommended improvements. g. Track Texas A&M mode share trends through expanded annual bicycle counts and user surveys. h. Continue to monitor bicycle parking demand and increase parking supply, with temporary or permanent facilities as needed. i. Monitor bicycle crash data to reduce bicycle crash rates. j. Regularly assess the needs of the campus walking and bicycling population and respond accordingly to these needs. k. Produce an annual report card identifying non-motorized trends and accomplishments

5. Evaluation & Planning	
Performance Measures	<ul style="list-style-type: none"> a. Increase in annual bicycle mode split (proposed source: periodic surveys) b. Increase in off-campus bikeways and bicycle amenities (proposed source: Cities of Bryan and College Station) c. Increase in bicyclists entering the TAMU campus (proposed source: periodic bicycle counts) d. Decrease in number of bicycle crashes e. Recognition by the League of American Bicyclists as a Silver-Level Bicycle Friendly University

2

Existing Conditions & Needs Analysis

The purpose of this chapter is to analyze existing on-the-ground infrastructure as well as support programs to determine how bicycling can help meet Texas A&M's transportation needs. Deficiencies here will form the foundation for future recommendations for facility improvements and policy/operational changes.

Introduction

Established in 1876, Texas A&M has grown to become a world leader in teaching, research, and service, with an international reputation for excellence in both academics and athletics. With an enrollment of more than 50,000 students, Texas A&M is the fourth largest among U.S. universities, located in College Station in the heart of Texas just hours from five of the nation's 20 largest cities (Houston, San Antonio, Dallas, Fort Worth and Austin). Aggie football, the George Bush Presidential Library and Museum, plus the many traditions and events stemming from the "Aggie Spirit" draws hundreds of thousands of visitors to campus year round, placing unique demands on its transportation and parking infrastructure.

Currently, Texas A&M main campus encompasses 5,500 acres, with approximately one-fifth of the student population living on campus. By fall of 2016 new housing developments on west campus and along the northern campus boundary are projected to add 4,000 new beds, which along with proposed and future academic program expansions such as the Engineering Complex, will significantly increase on-campus bicycle and pedestrian traffic. The city of College Station is simultaneously growing and with the expansion of its bicycle and greenway program many

students, staff and faculty are bicycling for transportation to and from campus.

Part 1: Setting

The setting of any university campus has a large impact on how people travel within, to and from the campus, and ultimately informs the recommendations that will prove effective in improving the bicycling environment. For this study, the setting is viewed through the following lenses:

- Study Area – The Bryan-College Station Region
- Topography & Climate
- Enrollment & Employment
- Campus and Regional planning and Development

Bryan-College Station Region – "Aggieland"

The Bryan-College Station metropolitan area is in the Brazos Valley region of Texas, approximately 100 miles from Austin, 100 miles from Houston and 165 miles from Dallas. The region's economic and social life is centered on Texas A&M, thus the area is popularly known as Aggieland. The 2010 census placed the region's population at 228,660, with the 2040 projected population at approximately 303,000. This growth is expected to be due in large part to ambitious plans to expand university programs and subsequent increases in student enrollment.

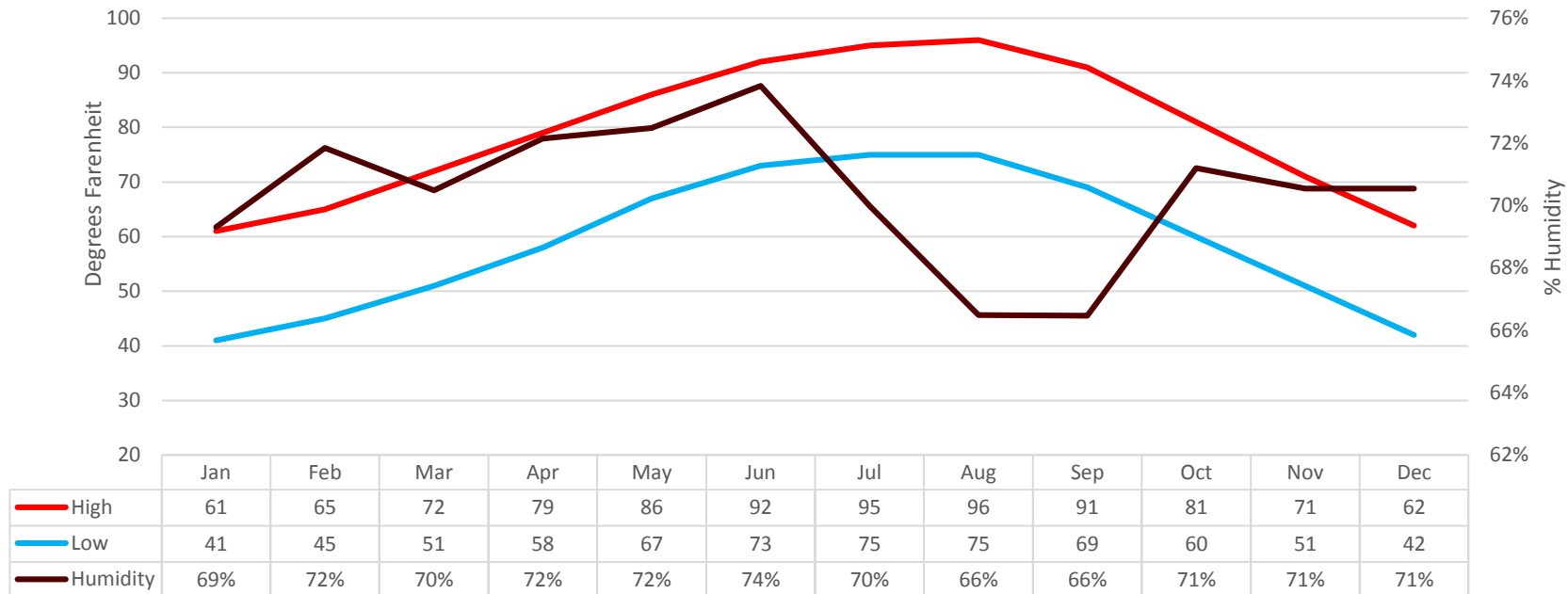
Topography & Climate

The Texas A&M campus sits at approximately 338 ft, with little elevation change (from a bicycling perspective, this topography is considered “flat”); excellent conditions for bicycling as one doesn’t require a significant level of fitness to get around by bike. The area’s climate is conducive to bicycling during most months of the year, with short, mild winters that see snow and ice only rarely. Between May and October, however, temperatures can get very hot, and with the region’s humidity can be a significant deterrent to bicycling for transportation as most students as well as staff/faculty have few places to ‘freshen up’ after a steamy ride. Table 1 shows the region’s climate conditions, which generally favor bicycling during the academic year.



This day in late October 2014 was perfect for bicycling

Table 1: Regional Climate



Campus Enrollment & Employment

Student enrollment for fall 2015 was approximately 53,000; undergraduates make up approximately 40,280, with graduate/professional ranks at around 12,720, placing it in the top 5 largest universities in the U.S. Of the 53,000 total number, approximately one-fifth of those live on campus. In addition, there are approximately 21,000 faculty and staff serving the College Station campus. Enrollment and employment numbers have grown significantly in recent years and will continue to do so as the university has set a goal of 75,000 students by the year 2025. Enrollment growth for the years 2010 through Fall 2014.

Table 2: TAMU College Station Enrollment

Year	2010	2011	2012	2013	2014
Total Students	49,129	49,861	53,187	52,449	55,809

Bicycling will play a critical role in the transportation system demands resulting from this growth. Between 2015 and 2016 the new housing in the West Campus development will accommodate over 2,500 students who will need transportation to reach Central campus over 1.2 miles away, a distance covered most efficiently through a dense campus environment by bicycle rather than walking, driving, or bus. In addition, new off-campus housing along University Avenue near the intersection of Texas Blvd will accommodate 1,900 students needing an efficient, safe transportation mode to navigate along and across high-traffic University Drive.

Part II: Existing Conditions

Bicycle Usage

Significant numbers of students and staff/faculty use a bicycle to travel to, from and within the A&M campus. There are various sources for data showing the percentages of people traveling to campus by any given mode; the term for this metric is “mode split”. The campus Transportation Services Department conducts a customer survey annually which collects mode split data for journeys to campus among other information.

Table 3: Campus Modal Split

Mode	2015	2014	2013	2012*	2011	2010
Bicycle	7.1	7.0	7.8		11.5	9
Walk	9.4	8.3	9.3		10.5	10
Drive Alone	63.2	64.7	63		55	56
Carpool	5.7	5.6	7		6.8	6
Transit	25.3	22.2	22.8		27.5	22
Motorcycle	1.1	1.8	0.9		1.1	1
Other	1.6	1.3	1.4		1.5	1

*No mode split survey was conducted in 2012

Between 2010 and 2015, bicycle mode split has decreased, from a high of 11.5% in 2011 to 7% in 2014 and 2015. It is unknown why bicycling levels to campus appear to have dropped since 2011, from the data it appears that a drive alone trips have risen proportionally over this time period.

For journeys within campus, a question from the 2012 Customer Survey regarding bicycle Fix-It Stations showed that 28% of respondents used a bicycle to get around within campus. This may indicate that a large number of students keep a bicycle on campus for internal trips even if they did not reach campus by bicycle.

Overall, College Station has relatively high level of bicycle commuting compared to the rest of the U.S. and particularly Texas cities. According to the 2012 American Community Survey, 3.3% of commuting trips throughout College Station were by bicycle, making it the highest bicycle mode split of any city in Texas, with Austin and Denton ranking second and

2: Existing Conditions & Needs Analysis

third respectively¹. Since the ACS doesn't distinguish between trips to work or trips to school in the survey language, it's likely the numbers are even higher for a city such as College Station that centers around such a large university where students may not be accurately represented in the overall data and if included, may not consider their trip to campus as a "commute" trip.

University campuses offer a special environment that can vary significantly in modal trends from the rest of the nation and even the general population within the same city. Students, faculty and staff on university campuses typically walk and bicycle in much higher numbers than their counterparts elsewhere.

Crash Data

One key metric in evaluating existing bicycling conditions on campus is to analyze data collected by law enforcement on crashes, either between bicyclists and cars, bicyclists and pedestrians, or those involving only a bicyclist. On the Texas A&M campus, the University Police Department maintains data on bike crashes, while the City of College Station (COCS) and TxDOT maintain data on crashes outside the campus boundaries.

The City of College Station 2010 Bicycle, Pedestrian and Greenways Master Plan includes the following information on bicycle and pedestrian crashes 2003 and 2008:

- 195 between a bicyclists or pedestrian with a motor vehicle were reported;
- Most bike crashes were on University, George Bush, Texas Ave, University Oaks Blvd, Southwest Parkway and Welsh
- The highest concentration of bike crashes in one location was three (3) at intersection of George Bush and Anderson
- Most common bike crash times were 7:00am, 1:00pm, and between 4:00 and 6:00pm

¹ "Where We Ride: Analysis of Bicycling in American Cities". League of American Bicyclists, 2012. Report on American Community Survey Data

More recent crash data from the City of College Station from 2011-2014 was provided and is summarized below and in Figure 1.

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CRASHES INVOLVING
BICYCLISTS
IN CITY OF COLLEGE STATION



27 % OF THESE CRASHES OCCURED
ON MAJOR SURROUNDING ROADS
(UNIVERSITY, TEXAS, GEORGE BUSH)

78 % OCCURRED BETWEEN 6AM AND
6PM (CLASS COMMUTE TIME)

In addition, the team received anecdotal reports from students, faculty and staff at listening sessions in April 2014 that there were "a lot" of bike crashes on George Bush Dr. at the intersections of Marion Pugh Dr. and Coke St. Finally, a representative from the University Police Department expressed concerns for bicyclists' safety at the intersection of University Dr. and South College Ave, having been called to several crashes at that location in recent years.

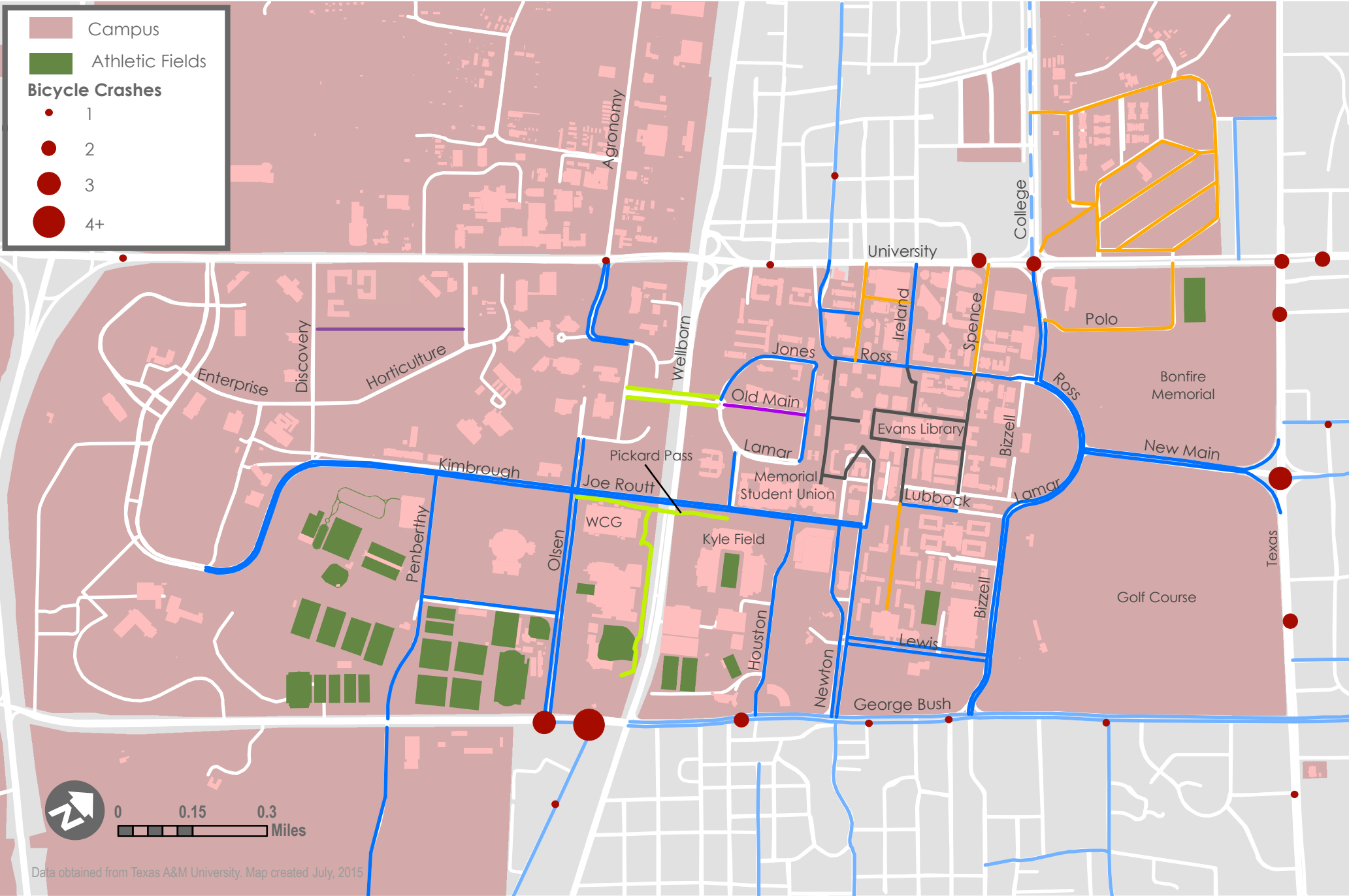
TEXAS A&M UNIVERSITY **BICYCLE DISTRICT PLAN**

Campus

Athletic Fields

Bicycle Crashes

- 1
- 2
- 3
- 4+



Data obtained from Texas A&M University. Map created July, 2015

FIGURE 1: **BIKE NETWORK** Off-Campus Bicycle Crash Locations

2: Existing Conditions & Needs Analysis

Community Engagement

Several community engagement activities helped the team ascertain the Texas A&M community's perception of bicycling for transportation to, from and within campus, including informal "listening sessions" in April 2014, a public workshop in October, e-mail communication from community members to Transportation Services staff, plus additional conversations and meetings.



Participants point out issues for bicycling at the public workshop

The following are the priority issues and comments:

Roads & Streets

- Better markings and signs for on-campus bike lanes and bike routes
- More separated bike paths needed
- Intersections are a problem both on- and off-campus; green conflict areas, dashes through intersection and signs needed to make safer for bikes

- The intersection of Olsen and Kimbrough feels dangerous, with too many cars conflicting with bikes and walkers
- Bike connectivity between Southgate and Northgate is needed
- Pavement condition both on and off campus is poor in spots, creating safety hazard and threatening tire and wheel damage
- Signal loop detectors don't always function; Welsh Drive given as example
- Intersections that feel unsafe or hostile for bicyclists include University Drive at Wellborn, Agronomy and South College; New Main and Texas; George Bush and Coke/Throckmorton, Houston, Wellborn, and Marion Pugh; and others.
- Need bike path or other treatment along University between the veterinary school and center of campus
- Lower the auto speed limit on Wellborn
- Cars often block the bike lane on Bush by using it as a turn lane
- Several bike/car conflicts and connectivity issues where Pickard Pass, the West Campus Garage driveways and Kimbrough meet
- Biggest road hazards for bicyclists are where jurisdictional boundaries meet, e.g., campus, City of College Station, TxDOT. College Main and University bike/ped crossing treatment is excellent example of all jurisdictions working together to improve safety.

Bike Parking

- Bike racks are often full or overflowing with bikes that are never used, so that daily bicyclists often cannot find a space
- Covered parking is needed for staff and faculty who are daily bicycle commuters
- If covered parking cannot be provided, staff and faculty should be able to take their bikes inside; this is currently up to the building proctor's discretion. Students need their roommate's approval to bring bike into room.

- Make bike registration mandatory so only bikes that are actually used regularly will take up parking spaces
- Number of required bike parking spaces needs to be codified in Council for the Built Environment standards
- Bike lockers needed



Bike parking is well utilized on the TAMU campus, however abandoned and disabled bikes create clutter that lessens the efficiency and capacity of the parking facilities

Education: Motorist & Bicyclist Behavior

- Use new student orientation processes to educate about bicycling laws, parking rules, routes, opportunities and general promotion of bicycling
- Motorists need to be educated that bikes have a right to use roads both on and off campus
- Bicyclists need to be educated on obeying stop signs and signals, and watching out for pedestrians better
- Too many conflicts between bicyclists and pedestrians on campus walkways, streets and intersections
- Bicyclists run stop signs and signals; need to teach courtesy and respect as well as the law

- Some bus drivers don't know how to operate around bicyclists
- Bicyclists should be required to have lights when riding on campus
- Bike commuting in Bryan vs College Station; Bryan motorists are noticeably less respectful of cyclists
- Many students who use a bike as primary mode of campus transportation have never bicycled in traffic before and need targeted education campaign.



The intersection of Ross & Spence Streets is congested for bicyclists and pedestrians

Promotion: Encouraging Students, Staff & Faculty to Bicycle

- Sweat is a big problem; make showers or some kind of clean-up arrangement available in more buildings, areas of campus
- Use new student orientation to promote bicycling as transportation
- Alternative transportation should be a part of the overall University-level education, teaches students about sustainability, environment, personal accountability, health/fitness

Organizational Assessment

Bicycling as a primary transportation mode can take hold in a community only when it is institutionalized into all functional areas such as comprehensive planning, transportation infrastructure design and planning, law enforcement, safety, public health, sustainability, operations/maintenance and others. University campuses are basically no different, as they often exist and operate as small cities. Texas A&M has established some effective and successful policies and practices, and faces challenges as well in the following areas:

- **Transportation Services** oversees parking and mobility for students, faculty and staff. The Alternative Transportation area is a robust program managing bus service, bicycling, and walking, counting among its current staff committed bicycle commuters and a League of American Bicyclists certified LCI (League Cycling Instructor). In a relatively short period of time, the AT program implemented new bicycle lanes and routes, coordinated effectively with the City of College Station and the Bryan-College Station MPO (regional transportation planning org), established regular bicycle education programs, and pursued innovative solutions such as bicycle share.
- **Campus Architect** is a relatively new program charged with coordinating all facilities and infrastructure to ensure compliance with the Campus Master Plan, architectural standards and design, and other aspects of the built environment. The office is overseeing the West Campus Connectivity plan among other key campus expansion projects, and is highly committed to this bicycle planning process, viewing bicycling as a critical element in campus community life and function.
- **Council for the Built Environment.** This top-level group of university leaders is the ultimate decision maker for campus planning, infrastructure and transportation. One of its members is the Vice President of Finance and Administration, who is above the Transportation Services Department, ensuring transportation and parking are considered and integrated into any campus planning.
- **Faculty Leadership.** Many long-time faculty are daily bicycle commuters and some wish to be engaged in improving campus for bicycling. The Associate Dean of the Architecture Department, has expressed interest in promoting bicycling from a variety of academic and campus administrative areas. In addition, faculty in the Recreation and Healthy Sciences areas are eager to see the university engaged more fully in promoting healthy lifestyles and sustainability through promotion of bicycling as transportation.
- **Academic.** Co-curricular programs are an outstanding opportunity for students to serve the university and learn in the areas of civil and traffic engineering, urban planning, physical fitness and health, human behavior studies and others. One example that could be emulated is the Bicycle Share Study conducted in 2012 by students in the PLAN 674 class, Transportation System Analysis.
- **Texas Transportation Institute (TTI).** One of the leading transportation research organizations in the U.S., TTI has long been a leader in bicycle and pedestrian infrastructure, safety, education and innovation by continually initiating research projects that serve to further establish bicycling as a legitimate mode of transportation. TTI's presence on campus will continue to be a key asset in growing bicycling as transportation.
- **Bryan-College Station MPO.** Elected officials throughout the region recognize the importance of bicycling as a key element in a multimodal transportation system, as well as efficient and low-cost transportation for the Texas A&M community. The MPO policy board recent vote to set aside 5% of Surface Transportation federal funding for bicycle and pedestrian projects; only the second MPO to take this key step (after the Austin region). In addition, the MPO has established the Bicycle Advisory Committee on which Texas A&M's Alternative Transportation program manager serves.

Challenges

- Multiple planning efforts and facilities upgrades/redevelopment projects conducted “in silos”.** The University took a positive step in establishing the Campus Architect Office to coordinate new construction, planning, and facilities expansions. However, more buy in is needed from all sectors of the campus community to submit to a higher planning authority and ongoing process. The Texas A&M campus is in reality a small city in and of itself and like a city needs the equivalent of a Planning Commission or department with authority over any changes to campus infrastructure.
- Incomplete stakeholder participation in key planning projects.** In several of the planning efforts observed for this review it was apparent that transportation was almost an afterthought rather than the priority it should be. Master planning that focuses on the aesthetics of a building or space but is not concerned with how students will get around is missing a crucial element. Similarly, a study or plan that is intended to address transportation should build on past studies and recommendations, especially work performed by experts. An example is the West Campus Connectivity Study which does not incorporate standardized bicycle transportation principles and facility types recommended by TTI in the Bikeway Improvement Technical Report of 2005.
- Planning and engineering projects lacking specific expertise in multimodal transportation in college campus environments.** Two key examples help illustrate the extent to which two of the three main transportation modes on campus—bicycling and walking—are not planned and designed using best practices or a thorough understanding of how modern college students navigate their world. First, key locations on campus that see a high degree of bicycle and pedestrian traffic were designed as automobile-dominated street networks prioritizing car mobility over student safety and connectivity. The area encompassing the West Campus Garage and the intersection of John Kimbrough and Olsen is one key example. Second, the excessively long bicycle dismount zone proposed in the West Campus Connectivity Study

would greatly impede mobility, increase travel times, and would likely not be observed or enforceable.

Bicycling Demand

With steady growth predicted for the entire Bryan-College Station region, plus the university’s enrollment goals of 75,000 students by 2025, the demand for bicycling infrastructure will also grow along with the transportation system at large. In addition, near-term university expansion projects are creating an immediate demand for both bicycling and walking infrastructure, specifically student housing developments in the West Campus area, and off campus along the eastern end of University Drive.

The West Campus student housing will add 1800 beds by the fall of 2016, bringing the total number to approximately 2,750. This location is approximately one mile from the center of the Texas A&M campus student life (using the Memorial Student Center as the “center”). This distance is too far to walk, and mobility via personal auto or bus would be limited. The most efficient and practical travel mode for student residents of the West Campus housing to the campus center is bicycle. While not as far away from the center of campus, new housing near the intersection of Texas Avenue and University also presents safety and mobility challenges for students, as they must travel along the high-volume University Drive corridor and cross six lanes of traffic to reach campus.



This group of bicyclists has just entered campus from student housing

Using mode split data for bicycling trips to and from campus, along with bicyclist user counts conducted within campus boundaries, bicycling trip

2: Existing Conditions & Needs Analysis

demand can be estimated for a sampling of Texas A&M and City of College Station growth scenarios. Adding in the percentage bicycle mode split this Bicycle District Planning sets as a goal increases those figures further.

The Five E's of Bicycle Planning

The Bicycle Friendly University designation established by the League of American Bicyclists has become the ultimate benchmark for how University campuses utilize bicycling as a critical transportation solution. Each year campuses apply for the designation which can be awarded at the Gold, Silver, Bronze or Honorable Mention levels. The BFU uses the Five E's of Bicycle Planning as its guiding principles:

- **Engineering:** What facilities exist including on street bike lanes, signed routes, intersection treatments, signals, crossings? This category also include bicycle parking facilities, wayfinding and multimodal connections.
- **Education:** What education programs/opportunities are there for bicyclists, pedestrians and motorists to learn about safe operation and courteous behavior toward all road users?
- **Encouragement:** How does Texas A&M and other entities promote, encourage, and incentivize bicycling?
- **Enforcement:** How does law enforcement (campus and city) support, promote, or hinder bicycling on and around campus?
- **Evaluation:** What metrics and performance measures does Texas A&M use to gauge progress on promoting bicycling as a viable transportation mode?

Engineering

Bikeway Network Connectivity

Figure 2 shows current bicycle facilities on campus and in the immediately surrounding area of College Station plus three types of network gaps: 1) spot gap, 2) linear gap, and 3) area gap. These gaps were determined through field observation, community engagement, and Alternative Transportation program staff input and are defined as follows:

- **Spot gaps** refer to point-specific locations lacking dedicated facilities or other treatments to accommodate safe and comfortable bicycle travel.
- **Corridor gaps** are missing link segments on a clearly defined and otherwise well-connected bikeway. These gaps will sometimes encompass entire street corridors.
- **Infrastructural Barriers** are long linear facilities that impede comfortable bicycle traffic, both along and across. For the purposes of this plan, University Dr., Texas Ave and Wellborn Rd are examples

Intersections

Intersections are junctions at which different modes of transportation meet and facilities overlap. An intersection facilitates the interchange between bicyclists, motorists, pedestrians and transit vehicles in order to advance traffic flow in a safe and efficient manner. The safest intersection designs for bicyclists contain the following strategies:

- **Increase awareness** between drivers and bicyclists
- **Increase the conspicuity** of bicyclists
- **Isolate conflicts**
- **Clearly assign priority** so that expected behavior is clear.

Intersection treatments can improve both queuing and merging maneuvers for bicyclists, and are often coordinated with leading bicycle or pedestrian phasing, or specialized signal types.

Traffic Control Devices

There are generalized types of improved crossings in and around the Texas A&M campus, as well as specially-designed treatments.

- **Marked crossings** use crosswalk markings, stop signs and sometimes flashing beacons to identified common or preferred crossing locations.
- **Traffic signals** control crossing traffic through signals for motor vehicles, bicyclists and pedestrians.

TEXAS A&M UNIVERSITY *BICYCLE DISTRICT PLAN*

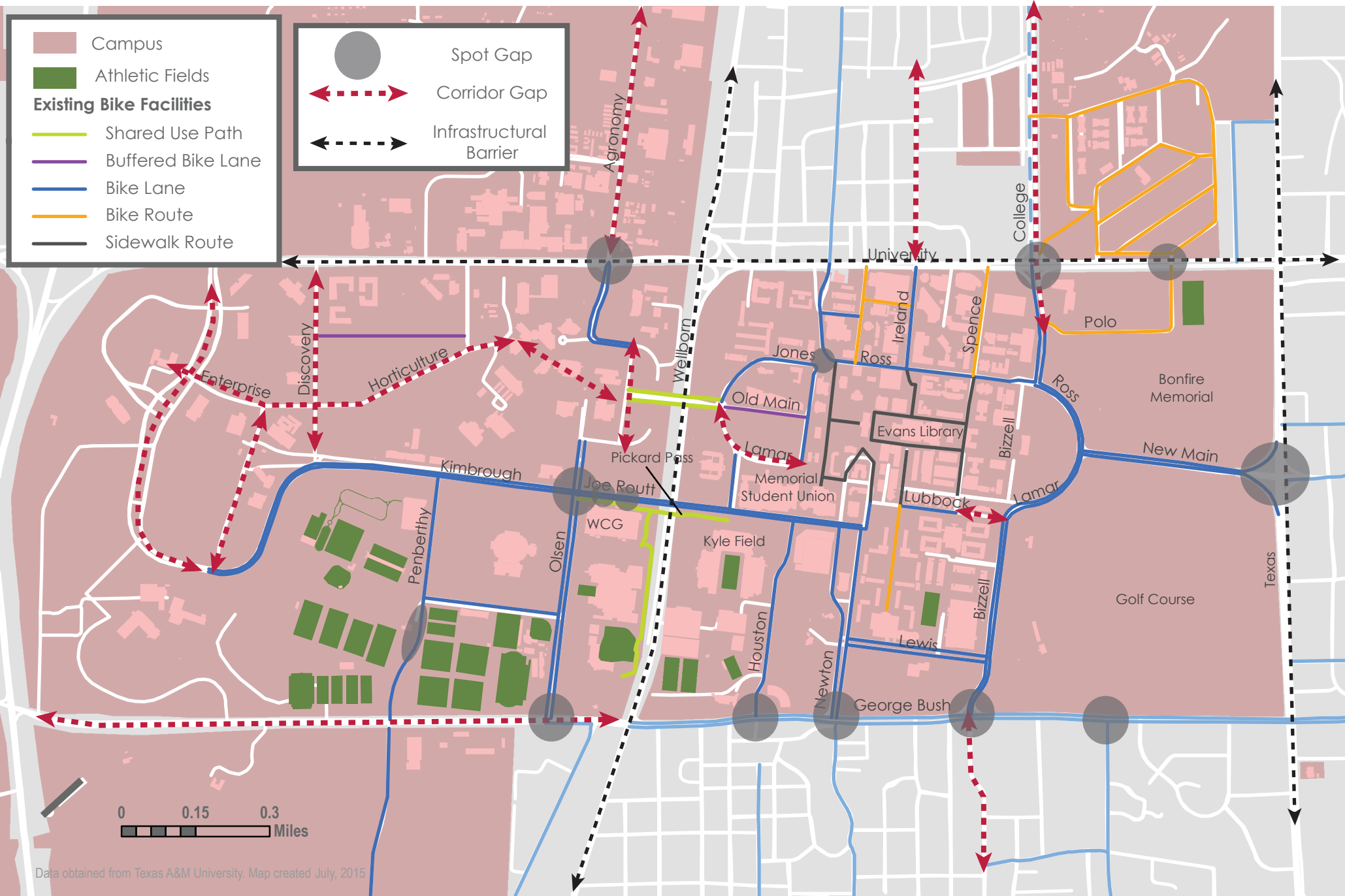


FIGURE 2: *BIKE NETWORK* EXISTING FACILITIES

2: Existing Conditions & Needs Analysis

- **Special treatments** include the relatively new Northgate crossing design at University and College Main/Houston which included ped/bike median refuge island, unique crossing markings and bicyclists/pedestrian activated signal.



This special intersection treatment in the popular Northgate District improves safety and connectivity for bicyclists and pedestrians.

Traffic Control Devices Assessment

As stated in the “Intersections” section above, there are many intersections and potential crossing locations that are uncomfortable or unsafe for bicyclists. Several of these were assessed for the Bicycle Action Plan. The following are brief descriptions of traffic control needs throughout the campus planning area:

- **Conflict markings** – Intersections that allow right and/or left turning motor vehicles can have turning conflicts with through bicyclists. Conflicts can be isolated either prior to the intersection

or at the intersection depending on turning lane configuration. If conflicts are difficult to mitigate through striping, such as in the case of multiple turn lanes, exclusive signalization may be needed.

- **Crossings at unsignalized locations:** In a university environment, it is often the case where bicyclists and pedestrians have strong crossing needs at non-signalized intersection locations. This can occur at minor intersections or at non-intersection locations.

Rapid Rectangular Flashing Beacons (RRFBs) are a modern active beacon technology that uses brighter LED lights and rapid flashing patterns to draw extra attention to bicycle and pedestrian crossings.

Hybrid Beacons (PHB or “HAWK”) are a relatively new innovation that greatly increases safe bicycling and walking mobility and connectivity. The device must be activated by the bicyclist/pedestrian, and will stop cars with a red light, then allow the cars to proceed after the bicyclists or pedestrians have crossed that half of the roadway. They are an excellent tool for safer bike/ped crossings at locations that don’t meet traditional signal warrants.

- **Two-stage turn Queue Boxes**, while still experimental, make it safer and more comfortable for bicyclists to make left turns across multi-lane corridors, by providing a protected place to wait in a two-part movement. This could be a critical tool for Texas A&M since the campus is surrounded on three sides by six-lane corridors including University, George Bush and Texas Avenue.

Multimodal Connections

Texas A&M’s bus service, also called “Aggie Spirit”, operates both within campus and along several routes serving College Station and limited locations in Bryan. It is an important intermodal connector for people who use a bicycle to commute to campus. Even though there are no bicycle racks on the buses themselves, a bike commuter could utilize the service after arriving on campus. One key issue regarding the bus system and bicycles is where bicyclists riding on sidewalks or using the shared-use paths come into conflict with crowds of people waiting to board or alighting from buses.



Texas A&M buses – “Aggie Spirit”

Brazos Valley Transit –Known as “The District” this service has several lines accessing the Texas A&M campus from areas of College Station, completing each circuit roughly every hour. On the south end of campus, The District buses enter campus on Bizzell, travel west on Lewis and exit on Coke. In addition there are several stops along the on Texas Avenue and the north along University. In February 2015 a new express route from Bryan to the campus was added, serving Monday through Friday every half-hour. Many in the campus community keep a bicycle on campus and transfer from the bus to bike for campus travel. Having ample covered and secure bike parking at transit stops would give transit commuters more mobility options throughout a day on campus and could help replace car trips to campus and parking demand.

Bicycle Share System – Bicycle share systems are an excellent multimodal transportation solution for college campuses. In 2013 Transportation Services partnered with Rugged Cycles on a pilot bicycle share system known as MaroonBikes. Free of charge to students, bicycles were accessed by an automated online account and then released by an electronically controlled key box inside a building or parking garage. Users could ride the bikes anywhere but had to return them to the original location and turn in the key. While usage of the system grew steadily over an 18-month pilot trial period, the system required several adaptations to make it more

effective as a transportation choice for the campus community. In 2014 MaroonBikes were pulled from the campus core, but are still operating from off-campus housing locations. Alternative Transportation program staff are currently evaluating other bicycle share system options for the future.

Parking Garages – For students, staff and faculty that drive to campus, many leave a bicycle locked at parking garages and utilize bicycling to get around campus. Parking garages are an excellent location for bicycle share stations.



Large numbers of bicycles parked in the West Campus Garage

Bicycle Facility and Wayfinding Signage

Bike route wayfinding is an important element in a promoting bicycling as transportation. By making it easy for people to choose the most direct routes to their destination, more will be motivated to bicycle. Wayfinding has the extra benefit of pointing bicyclists to established bike routes, thereby reducing unsafe riding and reducing potential conflicts in areas of high pedestrian traffic. There are good examples of bike network signage, e.g., Houston at Old Main, the dismount zone at the Memorial Student Center, through Pickard Pass, where signs designating separate pathways for bicyclists and pedestrians has reduced conflicts and crashes.

2: Existing Conditions & Needs Analysis



Examples of existing wayfinding markings and regulatory signage

However, more bikeway signage is needed throughout campus. The Office of Campus Architect is undergoing a Wayfinding Design study for the entire campus that will determine a design scheme for any signage throughout campus. The Campus Architect is eager to support the Bicycle District Plan by coordinating a bike route wayfinding system that fits in with the rest of campus. Any wayfinding plan that must also adhere to traffic control signage as set forth in the Manual of Uniform Traffic Control Devices (MUTCD) and its community wayfinding chapter.

Bike Parking

Bike parking is provided throughout Texas A&M campus, with racks located outside of most buildings. Two main types of racks are used, the single-wheel type (known as “wheel benders”, and the “Cora” or “coat hanger” rack. Inventory data provided by Transportation services estimates the number of short-term parking racks at approximately 10,500 as of 2015. The latter design is codified in the campus facilities standards, but the Alternative Transportation program is interested in sourcing an improved design in the future. Figure 3 shows location, and quantity of parking.

Texas A&M has a significant challenge in what has become known as “abandoned bikes”, when students bring a bicycle to campus with them, lock it up and never ride it again, or ride it until it needs repairs and then

leave it locked up and abandoned. This results in thousands of bicycles taking up bike parking spaces that others need to use, bikes tipped over, rusting and broken bicycles, all of which create an unsightly mess in spots throughout campus. The Alternative Transportation program staff spend considerable effort confiscating and impounding these abandoned bikes, placing a drain on university resources. A recent study on the TAMU campus by Rugged Cycles utilized 168 hours of video observation to at an off-campus property conclude that in the observed bicycle parking area that approximately half of the bicycles were never moved.

End of Trip Facilities

Covered bike parking – Covered bike parking helps make a trip more comfortable by offering a dry, protected space out of the elements to lock up or load up a bicycle. In Texas, the sun and heat can make bike seats too hot to touch and handlebar grips melt and disintegrate.

Bike racks may be covered by a stand-alone structure or located underneath awnings or overhangs of existing buildings. If overall space to create covered parking is limited, a small amount of covered parking can be set aside for permanent staff or faculty that bike commute daily to campus, and be available with a special permit or parking fee. Figure X shows current covered parking locations on campus.

Secure Parking Areas (SPAs). Long term, secure parking is a key amenity for bicycle commuters or visitors to campus who lock up their bike and leave it in the same spot all day. Bike SPAs are located in parking garages or other secure common area.

Showers are a key end of trip facility for people riding long distance, in hilly terrain or in hot climates such as Texas. Identifying existing shower facilities (for students, faculty and staff), or installing new ones as buildings are built/renovated will encourage more people to bicycle for transportation.

Fix-It Stations and Bike Hub. The Alternative Transportation program has made great progress in the past few years by installing 9 do-it-yourself Fix-It stations that include a pump and tools for simple repairs. In addition the Bike Hub is a bike repair shop, which offers some retail items like tubes, patch kits, lights and locks. The HUB is located across from the Quad on Lubbock Street.

TEXAS A&M UNIVERSITY *BICYCLE DISTRICT PLAN*

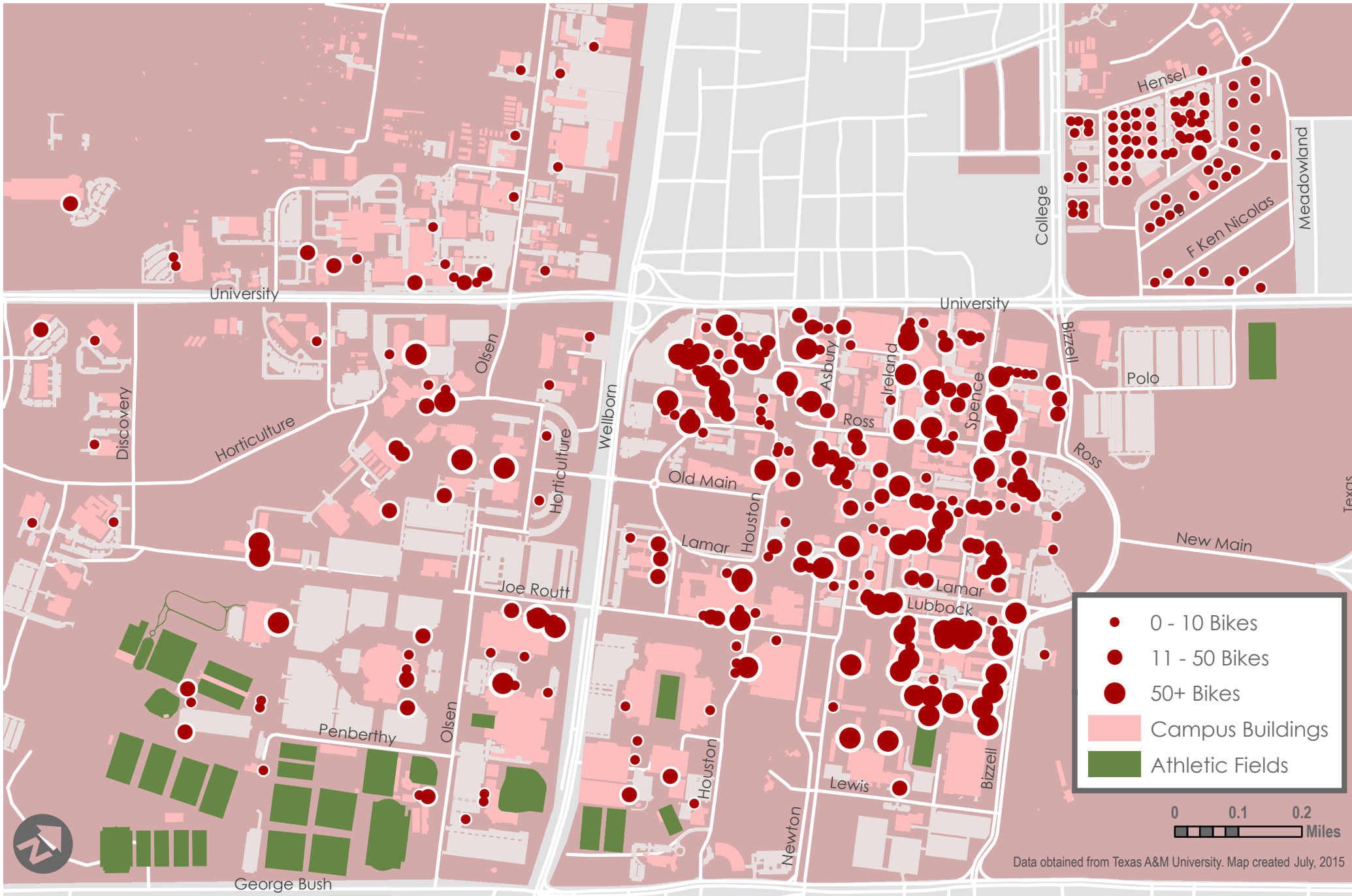


FIGURE 3:

BIKE PARKING CAPACITY **EXISTING FACILITIES**

2: Existing Conditions & Needs Analysis



Texas A&M has installed 9 do-it-yourself maintenance stations throughout campus

Education

All new students are required to attend several orientation events in the months preceding the semester start. While these activities would be an ideal time to promote transportation options, in fact there is very little time to do that. The Alternative Transportation program has a comprehensive web site on all aspects of bicycling on and to and Texas A&M campus, but it may not be effective in reaching students for this kind of information. In fact, during the April 2014 listening sessions and the October 2014 public workshop several students commented that they would not know to visit the web site for information on bicycling or other alternative transportation modes. Following are topics covered on the bicycle page of the AT program:

- Borrow a bike
- Bike registration

- The Hub (bike repair)
- Summer bicycle storage
- Campus bike lanes
- City of College Station bike facilities
- Online bicycle auctions
- Theft & safety
- Bike racks and parking information
- State bicycle laws
- Campus bike committee (currently inactive)
- Bike program updates

Safety and bicycle riding skills education is critical to college students, particularly those who have not been on a bicycle in recent years and that will be suddenly using one for transportation. Together with the City of College Station, Alternative Transportation staff offer League of American Bicyclists-based bicycle skills clinics 8 times during the academic year. The skills clinics are held off-campus.

Safety media campaigns – A high profile marketing campaign that highlights bicyclist safety can be effective in reminding all users—motorists and pedestrians as well as bicyclists—understand the rules and responsibilities on campus roads. This type of high-profile campaign is also an effective way to raise the profile of bicycling and improve safety for everyone. To date, Texas A&M has not conducted a comprehensive, high profile safety media campaign.

Encouragement

Transportation Services has placed a high priority on bicycling with its robust Alternatives Transportation program and the energy with which its staff have promoted bicycling. The high bicycle mode split data for College Station is testament to commitment Texas A&M has shown to bicycling. The bicycle web pages, the Maroon Bikes bike share system, Fix-It stations, infrastructure improvements, and safety skills classes are all elements that serve to encourage and promote bicycling as a transportation option. These successes can be built upon as a foundation to better encourage and

promote bicycling. Following are some Best Practices of other universities that actively promote bicycling:

In the past, a Campus Bike Committee helped inform efforts to optimize Texas A&M for bicycle transportation, but the Committee has been inactive for the last several years. The development of this Bicycle District Strategic Plan has reignited interest in having a bicycle advisory committee, and several students, staff and faculty have expressed the desire to participate and help improve conditions for bicycling to, from and on campus. A key role of the committee can be to put on encouragement events, involve students in helping create a bicycling culture, and assist the Alternative Transportation staff with various programs. In fact the very presence of the Campus Bike Committee can serve to encourage more students, faculty and staff to bicycle.

Celebrate Bike Week

A bicycle commuter campaign encourages people and makes the public aware that bicycling is a practical mode of transportation. Events such as free breakfast or coffee stations can be fun ways to celebrate bicycling and encourage new riders.

Commuter Benefit Program

A rewards program for regular bike commuters can help solidify the habit. Commuters log their trips year-round to receive benefits for biking to school/work such as gift certificates, cash payouts, or free bicycling accessories.

Bike Valet for Events

Texas A&M has a robust visitor scene with widely-attended events all year round. Providing convenient, secure parking at large events can make bicycling to events safer and highlight bicycling as a safe mode of transportation to the entire campus community. Temporary facilities such as corrals or mobile racks can be brought on site to meet bike parking demand.

Celebrate Unique Sites

With the many iconic sites in Aggieland, a bicycle tour would be a fun way to show new students how to get around by bike. Kyle Stadium, the George Bush Presidential Library, the gardens and green areas of West Campus, and the Bonfire Memorial are just a few destinations that could comprise a lengthy and information bike ride.

Enforcement

Bicyclist Behavior on Roadways

The University Police Department (UPD) enforces traffic law on roadways within the Texas A&M campus. According to records, Transportation Services staff reporting and observation during field work, there is a significant amount of reckless bicycling and flouting of traffic law including, bicyclists riding through stop signs and signals, riding too fast in areas of high pedestrian activity, riding in the dismount zone next to the Memorial Student Center, weaving and changing lanes without signaling, and others. While the UPD does issue citations to bicyclists, it is the opinion of Transportation Services staff that a much greater effort at enforcement needs to happen consistently throughout the academic year. The consultant team's observation of the high amount of noncompliant and reckless bicycling supports this, as bicyclists appear oblivious to stop signs and pedestrians in crosswalks, as if there were indeed no consequences to this unlawful behavior. Observing the intersection of Ross and Spence during class change, our Team was struck by the blatant disregard of traffic control on the part of many bicyclists. Pedestrians are not immune from this; many were seen stepping into the street with eyes glued to a smart phone, appearing to not even following basic advice to "look both ways first".

One of the possible reasons the UPD's efforts at citing bicyclists are not more robust is the cost of a ticket can be a significant financial hardship for college students and the officers prefer to issue warnings rather than impose a costly ticket. College students are human beings and as such may not be compelled to obey rules unless there are consequences. Many universities and cities across the U.S. offer a ticket relief program for bicycle citations, requiring a violator to take a bicycling safety and traffic law training to avoid paying the citation and having it show on their driving

2: Existing Conditions & Needs Analysis

record. Texas A&M has explored that possibility in the past, but since traffic law violations on campus are subject to state vehicle code, such a program would have to be authorized and under the purview of the City of College Station, which has not yet shown support for this strategy.

Bicyclist Behavior on Sidewalks, Paths and Plaza Areas

On the Texas A&M campus, UPD is not authorized to enforce traffic law outside of the roadway boundary, so they cannot write citations for bicyclists on sidewalks or paths. Reckless or rude bicycling on those areas would be subject to consequences only under campus regulations but currently there are no such rules guiding bicyclist and pedestrian behavior on sidewalks and paths. During listening sessions in April 2014, students, faculty and staff expressed concerns about bicyclist behavior in pedestrian areas, mostly that some bicyclists ride too fast or meander too much in crowded areas.

While it is certainly preferable to first teach good behavior rather than punish for bad, enforcement can be highly effective. After hearing input from the campus community and observing behavior of bicyclists, pedestrians and motor vehicle drivers, it is clear that a significantly more comprehensive and effective enforcement strategy is needed for roadways and pedestrian areas.

Evaluation

Transportation Services conducts both a general user survey and a mode split survey each year (discussed previously in this report). Additionally, crash data, bike parking data, law enforcement reports on bicycling traffic violations and complaints are all effective performance measures. If the Transportation Services resources are limited, co-curricular programs are an outstanding opportunity for students to serve the university and learn in the areas of civil and traffic engineering, urban planning, physical fitness and health, human behavior studies and others.

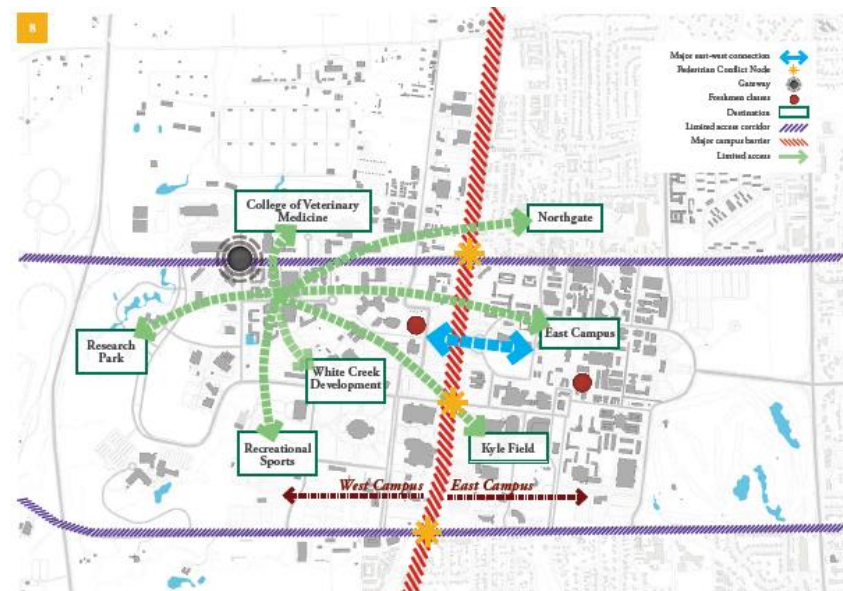
3 Review of Existing Planning Efforts

This section provides a summary of plans and policies relevant to bicycling both TO and ON the Texas A&M campus. The main sources of these plans are the University itself, City of College Station, and City of Bryan. In addition, the Bryan-College Station MPO and TxDOT have plans/policies with relevance to bicycling on campus that may be integrated into those of the TAMU campus and two cities. The 12 plans reviewed for this Plan are listed in Table 5 and described below. The plans are organized by jurisdiction and then year developed.

Introduction

The Texas A&M Bicycle District Plan is being developed in a planning environment that is strongly supportive of regional and local efforts to improve bicycle transportation. The Cities of Bryan and College Station, the Metropolitan Planning Organization, TxDOT, and the University itself have all made significant commitments to bicycling as a primary transportation choice for students and the community at large. This effort has resulted in the City of College Station (including TAMU) achieving the highest bicycle mode split for work/school trips in the entire state of Texas. Highlights of this regional collaboration include TxDOT including bike lanes on George Bush Drive, the bicycle/pedestrian crossing enhancements in the Northgate District at University Drive and College Main, the multimodal crossing treatment at Wellborn and the Tower, and others.

The University's robust growth plan, with the addition of student housing on West Campus and north of the campus, call for even more commitment to bicycling, as well as walking and transit as the transportation priorities on campus. In addition to Texas A&M initiating this planning process, an additional recent bold step has been taken in the region to improve the multimodal transportation environment: The Bryan-College Station MPO has passed a resolution to set aside 5% of category 9 funds for bicycle and pedestrian projects. Only one other MPO in Texas, CAMPO in the Austin region, makes this category of federal funds available for discrete bicycle/pedestrian improvements.



3: Review of Existing Planning Efforts

Analysis contained in the West Campus Connectivity Study

Table 4 Documents Reviewed

Plan	Agency	Year
Campus Master Plan (Vision 2020)	TAMU	2004
Bikeway Improvements Technical Report	TAMU Bikeway Task Force	2005
Bike Share Feasibility Study	TAMU Plan 674 Students	2012
DRAFT West Campus Connectivity Study	TAMU	2014
City of College Station Comprehensive Plan	College Station	2010
City of College Station Bicycle, Pedestrian, and Greenways Master Plan	College Station	2010
South College Avenue Corridor Redevelopment Plan	City of Bryan	2002
City of Bryan Comprehensive Plan	City of Bryan	2007
City of Bryan Street and Sidewalk CIP projects	City of Bryan	2014
Transportation Improvement Program	Bryan-College Station MPO	2012
Unified Planning Work Program	Bryan-College Station MPO	2014
Metropolitan Transportation Plan 2040-DRAFT	Bryan-College Station MPO	2014

Summary of Planning Efforts

Texas A&M University

Campus Master Plan (2004)

Description: The Plan proposes a “radical” reorientation of campus development policy in order to bring the physical environment into complementary alignment with the academic and social mission of the University, achieve the ideals of Vision 2020, and enhance the quality of campus life. It seeks to accomplish this through two primary means: growth management and improved quality of the physical environment. A Circulation plan is proposed within the Long Range Plan section of the document. It emphasizes a pedestrian-oriented scheme with limits on vehicles in certain parts of campus. It recommends general strategies for enhancing and integrating the circulation system for all modes of travel and that a more detailed transportation plan be considered by the University. There is very little text devoted to bicycling on campus.

Recommendations:

- Bicycles and service vehicles will conform to routes indicated in the Long Range Plan
- To unite the east and west campus areas, the University will develop two additional east/west underpasses under Wellborn Road and the RR, each to the north and south of the main axis. To create inner campus loop connecting east to west
- Limit east-west bicycle traffic to Jones/Ross and East Lamar/Joe Routt
- Utilize Spence St as a shared bicycle/pedestrian path
- Extensive bicycle dismount zones throughout campus.

Issue/Questions:

- While text in the Long Range Plan refers to significant limitations on bicycle lanes and paths in the central and east campus areas, Figure 1 on page 76 indicates an abundance of “possible” bike routes throughout the campus. Which of these two contradictory

conditions has been the guiding vision for bicycling on campus since the plan was adopted in 2004 is not clear.

- An update is needed on whether the additional two Wellborn underpasses be built, as these locations are key bicycle connections between Main and West Campus.

Bicycle System Task Force Report: Recommended Bikeway Improvements (2005)

Description: A subcommittee of the Task Force, led by TTI bicycle/pedestrian expert Shawn Turner, P.E., compiled these recommendations, defining bikeway as “a generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.” The focus of the report was on filling gaps in the existing campus bikeway network, and creating bicyclist-friendly intersections to connect to the surrounding community. It includes a substantial list of bikeway improvements related to shared-use paths, bike lanes, bicyclist-friendly intersections, bicycle dismount zones, traffic control devices, and other improvements. These recommendations are at a conceptual planning level with no engineering or cost estimates, although an ease of implementation rating of Low, Medium or High was given each recommendations.

Recommendations (sample):

- Bike paths should not be constructed in areas where they would intersect numerous sidewalks, pedestrian paths, or streets
- Bikes should be permitted to share unrestricted pedestrian areas on campus where space is abundant and pedestrian traffic is light
- Create connections from campus to the sidewalk that encircles the east side of campus; widen it to 10ft for a shared-use path
- Bike lanes and other facility improvements along Ireland, West Lamar, Jones/Central Houston; Spence, Bizzell, Olsen, Agronomy Rd and Penberthy
- Bike-friendly intersection improvements at Bizzell and New Main, George Bush, and University; Throckmorton/G. Bush; Olsen/University; New Main/Texas

- Bicycle dismount zones on north side of Evans Library
- Shorten access gate arms to provide at least 5 feet of space between the curb

Bike Share Feasibility Study; Plan 674 Student Project (2012)

Description: This is a comprehensive and detailed study utilizing GIS-based bike share suitability analysis tool adopted from a similar study in Madrid, Spain. The class used the following data to describe the existing intra-campus traffic flows, define transportation infrastructure and its safety concerns, and survey the “appetite” of potential bike-share users on the campus of TAMU:

- Dormitory occupancy
- Building square footage and occupancy
- Class registration numbers and room location
- Recreation center user trips by time of day
- Pedestrian and bicycle count data at the wellborn underpass
- Bicycle and pedestrian condition survey
- Campus transit trip data
- Parking lot utilization data, and
- Two years of campus transportation related accident reports

The study was conducted in three phases. The first phase determined the intra-campus 24-hour travel flow for a typical week day. The second phase utilized the flow concentrations and building, parking lot and bus stop characteristics, to build a GIS-suitability map locating the most probable sites for bike-stations. A user survey was applied to define the most important attributes of the system and frame an implementation strategy. Phase three of the study summarizes the most feasible system design and operational elements for the “pilot”/initial bike-share program.

3: Review of Existing Planning Efforts

Recommendations:

- Initiate a pilot bike share system of 19 stations, 510 bikes, and 255 docks.
- System should be a 4th generational smart dock type accessed through student ID or credit card, self-maintaining and available 24/7.
- Locations were mapped and categorized as small attractors, large attractors, generators, and mixed, with number of stations/bikes/docks assigned by category

Draft West Campus Connectivity Study (April 2014)

Description: This document provides a basic framework of a bicycle network within the west campus area with bike facilities proposed on several existing and future streets. The study was conducted by the same architect team that did the 2004 Campus Master Plan and echoes some of the same themes of that process, specifically a lukewarm regard for bicycling as an ideal transportation mode for the university community. In addition, there is little evidence that the architects were versed in bicycle network planning or facility design, as the only facilities proposed are bike lanes or Sharrows, and it is not clear from the document where each is recommended because the authors do not employ standard industry terminology. Of additional concern is the proposed map of recommended bicycle facilities that also includes East Campus; it omits many of the recommendations from the 2005 TAMU Bicycle System Task Force report mentioned above. Since that task force was led by a nationally recognized expert in Bicycle Network Planning (TTI's own Shawn Turner), it is significant that the 2005 report was apparently ignored. Below are stated recommendations from the Connectivity Study, but this list omits the recommended, extensive bicycle dismount zone through the middle of the entryway into West Campus.

- Establish a dedicated bicycle route along the primary boulevard through WCH with connections to secondary bicycle paths that lead to academic, social, and other residential facilities
- Establish a hierarchy of pathways that provide appropriately-sized facilities for bicyclists and that enhance cyclist safety

- Provide bicycle parking in close proximity to the entrances of the commons and residential buildings
- Offer multiple locations for bikeshare stations within the site
- Provide bicycle parking areas that are large enough to accommodate the growing bicycle community
- Recommend public off-campus bicycle enhancements along University Drive and George Bush Drive
- Establish a campus dismount policy for bicycles at bridges crossings along White Creek
- Propose shared roadways (sharrows) on low traffic volume streets with appropriate marking and signage

City of College Station

College Station Comprehensive Plan (2010)

Description: This Plan outlines a vision for maintaining the economic vitality, character and identity of College Station as it grows by an estimated 40,000 new residents by 2030. One of the six elements in the Plan's Vision Statement is "Increasing and maintaining the mobility of College Station citizens through a well-planned and constructed inter-modal transportation system." The Transportation section of the document (Chapter 6) stresses an orderly and integrated development of the city's transportation network, considering transit, bicycling and walking in addition to automobiles. A key statement in Chapter 6 shows the City's commitment to an inter-modal system: "Without significant investments in new and expanded roadways, pedestrian and bicycle facilities, and transit, the estimated travel demand will result in increased congestion and a degradation of level of service in numerous locations. To be successful, transportation investments must be accompanied by significant increases in transit ridership and the reduction of vehicle trip and travel distance through better land use planning, increased use of bicycles, and improved walkability. Chapter 6 also serves as the foundation for the City's Bicycle, Pedestrian, and Greenways Master Plan.

Recommendations:

- Ensure that Context Sensitive Solutions are employed in planning and design by amending the Unified Development Ordinance, the Bryan-College Station Unified Design Guidelines, and the City's project development process.
- Collect and monitor transportation data including vehicle miles traveled, traffic counts, levels of service, transit ridership, and pedestrian and bicycle facility usage and crashes.
- Perform upgrades and enhancements to intersections to improve multi-modal efficiency.

City of College Station Bicycle, Pedestrian and Greenways Master Plan (2010)

Description: Proposes 130 miles of bike lanes, 80 miles of bike routes, 41 miles of trails and 114 miles of sidewalks. As of the publication date, 4 miles of bike lane and 0 miles of bike route had been funded. Standard planning protocol for non-motorized transportation was utilized to divide the project list into Short-term (0-10 years), Near-term (11-20 years), and Long-term (21+ years) time frames. Agency and community partners, potential funding sources, and project development processes were identified in the Implementation Plan. Several bike lanes in proximity to the TAMU are planned including:

Short-term (0-10 years)

- George Bush from the future Jones-Butler extension to Wellborn, with a grade separation included at the intersection of Bush and Wellborn
- South of campus -- Timber /Glade from George Bush to Holleman
- Southeast of campus – Dominik from Munson to Texas Ave.

Near-term (11-20 years)

- West campus – Agronomy from University to F & B Rd

In addition to proposed facilities, several goals and policies that would foster a more complete and safe bicycle network were described.

Institutionalizing these goals and policies into the City of College Station's operations would greatly increase bicycling as transportation to the TAMU campus and throughout the City. Following are a sampling of goals/policies:

- A bicycle and pedestrian circulation plan should be required for new development and redevelopment to provide appropriate bicycle and pedestrian accommodations.
- All new and reconstructed collectors, arterials, and grade separated crossings should be planned and designed to ensure safe bicycle and pedestrian accommodations. Bicycle facilities on freeways and local subdivision streets may be considered based on context
- The proposed system should reflect and be reflected in related planning documents by planning organizations at the local and state level to connect facilities into a regional system.
- Coordinate with Texas A&M University to distribute information through on and off-campus student services to target students riding within and commuting to campus.
- Encourage the creation of campus tours given by bicycle to new students and staff. Basic bicycle laws and safety tips could be reviewed before the on-Bicycle tour
- Establish a "Share the Road" campaign that educates bicyclists and motorists about their rights and responsibilities in sharing roadway space. "Share the Road" signs should be placed along signed bicycle routes.
- Train law enforcement officers on bicycle and pedestrian rights and safe behaviors as well as common violations that cause bicycle and pedestrian crashes.
- Review and modify any local laws that may restrict multi-modal mobility in collaboration with the City of College Station Police Dept. and City Attorney.

3: Review of Existing Planning Efforts

City of Bryan

South College Avenue Corridor Redevelopment Plan (2002)

Description: The purpose of this Plan is to improve the transportation options along South College Avenue, creating a street that comfortably accommodates vehicles, bicycles, pedestrians and transit. The purpose of redesigning the street extends beyond transportation to influence land use, enhancing access to current points of interest such as schools and identifying types of development that are appropriate for the corridor. The plan includes a mobility analysis, development design concepts, a corridor master plan and funding and implementation sections. The goals of this plan are to repair and partially redesign the thoroughfare and revitalize the surrounding area. In the Urban Design Concepts section (Chapter 5) design elements including sidewalks and lighting, site amenities, signage, trees, typical street enhancements and enhanced intersections. This plan draws heavily on the objectives and actions defined in the 1999 City of Bryan Comprehensive Plan.

Recommendations:

- Several design concepts are provided for the South College Avenue Corridor from pages 5-8 to 5-16, including:
 - Intersection at South College Avenue and Sulphur Springs Road
 - Intersection at South College Avenue and Villa Maria Road
 - Intersection at South College Avenue and Carson Street
 - Transit stop enhancements at South College Avenue and Coulter Drive
 - Gateway/Monument enhancements at South College Avenue and Texas Avenue
 - Gateway/Monument enhancements at South College Avenue and Greenway Avenue
 - Gateway/Monument enhancements at South College Avenue and Hardy Street

- Pocket park on north side of Bryan Municipal Golf Course
- Enhanced treatment on south side of Bryan Municipal Golf Course
- Tools for implementation, pages 7-2 to 7-11
- Design/Development Standards, pages 7-13 to 7-14

City of Bryan Comprehensive Plan (2007)

Description: This plan provides a comprehensive analysis and recommendations on land use, transportation, community appearance, parks, open space and trails, drainage, utilities and municipal services. These 7 topics have goals, objectives and specific action statements at the end of each chapter. The implementation chapter provides a list of tools and explanations for guidance on implementation including: Implementation Action Guide & Implementation Team, Development Code Review, City Initiated Rezoning, Capital Improvement Program, Economic Development, and Communication and Accountability.

Recommendations:

Chapter 6 Transportation:

- GOAL #1: Provide a Safe, Efficient and Convenient Multi-Modal Transportation System
 - Objective A) Plan and develop a unified thoroughfare system linked to land use.
 - Action Statement 2: Update the Transportation Plans (Thoroughfare, Sidewalk and Bikeway Plans) annually.
 - Action Statement 3: Create and/or update the Sidewalk and Bikeway Master Plans and assure they are adopted as a subset to the Thoroughfare Plan so that they may be implemented in a similar manner.
 - Objective C) Encourage utilization of alternative modes of transportation including transit, bicycles and pedestrians.
 - Action Statement 2: Create a pedestrian and bike friendly community through the use of a Sidewalk/Bikeway Master Plan updated yearly to provide both new and

retrofit sidewalk and bike facility links between neighborhoods, schools, parks and major shopping centers.

- Action Statement 4: Install bike/pedestrian friendly traffic signal detection.
- Action Statement 6: Create a similar bikeway capital improvement plan to stripe and sign bike lanes and routes on existing thoroughfares that are being used as such.
- Action Statement 7: Assure bike lanes are striped and signed on all appropriate new thoroughfares as shown in the design guidelines. Establish guidelines to determine which type of bike facility should be installed on a new street.
- Action Statement 11: Obtain public access easements in addition to public utility easements when warranted for the inclusion (current or future) of off street hike/bike paths.
- GOAL #2: Maintain and Rehabilitate the Transportation Network.
 - Objective A) Implement the multi-year street improvement program.
 - Action Statement 2: Create and fund an annual sidewalk/bikeway capital improvement plan to incrementally add to the system in critical (schools, beaten paths) locations.

Chapter 7 Community Appearance:

- GOAL #1: Provide an attractive place to live, work and visit
 - Objective A) Develop attractive entrances and corridors.
 - Action Statement 4: Incorporate streetscape improvements, bike lanes and sidewalks into street widening and extension projects.

Chapter 8 Parks, Open Space and Trails:

- GOAL # 4: Develop a network of pedestrian and bicycle ways for hiking and cycling throughout Bryan.
 - Objective A) Preserve green-belt linkages throughout the City and the region.
 - Action Statement 5: (2007 - 2012) Add additional hike and bike trails to the system as per the Trails Element of this Comprehensive Plan.

2009 Update:

- In 2008, the City hired a consultant to assist with re-establishing the Capital Improvement Program. Projects from a newly adopted sidewalk master plan, and other vehicular and bike facilities are incorporated into the CIP.
- Thoroughfare Plan and Hike & Bike element are currently being updated.
- The Parks & Recreation Department is currently updating the Hike & Bike Plan Element

City of Bryan Street and Sidewalk CIP (2014)

Description: Listed below are the current street and sidewalk Capital Improvement Projects. These projects, including specific information regarding each project, can be found on the City of Bryan’s Capital Improvement Project website.

- Cavitt/Villa Maria – S. College/Dodge St. Traffic Signal Improvements
- W. 28th St. Reconstruct – Congress St. to Palasota St.
- 2010 Traffic Signal Improvements
- Wellborn Rd. and F&B/Old College Rd. Traffic Signal Impvts.
- Safe Routes to School 2009
- 2013 Street Maintenance – Overlays
- HSC Parkway Ph 1B & 2A

3: Review of Existing Planning Efforts

- Old Hearne Road Widening – Phase 1
- 2013 Street Maintenance – Concrete Reconstructs
- First St. Street Reconstruction
- 2014 Street Maintenance – Pavement Markings
- Villa Maria at Joseph Dr Traffic Signal Improvement
- Rosewood Trail Improvement
- W. 26th Street Reconstruction Project
- Briarcreek Court Alley Reconstruction
- Avenue E Street Improvements
- 2014 Street Maintenance – Crack Seal

Bryan-College Station MPO (BCSMPO)

Transportation Improvement Programs (2012)

Description: This plan was adopted in 2012 to serve as the 2013-2016 TIP. The TIP is a four-year, fiscally constrained program that identifies which federally funded projects will be implemented. The TIP must be consistent with BCSMPO's adopted Metropolitan Transportation Plan (MTP). The 2013-2016 TIP is being monitored and amended as necessary by the UPWP as the 2015-2018 TIP is developed.

There are no stand-alone bicycle or pedestrian projects listed in the TIP.

Projects listed are for the Texas Department of Transportation (TxDOT) Bryan District and represent the highway investments for the next four years.

Unified Planning Work Program (2014)

Description: The UPWP was developed to serve four main objectives: to define work activities to meet the needs of federal, state, and local agencies; to identify funding sources; coordinate work activities and relationships both internally and externally; and, to promote the wise use of public resources through sound decision-making and interagency coordination. The plan provides a review of legislative guidance such as MAP-21 and regional plans like the MTP and TIP.

The Unified Planning Work Program (UPWP) is prepared and approved by the Policy Committee of the Bryan/College Station Metropolitan Planning Organization (BCSMPO). Pursuant to current transportation legislation, the BCSMPO's 2014-2015 UPWP identifies all transportation and related planning activities that will be undertaken by the BCSMPO during the next two fiscal years from October 1, 2013 to September 30, 2015. The UPWP helps to assure that planning resources are allocated according to regional needs as identified by Brazos County, City of Bryan, City of College Station, Texas A&M University, the Texas Department of Transportation (TxDOT) and The District.

Recommendations: The following objectives and their tasks are described in the UPWP:

- Administrative Management tasks 1.1 – Staff travel and training: Attend workshops, conferences, seminars, webinars and other events that support the work of the BCSMPO and further enhance staff knowledge, skills and abilities.; Interagency Coordination: All cities, county, TAMU, TTI, econ develop, Bicycling Advocacy Groups
- Data Development & Maintenance tasks 2.1 – Developing inventories of traffic signal locations and bicycle and pedestrian facilities
- Short Range Planning tasks 3.1 – The objective of Task 3.0 is to implement and maintain short-term transportation planning activities associated with FY 2014-2018.
- Metropolitan Transportation Plan tasks 4.1 – 4.2 pages 11-12. Developing county-wide bicycle and pedestrian supplemental policies and design guidelines for use by member agencies in the development of a network of coordinated bicycle and pedestrian facilities, including in-street bicycle travel lanes, multi-use bicycle/pedestrian paths and trails, and sidewalks for pedestrians, that provides accessibility and connectivity within, across and adjacent to jurisdictional boundaries; and Identifying and prioritizing transportation projects for developing a multimodal transportation system
- 2040 Metropolitan Transportation Plan (MTP)
- An important element of the current UPWP is development of the 2040 MTP. This long-range plan focuses on developing a multimodal transportation system and serves as the guide to decision-making for the Policy Committee. Developing and implementing Performance-Based Planning, completion of data collection, data analysis, and system evaluation using the travel demand model, public outreach and technical writing will be done, in preparation for the update to the 2015-2040 MTP.

- Transportation Improvement Program (TIP) 2013-2016 will be monitored and amended as necessary and the 2015-2018 TIP will be developed in compliance with federal regulations.
- Special Studies tasks 5.1 – 5.2 pages 13-14 continued support of the BCSMI, Bryan-Collate Station Mobility Initiative, begun in 2006, addresses congestion in the Brazos Valley
- Budget Summaries section describes the estimated available funding per objective pages 15-17

Bryan-College Station MPO Metropolitan Transportation Plan 2040 (2014)

Description: The purpose of the Metropolitan Transportation Plan (MTP) is to provide a long-range transportation planning process for the Brazos County region that (1) identifies current transportation needs, (2) forecasts future transportation needs, and (3) establishes projects and strategies that address the needs. The MTP is required by federal legislation to address at least a 20-year planning horizon that leads to the implementation of a multimodal transportation system that facilitates the efficient movement of people and goods.

In Brazos County bicycle and pedestrian travel is gaining in popularity for several reasons. More and more citizens are choosing to utilize non-motorized forms of travel in their daily activities and for exercise and recreational purposes. Each MPO member is dealing with this increase in bicycle pedestrian travel according to its own needs; BCSMPO is responding as well.

To address Accessibility & Mobility for bicycle and pedestrian modes the MPO decided to use the Bicycle Level of Service (BPLOS) and Pedestrian Level of Service (PLOS) measures. These are two nationally recognized measures of user comfort level as a function of the geometry and traffic conditions in a corridor.

BCSMPO has formed a standing Bicycle and Pedestrian Subcommittee of the Technical Advisory Committee. This committee is comprised of bicycle and pedestrian planning experts from all of our member governments as well as TTI and private citizens. It was formed to assist MPO staff members in coordinating bicycle and pedestrian planning within the MPO planning

3: Review of Existing Planning Efforts

area. Texas A&M Alternative Transportation Services manager serves on the committee.

2014 Bicycle/Pedestrian Funding Policy

On September 3, 2014, the MPO Policy Committee adopted Resolution 2014-04 which established the Bicycle and Pedestrian Only Projects Funding Policy for use in updating the MTP with the following requirements for funds that may be available through the BCSMPO and the federal multimodal transportation planning process:

- Proposed bicycle and pedestrian only projects will comprise a minimum of 5% of funds available to the MPO for allocation to projects identified in the Metropolitan Transportation Plan.
- Bicycle and/or pedestrian infrastructure only projects must be able to meet financial and time constraint requirements associated with funds as they become available.
- The Bicycle and Pedestrian funds are not available for use as matching funds for grants received by local governmental or non-profit entities.
- Bicycle and Pedestrian funds are only available for use along on-system (State owned, operated or maintained) facilities unless a local entity provides matching funds equal to at least 20% of the total project costs.
- Projects will be recommended to the MPO TAC by the Regional Bicycle and Pedestrian Advisory Board (RBPAP) or the TAC Bicycle and Pedestrian Subcommittee until the RBPAP has been established. Project recommendations will be based on a project identification process using performance metrics identified in the MPO Bicycle and Pedestrian Project Prioritization Process.

4 Bicycle Network & Facilities Recommendations

This chapter identifies the draft intersection and corridor recommendations that were identified through stakeholder meetings, public meetings, and campus tours conducted April 23-25, 2014, and field analysis tours May 28-29, 2014.

Introduction

Based on the needs analysis and stakeholder/public input received from previous tasks, a series of strategies were developed utilizing the “5 E’s” approach (Engineering, Education, Encouragement, Enforcement and Evaluation) that Texas A&M, the City of College Station and regional partners can implement to meet the goals of this study.

Types of Bicyclists

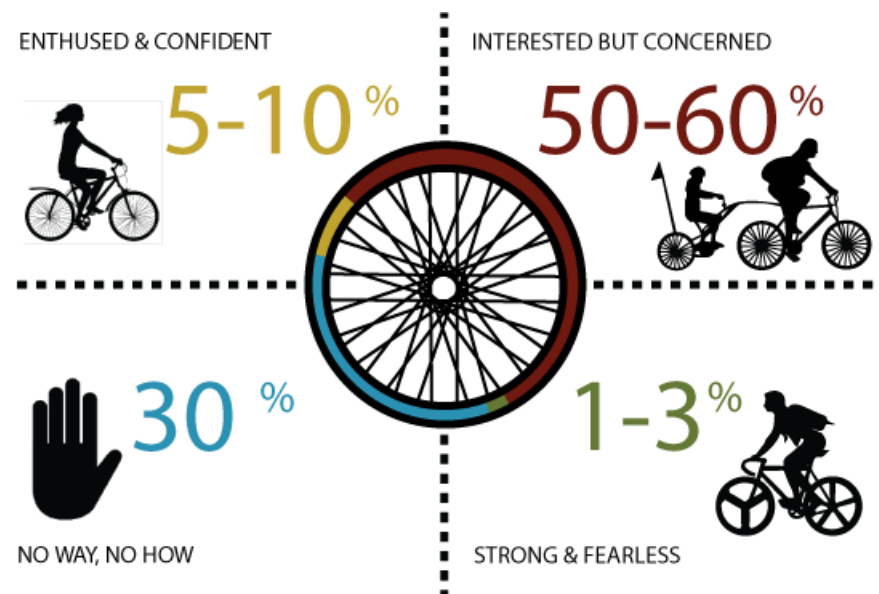
There are a variety of bicyclists of all skill levels in College Station and on the Texas A&M campus. A framework for understanding the characteristics, attitudes, and infrastructure preferences of different bicyclists in the US population as a whole is illustrated below.

Strong and fearless bicyclists (approx. 1-3% of population) will typically ride anywhere regardless of road or weather conditions, ride faster than other user types, prefer direct routes, and will typically choose to ride on the road, even if shared with vehicles, over separate bikeways like shared use paths.

Enthusied and confident bicyclists (approx. 5-10% of population) are fairly comfortable riding in dedicated bikeways but usually choose low traffic streets or shared use paths when available. This group can include many kinds, including commuter and recreational bicyclists.

Interested but concerned bicyclists (approx. 50-60% of population) comprise the majority of the population and are typically those who only ride on low traffic streets or shared use paths in fair weather. These people perceive traffic, safety, and other issues as significant barriers to bicycling.

No way, no how (approx. 30% of population). These are not bicyclists and will not ride a bicycle under any circumstances. Some may eventually try bicycling with time, education, and training.



4: Bicycle Network & Facilities Recommendations

This plan seeks to meet the needs of the “Strong and Fearless,” “Enthusied and Confident,” and “Interested but Concerned.” Bicycle infrastructure should accommodate as many user types as possible, with the goal of creating safe bicycling environments to encourage more ridership.

Key Considerations

The recommended network was developed using many inputs, which are summarized below.

Public Input Bicycle use trends, ideas, concerns, and preferences for future bicycle facilities were identified through past transportation surveys, a series of public meetings, and stakeholder interviews.

Field Analysis of Existing Conditions Fieldwork throughout campus was conducted to analyze ‘on-the-ground’ site conditions for opportunities and constraints for recommended bicycling improvements.

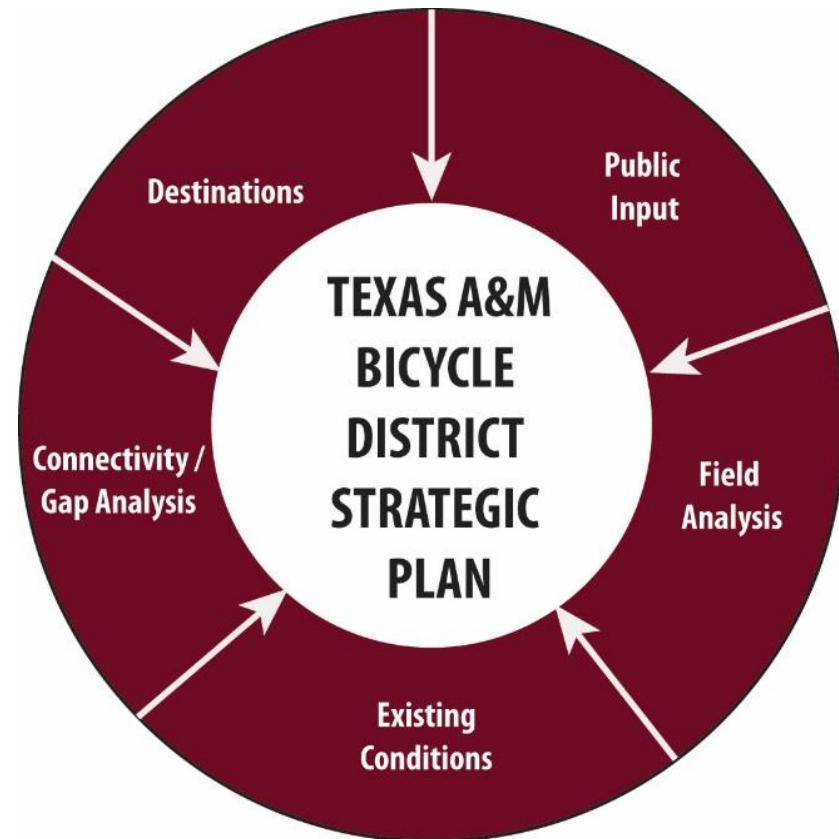
Existing Facilities and Current Recommendations Locations of existing facilities were identified in the field by project consultants and by existing data provided by the university; current recommendations were also analyzed from existing planning efforts.

Connectivity/Gap Analysis Gaps in existing facilities were identified through a spatial mapping analysis; recommendations were then made to connect those gaps.

Key Destinations Locations which are likely to attract people, such as the Library, the Student Union, and the recreation center were considered in network design.

Game Day for TAMU football games at Kyle Field generates intense demands on the transportation system. Any proposed bikeway improvements should not permanently impede the ability of the transportation system to function.

Engineering recommendations are depicted in Figure 4



TEXAS A&M UNIVERSITY *BICYCLE DISTRICT PLAN*

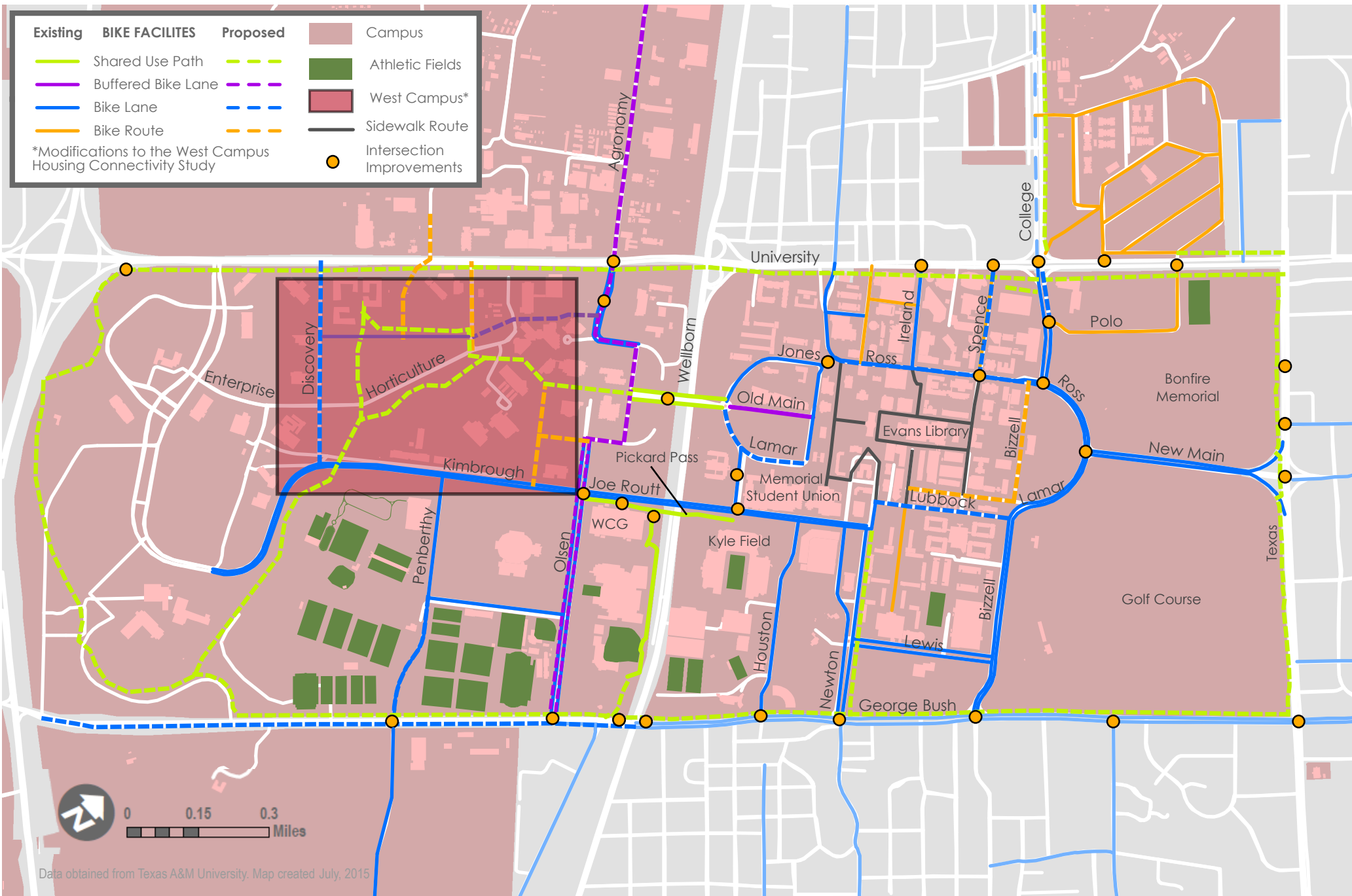


FIGURE 4: *BIKE NETWORK* EXISTING AND PROPOSED FACILITIES

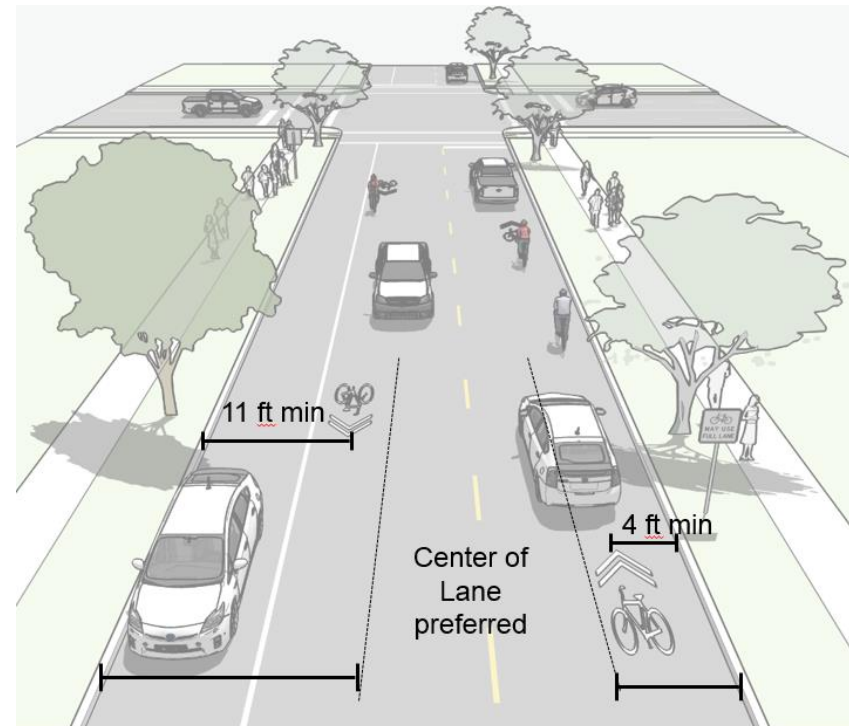
Bikeway Recommendations

As with previous chapters, the recommendations are organized by the five E's for consistency. Chapters 5 and 6 contain recommendations for Education, Encouragement, Enforcement and Evaluation.

Bicyclists have the same rights and responsibilities as motorists and are allowed to ride on all roads around campus. Modifications to roadways in the region, as well as the addition of off-street pathways, will make bicycling a safer and more viable form of transportation that will appeal to a larger range of the TAMU student body, faculty and staff. The following are brief descriptions of five types of bicycle improvements recommended in this plan. For additional design guidance please refer to the latest editions of the NACTO Urban Bikeway Design Guide and the AASHTO Guide for the Development of Bicycle Facilities.

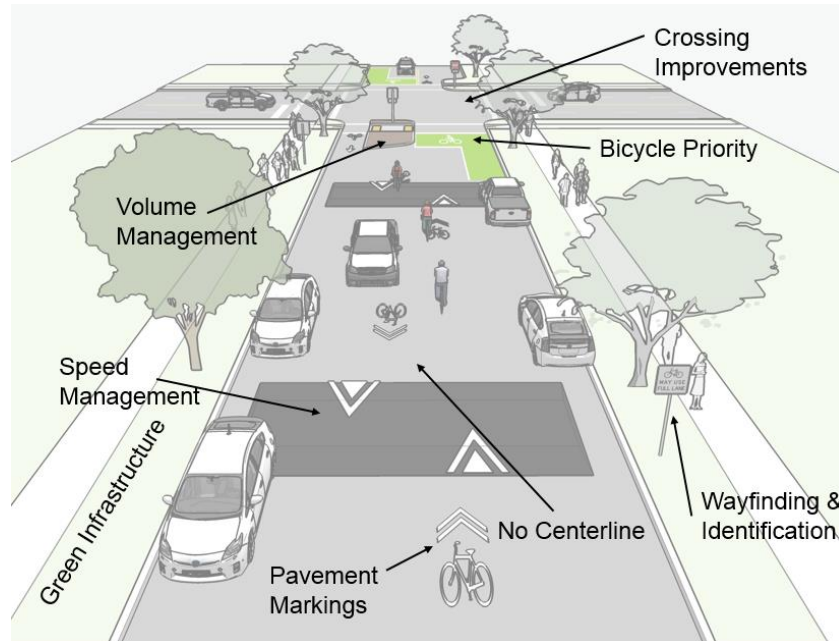
Facility Definitions

Marked Bicycle Routes A marked bicycle route is indicated by "Bicycle Route" signs and may be accompanied by shared-lane markings (sharrows). Sharrows make motorists more aware of the potential presence of cyclists; direct cyclists to ride in the proper direction; and remind cyclists to ride further from parked cars to avoid 'dooring' collisions. Signed Bicycle routes are designed for the Strong & Fearless and Enthused & Confident bicyclist.



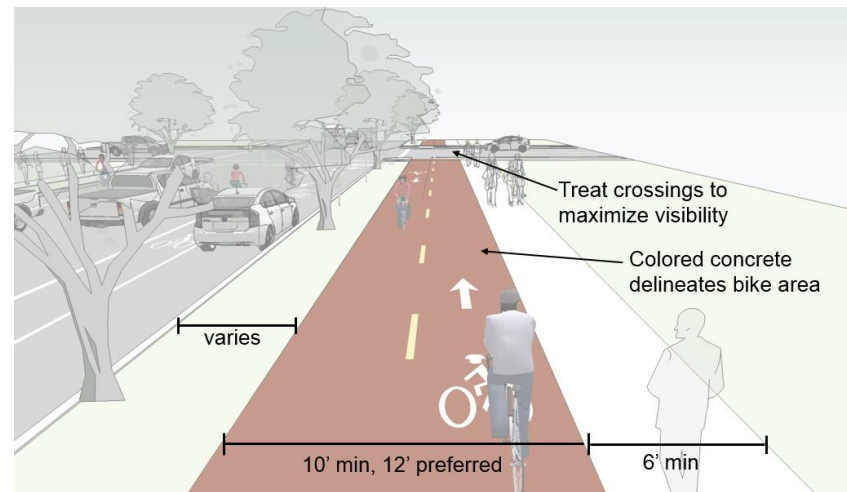
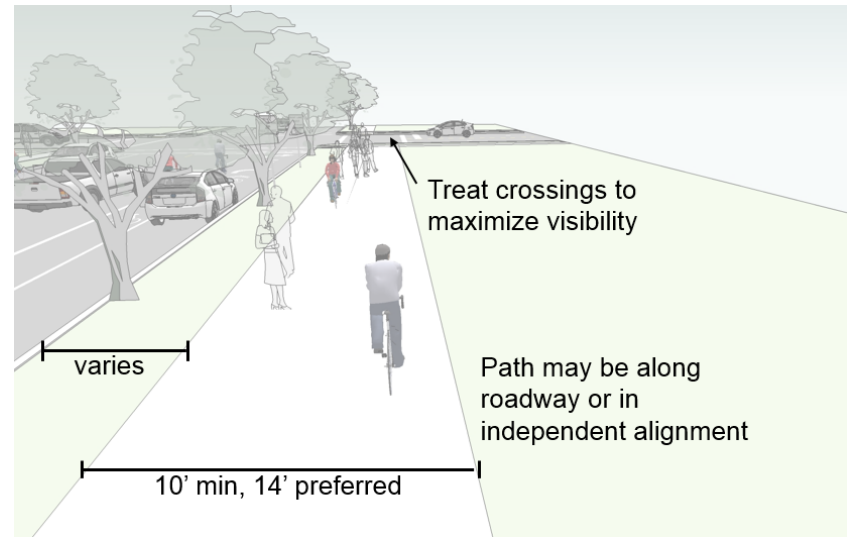
Marked Bicycle Route

Bicycle Boulevard Low-volume and low-speed streets that have been optimized for bicycle travel. Bicycle Boulevard treatments can be applied at several different intensities, which should be identified in detail during project design. Wayfinding signs, pavement markings, traffic calming and intersection treatments are potential elements of these facilities. Bicycle boulevards are designed to attract bicyclists of all ages and abilities, especially those in the ‘interested but concerned’ category. Any recommended bike route could be developed as a bicycle boulevard within campus.



Bicycle Boulevard – Common Elements

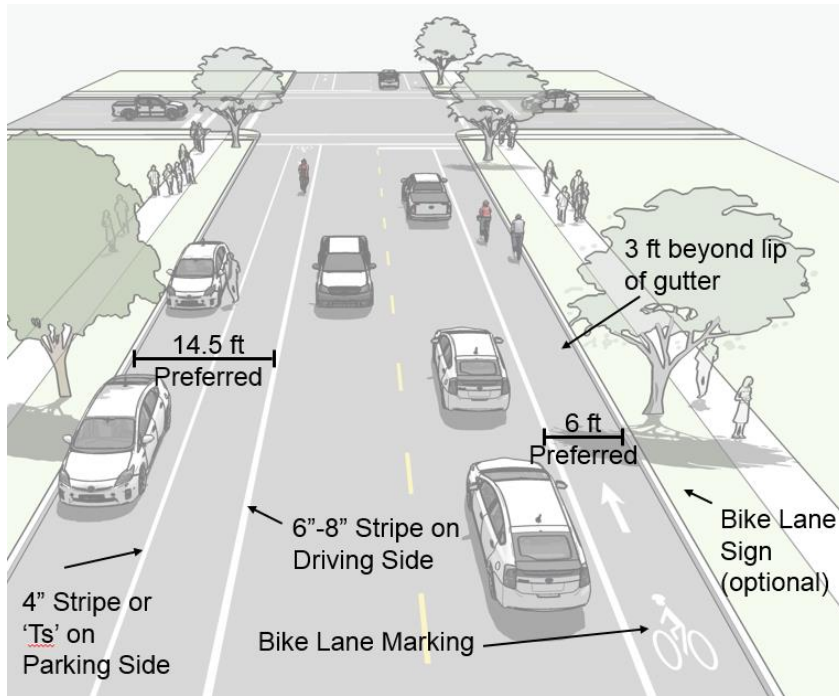
Pathways/Shared-use Paths are sidewalks or pathways within the campus that are capable of accommodating bicycle and pedestrian traffic. The bicycle network recommendations include shared-use paths to offer improved connections for bicyclists while providing space for higher volumes of bicyclists that are expected to use the campus in the future. Outside of the campus core and along the perimeter of campus parallel paths for bicyclists and pedestrians are recommended.



Shared-Use Path & Parallel Paths

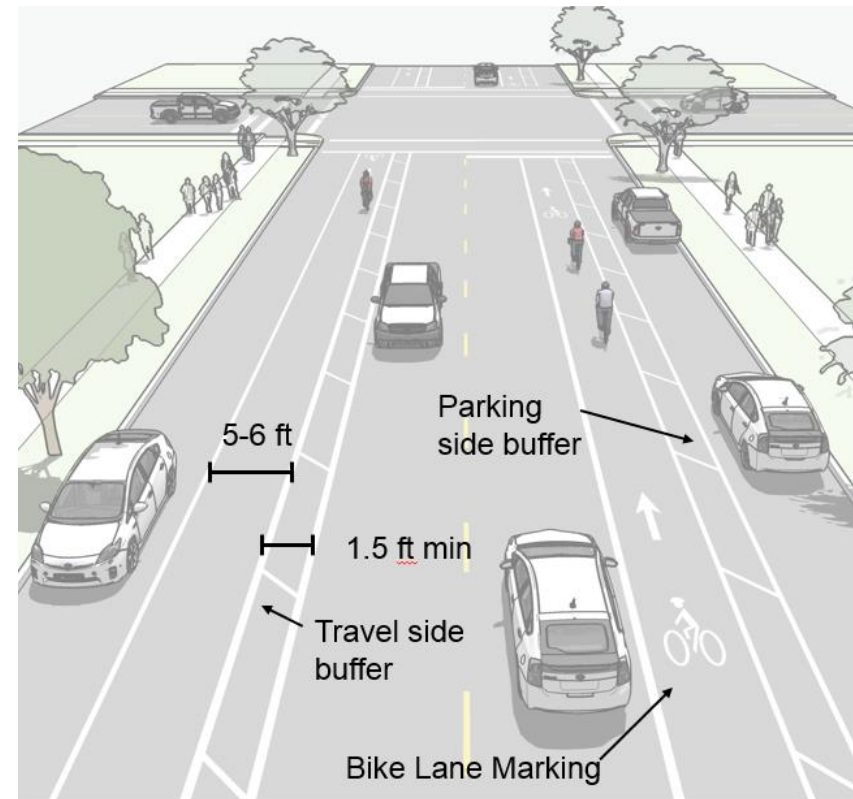
4: Bicycle Network & Facilities Recommendations

Bicycle Lanes A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicyclists. Bicycle lanes can be striped on existing roadways, sometimes with modifications to travel lane widths and configuration. As a general practice, any local arterial or collector that is widened should incorporate bicycle lanes with speed limit reduction considerations. In some instances, buffered or protected bicycle lanes will be appropriate.



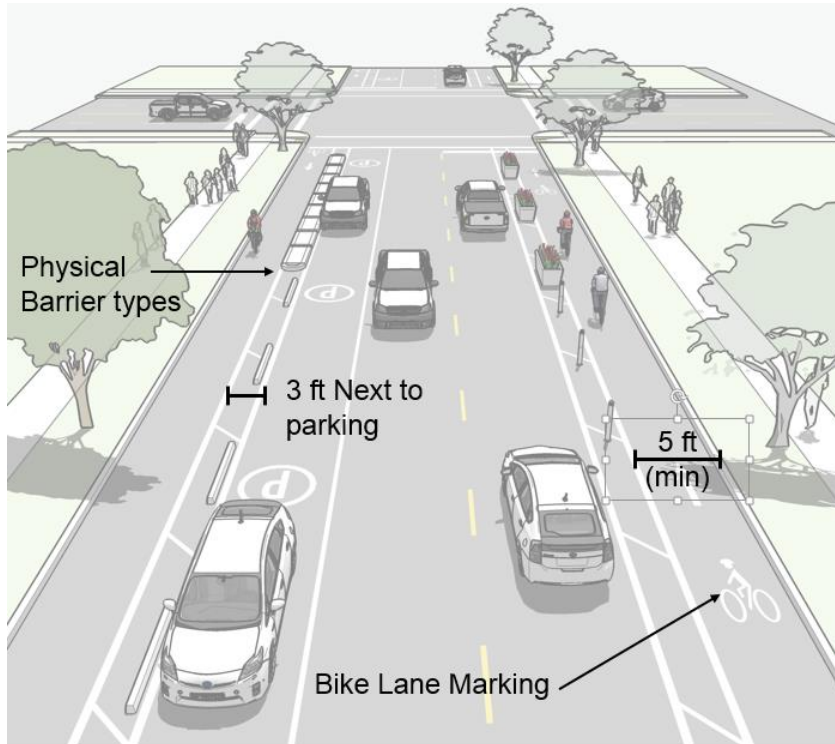
Conventional Bike Lane

Buffered Bike Lanes Similar to a bike lane, buffered bicycle lanes provide additional width to 'buffer' the bike lane, on the side of the adjacent travel lane and/or parking lane. They provide a more comfortable experience for bicyclists, but they also are an effective tool to discourage motorists from driving or parking in the bike lane that would otherwise be excessively wide.

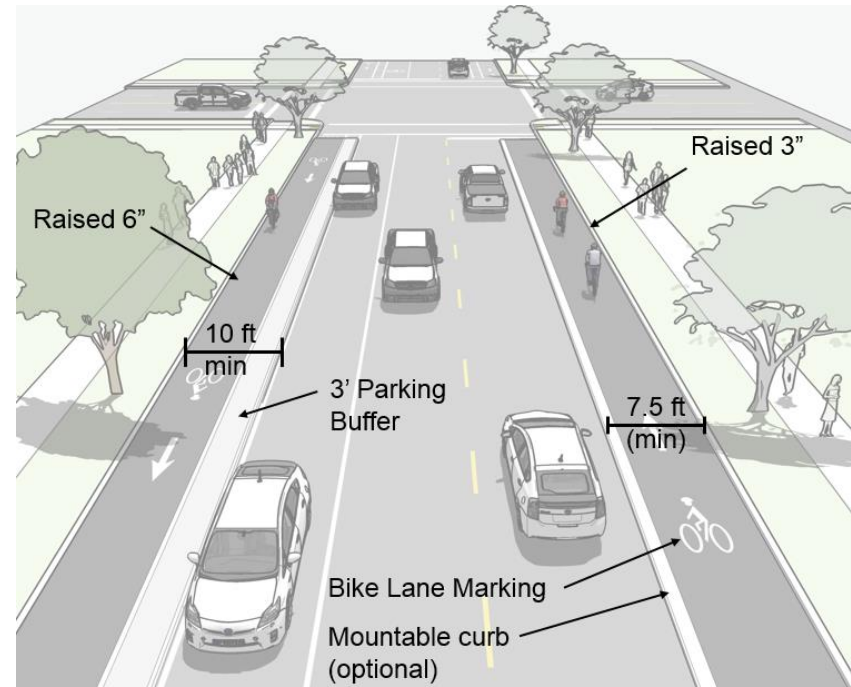


Buffered Bike Lane

Protected Bike Lanes Also known as Protected, or Separated Bike Lanes or 'Cycle Tracks'. Protected bike lanes are exclusive bike facilities that combine the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Protected bike lanes may be at street level or raised at a sidewalk or intermediate level. Protected bike lanes may also be one or two-way depending on design. Typically, if there is sufficient road space to do a buffered bike lane, a protected lane could be an option.

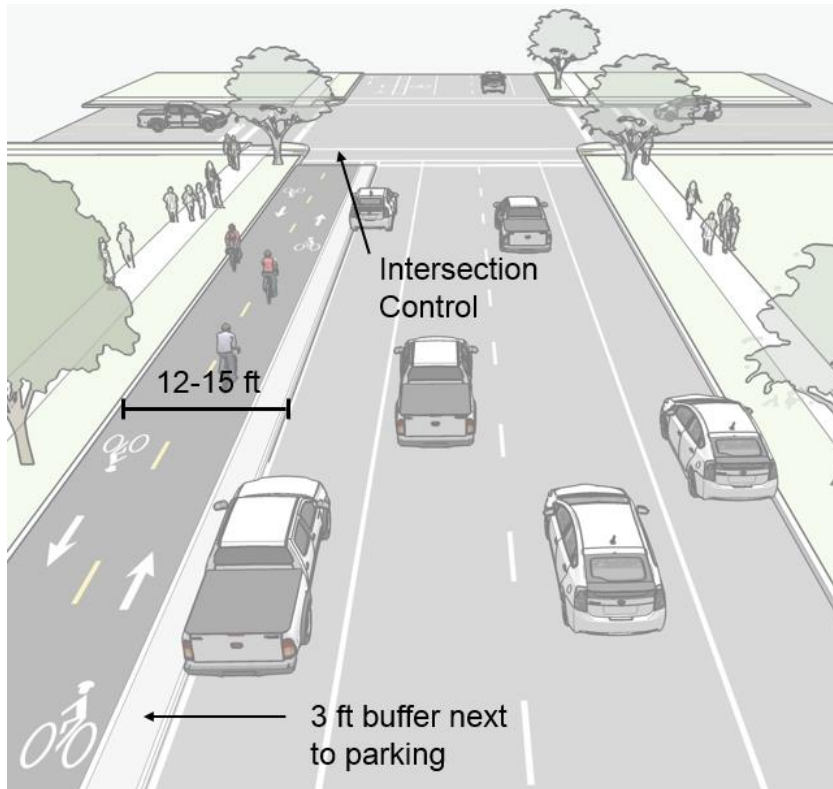


One-Way Street Level Protected Bike Lane



4: Bicycle Network & Facilities Recommendations

One-Way Raised Protected Bike Lane



Two-Way Protected Bike Lane (raised)

Intersection Treatments

Intersections have increased conflicts due to the multi-modal nature of the space. Providing intersection treatments can highlight the presence of bicyclists and pedestrians, thereby potentially improving user comfort and safety. Intersections are one of the most limiting existing constraints to increasing bicycling to the TAMU campus due to bike lane and other facilities that disappear in advance, multiple turning lanes, and high vehicle speeds / volumes. This chapter has detailed recommendations for improvements to intersections. Many of the recommendations will involve geometric changes to the intersections and will require curb/median reconfiguration, striping changes, signal modifications and signage. These changes are noted by individual project. As projects are advanced to implementation, the below features should be included within the design wherever possible.

This plan does not attempt to predict future development on and around the TAMU campus. The recommendations respond to existing conditions. Opportunities should be sought to leverage greater accommodation such as grade-separation or innovative crossing treatments like the Northgate District crossing at College Main. This crossing proves the effectiveness of such improvements for reducing barriers posed by major roadways such as University Dr.

Table 5: Recommended Bikeways

Type	Location	Cross Street A	Cross Street B	Length	Description
Advisory Bike Lane	Ross St	Houston St	Bizzell St	0.42	Pilot 'advisory bike lane' Since Ross St is not wide enough for standard bike lanes, encroachable bike lanes could be established to turn the 26 foot road into a single 14 driving lane (bi-directional) with 6 foot dashed advisory bike lanes in both directions. Drivers would yield to oncoming traffic if a bicyclist was in the bike lane until it was safe to pass. Signage needed. If University is unable to apply this concept green backed shared lane markings with removed edge lines would be recommended at 75 foot intervals.
Bike Lane	Discovery Dr	Kimbrough Blvd	University Dr	0.41	Bike Lanes through 4 to 3 lane reconfiguration. If desired, buffered bike lanes could be provided through a 4 to 2 lane reconfiguration.
Buffered Bike Lane	Proposed Street (West Campus)	Horticulture St	Olsen Blvd	0.26	Bike lanes should be provided on this, or any collector or arterial based road to be constructed as part of the West Campus area. If possible seek buffered bike lanes.
Bike Lane	Spence St	University Dr	Ross St	0.22	Width generally exists to install bike lanes with 10-11 foot travel lanes. Angled parking on north side of corridor would not be compatible with bike lanes. This should either convert to parallel with a buffer to the door zone, or a short shared lane marking section of the corridor could be established. Back-in angled parking could be compatible if deep enough. Intersection at University Drive should be made more bike friendly.
Bike Lane	Bizzell St	University Dr	Polo Rd	0.11	Install bike lane in northbound direction through curb reconstruction. Provide through bike lane to the left of free right lane. Shorten free right lane by half if possible to minimize exposure. Include conflict markings with green pavement color.
Bike Lane	W Lamar St	Old Main Dr	Houston St	0.18	Convert to one lane of travel between Old Main Dr and Gene Stallings Blvd, provide contra flow bike lane. Parking could be removed from north side of split between Gene Stallings Blvd and Houston St.
Bike Lane Improvement	Penberthy Blvd	George Bush Dr	Tom Chandler Dr	0.26	Widen roadway north of parking lot access on west side to accommodate a bike lane on the west side of the street.
Bike Lanes	George Bush Dr	Wellborn Rd	FM 2828	1.19	Install bike lanes in both directions. Travel lanes are typically 14 feet wide along George Bush, if these were narrowed to 11 feet, there would be at least 6 feet available for a bike lane in each direction. This continues the bike lanes that end at Wellborn Rd.
Bike Route	East of Spence St	Ross St	Lamar St	0.24	New bike route from Ross St to Lamar St; Provide green backed shared lane markings, ramps in central plaza, and signage. Route will mix w/ pedestrians at Admin Building.

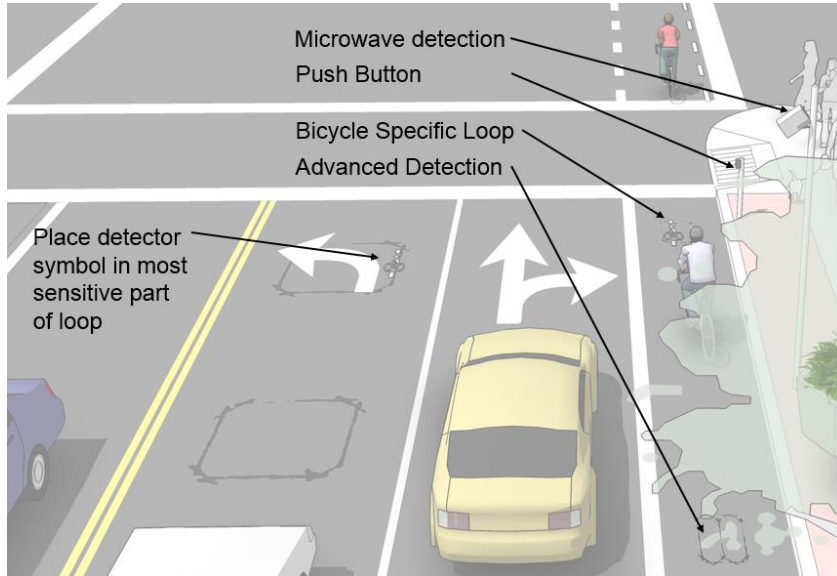
4: Bicycle Network & Facilities Recommendations

Type	Location	Cross Street A	Cross Street B	Length	Description
Bike Lane	Lamar St	Nagle St	Bizzell St	0.21	Lamar street to be reconstructed to have a contra-flow bike lane the westbound direction and a shared lane in the eastbound direction.
Bike Route	Adriance Lab Rd	University Dr	Horticulture St	0.17	New bike route with shared lane markings and signage. Dependent on West Campus development.
Bike Route	Proposed Street (West Campus)	Crosses University Dr	N/A	0.29	Bike Routes or shared bike/ped sidewalk
Bike Route	Proposed Street (West Campus)	Kimbraugh Blvd	Proposed Olsen to Discovery SUP	0.20	Bike Routes or shared bike/ped sidewalk
Buffered Bike Lane	Agronomy	University Dr	F and B Rd	0.75	Remove center turn lane and stripe for wide bike lane or narrow buffered bike lanes on both sides. Recommendation could be configured as a one-way protected bike lanes if desired.
Bike Lane	Lubbock St	Coke St	Bizzell St	0.27	Change configuration to make Lubbock one way for cars in direction of bus operations. Add bike lanes similar to the design of Joe Routt Blvd near Kyle Stadium
Buffered Bike Lanes	Olsen Blvd	University Dr	George Bush Dr	1.09	Road should be rebalanced from 4 lanes to 2 lanes with buffered bike lanes. This project could be constructed as a pair of one-way protected bike lanes as an option.
Sidewalk or SUP	North side of University Dr	Texas Ave	Polo Rd	0.21	Widen sidewalk or create new SUP from Residential at Texas Ave and University Ave to signal to Polo Rd
SUP	South Side of University Dr.	Texas Ave	Harvey Mitchell Pkwy	2.34	Should be constructed as 20 foot wide facility with a pedestrian walkway and a two-way designated bike track in a different pavement surface, asphalt or red concrete. Pedestrian and bicycle tracks could be attached or detached to each other. See CU Boulder example.
SUP	West Campus Dorms to Olsen at Old Main	West Campus Dorms	Olsen Blvd	0.58	Bicycles permitted to ride; omit dismount zone per WCCP
SUP	West Campus	West Campus Dorms	White Creek Loop Greenway	0.25	Connects West Campus Dorms to Intramural fields and sports facilities, make facility as wide as possible.

Type	Location	Cross Street A	Cross Street B	Length	Description
SUP	North Side of George Bush Dr	Texas Ave	Barbara Bush Dr (SUP)	2.26	Shared-use path could replace Bush bike lanes as low-stress bike route access campus from Southgate. Should be constructed as 20 foot wide facility with a pedestrian walkway and a two-way designated cycle track in a different pavement surface, asphalt or red concrete. Pedestrian and bicycle tracks could be attached or detached to each other. See CU Boulder example.
SUP	Texas Ave	University Dr	George Bush Dr	0.90	Should be constructed as 20 foot wide facility with a pedestrian walkway and a two-way designated bike track in a different pavement surface, asphalt or red concrete. Pedestrian and bicycle tracks could be attached or detached to each other. See CU Boulder example.
SUP	West campus shared use path	Olsen Blvd	Discovery St	0.67	Critical need in the development of West Campus, formal route unknown.
SUP	Lawn area	George Bush Dr	Olsen Field path	0.08	Formally connect George Bush Drive to pathway behind Olsen field which connects up to Pickard Pass, This could be a popular route if legitimized.
SUP	Zachary Building	Spence St	Blizzell St	0.06	Would provide a connection without having to go all the way to University Dr.
SUP	White Creek Loop Greenway	Wehner Building	University Dr via Bush Library	2.20	Links Wehner to Bush Library and extends to loop the Research Park area of campus.
SUP	College Ave	University Dr	Brookside Dr	0.80	Links Campus Housing and park to the core of campus. Coordinate with City of Bryan
SUP	Coke St	George Bush Dr	Joe Routt Blvd	0.37	Provide SUP on the east side of Coke St connecting the perimeter path to the core of campus. Much of this connection has no pedestrian facilities currently. Some of the wider sidewalk could remain as is on the north end of this corridor.

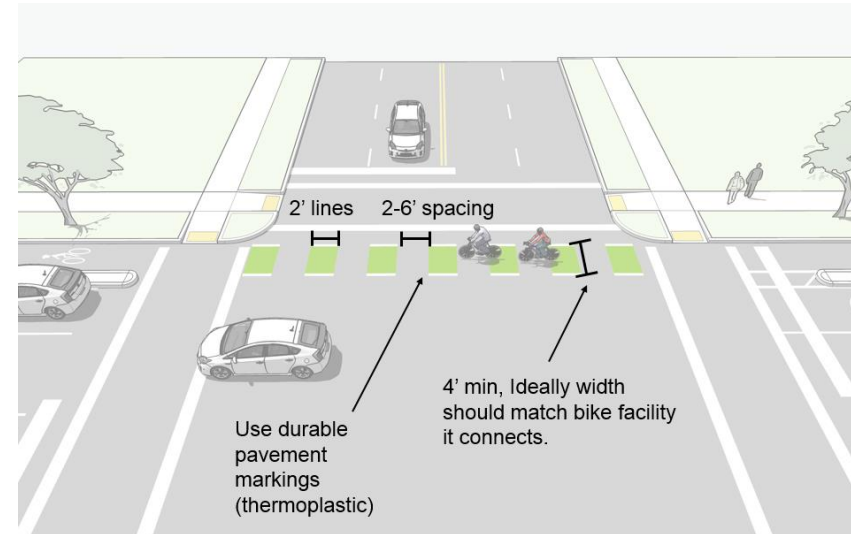
4: Bicycle Network & Facilities Recommendations

Bicycle detection at intersections allows bicyclists to trigger a traffic signal without the presence of motor vehicles. This helps to reduce delay in bicycle travel and increase safety by reducing the need to run red lights. Bicycle detection should be provided in conjunction with signage or pavement markings to clearly inform bicyclists how to detect the signal. Methods of bicycle detection include in-pavement loops, video, microwave, or push buttons.



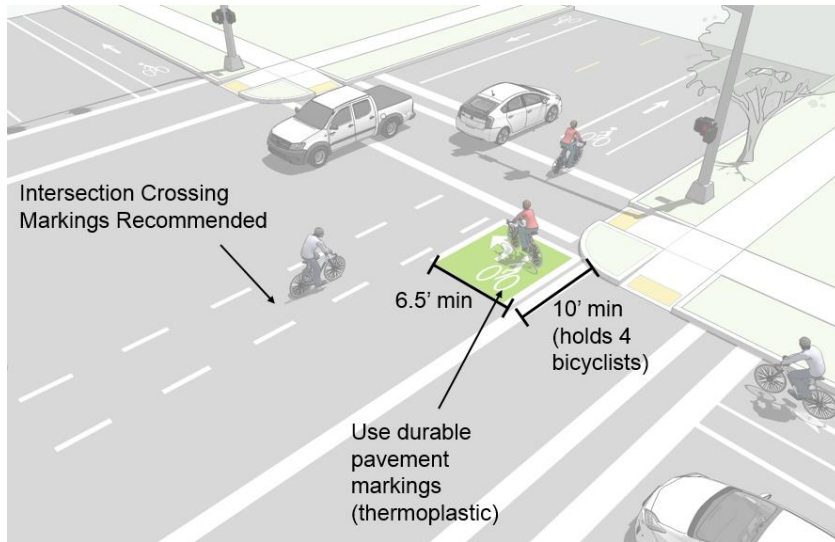
Examples of Types of Bicycle Detection

Intersection crossing markings guide bicyclists through the intersection by highlighting their intended path and providing a clear boundary between the paths of bicyclists traveling through the intersection and motor vehicles traveling either straight or executing a turn. Markings can be provided in a variety of forms, including a line of shared lane markings, chevrons, or colored pavement. The dashed green bar is recommended for use at Texas A&M.



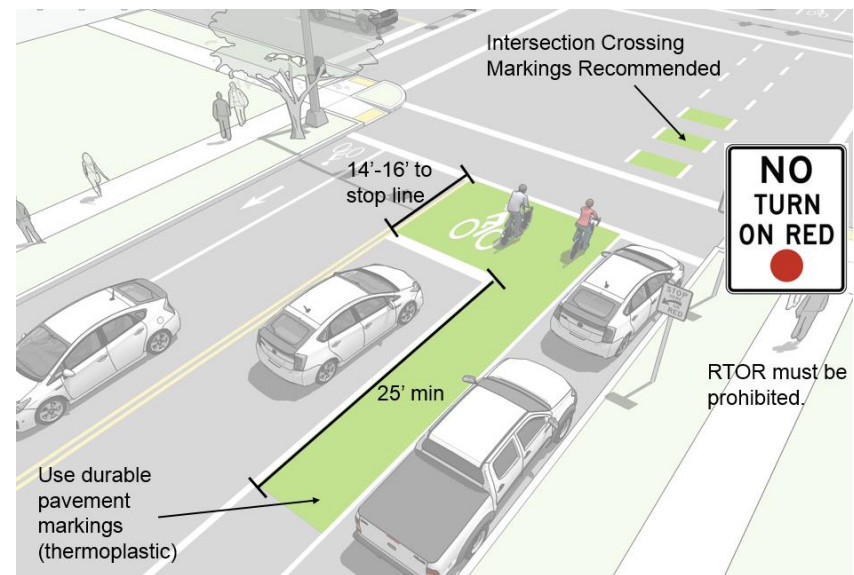
Intersection Crossing Markings

Two-Stage Turn Queue Boxes, while still considered experimental by FHWA, two-stage turn queue boxes offer bicyclists a safe way make left turns at multi-lane signalized intersections from a right side bike lane. Multiple positions are available for queuing boxes, depending on intersection configuration. FHWA does allow for use at T-intersections without experimentation, and several of the intersection recommendations contain this condition.



Intersection Crossing Markings and Two Stage Turn Queue Boxes

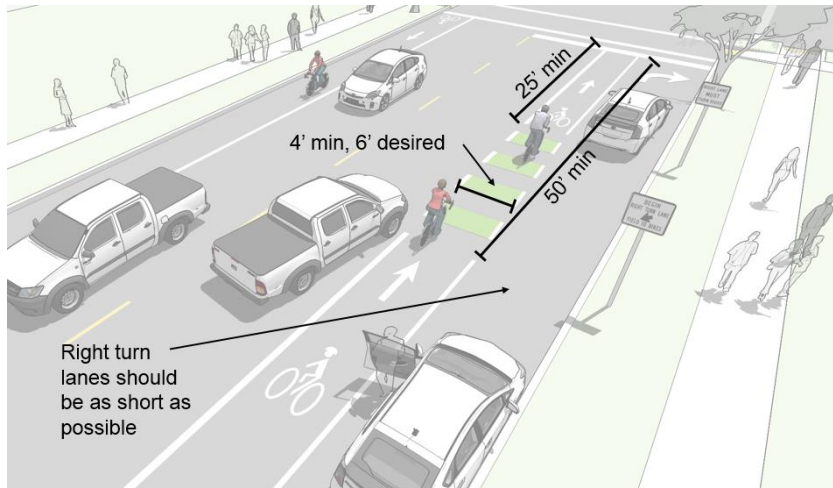
Bike boxes are designated zones at the start of traffic lanes at signalized intersections that allow bicyclists to get ahead of queuing traffic during the red signal phase. By providing a designated space for bicyclists, they can help large numbers of queuing bicyclists progress through intersections quickly. On two lane road intersections, bike boxes can also be used to facilitate left turns. Since bike boxes are typically delineated with color to improve visibility, they can reduce the risk of a “right hook” from motorists turning right in front of approaching bicyclists. Pedestrians also receive potential benefits from the installation of bike boxes because they reduce vehicles encroaching into the crosswalk.



Bike Box

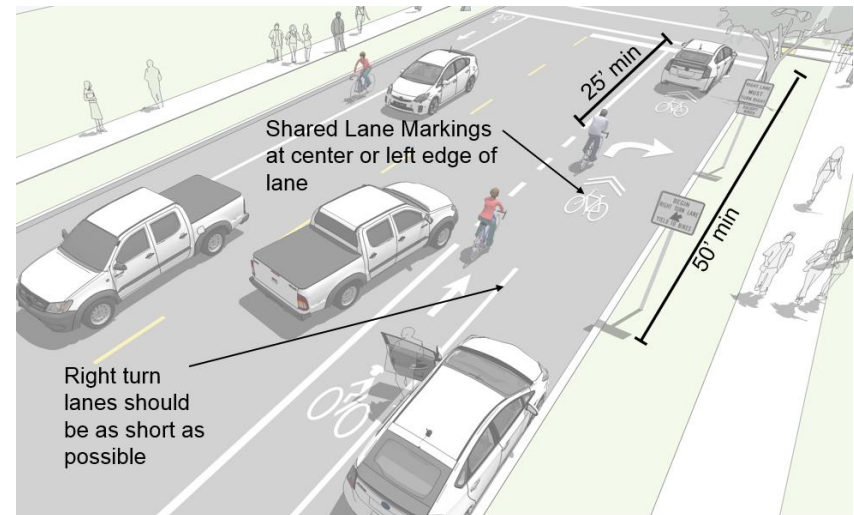
4: Bicycle Network & Facilities Recommendations

Through Bike Lanes enable bicyclists to correctly position themselves to the left of right turn lanes or to the right of left turn lanes. The treatment reduces conflicts between turning motorists and bicycle through traffic and provides bicyclists with guidance to follow the preferred travel path. This treatment can only be used where there is a right turn only lane.



Through Bike Lane Where Turn Lane is Created From Parking Lane

Combined Bike Lane/Turn Lanes place a suggested bike lane within the inside portion of a dedicated motor vehicle turn lane. Shared lane markings delineate the space for bicyclists and motorists within the shared lane or indicate the intended path for through bicyclists. This treatment preserves guidance in a situation where the bicycle lane would otherwise be dropped prior to an intersection, potentially due to the lack of available space to provide a dedicated through bike lane. The bicyclist/vehicle speed differential is lowest in this lane versus the adjacent through lane.

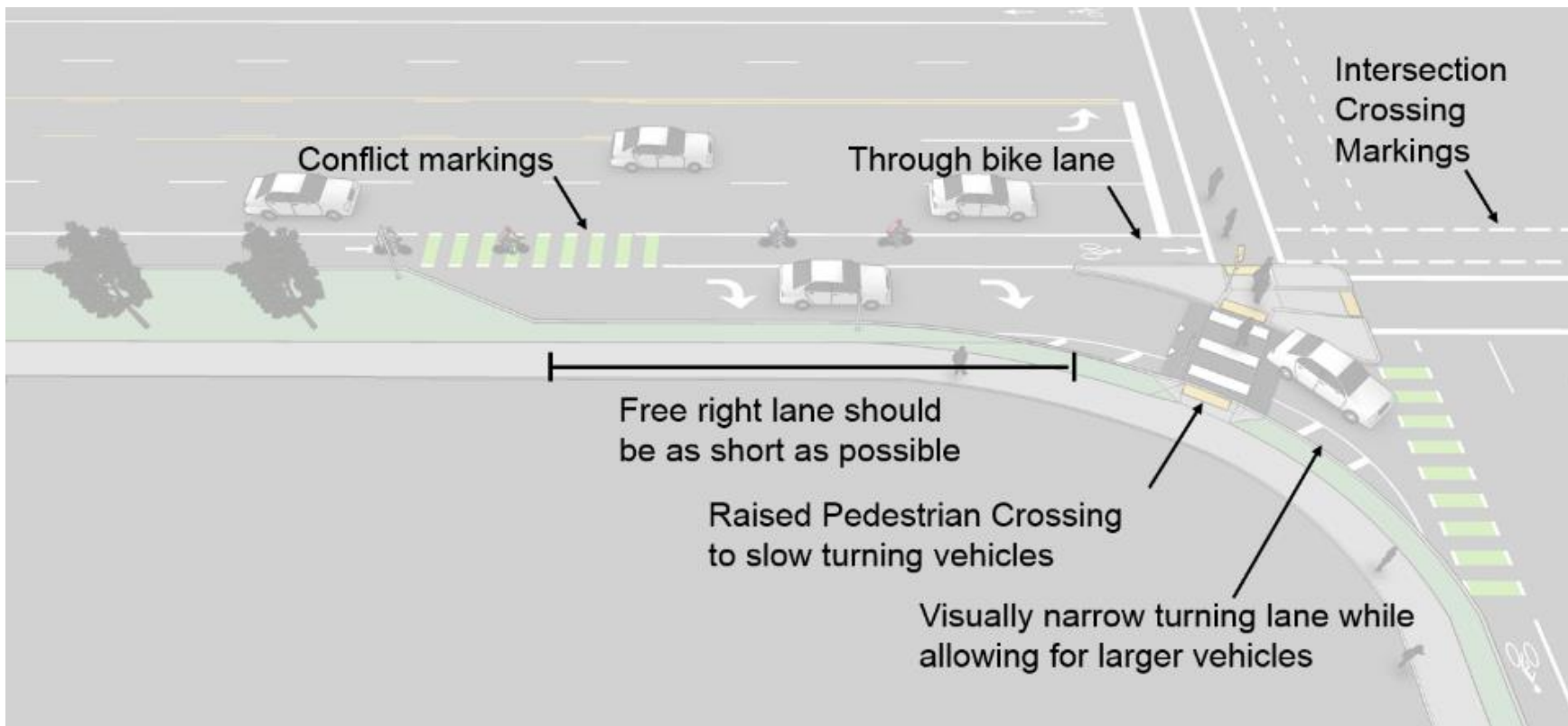


Combined Bike Lane/Turn Lane

Bikeway treatments at free right lanes can simplify complex situations and reduce the potential for crashes. Several key features are recommended to be retrofitted into TAMU's existing and future intersections with free right slip lanes. Some of these features can be added without geometric changes, while some may require modification to pork chop islands, curb and gutter, etc.

Modifications include:

- reducing the length of the storage bay or removing it entirely with vehicles accessing the free right lane from the outside travel lane
- through bike lanes being provided to the left of the free right lane
- conflict markings defining the point where vehicles accessing the free right turn must yield to through bicyclists
- features to slow turning traffic like lane narrowing and raised pedestrian crossings
- Intersection crossing markings



Recommended Free Right Lane Design

4: Bicycle Network & Facilities Recommendations

Table 6: Recommended Intersection Improvements

Location	Description
University Dr and Spence St	Improve signal for bicyclists and pedestrians. Add bike box on SB approach, with widened sidewalk leading to crossing from Church Ave. Provide intersection crossing markings to future bike lanes on Spence St. Pursue long term project to narrow and improve appearance of the access on the northern leg of the intersection.
University Dr and Agronomy Rd	Shorten free right turn bays, provide through bike lanes to the left of free right lanes with green conflict markings. Pork chop islands will need to be reduced in size to fit through bike lanes. Add intersection crossing markings.
University Dr and College Ave	Widen curb on the NB approach to provide through bike lane to signal (should be done only if there is somewhere to go on north side of the intersection. Alternate design would be to provide a bike ramp up onto the pork chop island. Narrow pork chop in SB direction to provide a place to ride. Mark conflict areas. Improvements will channel bicyclists safely into future bike lanes on S. College; connection to SUP and bike routes in student residential area east of S. College. Add pedestrian heads and accessible ramps/crossings.
Stotzer and Mitchell	SUP (part of TxDOT interchange project at Stotzer and FM 28180 will connect to SUP on south side of University)
University Dr and Polo Rd	Install Green backed sharrows in combination through/left lane. Identify place for bicycle to trip detector with pavement stencil. Identify preferred waiting area in SB direction.
Penberthy Blvd and George Bush Dr	If/when bike lanes are added to George Bush Dr, two-stage turn boxes for bicyclists entering and leaving campus should be added in all directions.
Wellborn Rd and George Bush Dr	As part of a project in design, a pair of pedestrian overpasses will be provided across George Bush Dr to connect areas south of campus. This will provide a good connection for the thousands of students living off or south of Marion Pugh Dr.
Olsen Blvd and George Bush Dr	If bicycle lanes are added to George Bush, a two-stage turn box for eastbound bike traffic should be provided with intersection crossing markings. Provide SB through bike lane to the left of right only lane to facilitate lefts onto George Bush. Provide Through bike lanes in EB and WB approaches.
Houston St and George Bush Dr	In SB direction, restripe so that right turn only lane becomes an 'add lane' with a through bike lane continuing to the left of it so that yielding behavior is clear. Provide Jug-handle turn box for EB bicyclists entering campus by cutting into the park strip next to the crosswalk, provide Intersection crossing markings for this movement. provide guide turn guide line for SB lefts to provide guidance for bicyclists making this movement also. provide sharrows with chevrons canted to the right within the SB right turn only lane.

Location	Description
Dexter, Throckmorton/Coke and Bush Dr	Set back southern leg crosswalk to install two stage turn box for EB bicyclists looking to turn left into campus. Reconstruct free right lanes in accordance with guidance in this plan to have through bike lanes and marked conflict areas. Install green backed sharrows on NB approach in rightmost lane.
Timber/Bizzell and George Bush Dr	Set back southern leg crosswalk to install two stage turn box for EB bicyclists looking to turn left into campus. mark green conflict areas across free right lanes. Install green backed sharrows on NB approach in rightmost lane. Two stage turn box could be provided for turns from the SB to EB direction. Prohibiting right turns on red in the NB and EB directions would be advisable.
Anderson St and George Bush Dr	Provide signal actuated jug-handle style two-stage box for WB to SB turns that would be coordinated with pedestrian signal. A bike signal on the SW corner facing north may be needed. Provide bike box with ingress lane between right and left only lanes with box projecting over left turn lane. This will allow right turns on red to remain an option for drivers.
Texas Ave and George Bush Dr	Texas Ave sidewalk/SUP on west side at Bush: Provide ramp connection to WB George Bush bike lanes. Modify or reconstruct pork chop islands on northern leg to allow bicyclists to pass within a bike lane. On WB approach provide through bike lane, but do not mark conflict area (see guidance for drop lane configuration). Provide intersection crossing markings in EB and WB directions. If through bike lane cannot be provided in EB direction, use guidance for combined bike lane/turn lane. Improvements will assist bicyclists from Eastgate neighborhoods.
Texas Ave and Lincoln Ave	Lincoln Ave has bike lanes and is a conduit for pedestrian and bicycle traffic to campus. A pedestrian hybrid beacon should be installed on the south side of the intersection making use of the existing median which should be extended and prohibit left turns for vehicles out of Lincoln. This will allow bus traffic to still turn left from Texas.
University Dr and Moore Ave	At-grade pedestrian crossing abandoned at this location in recent years. This is still a high value linkage and could take one of two forms. The crossing could be reestablished with a two-stage Hybrid Beacon crossing which would have push buttons in the middle of the median. Add ADA accommodation and bike accommodations. Alternatively an underpass could be provided with housing project. Location is 650 feet from existing signal, however that signal is busy and has turning conflicts with bikes/pedestrians.
Clark St and Routt Blvd	In SB and EB direction, set vehicle stop bar back 6 to 10 feet, keep bicycle stop bar in current position. This will make bicyclists departing the stop sign more visible to vehicles. Install a pair of bicycle specific ramps in the curb along the termination of Pickard Pass oriented as close as possible to the bike lanes on Clark St.
In between Jones St and Houston St	Houston street connector: Install green backed sharrows to connect bike lanes on both sides. Sharrows should lead bicyclists around the outside of the gate arms to connect to Northgate bike/ped crossing at University.
Ross St and Spence St	Install signs directing bicyclists to slow on approach to this intersection from all sides. A better design for this intersection would be to pull back the pedestrian crossings to line up with the outside of the brickwork and create a small roundabout at this location. This may focus pedestrian traffic more than the current 'scramble' scenario and define the key conflict points better. The middle of the roundabout could be the existing 'star'.
Ross St and Bizzell St	Remove pork chop islands. Create legible bike lanes that make all movements obvious. This project is in design as of the plan adoption.
Near Olsen and Old Main Dr	Review landscaping design to mitigate unsafe obstacles for bicyclists including curbed planting areas, tree overhang, and lack of designated bike space. Look for places to add bike markings and directional signage to make it clear how to use the connection.

4: Bicycle Network & Facilities Recommendations

Location	Description
New Main Dr & Bizzell St	Provide through bike lane in NB direction with conflict markings for free right lane. The NB bike lane should continue the entire way past New Main Drive. In WB direction, provide through bike lane through drop lane with right only lane configuration. In SB direction a jug-handle two-stage turn box could be added to link bicyclists with EB New Main Drive.
Texas Ave & New Main Dr	Buffer the bike lanes within the large free right lanes as the existing travel lanes are approximately 24 feet wide. Provide through bike lanes to Texas Ave on the EB leg with conflict markings over both free right lanes. Provide intersection crossing markings linking these to bike lanes on Walton Dr. For the WB approach, create a through bike lane from the outside through travel lane so that only one WB travel lane enters campus. The free right lane coming from Texas can form the second WB travel lane after the intersection. Conflict markings with yield lines at the pedestrian crossings and warning signs should be provided.
Kimbrough Blvd & Olsen Blvd	This intersection does not currently function well for any users. Options include 1) grade separate pedestrians and off-street bicyclists in underpasses, which would make game day traffic operations better. 2) install two lane roundabout, potentially make a two lane roundabout that would function as one-lane during normal day to day operations, but could be made a two-lane for game day. 3) signalize intersection and isolate left turns from conflicting with pedestrian signals.
Pickard Pass south of Kimbrough Blvd	Rebuild parking garage entrances so that pedestrian area is at grade and vehicles must raise grade to traverse them. Add Yield lines to leading edges of raised crossing. There is room for exiting and entering vehicles to queue north of the pedestrian crossing while waiting for a gap. Add ped crossing with bike wayfinding at western side of eastern garage entrance where there is a median. The median should be modified to act as a ped/bike refuge, this would facilitate bikes transitioning out of Pickard Pass to the westbound bike lane on John Kimbrough Blvd.
Bizzell St & Polo Rd	Install short WB through bike lane to aid left turns from Polo Rd. Install two-stage turn box for SB bicyclists wanting to turn left onto Polo Rd
Olsen Blvd & Medical Sciences	Square off Median noses. Provide centerline and stop bars in both directions within the median opening with the idea that one to two vehicles can queue here and wait for a gap in traffic. This will mitigate the loss of the second travel lane and will function as a short turn lane.
Texas Ave Crossing between University Drive and New Main Drive	Add bicycle/pedestrian access from the shared use path on the west side of Texas avenue utilizing the existing signal. Add crosswalks and retime signal. While this improvement serves bicyclists, it will also serve pedestrians and as there are no existing or proposed bike facilities on the east side of the intersection it can be more pedestrian in design.
University Dr & Ireland St	Install Green backed sharrows in SB right turn only lane to align with bike lane on south side.
Gene Stallings Blvd between Lamar and Routh	Parking bays are too short and longer vehicles block the bike lane. Recommend converting northern most angled parking on north side to parallel, or lengthen stalls and reconstruct sidewalk. Convert all angled parking into back-in angled parking for improved performance and safety.
Olsen Blvd & Old Main Dr	Need pedestrian/bike underpass. The 5 lane intersection stop controlled intersection is not an ideal solution.

Bike Share

A 2012 TAMU Bike Share Feasibility Study recommended a 4th generation dock based system with 19 stations, 510 bikes, and 255 docks. Subsequently, Maroon Bikes was launched in 2013, which offered free membership and allowed users to check the bike out for a multi-destination journey to be ultimately returned to an official bicycle docking rack. This technology was designed and manufactured in Texas and has a different cost model than typical station based bike share systems which are focused on short point to point trips. Maroon bikes encourages users to take the bike as part of a longer multi-point trip with data indicating that each use of a bike had an average of over two intermediate stops before returning. The cost allows the first two hours of use to be free with a one dollar charge for both the 3rd and 4th hour, subsequent hours are free. This means that the maximum charge is \$2 per day. Maroon Bikes are currently operated outside of the TAMU campus, while they had a presence on campus for over a year. Hullabaloo Dorm and WCG were responsible for about a third of total rides.

The Maroon Bikes model seems to work well for some off-campus residence applications allowing for a bike that can follow the student throughout the day.

Transportation Services has indicated that a larger system would be needed to have a sufficient impact on reducing the number of private bikes on campus. The system would need to have the ability to replace private bikes at a 4:1 ratio meaning one bike share bike would preclude four other bikes from being brought on campus. Approximately 1,000 bikes could be desired.

Such a system would be significantly expensive with a more traditional dock based system and may not provide economic returns. If each bike cost \$1,200 (which is at the lowest end of the bike share spectrum) then a program of that size would require well over \$1M in funding.

The pace of innovation within the bike share vendor industry is rapid, and may yield additional innovations in future years that make bike sharing more affordable and improve reliability and tracking. Transportation services may wish to investigate a high technology product such as SoBi,



The launch of Maroon Bikes in 2013

which allows existing racks to be utilized and centralizes all the technology of bike sharing within the bicycle itself. SoBi systems are typically distributed across an area rather than concentrated within stations. The bikes track status, location and usage. The cost is roughly half of 4th generation systems. SoBi offers demonstrations of their technology which may be of interest to TAMU.

Bicycle Parking Improvements

Bicycle parking on the TAMU campus can be improved and expanded both through infrastructure changes and through changes to policy.

Chapter 5 contains recommendations for issues related to bicycle parking such as abandoned bicycle management and bicycle registration.

Short Term Parking

Short-term parking is any parking (sheltered or non-sheltered) provided for a brief (two to three hour) time period. This is the most common type of bike parking found on the TAMU campus.

Larger universities, such as the University of British Columbia, University of California Davis, and Stanford University, typically find that their students are most likely to ride between campus destinations, and thus will be more likely to want plentiful short-term parking placed near destinations. Mode share studies completed by Stanford during 2011 confirmed that the majority of undergraduates and graduates follow this travel pattern.

Short term bike rack design has been standardized to the 'cora' or 'coat hanger rack' and the previous 'wheel bender' racks are being replaced with the coat hanger racks. This should continue as available funding allows

Proper bicycle rack installation also involves situating them appropriately with respect to buildings. Racks should be installed within 50 feet (or as close as possible) of main entrances to buildings in well-lit, visible parts of campus with high pedestrian volumes to deter theft and enhance the racks' overall convenience.

Siting Guidelines

Key considerations when siting short-term bicycle parking include:

- Close to destinations - 50 feet maximum distance from entrance
- Located along the "desire line" from adjacent bikeways
- Weather protected by siting racks under existing structures or installing free-standing structures when possible

- 36 inches (minimum)/48 inches (recommended) for bicycle rack spacing between racks/obstacles
- Provide a clear aisle of 48 inches (minimum)/60 inches (recommended) between rack aisles to provide ease of ingress/egress

Covered Bike Parking

TAMU can also improve short-term parking by providing increased numbers of covered bike parking by constructing shelters over groups of bike racks. Covered parking encourages bike use by protecting bicycles from the sun and rain, making bicycling a more attractive option during inclement weather. The University may consider incorporating covered bike parking into new building construction through the provision of overhangs or as standalone banks of parking with free standing or partially attached cover structures.



Existing covered bike parking on the TAMU campus

Long Term Parking

Long-term bicycle parking is meant to accommodate employees, faculty and students that are expected to leave their bicycle for more than several hours. This parking is typically provided in a secure, weather-protected location. Bike lockers and secure parking areas are examples of long-term bicycle parking.

Secure Parking Areas (SPAs)

Secure Parking Areas (SPAs) are long-term bicycle parking areas designed for commuters to provide a safe and secure location to leave a bicycle throughout the day. A SPA is a semi-enclosed space that offers a higher level of security than ordinary bike racks. Accessible via key-card, combination locks, or keys, SPAs provide high-capacity parking for 10 to 100 or more bicycles. Increased security measures create an additional transportation option for those whose biggest concern is theft and vulnerability.

Secure bicycle parking facilities are free-standing buildings or enclosed areas within a larger structure (for example, an enclosed portion of a parking garage or a room in an building with exterior access). SPAs are ideal for university staff, students, and faculty who will be working/attending class in one sector of campus, with little time-sensitive, cross-campus travel required. All new construction and building remodels should have SPAs installed for building occupant use. This is particularly true for residence halls where SPAs can encourage greater bicycle use and higher quality bicycles being brought to campus (which are also more likely to attract use).



Example of a Secure Parking Area in a parking garage



Example of a secure parking area in a residence hall (Georgia Tech)

Strategy

In developing and establishing SPAs on campus, TAMU should identify existing locations/sectors of campus that would benefit from SPAs.

Potential sites include:

- Campus Recreation Center
- Campus Housing
- Identify opportunities in new construction to add SPAs to buildings/ parking decks

Long-term secure bike parking is more costly than short-term parking, but, unlike bike racks, it can generate revenue through registration and user fees. Using Institute funds for bicycle infrastructure and support facilities may require consensus building among the various Institute departments.

However, as shown in the Bike Parking Projection section of this chapter, bicycle parking investments are fiscally attractive when compared to funds spent on other commute modes.

Siting Guidelines

Key considerations when siting/developing SPAs:

- Provide appropriate wayfinding signage to guide bicyclists to the long term parking
- Provide both double-height racks and single racks to maintain accessibility for all users
- Price appropriately in comparison with nearby vehicle parking
- Where possible, site in conjunction with lockers and showers for bicyclists’ use

Bike Parking Requirements

Some universities have adopted guidelines to ensure proper bike rack supply throughout their campus growth and expansion. These guidelines can take many forms, but most of them associate a fixed number of racks or bike parking spaces with a given size or use of the building. This allows the university to estimate usage and place racks where the greatest demand is likely to occur. In practice, additional bicycle parking may be needed or relocated to meet actual demand. Recommended standards for bike parking in the Bike Parking Requirements by Building or Activity Type table are adapted from the *Bicycle Parking Guidelines, 2nd Edition* (2010), which is a publication of the Association of Pedestrian and Bicycle Professionals (APBP). The standards were developed based on surveys and best practices from around the United States. These standards are from tables intended for communities and campuses that are densely developed, are more urbanized and which have high bicycle use.

Table 7: Sample University Bike Parking Requirements

Building Type/ Activity Type	Long-Term Bike Parking	Short Term Bike Parking
Residence Halls	0.5 spaces for each resident	0.10 spaces for each resident
Non-Assembly Cultural (libraries)	1.5 spaces for each 10 employees	1 space for each 8,000 sf of floor area
Assembly (e.g. stadiums or theaters)	1.5 spaces for each 20 employees	Space for 5% of maximum expected daily attendance
Education (e.g. higher education buildings at colleges and universities)	1.5 spaces for each 10 employees plus 1.5 spaces for each 10 students of planned capacity; or 1 space for each 20,000 s.f. of floor area, whichever is greater	1.5 spaces for each 10 students of planned capacity

Bike Parking Projections

It is a useful exercise to estimate the number of short-term bike parking spaces needed to accommodate future growth in enrollment and at a variety of different target bike mode shares. In recent years TAMU’s bike mode share has hovered around 8 percent. At a macro level, shown in Table 8, the campus is already sufficiently supplied with bike parking. Dealing with abandoned bikes and students that leave bikes for long periods of time are the key capacity issue that TAMU faces (see Chapter 5), not the current overall need for short-term racks. In fact, the university could theoretically accommodate a 10 percent mode share in 2025 with 75,000 students if existing racks were utilized only by daily commuters. Higher goals for bike mode share of 15 and 20 percent will necessitate additional parking. Additional parking will be needed with new campus development projects and to fine tune existing levels of parking due to local demand.

The projected number of bike parking spaces assumes an 80% rack utilization at peak bike parking period. This goal is a bike parking best

Table 8: 2025 Bike Parking Scenario Projections

Commute Rate Goal	Projected Campus Population in 2025 ¹	Projected Number of Bike Commuters in 2035 ²	Existing Bike Parking Spaces ³	New Bike Parking Spaces in 2025 ⁴	Total bike parking spaces in 2025 (existing plus new)	Number of Spaces Needed Per year to Meet Commute Rate Goal by 2025 ⁵
8%	75,000	6,000	10,500	-3,000	10,500	0
10%	75,000	7,500	10,500	-1,125	10,500	0
15%	75,000	11,250	10,500	3,563	14,063	356
20%	75,000	15,000	10,500	8,250	18,750	825

1. Based on campus population projects for students, faculty and staff.
2. Projected number of bike commuters in 2025 is generated by multiplying the commute rate by the projected campus population in 2025
3. Based on inventory provided by TAMU in 2014
4. The number of new bike parking spaces is generated using the following formula: (Projected Number of Bike Commuters in 2035 x 10 / 8) - Existing Bike Parking Spaces; 80% rack utilization is a best practice goal for peak period bike parking. This goal ensures there is a perception of bike parking availability and rack capacity issues, such as abandoned bikes on racks which accumulate over the course of a semester, can be accommodated.
5. Year one for implementation is assumed to be 2015; Implementation time frame is ten years.

practice and helps ensure there is a perception of bike parking availability. Rack capacity issues, such as abandoned bikes on racks which accumulate over the course of a semester, can also be accommodated using this rack utilization goal.

Table 8 provides guidance for student oriented short-term parking. University faculty, staff and other employees currently comprise 21,000 individuals. If the student body increases to 75,000, a similar proportional increase would result in approximately 30,000 staff. Using the APBP suggestions, this could result in a further need of approximately 4,500 long-term, secure parking spaces. A program to create secure long-term bicycle parking should be undertaken to serve existing and future employee and student needs. This would average 450 new long-term spaces per year if started in 2015. Providing secure long-term spaces would serve daily commuters better and reduce some of the congestion and stress from using the existing short-term parking.

Bike Center

This role is currently being served by the HUB, however as bicycling and enrollment increase on the TAMU campus it may be advantageous to plan for a larger and more visible bike center to serve as the anchor for the bicycle community and bicycle related activities for the TAMU campus.

Potential programmed elements of the Bike Center include:

- Professional bike repair
- Self-service bike repair
- Shop to sell refurbished bikes from Starter Bikes
- Bike parts and accessories
- Bicycle-related classes (maintenance, on-road riding, cold weather riding, etc)

4: Bicycle Network & Facilities Recommendations

In siting the bike center, TAMU should consider:

- Visibility to the campus community
- Access to/from identified bikeways
- Access to delivery vehicles
- Appropriate amount of space (classroom, showroom, and shop) for all programmed elements



Self-service secure bike parking



Bike center with repair and bike valet services

End-of-Trip Facilities

For those biking longer distances to campus, having end-of-trip facilities that support riding can encourage more bicyclists to ride more often. This is particularly true during warmer months.

Additionally, having access to tools and bike pumps allows bike riders on campus to fix unexpected mechanical issues or reinflate tires with air. Support facilities such as showers and fix-it stands can enhance convenience for bicycle commuters and those riding on campus.

As TAMU moves forward, the provision and location of shower (and locker) facilities should be a careful consideration in new and retrofitted buildings. Any new Secure Parking Areas that are developed should (ideally) have a shower and locker facility nearby, either in the same building or an adjacent building.

Additionally, fix-it stations can be added to areas around campus to complement the six existing stations that currently exist. Fixit stations could accompany the larger bicycle parking areas in a visible location.



Shower and locker facilities

5 Education, Encouragement & Enforcement Recommendations

Equally as important as providing bicycle and pedestrian infrastructure is ensuring that users are familiar with the treatments and know how to use them. This section presents recommended bicycle, pedestrian, and motorist education programs.

Education & Encouragement

Educational strategies are extremely effective in improving the walking and cycling environment while promoting non-motorized transportation. Utilizing several innovative educational approaches, TAMU has the potential to build on its solid foundation of supporting multi-modal transportation and to become a model walking and bicycling campus.

If you build a facility, people will use it; however, if you build the facility and tell people about it, they will embrace it. This section identifies encouragement strategies for TAMU and other partners to promote walking and bicycling as viable transportation options. This section identifies strategic opportunities for providing education and educational materials to the campus community.

The recommendations are based both on findings of previous tasks, plus experience gained in communities around the region and the United States.

The recommended strategies are:

- Media Safety Campaign
- Hosted Campus Safety Stations / Bicycle Ambassadors
- Centralized website
- Enhanced/Expanded Orientation Material / Talking Points for New Student Conferences and Campus Tours
- Bicycle Safety Clinic
- Bicycle / Pedestrian Advisory Committee
- Commuter Benefit Program
- Bike Valet for Events
- Car Free Campus Events

Media Safety Campaign

A high-profile marketing campaign that highlights bicyclist and pedestrian safety is an important part of helping all road users – including motorists, bicyclists, and pedestrians – understand their roles and responsibilities on campus roads. This type of campaign is an effective way to raise the profile of bicycling and improve safety for bicyclists, pedestrians, and motorists (including staff who drive on campus as part of their work).

A well-produced safety campaign will be memorable and effective and include clean, clear graphics in a variety of media, such as print or audio/video advertisements, the distribution of free promotional items, and email or in-person outreach. This type of campaign is particularly effective when kicked off in conjunction with other walking/bicycling events or at the beginning of each academic term. It is recommended that TAMU develop and launch a mobility safety campaign specific to campus users.

5: Education, Encouragement & Enforcement Recommendations

TAMU can also use the safety campaign to help brand all of the bicycling- and walking-related efforts on campus. Safety campaign messages can use similar graphics and colors used on bike/pedestrian orientation materials, bicycle-related campus signs, flyers for events, and promotional items, in order to create a cohesive message among all materials.

TAMU's safety campaign should address the following safety issues:

- Where bicycling is permitted and where bicyclists should walk their bikes
- Safe bicycling skills (especially in high-pedestrian use areas, such as the Mall)
- How to share the road (for all users – bicyclists, pedestrians, and motorists)
- Safely crossing major roadways on campus
- Light and helmet use
- Bicycling rights
- Yielding to pedestrians

Hosted Campus Safety Stations / Bicycle Ambassadors

Mobility ambassadors can disseminate bicycling and walking information to their peers and other campus users related to safety and campus rules, upcoming events, and other mobility programs and opportunities. They can also distribute promotional items such as buttons, magnets, or stickers. Mobility ambassadors can be volunteers or paid campus representatives, and should be trained on campus bicycle rules, safety, local bicycling resources, and successful outreach techniques.

Volunteers or staff can be roving campus ambassadors, or they can reach out to students at events or at a table during a designated time.

Stanford University establishes a campus safety station every Friday at White Plaza, from 11 a.m. - 2 p.m. (weather permitting).

Activities include:

- Bike registration (required by California law)
- free bike safety check-up
- Access to tire pump and simple tools
- Learn how to lock your bike up properly—avoid bike theft.
- Free headlights for FROSH and new transfer students

The ambassadors should wear a distinctive jacket/shirt/button that lets the public know that they can be approached with questions and comments, and they should be an encouraging presence, giving positive reinforcement and distributing free promotional items where possible.

This type of program could also be established in conjunction with the City of College Station. The City of Chicago has a robust bicycle ambassador program called Mayor Daley's Bicycling Ambassadors. They are a group of bicycle safety and education specialists who have been reaching out to Chicago residents since 2001. Their mission is to increase bicycle use while decreasing the number of bicycling related injuries and fatalities. This goal is accomplished through educating Chicago residents on the benefits of bicycling and bicycle safety. The major campaigns of the Mayor Daley's Bicycling Ambassadors include bicycle safety, motorist education on sharing the road with bicycles, shopping by bike, commuting to work by bike, and bikes on transit (including bus rack demonstrations).

Centralized TAMU Bicycling Website

Current and potential bicyclists can access the 'bicycle services' page within the Transportation Services department within the official TAMU website. The bicycle services website has a wealth of information about bicycling and should be even more so in the future. The Bicycle Services website should be raised in stature and given its own 'easy to remember url' that directs to the main page.

The website should be improved to be even more of a comprehensive "one-stop shopping" website on their Transportation Services webpage with comprehensive campus walking and bicycling information. TAMU's

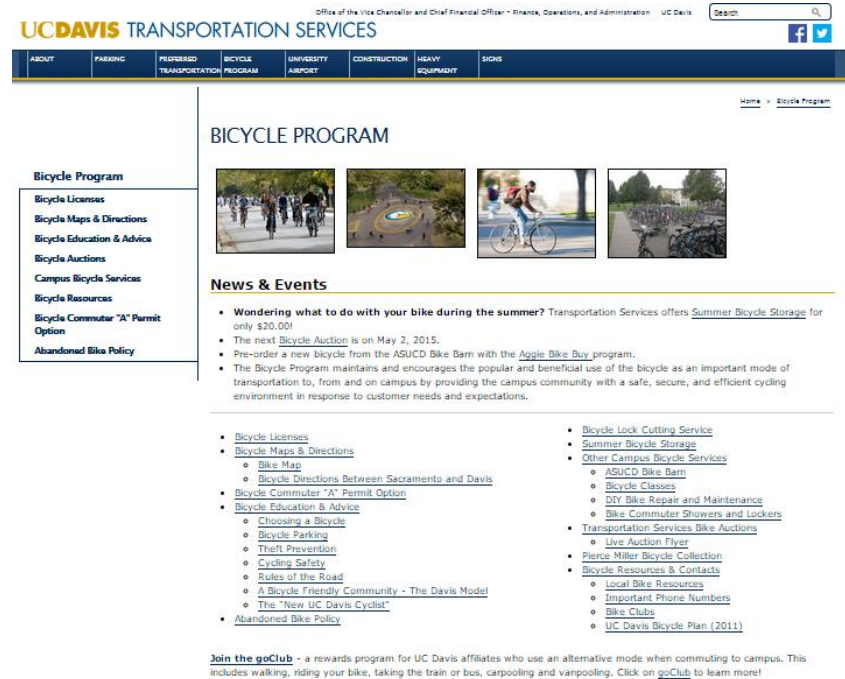
bicycle website should include existing information, and over time be expanded to include the following:

- **Maps and other bicycling resources** (e.g. bicycle parking locations, College Station, Bryan, and regional bike maps, bikes on campus on city transit, how to securely lock a bike, etc.)
- **Event postings**, including clinics or workshops, group rides/walks, campus-wide events, volunteer opportunities, and dates when students, faculty, and staff are encouraged not to drive
- **Information on how to safely and courteously bike on campus**, including rights and responsibilities, where bicycling is permitted and where to walk your bike, and safety tips
- **A list of local bike shops**, including phone number and address
- **A list of all local bicycling groups**, including clubs and advocacy groups
- **Secure Parking Access & Registration**, as TAMU implements secure long-term parking areas information about access and costs should be present here

The website may also feature:

- Bike buddy matching service
- Repair tutorials
- Message board
- Blog featuring stories and news
- Photo galleries from events and submitted by readers
- Popular bicycling routes
- Information and/or a forum for buying/selling bicycles

A one-stop mobility website will not be difficult to set up, but it will only be successful if the site is both easy to use and updated regularly. All website content should be reviewed regularly for accuracy. Extraneous links such as parking pass sales and car share should be moved to a different area of the TAMU website.



Example website from the University of California, Davis

The website, along with many of the other programs described in this section, can be advertised with branded promotional items such as magnets, buttons, or stickers that highlight biking and walking at Texas A&M. A short memorable slogan (e.g., "I bike TAMU" or "Aggies Bike") could be used on promotional items along with the website URL and could be distributed to students, faculty, and staff at events and through campus outreach.

Sample websites include:

- University of California, Santa Barbara <http://bikes.as.ucsb.edu/>
- Stanford University http://transportation.stanford.edu/alt_transportation/AlternativeTransportation.shtm
- University of California, Davis <http://taps.ucdavis.edu/bicycle/>

5: Education, Encouragement & Enforcement Recommendations

- University of Washington
<http://www.washington.edu/facilities/transportation/commuterse rvices/>

Expanded Orientation Materials for New Students

Texas A&M University should work with new student orientation and other beginning of year activities to increase the availability of information on walking and biking on campus and in College Station.

A bicycle/pedestrian campus orientation session at Alive! for all incoming students at the beginning of each school year can introduce bicycling and walking on/around campus to freshmen and transfer students.

A variety of outreach methods and materials can address important topics such as rights and responsibilities, when and where not to bicycle on campus, proper security measures, etc.

The Bicycle/Pedestrian Orientation should include:

- **Distribution of information to incoming and returning students** at the beginning of the year through school information packets, including locations of bike parking, instructions on how to properly lock your bicycle, how to share the road with cars, proper (and legal) roadway crossing behavior, etc.
- **Bike repair clinics** and other activities advertised through flyers, email, bulletin boards, and campus newsletters
- **Information tabling** at campus events and prominent locations (e.g. the CUB)
- **Promotion of the Texas A&M University Mobility Options website**, a resource for all mobility related information on campus
- **Bike lights and helmets** sold at cost or below cost at tabling events and through the campus bookstore
- **Distribution of free promotional items** promoting safe and courteous bicycling and walking on campus

A “bike/walk buddy” program can also be implemented to match current bicycling and walking students with interested students. This can be a simple program where students wear a sticker that says “I bike/walk to TAMU, ask me how,” or a more elaborate program that matches bike/walk buddies with interested students who live in the neighborhood

Bicycle Safety Clinics

Bicycle riding is a healthy and fun activity that is enjoyed by people of all ages. From the first time you ride a tricycle at age 2 or 3, there is nothing quite like the freedom that you get from riding a bike.

However, regardless of age proper bicycle safety is very important. In order to ride your bicycle safely, there are a number of factors to keep in mind - the bicycle must be in proper working order, with tires properly inflated, brakes being able to stop the bicycle and the steering must be working properly.

But other factors must be taken into consideration such as wearing a properly fitting bicycle helmet, the size of the bicycle must be appropriate for the rider and whether you’re riding on a bike trail or on the road, you must follow rules of the road.

Nearly every person in America can look forward to in-depth training before receiving a driver’s license. Bicycles are also vehicles that are used on the roads, but most Americans do not receive any training about the rules of the road, how bicycles work, or how to ride a bicycle on the roadway.

Texas A&M University Transportation Services, can offer a bicycle safety clinic multiple times throughout the year. At a minimum, curriculum should cover:

- Parts of a bicycle
- How a bike works
- Flat fixing
- Rules of the road
- Right of way

- Road positioning
- On-bike skills lessons (braking, turning, steering)
- On-bike community ride
- Campus routes

Bicycle / Pedestrian Advisory Committee

Many local governments have an official Bicycle/Pedestrian Advisory Committee made of citizen volunteers, appointed by City Council or the appropriate body, to advise on walking and biking issues. An advisory committee establishes an institution's commitment to making walking and biking safer. With the assistance of campus bicycling advocates or enthusiasts, TAMU should form an ongoing Bicycle/Pedestrian Advisory Committee composed of students, faculty, and staff to address mobility issues on campus.

The charges of the Bicycle/Pedestrian Advisory Committee (BPAC) should include some or all of the following:

- ◆ Review and provide input on campus facility planning and design as it affects walking and biking (e.g., streets, intersections, signals, and parking facilities)
- ◆ Participate in the development, implementation, and evaluation of transportation studies and plans
- ◆ Provide a formal liaison between university, faculty, staff, and students
- ◆ Develop and monitor goals and indices related to walking and biking on campus
- ◆ Promote safe and courteous bicycling on campus

Because BPAC members will be volunteers, it is essential to have strong staffing to support the committee in order for it to be successful. A Transportation Services staff member should be formally assigned to the BPAC and should take charge of managing the recruitment process, managing agendas and minutes, scheduling meetings, bringing agency issues to the BPAC, and reporting back to the university about the BPAC's recommendations and findings.

Sample committees include:

Michigan State University

<https://www.msu.edu/~auttc/>

Western Washington University

http://www.wwu.edu/transportation/student_involvement.shtml

Commuter Benefit Program

Commuter Benefits are a federally approved employer-provided incentive for employees to save money on their transit, vanpool and parking expenses. Many universities also extend the program to their student body.

Commuter benefits encourage people to walk, bike, rideshare and take transit to work. This helps relieve traffic congestion and improve air quality, making College Station and the Palouse a better place to live.

Effective January 1, 2013, the IRS pre-tax deduction limit is \$245/month for transit and vanpool expenses and \$245/month for parking expenses. \$20/month may be offered as a subsidy to employees who commute via bicycle.

Two campus programs are profiled below.

Stanford University

Stanford University has established the Stanford University Commute Club. By not purchasing a Stanford parking permit, and joining the Stanford University Commute Club, members help reduce emissions, minimize the number of vehicles traveling to and from campus, and benefit financially by not driving alone. Rewards can reach up to \$300 (\$25/month) a year in Clean Air Cash or Carpool Credit.

More information can be found at their website:

http://transportation.stanford.edu/alt_transportation/Commute_Club.shtml

5: Education, Encouragement & Enforcement Recommendations

Oregon Health & Science University (OHSU)

Oregon Health & Science University (OHSU) provides an incentive for employees who choose to bike to work for at least 2 miles of their trip.

Bicyclists are reimbursed for their commute with one of three incentives for each 30 trips biked. Members of the parking program are refunded one month's parking. Members of the transit pass program received \$35 (in addition to the overall subsidy on their passes). Bicyclists who are members of neither program receive \$50.

More information can be found in this document:

<http://www.ohsu.edu/parking/bike/OHSUBikeSite2010.pdf>

Bike Valet for Events

Bike valet is like a coat check...for your bike! Volunteers set up a secure area of bike racks, and offer valet service to event goers who arrive by bike.

Adding bike parking allows them to be positive and friendly when directing cyclists to the parking corral. As a bonus, most people who would have locked to poles and fences will seek out the corral instead.

Patrons receive a branded claim ticket and leave their bikes in a secure location. Bike valet brings convenience and peace of mind to event patrons, and provides a secure, orderly site plan for event planners.

Bike valet can be offered as a free service or as a fundraiser for various campus groups with a minimal fee of \$2-\$5/bike.



Bike Valet on the University of Arizona campus

Game Day

It is no surprise that game weekend for the Texas A&M football games generates a great deal of traffic in College Station and specifically around Kyle Field. With RVs showing up to surrounding campus lots the night before games, and Aggies of all ages lined up along Houston Street in the early a.m. to secure tailgating space in Spence Park, navigating the surrounding streets can be difficult and dangerous. The major north-south road adjacent to Kyle Field, Wellborn Road, has an event day traffic plan, as do all of the campus roads south/southeast of the Memorial Student Center (MSC). This includes the closure of the bicycle lane along Houston Street. The transportation services department should continue to work with Athletics and the Texas Transportation Institute to institute the non-motorized routes while making sure those routes are clearly identified and publicized for all visitors. In addition, the transportation services department should explore instituting a bike valet to be located around the MSC with routes to and from the valet parking that avoid the majority of the vehicle traffic. But with the new addition in 2015 bringing stadium capacity up to 102,512 (the 5th largest stadium in the US), traffic constraints around Kyle Field will not be alleviated anytime soon.

Car Free Campus Events

Usually held on a weekend day, car-free events temporarily close streets to cars and open them up to people walking, bicycling, dancing, hula hooping, skateboarding, playing games, and so on. These events (often called ‘ciclovias’) have been very successful internationally and are rapidly becoming popular in cities across the world. Carfree events on campus could highlight the ease and convenience of walking and biking to school.

This type of event could include a street fair or other festival-type activities to garner interest, and TAMU could partner with College Station, a local bicycling group, or a campus environmental or social group to host the event.

A car-free day on campus would promote health and community by creating a safe space for physical activity and social interaction, while celebrating bicycling and other forms of non-motorized transportation. A car-free street event could take place one time or annually on a weekend day on campus. It is expected that this type of event would be very popular among students and well-attended by the campus community.

Enforcement

Enforcing traffic laws related to bicycling and walking helps to promote a safer environment for all road users. This section presents recommended region-wide bicycle and pedestrian enforcement programs.

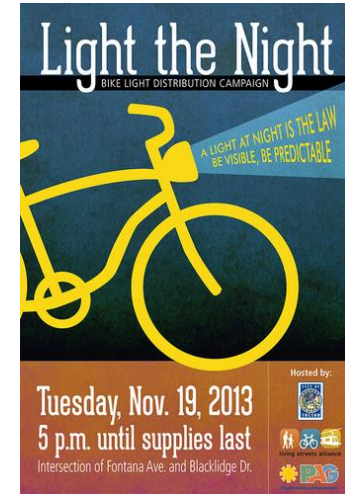
The recommended strategies are:

- Lights on bike campaign
- Targeted enforcement
- Diversion course
- Speed radar signs
- Abandoned bicycle program improvements
- Mandatory bike registration policy

Lights on Bike Campaign

Many bicyclists, especially students, are unaware that lights are required by law, or they simply do not purchase lights. Research shows that bicyclists who do not use lights at night are at much greater risk of being involved in bike-car crashes.

The University Police Department (UPD) already enforces bike light use on campus. The goal of a bike light campaign is to encourage light use through marketing, outreach, and the distribution and on-the-spot installation of free or low-cost bike lights on the TAMU campus. This multi-pronged outreach effort should take place every fall, as the days are getting shorter and as students are returning to school. UPD staff and student volunteers could lead the outreach efforts, while the Alternative Transportation Manager could coordinate the campaign.



The TAMU bike light campaign should include the following elements:

- Well-designed graphic ads throughout campus; could be included as part of a safety campaign
- Outreach to students, faculty, staff, and visitors through roving Bicycle Ambassadors, tabling, orientation, the Transportation Services website, etc.
- Continued enforcement of bike light laws
- Discounted or free bike lights and reflective gear distributed on campus and available at local bike shops during the beginning of the academic year or term
- Bicycle Ambassadors stationed at key locations who thank bicyclists using bike lights and reward them with a small gift

Campaign in Tucson and the University of Arizona

5: Education, Encouragement & Enforcement Recommendations

STOP Sign Enforcement

Enforcement options are a potential countermeasure to unsafe and illegal motorist/bicyclist behavior at intersections. Studies report the reduction of traffic law violations when enforcement is used.

To be successful, the enforcement action should identify the intersections that can potentially benefit from increased enforcement. Such intersections should have a combination of high stop sign violation rates and related crash patterns. In some cases, public input or observations by law enforcement personnel may suggest that a location should be targeted with enforcement.

The success of any enforcement program depends substantially on the performance of the officer in the field. It is important that all officers involved be told of the objectives and expected benefits of the program and that they are given regular feedback on their effectiveness.

Enforcement campaigns can be positive in nature as well with enforcement personnel distributing rewards for good behavior rather than penalties for bad behavior. Georgia Tech had a 'stop for cookies' day where good stopping behavior was rewarded with a cookie. BYU has also given coupons for free ice cream to campus bicyclists who obeyed the law.

Care must be taken to identify appropriate and safe locations to stop violators and issue citations.

Parking Enforcement in Bike Lanes

Blocking bike lanes or marked shared lanes forces cyclists to merge with faster moving traffic, endangering them and other motorists. Instituting an enforcement crack down (through ticketing or warnings) on parking in bike lanes at key locations around campus increases safety for all roadway users on campus.

Diversion Course

A bicycle and pedestrian diversion course can be offered in lieu of a ticket for bicycle and pedestrian related infractions, or some motorist infractions. Those who are cited can attend a class that teaches bicycle and pedestrian

safety. Bicycle and pedestrian diversion courses enforce the law while also reinforcing safe behaviors through education.

At Stanford University, Parking & Transportation Services and Stanford Public Safety co-host a free bike safety class twice a month as a part of SUDPS' Bike Diversion Program. These presentations are part of a program initiative to educate cyclists about fundamental bicycle safety.

Speed Radar Signs

Permanent radar speed signs or portable trailers can help reduce traffic speeds and enforce speed limits in areas with speeding problems, such as Stadium Way. Police set up a permanent sign or unmanned trailer that displays the speed of approaching motorists along with a speed limit sign. The speed trailer's roadway placement should not obstruct bicycle or pedestrian traffic. Speed trailers work as both an educational and enforcement tool. By itself, the unmanned trailer educates motorists about their current speed in relation to the speed limit.

Speed trailers can transport easily to streets where local residents complain about speeding problems. The cities' police departments could station officers near the trailer to issue speeding citations when speeding continues to occur.

The City of College Station could provide the management role for this program, working with the public to determine which locations are in most need of enforcement. This program can be administered randomly, cyclically, or as demand necessitates because of the speed trailers' portability. Speed trailers could be especially beneficial on bicycle boulevards to reinforce the role the City is taking in improving the bicycle environment for less experienced bicyclists.



Radar speed sign on the Cal Poly San Luis Obispo campus

Abandoned Bicycle Program Improvements

Abandoned bicycles are a significant issue at TAMU and consume a large portion of the available on-campus bike parking capacity. Abandoned bicycles appear on bike racks for a variety of reasons including:

- Poor quality bikes that mechanically do not provide good experiences for their owners
- Students not continuing with bicycling despite bringing a bicycle to campus
- Seasonally, especially as students transition and leave unwanted bicycles behind.

Abandoned bicycles take up valuable rack space, are unattractive, and discourage use by making the rack look unsafe or neglected. There are several possible solutions that should be implemented in unison to combat Texas A&M's abandoned bikes dilemma:

Mandatory Bicycle Registration Policy

Registering a bicycle on campus has multiple benefits for the owner and campus alike. Many campuses (University of Oklahoma, Stanford University, University of Texas, Austin, University of Maryland, and Princeton University to name several) have mandatory bicycle registration policies to help support students and staff.

These programs range in cost from free to \$10/year, while providing multiple benefits to the community, including:

- **Bicycle Identification.** If your bike is stolen, its serial number is needed in order to aid police in its recovery. When a bike is registered, the serial number can be cross-referenced with the bike owner's name, and acts as an independent proof of ownership. Recovered bicycles that are not registered have less chance of being returned to their rightful owners, since proof of ownership is often more difficult. In addition, if your bicycle is removed due to a parking infraction, the University will have a record of your bike and be able to contact you to retrieve your bicycle. Unregistered bikes could be promptly confiscated and disposed of more easily and with less cost to the university.
- **Theft Deterrence.** Thieves may be less likely to steal a bike with a registration sticker since its owner can easily be identified. Stolen registered bicycles can be posted on both statewide and nationwide crime computers.
- **Identifying a need for additional bike parking** by periodically inventorying numbers of bicycles on campus.



5: Education, Encouragement & Enforcement Recommendations

New Student Outreach

More effective education to new students about all transportation options. Many students who bring a bike campus do not end up using it, as they choose to ride transit, or prefer to walk. The Transportation Services could establish a program that prioritizes transportation information in all new student and parent orientation activities, so that only those students who will actually ride a bike brings one onto campus.

Safety Education and Encouragement

Some students who bring a bike to campus expecting to use it do not because they aren't experienced in traffic and realize they're not comfortable bicycling. A comprehensive education and encouragement program might convince those students to bicycle, thus helping maintain bike rack turnover.

Tagging and Removal Program

TAMU already has an aggressive bicycle removal program including significant lessons learned. TAMU previously tagged bicycles with large colored pieces of paper, however this became a signal to bike thieves that the bike could be stolen with little consequence. The university now uses small breakaway fasteners that are hard to see and are not noticed by the majority of bicyclists. Someone removing their bike from a rack would break the tie and continue on unaware. The university should continue to tag and remove abandoned and inoperable bicycles aggressively to alleviate rack space for existing users. Inoperable bicycles are defined as those without air in the tires, those missing key components (seats, wheels, etc.), those in a state of considerable disrepair, and those that have been parked in the same location for more than a month. Impounded bicycles should be stored for 90 days to provide bicycle owners the opportunity to reclaim their bicycle. Bicycles are periodically auctioned if in good shape or sold in lots. Bikes could be cherry picked to form the core of a loaner or leased bike program that the university has already started.

Overnight parking prohibition warning and enforcement.

In spring of 2015 the Alternative Transportation program initiated a successful program to target bikes parked overnight at select locations, the idea being that bikes parked overnight were likely to actually be

abandoned bikes. Stickers were placed on bike racks warning that any bikes left overnight would be confiscated. Locations included academic buildings (Kleberg, Blocker, Petroleum Engineering and Chemistry) the Memorial Student Center, the Recreation Center, and Heldenfells dormitory. After a couple of weeks, staff patrolled the racks at 11:00 pm, cut the locks of any abandoned bikes, and left instructions on how to call for an appointment to get the bike back. Violators are issued a warning first, but must pay a fee to retrieve their bikes for subsequent violations. Serial numbers of all confiscated bikes are entered into a database that can be cross-referenced with the University Police Department's list of students who had UPD engrave their driver's license into the bike frame. Those students will receive further notification that their bike has been confiscated, but if they do not retrieve it, the bike will be auctioned off. This initiative has been effective in reducing abandoned bikes and should continue as a regular activity. Currently rack locations with daytime classrooms are restricted for no overnight parking, where rack locations near research facilities have some racks with no restrictions.



Examples of 'tagged' bicycles at the University of Utah

6

Evaluation & Performance Measures

Evaluation strategies were developed and designed to assist TAMU staff in measuring the success of this Plan over time. There are two distinctly separate yet related items identified as baseline and benchmarking tools – system usage and system expansion. The baselines will be established during the planning process to allow TAMU staff to track usage and expansion over time.

Introduction

Cities and universities around the world have begun monitoring their bicycle and pedestrian programs in order to track the number of non-motorized users, gauge user perceptions of the bicycle and pedestrian networks and identify trends in safety. Results are published in a periodic 'report card,' which are typically prepared every one to two years.

There are two reasons for regularly measuring and reporting bicycle and pedestrian investment and activity.

First, the information gathered for the report allows the community to measure progress towards achieving stated goals for walking and bicycling.

Second, a quality data monitoring program can help TAMU and the City of College Station to obtain funding for new projects.

Most grant programs require awardees to monitor the results of funded projects, including a baseline count and monitoring usage over time.

Communities with established bicycle and pedestrian monitoring programs will tend to have an advantage over other cities when pursuing funding.

The key to a successful monitoring program is to identify useful data that can be gathered through available resources, that is consistently available over time, and that can be used for year-to-year comparisons. Texas A&M University and the City of College Station can issue bicycle and pedestrian report cards separately or combine them into a non-motorized transportation report card. This report should be made available online.

Key Elements of a Bicycling Report Card

A set of key figures can be used to identify trends in bicycling, miles of bicycle facilities, safety, etc. It is important to supplement this quantitative data with survey data aimed at gauging resident perceptions of the bicycle network. Questions can be tailored to provide information that will inform the location and design of future facilities.

The report card should:

- Utilize performance measures to track progress towards achieving stated objectives related to bicycles and pedestrians.
- Measure the number of bicycle users
- Measure user perceptions of the system
- Measure the quantity of bicycle facilities
- Measure trends in safety
- Measure transit use and multi-modal connections
- Report results in a format that is accessible to the general public

6: Evaluation & Performance Measures

Quantitative Data

The primary quantitative data sources included in monitoring programs:

- **Count Data** – There are two types of counts that can be used to measure bicycling and walking.
 - **Screen Line Counts** monitor the number of cyclists crossing an invisible line across a roadway. They are primarily used to identify general trends in volumes.
 - **Intersection Counts** are used to monitor the number of cyclists passing through an intersection. Depending on the volumes of bicyclists, intersection counts may be more complicated and require additional counters because they record two streets as well as turning movements. Intersection crossing counts should be conducted at high crash locations and where safety studies are desired.
- **Infrastructure** – Measure the number of miles of different types of bicycle and pedestrian facilities, number of bicycle parking spaces, etc. Some of this data is currently available from existing GIS files.
- **Safety Data** – Track the number of injury and fatality crashes involving bicycles and pedestrians.

To accumulate additional data for benchmarking purposes, TAMU and the City of College Station should consider expanding the count program to additional locations throughout the city. Some count programs measure additional items on their count forms, such as gender and helmet use.

Qualitative Data

Survey Instrument

The annual TAMU commuter survey provides significant information about transportation choices, behavior, and preferences on campus. The survey should continue to help TAMU track trends related to bicycle commute rates, attitudes about bicycling to campus, and changing needs on campus. Surveys could also be adapted to monitor user perceptions, satisfaction and desires with regard to existing facilities. They can also be used to monitor trip purpose, bicycling and walking habits, etc.

One survey concept that is extremely easy to present and intuitive for people to understand is to simply ask respondents to rate different aspects of bicycling and walking on a scale from 0 to 10, where 0 = strongly disagree and 10 = strongly agree. The report card can then report the average response value in a concise way that allows for easy comparison of perceptions of bicycling and walking over time.

Survey Distribution

There are at least two options for survey distribution and the appropriate methodology may differ for bicycles and pedestrians, as more people on the TAMU campus currently walk than bicycle.

- **Intercept surveys** can be performed at the same time as annual counts. However, depending on the number of counts performed, this may result in a very low sample size. It is common for intercept survey respondents to be given the option of mailing in their survey response (so that they can complete it later) or completing it online.
- **Internet/Mail-in surveys** can be distributed by Transportation Services to the greater campus community.

Report Format and Frequency

The report card should be visually appealing and be seen as an opportunity for TAMU (and the City, if participating) to showcase both the importance of non-motorized transportation and highlight what the university is doing to make TAMU a great place to walk and ride a bicycle.

The report should have an attractive cover, provide an introduction explaining the purpose of the report, and include abundant photos. Reporting the actual metrics can be done in as few as 1-2 pages. Each report card can dedicate additional pages to highlight recent investments, new facility designs, etc. The report can also include sections about additional information that impact bicycling or walking, such as combining cycling with public transport or the socio-economic benefits of walking/cycling. A survey of international best practices indicates that cities report trends in bicycling and walking as frequently as every year, but sometimes as infrequently as every five years. It is recommended that TAMU release its report card(s) every two years

Bicycle Friendly University Designation

TAMU’s progress towards achieving Platinum Bicycle Friendly University status can track a great deal of the changes and improvements to campus bicycling. The evaluation criteria for the BFU program, similar to this plan is based on five E’s: Engineering, Education, Encouragement, Enforcement and Evaluation. A university must show a comprehensive approach to bicycle-friendliness to rate highly. The university must complete a detailed questionnaire developed by the League of American Bicyclists in order to apply for recognition. There is one opportunity per year to apply, which is generally in august. Submitted applications are reviewed and universities are designated one of four medal categories (Platinum, Gold, Silver, or Bronze), given an honorable mention, or do not receive recognition. An application was prepared concurrent with the production of this plan in 2015. While awards are valid for four years, TAMU is encouraged to apply annually, or as significant new initiatives or facilities are improved to increase in ranking.

Table 9: Bicycle Friendly University Scores

Designation	Key Characteristics
Platinum	<p>Campus exemplifies what it means to be a BFU, with high marks across the board. IN short, people are on bikes everywhere.</p> <ul style="list-style-type: none"> • Campus has a well-connected, comfortable and safe bicycling network • There are excellent bicycle parking facilities • Outstanding bicycle education programs • A supportive police force
Gold	<p>The Campus has a strong bike culture, but may still need to offer more accessibility in the bike network.</p> <ul style="list-style-type: none"> • Campus has a well-developed bike network, but has some gaps • Programs to encourage more bicycling could be developed further • Bicycling education could be strengthened

Designation	Key Characteristics
Silver	<p>Campus welcomes bicycles, but two or three of the E’s are not well developed.</p> <ul style="list-style-type: none"> • Focus should be placed on what E’s are not well developed • Strategies should be devised to ensure progress is being made in all 5 E’s categories
Bronze	<p>The bicycling network and supporting programs/policies are generally not well developed, which leads the campus to feel only modestly welcoming to bicyclists.</p> <ul style="list-style-type: none"> • Steps are being taken in the right direction to address all 5 E’s • Only one or two E’s are actively being focused on throughout campus • More focus and commitment by the campus community needs to be taken to elevate and prioritize the viability of bicycling on campus
Honorable Mention	<p>Campus is just beginning to address the needs of bicyclists on campus</p> <ul style="list-style-type: none"> • There are currently few bicyclists on campus • The majority of students/faculty are not being encouraged to bike • More focus and commitment by the campus community needs to be taken to make improvement in all 5 E’s categories
No Recognition	<p>The needs of bicyclists on campus are not being addressed</p> <ul style="list-style-type: none"> • There are currently few to no bicyclists on campus • The great majority of students/faculty are not being encouraged to bicycle • Most, if not all, of the 5 E’s are not being developed to improve bicycling conditions

6: Evaluation & Performance Measures

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7 Implementation

This chapter provides a framework to coordinate implementation of the bicycle district strategic plan including cost estimates and implementation strategies. The plan must be flexible to respond to short and long term projects and nimble enough to work with existing capital projects.

Introduction

The implementation of this Plan will require a concerted, collaborative effort of project partners. Some recommended projects will require significant funds, while other policy and program recommendations are inexpensive means to create a bike-friendly campus. The proposed bicycle/pedestrian advisory committee should play an important role in revisiting this plan and to make adjustments when new projects or completed or when other conditions change.

Implementation of the Plan will take place incrementally through small steps taken over many years, depending on available funding and coordination with external agencies. The following strategies and action items can guide the University toward developing the projects identified in this plan.

This plan has been created and shaped by the Transportation Services Department; however, successful implementation of the plan will require other partnerships both internal and external to TAMU. Many departments and individuals will ultimately play an important role in TAMU reaching its vision of being one of the most bicycle friendly universities in the United States.

Cost Estimates

The planning-level cost estimates presented in this chapter are based on an understanding of general project components, rather than on a detailed design. They should be considered as “Order of Magnitude” in accuracy. American Society for Testing and Materials (ASTM) Standard E2620 defines Order of Magnitude as being accurate to within plus 50% or minus 30%. This broad range of potential costs is appropriate given the level of uncertainty in the design at this point in the process. Many factors can affect final construction costs, including:

- Final construction phasing
- Revisions to the design as required by local, state and federal permitting agencies
- Whether the project is stand alone, or included as a portion of a larger capital project
- Fluctuations in commodity prices during the design and permitting processes
- Selected construction materials
- Type and quantity of amenities (e.g., benches, lighting, bike racks, etc.)
- Extent of landscaping desired

As projects progress through preliminary and final design phases, these uncertainties begin to diminish. With each round of refinement, the range of expected construction costs will become more accurately known. Design costs are not represented in these estimates because this service could be provided by TAMU, the City of College Station, the City of Bryan, TxDOT, or private consultants. Typically design costs range from 3-5% for simple projects to 30% or higher for more substantial projects that require

6: Evaluation & Performance Measures

extensive design services such as structural, geotechnical, or environmental engineering. Also not included are mobilization costs (which vary from project to project) or a project contingency.

For linear bikeway projects a low and a high planning level cost estimate were developed. The difference is based on lower end versus higher end materials. For example low cost pavement markings could include waterborne paint versus more durable and expensive thermoplastic markings. For intersections and spot improvements, a single cost estimate is provided, however all of the same uncertainties previously mentioned apply.



This new buffered bike lane was constructed as part of the new West Campus dorms, its cost was included as part of a larger project

Costs are provided in current (2015) dollars. Since the projects recommended in this plan will be completed over many years, the University will need to factor in inflation and other considerations at the time it embarks on a particular project.

Implementation Strategies

On-street bikeway projects can often be implemented quickly and efficiently when coordinated with planned roadway projects or pavement management activities like overlays or seal coatings. Conversely, shared-use path projects may require higher amounts of funding and coordination to reach construction. Intersections on the perimeter of campus will require coordination with TxDOT and/or the City of College Station/Bryan.

1. **Complete inexpensive “low-hanging fruit”** projects first to increase the mileage of bicycle facilities. Some of the projects that are recommended in Chapter 4 do not require complicated restriping and can be completed quickly. Additionally, the ‘Action Plan’ that was presented to Transportation Services contains many interim improvements that can be made prior to more complex projects which may involve geometric changes or necessitate resurfacing.
2. **Opportunistically pursue projects** such as bike lanes or intersection improvements that require extensive re-striping in conjunction with roadway resurfacing projects as they occur.
3. **Leverage existing university projects** such as residence halls and new educational buildings to create new linkages and implement a portion or all of overlapping projects recommended in Chapter 4.
4. **Strategically pursue high-priority projects** as determined by Transportation Services and programs with local partners. Examples would include shared-use path and intersection improvements along TxDOT corridors to improve safety and mobility of persons accessing TAMU. Such projects would likely not occur without partnership and intervention on the part of TAMU.
5. **Incrementally pursue projects** based on available resources with the goal of eventually completing the project in full. Larger or more lengthy projects may require several phases, or coordination with other campus construction projects which will necessitate incremental implementation.

Table 10: Bikeway Cost Estimates

Type	Location	Cross Street A	Cross Street B	Length	Cost (low)	Cost (high)
Advisory Bike Lane	Ross St	Houston St	Bizzell St	0.42	\$2,900	\$10,700
Bike Lane	Discovery Dr	Kimbrough Blvd	University Dr	0.41	\$24,300	\$29,400
Buffered Bike Lane	Proposed Street (West Campus)	Horticulture St	Olsen Blvd	0.26	\$4,200	\$27,300
Bike Lane	Spence St	University Dr	Ross St	0.22	\$2,400	\$14,000
Bike Lane	Bizzell St	University Dr	Polo Rd	0.11	\$41,700	\$60,000
Bike Lane	W Lamar St	Old Main Dr	Houston St	0.18	part of existing project	
Bike Lane Improvement	Penberthy Blvd	George Bush Dr	Tom Chandler Dr	0.26	\$51,800	\$55,000
Bike Lanes	George Bush Dr	Wellborn Rd	FM 2828	1.19	\$64,000	\$75,000
Bike Route	East of Spence St	Ross St	Lamar St	0.24	\$3,600	\$5,000
Bike Lane	Lamar St	Nagle St	Bizzell St	0.21	\$1,200	\$1,600
Bike Route	Adriance Lab Rd	University Dr	Horticulture St	0.17	\$1,100	\$2,600
Bike Route	Proposed Street (West Campus)	Crosses University Dr	N/A	0.29	\$1,900	\$4,300
Bike Route	Proposed Street (West Campus)	Kimbrough Blvd	Proposed Olsen to Discovery SUP	0.20	\$1,300	\$3,000
Buffered Bike Lane	Agronomy	University Dr	F and B Rd	0.75	\$55,400	\$57,800
Bike Lane	Lubbock St	Coke St	Bizzell St	0.27	\$2,500	\$3,500
Buffered Bike Lane	Olsen Blvd	University Dr	George Bush Dr	1.09	\$13,900	\$17,400
Sidewalk or SUP	North side of University Dr	Texas Ave	Polo Rd	0.21	\$88,800	\$105,400
SUP	South Side of University Dr.	Texas Ave	Harvey Mitchell Pkwy	2.34	\$988,500	\$1,173,800
SUP	West Campus Dorms to Olsen at Old Main	West Campus Dorms	Olsen Blvd	0.58	N/A	N/A
SUP	West Campus	West Campus Dorms	White Creek Loop Greenway	0.25	\$105,600	\$125,400

6: Evaluation & Performance Measures

Type	Location	Cross Street A	Cross Street B	Length	Cost (low)	Cost (high)
SUP	North Side of George Bush Dr	Texas Ave	Barbara Bush Dr (SUP)	2.26	\$954,700	\$1,133,700
SUP	Texas Ave	University Dr	George Bush Dr	0.90	\$380,200	\$451,500
SUP	West campus shared use path	Olsen Blvd	Discovery St	0.67	\$283,100	\$336,100
SUP	Lawn area	George Bush Dr	Olsen Field path	0.08	\$33,800	\$40,200
SUP	Zachary Building	Spence St	Blizzell St	0.06	\$25,400	\$30,100
SUP	White Creek Loop Greenway	Wehner Building	University Dr via Bush Library	2.20	\$929,300	\$1,103,600
SUP	College Ave	University Dr	Brookside Dr	0.80	\$338,000	\$401,300
SUP	Coke St	George Bush Dr	Joe Routt Blvd	0.37	\$156,300	\$185,600

Table 11: Intersection / Spot Improvement Cost Estimates

Location	Cost
University Dr and Spence St	\$28,000
University Dr and Agronomy Rd	\$6,000
University Dr and College Ave	\$30,000
Stotzer and Mitchell	Part of existing project
University Dr and Polo Rd	\$4,000
Penberthy Blvd and George Bush Dr	\$3,000
Wellborn Rd and George Bush Dr	Part of existing project
Olsen Blvd and George Bush Dr	\$5,000
Houston St and George Bush Dr	\$7,000
Dexter, Throckmorton/Coke and Bush Dr	\$18,000
Timber/Bizzell and George Bush Dr	\$10,000
Anderson St and George Bush Dr	\$23,000

Location	Cost
Texas Ave and George Bush Dr	\$14,000
Texas Ave and Lincoln Ave	\$90,000
University Dr and Moore Ave	\$100,000
Clark St and Routt Blvd	\$3,000
In between Jones St and Houston St	\$3,000
Ross St and Spence St	\$1,000 - 20,000
Ross St and Bizzell St	Project in design
Near Olsen and Old Main Dr	\$1,500
New Main Dr & Bizzell St	\$6,000
Texas Ave & New Main Dr	\$15,000
Kimbrough Blvd & Olsen Blvd	\$150,000 - 2,000,000
Pickard Pass south of Kimbrough Blvd	\$20,000

Location	Cost
Bizzell St & Polo Rd	\$2,000
Olsen Blvd & Medical Sciences	\$8,000
Texas Ave Crossing between University Drive and New Main Drive	\$29,000
University Dr & Ireland St	\$2,000
Gene Stallings Blvd between Lamar and Routt	\$20,000
Olsen Blvd & Old Main Dr	\$250,000 - \$800,000
University Dr and Spence St	\$28,000
University Dr and Agronomy Rd	\$6,000

Funding Strategy

In order for the Institute to achieve the goals of this Plan, TAMU will need to fund improvements from a variety of sources and partners. The university will need to be opportunistic and utilize other capital projects where possible and combine sources of funding.

Five primary sources make up the core funding strategy for this Plan. They are:

- **Capital Budgets** - The Institute can use the concepts and policies presented in this Plan to implement this Plan through regularly scheduled capital projects, such as streetscape projects, street resurfacing or new building construction.
- **Department Budgets** - Departments like Police and Housing can use their maintenance resources and staff to support programs and bike infrastructure maintenance.
- **Fees** - Student fees and parking fees provide an opportunity to generate revenue to fund infrastructure projects, such as bicycle

parking; and programs, such as commuter reward incentive program.

- **Grants** - Competitive grants through public agencies or through private or non-profit foundations can generate additional resources for projects and programs.
- **Fundraising Campaigns** - Fundraising through Institute groups, student organizations or even crowd-funding can help generate additional resources for projects and programs.

