Circulation and Accessibility Plan
TABLE OF CONTENTS

1. RETHINKING HOW PEOPLE MOVE AT THE MĀNOA CAMPUS ............5
2. MĀNOA CAMPUS ........................................................................ 13
3. MOVING AROUND THE CAMPUS .................................................. 19
4. DEVELOPING Context Sensitive Solutions ................................. 43
5. BUILDING THE FOUNDATION .......................................................... 47
6. CAMPUS CIRCULATION ACTION PLAN ....................................... 71
7. CATALYTIC PROJECTS .................................................................... 111
8. ACCESSIBLE GRID IMPROVEMENTS ........................................ 127

APPENDIX A: NETWORK CONCEPT AND EVALUATION
APPENDIX B: TRAFFIC ANALYSIS
APPENDIX C: ACCESSIBLE GRID SUMMARY
1

RETHINKING HOW PEOPLE MOVE AT THE MĀNOA CAMPUS

Universities that offer transit-rich, walkable, bicycle-friendly environments are at a competitive advantage in retaining and attracting top-flight staff, faculty and students.

Many universities are responding to the growing demand for walkable campuses and the negative impacts of auto-dominance and poor ADA access on the quality of life in campus communities. This is for a number of reasons. Students and staff are investing in a place, as much as they are investing in an education or career. When cars and surface parking dominate the campus landscape, campuses diminish the value of their limited land.

An alternative approach is to maximize the space available through parking management and transportation demand management, freeing up space for iconic pathways, green space, places for social discourse, or even new buildings. These are elements of great campus environments, and great campus environments are in demand.

It is for these reasons the University of Hawai‘i at Mānoa (UH Mānoa) is developing an action plan toward building a walkable, accessible, and functional campus. This Circulation and Accessibility Plan presents a comprehensive guide and long-term vision for implementing circulation and ADA accessibility improvements to the campus. UH Mānoa also has a responsibility to provide a campus environment that is accessible to all campus affiliates, regardless of their physical or cognitive abilities.

The Plan integrates physical infrastructure initiatives and policy strategies for campus access, campus placemaking, internal circulation, and utility upgrades. This Plan governs the investments that impact affiliate arrival at campus gateways and the experience of moving within the campus extent.
A PLAN...YEARS IN THE MAKING

The Circulation and Accessibility Plan emerges from a series of policy and planning initiatives aiming to sustainably accommodate steady student and faculty growth while improving quality of life for all campus affiliates. In 2012, UH Mānoa completed two critical planning initiatives that informed this process: the Campus Transportation Demand Management (TDM) Plan and the Landscape Master Plan (LMP).

The Campus TDM Plan established a package of campus access strategies to help address growing transportation-related challenges and meet the diverse mobility needs of the Mānoa campus’ faculty, staff, and students. The Campus TDM Plan offers the University immediate solutions as well as near-, mid-, and long-term strategies to address affiliates’ growing interest in flexible mobility options and optimize existing parking resources.

Recognizing that prominent roadway infrastructure, parking, and vehicular access to campus distract from the pedestrian realm, the LMP strategically improves the spatial, functional, and aesthetic relationship University affiliates share with the UH Mānoa campus environment. The LMP set a framework for the purposeful ordering of the landscape to better organize the campus environment. The LMP developed concepts for multimodal circulation on the campus and established a framework to connect the grid of buildings with accessible pathways.

Each plan complements the next. The Campus TDM Plan is the mechanism to get people to campus with a range of mobility options that can free up space from parking to other uses. The Landscape Master Plan provides the vision and concepts for open space, circulation, placemaking, and aesthetics. And the Circulation and Accessibility Plan is the investment strategy and operational program that moves the LMP vision toward reality.

A CAMPUS ADAPTING TO A CHANGING WORLD

Millennials and Generation Z, those born from 1983-2000 and after 2000, respectively, are changing the way people travel in the United States. These generations represent current and future student population as well as researchers, staff, and non-tenured faculty at UH Mānoa. Millennials and Generation Z prefer efficiency, multitasking, and a multitude of options, whether walking, riding TheBus, bicycling, or using bike share and car share, or hailing a transportation network provider, like Uber or Lyft. And walking is the glue that holds it all together.

Since 2004, they have contributed to national patterns that result in decreasing vehicle miles traveled (VMT) and fewer driver’s licenses obtained. This cohort is relying more on transit than on car use, opting to focus their time socializing in person and on social media rather than driving. Millennials help transit ridership surge 10% from 2005 to 2011. The last decade has shown that their preferences for a wide choice of transportation options have impacts on the national market—and the market should continue providing more options.

As nearby off-campus housing supply expands and the student population grows, UH Mānoa seeks to invest its mobility and campus planning dollars on new transportation choices, walkability and accessibility upgrades. UH Mānoa’s predominant Millennial population requires the university to respond to changing preferences. For many, UH Mānoa is their community for two, three, four years, or more. A substantial portion of faculty and staff’s waking hours will be spent on campus. They expect a livable domain for the duration of their stay.
CHAPTER 1: RETHINKING HOW PEOPLE MOVE AT THE MĀNOA CAMPUS

YOUNG ADULTS ARE FINDING NEW WAYS TO GET AROUND.

From 2001 to 2009, 16- to 34-year-olds...

- 16% Took more walking trips
- 24% Took more bike trips
- 40% Traveled farther on transit
- -23% Drove fewer miles


Why don’t you have a license?
Most frequent response from 615 surveyed adults, ages 18-39

- I’m too busy: 37%
- It’s too expensive: 32%
- I can get a ride: 31%
- Prefer to bike/walk: 22%
- Prefer transit: 17%

University of Michigan Study, August 2013

FEWER YOUNG ADULTS ARE DRIVING

Percentage of 16- to 24-year-olds with a license fell from 2001 to 2010

- 2001: 78.1%
- 2010: 74.8%

Federal Highway Administration, "Distribution of Licensed drivers," 2001-2010

“With smartphones and other mobile devices, we can now find the BEST WAYS OF TRANSPORTATION. This change in LIFESTYLE and technology is what sets my generation apart from others.”

ELEMENTS OF A WALKABLE MĀNOA CAMPUS

A common trait of most world class campus institutions is walkability. But what does it mean to be a walkable campus? These eight factors are commonly observed ... and UH Mānoa is taking note.

Streets as place.
Streets are the public canvas where campus life unfolds. Streets convey people, vehicles, goods, and ideas. They also foster random connections and enable public art, political display, and cultural discourse.

Direct and dense networks of interior paths with multiple accesses to exterior streets.
Pedestrian and bicycle paths are the connective tissue of the campus, linking people between destinations at a manageable and human-scaled pace.

Streets as a verdant landscape.
Walkable campuses and green campuses go hand in hand. Tree-lined streets and walkways provide a sense of enclosure, slow cars, provide shade, and enhance the campus aesthetic.

Direct and comfortable connections to frequent transit and shared mobility options.
Direct, legible, and conflict-free connections to transportation facilities, like transit stops, shared mobility hubs, and other multimodal parking facilities (car, bike, moped, etc), are critical to support a pedestrianized campus core.

Managed parking and right of way.
A walkable campus strategically manages the movement and storage of cars, while minimizing conflicts between people walking, biking, skateboarding, and driving.

Sociable spaces.
Campuses are an inherently social environment. Streets, paths, quads, and other civic spaces are the lifeblood of the campus experience and need to be designed to encourage social interaction.

Legible connections.
Walkable campuses are easy to navigate either by design, through an intuitive grid, or by visual cues, through wayfinding.

Activation programs.
Troves of people walking bring a vibrancy to the campus, but public programming on streets and other public space during off-peak times can activate the campus for 18 or more hours of the day.
GUIDING PRINCIPLES FOR CAMPUS CIRCULATION AND BUILDING ACCESS

Circulation and access to and from UH Mānoa buildings and parking resources will be driven by a circulation framework that prioritizes investments that further campus walkability and overcome barriers to accessibility. These campus circulation and building access principles derive from foundational policies and design values documented in the LMP and Campus TDM Plans (see the Access and Circulation Hierarchy callout for more information). The framework principles are as follows:

1. **All Ages and Abilities Campus.** Direct drop-off access and streets, pathways, transit stops, and parking facilities that put persons with disabilities on a level playing field.

2. **Walkability First.** A high quality and accessible walking environment that connects great campus places.

3. **Delivery, Service, and Emergency Access.** Back-of-house service networks that limit conflicts with people walking and biking on campus.

4. **Traffic and Conflict Management.** Strategically located parking facilities, drop-off zones, and auto access routes that limit conflicts with people walking.

5. **Transit Access.** Dignified access to TheBus, the Rainbow Shuttle, and TheHandi-Van.

6. **Dedicated Bikeways.** Low stress bicycle connections that directly and safely connect affiliates to campus destinations.
UH MĀNOA’S ACCESS AND CIRCULATION HIERARCHY

The 2012 Campus TDM Plan laid the groundwork for greater emphasis on pedestrian movement and separation from motor vehicle traffic. The access and circulation hierarchy, shown below, provides overarching direction for mobility and campus circulation investments, clarifying the decision-making process for the University. There should be strong and defensible policy reasoning to deviate from the investment principles implied by the hierarchy.
CHAPTER 1: RETHINKING HOW PEOPLE MOVE AT THE MĀNOA CAMPUS

PLAN STRUCTURE

The University of Hawai`i at Mānoa Circulation and Accessibility Plan is built on a detailed assessment of existing circulation and accessibility barriers on campus. The Plan establishes a network strategy and “punch list” for infrastructure investments.

But there is much more to creating a walkable, accessible Mānoa campus than simply redesigning streets and building new and better pedestrian and bicycle pathways. Changes to policies and procedures that address conflicts, path maintenance, and back-of-house operations are critical to making the campus function for all users regardless of ability. The plan includes the following elements:

1. **Rethinking Movement at the Mānoa Campus**
   Sets the issues and reasoning for the Plan.

2. **The Mānoa Campus**
   Summarizes the campus form, grid, and general orientation, while illustrating key public space elements on campus.

3. **Moving Around Campus Today**
   Provides a snapshot of baseline conditions on campus for different users, whether they are circulating between buildings or fulfilling campus operations.

4. **Preferred Circulation Network Concept**
   Updates network priorities for pedestrians, bikes, transit, parking access, and service vehicles.

5. **Enabling Strategies**
   Lays out the strategies that will enable a better walking and biking environment while optimizing parking location and campus operations.

6. **Campus Circulation Action Plan**
   Recommends multimodal projects and grade assist improvements that implement the preferred circulation network concept.

7. **Catalytic Projects**
   Illustrates schematic designs and design conceptual programming for three catalytic projects—the three highest scoring multimodal projects.

8. **Accessible Grid improvements**
   Identifies the types of barriers on campus and digests the 901 accessible barriers into a list of spot and cluster improvements.

9. **Appendices**
   The appendices document the evaluation of network concept options, traffic analysis, and the summary of all accessible barriers on campus.
MĀNOA CAMPUS

The Mānoa campus accommodates people walking with a wide range of amenities.

McCarthy Mall and Legacy Path offer bold connections among tree-lined spaces separated from motor vehicles. And while the campus provides many walkable spaces, such as sidewalks and marked crossings, the Mānoa campus is not universally accessible to people of all ages and abilities. Portions of the campus—particularly makai of Dole Street—lack a well-connected network of accessible pathways. Many popular pathways have barriers to accessibility such as stairs or corners without nearby ramps and poor pavement quality that require out of direction travel or prevent access altogether.
UH Mānoa’s campus is lined and bisected by several types of thoroughfares that accommodate people walking and on bicycles at various levels.
Primary access streets are the major thoroughfares connecting UH Mānoa’s gateways to surrounding neighborhoods and the broader regional transportation network. People walking along and across these streets are typically met with high traffic volumes, moderate speeds (over 30 mph), and limited to no separation from motorized traffic. Distances between crossings are typically long (near 300 feet) and occur at signalized intersections.

Secondary access streets connect UH Mānoa’s gateways to buildings and parking lots on campus. People walking near these streets encounter moderate traffic volume with moderate speeds (25 to 30 mph). Roadway separation ranges from none to a limited parking buffer (roughly 8 feet). Distances between crossings vary from 150-200 feet and are placed at intersections and mid-block crossings.

Parking access streets are internal limited access networks that service UH Mānoa’s parking lots and service areas. People walking along these streets are typically met with low traffic volumes and speeds less than 25 mph. There is limited to no separation from roadway traffic, with frequent areas of shared street activity.

Campus Road (top right) and the courtyard in front of Campus Center (right center) provide access to parking and drop-off points, but create conflicts with people walking and biking on campus. McCarthy Mall (bottom right) is the primary pedestrian pathway on campus and is flanked by Varney Circle and East-West Road, both major conflict points with motorized traffic.
PUBLIC SPACE DESIGN ELEMENTS

Several elements of good public space design are commonly found on walkable university campuses. While many of these elements are currently visible at UH Mānoa, the campus lacks widespread and coordinated application of these design features.

Roadway Geometry

Roadway geometry defines how the street and sidewalk spaces are divided for all street users. High volume and high speed arterials pose significant challenges for vulnerable road users from crossing the street to riding a bicycle with traffic.

Intersection Treatments

Intersection and gateway features can be customized to the local context. Public art, creative crosswalk design, or a combination of intersection and sidewalk treatments remind street users that they are in a special place. Placemaking elements can also assist in wayfinding by serving as a reference point or campus portal.

Shared Spaces

Shared space design concepts limit separation between all users by reducing street width, removing curb lines, minimizing signage and striping. Passage through the space relies on person to person negotiation. Shared spaces have many benefits including slow vehicle speeds, activating public space, and balancing priority for all users.
Universally Accessible Design

People with mobility or other disabilities sometimes face obstacles in the physical environment that prevent full access to valued people and places. Universal design eliminates these barriers to support safe and convenient travel for all people. Universally accessible features include curb ramps, building ramps, uninterrupted sidewalks, and tactile surface among other improvements.

Pedestrian Realm

The pedestrian realm can be comprised of as many as five zones to support through and lingering movements: the frontage, pedestrian through, furniture, curb, and enhancement/buffer zones. The pedestrian through zone needs to be wide enough to comfortably accommodate expected volumes. Places to sit and park bicycles enhance the pedestrian experience, but should not obstruct through movements.

Stormwater Treatments

Bioswales are landscape design elements that remove silt and pollution by collecting and filtering runoff water. They also improve the pedestrian environment by providing a landscaped buffer from vehicles. Bioswales can fit in the furniture zone of the sidewalk or take the place of a parking space, thereby narrowing the road width and managing traffic speeds.
Like many other college campuses across the country, campus affiliates can circulate through UH Mānoa with a range of transportation options. On any given day, people walk, skateboard, bike, moped, take shuttles, and drive.

The "design vehicles" that commonly occupy campus streets and paths include:

» People socializing while walking
» People walking hurriedly
» People riding bikes
» Buses dropping off and picking up affiliates
» People accessing moped and motor vehicle parking
» Motorists dropping off and picking up affiliates
» People delivering goods

The following sections highlight the conditions, experience, conflicts, and challenges of walking, biking, taking transit, driving, and delivering goods at UH Mānoa. Particular emphasis is placed on the comfort and barriers experienced when walking throughout campus—especially for affiliates with physical, visual, and cognitive impairments.
The University of Hawaii at Mānoa urges its students, faculty, staff, and visitors to “Move with Aloha”—a slogan engendering respect for people moving through campus.
WHO IS MOVING WITH ALOHA?

Move with Aloha is a safety campaign established by UH Mānoa in 2010 to promote awareness of people walking and bicycling on campus. The goal of the campaign is to create a safe campus environment for all campus users through courteous and considerate behavior. Sharing the campus environment is a key tenet of the program.

The campaign is comprised of three initiatives, implementing Share Zones, installing sharrows, and establishing bike routes to connect the campus with the surrounding environment. During peak hours, people bike riding or skateboarding are required to dismount and proceed on foot in areas with high levels of pedestrian traffic. These areas include McCarthy Mall, Legacy Path, the Physical Education Complex, and other central campus destinations.
At UH Mānoa, as at most universities, the availability and quality of pedestrian malls, sidewalks, crosswalks, curb ramps, and other supports for walking vary throughout the campus. This is due, in part, to historical development patterns, campus growth, limited transportation funds, and a general orientation towards automobile travel. The distribution and quality of pedestrian infrastructure influences the way staff, students, affiliate, and visitors experience the campus.

Pedestrian Malls

In general, pedestrian malls are areas of high pedestrian traffic separated from motor vehicles and include amenities such as ample lighting, wide sidewalks, lush landscape buffers, wayfinding and street furniture. The Mānoa campus is anchored by two pedestrian malls. McCarthy Mall is the primary pedestrian access for campus destinations such as the Queen Lili‘uokalani Center for Student Services and Hamilton Library. Legacy Path begins with the Dole Street Gateway and extends mauka toward Varney Circle, providing access between the lower Campus Parking structure and Campus Center.

Sidewalks and Walkways

Sidewalks and walkways are intended for pedestrian use, typically adjacent to the street separated from motor vehicle traffic. The Americans with Disabilities Act requires a minimum four foot wide unobstructed sidewalk. The Mānoa campus has sidewalks along most key campus streets and intra-campus walkways between destinations.

Crossings

Crossings are a legal extension of the sidewalk at intersections. Pavement markings, at intersections and midblock, alert motorists of pedestrian conflict points. The Mānoa campus includes a range of crossing types: unmarked, marked, raised, and signalized. Safe, comfortable and frequent crossings are paramount to a walkable environment especially in areas with high motor vehicle traffic such as University Avenue and Dole Street.

Shared Pathways and Parking Lots

Shared pathways and parking lot travel paths are encountered in the Mānoa walking network. These are areas where low-speed motor vehicles mix with pedestrian pathways. Some shared pathways are marked with warnings to pedestrian and motorists about the shared space. The pedestrian travel paths through parking lots on campus are typically not defined because they are generated as desire lines from individual parking stalls.
The accessible grid connects campus destinations on the shortest path.
CHAPTER 3: MOVING AROUND THE CAMPUS

BARRIERS AND ACCESSIBILITY

The basic principle of accessibility is, at minimum, to comply with ADA standards. To achieve universal accessibility, sidewalks and pathways should be traversable with a wheelchair or other mobility device. Universal design elements include curb ramps and compliant pedestrian push buttons at all intersections and ramp alternatives at stairs. Universally accessible pathways should also be safe and comfortable to walk or roll on for all users - reducing conflict with other modes and providing enhanced crossings at streets with more automobile traffic.

The basic objective is to have at least one connection to each building as a starting point for prioritization. As an ongoing goal, the Mānoa campus should create as many accessible pathways and entrances as feasible.

The Accessible Grid

The accessible grid is the planned network that connects campus destinations on the shortest travel path for all levels of mobility. The grid includes pedestrian facilities (sidewalks, paths, curb ramps/crossings, ramps), connections to disabled parking, and transit/shuttle passenger facilities. Today, many barriers exist along the planned network.

Pedestrian Network Barriers

Although most paths on the Mānoa campus are traversable by foot, people using wheelchairs or other mobility devices face difficulties because some sidewalks are in disrepair or not designed for wheelchair access. Gaps or barriers on accessible routes require these people to travel out of direction to get around the barrier, move into the street, enlist help from a friend or passerby, or not make the trip at all.

Accessibility barriers can range in extent. On the Mānoa campus, a low-level barrier would be a gap or upheaval along McCarthy Mall. In contrast, several paths between the lower campus and Dole Street are missing ramps, sidewalks, and elevators. This is a high level barrier where a person in a wheelchair would need to find an alternative route to access the lower sport fields. Other types of barriers range from poor pavement quality and obstructions to steep path and substandard cross slopes.
CHAPTER 3: MOVING AROUND THE CAMPUS

Many barriers exist along the planned accessible grid.
DIGNIFIED ACCESS

What is Dignified Access?

Dignified access provides a network that can be maneuvered safely and comfortably with a wheelchair. Any high level barrier, such as a missing curb ramp or pathway obstruction, is a gap in the dignified accessible grid. Absent pathways or desire lines through parking lots are also gaps in the dignified accessible grid. The map on the previous page shows how barriers in the accessible grid accumulate into network gaps.

Case Examples

The staircase connecting McCarthy Mall to Hamilton Library requires out of direction travel for people using mobility devices. In general, stairs are common high level barriers that need accessible alternatives such as a wheelchair ramp or elevator.

Building 171P on Lower Campus Road has a limited pedestrian grid for dignified access because the sidewalk on that side of the street ends without curb ramps. A person in a wheelchair would need to enter the roadway to connect to other campus destinations.

The images to the right illustrate the difference between access and “dignified” access at the stairway between Hamilton Library and McCarthy Mall and at Building 171P on Lower Campus Road.

Images from Nelson\Nygaard

26
Consolidated accessibility barriers persist throughout the campus
AUTO ACCESS

According to the 2007 Long Range Development Plan, the campus population swells to 30,000 persons during the daytime. A 2011 Campus Transportation Survey showed that 33% of campus commuters drive alone to campus and another 6% carpool.

The large campus population and drive-alone rate puts increased strain on UH Mānoa’s street network and parking facilities. Adding to the congested roadway are nearby St Francis School, Mid-Pacific Institute, and campus visitors for special events. Dole Street and University Avenue also serve as network corridors for nearby neighborhoods. During peak hours, congestion can be observed at the campus portals, particularly along Maile Way and Dole Street as motorists exit upper campus parking locations and the Lower Campus Parking Structure, respectively. Parking on the Mānoa campus is difficult to find during peak hours, and it is not uncommon for affiliates to be dropped off on streets within the campus. See Appendix C for detailed analysis of existing traffic conditions and intersection performance.

Parking Locations

Parking storage is distributed throughout the Mānoa campus. Facilities range from parking structures to open lots and on-street parking. Students primarily park in the Lower Campus Parking Structure, which is the largest parking facility on campus. Campus parking is permit restricted or can be purchased for daily cash rates. Visitor parking lots also have kiosks to pay for short-term parking.

ADA-Compliant Parking

ADA compliant parking spaces are located throughout the campus. It is important that these parking spaces are available to persons who qualify to use them. Most ADA compliant spaces have an accessible ramp to the pedestrian gird and are close to building entrances. Demand for these spaces is monitored to meet the needs of campus users as they change.
ADA compliant spaces are distributed throughout the campus.
THEBUS ACCESS

TheBus is the transit service for Honolulu, the Mānoa campus, and the island of Oahu. It is privately managed by O‘ahu Transit Services Inc under a public-private partnership with the City and County of Honolulu Department of Transportation Services.

Service Routes

TheBus has eleven routes that serve the Mānoa campus including the 4, 6, 13, 18 plus express routes A, 80A, 85, 85A, 90 and 94. Express routes only run on weekdays during the traditional peak travel periods and do not always match the peak arrival and departure movements on campus.

The frequency of transit routes range from 10 to 30 minutes during weekday peak periods and 30 minutes to an hour during night and weekend periods. Route 4 is the most frequent and direct route to campus.

Stops

Stops are present along all primary access streets on campus, including University Avenue, Dole Street, Metcalf Street, Maile Way, and East-West Road.

The central hub of transit on campus is Sinclair Circle near University Avenue between Metcalf Street and Dole Street. It is served by ten routes. Average boarding and alighting at this stop is 2,259 riders, making it the stop on campus with the highest boarding and alighting activities. Other notable stops are Dole Street at East-West Road where the boarding and alignment is 482 and 409, for eastbound and westbound stops respectively.

Stop Amenities

Rider amenities vary widely between stops on campus. Stops along Dole Street provide a low level of amenities; a small bench big enough for two people and no shelter or shade. Several stops lack any distinguishable signage or dignified waiting areas. The stops at University Avenue & Metcalf Street and University Avenue & Dole Street have shelters and trash cans. The campus transit centerpiece, Sinclair Circle, exhibits the highest level of amenities with several shelters, benches, trash cans and a real time transit display monitor.
RAINBOW SHUTTLE ACCESS

Rainbow Shuttle is a free shuttle provided to UH Mānoa affiliates operating Monday through Friday with frequencies of 15 to 30 minutes. There are six daytime routes that run from 6:30 AM and to 6:00 PM. One route runs from 5:00 PM to 10:30 PM. Route E2 runs for the longest duration, from 6:45 AM to 11:15 PM. All Rainbow Shuttle fleet vehicles are ADA-compliant.

Varney Circle is the central hub for all routes in the Rainbow Shuttle System. With high ridership, shuttles will service a new central hub relocated to the mauka side of Queen Lili‘uokalani Center for Student Services.

Stop Amenities

 Desired bus stop amenities include transit system schedule, seating, lighting, shelter and transit signage.

 Rainbow Shuttle shuttles are limited to stop signage and seating at a few locations. Most stops include a list of stop locations, but do not identify the route or provide a system map.
BIKE NETWORK

The UH Mānoa campus is centrally located in Mānoa Valley mauka to Honolulu’s urban centers, making it an attractive market for bicycle access. The 2012 Campus Transportation Demand Management Plan found 43% of affiliates live within 20 minute bicycle catchment area (3 miles bicycling at a leisurely 12-14 mph pace) that also includes most major Honolulu destinations makai of campus from Punchbowl to Diamond Head.

Bike Access

The existing bike network provides limited campus access for people on bicycles. Bike lanes have been striped along Metcalf Street, Dole Street, and University Avenue south of the Mānoa campus. Designated bike routes extend from upper campus into the surrounding neighborhoods. Maile Way, East-West Road and part of Dole Street are designated bike routes, without separate facilities, but rather shared use markings, also known as sharrows, to improve motorist awareness of bicyclists and direct cyclists outside the door zone of parked vehicles.

Bike Parking

Bike parking is distributed throughout the Mānoa campus, with more than 50 bike rack locations and a secured card-access bike cage at Parking Structure (available free to UH Affiliates).

Future Bike Share Access

Hawaii Bikeshare is scheduled to launch in fall 2016 with over 200 bike docking stations. The initial operation area is planned to include Chinatown, Downtown, Diamond Head, and UH Mānoa. Hawaii Bikeshare will provide a new type of mobility for UH Mānoa affiliates with sturdy upright bicycles that can be docked at any station. The bikeshare system will increase UH affiliates access to nearby destinations and extend the reach of transit.

Key Challenges

In general, people biking to the Mānoa campus face substantial barriers to travel such as high speed and volume arterials and limited connectivity due to the H-1 Freeway and a disconnected street grid. In several locations the current campus bikeways will attract only the very bravest riders, as they are designed to the minimum bikeway standards. These facilities, for example bike lanes along University Avenue, put cyclists in compromising situations with conflicting motor vehicle traffic.
SKATEBOARDS AND MOPEDS

SKATEBOARDING

Skateboarding is a popular, efficient form of transportation on the island of Oahu, and a cultural institution of the Mānoa campus.

Policy

Although skateboarding is a popular mode of transportation on campus, there are certain areas where skateboarding is restricted. Skateboarders are required to dismount in heavily traveled pedestrian areas including McCarthy Mall, Legacy Path, Sustainability Courtyard, and the Lower Campus Athletic Complex. The dismount policy is also reiterated with the Move with Aloha campaign. Skateboarding is also prohibited inside buildings and on internal walkways.

Skate Docks

Skate Docks are located intermittently throughout campus, including a recently installed skateboard rack at the Campus Center Courtyard. Skateboard storage encourages safe and secure storage on campus, while avoiding protruding skateboards in aisles and walkways.

Key Challenges

Skateboarders share the same space with pedestrians and people in wheelchairs, therefore awareness and safety precautions should be followed to reduce conflicts in shared facilities.

MOPEDS

Unlike bicycles and non-motorized forms of transportation, scooters and mopeds require a permit to park on campus. Mopeds may only park in designated permit parking spaces.

Mopeds must travel with other motor vehicles and are not permitted to operate on sidewalks, bike lanes, and other pedestrian spaces. Moped parking is often adjacent to bicycle parking, as shown in the image below.

While skateboarding and moped use is an important part of the local culture, conflicts between these modes and people walking is a major challenge. Some moped parking lots, such as the lot at Campus Road near Hemenway Hall, are located in areas with heavy pedestrian volumes. Images from Nelson\Nygaard
Moped parking on Maile Way is a built in conflict for moped users and people walking.

Image from Nelson\Nygaard
Daily maintenance and operations are a vital part of campus life. Trash bins, loading docks, and other service areas need to be accessible to trucks and other service vehicles. These access routes often intersect pedestrian walkways, introducing safety issues, because drivers may have scheduling constraints and the vehicles often require a bigger footprint than personal vehicles.

**Operations, Maintenance, and Pedestrian Access**

Service access on the Mānoa campus overlaps with the accessible grid and heavily traveled walkways (top photo). Potential safety issues arise when people are walking, rolling, or biking in the same area where large maintenance vehicles operate.

Not only do service areas interfere with pedestrian travel, they can distract from the campus aesthetics. Trash dumpsters and other maintenance infrastructure can make the campus pathways feel uninviting. This is particularly evident behind Campus Center where dumpster bins, traditionally hidden as a back of house function, are exposed to a popular campus walking path.

Back-of-house areas present conflicts with service and delivery vehicles. Exposed trash containers and steep grades on access ramps create challenging conditions for people using service connections as a cut-through route option.

Images from Nelson\Nygaard
CHAPTER 3: MOVING AROUND THE CAMPUS

Conflicts with Pedestrians
Accessible Grid
Service Access
Facilities and Maintenance Facilities

Data Sources: ESRI, City and County of Honolulu, UH Mānoa
Shared and Mixing Zones

Shared zones are pathways on campus where pedestrians and vehicles operate in the same space but pedestrians are given priority over vehicle traffic. The shared zones are typically distinguished with a combination of concrete pavement treatment, removable bollards that restrict access, and signage to warn motor vehicles. Vehicles in shared zones are expected to travel at walking speeds and give priority to pedestrians.

Campus Center Courtyard

The western terminus of Correa Road will be a shared zone for a small parking lot and high volume pedestrian corridor that ends before Legacy Pathway. The shared space is to be light gray concrete in contrast to black asphalt in the parking lot. There will be yellow bollards to prevent vehicles from entering pedestrianized zones in the Campus Center courtyard.

Information Technology Center

A shared zone between the newly constructed Information Technology Center (IT) and Physical Science Building will become a primary pedestrian walkway. Motorist warning signage will be removed when the zone is pedestrianized.

UH Mānoa includes numerous areas that mix high pedestrian volumes and high auto movements. The mixing zone/access road at The IT Center uses signage to indicate shared use of the connection. The Campus Center courtyard mixing zone presents major conflicts between people walking and parking motorists.

Images from Nelson\Nygaard
CHAPTER 3: MOVING AROUND THE CAMPUS

Conflicts with Pedestrians
Accessible Grid
Service Access
Facilities and Maintenance Facilities

Data Sources: ESRI, City and County of Honolulu, UH Mānoa
This Plan is built from a thoughtful mix of leading practices in campus design and solutions identified by campus stakeholders who best know the campus and what it takes to circulate it on foot, by bike, on buses, and in cars.

A wide variety of campus stakeholders, representing different interests, attended a campus walk audit and design charrette facilitated by local and national experts in walkable campus and street design to:

- Learn about the common elements of walkable campuses
- Diagnose issues in the field related to pedestrian safety, ADA accessibility, driving conditions, transit operations, and conflicts with back-of-house operations
- Collaboratively establish design principles and values for the campus at large
- Explore principle-based design and operational opportunities that should be considered for Maile Way
The values and principles established during the walk audit and design charrette are carried forward into the network concept design, project selection, evaluation criteria, and schematic design of catalytic projects. They are thematically represented in Chapters 5 through 8:

» Establish an accessible grid that limits walking distances
» Develop legible and coordinated wayfinding
» Provide public seating and weather shelters throughout the campus’ public spaces
» Establish short, frequent, and visible pedestrian crossings
» Separate bicyclists from pedestrians and motorized traffic as feasible
» Calibrate campus streets for low speeds (15 mph desired for internal streets desired; 25 mph desired for external streets)
» Maintain and optimize access for delivery, emergency, and service vehicles
» Consider centralized parking at the periphery of the Upper Campus core
» Expand opportunities for passenger drop-off zones
» Establish gateway features that reinforce arrival and campus identity

Who participated in the walk audit?

» Office of Planning & Facilities
» Commuter Services
» Hawaii State Disability and Communication Access Board
» KOKUA Hawaii
» Building & Grounds Management
» Financial Management Office
» Graduate Student Organization
» Associated Students of the University of Hawaii
» Department of Urban & Regional Planning
» University of Hawaii Sea Grant College Program
» Campus Center
» Student Housing Services
» Hawaii Bicycling League
» Bikeshare Hawaii
» Office of Capital Improvements
» Equal Employment Opportunity and Affirmative Action (EEO/AA) Office
» Student Life and Development
BUILDING THE FOUNDATION

UH Mānoa’s Campus TDM Plan establishes modal priorities for investments in campus circulation, indicating that campus affiliates with mobility, visual, cognitive, and hearing impairments as well as people walking have the highest priority for investment. The functioning, experience and even marketability of UH Mānoa is largely dependent on how people move about and how well connected its various parts are to one another.

Given its location, diverse affiliate population and land use diversity, UH Mānoa must accommodate different modes of travel in nearly all parts of its campus. The university’s multimodal circulation networks will focus on strategies that optimize parking and service access, while prioritizing the movement and needs of people walking, biking, and accessing transit.

This chapter presents circulation strategies that serve as the foundational actions to achieving the campus’ circulation, safety and accessibility objectives by extending the Upper and Lower Campus pedestrian pathway network, establishing a dedicated bicycle network, and managing private vehicle and large truck access.
PREFERRED CIRCULATION NETWORK CONCEPT

Two preliminary multimodal network concept options were established based on the LMP’s circulation concept, the Circulation and Accessibility Plan’s guiding principles, stakeholder input, spatial constraints, and national best practice in walkable campus design. The two options rethink the campus’ existing networks, and achieve the vision by suggesting strategies that reinforce pedestrian priority and manage the impact of cars in the core of Upper Campus.

The preliminary multimodal network concept options were evaluated using an unweighted multiple account evaluation (MAE) framework estimating the ability of each network option to achieve the guiding principles relative to the existing condition. The MAE is based on the criteria listed in the table on the next page. See Appendix A for more detail on the preliminary network options and the network evaluation results.

The resulting preferred multimodal circulation network, presented by mode on the following pages, builds on the Landscape Master Plan (LMP) goals of eliminating vehicle traffic and extending the pedestrian mall, developing a new central walkway and improving bicycle and other wheeled access.

NETWORK CONCEPTS PRESENTED IN THIS SECTION:

Pedestrian pathway network  Bikeway network  Transit pathway network  Auto/parking access network  Service network
<table>
<thead>
<tr>
<th>GUIDING PRINCIPLE</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| All ages and abilities campus | » Reduces identified accessibility barriers and gaps  
» Provides opportunities for drop-offs for people with temporary or permanent disabilities  
» Increases Upper Campus ADA parking stalls |
| Walkability first | » Maintains or expands priority for pedestrians  
» Manages vehicle speeds and volumes  
» Eliminates a gap or barrier in the pedestrian network  
» Separates pedestrians from people biking, skateboarding, and driving  
» Provides new opportunities for campus placemaking and social space |
| Delivery, service, and emergency access | » Maintains or improves delivery, service, or emergency access to campus buildings and public spaces  
» Reduces conflicts between service vehicles, people walking or bicycling, and people with disabilities |
| Traffic and conflict management | » Maintains acceptable intersection operations at key vehicle portals  
» Reduces through traffic along internal campus roadways  
» Limits motor vehicle speeds along the primary pedestrian spine  
» Removes or limits the exposure of people walking on campus |
| Transit Access | » Provides an operational improvement to the TheBus and/or Rainbow Shuttle  
» Provides space for improved transit passenger facilities |
| Dedicated Bikeways | » Provides dedicated bicycle facilities that separates bicycle traffic from pedestrian and motor vehicle traffic |
## PEDESTRIAN PATHWAY NETWORK

### NETWORK DESCRIPTION
The Pedestrian Pathway Network reorients the campus around people walking and socializing. A network of accessible pedestrian pathways is complemented by the shifting of full streets and parking to walking and leisure space. The major feature of the Pedestrian Pathway Network is the primary pedestrian spine—a network of wide, consistently-paved paths that connect affiliates between most major campus destinations (e.g., Campus Center, major lecture halls, the dorms, high ridership transit stops, major parking resources, and recreation).

New shared street connections on Farrington Road, Correa Road, and Pope Road expand pedestrian priority on campus, while maintaining core service and parking access functions. Shared streets are curbless connections that reinforce pedestrian priority by slowing speeds and limiting traffic control. At UH Mānoa, shared streets can be used by people walking, riding bikes, and driving qualified vehicles.

Secondary paths connect affiliates from the primary spine to all other campus destinations.

The Pedestrian Pathway Network also focuses on ways to assist with grade change challenges. Hill assist options recommended for construction include elevators, ADA-compliant ramps, and cut-and-cover pathways leading to new elevators, including those in the proposed new parking and delivery center at Dean Hall and Warrior Recreation Center.

### KEY ELEMENTS
- Campus Road, McCarthy Mall, a new connection between Legacy Path and Sinclair Circle, along Maile Way between Farrington Road and East-West Road, and along Dole Street between Legacy Path and East-West Road provide the primary Ewa-Diamond Head pedestrian spine connections.
- Mauka-makai primary pedestrian spine connections are provided on Legacy Path from Maile Way to Varney Circle, the Hamilton Library path between Maile Way and McCarthy Mall, the current Bachman Hall parking lot, the path between Watanabe Hall and the Geophysics building along Donagho Road from Correa Road and Dole Street, and along East-West Road between Maile Way and Dole Street.
- A shared street environment with pedestrian adjacency accommodation on Correa Road and Post Road.
- A new parking and delivery center near Campus Center brings pedestrians to grade level crossings via an elevator.
- Stair and elevator access offer two new pedestrian connections between Dole Street and Lower Campus.
- New elevator connection at the southeast corner of Andrews Amphitheater connects Legacy Path via underground tunnel between Andrews Amphitheater ADA access and parking.
- Pedestrian crossing enhancements are provided along Dole Street.
- The Architecture School parking lot is rebuilt to eliminate ADA barriers caused by grade issues.

### CONSISTENCY WITH LMP CIRCULATION CONCEPTS
The preferred pedestrian circulation option enhances the LMP pedestrian objectives of enabling desire lines, creating connected social spaces, and linking affiliates to transit, auto parking, and bike parking. The principle changes from the LMP include:
- A larger and more interconnected primary pedestrian spine.
- Enhanced connections between upper and lower campus using elevators.
- Enhanced connections between upper and lower campus behind Gateway House and East-West Road.
- Incorporation of shared spaces on Farrington Road, Correa Road, and Pope Road.
BIKEWAY NETWORK

NETWORK DESCRIPTION

A network of comfortable bikeways coupled with secure, covered bike parking and a public bike share system provides a real alternative to driving that is affordable, space efficient, and relatively easy to maintain.

The two Bikeway Network Concepts evaluated aimed to connect the campus to adjacent neighborhoods along the existing and planned Honolulu system using protected bike lanes and paths. New shared street connections on Farrington Road, Correa Road, and Pope Road expand the internal campus bike network while maintaining core service and parking access functions. Dismount zones are minimized to maintain network connectivity.

The Bikeway Network also provides hill assist options including elevators, and cut-and-cover pathways leading to new elevators.

KEY ELEMENTS

- Uphill bike lane on Maile Way between University and Farrington
- Shared lane markings on East-West Road between Maile Way and Pamoa Road
- Protected bike lanes or dedicated bike paths on Campus Road and Legacy Path
- Improved connectivity on Lower Campus streets to adjacent neighborhood bike networks
- Shared street environments for bikes and cars on Correa Road, Farrington Road, and Pope Road
- Five proposed bike share stations as part of Bikeshare Hawaii’s initial system roll-out
- Six additional bike share stations as part of future Bikeshare Hawaii system expansion
- Bicycle dismount zones on McCarthy Mall and Legacy Path from Dole Street past Stan Sheriff Center to Lower Campus Road
- Two new bike-friendly elevators provided between Dole Street and Lower Campus

CONSISTENCY WITH LMP CIRCULATION CONCEPTS

The preferred bicycle circulation option builds on the LMP recommendations for the use of on-street bike lanes and multi-use paths. The principle changes from the LMP include:

- More extensive network of protected bike lanes and wide multi-use paths
- Protected bike lanes along Maile Way and East-West Road that separate people riding bicycles from vehicles on these critical bicycle connections
- Bicycle facilities through the center of campus that separate people on bicycles from people walking, minimizing the need for dismount zones
- Climbing lanes along steep grades such as on Maile Way between Farrington Road and University Avenue and along Dole Street east of Mānoa Stream, that take slow moving bicycles out of mixed purpose lanes
- Use of shared lane markings on low volume and low speed streets such as Correa Road, Pope Road and Kalei Road, and Farrington Road where people on bicycles and drivers share the street
- Bike lane enters Legacy Path at Dole Street gate through left entry separate from center pedestrian gate
## TRANSIT PATHWAY NETWORK

<table>
<thead>
<tr>
<th>NETWORK DESCRIPTION</th>
<th>KEY ELEMENTS</th>
<th>CONSISTENCY WITH LMP CIRCULATION CONCEPTS</th>
</tr>
</thead>
</table>
| Transit services operating at UH Mānoa, including TheBus, Rainbow Shuttle, and HandiVan paratransit service, offer campus access for affiliates arriving from points throughout Oahu as well as a means for circulation between campus destinations. The campus’ limited network and lack of concentrated density drives transit’s ability to access key demand generators. | » All transit pathways remain the same (except at Farrington Road)  
» The Rainbow Shuttle hub shifts to QLCSS | The preferred transit network option is now coordinated with the Landscape Master Plan, which moved Rainbow Shuttle service hub to the north side of QLCSS. |
AUTO/PARKING ACCESS NETWORK

NETWORK DESCRIPTION
The attainment of the LMP vision requires the rethinking of personal automobile access and parking supply. Parking removal in the core of campus and restriction of automobile access along Campus Road extend the campus’ signature pedestrian mall. The options considered here maintain the supply of parking, by moving it to the campus periphery and sub-surface as development opportunities present themselves. The Campus TDM Plan provides supporting strategies for the preferred network option.

KEY ELEMENTS
» Underground parking structure built as part of potential student housing development located between Campus Center, Bachman Hall, and Sinclair Library
» Direct drop-off access to buildings makai of Dean Hall and ewa of Varney Circle and Legacy Path via qualified access permits or underground connection from the new parking/delivery center
» Restricted vehicle access to Varney Circle is offset by new drop-off pavilion/loop and campus portal at the mauka QLC parking lot
» Additional parking structure capacity at the existing Spalding Hall and Kennedy Theater lots, a new structure directly east of the existing Parking Structure in Lower Campus
» Replacement of seven Upper Campus interior moped/motorcycle parking spots with nine peripheral spots
» At minimum, no net loss in ADA parking stalls and likely a net gain in ADA parking stalls in the Upper Campus lots

CONSISTENCY WITH LMP CIRCULATION CONCEPTS
The LMP requires parking removal in the core of the campus and restricts automobile access along Campus Road to extend the campus’ signature pedestrian mall. The principle changes from the updated LMP include:
» Parking expansion in structures and surface lots at Spalding Hall and Kennedy Theater to mitigate on street parking loss for visitors and permitted affiliates
» Provision of underground parking and delivery areas at Campus Center
» New parking and CUP structure with tennis courts above on lower campus
» Conversion of Correa Road, Farrington Road, and Pope Road to a shared street with limited vehicular access
» A fully pedestrianized access route from East-West Road to University Avenue results from the prohibition of vehicular traffic west and north of Varney Circle on Campus Road and Farrington Road
» A new vehicular connection between the Richardson Law Library and Johnson Hall provides for event egress from the new lower campus parking structure
CHAPTER 5: BUILDING THE FOUNDATION

Preferred Auto/Parking Concept
- Major Vehicle Access
- Minor Vehicle Access
- Shared Street with Controlled Access
- Underground Dropoff Access
- Underground Parking Footprint
- Major Upper Campus Dropoff Point
- Potential Controlled Access
- Potential New or Expanded Parking Facility
- Major Parking Facility
- ADA Parking
- Potential New Moped Parking
- Existing Moped Parking
- New Elevator

New Connection to Shidler via elevator
Improve Parking Lot to remove slope issue
New Elevator connecting Legacy Path, Andrews Amphitheatre ADA access, and Parking Structure
All-way Pedestrian Phase

Data Sources: ESRI, City and County of Honolulu, UH Mānoa
SERVICE NETWORK

NETWORK DESCRIPTION

The preferred service network prioritizes continued access by service, emergency and utility vehicles, while separating these functions from people walking on campus. This approach limits service conflicts with other modes while enabling essential deliveries, pick-up and maintenance. Efforts to consolidate back of house service elements were explored, especially for those areas where the pedestrian and service networks overlap.

KEY ELEMENTS

- Underground service and delivery center built as part of potential new student housing development located between Campus Center, Bachman Hall, and Sinclair Library (provides service and ADA parking access under Dean Hall)
- Underground connection from the new parking and delivery center to Dean Hall and Warrior Recreation Center
- Major service/pedestrian conflict at Sinclair Circle/Bachman Hall lots removed
- Controlled access for service vehicles at Correa Road (on both ends of the street), Pope Road, and a new service access north from Dole Street between Sakamaki Hall and Krauss Hall
- Other locations with controlled access that may include time-restricted service access include Farrington Road and Campus Road (interim ADA drop off access provided before Campus Road is rebuilt)
- New service connections to the proposed tennis court parking structure via Dole Street

CONSISTENCY WITH LMP CIRCULATION CONCEPTS

Service access options are enhanced with the following changes from the updated LMP:

- Removal of at-grade access routes into the center of campus, except along shared street connections on Correa Road and Pope Road
- New underground service and delivery center built as part of potential new student housing development located between Campus Center, Bachman Hall, and Sinclair Library providing critical service access to Campus Center, Warrior Recreation Center, Hemenway Hall, and Sinclair Library
- Downgrading of Correa Road from a major vehicular circulation roadway to a shared street
- Creating new service, delivery, and emergency vehicle accesses at Sakamaki Hall and to the new Lower Campus parking structure south of Dole Street between the Law Library and Johnson Hall A.
SUPPORTING STRATEGIES

The plan’s successful implementation depends on utilizing supporting strategies campus-wide.

CATEGORIES

1. FOCUS ON PEOPLE AND ACCESSIBILITY
2. MANAGE PARKING AND VEHICLE DEMAND
3. OPTIMIZE BACK-OF-HOUSE OPERATIONS
4. ESTABLISH NEW TOOLS FOR CIRCULATION
1. FOCUS ON PEOPLE AND ACCESSIBILITY

Aggressively prioritize pedestrian movement and safety. Pedestrian safety is paramount and as such UH Mānoa should expand the pedestrian network and ensure crossings are frequent, safe and clearly marked. Conflicts between parking cars, services vehicles and walking, biking, and skateboarding affiliates should be addressed through dedicated paths, traffic calming, realigned parking and service routing, and operational modifications.

Prioritize maintenance. Diligent pathway maintenance is critical to reduce long-term capital costs and ensure the campus remains accessible to people of all abilities over time. Pathway repairs should be made from edge to edge to avoid unraveling and unattractive cuts. Asphalt paving may only be used for temporary walkways on campus. The university should use maintenance-approved, distinctive, pervious paver materials for pedestrian pathways, conflict areas, and civic spaces that ensure longevity and safe use during rain events. Pavers should not include beveled features as these can be challenging to traverse for people using mobility devices or even painful for people with nerve damage.

Review projects for accessibility. Disability specialists and people with mobility impairments provide a perspective that is not immediately apparent to able-bodied decision makers. Kokua and the Hawaii State Disability and Communication Access Board review will ensure public realm, parking and street improvements achieve ADA compliance, at a minimum. Refer to Public Right-of-Way Accessibility Guidelines (PROWAG) as a benchmark for accessible design.
Invest in elevator and other grade assist infrastructure. Grade change is the most challenging accessibility issue on the UH Mānoa campus. Whether building new elevators or supporting existing stairways with ADA-compliant ramps, UH Mānoa should provide new facilities that break down barriers and meet desire lines for the campus’ most mobility-impaired affiliates.

Formalized drop-off zones. Drop-off zones should be established near campus buildings to create short paths for people with disabilities. The drop-off zones should be predictable and avoid high demand pedestrian areas. Wayfinding should direct affiliates to nearest drop-off areas.

Minimize construction impacts. As the campus continues to develop, UH Mānoa needs to accommodate pedestrians during construction. Pathways should remain unobstructed from utility cuts and construction equipment/materials wherever possible. If sidewalks must be blocked during construction, detours should be made along the shortest route, clearly marked and separated from motorized traffic and construction vehicles. Service and construction vehicles should be prohibited from parking on sidewalks. UH Mānoa should require bicycle and pedestrian access plans for all phases of construction, with a goal of minimizing the duration of temporary closures. Approved closures should be inspected regularly.
2. MANAGE PARKING AND VEHICLE DEMAND

Implement the UH Mānoa Campus Transportation Demand Management (TDM) Plan. Reducing demand for on-campus parking and optimizing the use of existing parking facilities is the most-cost effective way to dedicate more space to circulation, open space, and campus placemaking. The Campus TDM Plan provides a detailed action plan to reduce parking demand over time and establish a stable revenue source by pricing parking appropriately. Funds will support parking facility maintenance and existing and proposed TDM programs.

Shift parking outside of the campus core. Consolidating 597 parking spaces to centralized parking structures outside of the campus core frees up space to expand and enhance the campus’ active transportation experience. Parking projects should capitalize on ongoing campus utility infrastructure projects.
Centralize visitor parking as close to key destinations as possible. Visitor parking should be located in accessible portals of campus near campus attractions such as the Kennedy Theater and Spalding Hall. Parking wayfinding is critical to reduce parking search time, limit conflicts due to circuitous routing, and reduce congestion stemming from search-for-parking traffic, which generally represents anywhere between 15-30% of traffic on campuses.

Locate moped parking away from the Primary Pedestrian Spine and the core of campus. Many moped lots are located and configured in a way that encourages wrong-way riding and conflicts with people walking. Coupled with pedestrian improvements, new locations can both provide access and limit conflicts with pedestrians.

Establish a perimeter of gate accesses around the Upper Campus. Qualified gate entry is proposed to enhance the pedestrian experience on Varney Circle, Correa Road and Farrington Road. Ongoing access for service vehicles, emergency vehicles, and people requiring ADA access can be permitted, with visitors or those requiring temporary access for drop-offs directed to kiosks to obtain credentials.
3. OPTIMIZE BACK-OF-HOUSE OPERATIONS

Establish off-peak delivery times. Many deliveries occur during the day, coinciding with peak pedestrian periods. Scheduling deliveries outside of peak pedestrian periods can help minimize interactions between vehicles and people on foot.
Establish a centralized delivery center for the campus. A central receiving and shipping center reduces the points of entry for deliveries, in turn reducing potential conflict points with people walking, biking, and skateboarding. This change also shifts visual clutter of large vehicles to a new underground parking and delivery center.
Develop a multimodal wayfinding program. A branded and integrated wayfinding program provides cues that simplify access to campus destinations, parking, and transit. Wayfinding is an essential component of public space planning, knitting together campus streets, pathways, open spaces, and pedestrian malls into a cohesive public space. A campus wayfinding system at UH Mānoa would not only guide people walking, biking, and skateboarding on campus, but would also direct commuters and visitors arriving and travelling through the campus by all modes.

Invest in voice responsive wayfinding technology. New innovations in voice-responsive wayfinding and multi-sensory devices will assist navigation through the UH Mānoa campus for people with vision impairments. Partnerships with private foundations or research affiliates looking to innovate in the accessibility realm should explore grant opportunities.
Site Bikeshare Hawaii stations where affiliates want to go. UH Mānoa Bikeshare stations will connect affiliates within campus and to other destinations throughout urban Honolulu. Bikeshare stations on campus should be placed in accessible, heavy traffic areas that are connected by the planned bikeway network.

Implement dynamic parking signs. UH Mānoa should consider investing in real-time electronic parking wayfinding (also known as variable messaging signs - VMS) to inform affiliates of current parking condition and reduce congestion caused by the parking search. Combining real-time parking utilization software with VMS systems will extend the effective availability and utilization of parking.

Pursue golf cart shuttling and delivery services. The university should invest in a series of golf cart services to transport mobility-impaired affiliates (both temporary and permanent impairments), goods, and materials across the campus. The disability golf cart service should be free to use, and on demand or through qualification via a streamlined application, review, and approval process. Delivery services should be developed as part of the proposed centralized parking and delivery center near Campus Center. All vehicles should use fully electric propulsion systems.
CAMPUS CIRCULATION
ACTION PLAN

A walkable Mānoa campus offers dignified access to all campus affiliates. Any affiliate can walk to anywhere they choose, safely, and comfortably, in as short of a distance as possible.

The preferred circulation network will ensure UH Mānoa is an oasis for walking, biking, and skateboarding, but also a highly functioning campus meeting core that meets service, delivery, and parking needs. Achieving the new multimodal circulation network concept will require a number of strategic capital investments ranging from street reconfigurations and pedestrian pathways, to infrastructure that assists affiliates up and down steep elevation change.

Many of the multimodal projects described in this chapter complete the missing elements in the preferred multi-modal circulation networks. They will enable safer and more humane access and circulation between campus destinations. The projects described in this chapter were identified based on detailed site reconnaissance, previous campus planning efforts, and stakeholder input. Final design and cost will be determined by detailed civil engineering and design work.

The Key Facilities Toolkit starting on page 73 provides a snapshot of the new facility types, how they are used, and why they are important for UH Mānoa’s development.
## Prioritizing Multimodal Projects

The qualitative evaluation framework summarized in the table to the right was used to assess the potential for each project to advance the multimodal circulation concepts. Based on the evaluation scores, and weighting Walkability First as the most important criterion, each project is assigned a priority level of high, medium, or low.

In some cases the long-term multimodal projects outlined in the Campus Circulation Action Plan overlap with the most severe accessibility barrier projects. The location and details of the high severity barriers are conveyed in Chapter 8. The most severe accessibility barriers should be implemented separately in the near-term. Elements of overlapping long-term multimodal projects should incorporate proximal severe accessibility barrier improvements.

<table>
<thead>
<tr>
<th>GUIDING PRINCIPLE</th>
<th>CRITERIA</th>
</tr>
</thead>
</table>
| All ages and abilities campus | » Reduces identified accessibility barriers and gaps  
» Provides opportunities for drop-offs for people with temporary or permanent disabilities  
» Increases Upper Campus ADA parking stalls |
| Walkability first | » Maintains or expands priority for pedestrians  
» Manages vehicle speeds and volumes  
» Eliminates a gap or barrier in the pedestrian network  
» Separates pedestrians from people biking, skateboarding, and driving  
» Provides new opportunities for campus placemaking and social space |
| Delivery, service, and emergency access | » Maintains or improves delivery, service, or emergency access to campus buildings and public spaces |
| Traffic and conflict management | » Maintains acceptable intersection operations at key vehicle portals  
» Reduces through traffic along internal campus roadways  
» Limits motor vehicle speeds along the primary pedestrian spine  
» Removes or limits the exposure of people walking on campus |
| Transit Access | » Provides an operational improvement to the TheBus and/or Rainbow Shuttle  
» Provides space for improved transit passenger facilities |
| Dedicated Bikeways | » Provides dedicated bicycle facilities that separate bicycle traffic from pedestrian and motor vehicle traffic |
| Implementation | » Coordination with Infrastructure project |
KEY FACILITIES TOOLKIT

This design toolkit provides basic parameters and design considerations for some of the facilities recommended in the Circulation and Accessibility Action Plan.

LIST OF FACILITIES

1. SHARED STREETS
2. PRIMARY PEDESTRIAN SPINE AND INTERFACE WITH BIKEWAYS
3. BIKEWAYS
4. STUB CONNECTIONS
5. FLOATING TRANSIT ISLANDS
6. PROTECTED INTERSECTIONS
Winthrop Street in Cambridge, MA
Image from Better Cities and Towns

A shared street in Asheville, NC
Image from NACTO

A well-designed shared street in Montreal, Canada that mixes placemaking with building access
Image from Drew Meisel
## 1. SHARED STREETS

<table>
<thead>
<tr>
<th>What is it?</th>
<th>Shared streets are a unique approach to street design that sees the street as a social space. The basic premise is that street users will negotiate passage through the narrow street if traffic control devices, pavement markings, and signs are limited or completely removed. Curb is removed blurring the traditional divide between pedestrian space and motorized travel way. A common area is created and shared by people walking, biking, and driving. This encourages slower motor vehicle speeds, more attentive motorists, and a safer, more interactive environment.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is UH Mānoa building it?</td>
<td>Many streets on the Mānoa campus require cars, service and delivery vehicles, and people walking and on bike to intermix. Campus streets have the potential to be redesigned and enhanced as a public space for walking, socializing, parking access, and back-of-house operations.</td>
</tr>
</tbody>
</table>
| Design considerations | » Shared streets are typically free of traffic lights, stop signs, curbs, and painted lines that define separated spaces for road users.  
» Visual tactile cues distinguish between pedestrian-only and shared zones. A variety of materials, treatments and objects may be incorporated into creating visual/tactile cues, including:  
  ▪ Textured material on shared zones that contrast the smoother surfaces at pedestrian-only zones  
  ▪ Use of detectable warnings for detection by people with visual impairments  
  ▪ Bollards or bioswales to delineate a walking space  
» Shared streets may include a host of designs to slow motor vehicle speeds and ensure all roadway users are safely integrated, such as:  
  ▪ Street furniture, including benches, planters, and bicycle parking to help define a shared space.  
  ▪ Bollards and other architectural elements that define entry into the shared space  
  ▪ Landscaping and raised planters  
  ▪ Changes in road geometry to create shortened sight lines  
  ▪ Signage and tactile warning strips indicating the entrance to a shared street  
  ▪ Staggered blocks of landscaping and/or parking act as chicanes |
| Design guidance resources | » NACTO Urban Street Design Guide  
» Boston Complete Streets Guidelines  
» Hawaii DOT Statewide Pedestrian Master Plan and Pedestrian Toolbox |
| What other campuses have done it? | » University of Hawaii at Mānoa  
» Harvard University  
» Temple University (Campus Master Plan 2014) |
| Cost range | Chicanes: $2,000 to $25,000 each  
Gateway sign: $5,000 to $65,000 each, depending on gateway type, size, and materials  
Street furniture (benches): $250 to $5,750 each, depending on bench type and material  
Full shared street: $800,000-$1,150,000 per mile for planning, design, and construction* |

* Based on Seattle's four-block long Bell Street Park
Signage and paving materials indicate proper walking and biking alignment on the Burke-Gilman Trail near University of Washington
Image from the University of Washington

Pedestrian crossings along a protected bikeway
Image from Will Sherman
### 2. PRIMARY PEDESTRIAN SPINE

| **What is it?** | The Primary Pedestrian Spine is the network of high quality pedestrian paths on the UH Mānoa campus that connect the greatest concentration of people walking to key campus destinations and landmarks. The vision for the primary pedestrian spine is to provide wide and consistently designed paths that prioritize people walking and crossing the street. Full separation from other modes is emphasized, except where shared streets encourage mixing and safe travel speeds by design. |
| **Why is UH Mānoa building it?** | Most walkable universities have a clearly defined pedestrian spine that links classrooms and buildings on campus. UH Mānoa’s network of pedestrian walkways are separated from traffic, providing a safe network of paths that give priority to pedestrian movements on campus. Special design consideration is needed where UH Mānoa’s walkways intersect with designated bikeways. |
| **Design considerations** | UH Mānoa’s Landscape Master Plan lays out design considerations for pedestrian walkways, including paving treatments and design elements at campus gateways:  
- Walkways should be continuous, with paving material changes, markings, signs, bollards, or other devices when walkways pass through a shared use area.  
- Wide, consistent paving treatments, such as cast-in-place concrete or unit concrete pavers for major pedestrian corridors.  
- Design elements at pedestrian gateways include plantings, paving treatments, lighting, walls to indicate a passageway, and/or places to sit. |
| **INTERFACE WITH BIKEWAYS** | In places where a protected bikeway parallels the pedestrian spine, special design treatments and dedicated crossings are needed to help people on foot cross the bikeway and give warning to people on bike to watch for pedestrians. Key interface areas that will require signage and distinctive pavement markings include the Legacy Path, Campus Road, Sinclair Circle Path, and Maile Way. Ramping the bikeway to pedestrian walkway level (often a 6” rise) can act as a speed management tool and reinforce yielding to people on foot at crosswalks. Regulatory and wayfinding signage assist in setting expectations and navigation. |
| **Design guidance resources** |  
- The University of Hawaii at Mānoa Landscape Master Plan  
- NACTO Urban Street Design Guide  
- NACTO Urban Bikeway Design Guide  
- Hawaii DOT Statewide Pedestrian Master Plan and Pedestrian Toolbox |
| **What other campuses have done it?** |  
- University of California, Los Angeles  
- University of Washington  
- University of Kentucky |
| **Cost range** | Continental crosswalk markings: $100-2,100 each  
High-visibility crosswalk: $600-5,700 each  
Advisory Signs: $250-500 each |
CHAPTER 6: BUILDING THE FOUNDATION

Separated bikeway along Vassar Street at MIT
Image from City of Cambridge

Shared lane markings send the message that users should share the road, and indicate where in a roadway a bicyclist should ride
Image from Bike SD

UCLA has added a bright green bike box to create a safe place for bicyclists to wait at a busy campus intersection
Image from UCLA
### 3. BIKEWAYS

<table>
<thead>
<tr>
<th>What is it?</th>
<th>Bikeways are dedicated paths of travel for people on bikes that provide varying levels of separation from motor vehicles and pedestrians. Common bikeway facilities on university campuses include on-street routes with shared lane markings (“sharrows”), buffered bike lanes, protected bike lanes, and off-street bike paths or multi-use paths.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is UH Mānoa building it?</td>
<td>With modest investments in bicycle infrastructure, the University can tap into unrealized demand for bicycling, the lowest cost and most time-efficient mode of travel on campus. The campus bikeway system will connect affiliates to major destinations and limit interactions with motor vehicle traffic, service areas, and areas with high pedestrian demand. UH Mānoa also has the opportunity to connect on-campus routes with bike facilities being built throughout urban Honolulu as part of the city’s Complete Streets and Oahu Bike Plan.</td>
</tr>
</tbody>
</table>
| Design considerations | Bicycle routes on campus, including in-road sharrows and bicycle paths, should be designed to minimize conflict points (pedestrian and vehicular) while providing access to major destinations of the campus. To that end, protected bike lanes are the target bicycle facility for the on-campus bikeway network. Conventional bike lanes or shared lane markings are limited to streets with low speeds and vehicle volumes.  

**Shared lane markings** are markings painted onto the road to indicate that bicycle traffic is expected to share the lane and to indicate proper bicycle position in the lane. Shared lane markings should be striped to direct bicyclists away from the “door zone” of parked cars and offer directional queues for wayfinding at intersections.  

**Conventional bike lanes** designate a narrow lane on the road for bicyclists. **Buffered bike lanes** provide extra space between the bicycle lane and adjacent vehicle or parking lane. **Protected bike lanes** are bike lanes that are physically separated from other road users by bollards, planters, curbs, or parked cars. They can be one- or two-way.  

Bikeways can use colored pavement to increase visibility along corridors, at intersections or crossings, or other conflict points like driveways. Bike boxes, “jughandle” turn facilities, intersection crossing markings, median refuge islands, protected intersections, and through bike lanes are design treatments for improving bicycle safety and facilitating turns at intersections. |
| Design guidance resources | » Honolulu Complete Streets Design Manual  
» NACTO Urban Bikeway Design Guide  
» The University of Hawaii at Mānoa Landscape Master Plan  
» MassDOT Separated Bike Lane Planning and Design Guide |
| What other campuses have done it? | » University of California, Berkeley  
» University of California, Davis  
» University of California, Santa Barbara  
» University of Massachusetts, Amherst  
» University of Washington |
| Cost range | » Shared lane markings: $250-$500 each, including installation  
» On-street bike lane: $20,000-$325,000 per mile, depending on site conditions, width, and materials  
» Separated bike lanes: $500,000-$4,300,000 per mile, depending on site conditions, width, and materials  
» Off-street paths (concrete): $150,000 to $385,000 per mile depending on conditions, width, and materials |
Restricting loading to low traffic volume periods reduces conflicts

Ohio State University employs curbless service area design and time restricted delivery and service access
# 4. STUB CONNECTIONS

<table>
<thead>
<tr>
<th>What is it?</th>
<th>Stub connections are dead-end loading/unloading areas behind campus buildings. Stub connections often serve a dual purpose as a key cut through connections for affiliates walking on campus, creating potential conflicts between pedestrians and service and delivery vehicles. Similar to alleyways, low vehicle speeds and lack of through-traffic make stub connections a relatively desirable place to walk, especially when they provide a more direct path for pedestrians.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why is UH Mānoa building it?</td>
<td>UH Mānoa aims to be renowned as a highly walkable and safe campus. As such, the design vehicle for the campus’ public spaces is the pedestrian, requiring lowest common denominator design even at back-of-house service locations. Understanding that efficient delivery and maintenance access are an essential part of campus operations, stub connections can still be designed to ensure safe pedestrian passage and minimize conflicts between service vehicles and pedestrians.</td>
</tr>
<tr>
<td>Design considerations</td>
<td>The design of stub connections should balance their utilitarian function with their placemaking/connectivity potential.</td>
</tr>
<tr>
<td>» Separation of pedestrians and vehicles is preferred, where possible. Physical barriers, such as gates and permanent or retractable bollards, can be used to separate vehicles and pedestrians.</td>
<td></td>
</tr>
<tr>
<td>» <strong>Curbless service areas</strong> can reinforce that stub connections are shared by many users, but should only be used in areas with low frequency service access.</td>
<td></td>
</tr>
<tr>
<td>» <strong>Clearly demarcated loading zones</strong> using pavement markings indicate to pedestrians where loading activities and service vehicle parking is prioritized.</td>
<td></td>
</tr>
<tr>
<td>» <strong>Bollards and other landscaping features</strong> should be designed to minimize conflicts with freight movements.</td>
<td></td>
</tr>
<tr>
<td>» Many deliveries currently occur during the day, coinciding with peak pedestrian periods. <strong>Scheduling deliveries outside of peak pedestrian periods</strong> can help minimize interactions between vehicles and people on foot.</td>
<td></td>
</tr>
<tr>
<td>» <strong>Restrict vehicle access</strong> and/or require authorization of qualified vehicles before they can access the campus pedestrian zone. Access can be restricted through the use of gates or retractable bollards.</td>
<td></td>
</tr>
<tr>
<td>» <strong>Vehicles should travel at a walking pace</strong> (10 mph maximum) in spaces where vehicles, cyclists, and pedestrians mix. In all service zones that also serve as a pedestrian connection, right-of-way should be granted to people walking and biking.</td>
<td></td>
</tr>
<tr>
<td>Design guidance resources</td>
<td>» NACTO Urban Street Design Guide (See Alleys)</td>
</tr>
<tr>
<td>» SDOT University District Alley Activation Plan</td>
<td></td>
</tr>
<tr>
<td>» City of Los Angeles Green Streets &amp; Green Alleys Design Guidelines</td>
<td></td>
</tr>
<tr>
<td>» Chicago DOT Green Alley Handbook</td>
<td></td>
</tr>
<tr>
<td>What other campuses have done it?</td>
<td>» Stanford</td>
</tr>
<tr>
<td>» Ohio State University</td>
<td>» University of California, Los Angeles</td>
</tr>
<tr>
<td>» University of Washington</td>
<td></td>
</tr>
<tr>
<td>Cost range</td>
<td>Bollards: $500-$750 each, may be more or less depending on materials</td>
</tr>
<tr>
<td>Parking gates: $2,000-$5,000 each, depending on location, type, design, material, height, etc.</td>
<td></td>
</tr>
</tbody>
</table>
Protected bike lane and floating transit island in Denver, CO
Image from Andy Cross/The Denver Post

A shared street in Asheville, NC
Image from NACTO
## 5. FLOATING TRANSIT ISLANDS

<table>
<thead>
<tr>
<th><strong>What is it?</strong></th>
<th>Floating transit islands allow buses and bicycles to navigate the bus zone in their own dedicated lanes. The bus stop is on a raised island set away from the curb, which allows the bike lane to pass behind the island. This design eliminates leap-frogging of bus and bike traffic in the bike lane.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Why is UH Mānoa building it?</strong></td>
<td>Floating transit islands improve safety on corridors where buses and bicyclists share the road. Transit islands also benefit transit operations, streamlining transit service by speeding up boardings, and improving accessibility through bus-level boarding. Intermixing of high bus and bike volumes on Dole Street warrants this added protection for both users.</td>
</tr>
</tbody>
</table>
| **Design considerations** | » Clearly demarcated pedestrian crossing—through markings, color, and signage—where pedestrians cross the bike lane to reach the transit stop.  
» Transit islands must be large enough for waiting passengers, and passenger amenities such as benches, shelters, and trash receptacles.  
» Islands should be designed to permit accessible boarding with a 9.5” to 12” high platform.  
» Curb cuts and textured surfaces provide cues for visually impaired passengers.  
» When street space does not allow for in-lane bus stops, bike paths can be routed onto the sidewalk to bypass the bus stop. This treatment should be supported by pavement markings to indicate priority. |
| **Design guidance resources** | » NACTO Transit Street Design Guide  
» FHWA Separated Bike Lane Planning & Design Guide  
» San Jose Transit Guide |
| **What other campuses have done it?** | Floating transit islands have been installed at transit stops in several cities:  
» RTD / City of Denver  
» King County Metro / City of Seattle  
» San Francisco, California |
| **Cost range** | Floating transit islands: $25,000 each |

Floating transit island and pedestrian refuge on Guadalupe Street at the University of Texas at Austin  
(Image from NACTO)
Protected intersection in Chicago provides separated space for bicyclists, pedestrians, transit, and autos
Image from Chicago DOT

Protected intersection at the intersection of 200 West and 300 South in Salt Lake City
Image from Nelson\Nygaard

Protected intersection in Davis, California
Image from People for Bikes
# 6. PROTECTED INTERSECTIONS

**What is it?**
Intersections expose people walking and biking to conflicts with motorized traffic. Intersections are particularly challenging with protected bicycle lanes as the physical buffer ends as the lane passes through the intersection. Protected intersections extend the separation between vehicles, pedestrians, and bicycles through the intersection by providing queuing areas and reducing the number of potential conflicting movements that happen at the same time.

**Why is UH Mānoa building it?**
UH Mānoa aims to provide a safe environment for walking and biking, particularly at the intersection of primary pedestrian spine connections and protected bike lane junctions. The Circulation Action Plan identifies two locations to introduce a protected intersection: Maile Way at Farrington Road and Dole Street at East-West Road.

**Design considerations**
Key components of the protected intersection design include:

- **Designated and distinct crossing zones** for bicyclists and pedestrians, which require crosswalks to be moved back from the intersection.
- **High visibility crosswalks** and pavement markings to clearly define the spaces for pedestrians and cyclists.
- **Corner refuge islands** offset the corners of the intersection to provide a space for bicyclists to wait and increase visibility of bicyclists for motorists.
- **A separate signal phase for bicycles and “No Right on Red,”** which reduces turning movement conflicts.
- **Minimized corner radii** as much as possible to slow turning speeds while still accommodating large vehicles. When wide corner radii must be used to accommodate large vehicles on truck and bus routes, a mountable corner apron can be used to define a secondary corner and retain slow small vehicle turning speeds.
- **Set back stop bars** for inside travel and turn lanes to increase visibility of people in crosswalks and provide additional maneuverability for large vehicles.

**Design guidance resources**
- MassDOT Separated Bike Lane Planning and Design Guide
- NACTO Urban Bikeway Design Guide
- ProtectedIntersections.com

**What other campuses have done it?**
Protected intersections have been built in a handful of U.S. cities, including:
- Davis, California
- Salt Lake City, Utah
- Chicago, Illinois
- Austin, Texas

**Cost range**
Protected intersection: $750,000-$1,250,000, depending on materials, curb reconstruction, and intersection complexity*

* The protected intersection at East Covell Boulevard and J Street in Davis, California cost $1 million to construct
Multimodal Project Corridors

Multimodal project corridors and grade-assist projects listed in this section

Image from Nelson\Nygaard
ACTION PLAN PROJECTS

Investments in 32 multimodal corridor projects and 12 grade-assist, high priority projects will create a walkable campus and implement the modal network concepts.

Each project is summarized by project number, including project extents and locations, descriptions, benefits, priority-level, and planning-level cost estimates. Many projects overlap with planned utility corridor projects, and can be completed with substantial cost savings and mobilization efficiencies as roadways are excavated and reconstructed.
01

CUP #1 PEDESTRIAN PATH

LOCATION
From East-West Road at Biomedical Sciences to CUP #1

NETWORK  COST
$87,000

DESCRIPTION
New mauka-makai pedestrian path to proposed CUP #1.

KEY BENEFITS
» Provides direct desire line to new learning and research facility built as part of the CUP #1 project

02

EAST-WEST ROAD TRAFFIC CALMING IMPROVEMENTS

LOCATION
East-West Road from Maile Way to Pamoa Road

NETWORK  COST  ACCESS
$506,000  46 addressed accessibility barriers

DESCRIPTION
Repaving project with shared lane markings, curb extensions at all corners of the Bio-Science Access Driveway, up to two neckdowns, and three raised crossings with continental crosswalk markings.

BENEFITS
» Manages auto speeding
» Provides more frequent and more visible pedestrian crossings
» Provides wayfinding and visibility for people biking
» Addresses 46 identified accessibility barriers
03

UNIVERSITY AVENUE/MAILE WAY INTERSECTION REDESIGN

LOCATION
Maile Way & University Avenue

NETWORK       COST      ACCESS

$1,188,000    7 addressed accessibility barriers

DESCRIPTION
Intersection redesign including new distinctive gateway features, changes to signal operations (leading pedestrian intervals), introduction of curb radii reduction and curb extensions at all four corners. The University should work with the City to study a single-lane roundabout. University Avenue should be designed per the City and County’s Multimodal Corridor Redesign project.

BENEFITS
» Establishes a clear gateway the Mānoa campus.
» Manages high speed turns
» Reduces crossing distance and signal wait time for people crossing the street
» A single lane roundabout would have multiple benefits, including improved traffic flow, improved pedestrian and bicycle safety, and reduced delay for all users
» Addresses seven identified accessibility barriers

04

MAILE WAY IMPROVEMENTS I

LOCATION
Maile Way between University Avenue and Farrington Road

NETWORK       COST      ACCESS

$641,000    18 addressed accessibility barriers

DESCRIPTION
Corridor redesign including westbound floating bus stop, 8’ mauka sidewalk rebuild. Makai sidewalk will be expanded from 5-6’ to 8’. The existing landscaped median will remain, but the car turnaround roughly 300’ southeast of the University Avenue intersection will be removed and replaced with a continuous landscaped median (roughly 60’). Two new raised crossings with pedestrian refuge islands are proposed at Shidler College of Business and west of the QLC Drop-Off and Shuttle Pavilion. Parking removed as part of this project will be relocated to new centralized structures, including the proposed Spalding Hall Parking Structure and underground parking and delivery center. This project, and its related components, scored as a catalytic project with elevated implementation priority. See Chapter 7 for more detailed project description.

BENEFITS
» Manages auto speeding by narrowing travel lanes
» Widens the makai sidewalk of Maile Way
» Creates an accessible sidewalk on the mauka side of Maile Way
» Provides more frequent and more visible pedestrian crossings
» Provides wayfinding and visibility for people biking eastbound toward the center of campus
» Provides a dedicated bike lane for people riding uphill toward University Avenue
» No net change in tree coverage
» Addresses 18 identified accessibility barriers
MAILE WAY IMPROVEMENTS II

LOCATION
Maile Way from Farrington Road to East-West Road

NETWORK	COST	ACCESS
:\:\:\:\::\: $976,000	25 addressed accessibility barriers

DESCRIPTION
Corridor redesign and street reconfiguration including two-way protected bike lane, widened sidewalk with additional landscaping mauka of the existing raised landscaped media, and two high visibility crossings. Westbound travel lane shifted to makai side of raised median immediately east of the Farrington Road. All three driveways will be redesigned as shared connections with level pedestrian crossings. Existing moped parking at East-West Road would be relocated and replaced with pedestrian space and including street furniture. Parking removed as part of this project will be relocated to new centralized structures, including the proposed Spalding Hall Parking Structure and underground parking and delivery center. This project is a component of the Maile Way catalytic project. See Chapter 7 for a more detailed project description.

KEY BENEFITS
» Manages auto speeding by reducing travel lanes
» Widens the sidewalk on the mauka side of Maile Way
» Provides more frequent and more visible pedestrian crossings
» Provides a fully protected and high quality bike lane in both directions
» Removes significant conflicts between mopeds and people walking
» No net change in tree coverage
» Addresses 25 identified accessibility barriers

FARRINGTON ROAD/MAILE WAY PROTECTED INTERSECTION

LOCATION
Farrington Road & Maile Way

NETWORK	COST
:\:\:\:\::\: $286,000

DESCRIPTION
Major intersection redesign featuring a raised, protected intersection with corner islands. The intersection will feature continental crosswalks and bike conflict markings on each approach. Intersection will remain stop-controlled. This project is a component of the Maile Way catalytic project. See Chapter 7 for more detailed project description.

BENEFITS
» Prioritizes safe pedestrian and bicycle crossings
» Manages high speed turns
» Widens the sidewalk on the mauka side of Maile Way
» Provides more visible pedestrian crossings
» Limits conflicts between people walking and biking
**EAST-WEST RD/MAILE WAY INTERSECTION REDESIGN**

**LOCATION**
East-West Road & Maile Way

**NETWORK**  
Walk  
Bike  
Car

**COST**  
$413,000

**DESCRIPTION**
Stop-controlled intersection with continental crosswalks and conflict markings for the junction of two two-way protected bike lanes. Northbound travel lane on East-West Road moved to east side of raised median immediately north of the intersection (requires cut through existing curb work between two large trees). This project is a component of the Maile Way catalytic project. See Chapter 7 for a more detailed project description about cycle track alignment and intersection treatment.

**BENEFITS**
» Prioritizes safe pedestrian and bicycle crossings  
» Manages high speed turns  
» Resizes the intersection to reduce crossing distance  
» Widens the sidewalk on the mauka side of Maile Way  
» Provides more visible pedestrian crossings  
» Limits conflicts between people walking and biking  
» Addresses one identified accessibility barrier

**ACCESS**  
1 identified accessibility barrier addressed

---

**QLC DROP-OFF AND SHUTTLE PAVILION**

**LOCATION**
Maile Way north of QLC at existing parking lot

**NETWORK**  
Walk  
Car

**COST**  
$633,000

**DESCRIPTION**
New primary campus drop-off and shuttle pavilion. The relocated shuttle hub will have covered waiting areas and expanded pedestrian space. The pavilion will incorporate campus gateway features and placemaking. Farrington Road will be a gate-controlled limited access shared street. This project is a component of the Maile Way catalytic project and is to be coordinated with installation of chilled water loop and decommissioning of existing utility room on the north side of QLCSS. See Chapter 7 for more detailed project description.

**BENEFITS**
» Provides space for a dramatic campus gateway  
» Creates a comfortable passenger waiting environment for Rainbow Shuttle riders  
» Creates a formal dropoff space near the center of campus that limits conflicts with pedestrians  
» Adds capacity for ADA parking stalls  
» Maintains all existing trees
## SPALDING HALL PLAZA AND PARKING STRUCTURE CONNECTION

### LOCATION
Maile Way & Spalding Hall

### NETWORK
- Pedestrian way
- Bike
- Car

### COST
$115,000

### ACCESS
11 addressed accessibility barriers

### DESCRIPTION
New ADA-compliant pedestrian pathway and parking access. New pedestrian pathway will be located along the west side of the existing service connection between Maile Way and Spalding Hall, cutting through existing grassy area. All trees will be preserved. This project includes redesigning the Spalding Hall plaza with removable bollards to manage motor vehicle access to service vehicles only. This project is a component of the Maile Way catalytic project. See Chapter 7 for more detailed project description.

### KEY BENEFITS
- Provides dedicated pedestrian walkway to eliminate conflicts with service vehicles
- Formalizes space for service vehicles
- Maintains all existing trees
- Addresses 11 identified accessibility barriers

### BENEFITS
- Provides dedicated pedestrian walkway that extends the primary pedestrian spine to eliminate conflicts with vehicles
- Restores Varney Circle as a key crossroad for pedestrian and bicycle circulation
- Allows qualified service access outside of regular classroom hours
- Addresses 46 identified accessibility barriers

## CAMPUS ROAD/FARRINGTON ROAD PEDESTRIANIZATION PROJECT

### LOCATION
Campus Road/Farrington Road between University Avenue and Farrington Road

### NETWORK
- Pedestrian way
- Bike
- Car

### COST
$1,476,000

### ACCESS
46 addressed accessibility barriers

### DESCRIPTION
Removal of existing road bed and replacement with a fully pedestrianized space along Campus Road with wide pedestrian pathways, street furniture, enhanced landscaping, and a dedicated protected bikeway between Varney Circle and University Avenue. Farrington Road would be reconstructed as a shared street with a bollard-protected dedicated pedestrian pathway on the west side of the right-of-way. Access to vehicle is gate-controlled at Maile Way and at University Avenue allowing qualified access outside of regular school hours. The University Avenue/Metcalf Street pedestrian and bicycle gateway could include iconic gateway features and placemaking elements.

### BENEFITS
- Provides dedicated pedestrian walkway that extends the primary pedestrian spine to eliminate conflicts with vehicles
- Restores Varney Circle as a key crossroad for pedestrian and bicycle circulation
- Allows qualified service access outside of regular classroom hours
- Addresses 46 identified accessibility barriers
UNIVERSITY AVENUE CORRIDOR IMPROVEMENTS

LOCATION
University Avenue from Maile Way to H-1 Freeway

NETWORK COST ACCESS

$2,760,000 45 addressed accessibility barriers

DESCRIPTION
Support the City and County of Honolulu’s efforts to implement bike lanes, pedestrian improvements, signalization, and other traffic system management tools per the Oahu Bike Plan and other recent traffic studies.

BENEFITS
» Provides a critical bicycle connection to and from the campus
» Enhances safe pedestrian connections between the School of Education and the main Upper Campus area
» Manages speeding during off-peak travel periods
» Improves traffic flow and transit travel times during peak travel periods
» Addresses 45 identified accessibility barriers

UNIVERSITY AVENUE/ METCALF STREET PEDESTRIAN GATEWAY

LOCATION
University Avenue & Metcalf Street

NETWORK COST ACCESS

$353,000 1 identified accessibility barrier addressed

DESCRIPTION
Pedestrian gateway enhancements including a fully protected pedestrian and bicycle crossing with all-way pedestrian scramble, pedestrian refuge islands, and iconic gateway features and placemaking elements.

BENEFITS
» Enables safe pedestrian crossings into one of the campus’ main gateways
» Establishes the intersection as a campus landmark through good urban design
» Manages speeding during off-peak travel periods
» Addresses one identified accessibility barrier
### Everly Hall/University High Pedestrian Improvements

**Location**
University High internal access

<table>
<thead>
<tr>
<th>Network</th>
<th>Cost</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚶‍♂️</td>
<td>$165,000</td>
<td>20 addressed accessibility barriers</td>
</tr>
</tbody>
</table>

**Description**
Pedestrian pathway improvements primarily focusing on fixing accessibility barriers. Improvements include formalizing pedestrian paths where they do not exist along desire lines and construction of curb ramps at driveways where they do not exist or are substandard. This project would be constructed in coordination with utility and infrastructure projects.

**Key Benefits**
- Improves K-12 student safety during drop-off and pick-up time
- Formalizes clear pedestrian pathways at the parking lot
- Addresses 20 identified accessibility barriers

### University Avenue Pedestrian Underpass

**Location**
Sinclair Circle

<table>
<thead>
<tr>
<th>Network</th>
<th>Cost</th>
<th>Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>🚶‍♂️</td>
<td>$2,697,000</td>
<td>1 identified accessibility barrier addressed</td>
</tr>
</tbody>
</table>

**Description**
Pedestrian underpass across University Avenue to connect main campus to Everly Hall/University High School. This project would be constructed in coordination with utility and infrastructure projects.

**Benefits**
- Provides a safe pedestrian connection across University Avenue
- Connects affiliates to TheBus transit service at Sinclair Circle
- Addresses one identified accessibility barrier
Chapter 6: Building the Foundation

15

Priority level: Low

Underground Parking, Delivery and Pedestrian & Vehicular Connections

Location
Between Campus Center, Andrews Amphitheater, Bachman Hall, Sinclair Library, and Hemenway Hall

Network  Cost  Access
Car  $$$  15 addressed accessibility barriers

Description
Two vehicle and loading accesses to the proposed underground parking and delivery center via Dole Street and Sinclair Circle. Project uses the existing grade change going east from University Avenue and north from Dole Street (requires major grading and tunnel work). Final grading and alignment require detailed civil engineering. Project also includes tunnel work to extend underground access to Campus Road. This project is proposed in coordination with the proposed campus housing project at this location.

Benefits
» Established direct connections to new parking, drop-off, and service/delivery resources in the center of Upper Campus
» Provides direct drop-off and disabled parking access to Dean Hall, Warrior Recreation Center, and Hawaii Hall, supplanting the loss of access to Campus Road
» Eliminates parking access and delivery conflicts through the Bachman parking lot
» Addresses 15 identified accessibility barriers

16

Priority level: Low

Architecture School Parking Lot Regrade

Location
Architecture School Parking Lot

Network  Cost  Access
Person  Car  $313,000  6 addressed accessibility barriers

Description
Regrade and repave existing surface parking lot and adjacent walkway along George Hall connecting Quad to new Shidler elevator to achieve ADA compliance.

Benefits
» Allows for more disabled parking supply with proposed connections to Shidler elevator access (see Project G1 below)
» Addresses six identified accessibility barriers
CHAPTER 6: BUILDING THE FOUNDATION

MCCARTHY MALL REDESIGN

LOCATION
McCarthy Mall from Varney Circle to East-West Road

NETWORK COST ACCESS
 pedestriancost

$1,139,000 51 addressed accessibility barriers

DESCRIPTION
Full reconstruction of McCarthy Mall including enhanced pedestrian walkways, landscaping, and new placemaking and seating areas.

KEY BENEFITS
» Rehabilitates UH Mānoa’s most recognized and celebrated public spaces
» Addresses 51 identified accessibility barriers

EAST-WEST ROAD IMPROVEMENTS

LOCATION
East-West Road from Dole Street to Maile Way

NETWORK COST ACCESS

$1,628,000 52 identified accessibility barrier addressed

DESCRIPTION
Corridor redesign and street reconfiguration including two-way protected bike lane and enhanced landscaped buffer, shifting the northbound travel lane west of the existing median for two-way street operations. The catalytic projects in Chapter 7 provide detail on the proposed alignment and project features at the mauka, central, and makai segments of the corridor.

BENEFITS
» Manages auto speeding by narrowing travel lanes
» Provides wide, verdant pedestrian buffer on the east side of the street
» Provides frequent and more visible pedestrian crossings
» Provides a fully protected and high quality bike lane in both directions
» No net change in tree coverage
» Addresses 52 identified accessibility barriers

Priority level: Medium

Priority level: High

Access

identified accessibility barrier addressed
### Chapter 6: Building the Foundation

#### Network

**19.** **Correa Road Shared Street**

**Priority level:**

- [ ]
- [ ]
- [X]
- [ ]

**Location**

Correa Road from Campus Center to East-West Road

**Network**

- Bike
- Car

**Cost**

$2,426,000

**Access**

33 addressed accessibility barriers

**Description**

Shared street project with two gate-controlled access points: at Legacy Path and at the west edge of the proposed Kennedy Theater parking structure. Between East-West Road and the Kennedy Theater gate-controlled access point, Correa Road will serve as a full street and include a makai side multiuse path allowing bicycle access into the shared portion of the corridor. The shared space and a wide dedicated pedestrian path will be separated by a 3’ detectable warning strip, or other tactile material, with bollards placed up to 25 feet apart. The tactile delineation is applied to indicate to pedestrians (particularly those with visual impairments) when they are entering into shared space with motor vehicle traffic. See Chapter 7 for a more detailed project description about the shared street design and intersection treatments.

**Benefits**

- Provides a low speed and low volume street that limits conflicts with people walking and biking
- Provides dedicated pedestrian walkway in addition to the shared street
- Creates a key internal bikeway connection with a variety of shared and non-motorized facilities
- Allows qualified parking, service, and drop-off access west of the proposed Kennedy Theater parking structure
- Allows qualified service access at Legacy Path outside of classroom hours
- Addresses 33 identified accessibility barriers

**20.** **Pope Road**

**Priority level:**

- [ ]
- [ ]
- [X]
- [ ]

**Location**

Pope Road from East-West Road to Pacific Ocean Science & Technology Bldg

**Network**

- Bike
- Car

**Cost**

$1,561,000

**Access**

12 addressed accessibility barriers

**Description**

Shared street project with gate controlled access at East-West Road. Uses a similar design aesthetic as Project 19.

**Benefits**

- Provides a low speed and low volume street that limits conflicts with people walking
- Allows qualified service and drop-off access to the Pacific Ocean Science & Technology building
- Addresses 12 identified accessibility barriers
LEGACY PATH IMPROVEMENTS

LOCATION
Legacy Path from Dole Street to Varney Circle

DESCRIPTION
Full reconstruction of Legacy Path including enhanced pedestrian walkways, landscaping, and new placemaking and seating areas with no tree removal. A two-way protected bikeway will be constructed on the east side of the Legacy Path to limit conflicts with pedestrians. The protected bike way will be 12’ wide with a minimum 3’ landscaped buffer on either end of the bikeway facility.

KEY BENEFITS
» Rehabilitates one of UH Mānoa’s key pedestrian corridors improving access between Lower and Upper Campus
» Completely removed cars from the most critical portion of the north-south primary pedestrian spine
» Addresses 31 identified accessibility barriers

DOLE STREET ROAD DIET

LOCATION
Dole Street from University Avenue to Center for Hawaiian Studies

DESCRIPTION
Road diet project that creates space for protected bike lanes, floating transit stops, and new pedestrian refuge islands. The Dole Street/East-West Road intersection will be reconstructed as a protected intersection and includes consideration of a pedestrian scramble signal phase. The Dole Street road diet will need to be coordinated with University Avenue redesign process, which will recommend intersection and signal optimization strategies that will address peak hour congestion issues.

BENEFITS
» Expands the sidewalk for a key portion of sidewalk that sees major residential dorm traffic
» Establishes multiple safe crossing options to mitigate unsafe mid-block crossings
» Removes west bound merge through intersection of University Ave
» Reduces signal delay for resident students at the Dole Street/East-West Road intersection
» Upgrades the existing narrow bike lanes to a protected bike lane, providing a critical bicycle connection to and from various campus destinations
» Improves the waiting experience for transit passengers and reduces transit dwell time at stops
» Addresses 44 identified accessibility barriers
CHAPTER 6: BUILDING THE FOUNDATION

SAKAMAKI MAINTENANCE ROAD

LOCATION
Between Sakamaki Hall and Krauss Hall from Dole Street to Legacy Path

NETWORK COST ACCESS
🚗 $502,000 13 addressed accessibility barriers

DESCRIPTION
Rebuilt driveway that will serve as internal service connection with gate-controlled access points and ‘hammerhead’ driveway turnaround at Legacy Path.

BENEFITS
» Allows qualified service and drop-off access between Dole Street and Legacy Path
» Allows qualified service access to Legacy Path outside of classroom hours
» Addresses 13 identified accessibility barriers

PHYSICS AND ENGINEERING PEDESTRIAN PATH IMPROVEMENTS

LOCATION
Between Sakamaki Hall/Holmes Hall and Watanabe Hall/Hawaii Institute from Dole Street to Correa Road

NETWORK COST ACCESS
🚶 $426,000 16 addressed accessibility barriers

DESCRIPTION
Pedestrian pathway project that connects campus buildings from Dole Street to Correa Road. Pedestrian path would be constructed up to 20’ wide (depending on path and topographic constraints) and furnished with street furniture, landscaping, and placemaking features.

BENEFITS
» Creates a formal primary pedestrian spine connection furnished a wide pathway
» Addresses 16 identified accessibility barriers
CHAPTER 6: BUILDING THE FOUNDATION

HAMILTON-PHYSICAL SCIENCE PEDESTRIAN AND BICYCLE PATH IMPROVEMENTS

LOCATION
From Correa Road to Spalding Plaza

NETWORK COST ACCESS
: : : $365,000 7 identified accessibility barriers

DESCRIPTION
Improve pathway with signage and shared pavement marking to accommodate people walking and biking. The path should be widened and clearly marked for heavily traveled non-motorized traffic use. Space for bicycling should be formalized near Hamilton Library. The existing dismount zone at McCarthy Mall will be maintained.

KEY BENEFITS
» Creates a formal north-south bicycle connection and uses signage and pavement markings to reinforce move with Aloha principles
» Addresses seven identified accessibility barriers

KALELE ROAD IMPROVEMENTS I

LOCATION
Kalele Road from Lower Campus Road to Parking Structure

NETWORK COST ACCESS
: : : $666,000 11 identified accessibility barrier addressed

DESCRIPTION
Roadway repaving project including shared lane markings, traffic calming features (up to 4 speed humps), and sidewalk construction.

BENEFITS
» Closes key sidewalk gaps
» Manages auto speeding
» Provides more frequent and more visible pedestrian crossings
» Provides wayfinding and visibility for people biking
» Addresses 11 identified accessibility barriers
Chapter 6: Building the Foundation

Kalele Road Improvements II

**Location:** Kalele Road from Parking Structure to Murakami Stadium

**Network:**
- Pedestrian
- Bicycle
- Car

**Cost:** $628,000

**Access:** 7 addressed accessibility barriers

**Description:** Roadway repaving project including shared lane markings, traffic calming features (up to 4 speed humps, sidewalk construction (makai side), and curbs extensions at the intersection of Kalele Road and Kalei Road.

**Benefits:**
- Closes key sidewalk gaps
- Manages auto speeding
- Provides more frequent and more visible pedestrian crossings
- Provides wayfinding and visibility for people biking
- Addresses seven identified accessibility barriers

Lower Campus Road Improvements

**Location:** Lower Campus from Dole Street to Kalele Road

**Network:**
- Pedestrian
- Bicycle
- Car

**Cost:** $1,410,000

**Access:** 46 addressed accessibility barriers

**Description:** Roadway repaving project including shared lane markings, sidewalk construction, up to five speed humps, and three pedestrian crossings with continental crosswalk markings.

**Benefits:**
- Closes key sidewalk gaps
- Manages auto speeding
- Provides more frequent and more visible pedestrian crossings
- Provides wayfinding and visibility for people biking
- Addresses 46 identified accessibility barriers
PARKING STRUCTURE VEHIUCULAR AND PEDESTRIAN ACCESSES

LOCATION
Proposed new Lower Campus parking structure

NETWORK COST ACCESS

DESCRIPTION
Two driveway connection projects with sidewalks on both sides of the street serving the proposed new Lower Campus Parking Structure from Dole Street and Kalele Road. This project will be constructed as part of the CUP#2 project.

KEY BENEFITS
» Provides new auto and pedestrian accesses to the proposed new Lower Campus parking structure
» Provides service access to CUP #2
» Addresses six identified accessibility barriers

KOLO PEDESTRIAN PATH

LOCATION
Kolo Place & Lower Campus Road

NETWORK COST

DESCRIPTION
Twelve-foot pedestrian path project from Lower Campus Road to Kolo Place between the Office of Procurement, & Real Property Management and the Speech Pathology/Audiology Building.

BENEFITS
» Addresses a short gap/desire line in the primary pedestrian spine
### LOWER CAMPUS PARKING STRUCTURE PATHWAY

**LOCATION**
From Dole Street to Parking Structure

**NETWORK**  | **COST**  | **ACCESS**
--- | --- | ---
**  | **$116,000**  | **4** addressed accessibility barriers

**DESCRIPTION**
Construction of a minimum 12' pedestrian path to connect affiliates between the ridge at Dole Street and Kalele Road/Parking Structure. This project could be constructed as part of the proposed CUP #2/Parking Structure project.

**BENEFITS**

- Provides a direct pedestrian connection between Upper and Lower Campus
- Addresses four identified accessibility barriers

### SINCLAIR CIRCLE & BACHMAN PLAZA

**LOCATION**
Sinclair Circle, Bachman Place, and Parking Lot, between University Avenue and Campus Center

**NETWORK**  | **COST**  | **ACCESS**
--- | --- | ---
**  | **$3,923,000**  | **16** addressed accessibility barriers

**DESCRIPTION**
Reconstruct existing parking lot and parking accesses into a pedestrian plaza with street furniture and landscaping. This project would feature a generous pedestrian plaza and a dedicated east-west bike path connecting the Sinclair Circle transit hub and Campus Center.

**BENEFITS**

- Eliminates pedestrian conflicts with parking and service traffic
- Establishes a new bicycle connection between Legacy Path/Campus Center and transit services at Sinclair Circle
- Creates a generous pedestrian plaza for social interaction and pedestrian connections
- Addresses 16 identified accessibility barriers
CHAPTER 6: BUILDING THE FOUNDATION

SHIDLER SCHOOL OF BUSINESS ELEVATOR CONNECTION

LOCATION
Architecture School

NETWORK  COST  ACCESS
 Estimates  $$$$$  1 identified accessibility barrier addressed

DESCRIPTION
ADA-compliant elevator access to Shidler College of Business School from the Architecture School parking lot. Access is provided from the northwest corner of George Hall and connects affiliates to Shidler College of Business via a new elevator shaft.

KEY BENEFITS
» Eliminates the most critical barrier to the northwest corner of the campus
» Significantly reduces walk distance to Shidler School of Business from the Campus Road
» Addresses one identified accessibility barrier

G1

DEAN HALL & HAWAII HALL ELEVATOR CONNECTION

LOCATION
Dean Hall & Hawaii Hall

NETWORK  COST

DESCRIPTION
Construction of ADA-compliant elevator access and stairwells to Dean Hall and Hawaii Hall to be constructed with proposed subterranean parking structure.

BENEFITS
» Established direct connections to the new underground parking, drop-off, and service/delivery center in the center of Upper Campus
» Provides direct drop-off and disabled parking access to Dean Hall and Hawaii Hall, supplanting the loss of access to Campus Road.
» If proposed parking structure design precludes excavating Campus road, elevator access will be provided to at grade crossing
» Addresses four identified accessibility barriers

G2
CHAPTER 6: BUILDING THE FOUNDATION

G3

Priority level:

ANDREWS OUTDOOR THEATER ELEVATOR CONNECTION

LOCATION

Andrews Outdoor Theater

NETWORK  COST

DESCRIPTION

ADA compliant elevator to connect the lower level of the parking structure to the outdoor theater. A short pedestrian tunnel would be constructed underneath Dole Street.

BENEFITS

» Provides ADA access to Andrews Amphitheater
» Provides a new connection to Parking Structure using new utility corridor easements

G4

Priority level:

CAMPUS CENTER / WARRIOR RECREATION CENTER ELEVATOR CONNECTION

LOCATION

Campus Center & Warrior Recreation Center

NETWORK  COST

DESCRIPTION

Construction of ADA-compliant elevator access and stairwells to Warrior Recreation Center to be constructed with proposed subterranean parking structure.

BENEFITS

» Establishes direct connections to the new underground parking, drop-off, and service/delivery center in the center of Upper Campus
» Provides direct drop-off and disabled parking access to the Warrior Recreation Center, supplanting the loss of access to Campus Road
### Lower Campus Elevator Connection I

**Location**
Lower Campus Parking Structure (proposed) between the Law School and Johnson Hall

**Network**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cost**
$$ $$ $$ $$

**Description**
New ADA-compliant elevator to connect to Lower Campus at the west side of the proposed new Lower Campus parking structure. Access ramps to be constructed with CUP #2.

**Key Benefits**
- Establishes direct connection between Lower Campus Road, various levels of the proposed new parking structure, and Dole Street/Upper Campus
- Potential secondary vehicular access for event access and egress should be studied during structure design

### Lower Campus Elevator Connection II and Ramp Access

**Location**
East side of Lower Campus Parking Structure (proposed)

**Network**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Cost**
$$ $$ $$ $$

**Description**
New ADA-compliant elevator to connect to Lower Campus at the east side of the proposed new Lower Campus parking structure. Access ramps to be constructed with CUP #2.

**Benefits**
- Establishes direct connection between Lower Campus Road, various levels of the proposed new parking structure, and Dole Street/Upper Campus
G7

HALE ALOHA RAMP

LOCATION
Hale Aloha Courtyard from Hale Aloha Lehua to Hale Aloha Cafeteria

DESCRIPTION
New ADA compliant ramps in the Hale Aloha plaza area.

BENEFITS
» Addresses two identified accessibility barriers
» Significantly reduces walk distance at the primary dorm access for people that cannot navigate the existing stairway

G8

GEORGE HALL RAMP

LOCATION
Stairs leading into a parking lot on the west side of George Hall

DESCRIPTION
Stairs leading into a parking lot on the west side of George Hall will be furnished with a new ADA-compliant wheelchair ramp.

BENEFITS
» Addresses three identified accessibility barriers
» Reduces walk distance for people that cannot navigate the existing stairway
G9

**BACHMAN HALL RAMP**

**LOCATION**
Stairs in a greenspace west of Bachman Hall

**NETWORK**  
Stairs in a greenspace east of Bachman Hall will be furnished with a new ADA-compliant wheelchair ramp.

**COST**  
$\text{****}$

**DESCRIPTION**
Stairs in a greenspace east of Bachman Hall will be furnished with a new ADA-compliant wheelchair ramp.

**KEY BENEFITS**
- Addresses one identified accessibility barrier
- Reduces walk distance for people that cannot navigate the existing stairway

**Priority level:** Low

G10

**MUSIC BUILDING COMPLEX RAMP**

**LOCATION**
Stairs leading into the parking lots at the Music Complex

**NETWORK**  
Stairs leading into the parking lots at the Music Complex will be furnished with a new ADA-compliant wheelchair ramp.

**COST**  
$\text{****}$

**ACCESS**
1 identified accessibility barrier addressed

**DESCRIPTION**
Stairs leading into the parking lots at the Music Complex will be furnished with a new ADA-compliant wheelchair ramp.

**BENEFITS**
- Addresses one identified accessibility barrier
- Reduces walk distance for people that cannot navigate the existing stairway

**Priority level:** Low
### G11

**Priority level:** Low

**KALELE ROAD, HALE NOELANI & HALE WAINANI**

**LOCATION**
Stairs leading from Kalele Road to Hale Noelani and Hale Wainani

<table>
<thead>
<tr>
<th>NETWORK</th>
<th>COST</th>
<th>ACCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>$$$$</td>
<td>4 addressed accessibility barriers</td>
</tr>
</tbody>
</table>

**DESCRIPTION**
Stairs leading from Kalele Road to Hale Noelani and Hale Wainani will be furnished with a new ADA-compliant wheelchair ramp.

**BENEFITS**
- Addresses four identified accessibility barriers
- Reduces walk distance for people that cannot navigate the existing stairway

### G12

**Priority level:** Low

**HAMILTON LIBRARY**

**LOCATION**
Stairs leading from McCarthy Mall to Hamilton Library

<table>
<thead>
<tr>
<th>NETWORK</th>
<th>COST</th>
<th>ACCESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$$$$</td>
<td>1 addressed accessibility barriers</td>
</tr>
</tbody>
</table>

**DESCRIPTION**
Stairs leading from McCarthy Mall to Hamilton Library will be furnished with a new ADA-compliant wheelchair ramp.

**BENEFITS**
- Addresses one identified accessibility barrier
- Reduces walk distance for people that cannot navigate the existing stairway
CATALYTIC PROJECTS

The University of Hawaii at Mānoa hosts a diverse mix of affiliates that walk, roll, bicycle, take transit, and drive. Unfortunately, the historic prioritization of motor vehicles on campus created streets with disconnected pedestrian and bicycle facilities, fast-moving traffic conditions, and undersized transit facilities.

This plan proposes to improve these inhospitable pedestrian, cyclist, and transit conditions with four catalytic projects that represent an ambitious vision to transform the Mānoa campus into a network of lively multimodal corridors.

The catalytic projects were developed in coordination with the 2016 Infrastructure & Water Re-Use Master Plan, an expansive utility construction project affecting several Mānoa campus corridor right-of-ways. That plan’s utility corridor and CUP projects provide an opportunity to rethink the streetscape in a holistic manner, allowing significant improvements to circulation and accessibility that spot improvements cannot achieve. The coordinated effort to design and construct the Catalytic Projects as part of the utility projects can accelerate the implementation timelines to less than five years, a milestone that would be difficult to achieve if pursued independently.
MAILE WAY

CURRENT CONDITION

Maile Way is one of two corridors that links University Avenue to East-West Road and is the primary mauka gateway to the Mānoa campus. Narrow sidewalks and on-street shared-lane markings permit walking and bicycling, but high volume traffic and on-street parking dominate the street environment. Ultimately, the street network is defined by its vehicle-oriented design, which limits the attractiveness of walking, bicycling, and transit as viable modes of travel.

PROJECT VISION

This catalytic project undertakes an ambitious effort to rethink how the Maile Way corridor functions to prioritize the safe and convenient travel of university affiliates arriving by transit, walking or on bicycle. The package of streetscape changes and operational improvements will transform how people travel along Maile Way while preserving street trees, driveway access, and key campus landscape elements.

SEGMENT DESCRIPTIONS

Maile Way has two distinct segments; the west segment from University Avenue to Farrington Road and the east segment from Farrington Road to East-West Road. The two segments are connected via a ‘protected’ intersection at Farrington Road. The proposed improvements for this corridor include:

West Segment: University Avenue to Farrington Road

Along this segment, the typical cross section will include a westbound bicycle lane. Spot improvements include a formal sidewalk on the mauka side with a floating bus stop, high visibility crosswalks with center refuge islands and curb extensions at key driveways.

East Segment: Farrington Road to East-West Road

On the east segment a transformational shift of motor vehicles makai of the median allows for a two way protected bike lane and widened sidewalk with landscaping on the mauka side. Other improvements include maintenance of driveway access and a vehicle parking structure with pedestrian pathway connections.
KEY INTERSECTIONS

Maile Way & Farrington Road
The transition from the west to east segments creates complex geometry and potential conflicting turning movements that are solved by a raised protected intersection on Maile Way at Farrington. High visibility markings, raised corner islands and mixing zones alert bicyclists and pedestrians to potential conflicts, while larger curb radii and advance stop bars provide queuing space apart from motor vehicles. The intersection enhancements provide a gateway southbound onto the shared street on Farrington Road, with gate controls for qualified access by emergency vehicles at any time and service vehicles outside of classroom hours.

Maile Way & East-West Road
As a main campus portal to the northeast area of campus, the intersection of Maile Way and Farrington Road is heavily traveled with a mix of pedestrian, bicyclists, transit and motorist traffic. Overly long crossing distances and accessibility issues will be addressed at this intersection of two-way protected bike lanes by transitioning northbound motor vehicle traffic from the west to east side of the median with a chicane, applying high visibility bicycle and pedestrian crossing markings and considering a gateway structure or collegiate monument as an intersection element.

QLC Shuttle & Drop-Off Pavilion
The QLC Shuttle and Drop-Off Pavilion is a cornerstone of the Maile Way catalytic project, and will serve as Rainbow Shuttle’s system hub and one of the primary Upper Campus drop-off portals. The current parking lot will be redesigned as a shuttle pavilion for the Rainbow Shuttle and HandiVan operations, as well as short-term visitor parking and drop-off location. The project uses the existing access road for ingress and egress operations with loop circulation that returns to Maile Way. Rainbow Shuttle and HandiVan have prioritized egress onto Farrington Road via a gate controlled connection. Farrington Road will also be gate controlled south of the shuttle pavilion to restrict access to Varney Circle.

OTHER PROJECT ELEMENTS

Other project elements will include the removal of the moped parking lot at Moore Hall onto a nearby parking lot. The current configuration compromises the pedestrian environment along Maile Way by forcing moped drivers to maneuver across the sidewalk to access parking lot stalls.

Finally, an assessment of bioswale opportunities along Maile Way shall be examined with the utility corridor and CUP projects. Areas of opportunity include landscaped areas or repurposed on-street parking.
CHAPTER 7: CATALYTIC PROJECTS

Floating bus stops improve transit efficiency and operate in conjunction with climbing bike lanes.

Enhanced crossing with refuge island raise visibility and simplify pedestrian decision-making.

Remove vehicle turnaround and replace with landscaped median. The turnaround will be relocated to new QLCSS drop-off pavement.

The climbing bike lane formalizes route that connects to regional bikeway network.

The current parking lot will be redesigned to serve as the primary Rainbow Shuttle hub and Upper Campus drop-off portal.

The transition from east to west segments creates complex intersection geometry, turning movements assisted by a raise, protected intersection.

Covered bus shelter and shaded platform.

The westbound travel lane will be repurposed as two-way protected cycletrack, landscape buffer, and expanded pedestrian space.

Ingress and egress to Farrington Road and Varney Circle controlled by gate access.

Shared street with controlled access to Varney Circle. Bollards and warning strip delineate space shared with motor vehicles.

Shared street treatment maintains access to campus buildings. High visibility marking and warning strip establish pedestrian and bike priority.

Parking structure access and new pedestrian walkway to Spalding Hall increase access points to campus. Removable bollards pedestrianize Spalding Plaza.

Westbound travel lane will be shifted makai of median for two-way street operations.

Bioswale opportunities will be identified pending final stormwater trunkline alignment.

Wayfinding and shared lane markings will connect campus to surrounding bikeway network.

Moped parking will be relocated from pedestrian walkway to nearby parking lot.

Bus and truck sweeps will be accommodated for all turning movements.

A chicanè transition will be used to transition to existing road alignment mauka of East-West Road.

High visibility pedestrian and bicycle crossing marking simplify decision-making and increase driver awareness.

Greenspace can be used for potential gateway or collegiate feature.
DOLE STREET

CURRENT CONDITION

Dole Street is a primary network corridor that connects the Mānoa campus to nearby neighborhood and urban centers. The corridor currently flows like a river separating the upper and lower campus, favoring the flow of motor vehicles while offering narrow bike lanes and long distances between multi-lane pedestrian crossings. Transit amenities are limited.

PROJECT VISION

The Dole Street Road Diet envisions the street as a truly multimodal corridor, where the automobile will still play a central role, but it will be more inviting, safe and convenient for all users. A focus on accessibility, comfort and safety for all modes goes hand in hand with expanding mobility choices, supporting campus travel, and enlivening the street throughout the corridor.

SEGMENT DESCRIPTIONS

The four general purpose lanes will be rechannelized into three lanes with one in each direction plus a center lane, to free up space for other street elements. Ewa of the improvements the City is currently planning to address peak hour intersection delay at University Avenue. The road diet allows the introduction of one way protected bike lanes and high-visibility conflict markings at all driveways on each side of the street, three ADA accessible floating bus stops that reduce transit dwell time and eliminate bike-bus conflicts, and Rectangular Rapid Flashing Beacons or pedestrian refuge islands at the existing Donagho Road and Legacy Path mid-block crossings.

Donagho Road will also be pedestrianized with the catalytic project. Along Dole Street, a wider sidewalk on the north side from Donagho Road to East-West Road complements the primary pedestrian spine network.
KEY INTERSECTIONS

Dole Street & Lower Campus Road
The intersection of Dole Street and Lower Campus Road is complicated by the auxiliary lane and right turn slip lane that facilitate commuter access to parking from University Avenue. With high traffic volumes and congestion during peak hour, maintaining intersection capacity is an important goal for this intersection design. Improvements for pedestrian safety include a mauka-makai crosswalk on the west intersection approach. Bicycle improvements include an eastbound buffered bike lane between the Dole Street through lane and right turn lane that transitions to protected bike lane downstream of the intersection, shared lane markings on Lower Campus Road, and left turn bike boxes to the north and south approach.

Dole Street & East-West Road
The signalized intersection of Dole Street and East-West Road is a high traffic intersection that connects the proposed one-way protected bike lanes on Dole Street with the future two-way protected bike lane on East-West Road. To continue the high quality bicycle facilities through the intersection, this plan proposes a protected intersection treatment with a separate signal phase for bicycles, a bike-ped mixing zone, and vehicular “Right Turn on Red” prohibitions. This is made possible by relocating the northbound travel lane on East-West Road to the west side of the median for undivided, two-way street operations. Pedestrian connections to the proposed Lower Campus Parking Structure are accomplished via a new southern leg to the intersection.

OTHER PROJECT ELEMENTS

» Final location for bioswales along Dole Avenue require further study and will be determined in coordination with the utility corridor and Central Utility Plant projects.

» Carefully place storm drainage grates outside of the bike lane travel-way.
CHAPTER 7: CATAl YTIC PRo JECTS

1 Bike boxes’ and ‘jughandles’ establish space for bicyclists to make two-stage left turns.
2 Formalizing routes with wayfinding and enhanced roadway markings will help establish bicycle priority streets that connect to destinations.
3 New driveway to underground parking and service access.
4 Conflict markings draw attention to conflict points and improve driver awareness.
5 Protected bike lanes provide separation from moving traffic and encourage riders off the sidewalk.
6 Floating bus stops improve transit efficiency and operate in conjunction with protected bike lanes.
7 New refuge island with separated pedestrian and bicycle markings to delineate crossing space.
8 Connection to Legacy Path two-way cycletrack enhances low-stress bicycle network.
9 Maintenance access to Krauss Hall and Sakamaki Hall will be preserved.
10 Enhanced crossing with refuge island and rectangular rapid flashing beacon (RRFBS) will raise visibility to drivers.
11 Qualified access to Lower Campus Parking Structure. (Final alignment to be determined.)
12 The protected intersection separates people walking, bicycling, and driving.
13 The northbound travel lane will be repurposed as two-way cyclotrack and connect to primary bikeway network.
14 Yield markings and green paint establish right of way and emphasize bicycle space.
CORREA ROAD

CURRENT CONDITION
Correa Road is the primary spine from Campus Center to East-West Road. It is currently designed as a low-traffic access road that serves parking lots and driveways to campus buildings. Due to the street’s centric location on campus and lack of nearby east-west pedestrian paths, Correa Road has high volumes of pedestrian and bike traffic during peak hours.

PROJECT VISION
The planned Correa Road project will introduce a broad range of human-scale design changes to support a more interactive environment. As a shared street, motorized traffic provided with qualified access (i.e., people with temporary or permanent disabilities who need to be dropped off or park and maintenance operations) will be invited to travel at walking speed.

KEY INTERSECTIONS
Key design elements of the East-West Road at Correa Road intersection include connecting the two-way protected bike lane along East-West Road with the Correa Road using high visibility crossing and conflict markings and an 8’ pedestrian refuge island. The concept supports the maintenance of the truck sweep path for all turning movements.

SEGMENT DESCRIPTIONS

West Segment
The west segment will include an at-grade 18’ wide shared street with urban design elements such as a 3’ detectable warning strip and bollard delineators designating a defined walkway on either side of the street. The path available for motorized use should be 18’ wide to allow for passing vehicles, and maintain access to loading docks and building driveways along Correa Road. A secondary gate-controlled access point at Legacy Path, will be limited to service vehicles outside classroom hours and emergency vehicles at all hours.

East Segment
To the east of the Physical Science building, a 20’ wide two-way street will be constructed to provide access between East-West Road and the planned parking structure. The street will have shared lane markings to indicate the bicycle path. A wide 10’ sidewalk will be constructed adjacent to the roadway.
Correa Road Proposed Cross Section
Image from Nelson\Nygaard
1. Controlled access gate at Campus Center prioritizes pedestrian environment with vehicle operations.
2. Qualified parking lot access.
3. Bollard and detectable warning strip delineate space for shared space with motor vehicles.
4. Maintain building operations and loading dock access.
5. Shared space with permeable pavers, landscaping, and outdoor furniture.
6. Controlled access gate and bicycle inlet to shared street.
7. Wide sidewalk connects pedestrian network.
8. Maintain vehicle access to planned parking structure.
9. Green paint draws attention to conflict areas and increases bicycle visibility for pedestrians.
10. Northbound travel lane will be shift west of median for two-way street operations.
11. Northbound travel lane will be repurposed as two-way cycletrack and connect to primary bikeway network.
VARNEY CIRCLE/CAMPUS ROAD

CURRENT CONDITION

The circular parking lot around Varney Circle’s center water feature and landscaping distracts from this focal point at the intersection of Campus Road, McCarthy Mall and Farrington Road. Despite being a landmark hub that provides access to many campus destinations, the poor pavement quality, disconnected sidewalk, and bike dismount zone makes the Campus Road spoke unattractive to walk and bike along.

PROJECT VISION

Campus Road and Varney Circle will transform into an inviting pedestrian mall with separated bicycle facilities providing vital internal connections to the Maile Way and East-West Road investments. As outlined in the Landscape Master Plan, Campus Road and Varney Circle will be redesigned as an extension of McCarthy Mall with urban design interventions to invite nonmotorized users with comfortable and quality spaces to travel and linger along. Parking will be relocated to the proposed new parking structure on Maile Way.

This invitation will be supported with a fully pedestrianized Campus Road between Varney Circle and University Avenue connecting to the Farrington Road shared street. A two way protected bike lane will parallel and intersect the pedestrian spine, with frequent and visible stop sign controlled pedestrian crossings at high volume junctions. Finally, gate-controlled access and turnaround opportunities will maintain facilitated access for qualified users and campus operations. Service access to Campus Road should be available outside classroom hours and emergency access would be maintained throughout the day.
CHAPTER 7: CATALYTIC PROJECTS

Varney Circle Concept Plan (Draft)
Image from 2016 Landscape Master Plan
ACCESSIBLE GRID IMPROVEMENTS

The University of Hawaii at Mānoa envisions an inviting, walkable campus that fosters social and collegiate interaction. A dignified and direct accessible grid of pathways is fundamental to that vision, ensuring barrier-free campus access for all affiliates.

The accessible grid is the network that connects campus destinations along the shortest paths of travel for all levels of mobility. It includes pedestrian facilities (sidewalks, paths, curb ramps/crossings, ramps), connections to disabled parking, and transit/shuttle passenger access. At minimum, the accessible grid should comply with ADA standards and be traversable using a wheelchair or mobility device. The accessible grid should also contain high visibility crossings, resting areas, and wayfinding where applicable.

Currently the accessible grid at UH Mānoa is extensive but not universally accessible. Barriers on campus, such as substandard curb ramps or stairways without ramp alternatives, limit travel for people using mobility devices. At minimum, accessibility barriers make travel on the campus uninviting. At their worst, they limit accessibility to classrooms and courses of study. Improvements that address the barriers, such as reconstruction of sidewalks, elevators and ramps, lead the campus towards the vision of a universally accessible grid.
BARRIERS ON THE MĀNOA CAMPUS

Over 900 location-specific accessible barriers were identified during a detailed site reconnaissance of the UH Mānoa campus. The accessible barriers were categorized by type, location, level of severity, and proximity to other barriers. Nine unique barrier group types are present on the UH Mānoa campus as well as numerous barriers that do not fit in one of the nine groups. The table below describes the barrier group types. The location of the barriers by type are summarized in the maps on subsequent pages.

<table>
<thead>
<tr>
<th>BARRIER</th>
<th>DESCRIPTION</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement quality</td>
<td>Cracks and fractures that are difficult to navigate with a mobility device.</td>
<td>![Example Image]</td>
</tr>
<tr>
<td>Sidewalk upheaval</td>
<td>A quarter-inch gap or uplift in the sidewalk, uplifts enough to catch foot or stall wheel.</td>
<td>![Example Image]</td>
</tr>
<tr>
<td>Absent segments and curb access</td>
<td>Missing sidewalk or access ramp disrupts the intended paths of travel for people using a wheelchair or mobility device.</td>
<td>![Example Image]</td>
</tr>
<tr>
<td>Obstructions</td>
<td>The travel path intersects objects such as a street pole without clearance to bypass the object.</td>
<td>![Example Image]</td>
</tr>
<tr>
<td>Substandard curb ramps</td>
<td>Curb ramps that have steep grades, lack landing zones for wheelchairs, and/or do not have a tactile surface to indicate transition to roadway space.</td>
<td>![Example Image]</td>
</tr>
<tr>
<td>BARRIER</td>
<td>DESCRIPTION</td>
<td>EXAMPLE</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Cross slope</td>
<td>Steep cross slopes present challenges that are difficult to navigate with a mobility device due to off-balance in weight</td>
<td></td>
</tr>
<tr>
<td>Steep grades</td>
<td>Similar to cross slopes, grade elevation gains greater than 1:12 hinder mobility.</td>
<td></td>
</tr>
<tr>
<td>Narrow sidewalks</td>
<td>Pathways less than four feet wide present difficulties for people with mobility devices. They also are uncomfortable for passing other people or walking side-by-side.</td>
<td></td>
</tr>
<tr>
<td>Stairs or abrupt elevation change</td>
<td>Stairs or steps without a nearby alternative path cannot be navigated with a wheelchair.</td>
<td></td>
</tr>
<tr>
<td>Other barriers</td>
<td>Other barriers including drainage grate, lack of hand-railing, vegetation growth, or other obstacles that hinder navigation with a mobility device.</td>
<td></td>
</tr>
</tbody>
</table>
BARRIER 1: PAVEMENT QUALITY

DESCRIPTION
Cracks and fractures that are difficult to navigate with a mobility device.

MAP

EXAMPLE IMAGE
BARRIER 2: SIDEWALK UPHEAVAL

DESCRIPTION

A quarter-inch gap or uplift in the sidewalk, uplifts enough to catch foot or stall wheel.

EXAMPLE IMAGE
BARRIER 3: ABSENT SEGMENTS AND CURB ACCESS

DESCRIPTION

Missing sidewalk or access ramp disrupts the intended paths of travel for people using a wheelchair or mobility device.

MAP

© Example Image

EXAMPLE IMAGE

© Example Image
BARRIER 4: OBSTRUCTIONS

DESCRIPTION

The travel path intersects objects such as a street pole without clearance to bypass the object.

EXAMPLE IMAGE
BARRIER 5: SUBSTANDARD CURB RAMPS

DESCRIPTION

Curb ramps that have steep grades, lack landing zones for wheelchairs, and/or do not have a tactile surface to indicate transition to roadway space.

MAP

EXAMPLE IMAGE
BARRIER 6: CROSS SLOPE

DESCRIPTION

Steep cross slopes present challenges that are difficult to navigate with a mobility device due to off-balance in weight.

MAP

EXAMPLE IMAGE
BARRIER 7: STEEP GRADERS

DESCRIPTION

Similar to cross slopes, grade elevation gains greater than 1:12 hinder mobility.

MAP

EXAMPLE IMAGE
BARRIER 8: NARROW SIDEWALKS

DESCRIPTION

Pathways less than four feet wide present difficulties for people with mobility devices. They also are uncomfortable for passing other people or walking side-by-side.
BARRIER 9: STAIRS OR ABRUPT ELEVATION CHANGE

DESCRIPTION

Stairs or steps without a nearby alternative path cannot be navigated with a wheelchair.

MAP

[Map showing Barrier Projects and Stairs / Steps]

EXAMPLE IMAGE

[Image of stairs with a nearby alternative path]
BARRIER 10: OTHER BARRIERS

DESCRIPTION

Other barriers including drainage grate, lack of hand-railing, vegetation growth, or other obstacles that hinder navigation with a mobility device.

EXAMPLE IMAGE
Prioritizing UH Mānoa’s Many Barriers

There are many accessible barriers on Mānoa’s campus and not enough staff resources or funding to tackle them all at once. To address the barriers in a meaningful way, the study team developed a data-driven approach to prioritize barrier improvements.

Cost
The cost to address each barrier type was estimated on a qualitative scale. In general, barriers such as vegetation and sidewalk upheavals cost less to correct than grade and elevation barriers which could require a significant level of construction and material costs to mitigate. Barrier costs were ranked from very low (level 1) to very high (level 5) with the majority of barriers scoring as level 3 or level 4. Improvement costs were based on standard infrastructure cost estimates from the Highway Safety Research Center’s Pedestrian and Bicycle Information Center, as well as recent localized material and labor costs.

Severity
Barrier severity ranges from minimal (level 1) to impassable (level 3). A rough paved surface would be scored as severity level 1 while the absence of a curb ramp at an intersection corner would be severity level 3.

Distance Reduction
Stairs, steps, and other barriers to the accessible grid require people using wheelchairs or other mobility devices to travel out of direction to bypass the barrier. For example, the stairway at Hamilton Library provides direct access from the library to McCarthy Mall. People who cannot traverse the stairs are required to take the alternate route which is approximately 300 feet longer. Improvements that eliminate or reduce out of direction travel were noted in the evaluation criteria.

Cluster Inclusion
Barriers that are located in close proximity to other barriers or can be bundled together were identified as cluster locations. Addressing barriers in clusters reduces time and construction costs, where applicable.

The weighted barrier score is derived from scoring the four primary factors and weighting the scores based on the importance of each factor. Severity was assigned the highest weight factor (3), followed by distance reduction (2), and then cost and cluster inclusion (1). Severity was assigned the highest weight because it is the most significant impedance to accessibility.

HOW DOES UH MĀNOA ELIMINATE BARRIERS?

UH Mānoa envisions a walkable grid accessible to any affiliate and reaching that vision requires eliminating barriers on campus. By approaching the barriers with a multi-layered prioritization strategy, including identification of spot barriers and coordinating barrier cluster improvements, barriers can be eliminated in the most time-, cost-, and resource-efficient manner.
ELIMINATE BARRIERS AS PART OF MULTIMODAL AND GRADE-ASSIST PROJECTS

Many of the accessibility barriers overlap with one of the 32 multimodal projects or 12 grade-assist projects conveyed in Chapter 6. The multimodal and grade-assist project are specific areas of campus identified for safety and connectivity improvements. For example, the pavement quality barriers along Legacy Path will be eliminated and replaced with a high quality walkway as part of the Legacy Path Improvement Project. Barriers that fall within the multimodal project area should be coordinated with the long-term multimodal plan. Severe barriers should be implemented separately and immediately.

Project Highlight
Currently the Shidler College of Business is only stairway accessible from the School of Architecture Parking lot. A proposed ADA-compliant elevator would connect affiliates from the northwest corner of George Hall to Shidler College of Business. This grade-assist project eliminates the most critical barrier in this corner of the campus and significantly reduces walk distance to the Shidler School of Business from the Campus Road.

Location of the proposed grade-assist project at Shidler College
Image from Google Maps
ELIMINATE MULTIPLE BARRIERS AT ONCE

Barriers that occur in close proximity to each other can be bundled into stand-alone accessibility cluster projects in order to economize on mobilization and construction costs.

Forty barrier clusters were identified on the campus with an average of four barriers within each cluster. Surfaced tree roots are the predominant cause of multiple barriers in a confined area. For example, the cluster of barriers along the Legacy Path walkway between the Law School and Law Library has a mix of sidewalk upheavals and poor pavement quality. These barriers are within feet of each other and should be improved with one project.

The map below illustrates cluster project locations and their ID numbers.

Project Highlight
The mauka-makai pathway from Moore Hall to McCarthy Mall has eight barriers clustered together including sidewalk upheavals and limited stairway access. This cluster of barriers was identified as project number 28, which adds an accessible ramp and smooths the sidewalk.
ELIMINATE SPOT BARRIERS

Although many barriers will be addressed as part of multimodal and cluster projects, the remaining barriers will need to be treated as spot barriers. Spot barriers are typically small improvements, such as repairing sidewalk upheaval at Moore Hall, which can be addressed as resources become available.

The table below describes the highest priority accessible grid spot improvements based on the evaluation criteria. The table contains a description of the identified barrier, the location of the barrier, recommended improvement, and estimated costs. The full list of all identified barriers and the associated priority score are available in the appendix to this report.

Final design improvements and associated costs are pending detailed survey and civil engineering design.

<table>
<thead>
<tr>
<th>BARRIER ID</th>
<th>LOCATION</th>
<th>BARRIER IDENTIFIED</th>
<th>SCORE*</th>
<th>PRIORITY</th>
<th>RECOMMENDATION</th>
<th>COST ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>158</td>
<td>Physical Plant Building 1</td>
<td>Absent sidewalk</td>
<td>4.0</td>
<td>Very High</td>
<td>Construct east-west sidewalk adjacent to Physical Plant Building 1</td>
<td>$9,600</td>
</tr>
<tr>
<td>96</td>
<td>Hale Noelani at Kalei Road</td>
<td>Absent curb ramp and crossing</td>
<td>4.0</td>
<td>Very High</td>
<td>Install two curb ramps and high visibility crosswalk</td>
<td>$3,000</td>
</tr>
<tr>
<td>122</td>
<td>Hale Aloha Ilima</td>
<td>Missing pathway</td>
<td>4.0</td>
<td>Very High</td>
<td>Construct sidewalk along the east face of Hale Aloha Ilima Tower</td>
<td>$13,000</td>
</tr>
<tr>
<td>137</td>
<td>Lincoln Hall Annex</td>
<td>Missing pathway</td>
<td>4.0</td>
<td>Very High</td>
<td>Install curb ramp and sidewalk to basketball court</td>
<td>$6,200</td>
</tr>
<tr>
<td>328</td>
<td>Hale Aloha Ilima</td>
<td>Stairs or steps</td>
<td>3.4</td>
<td>High</td>
<td>Install two curb ramps and high visibility crosswalk</td>
<td>$3,200</td>
</tr>
<tr>
<td>339</td>
<td>Lincoln Hall</td>
<td>Stairs or steps</td>
<td>3.4</td>
<td>High</td>
<td>Install access ramp for Lincoln Hall Access</td>
<td>$10,000</td>
</tr>
<tr>
<td>399</td>
<td>East-West Center (Burns Hall)</td>
<td>Stairs or steps</td>
<td>3.4</td>
<td>High</td>
<td>Install access ramp for East-West Road</td>
<td>$10,000</td>
</tr>
<tr>
<td>446</td>
<td>Food Science driveway</td>
<td>Stairs or steps</td>
<td>3.4</td>
<td>High</td>
<td>Install access ramp for Food Science driveway</td>
<td>$10,000</td>
</tr>
<tr>
<td>159</td>
<td>Agricultural Science Facility</td>
<td>Missing crosswalk</td>
<td>3.3</td>
<td>High</td>
<td>Install high visibility raised crosswalk</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

* Each project was assigned a prioritization score weighted from 0 to 4, with 4 being the highest prioritization. The score was based on a combination of evaluation factors, such as walkability and transit access, detailed in the appendix to this report.