

Complete Streets at the University of Utah

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Executive Summary

Complete Streets are an approach to designing streets that prioritize safety, accessibility, and sustainability for all users. Our team has researched the concept of Complete Streets and analyzed its application within the University of Utah campus. The university is experiencing rapid growth and aims to reduce greenhouse gas emissions. The adoption of Complete Streets can help in achieving these goals while accommodating the needs of all users.

Our research involved interviewing Salt Lake City Transportation Division representatives and examining case studies from different cities. We also consulted guidelines provided by the Wasatch Front Regional Council (WFRC) and Salt Lake City. Based on our findings, we have outlined four critical recommendations for the University of Utah to consider:

- **Adopt a Complete Streets policy:** Embracing an approach that prioritizes multi-modal forms of transportation will help the university meet the needs of its growing population and climate goals.
- **Implement effective methods where possible:** Add Complete Street design elements to existing roads without incurring high costs, such as pedestrian hybrid beacons and crosswalk visibility enhancements.
- **Create corridors of high comfort pathways for bicyclists and pedestrians:** Establishing designated corridors for pedestrians and cyclists can ensure their safety and comfort while accounting for financial limitations and a car-centric culture.
- **Work more closely with partner agencies:** Collaborate with UDOT and Salt Lake City, which share road ownership with the university, to achieve a unified vision for campus streets.

Implementing these recommendations can contribute to developing a more sustainable and inclusive campus, better serving the needs of students, faculty, and visitors at the University of Utah.

What is a Complete Street?

There is no singular design prescription for a complete street. Each project is unique, and responding to its complete street may include community context.

- Sidewalks
- Bike lanes
- Special bus lanes
- Comfortable and accessible public and transportation stops
- Frequent and safe crosswalks
- Median islands

- Curb extensions
- Narrower travel lanes
- Roundabouts

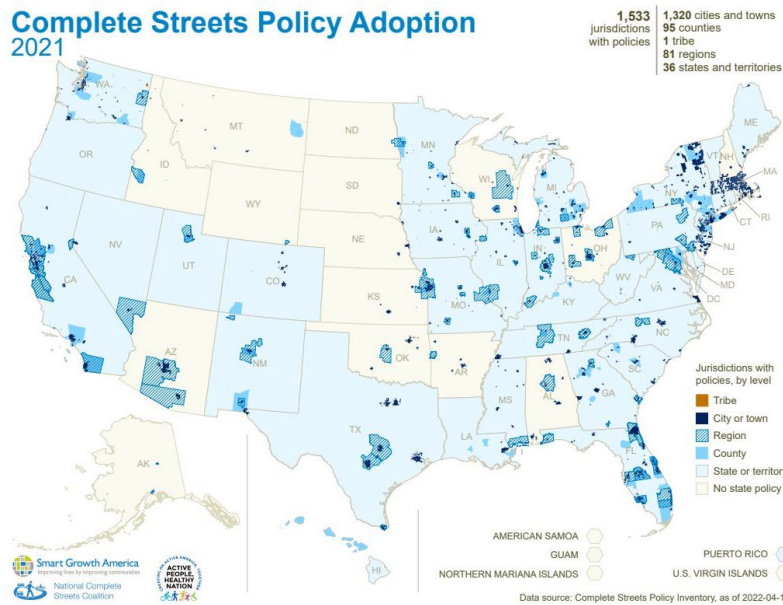
The context and needs of users are different in rural, suburban, and urban communities. However, the concept of a “complete street” is more of an approach than a specific design. It integrates people in the planning, design, construction, operation, and maintenance of transportation networks enabling safe use and access for all people who need to use them. Usually, the resolution for reinvestment of a street to a “Complete Street” stems from unmet needs because of traditional transportation approaches to the original street design.

Entities like Smart Growth America are leading the push for Complete Streets across the country. They envision neighborhoods for families of all income levels living alongside one another in locations where daily needs are close by and diversity in the transportation system, giving people the choice of how they can get around safely and efficiently. Thus the concept of a “complete street” is implemented.

Complete streets are usually implemented due to binding ordinances, laws, or resolutions. Across the country, policies are increasing as more cities and communities begin to realize the benefits of having safe, accessible, and healthy streets.

As of 2021, 1,533 jurisdictions with Complete Streets policies are in place in the U.S. The best policies are ever-evolving to focus more on implementation and equity. Are the policies being fully implemented in order to change what is designed, built, and where? Do they prioritize improving equity in tangible ways?

Complete Streets Policy Adoption 2021



Smart Growth America has adopted a policy framework created through The National Complete Streets Coalition (NCSC) as the ten elements of an ideal Complete Street to help communities develop and implement policies and practices that ensure streets are safe for people of all ages and abilities, balancing the needs of different modes, and to support local land uses, economies, cultures, and natural environments. These ten policy elements, revised in 2018, are based on the collective expertise in transportation planning and design, created in consultation with NCSC’s steering committee members and a group of national stakeholders consisting of engineers, planners, researchers, and advocates.

These elements serve as a national model of best practices that can be implemented in nearly all types of policies at all levels of governance in any type of place:

1. Establishes commitment and vision

- *How and why does the community want to complete its streets? This specifies a clear statement of intent to create a complete, connected network and consider the needs of all users.*

2. Prioritizes diverse users

- *It prioritizes serving the most vulnerable users and the most underinvested and underserved communities, improving equity.*

3. Applies to all projects and phases

- *Instead of a limited set of projects, it applies to all new, retrofit/reconstruction, maintenance, and ongoing projects.*
4. *Allows only clear exceptions*
 - *Any exceptions must be specific, with a clear procedure that requires high-level approval and public notice prior to exceptions being granted.*
 5. *Mandates coordination*
 - *Requires private developers to comply and interagency coordination between government departments and partner agencies.*
 6. *Adopts excellent design guidance*
 - *Directs agencies to use the latest and best design criteria and guidelines and sets a time frame for implementing this guidance.*
 7. *Requires proactive land-use planning*
 - *Considers every project's greater context, as well as the surrounding community's current and expected land-use and transportation needs.*
 8. *Measures progress*
 - *Establishes specific performance measures that match the goals of the broader vision, measurably improve disparities and are regularly reported to the public.*
 9. *Set criteria for choosing projects*
 - *Creates or update the criteria for choosing transportation projects so that Complete Streets projects are prioritized.*
 10. *Creates a plan for implementation*
 - *A formal commitment to the Complete Streets approach is only the beginning. It must include specific steps for implementing the policy in ways that will make a measurable impact on what gets built and where.*

Complete Streets at the University of Utah

The University of Utah is in a period of rapid growth. The university plans to increase enrollment to 40,000 students by 2025 (University of Utah, Strategy 2025) and continues to rank among Utah's largest employers. Alongside this growth, the university has pledged to reach net-zero greenhouse gas emissions by 2040. This includes an 80% reduction in greenhouse gas emissions from transportation compared to the 2007 baseline. With the pressure to reduce greenhouse gas emissions and an increased need for on-campus housing and building expansion, the issue of space at the university is paramount. In total, the university must meet the needs of 70,000 people with 27,792 parking spots and 3,694 bicycle spots (Cannon and Brumbaugh).

Campus growth and pressing climate needs require the popularization of car-alternative modes of commuting to and navigating around campus. University transportation and commuter services actively promote these different transit methods (walking, biking, taking local transit) and encourage campus planning with these priorities in mind. During the building process, university transportation reviews construction documents to ensure effort is placed on how people will get around, including through the use of sidewalks, ADA-compliant pathways, bicycle lanes, and driving considerations. Despite these efforts, in a recent commuter survey in which people identified barriers to taking public transportation or biking to campus, a primary deterrent was the lack of safety felt on the roadway (Cannon and Brumbaugh). The University of Utah does not have a Complete Streets policy that enhances street safety by ensuring roadways are built and updated with multiple forms of transportation in mind. We encourage the university to adopt a Complete Streets policy to better serve its mission as a leader in education, innovation, health, and sustainability.

As the Campus Road Ownership map makes clear, the roadways on campus fall under five different types of ownership: Salt Lake City, Federal, Private, Utah Department of Transportation (UDOT), and the University of Utah. The multiple jurisdictions make a unified vision for campus streets difficult. Many of the larger thoroughfares, like North Campus Drive, Mario Capecchi Drive, and South Campus Drive, are owned by UDOT, and much of Research Park belongs to Salt Lake City. We encourage the University of Utah to adopt a Complete Street policy that prioritizes multi-modal forms of transportation and encourages the campus to work closely with other agencies to meet the needs of campus commuters, university growth, and climate goals.

Precedent and References

Salt Lake City

In April, our team interviewed two members of the Salt Lake City Transportation Division: Jon Larsen, Transportation Division Director, and Jeff Gulden, Transportation Engineer. Our intention for this conversation was to explore Salt Lake City's Complete Streets Ordinance, its successes, barriers to implementation, and advice they might have for developing a Complete Streets policy on campus. They made clear that since adopting Complete Streets in 2010, the city has refined its planning and transportation guidelines to the point the ordinance is no longer as useful as it once was. Larsen explained that it is his belief that we shouldn't have to make every street do everything. The Salt Lake Transportation Division, he shared, is focused on creating corridors of high-comfort bike facilities rather than a broad network, and the main goal is layering these corridors to facilitate bike travel across the city. He went on to describe many of the techniques used to foster high-comfort bike and pedestrian spaces, including:

- Narrowed pavement

- One-lane travel
- Biking sidewalks
- Traffic calming
- Tucan signals (bike crossing buttons)
- Road diets.

In outlining barriers, Larsen said that the right of way is often fixed, and most projects do not acquire the right of way. Without this, the Division is extremely limited in its ability to incorporate effective methods for Complete Streets. He also emphasized the expense of creating high-quality design elements that increase street access. With these issues in implementation, Larsen stressed the need to create and highlight concentrated corridors where pedestrian and bike use is prioritized, leaving many thoroughfares principally for vehicle traffic. He emphasized that it is often safer for drivers and bikers when bikers travel primarily on specific roads (600 South, for instance) rather than bike on all streets regardless of traffic and visibility. Offering advice, Larsen suggested that if the university were to adopt a Complete Streets policy, it should be specific: it's essential to identify corridors where bikes can travel safely, where cars can go, and dedicated places for public transit. He also emphasized the need for convenient bike parking (Larsen and Gulden).

Wasatch Front Regional Council

To design a complete street for the University of Utah campus, the university could use the resources and design guidelines provided by the Wasatch Front Regional Council (WFRC) Complete Streets section, which emphasizes a strong vision, specifying all users, applying the policy to all projects, considering exceptions, creating a complete system, collaboration among agencies, design criteria, context-sensitive design, performance measures, and implementation. These resources include information on creating streets that prioritize safety, accessibility, and sustainability for all users and case studies from other communities that have successfully implemented complete streets.

In addition to using the WFRC resources, the University of Utah could apply the five essential elements of good complete street design: assembling the design team, defining the context, identifying goals and objectives, assessing design standards and trade-offs, and utilizing tools like StreetPlan for interactive planning. Developing a functional Complete Streets policy for the campus would outline the university's commitment to creating streets that equally prioritize pedestrians, cyclists, public transportation, and motor vehicles and provide guidance for future street design and maintenance.

The policy could include specific goals and objectives related to creating a more sustainable and equitable transportation system on campus. For example, the policy could set targets for increasing the number of bike lanes, improving pedestrian crossings, or reducing greenhouse gas

emissions from transportation. The policy could also outline the process for engaging with stakeholders, including students, staff, and faculty, to ensure that their needs and preferences are considered in street design and planning.

Applying the concept of Complete Streets to the University of Utah campus, Central Campus Drive could be designed to prioritize the safety and comfort of all users. For example, bike lanes and sidewalks could be added or improved to provide safe and efficient access for pedestrians and cyclists. Additionally, public transportation could be integrated more fully into the campus infrastructure, with designated bus stops and bike racks to make it easier for students and staff to use alternative modes of transportation.

By implementing Complete Streets principles on Central Campus Drive and throughout the campus, the University of Utah could create a more equitable and sustainable transportation system that benefits all university community members. This could increase safety, improve health, and reduce greenhouse gas emissions while creating a more enjoyable and accessible campus environment.

In conclusion, using the resources and design guidelines provided by the WFRC Complete Streets section, applying the five essential elements of good complete street design, and developing a functional Complete Streets policy for the campus, the University of Utah could create a transportation system that is safe, accessible, and sustainable for all users. This could lead to a healthier, more vibrant campus community and contribute to the overall well-being of the surrounding region.

Case Studies

Universities

- the University of Connecticut
- Montclair University
- the University of North Carolina
- Portland State
- Chico State

Regions/States

- Washington
- Massachusetts
- New York City

- Portland
- San Francisco

Common Complete Streets categories for re-design

- **Road Diet** - reduction of automobile lanes, usually 4-5 lanes reduced to accommodate bike lanes and center lanes
- **Arterial Rehab** - busy, multi-lane streets re-designed to accommodate other types of road users while improving the aesthetics of the area
- **Urban, Mix-Use** - streets that host a diverse mix of uses. Improvements to the public right of way can further grow and support that diversity and energy.
- **Main Street** - usually at the center of town, the place where people go to shop, socialize, and attend community events.
- **Bike Street** - dedicated bicycle infrastructure from a simple bike lane to several miles of world-class urban trails
- **Transit Street** - Transit streets emphasize buses and trains and employ designs that make it easy for people to use them. Transit streets can catalyze economic development, aka Transit-Oriented Development.

Case Study: Road Diet – Stone Way N. - Seattle, WA Metro Population: 3,905,026 / City Population: 608,660



Implementation

- Converted from four lanes to two lanes and addenda center turn lane.
- A bicycle lane was added to the uphill side, and sharrows were added to a wider travel lane on the downhill side.

Key Outcomes

Pedestrian collisions were reduced by 80% in part due to improved crosswalks in compliance with federal and city guidelines. Total collisions also decreased by 14%. Drivers also slowed down closer to the posted speed limit. Those traveling over the speed limit of 40 mph declined by more than 80%. Cycling increased by 35% over a 3-year period, and bicycles now represent 15% of peak traffic volume on the street.

Case Studies: Bike Street – 8th, 9th Avenues NY, NY; Metro Population: 22,214,083 / City Population: 8,175,133



Implementation

- Travel lanes were narrowed to generate space for bicycle tracts, separated from auto traffic with a row of cars and a buffer zone.
- Intersections are designed to regulate vehicular left turns to prevent collisions with bike lane users.

Key Outcomes

20% decline in crashes causing injuries. The severity of crashes also decreased. Sales at locally-owned businesses increased by almost 50% after the addition of bike lanes. Automobile travel times also decreased.

Case Study: Road Diet – East Blvd Charlotte, NC; Metro Population: 2,296,569 / City Population: 731,424



Implementation

- Four auto lanes down to two with two bicycle lanes and a center turn lanes
- Crosswalks were marked with a distinct paving pattern, and planted pedestrian refuge islands to reduce crossing distance.

Key Outcomes

Sidewalk cafes and outdoor dining options increased significantly. Reduced traffic noise and a greater separation between diners and moving traffic contributed to the change. Automobile traffic speeds also dropped. However, travel times did not change, and there was minimal impact on automobile traffic in general.

Case Studies: Transit Street – SW 5th, 6th Avenues Portland, OR; Metro Pop.: 2,289,800 / City Pop: 583,776



Implementation

- TRAX system was incorporated into the existing transit mall along with new transit shelters.
- Bus-only lanes.
- A bike lane was added, and automobile traffic was diverted to other streets.

Key Outcomes

Between 2001 and 2006, 68 bus-related collisions occurred on average each year before the redesign. After the redesign, bus-related crashes decreased to a yearly average of 27, and 13 TRAX-related collisions yearly. The redesign also led to commercial retail developments, including two hotel renovations that generated an increase of \$1.5 billion in private-sector investment. A “Block by Block” assistance program also helped to implement 40 storefront renovations and other improvements that cost \$1.4 million and leveraged almost \$10 million in private investment.

Case Studies - Key Findings and Results

Public/Private Transportation

- Reduced or converted auto lanes
- Non-car modes increased
- Public transportation ridership increased
- Improved travel time for buses
- Speed declined
- More cyclists
- Accidents declined

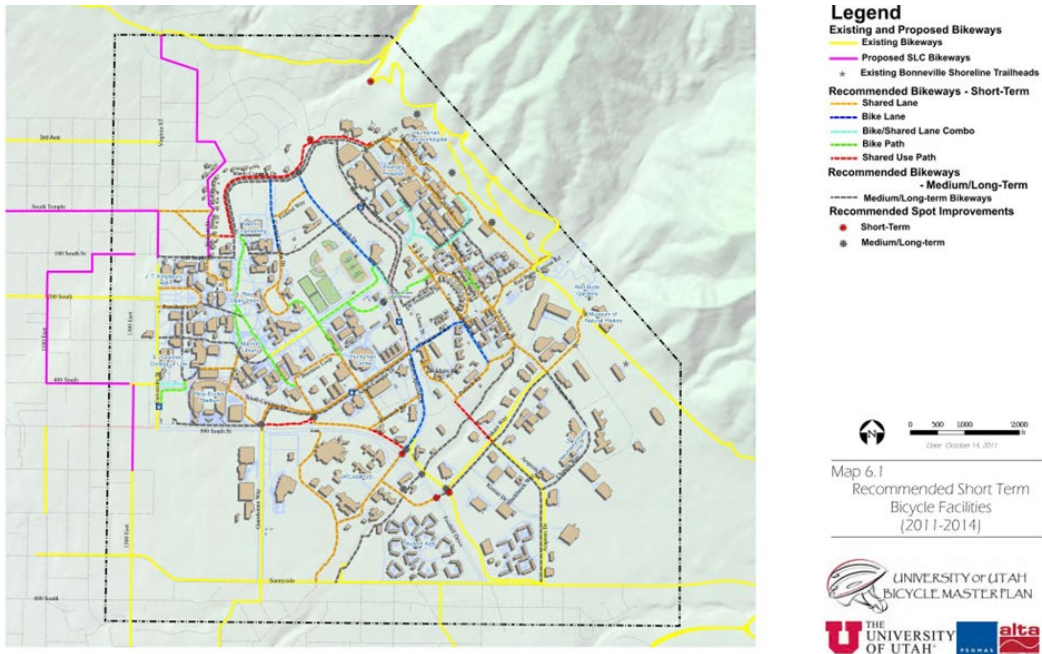
Social/Community

- Improved street life
- Crimes decline
- More outdoor dining
- Buildings revitalized
- New housing in downtown areas
- Retail vacancies reduced
- Retail sales increased
- Boost to property values
- Increase in jobs

Example of Implementation of Effective Methods

With the understanding that not every street needs to be a complete street, The University should move forward with developing corridors that provide a network for students, faculty, and visitors to the University. The past decade shows promise for what the University of Utah could become if the emphasis is put on developing this network. The HPER mall is an excellent example of this. As the spine of the campus, it runs perpendicular to the hillside, connecting the densest parts of the University with bike lanes, wide and ample pedestrian sidewalks, pedestrian priority, lighting, ramps, and vegetation. In 2011 the University of Utah developed a map of recommended bikeways separated into short and long-term development (see image below.) As of 2023, most of these short-term bikeways have been developed; however, a few remain car-

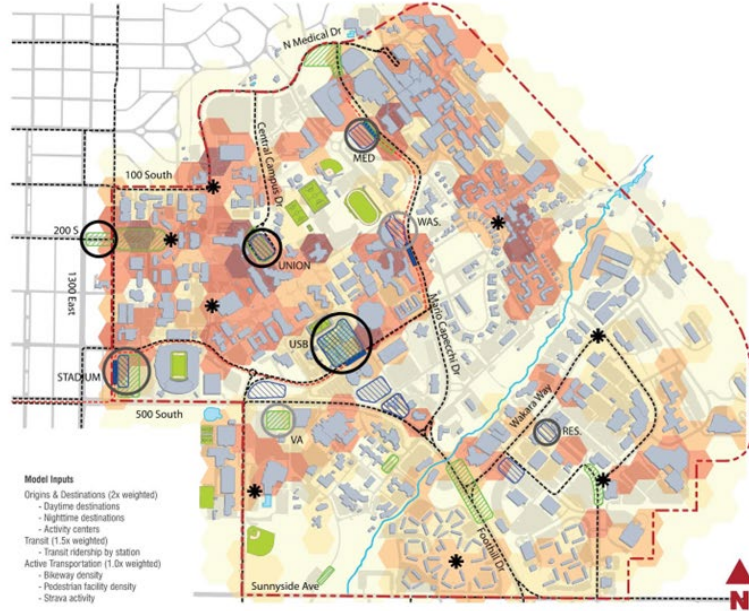
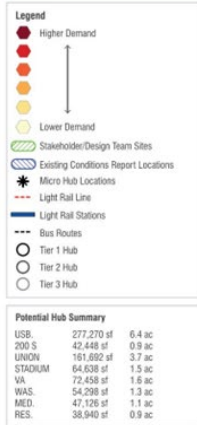
centric such as Central Campus Dr. could become a part of this extremely valuable network if some small but important modifications were implemented.



University of Utah Bicycle Masterplan

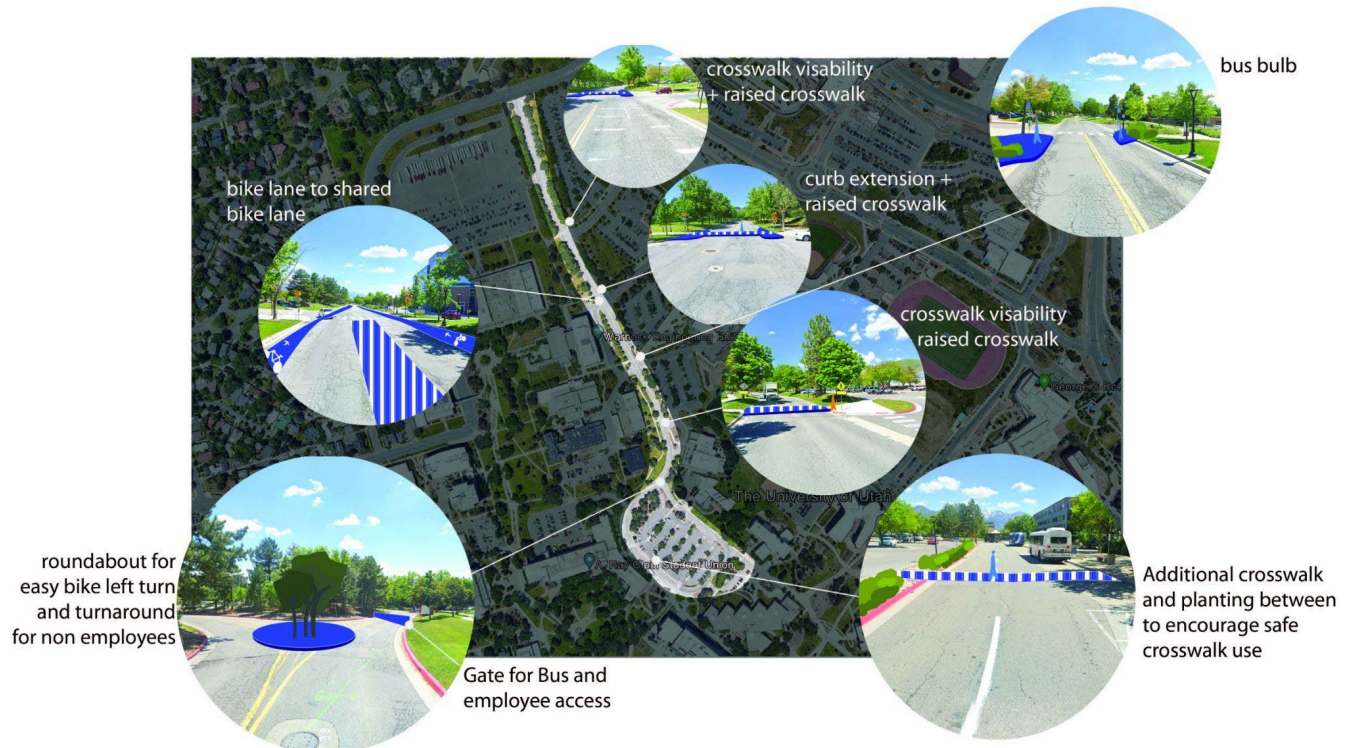
The University of Utah additionally conducted a mobility study as a part of The University of Utah Campus Master Plan in 2005. Within this study, the University identified hubs for public transit (see image below). Of the three tier-one hubs, The Union Building bus station still gives priority to the individual driving their car to campus. If our desire as a university is to encourage other modes of transportation, perhaps priority should be redistributed.

Composite Suitability Map for Mobility Hub Siting



University of Utah Mobility Hot Study pg. 39

Because of the importance of Central Campus Dr. in building a more robust network of complete streets at the University of Utah, we have concentrated an effort to implement some of the effective methods we have previously identified to redesign this road to become a safer and more inclusive route for multiple modes of transportation. The following image illustrates our resolve for a multitude of issues identified on Central Campus Dr. but concentrating on the importance of the safety, comfort, and importance of bikers, pedestrians, and buses, reclaiming the street back from the car.



Our Recommendations

Following the thorough research detailed above, our team has developed four main recommendations for Complete Streets on campus. We recognize our limited expertise on a complex topic, but we hope our report can provide some additional insight for the University of Utah Transportation.

1. **Adopt a Complete Streets policy:** Embrace an approach that prioritizes multi-modal forms of transportation will help the university meet the needs of its growing population and climate goals.
2. **Implement effective methods where possible:** Many effective methods can be additive to existing roads without serious cost or construction (e.g., pedestrian hybrid beacons and crosswalk visibility enhancements). We recommend adding elements of Complete Street design now with a broader strategy to implement even more as road redesigns occur.
3. **Create corridors of high comfort pathways for bicyclists and pedestrians:** Corridors ensure safety and comfort for pedestrians and cyclists while also pragmatically accounting for financial limitations and the car-centric culture. We recognize people will continue to drive onto campus, and not all roads can do everything, which is why we recommend these corridors.

4. **Work more closely with partner agencies:** Collaborate with UDOT and Salt Lake City, which share road ownership with the university, to achieve a unified vision for campus streets.

Implementing these recommendations can contribute to developing a more sustainable and inclusive campus, better serving the needs of students, faculty, and visitors at the University of Utah.

Conclusion

In conclusion, the adoption of Complete Streets is a significant step towards achieving sustainable, accessible, and safe transportation systems for all users. Through our research on the University of Utah campus, we have identified four key recommendations that can help the institution to achieve these goals while meeting the needs of its growing population. These include the adoption of a Complete Streets policy, implementing effective methods where possible, creating corridors of high comfort pathways for bicyclists and pedestrians, and working more closely with partner agencies. The implementation of these recommendations can contribute to the development of a more inclusive and sustainable campus, better serving the needs of students, faculty, and visitors. The national model of best practices, as outlined by The National Complete Streets Coalition, provides guidelines that can be implemented in various policies at all levels of governance to ensure that streets are safe for all users.

References

- “2008 Campus Master Plan - Planning, Design & Construction.” Utah.edu, 21 Aug. 2021, pdc.utah.edu/2021/08/21/2008-campus-master-plan/.
- “Bicycle Master Plan – Planning, Design, & Construction.” Pdc.utah.edu,
- “Campus Planning - Planning, Design & Construction.” Pdc.utah.edu, pdc.utah.edu/campus-planning/#planning_resources. Accessed 28 Apr. 2023.
- “Campus Planning - Planning, Design & Construction.” Pdc.utah.edu, pdc.utah.edu/campus-planning/. Accessed 28 Apr. 2023.
- “Complete Streets Demonstration Projects (Washington).” Smart Growth America, smartgrowthamerica.org/resources/complete-streets-demonstration-projects-washington/. Accessed 28 Apr. 2023.
- “Landscape Master Plan - Planning, Design & Construction.” Pdc.utah.edu, pdc.utah.edu/2021/08/21/landscape-master-plan/. Accessed 28 Apr. 2023.
- “National Complete Streets Coalition.” Smart Growth America, smartgrowthamerica.org/program/national-complete-streets-coalition/.
- “North End Equitable Development Strategy (NEEDS).” Smart Growth America, smartgrowthamerica.org/resources/north-end-equitable-development-strategy-needs/. Accessed 28 Apr. 2023.
- “Pedestrian Design Guide Update | Portland.gov.” Www.portland.gov, www.portland.gov/transportation/planning/pedestrian-design-guide-update. Accessed 28 Apr. 2023.
- “What Is “Complete”?” Strong Towns, www.strongtowns.org/journal/2015/8/20/what-is-complete. Accessed 28 Apr. 2023.
- Cannon Ginger and Solomon Brumbaugh. Interview. Conducted by Complete Streets team, 21 Care.” Strategy.utah.edu.
- Communications, Mike Enright '88 (CLAS), University. “Complete Streets” Improve Campus Environment.” UConn Today, 31 Jan. 2018, today.uconn.edu/2018/01/complete-streets-improve-campus-environment/#. Accessed 28 Apr. 2023. February 2023.
- Larsen, Jon and Jeff Gulden. Interview. Conducted by Complete Streets team, 13 April 2023.
- Morton, L., Perry, T., Chang, A., Wender, K., & Hupp, C. (2020). University of Utah Campus Mobility Hub Study (p. 159). pdc.utah.edu/2011/05/12/bicycle-master-plan/ Accessed 28 Apr. 2023

Pedestrian Design Guide Administrative Rule Project ... - Portland, Oregon.
https://www.portland.gov/sites/default/files/2022/PDG%20-%20Public%20Hearing%20Summary%20and%20Recommendations_final.pdf.

UNIVERSITY of UTAH CAMPUS MOBILITY HUB STUDY.
d2vxd53ymoe6ju.cloudfront.net/wp-content/uploads/sites/25/2021/11/22080708/20-06-25-University-of-Utah-Campus-Mobility-Hub-Study-Compressed.pdf. Accessed 28 Apr. 2023.

University of Utah. “Strategy 2025 | A Pathway to the Future of Higher Education and Health

WASATCH CHOICE 2050 Complete Street [Lecture notes]. (n.d.). WASATCH FRONT REGIONAL COUNCIL. <https://wfrc.org/vision-plans/wasatch-choice-2050-3/toolbox/complete-streets/>

WFRCBrochureR5 [Online forum post]. (n.d.). WASATCH FRONT REGIONAL COUNCIL. <https://wfrc.org/About/>