



A Redesign of College Street between 8th Avenue & 11th Avenue

A Tiered-Solutions Approach

Isabella Corey
Travis Fisher
Verena Lawrence
Jess Maynard
Madison McNutt

Montana State University HONR 494 Design Thinking
Dr. Brad Stanton & Dr. Lucas Graf

Table Of Contents

- 1. Context**
- 2. Stakeholders**
 - 2.1 Pedestrians/Students**
 - 2.2 Cyclists**
 - 2.3 Businesses and Business Owners**
 - 2.4 Residents**
 - 2.5 Motorists**
 - 2.6 Montana State University**
 - 2.7 City of Bozeman**
- 3. Other Research**
 - 3.1 The Walk Audit Notes and Links**
 - 3.2 Parklet Notes and Links**
- 4. Plans for Existing Infrastructure**
 - 4.1 Crosswalk**
 - 4.2 Traffic Mirrors**
 - 4.3 Bicycle Lane**
 - 4.4 Curb Extensions**
 - 4.5 Replant Trees**
 - 4.6 Change MSU Parking Lot Infrastructure**
 - 4.7 Attractive and Efficient Lighting**
 - 4.8 Replacing Power Poles**
 - 4.9 Artwork and Murals**
- 5. Plans for New Infrastructure**
 - 5.1 Shared Pedestrian and Cycling Space**
 - 5.2 Angled Parking**
 - 5.3 Bury the Power Lines**
 - 5.4 Pedestrian Bridge**

5.5 Roundabout at 8th Ave. and College St.**5.6 Shared Space****6. Renderings of Potential Solutions****6.1 Rendering One****6.2 Rendering Two****7. Considerations****7.1 Business Owner Buy-In****7.2 Snow Removal****7.3 MSU Buy-In****8. Ideas for Community Outreach****8.1 Poll Board****8.2 Survey****8.3 ASMSU Communication****9. Conclusion**

1. Context

College St. is a main thoroughfare for cars to drive between Huffine Ln. and 8th Ave. The stretch of road between 11th Ave. and 8th Ave. sees significant car, pedestrian, and cyclist traffic. This portion of the street, unlike any other part, is lined by businesses on one side and Montana State University on the other. This means that there are likely more people using this stretch of road to access the businesses and the university, as pedestrians, cyclists, and motorists, increasing the confusion and congestion of traffic. Traffic counts done by the Montana Department of Transportation in 2016 and 2017 (location ID 16-3B-078) place the average number of vehicles who use this stretch of College St. in a 24-hour time period at around 10,421 vehicles. Additionally, traffic volume has increased by about 2,000 cars since 2005.

This section of College St. is a connector between the city and the university and is thus characterized by heavy foot traffic in the form of students, staff, and faculty as they transition between campus and the city. In addition, College St. is heavily impacted by the growing student and city population. This street needs to be redesigned with this growth in mind, especially since it currently is not functionally effective for the various uses the street sees and the amount of use it sees. Our team has partnered with the Western Transportation Institute to ideate traffic calming solutions for the stretch of College St. between 8th Ave. and 11th Ave. These are presented in two categories: plans that can be implemented within the existing infrastructure and plans that require new infrastructure that can be incorporated into the planned reconstruction of College St. between 8th Ave. and 19th Ave. during fiscal year 2022. These solutions aim to improve the safety, accessibility, customer appeal, and overall effectiveness of the section of College St. between 8th Ave. and 11th Ave.

2. Stakeholders

There are many groups of people who use and are impacted by College Street. The primary groups identified were students/pedestrians, cyclists, businesses and business owners, residents, motorists, Montana State University, and the City of Bozeman.

For the purposes of this redesign process, student pedestrians are the primary stakeholders. They represent the pedestrian group most vulnerable to traffic and there is much overlap between this group and other groups of stakeholders. Therefore, many of the ideas presented in this document prioritize student needs if there are competing interests.

2.1. Pedestrians/Students

Pedestrians are a primary stakeholder of a redesign of College St., especially since they are the most vulnerable users of the street from a safety standpoint. Students and other pedestrians were interviewed and asked whether they had any problems with the road, and surprisingly, most said that they had not. Several said that it was an inconvenience to have to wait for traffic before crossing and that visibility between parked cars was a concern. However, students also mentioned that they felt a controlled crossing might actually be more of an inconvenience if the crossing was not strategically placed.

Pedestrians were also asked about their general impressions regarding using the road every day, and why they feel that way. Mostly positive feedback was given, particularly about the student-oriented businesses on College St. In addition to interviewing pedestrians regarding their impressions of the street, how and where they crossed the street was observed. In general, they crossed at areas of convenience--in particular, parallel to the sidewalk that extends between Culbertson and Langford Halls across to Joe's Parkway, and at the intersection of 10th Ave. and College St. When designing for pedestrians, ease and accessibility of any implemented controlled crossings needs to be considered as well as where and how often the street is crossed.

2.2. Cyclists

Many MSU students, faculty members, and University area residents use College St. during their daily commutes. While there have been provisions taken for pedestrians and drivers, the road is especially unfit for cyclists. When interviewed, many cyclists stated the need for a bike lane on College St. This street is one of the main corridors that passes

from 19th Ave. to Willson St., so cyclists and drivers often utilize the thoroughfare. There are bike ramps near the 11th Ave. and College St. roundabout that are meant to guide cyclists on and off of the sidewalk. However, many cyclists do not understand the true purpose of these bike ramps. Additionally, the bike ramp that branches off of the sidewalk on the east side of the roundabout is positioned adjacent to the street's 2-Hour Parking spaces. Due to this, after utilizing the sidewalk surrounding the roundabout, cyclists are positioned to potentially run into the back of a parked car. If these cyclists move quickly and swerve into the street before running into the back of the car, they run the risk of colliding with traffic. Since there are more than 10,000 cars traveling along College on some days, the risk of colliding with cars is substantial. Taking cyclists into account when redesigning the stretch of College St. will result in increased safety and ease of use for cyclists.

2.3. Businesses and Business Owners

In addition to the obvious investments that are involved with the business owners, there were several others that had not been taken into consideration initially. The most important aspect for the owners of the businesses that I talked to was the business access, in particular access to parking spaces allocated to each business, implying that any change to the street would have to address these issues. The overwhelming support from business owners' that we saw for crosswalks also probably stemmed from related concerns. Optimism over the future of the street is there, but the city has to take into account the concerns that these businesses expressed.

2.4. Residents

Aside from business owners, those who live on-streets on and around College St. may be the most affected by any changes made to the street. A large portion of the residents are students at MSU and cross College St. each day to go to campus, sometimes doing so multiple times a day. One of the primary complaints of those who need to cross College St. is that there are no crosswalks at intersections that would allow them to cross the

street more safely. Additionally, due to both the proximity of the university and the numerous businesses and limited parking spots, many people who are not residents park in areas that are reserved for residents, thereby decreasing the parking options for those who live there. Residents have also expressed interest in making the section of College St. between 8th Ave. and 11th Ave. more visually appealing and safer. Residents may be more likely to spend time at the businesses if the street were redesigned to be more welcoming to pedestrians and customers as well as to be safer and to include ADA compliant sidewalks and other features.

2.5. Motorists

Motorists make up the majority of the traffic on College St. Many of this traffic is due to commuters using College St. as a way to move between Willson St. and Huffine Ln. Another large part is due to MSU students, staff, and faculty. While driving, motorists need to pay attention to the many confusing parts of College St. between 8th Ave. and 11th Ave. There are many pedestrians crossing the road, oftentimes not at road intersections where they technically have the right of way. Drivers have to constantly be alert to the many pedestrians crossing College St.

2.6. Montana State University

The university is a major stakeholder in this project because a redesign may affect their land use. By altering any parking areas near campus, the university is directly affected. A large portion of the pedestrian traffic on College St. consists of students who are commuting to and from campus. The majority of people driving and biking on the street also attend or work at MSU. While redesigning the street would require sacrifices from the MSU, the end result would likely benefit the university. During the walk audit we conducted on 17 October, 2019, student representatives of the university joined us to express their opinions about the street's issues. Each of the ASMSU senators described a need for a redesign project. The senators expressed concerns for the safety of MSU students and faculty members, as well as nearby residents. Additionally, the street does

not currently appeal to recreational users—the heavy users of the street travel through this corridor primarily due to convenience. There is no particular design appeal that would attract outside visitors to this portion of College St. If a redesign project was finished that encouraged recreation on College St., nearby businesses would gain customers and exposure, improving the vitality of this city district.

2.7. City of Bozeman

The City of Bozeman is the most influential stakeholder of this project. Funding for any changes to the corridor will be provided by the city. The reconstruction of College St. in fiscal year 2022 is headed by the city, so city buy-in to this project is very important. The city makes the final decision for how the street, sidewalks, and bike lanes will be redone. This document contains many solution suggestions that have varying costs and complications associated with them. The City will have to choose which solutions to actually implement.

3. Other Research

3.1. Walk audit notes and links

On October 17th, 2019, representatives from the Western Transportation Institute, ASMSU, and the Montana State University School of Architecture joined the in conducting a walk audit between 8th and 11th on College St. Over the course of this audit, a walkability rating was assigned to various segments. On a scale from 1 to 10, the segments overall received an average score of 5 from our participants. This was based on four criteria including land use/destinations, network connectivity, safety and accessibility, and design. The reasoning behind this mediocre score was a lack of crosswalks, narrow lanes, non-ADA compliant sidewalks, little space for snow storage, noisy traffic, and uninviting aesthetics overall. Further notes and discussions from the walk audit can be found in the full document linked below.

[CollegeStWalkAuditNotes.pdf](#)

3.2. Parklet notes and links

Through conducting the walk audit on October 17th, 2019, our group was better able to organize and understand public comments provided to us by the Landscape Design students from the College of Agriculture who hosted an on-street parklet event at College and 8th. For this event, a parking space was repurposed with couches and a tent for individuals to relax. Individuals who stopped were then asked to give their thoughts on how they would like to see College St. improved. An overwhelming percentage requested bike lanes, safe crossing facilities, pedestrian-oriented or exclusive space, and greater beautification of the buildings and empty lawn areas behind Johnstone and Culbertson Hall. The full list of commentary is provided in the link.

[*Park\(ing\)Day_CollegeStreetLifeIdeas.pdf*](#)

4. Plans that Work within Existing Infrastructure

There are several plans that can be implemented before and/or congruently with the planned reconstruction of College St. in fiscal year 2022. These plans generally have lower costs associated with them than any plans that require new infrastructure, however they can also have a great impact, especially if implemented soon. In this section, plans are ordered from being easier to implement to being more involved.

4.1. Crosswalk (see rendering two)

- One on the west side of the College and 10th intersection
- From the sidewalk that comes out between Langford and Culbertson Halls across to Joe's Parkway
 - Remove/block the entrance into Joe's Parkway that is right there; customers can use the two other entrances/exits. Create a one way parking system at Joe's (an entrance and an exit).
- These are the two places where we observed the most pedestrians crossing College between 8th and 11th

- All crosswalks need to be ADA accessible, even if curb extensions are not installed. (Curbs need to have “soft” ramped edges onto the crosswalk, not the current drastic edges between the sidewalk and the road)
- Could additionally install warning lights on either side of the street to alert cars to the presence of pedestrians

4.2. Install traffic mirrors to allow pedestrians to better see oncoming traffic

- Best place to install: by Joe’s Parkway across from the sidewalk that comes out between Langford and Culbertson Halls
- Current street parking prevents pedestrians from effectively seeing oncoming traffic

4.3. Incorporate a bicycle lane (see rendering two)

- Remove street parking
 - Would also improve ability for pedestrians to see street traffic
- Turn space into a bicycle lane
- Could be done on the southern and/or northern sides of the street

4.4. Curb extensions at intersections (where crosswalks may be put in)

- Makes curbs and sidewalks ADA compliant
- Allows pedestrians to see traffic
- Makes pedestrians more visible to traffic

4.5. Re-plant/plant trees on north and south side of College St.

- Widen green space
- Or turn into sculpture area

4.6. Block entrance/exit to MSU residence hall parking lot on College St.

- Will limit traffic on College and increase traffic on Harrison
- Less congestion while drivers try to pull out of or into the parking lot
- Could extend the sidewalk across the existing entrance/exit
- Could place barriers across the existing entrance/exit

4.7. More attractive and efficient lighting (see rendering one)

- Improve aesthetics and visual appeal of the street and business area
- Strings of lights across the street (see figure one for an example)



Figure 1. Image of Larimer Square in Denver, CO. The string lights used on the street provide a good visual and example of how such lights could be incorporated. This image also shows how these lights can improve the visual appeal and imbue a more welcoming feel for pedestrians and customers of businesses.

4.8. Replace existing poles that hold up power lines

- Current poles are old and leaning and have a large number of old staples in them from event posters
- Staples and old posters make area look more unattractive (are more visible as of Nov. 13th, 2019 when trees along the north side of College St. were removed)
- Replace with a material that does not allow posters to be stapled to poles

4.9. Artwork or murals on buildings adjacent to roads

- The current buildings on the South side of the street (Johnstone and Culbertson Halls) are not visually appealing, and there is an opportunity to create visual appeal on the sides of the buildings
- Artwork would not only make the area more appealing for pedestrians, but also appealing visuals that may slow motorists down too

5. Plans that Require New Infrastructure

In order to fully prepare for continually increasing traffic in Bozeman both along the College St. corridor as well as from MSU, more major improvements should be implemented, many of which require new infrastructure. Several ideas presented in this section are less feasible due to differing reasons, however they present real solutions to problems. Even if an idea is not incorporated into the redesign in its entirety, parts can be incorporated to make College St. a more safe and consumer-friendly street.

5.1. Turn sidewalk on the south side of College St. into shared pedestrian/cyclist space (see rendering two)

- “Extension” of the shared cyclist and pedestrian space on the southern side of College St. between 11th Ave. and 19th Ave.
- Could widen and re-pave existing sidewalk
 - Remove street parking on one side of the street
 - Widen into the grass next to the sidewalk

5.2. Create angled parking and move sidewalk further back from street

- Could create an entirely new pathway in the grassy area on the MSU side of College St.
- Space of the current sidewalk could be repurposed into angled parking
- Would provide a barrier between pedestrians/cyclists and the road
- Would create considerably more spaces for parking

5.3. Bury power lines beneath sidewalk and street

- Would make the northside of College St. feel more open
- Provides potential for other projects on the street. Examples include:
 - Lighting
 - Shared bike/pedestrian pathway
 - Different parking designs

5.4. Pedestrian bridge over College St.

- Remove the need for cars to come to a complete stop; would allow the thoroughfare to maintain flow and therefore meet the needs of multiple users at once
- Could create a better sense of community if compounded with upgrades to the street's aesthetics as a whole
- Could be combined with attractive lighting and mural art
- There are many design options, however incorporation of a ramp would ensure ADA compliance

5.5. Roundabout at the intersection of 8th Ave. and College St. (see rendering two)

- This would increase safety and reduce congestion of College St.
- Construct a roundabout similar to the one at the 11th Ave. and College St. intersection
- Include convenient and safe crosswalks for pedestrians
- Make the roundabout/intersection more aesthetically pleasing

5.6. Shared space (see rendering one)

- Reduced speed limit
- Cars, pedestrians and cyclists share the same space without much signage
- Different textured street between 8th Ave. and 11th Ave.
 - Options could include cobblestones or brick
- Make barriers/physical constructions to get people to slow
- Options could include flower planters and/or sculptures
- Decreased speed and potential incorporation of visually appealing barriers would increase the aesthetics
- All involved individuals act with increased caution due to the more chaotic nature of the space
- Promotes eye contact and negotiation, allowing for more efficient passage through the space but decreasing collisions

6. Renderings of Potential Solutions

6.1. Rendering one

In the first rendering shown below, a shared space has been depicted. The purpose of this rendering is to visualize how a more aesthetic and pedestrian-oriented space would not only force drivers to be cautious, but create an atmosphere that supports community-focused interactions. This environment is created through three main

changes: 1. Resurface the road with a non-traditional material, 2. Improving the lighting of the street, and 3. Removing street parking.

Resurfacing the road could be done with materials such as colored concrete, brick, cobblestone, or other materials. This change would invoke a sense in drivers that the space is not oriented towards vehicles, thereby reducing their speed in response. Adding strings of lights over the width of the street would not only promote better visibility, but again signals to drivers a sense of limited space and the need for caution. Lights such as these would additionally improve the visual appeal of College St., encouraging drivers and pedestrians to enjoy spending time on this portion of College, rather than seeing it as an arterial to be rushed through without consideration of its businesses and potential for culture. Removing street parking entirely would allow pedestrians, cyclists, and vehicles to make eye contact further in advance and negotiate movements around one another more effectively. Currently, there are not enough spaces to justify the impediment of visibility such on-street parking causes. A shared space would be more efficient because traffic could theoretically move at a slower pace continually versus being forced to come to a complete stop with every pedestrian. The detrimental effect of having to repeatedly stop can be seen in the congestion on 11th Ave. wherein crosswalk after crosswalk keeps cars trapped for minutes on end, which can result in aggressive and dangerous behavior.



Rendering 1. Depiction of a shared space. Cobblestoned streets would provide a different texture, alerting drivers to slow down. A shared space for pedestrians, cyclists, and motorized traffic would decrease traffic speeds and increase communication among all the involved parties. String lights across the street would improve lighting as well as improve the visual appeal of the street.

6.2. Rendering two

Several smaller-scale proposals are shown in the second rendering. First, the intersection at 8th Ave. and College St. could be converted into a roundabout as seen at the intersection of 11th Ave. and College St. Provided the high volume of traffic passing through this area on a daily basis, many confusing interactions take place at this four way stop. Often, cyclists will cut through the intersection without stopping, vehicles will struggle to negotiate whose turn it is to go, and pedestrians feel uncomfortable holding up so many various lanes of cars. This intersection additionally can cause congestion on College St. during peak traffic hours as each car has to stop and wait for their turn to cross the intersection. By making this a roundabout, all involved parties could navigate with a much clearer sense of organization and efficiency.

To improve the safety and comfort of cyclists, on-street parking could be removed and converted into a bike path. This would not only drastically improve visibility, but it would promote cyclists to behave more like vehicles. Currently, much of the confusion comes when cyclists behave as both pedestrian and vehicle. When interviewed, cyclists often stated that they feel roads neglect their needs and therefore act independently. However, by providing them with a designated and separated space, such as with green-painted bike lanes, cyclists are much more willing to follow these rules, allowing vehicles to better predict and work around these individuals.

To increase the safety of pedestrians and aid them in crossing College St., flashing crosswalk could be installed, modeled after the one found on Kagy and S. 7th Ave. Through installing a crosswalk, pedestrians would be drawn to the safety and convenience of a designated crossing space, reducing the unpredictability and confusion caused by the current jay-walking. To further guide pedestrians to the crosswalk and deter illegal crossings, art installations or other barriers could separate the sidewalk and street, guiding users towards using the more convenient crosswalk. This would also be beneficial in improving the street's aesthetics.

Lastly, a pedestrian path could be placed several feet into the grassy area of the lawn between Johnstone and Culbertson Halls and the street. Not only would individuals

feel safer and more at ease through having greater separation between pedestrians and road traffic, but shifting the location of the sidewalk would provide space for the aforementioned bike lane without compromising parking (if this aspect could not be removed). Another option regarding the bike and pedestrian facilities would be to combine the two into a single shared pathway, similar to the path extending along College St. between 11th Ave. and 19th Ave. This could allow on-street parking to remain if the path were cut into the grassy area behind the residence halls.



Rendering 2. Visualization of many of the ideas presented above. These suggestions primarily work within the existing infrastructure. They are also geared toward increasing the safety of pedestrians, cyclists, as well as motorists.

7. Considerations

It is important to recognize that there are several outside factors that will be crucial to consider for the redesign of College St.

7.1. Business owner buy-in

- To attract more customers, many business owners would like to see an increase in the available parking spaces for potential customers.
- Increasing safety and aesthetics will draw more foot traffic and increase the number of customers.
- The crosswalk that will cross from between Langford and Culbertson Halls to Joe's Parkway may affect the volume of traffic to and from the store, so may be a hindrance to full support from that business. However this crosswalk could increase foot-traffic from the university to offset any change in vehicle traffic.

7.2. Snow removal

- Cobblestones or other differently textured material for the street may hinder snow removal.
- Snow will still need to be able to be removed efficiently especially since many different types of traffic that use this section of College St.

7.3. Buy-in from MSU

- The south-side of College St. directly borders the university's property, so MSU would have to support any planned changes that would affect their property.
- Any changes to College St. between 8th Ave. and 11th Ave. directly affect the university, so MSU's support is beneficial.

8. Ideas for Community Education and Outreach

There are several important factors that go into a successful integration into use by the community. Public awareness to the efforts being made before, during, and after the implementation of the project are vital to the long-term success.

8.1. Poll board

- Something people can fill out and answer right away as they are at the location of interest.
- Installing temporary suggestion collection methods.
 - Bulletin board or large sheet of paper to collect
 - Suggestion box

8.2. Survey

- Open to the public; including pedestrians, students, business owners, cyclists, residents, and commuters through the area.
- Maximizes the input that the public can have in the considerations for the redesign of College St. and other areas.
- The form will not expire and therefore will show changes in opinion over time if they exist.
- The survey can be edited to tailor the information desired by the group researching public opinion.
- The links can be paired to a QR code and other forms of convenience marketing that allow for outreach.
- In addition, the capacity for the effectiveness of this campaign is limited to the vocal public awareness that occurs in association with this form.

[Hyperlink to Google Form](#)

8.3. Communicating more with ASMSU to get student input

ASMSU is aware of projects happening all around the university, and they are able to kickstart new research. A more open stream of communication between the City of Bozeman and ASMSU would allow students to speak for their community.

9. Conclusion

From a series of stakeholder interviews, our group determined that the stretch of College St. between 8th Ave. and 11th Ave. could be majorly improved. Students and faculty of MSU, neighborhood residents, and people commuting by way of College St. all use the corridor in their daily routines. Pedestrians, cyclists and motorists may all experience uneasiness when traveling along College St. because the street's design is not particularly safe. We determined that pedestrians are the primary stakeholders, as they are among the most frequent as well as most vulnerable users. Changes made to improve the safety and accessibility of sidewalks and crosswalks would greatly improve the street's overall walkability. While the ideal improvements are more expensive and require new infrastructure, these would not only increase safety and accessibility, they would also greatly enhance the visual appeal of the street. There are also a number of simpler and less involved redesign options that can immediately improve College St. Pedestrians, cyclists, drivers, business owners, residents and any other frequent users of College St. would all benefit from the ideas presented here.