Downtown Dubuque Alternative Transportation Action Plan

IOWA Initiative for Sustainable Communities

THE CITY OF DUBUQUE
Masterpiece on the Mississippi

IOWA School of Planning and Public Affairs

Downtown Dubuque Alternative Transportation Action Plan

Prepared by:
Elizabeth Brackett
Beyza Cikmaz
Evan Doyle
Gabriel Fordjour

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City of Dubuque:
Gina Bell, Director of Sustainability
Jason Duba, Assistant Planner
Steve Sampson Brown, Engineering Project Manager

University of Iowa School of Planning and Public Affairs
Jovana Kolasinac, Design Specialist
Travis Kraus, Associate Professor of Practice and Director, Iowa Initiative for Sustainable Communities
Dr. Steven Spears, Associate Professor of Instruction
Dr. Ja Young Kim, Visiting Assistant Professor

Table of Contents

A bicycle storage area in downtown Dubuque

Executive Summary

The City of Dubuque is determined to improve alternative transportation mobility, accessibility options, and sustainability, but the missing links to these problems are actionable steps to achieve the city's goals. This Transportation Action Plan (TAP) outlines practical action steps to expand Dubuque's transportation system by incorporating multiple transportation types and enhancing connectivity and mobility for residents. There is an apparent, strong desire from city leaders to find transportation solutions, shown through the numerous city plans passed by the City Council. However, the built environment and current services frequently limit residents' choices. By implementing the recommended actions outlined in this TAP, Dubuque can address the pressing challenges it faces and pave the way for improved alternative transportation accessibility, safety, connectivity, and comfortability.

This 5-year action plan serves as a concise roadmap to guide the present and future alternative transportation planning, design, and implementation within the city's downtown and surrounding neighborhoods. While comprehensive transportation planning is important, for the sake of inspiring more actions now the project team decided to start with a plan focused on downtown to see early success with the hopes of sparking more development across other parts of the city in the near future. The primary focus of this TAP is providing strategies and actions to enhance pedestrian and cyclist safety, promote public transit usage, and foster comfortability and convenience. The plan is rooted in four overarching principles – sustainability, equity, safety and connectivity, and street transformation – which create the groundwork for the recommended steps to inform the city's alternative transportation decisions. Each action within the plan supports one or more of these four guiding principles.

Through an analysis of existing plans, data collection, community engagement, case studies, and related research, the team has identified four key strategies. These include bicycle infrastructure improvements, parking management, pedestrian infrastructure improvements, and multimodal amenities. Successful implementation of these recommendations can significantly advance Dubuque's alternative transportation objectives and support city officials in meeting their Climate Action Plan targets.

Introduction

The Downtown Dubuque Alternative Transportation Action Plan (TAP) is a short-term action plan that will serve as a focused strategy for present and future alternative transportation initiatives within Dubuque's downtown and adjoining neighborhoods. The TAP merges the prior goals and objectives outlined in existing Dubuque plans to create practical, actionable steps. The City's previous plans identify alternative transportation infrastructure as an essential component to reducing carbon emissions, combating climate change, promoting equity and active travel, and enabling the movement of people within and around the downtown area.

This plan assesses the current state of Dubuque's alternative transportation system, which is characterized by ambitious goals and visions with, to date, little successful implementation of those goals. Among the city's existing goals are reducing greenhouse gas emissions by 50%, reducing vehicle miles traveled (VMT) by 10%, and implementing complete street principles on 25% of Dubuque streets by 2030 (Dubuque Climate Action Plan, 2020).

Despite adopting numerous alternative transportation-related plans in the past, the City of Dubuque has not had a tangible progress in realizing many of the transportation goals outlined in those plans since their inception. The team analyzed the city's downtown alternative transportation system across three infrastructure categories: bicycle, pedestrian, and parking, to create an effective TAP. The team individually and holistically analyzed these categories to create a plan for a cohesive, multimodal transportation system in the city of Dubuque's downtown. By analyzing existing conditions in the city and researching similar cities and case studies, the team generated actions aimed at achieving the city's alternative transportation goals.

Bicycle markings in downtown Dubuque

Community Characteristics

77.2%	7.5%	1.3%	0.3%	3.4%	9.4%	0.9%
Drive alone	Car pool	Use Transit	Bike	Walk	Work from home	Other

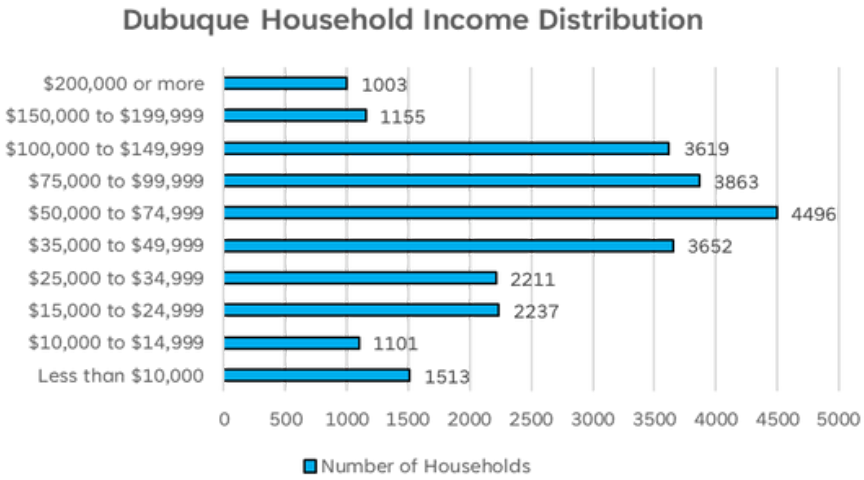
Source: ACS 2021 5-year estimates

59,329
Dubuque's Total Population

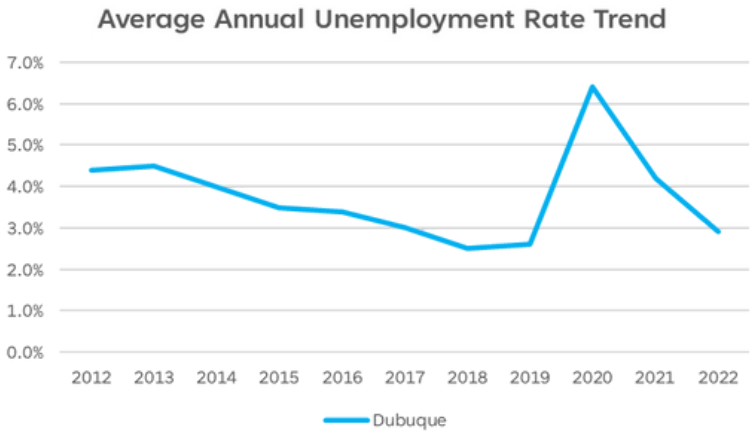
Source: ACS 2021 5-year estimates

25.2%
of households downtown do not have access to a car

Source: ACS 2021 5-year estimates



Source: ACS 2021 5-year estimates



Source: Iowa Workforce Development

Lots of Planning, Little Implementation

The City of Dubuque has been proactively planning for alternative transportation for over two decades, evidenced by the passage of almost twenty transportation plans during this time. These plans have covered a wide range of concerns that remain relevant to the city today, including items like better transportation network connectivity; additional bicycle infrastructure, bike lanes, and safety education; urban design enhancements such as better street lighting, green and complete streets, or mixed-use developments; better parking management; and improved transit services.

Figure 1 shows that plans addressing these topics have been passed by the Dubuque City Council as early 2000 and as recently as 2023. Notably, some themes have recurred up to eleven times across these plans. The comprehensive scope of these previously adopted plans has laid the groundwork for alternative transportation developments that align with the city's vision for improvements to the system. Further, whether these plans are long- or short-range, they provide many opportunities for Dubuque to improve its existing transportation system and better meet the needs and desires of Dubuque residents.

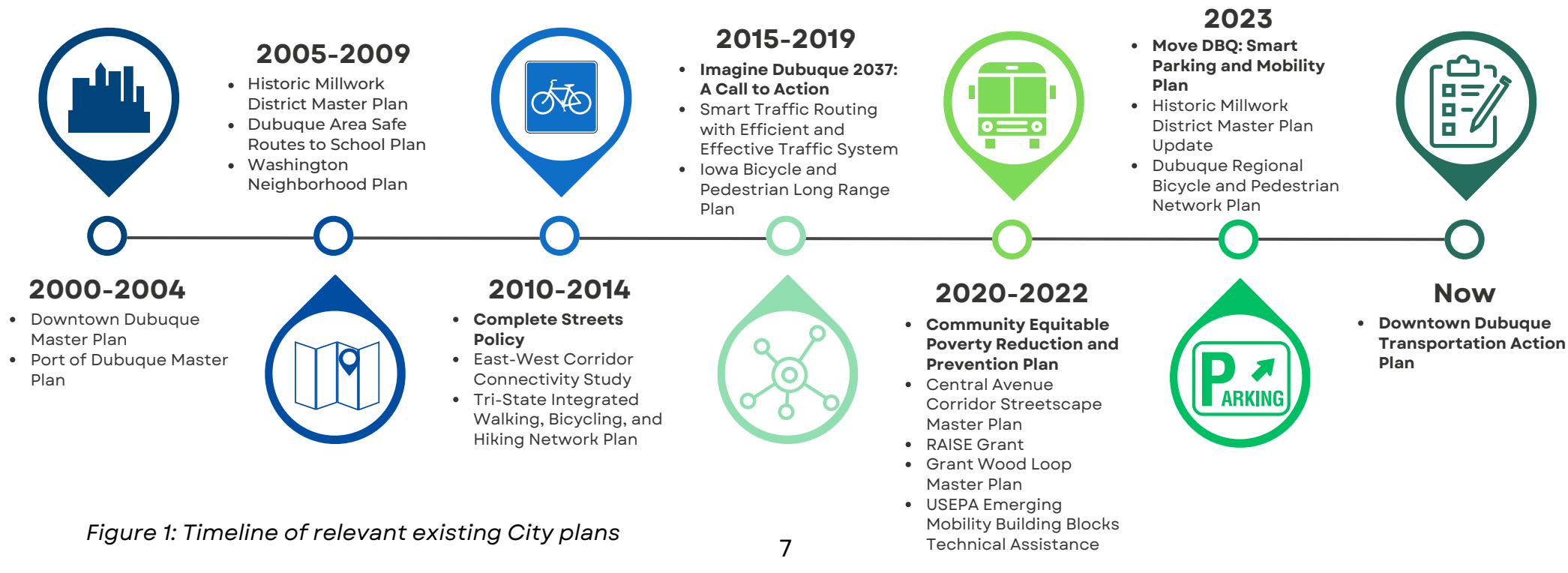


Figure 1: Timeline of relevant existing City plans

The City's adoption of a range of alternative transportation-related plans is a progressive step towards addressing the identified issues. However, while the adoption of these plans is a step forward in fixing those problems, merely adopting the plans falls short of achieving the intended outcomes.

Dubuque has yet to turn many of the aspects of the plans in **Figure 1** into tangible actions. The list of transportation-related topics included in **Figure 2** are all still goals for the city in 2024. Despite the best intentions, the past two decades of planning for an improved transportation system has resulted in few actions by the city and little substantive change. Building on the city's prior goals, this plan presents action steps that can create change in Dubuque.

Transportation demands of new and existing Dubuque residents are changing. Providing new ways to navigate and explore the city through walking, biking, and transit will allow for increased mobility, a better-connected transportation network, a vibrant city center, and an improved quality of life for many Dubuque residents.

Figure 2: Goals from existing City plans

Through research, community engagement, and an analysis of downtown Dubuque's transportation landscape, the project team has identified a set of challenges confronting the area. These challenges include inadequate infrastructure for alternative transportation modes, limited transportation diversity, fragmented transportation connectivity, a steep bluff that separates downtown from the rest of the city, and a parking system that occupies much of the space downtown. This plan proposes feasible solutions that will mitigate the negative impacts posed by these challenges to Dubuque residents.

Residents exceedingly rely on automobiles as their primary mode of transportation, with 87.8% of workers in the Dubuque Metropolitan area using an automobile to get to work in 2021. Of the 9 metropolitan statistical areas in Iowa, this percentage is only surpassed by the Quad Cities and Sioux City (5-Year ACS Data, 2021). Part of this reliance stems from the scarcity of pedestrian and bicycle infrastructure which has low connectivity to essential city services and destinations. Without adequate infrastructure for pedestrians and bicyclists, a car is the most logical option. In downtown Dubuque, pedestrian infrastructure is relatively adequate with well-maintained sidewalks throughout, but available

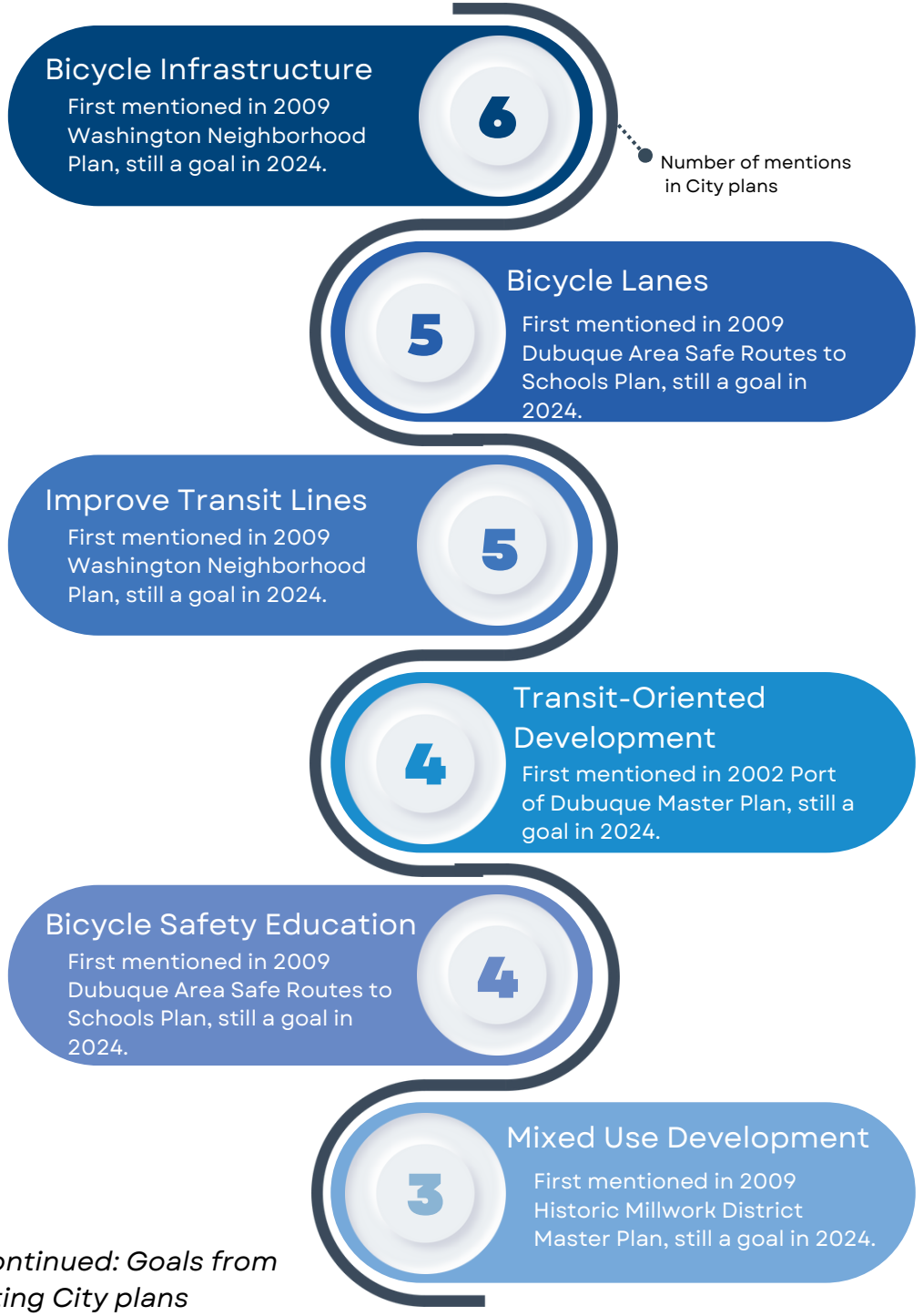


Figure 2, continued: Goals from existing City plans

bicycle infrastructure is notably lacking with zero dedicated, on-street bike lanes in the city. Bicyclists are left with few options to ride their bikes: either utilizing roadways with sharrows, riding on trails, or attempting to ride on roads with no bicycle markings. This makes biking in Dubuque difficult and potentially dangerous but keeps driving easy and convenient. The lack of bicycle infrastructure exacerbates automobile dependence and restricts opportunities for those who do wish to bike or do not have a personal vehicle. This is especially important because approximately 25% of households downtown do not have access to a vehicle (5-year ACS Data, 2021). With the lack of alternative transportation infrastructure, residents who do not own a vehicle may have trouble moving throughout the city for work, school, errands, or recreation.

Compounding the low rates of walking and biking is the decrease in the utilization of the city's public transportation system, the Jule. The system has seen a 11.7% decrease in ridership from fiscal year 2016 to fiscal year 2019 (Equitable Poverty Reduction & Prevention Plan, 2021). Ridership has continued to decrease due to the COVID-19 pandemic. Since 2019, the system has continued to search for ways to increase ridership. Adding diversity in transportation modes like walking, biking, and public transit will enhance the overall transportation network, providing residents with expanded and more sustainable transportation options tailored to their daily lives.

Transforming downtown Dubuque into a vibrant destination for residents and tourists must include enhancing its urban design. Currently, downtown Dubuque is tailored to automobile usage, with most roads designed to accommodate cars rather than pedestrians, making many streets uncomfortable for foot traffic. Cars travel at high speeds on main downtown roads like Central Avenue and White

Locust Street, with parking and a transit shelter

Street, discouraging many pedestrians from walking. The reliance on automobiles not only diminishes transportation diversity but also hampers overall mobility.

Moreover, Dubuque's overabundance of parking infrastructure occupies valuable space that could be repurposed for other uses. While there are over 30-acres of off-street parking availability downtown and on-street parking spaces lining both sides of nearly every street, much of this parking space remains underutilized. During peak parking hours (in other words, the busiest parking time of the day), Dubuque's on-street meters are just 31% occupied and the off-street parking lots and garages are only 26% occupied (Move DBQ, 2023). This low utilization of downtown parking provides Dubuque with the flexibility and opportunity to reimagine these often-vacant spaces into more public-oriented purposes, effectively revitalizing downtown Dubuque and fostering a more dynamic urban environment.

Lastly, addressing the mobility challenges posed by the bluff that divides the downtown area from the west side is crucial for improving transportation accessibility for Dubuque residents. Many pedestrians and bicyclists find navigating the hilly roads uncomfortable and unsafe, leading to physical exhaustion and a dangerous environment when trying to navigate the bluff. Mitigating this challenge will take innovative and creative solutions.

This plan will address in greater detail the challenges Dubuque faces and propose actionable steps to mitigate them effectively. By confronting Dubuque's excessive reliance on automobiles for transportation, the implemented action steps will:

- Improve overall mobility and connectivity by providing a wider range of viable transportation options that are less expensive than automobile usage,
- Reclaim downtown space formerly occupied by unused parking for other community priorities,
- Increase safety and comfortability for all pedestrians and bikers,
- Lower total greenhouse gas emissions by encouraging walking and biking amongst residents and visitors, and
- Create a vibrant urban, downtown space that is desirable for both residents and tourists to visit.

Methodology

To develop solutions for the transportation challenges in downtown Dubuque, the project team took on a multifaceted approach to analyze the transportation system. Components of the system were analyzed individually and integrated holistically to identify interconnected issues and create successful solutions. Using a diverse set of methods, including both quantitative and qualitative data analysis, the team conducted an examination of the city's downtown alternative transportation system. These methods include the collection of community data and characteristics, a stakeholder analysis, public engagement events and activities, an inventory of pedestrian, bicycle, and parking infrastructure, and research into the best practices and successful case studies from other cities. The use of these methods and analyses resulted in actionable recommendations for implementation by the city.

Stakeholder Analysis

A TAP requires identifying community members that may be affected by the plan's implementation. Dubuque's transportation system impacts both residents and those traveling from outside of Dubuque.

To understand the individuals and groups that are impacted by Dubuque's transportation system, the project team conducted a stakeholder analysis. The analysis process enhanced the understanding of the specific individuals and groups affected and their influence over transportation system changes. Identified stakeholders include sub-groups of individuals, formal entities like non-profits or organizations, and government bodies, among others.

Figure 3 presents a list of stakeholders, categorized by their level of impact and influence. Highly influential stakeholders are placed on the right side of the matrix, while historically less influential ones are placed on the left. Those at the bottom of the matrix are expected to be less impacted by the TAP, while those at the top are expected to be more impacted. **Appendix A** supplements this information with a detailed list of identified stakeholders and their relevance to the TAP. Stakeholder consideration was integral to the planning process and informed the selection of groups to engage with during community outreach events. This was done to identify those that can impact and be impacted by the project.

Stakeholder Analysis

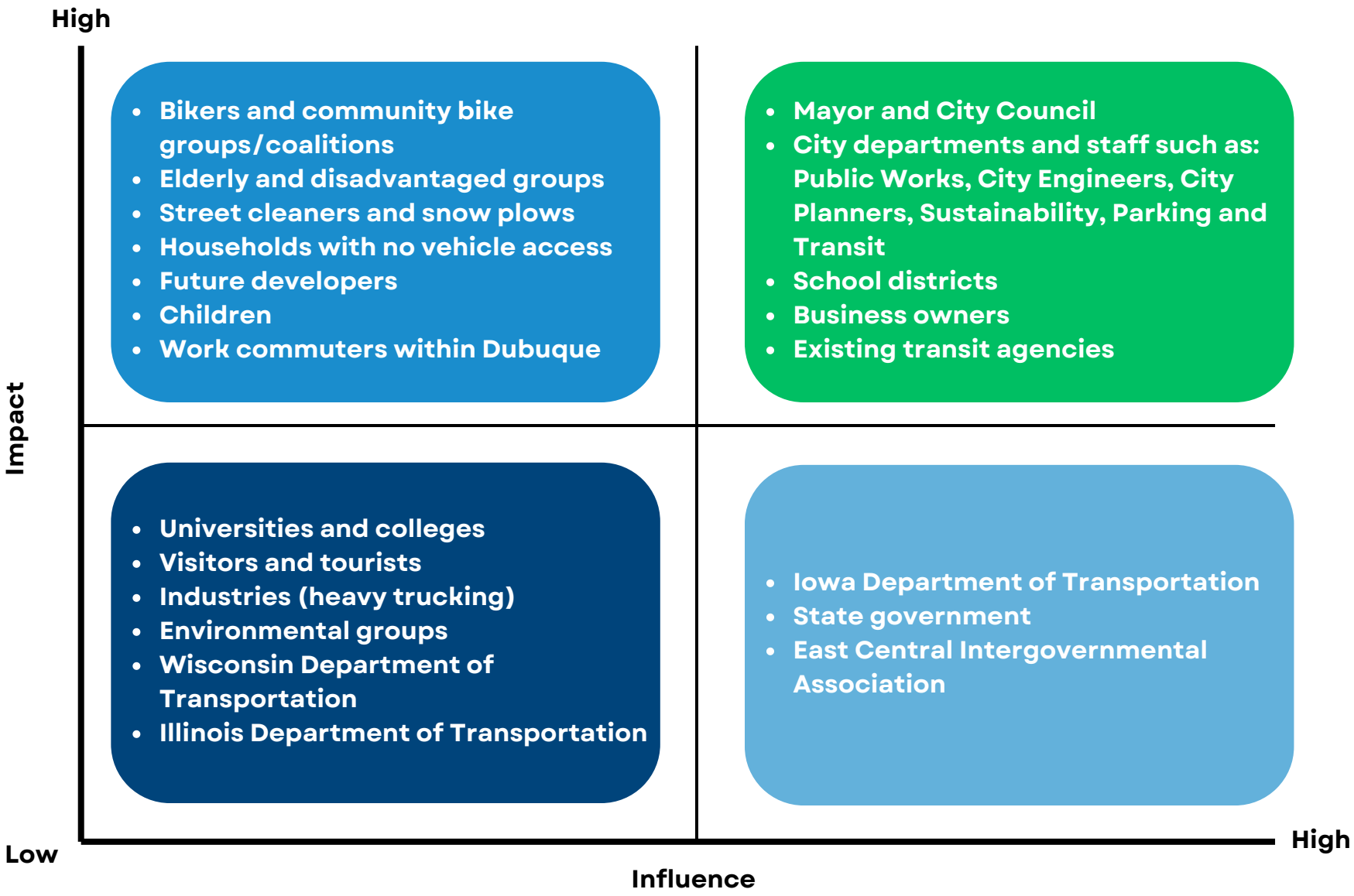


Figure 3: Stakeholder Analysis Matrix

Community Engagement Events

After identifying stakeholders that will be impacted by and are influential to the implementation of the TAP, community engagement was conducted to gather stakeholders' opinions. Community engagement is a crucial step in planning projects to ensure that the final plan reflects the desires and needs of Dubuque's residents. The project team conducted four separate visits to Dubuque during the community engagement process. Even though the outcomes of these events do not represent the entire community, they give essential ideas and concerns that were relevant to the project recommendations. The events are detailed below.

IISC Kickoff Event

The IISC Kickoff Event took place on September 8th, 2023. During this visit, project partners introduced the needs of Dubuque, discussed project goals, and toured the city to understand the existing transportation conditions. This event gave initial insights into the planning efforts in Dubuque and why the TAP is necessary.

Farmers' Market Interviews

On October 21st, 2023, Dubuque residents were interviewed at the Dubuque Farmers' Market about existing transportation conditions in Dubuque and their feelings about alternative transportation options. Interview question topics included parking, driving, alternative modes of transportation, and proposals for the TAP. The discussion guide is displayed in **Appendix B**.

Experienced Alternative Transportation Users Focus Group

After a successful event with residents from around Dubuque, a focus group event took place on October 29th, 2023, for experienced alternative transportation users at Backpocket Brewery in downtown Dubuque. The event was tailored specifically to bicyclists and pedestrians with experience using alternative transportation in Dubuque. Bicycle groups, running clubs, and other mobility activist organizations were invited to attend the event. Invited groups include:

- Dubuque Running Club
- The Flat Iowa Society Biking Club
- Tri-State Trail Vision
- Urban Bicycle Food Mission
- Dubuque Bike Coop
- Mississippi Valley Running Association
- Dubuque Bicycle Club
- Dubuque Forward

The participants were encouraged to use alternative transportation to travel to the event, where they were then asked about their commute patterns, both regularly and on the event date. This discussion covered topics such as emotions regarding specific routes and streets, their needs and desires as bicyclists and pedestrians, and overall feelings of safety and comfortability while using alternative transportation modes in Dubuque. The event invitation and discussion guide are displayed in **Appendix C**.

It is important to note that this event was not representative of the entire population of Dubuque; instead, it focused on experienced individuals who frequently used alternative transportation modes. Eleven participants attended: three pedestrians, six bicyclists, and two drivers.

Residents viewing plan proposals at "Our City, Our Future" event

Our City, Our Future Event

On April 6, 2024, Dubuque residents participated in an event titled "Our City, Our Future: Affordable Housing and Alternative Transportation" at the Dubuque Multicultural Family Center. During this event, all Dubuque residents had the chance to review posters about the project, engage with the project team, and provide comments and feedback on the project recommendations. The team presented preliminary project recommendations to the public and they had the opportunity to provide feedback on what they liked or disliked. The team used this information to amend the recommendations as necessary. Approximately 50 people attended the event, with 17 leaving written comments for the team. The comments and feedback collected during this event were used to determine the final recommendations presented to the city. The event's posters presented to the public are displayed in **Appendix D.**

Publicity for the event was conducted in multiple phases. Initially, word-of-mouth promotion was facilitated by city workers and residents. This was followed by invitations extended to specific stakeholders. Finally, a press release and posts on the City's social media channels were utilized to further publicize the event.

Pedestrian Infrastructure Analysis

To explore the existing pedestrian conditions in Dubuque and inform the forthcoming strategies and action steps, an in-depth pedestrian infrastructure analysis was conducted. This analysis involved examining specific street segments within downtown Dubuque and analyzing the pedestrian infrastructure. The streets selected for analysis were based on the existing Jule transit routes to promote multimodal transportation. The streets analyzed are shown in **Figure 4**.

Using Google Street View, each street segment was examined for pedestrian infrastructure characteristics including the number of travel lanes, sidewalk width, sidewalk type (brick, concrete, etc.), sidewalk condition, number of streetlights, presence of street trees, presence of a grass buffer between the sidewalk and street, presence of pedestrian amenities (benches, trash cans, etc.), pedestrian-oriented signage, and presence of transit stops.

Upon completion, the analysis identified areas within the project area lacking the infrastructure to ensure pedestrian safety and comfort in downtown Dubuque. This spatial information informed the strategies and actions aimed at promoting pedestrian activity and upgrading pedestrian infrastructure.

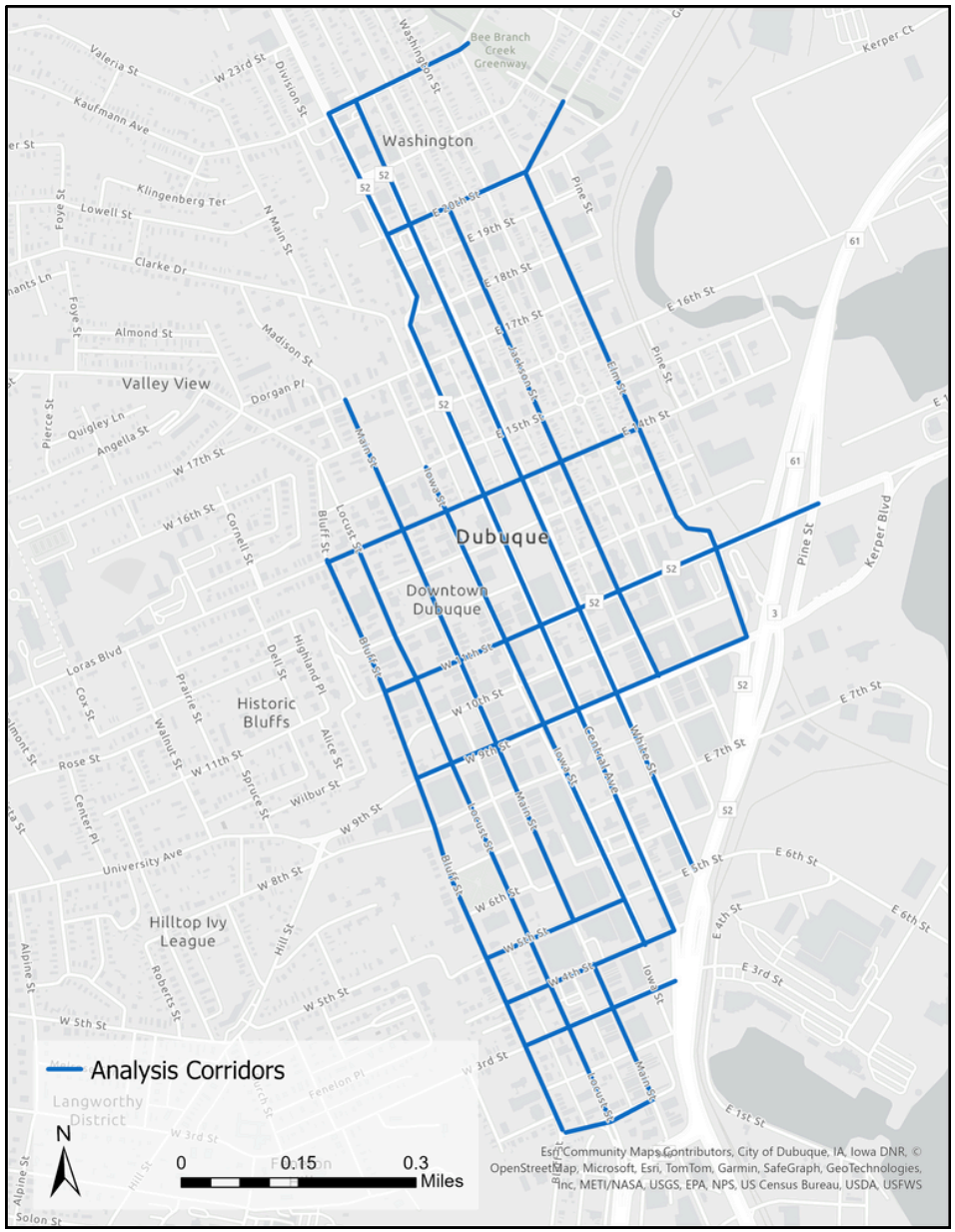


Figure 4: Infrastructure analysis corridors

Bicycle Infrastructure Analysis

To identify the streets in Dubuque where existing conditions are conducive to street transformation, a bicycle infrastructure analysis was conducted in conjunction with the pedestrian infrastructure analysis. This analysis involved examining specific street segments within downtown Dubuque and assessing street characteristics. The streets selected for analysis were the same as those utilized for the pedestrian infrastructure analysis, as shown in **Figure 4**.

Using Google Street View and public records from the City of Dubuque and the Iowa Department of Transportation (DOT), each street was examined for the average annual daily traffic (AADT), Iowa DOT road classification, number of travel lanes, number of roundabouts, average speed limit, bicycle and pedestrian safety score, amount of on-street parking, street width, and adjacent land use typology. The outcome of this analysis, combined with case studies and input from community engagement events, aided in identifying streets that can be transformed into safe, comfortable, and desirable routes for alternative transportation modes.

Parking Inventory

The supply of public parking in Dubuque makes parking personal vehicles downtown convenient and accessible. To gauge the demand for parking, the findings from the Move DBQ plan on peak parking utilization rates for on-street parking by block and in downtown parking garages were utilized. The team also gathered the total acreage of total and just public off-street parking in downtown Dubuque. The total acreage is the amount of land that both private and public parking ramps occupy in the downtown area. Using data on the total acreage of private and public off-street parking for downtown Dubuque, the project team separately computed the total acreage of just public off-street parking for downtown Dubuque to determine the amount of parking that Dubuque has more direct control over. The parking analysis guided both the bicycle infrastructure and parking management strategies in the TAP.

Research and Case Studies

To select case studies, municipalities that have successfully implemented transportation initiatives like those in the TAP were reviewed. The project team chose case studies based on their relevance to the strategies outlined in this TAP, with a focus on cities that have tackled comparable challenges in urban design, e-bike rebate programs, street transformations, and navigating the bluff. Factors such as city size, effectiveness of measures, and replicability of solutions in Dubuque guided the selection process. After the case studies were selected, the project team studied the outcomes, lessons, and action steps which ultimately informed the creation of strategies and actions for Dubuque. The relevant case studies and research findings are detailed in **Appendix E.**

People walking along Jackson Street

A Jule bus driving on Locust Street

Plans Versus Reality

Enhancing alternative transportation options has been a recurring goal in Dubuque. However, while some of their goals have made recent progress, many of these actions have not yet been fully realized. To better understand the current conditions of the city's alternative transportation system, this section highlights some of the city's previously established goals and discusses the project team's findings on the progress made on those goals. The findings come from a mix of methods outlined above. The city's previous goals include:

- Sidewalk improvements including sidewalk widening, street furniture, and lighting,
- Bicycle infrastructure and bicycle lanes,
- Bicycle safety education,
- Complete and green streets with traffic calming measures,
- Bicycle and pedestrian network connections,
- Parking management,
- Transit line improvements, and
- Transit-oriented, mixed-use development.

Street trees and sidewalks on Main Street in Dubuque

Sidewalk Improvements, Street Furniture, and Lighting

The city has made it a goal to improve conditions for pedestrians through infrastructure improvements such as street furniture, sidewalk widening, and street lighting. Through the pedestrian analysis, the current conditions of Dubuque's sidewalk infrastructure have been analyzed. Overall, Dubuque's sidewalks are in good condition and cover all of downtown. Approximately 60% of surveyed blocks had sidewalks that were rated "very good" or "excellent."

However, there are some areas for improvement, particularly concerning street trees, street lighting, and the creation of buffers between roadways and sidewalks. 55% of surveyed downtown blocks lacked any presence of street trees. Trees are a crucial street component as they are proven to enhance air quality, mitigate flooding, and enhance street aesthetics (Mullaney, et al., 2015). The analysis also revealed that many downtown blocks had insufficient street lighting, particularly in the northern neighborhoods, as shown in **Figure 5**. Streetlights enhance pedestrian and cyclist safety and are especially important during nighttime.

70% of downtown blocks lacked a buffer between sidewalks and roadways. These buffers, typically a few feet wide and covered in grass, play an important role in ensuring pedestrian comfort and safety by separating them from vehicle traffic. By addressing these areas for improvement, Dubuque can improve pedestrian experiences and create a more aesthetically pleasing urban environment.

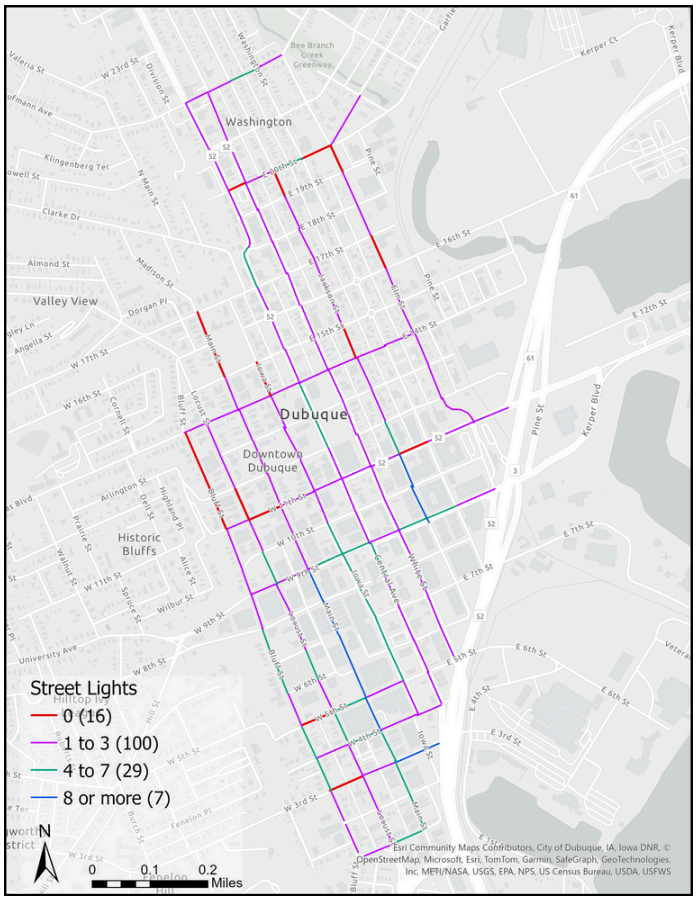


Figure 5: Street lights in downtown Dubuque

Bicycle Infrastructure and Bicycle Lanes

The city has had recurring goals of adding bicycle infrastructure and dedicated, on-street bicycle lanes. However, the existing bicycle infrastructure in Dubuque is limited to trails, sidewalks, and sharrows, with no dedicated on-street bike lanes available except what is scheduled to be installed in the summer of 2024 on 9th and 10th Streets. Sharrows, indicating roadways shared by bicyclists and cars, pose safety concerns and discomfort for both cyclists and drivers. Many bikers, and even drivers, do not feel safe or comfortable sharing the road with each other knowing the risks involved. While sidewalks are present downtown, bikers are encouraged to use roads with sharrows rather than the sidewalks to mitigate the risk of bicycle-pedestrian accidents. Because of this, dedicated bike lanes are essential for enhancing safety and mobility for bicyclists, pedestrians, and drivers. The other potential space for bicyclists is on trails. While trails offer recreational space, they are not optimal for commuting purposes or utilitarian trips. Adding dedicated bike lanes that connect with the existing trail system can expand the bicycle network, facilitating both recreational and utilitarian cycling and creating connectivity in downtown Dubuque. The difference between sharrows and dedicated bike lanes is depicted in **Figure 6**.

The results from the bicycle infrastructure analysis, paired with results from community engagement events and all other analyses conducted by the team, are what ultimately guided the selection of streets most suitable and desirable for implementing dedicated bike lanes through street transformations. Other priorities for the network include creating a well-connected bike network through dedicated bike lanes, trails, and sharrows; access to community centers and resources like governmental buildings, community spaces, or commercial activities; the street's given parking tradeoff; and input from the "Our City, Our Future" public engagement event. Street specific results from this analysis are presented within the Best Path Forward section.

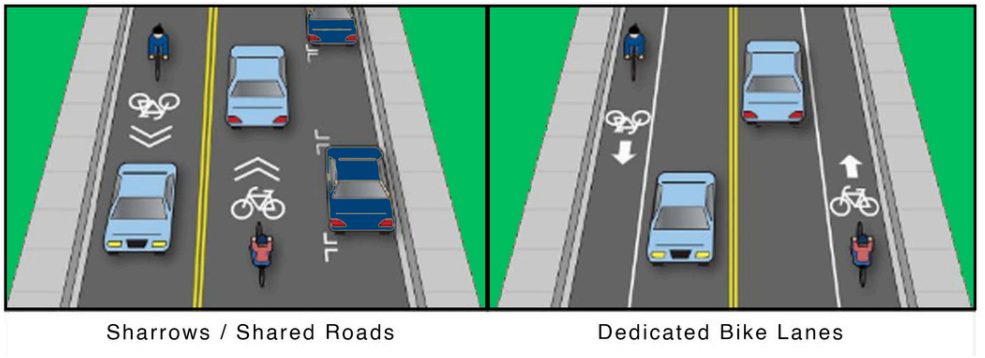


Figure 6: Sharrows versus dedicated bike lanes

Bicycle Safety Education

Despite numerous plans advocating for safe bicyclist and driver education in Dubuque, community engagement revealed that education resources are currently inadequate. Many residents stated that they did not know bicyclists' rules and responsibilities on sidewalks and roads, contributing to discomfort and uncertainty when sharing the roadway. Addressing this gap in education is necessary to promote alternative transportation modes effectively in Dubuque. By providing education on safety for both bicyclists and drivers, Dubuque can foster a culture of awareness and respect on city streets.

Complete Streets and Green Streets with Traffic Calming

Complete streets have been a goal for Dubuque since 2011, with the passing of the Complete Streets Policy. However, there is no street with complete street characteristics present in Dubuque.

Traffic calming techniques can help to make pedestrians and bicyclists more comfortable on the road, especially those with heavy volumes of traffic. To measure the volume of traffic on the road, Annual Average Daily Traffic (AADT) counts can be used. AADT is a metric that assesses the average volume of cars and trucks on a road throughout the year (U.S. DOT, 2018). **Figure 7** shows the AADT on roads in Dubuque.

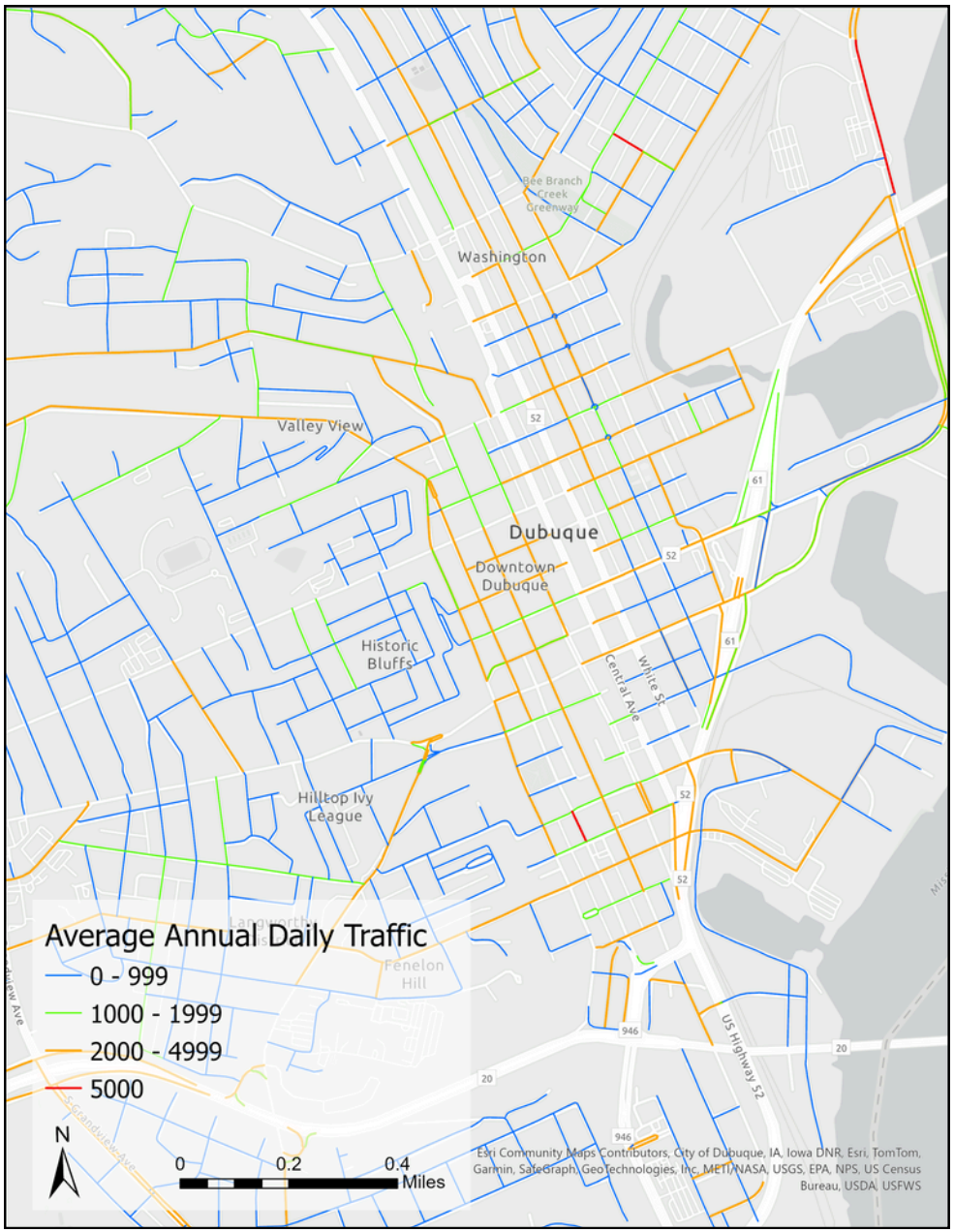


Figure 7: AADT on roads in downtown Dubuque (U.S. DOT, 2018)

Bicycle and Pedestrian Network Connections

Promoting multi-modal connections has been a goal for the city of Dubuque for over two decades. Multi-modal connections and an integrated trail network are necessary for the comfortability of alternative transportation users.

As shown in **Figure 8**, the city does not have a large variety of recreational trail options, but shared recreational paths extend uninterrupted from the northern neighborhoods to downtown. However, the public transportation system has a large network throughout the city, especially downtown. This helps to create multi-modal connections between trails and transit.

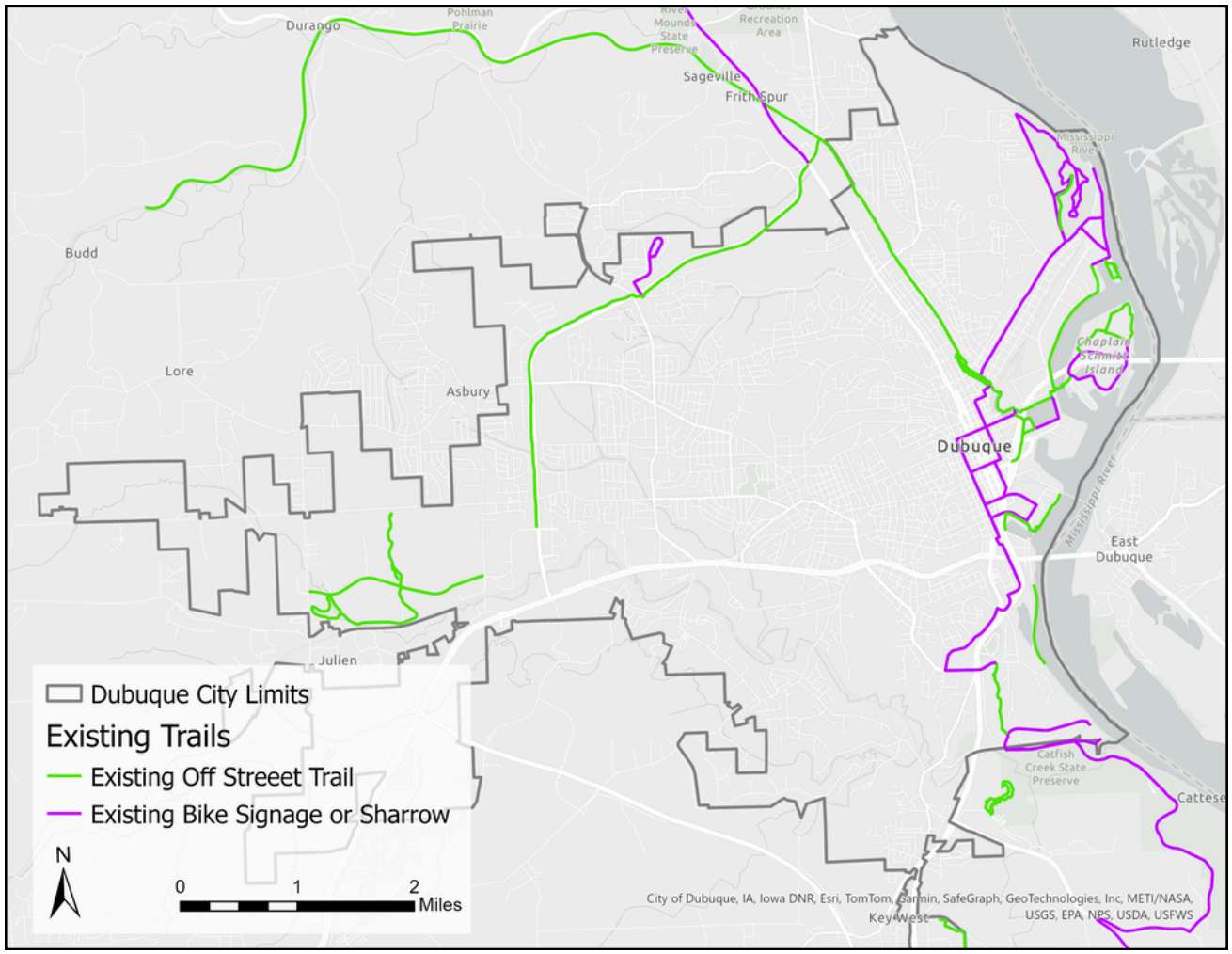


Figure 8: Bicycle network connectivity in Dubuque (Open Street Map Road Network, 2021)

Parking Management

Parking management has been a prominent goal for Dubuque since the early 2000s. Recently, the Move DBQ study analyzed parking availability in downtown Dubuque, finding there are plenty of parking options throughout the downtown area. The parking options downtown include:

- **7** public parking ramps,
- **16** public parking lots, and
- **7,400** total parking spaces (off-street and on-street combined)

Downtown Dubuque's total off-street parking footprint is substantial, totaling 35.5 acres, including both public and private ramps and lots. When considering just public parking lots and ramps, land the city has direct control over, the coverage is 23.7 acres (Google Earth, 2023). For reference, one acre of land can typically accommodate 150 vehicles, suggesting downtown Dubuque's off-street parking footprint can fit approximately 5,325 cars simultaneously (Holland, 2014). The public off-street parking in Dubuque is equivalent to about 18 football fields, taking up much of the valuable downtown land.

Despite the abundance of parking available downtown, the utilization of this space is very low. Of the 4,000 parking ramp spaces downtown, only an average of 28% of spots (about 1,120 spaces) are occupied at peak demands. Peak demand is defined as the busiest time of the day; in other words, the maximum number of cars parked at that location throughout the entirety of the day. Just over one thousand parked cars are utilizing off-street spaces, while there is availability for four to five thousand, leaving many spaces empty and unused throughout the day. Similarly, on-street parking experiences low utilization rates, with only 31% of spaces occupied at peak demand. This suggests that there is an oversupply of parking options both off-street and on-street, urging the need for more efficient use of these spaces. If drivers are opting for on-street parking over off-street garages, finding ways to move on-street parkers to available off-street spaces would allow for more street space to be dedicated to alternative modes of transportation like biking or walking.

Figure 9: Parking lot and ramp locations (Move DBQ, 2023 in progress)

The location of parking ramps and parking lots is displayed in **Figure 9**. General on-street parking meter locations and their time limits are shown in **Figure 10**. Move DBQ analyzed the average usage rates of the parking spaces listed above during peak demand. The utilization for ramps, lots, and parking meters are all like that of the parking ramp utilization: underutilized.

- Parking ramps - 28% occupied
- Parking lots - 24% occupied
- Parking meters - 31% occupied

The underutilization of parking spaces downtown, with about 70% of spaces sitting empty during peak hours and even more during non-peak hours, highlights the opportunity for this TAP. Not only do unused parking ramps and lots occupy valuable downtown land, empty on-street spaces occupy the limited street space. To fix this issue, the plan proposes the removal of on-street parking in certain areas to make room for dedicated bicycle lanes.

The project team has also gathered parking information specific to the streets recommended for street transformation. This information, including impacted parking spaces to be removed on each street and nearby parking alternatives, will be presented alongside additional street-specific information in the Best Path Forward section.

Figure 10: Parking meter time limits (Move DBQ, 2023 in progress)

Transit Line Improvements

Transit has been an important goal in Dubuque's plans, with numerous action steps proposed to ensure it serves the residents timely and efficiently. To assess transit access and effectiveness, the poverty index of Dubuque Census tracts were used to spatially analyze access to transit stops and lines. This analysis, shown in **Figure 12**, demonstrates the concentration of poverty within each tract, combining family poverty rates and the percentage of households receiving public assistance (Office of Policy Development and Research, 2023). A comparison of **Figure 11 and 12** reveals a correlation between poverty levels and households without access to a vehicle, indicating a need for equitable mobility solutions in areas with high poverty rates and low vehicle ownership (The Transportation Planning Capacity Building Program, n.d.).

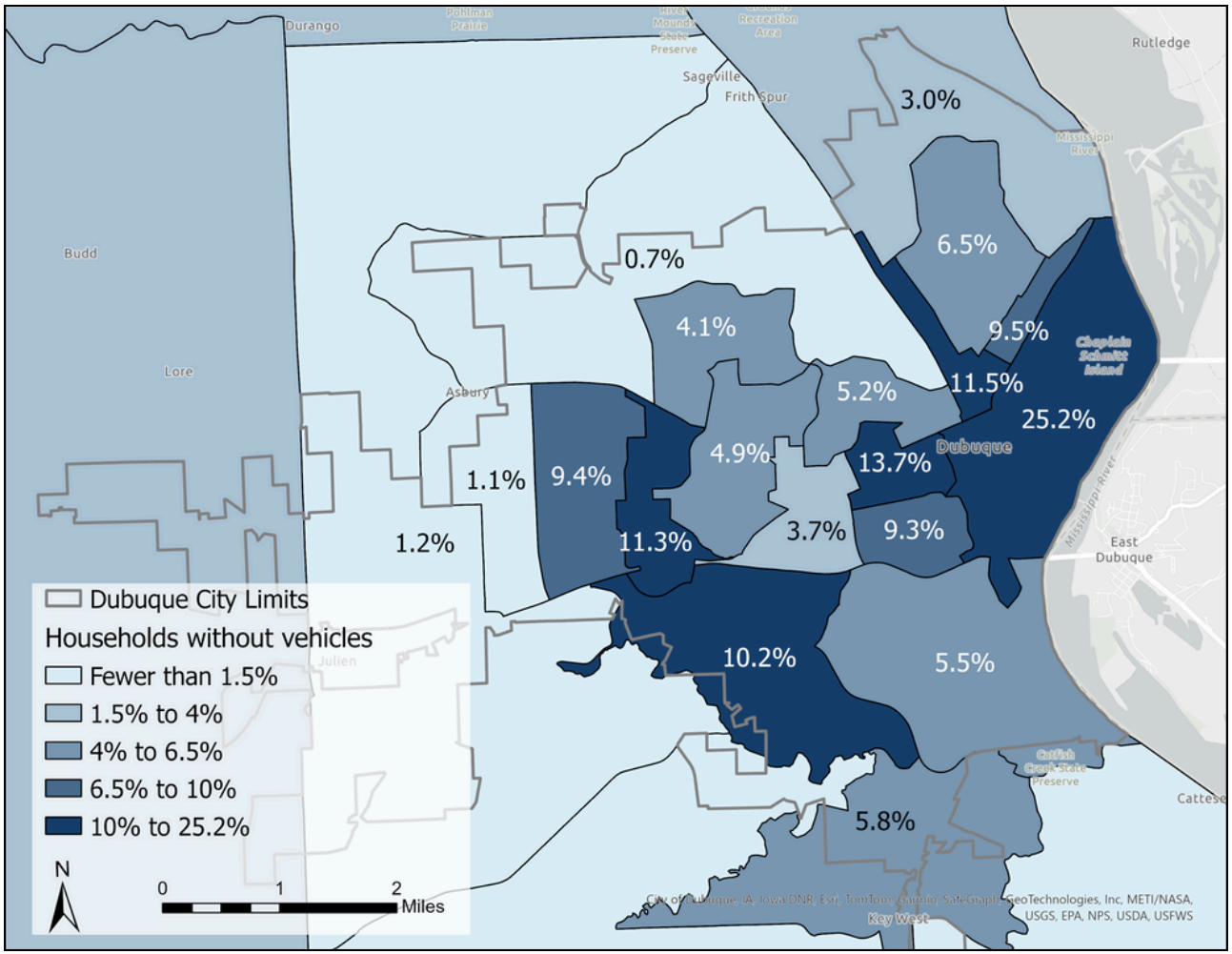


Figure 11: Households without access to vehicles in Dubuque (ACS 5-year estimates, 2021)

Transit Line Improvements

Shown in **Figure 12**, public transportation lines are distributed throughout the city, primarily in areas with elevated poverty levels. Despite the good spatial distribution of transit lines, public comments suggest inefficiencies in fare price, wait times, and travel times, emphasizing the need for targeted improvements to ensure equitable access to transportation resources across Dubuque.

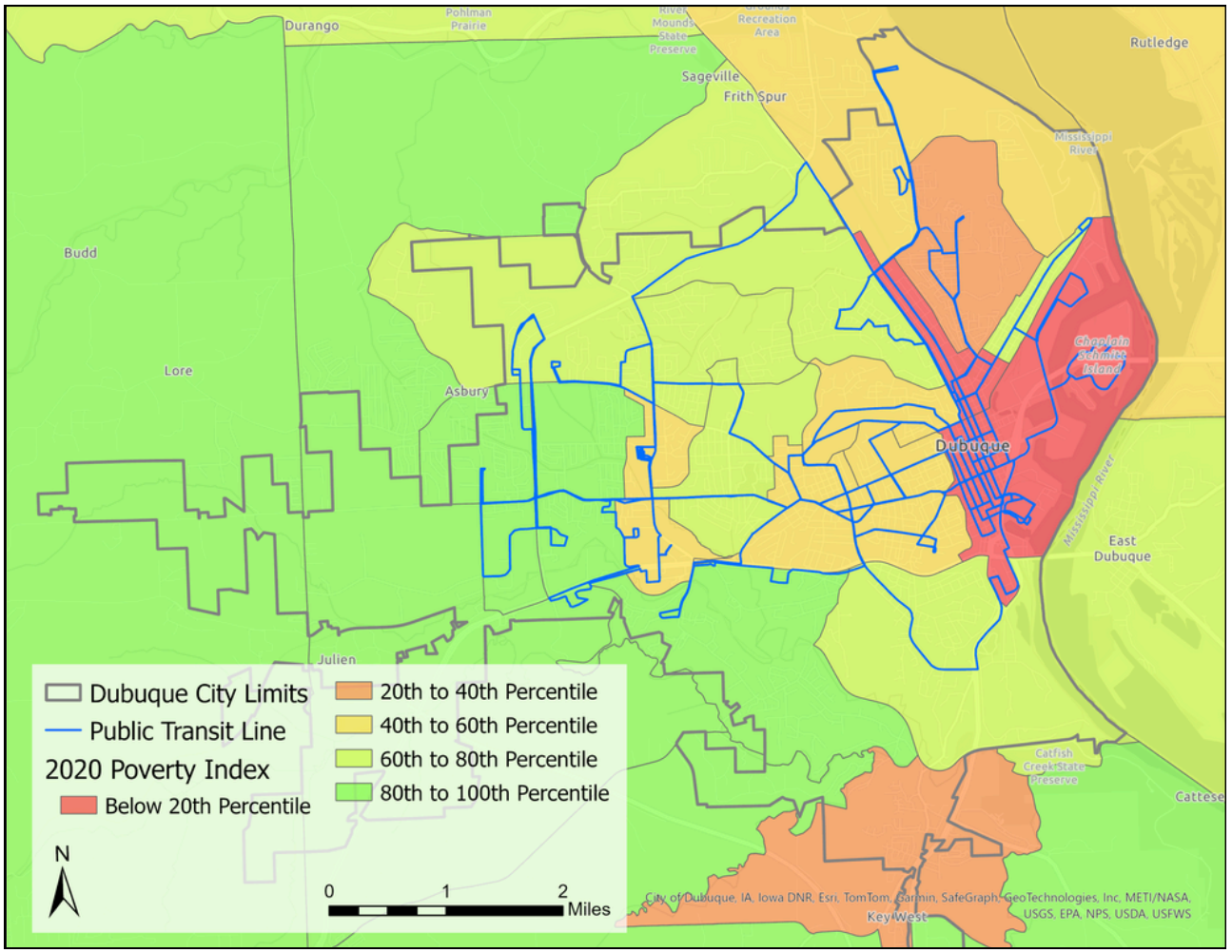


Figure 12: Transit lines by poverty index in Dubuque (U.S. Department of Housing and Urban Development, 2020; City of Dubuque, 2019)

Transit-Oriented, Mixed-Use Development

The city has made transit-oriented, mixed-use development a goal in five separate plans. Dubuque remains largely non-mixed, characterized by separate, distinct commercial and residential zones, as shown in Figure 13. The existing land use shows the city is dominated by single-family residential housing and separate land use types. However The Millwork district has become an excellent example of mixed-use development.

Transit-oriented, mixed-use development relies on the proximity of community resources and job centers to residents. Figure 14 indicates an even distribution of amenities such as schools, hospitals, and libraries across the city and shows that there is a notable concentration of these resources in areas with higher poverty rates. This spatial distribution shows the need for strategic actions to foster more equitable access to community services, aligning with the city's goal of promoting transit-oriented development.

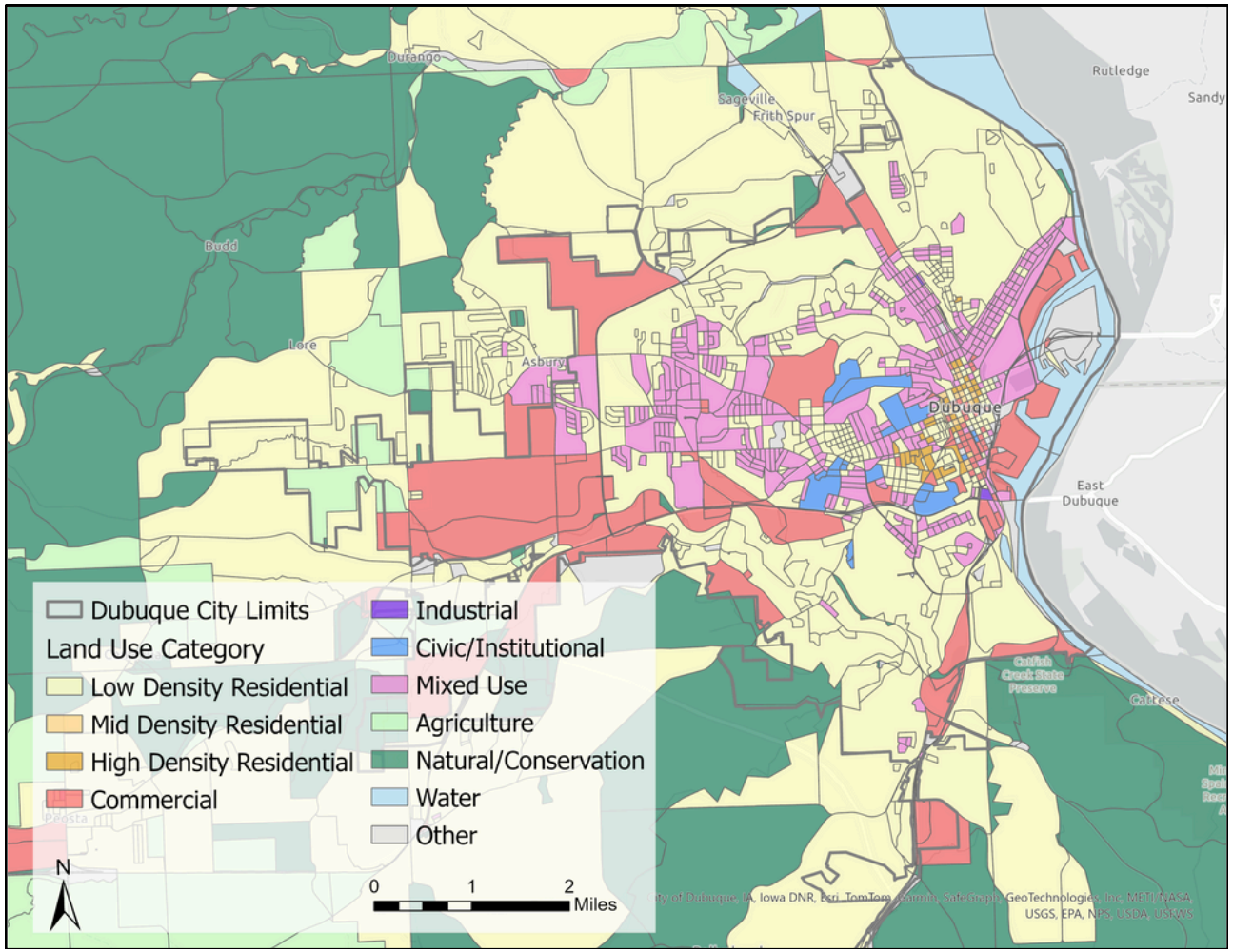


Figure 13: Land Use in Dubuque (City of Dubuque, 2023)

Transit-Oriented, Mixed-Use Development

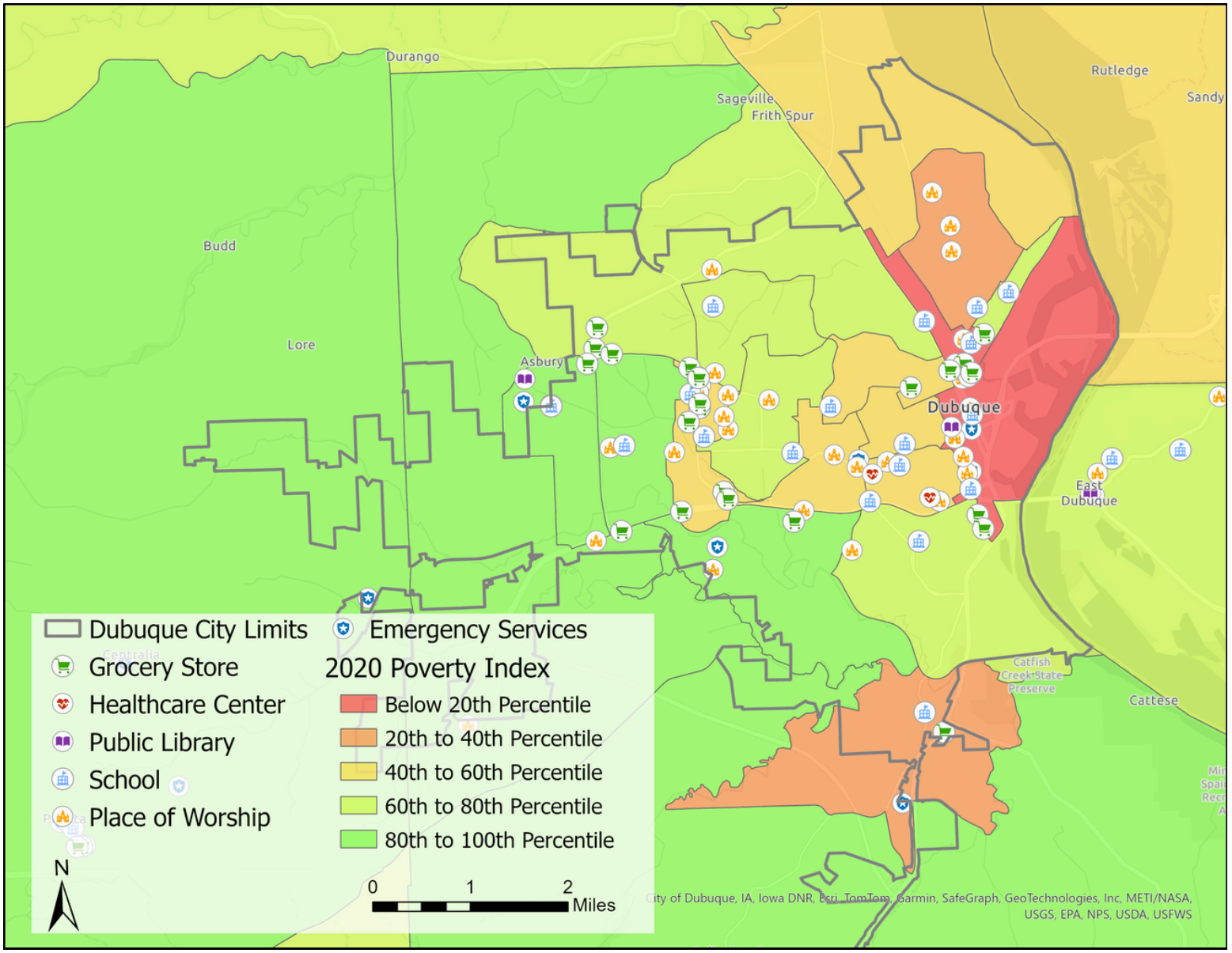


Figure 14: Proximity to community resources compared to poverty index in Dubuque (U.S. Department of Housing and Urban Development, 2020)

Major Obstacles

Dubuque residents face several obstacles when considering alternative transportation modes. Each obstacle is influenced by a variety of factors, as explained here.

1. **Existing lack of infrastructure**: The absence of dedicated bike lanes and limited public transportation network discourages residents from embracing alternative transportation modes. Although the city's public transportation network reaches almost every neighborhood, the dwindling number of users and its frequency does not encourage people to use this system effectively. Without proper infrastructure, residents may feel unsafe or uncomfortable when using alternative modes.
2. **Topography**: Dubuque's unique topography poses hurdles for alternative transportation, especially for bicyclists and pedestrians. Specifically, the bluff that divides the downtown and western residential areas restricts alternative transportation modes.
3. **Abundance of parking**: The abundant availability of parking spaces (on-street metered parking and off-street public and private parking), both in residential areas and commercial centers, encourages car dependency and use while undermining the feasibility of enhancing alternative transportation modes.
4. **Driving habits**: Driving culture in the U.S. prioritizes vehicles as the default mode of transportation, making it challenging to shift habits and behaviors towards alternative modes. Additionally, individual preferences for comfort and privacy may lead people to choose driving over alternative options.
5. **Urban sprawl**: Urban sprawl disperses homes, businesses, and amenities over large areas, resulting in low population density. This makes it difficult to establish efficient public transit routes or build infrastructure such as bike lanes or pedestrian-friendly pathways.
6. **Land use**: Zoning regulations separate land uses, leading to the development of isolated residential, commercial, and industrial areas. This separation increases travel distances between destinations, making alternative transportation modes less practical for residents.
7. **Time and convenience**: Alternative transportation modes often demand more time, effort, and energy compared to using personal vehicles, especially if the infrastructure is lacking or public transit schedules are inconvenient.
8. **Lack of awareness or education**: Residents may not be aware of the benefits of alternative transportation modes or how to access them. Educational campaigns and outreach efforts can help raise awareness and promote the use of alternative transportation options.

Major Opportunities

There are several opportunities that will bolster the recommendations in this plan. Each opportunity is explained here.

1. **Existing road space**: In Dubuque, numerous roads have ample space that presents great opportunities for street transformations. For example, downtown streets often have wide travel lanes with on-street parking on both sides, leaving room to integrate alternative transportation infrastructure.
2. **Ongoing transportation initiatives**: There are currently multiple ongoing transportation-related initiatives in Dubuque. These include the Move DBQ study, a RAISE grant application for the construction of a pedestrian bridge and complete street enhancements, and a bike lane pilot program through downtown. These initiatives highlight the city's active stance in promoting sustainable transportation options and their concerted effort towards creating a more connected and comfortable urban environment. Many city staff and officials have explicitly stated their support for new and improved transportation initiatives.
3. **Sidewalk conditions**: Another promising feature in downtown Dubuque is the condition and extensive coverage of the sidewalk network. The pedestrian analysis revealed that every street segment downtown is equipped with sidewalks, with the majority being in good or exceptionally good condition. The existing sidewalk infrastructure enables more targeted pedestrian enhancements, as efforts can extend beyond sidewalk maintenance and instead focus on improvements tailored to pedestrian comfortability.
4. **Transit integration**: As mentioned earlier, the Jule transit service has widespread coverage across Dubuque, with several stops throughout downtown. Additionally, Jule is currently undergoing a study aimed at optimizing routes, identifying possible service changes, and determining possible equipment upgrades. The existing network and ongoing initiative present an opportunity to connect pedestrians and bicyclists to the transit system. This approach will create a robust multi-modal network throughout Dubuque, enhancing mobility for residents.
5. **Resident desires**: A wave of support is emerging among Dubuque residents for a shift in the city's transportation system. Across our three community engagement events, over 100 residents have echoed their desire for the implementation of alternative transportation infrastructure in Dubuque. This movement presents an opportunity for the city to create a transportation system that enhances mobility and provides a better quality of life for residents.

Best Path Forward

Dubuque has ambitious alternative transportation goals, but the city has seen minimal progress in their implementation. The TAP translates those aspirations into tangible outcomes, envisioning a transformation of the city's downtown existing infrastructure to foster alternative modes of transportation that are safe and enjoyable for residents. To achieve this, there are four key principles that serve as the foundation for the coming strategies and actions.

Sustainability

Goal: Reshape the transportation system to accommodate active mobility options to contribute to the City's climate action goals.

The City of Dubuque has set a target in its Climate Action Plan to reduce greenhouse gas emissions by 50% by the year 2030 (Dubuque Climate Action Plan, 2020). The transportation sector constitutes approximately 20.4% of Dubuque's total greenhouse gas emissions. This is due, in part, to the percentage of commuters who rely on personal vehicles (City of Dubuque Comprehensive Plan, 2017).

In response to this challenge, Dubuque has committed to reducing VMT by 10%, according to its Climate Action Plan, to mitigate emissions from transportation. Further, the city aims to enhance street infrastructure to align with complete streets principles, with a target of 25% of streets meeting these criteria by 2030 (Dubuque Climate Action Plan, 2020).

Equity

Goal: Enhance the transportation system to be equitable and inclusive for all people in Dubuque.

Equity is defined as the fairness in opportunities and outcomes for all individuals and is a key principle in urban development. Transportation plays a fundamental role in the access of social and economic opportunities for residents. It is essential to offer alternative modes of transportation with extensive connectivity across the city, especially in areas characterized by low rates of vehicle ownership. Neighborhoods within and adjacent to downtown have the lowest rates of vehicle ownership in Dubuque, presenting a challenge in ensuring residents access to facilities and services. By focusing on equitable access to alternative transportation options, the TAP aims to create inclusive development and improve the quality of life for all residents in Dubuque.

Safety and Connectivity

Goal: Create a safe and well-connected bicycle and pedestrian network throughout downtown.

The absence of dedicated on-street bike lanes within Dubuque poses a significant challenge for bicyclists, making their journeys unsafe and uncomfortable. Additionally, the lack of dedicated lanes deters prospective bicyclists, including children under 18, who view road-sharing with drivers as unsafe and uncomfortable. Consequently, potential bicyclists choose not to use bicycles for recreational or utilitarian purposes.

The poor connectivity of existing trails furthers the reluctance to bike within the city. Creating a cohesive, safe, and comfortable network for bicyclists and pedestrians is therefore a critical goal within the TAP. By prioritizing interconnected, safe networks, bicycling and walking will become more viable modes of transportation and improve the urban landscape in Dubuque.

Street Transformations

Goal: Modify on-street parking to create space for alternative transportation infrastructure.

The existing parking situation in Dubuque is not just inefficient, but also acts as a barrier to the adoption of alternative transportation modes. In response, street transformations are an essential goal within the TAP. Modifying the city's on-street parking spaces to create space for alternative transportation mode infrastructure, including dedicated bike lanes and street trees, will enhance the safety and comfort of Dubuque residents.

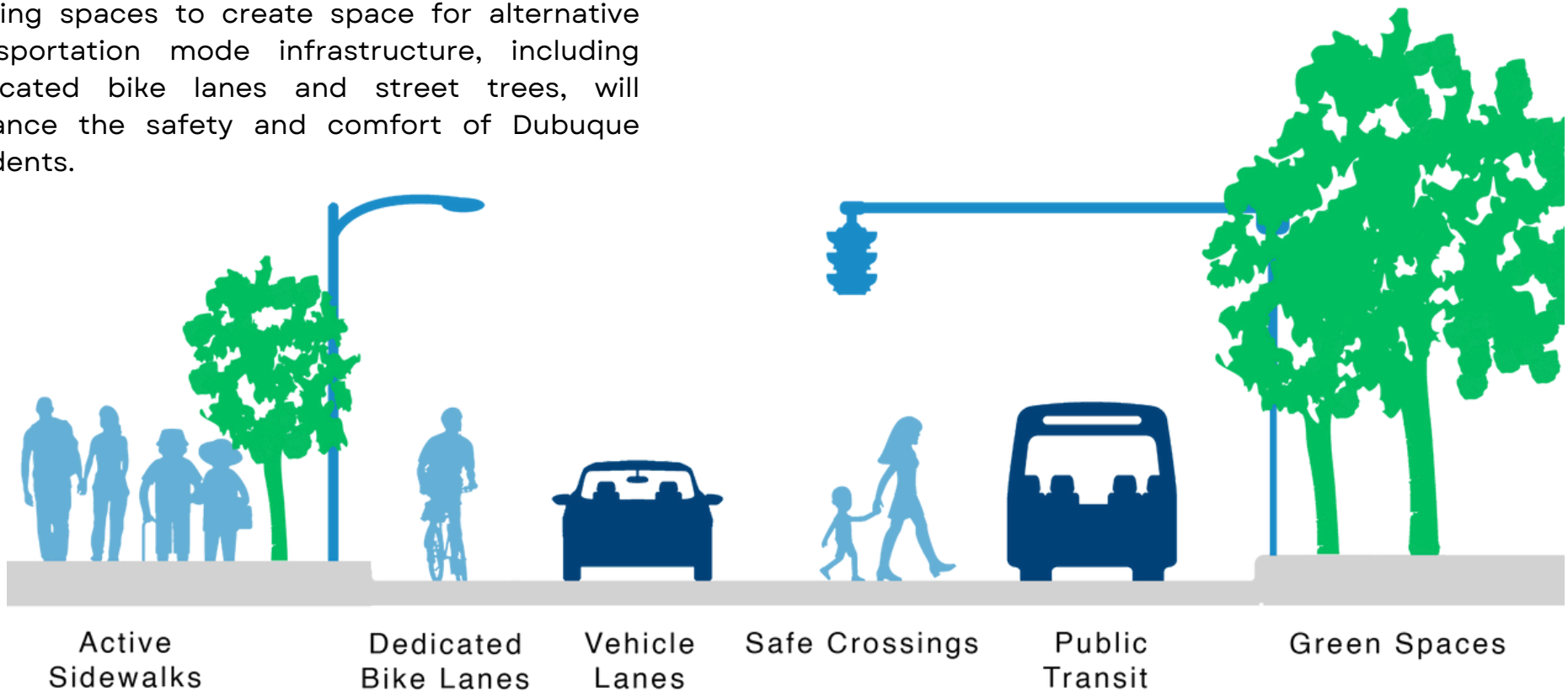


Figure 15: What is a complete street?

Strategies

With these four goals, the plan provides four broad alternative transportation strategies:

- Bicycle infrastructure improvements
- Parking management
- Pedestrian infrastructure improvements
- Multimodal amenities improvements

These strategies are designed to align with the goals of existing and ongoing initiatives in the city. This section describes these specific strategies in detail. The full list of action steps for each strategy are provided in the action table. This systematic implementation of strategies and action steps will transform Dubuque's transportation system, promoting alternative transportation options. and enhancing the quality of life for residents.

Bicycle Improvements

The team analyzed potential roads for dedicated bike lanes in coordination with the city's ongoing initiatives to add bike lanes on 9th and 10th Streets, as well as the planned trail extension near the eastern boundary of those streets. Given the city is planning bike lanes on those roads, they were excluded from our analysis. Our focus for bike lane selection was on routes that maximize downtown connectivity, which includes existing trails, sidewalks, sharrows, and public transit stops.

Following this bicycle infrastructure analysis, the team identified five priority routes that allow for simple implementation and enhanced overall connectivity. The five routes are presented below, along with rationales for their selection. The roads are ordered in terms of prioritization. Additionally, the potential impact on parking spaces, nearby off-street parking alternatives, and other relevant information is provided. The estimated number of parking spaces were derived using total number of metered and free on-street parking spaces and each block's peak utilization percentages from Move DBQ.

Each road transformation will be unique to the road due to varying road widths, with street-specific details below. Generally, these roads' transformations will include repurposing on-street parking to generate space for dedicated bike lanes. All recommended bike lanes will be on-street and buffered to provide space away from moving traffic. The bicycle lanes will have areas of green, textured paint at the beginning of each block to signal to drivers that there is a dedicated space on the road only for bikers. To further make space for bicycle lanes, driving travel lane widths will be decreased to discourage speeding and encourage cautious driving. "Bikers allowed use of full lane" signs should be placed alongside the roads with bike lanes to further indicate to drivers they are not the only ones utilizing the roadway.

Bicycle Improvements

15th Street

New road design: Two buffered, dedicated on-street bike lanes from Sycamore Street to Bluff Street. Northern bike lane travels westbound and southern bike lane travels eastbound.

Connectivity: Connects to the plan's proposed dedicated bike lanes on Bluff Street, Locust Street, and Central Avenue (north/south), along with the plan's proposed sharrows on Jackson Street and Washington Street (north/south). The bike lane will connect directly to Bee Branch Trail, allowing residents from the neighborhoods north of downtown (e.g., North End, Point) a safe bike path to get to downtown's services and resources.

Transit: This bike lane has six bus stops within a block of the proposed route.

Nearby community attractions: Jackson Park, Bee Branch Creek Greenway, and Steeple Square.

Parking implications: Removal of all southside spaces (estimated 34 impacted spaces). The parking spaces on the northside should be made free, and the team recommends the removal of the 12 on-street parking meters. Free parking on this route allows residents who live adjacent to the street space to park and can encourage all residents to visit Jackson Park and the downtown area.

Nearby parking locations: No nearby parking areas. Free on-street parking to provide alternative parking opportunities.

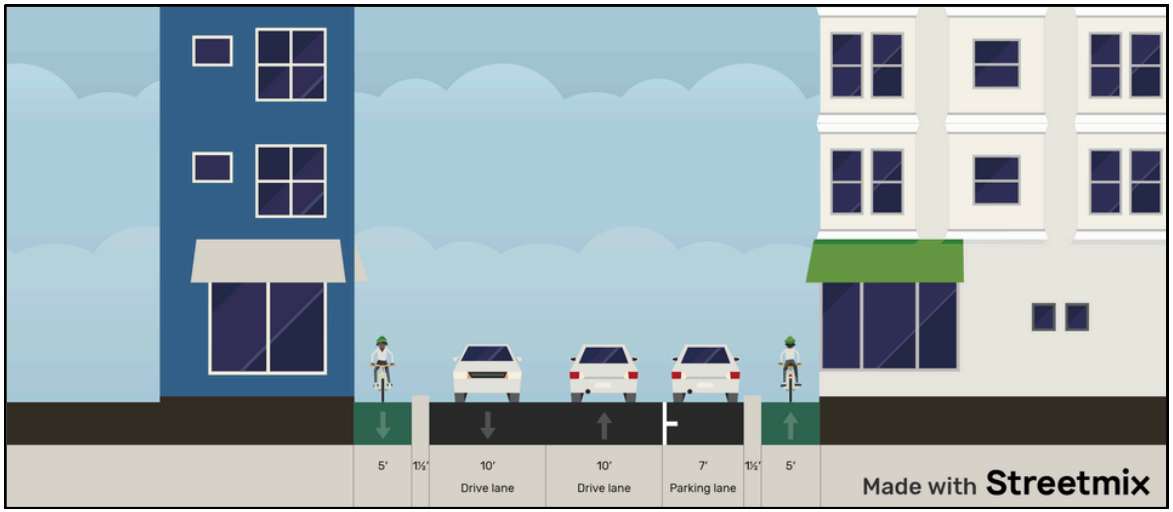


Figure 16: 15th Street street cross-section

Bicycle Improvements

15th Street

Figure 17: 15th Street after street transformation

Bicycle Improvements

Bluff Street

New road design: One buffered, dedicated on-street bike lane from West 5th Street to 15th Street. This bike lane will be on the western side of the road traveling southbound.

Connectivity: Connects to the plan's proposed dedicated bike lanes on 15th Street and West 5th Street, and to the city's bike lanes in progress on 9th Street and 10th Street. It will run opposite direction to the proposed bike lane on Locust Street.

Transit: This street has seven bus stops within a block of the proposed route.

Nearby community attractions: Carnegie-Stout Public Library, Washington Park, Dubuque Elevator, and many light commercial activities.

Parking implications: Removal of all eastside parking spaces (estimated 35 impacted spaces). Western spaces to remain.

Nearby parking locations: Locust Street Ramp (9th Street & Locust Street), 9th Street and Bluff Street Lot, 5th Street and Bluff Street Lot, 3rd Street and Locust Street Lot, or the 3rd Street and Main Street Lot.

Locust Street

New road design: One buffered, dedicated on-street bike lane from West 5th Street to 15th Street. This bike lane will be on the eastern side of the road traveling northbound.

Connectivity: Connects to the plan's proposed dedicated bike lanes on 15th Street and West 5th Street, and to the city's future bike lanes on 9th Street and 10th Street. It will run opposite to the proposed bike lane on Bluff Street.

Transit: This bike lane has ten bus stops within a block of the proposed route.

Nearby community attractions: Carnegie-Stout Public Library, Washington Park, the Historic Federal Building, religious centers, meeting centers, and light and large commercial areas such as restaurants, banks, and a gas station.

Parking implications: Removal of all westside parking spaces (estimated 42 impacted spaces). Eastern spaces to remain.

Nearby parking locations: Locust Street Ramp (9th Street & Locust Street), Iowa Street Ramp, Five Flags Ramp, 9th Street and Bluff Street Lot, 5th Street and Main Street Lot, 3rd Street and Locust Street Lot, or the 3rd Street and Main Street Lot.

Bicycle Improvements

Bluff Street

Figure 18: Bluff Street after street transformation

Bicycle Improvements

Locust Street

Figure 19: Locust Street after street transformation

Bicycle Improvements

5th Street

New road design: Two buffered, dedicated on-street bike lane from Bluff Street to White Street. Northern bike lane travels westbound and southern bike lane travels eastbound.

Connectivity: Connects to the plan's proposed dedicated bike lanes on Bluff Street, Locust Street, and Central Avenue providing a southern end connection to downtown areas.

Transit: This bike lane has two bus stops within a block of the proposed route.

Nearby community attractions: Five Flags Center, U.S. Postal Service, light commercial activities such as a cafe, a bar, and office spaces.

Parking implications: Removal of all parking spaces (estimated 11 impacted northside spaces and 17 impacted southside spaces).

Nearby parking locations: 5th Street and Bluff Street Lot, 5th Street and Main Street Lot, 3rd Street and Main Street Lot, or the Iowa Street Ramp

Central Avenue

New road design: Convert the roadway from one-way to two-way traffic. Two buffered, dedicated on-street bike lane from West 5th Street to 15th Street. The eastside bike lane will travel northbound and the westside bike lane will travel southbound. Improved urban design practices such as adding greenspace between the roadway and the sidewalk.

Connectivity: Connects to the plan's proposed dedicated bike lanes on 15th Street and West 5th Street, and to the city's bike lanes in progress on 9th Street and 10th Street.

Transit: This bike lane has eight bus stops within a block of the proposed route.

Nearby community attractions: City Hall, Dubuque County Sheriff's Office, Dubuque County Courthouse, Prescott Elementary School, the Multicultural Family Center, UnityPoint Health, Bicycle World, and many other light commercial activities like restaurants and office spaces.

Parking implications: Removal of all on-street parking spaces (estimated 38 impacted eastside spaces and 29 impacted westside spaces).

Nearby parking locations: City Hall Parking Lot, Central Avenue Parking Ramp, or the Iowa Street Ramp.

Bicycle Improvements

5th Street

Figure 20: 5th Street after street transformation

Bicycle Improvements

Central Avenue

Figure 21: Central Avenue after street transformation

Bicycle Improvements

Jackson, Washington, and 3rd Street

In addition to dedicated bike lanes on the five streets above, it is recommended that sharrows be implemented on Jackson Street, from 19th to 6th Street; Washington Street, from 19th to 7th Street; and 3rd Street, from Bluff to Main Street.

Jackson Street is a residential area north of 11th Street, with slow traffic speeds and narrow roads, making it fit for sharrows as opposed to dedicated bike lanes. South of 11th Street, Jackson Street has sharrows already. Adding sharrows from 11th to 19th Street will connect Jackson Street further north.

Washington Street is a residential area north of 14th Street. From 11th to 14th Street, there is a mix of residential and commercial activity. South of 11th Street, Washington Street has sharrows already. Like Jackson Street, adding sharrows from 11th to 19th Street will connect Washington Street further north.

3rd Street will have 2 blocks with sharrow markings to help connect those coming from the western end of West 3rd Street to downtown. The sharrows will begin on Bluff Street and end on Main Street. This can help connect to the Locust Street dedicated bike lane running south to north.

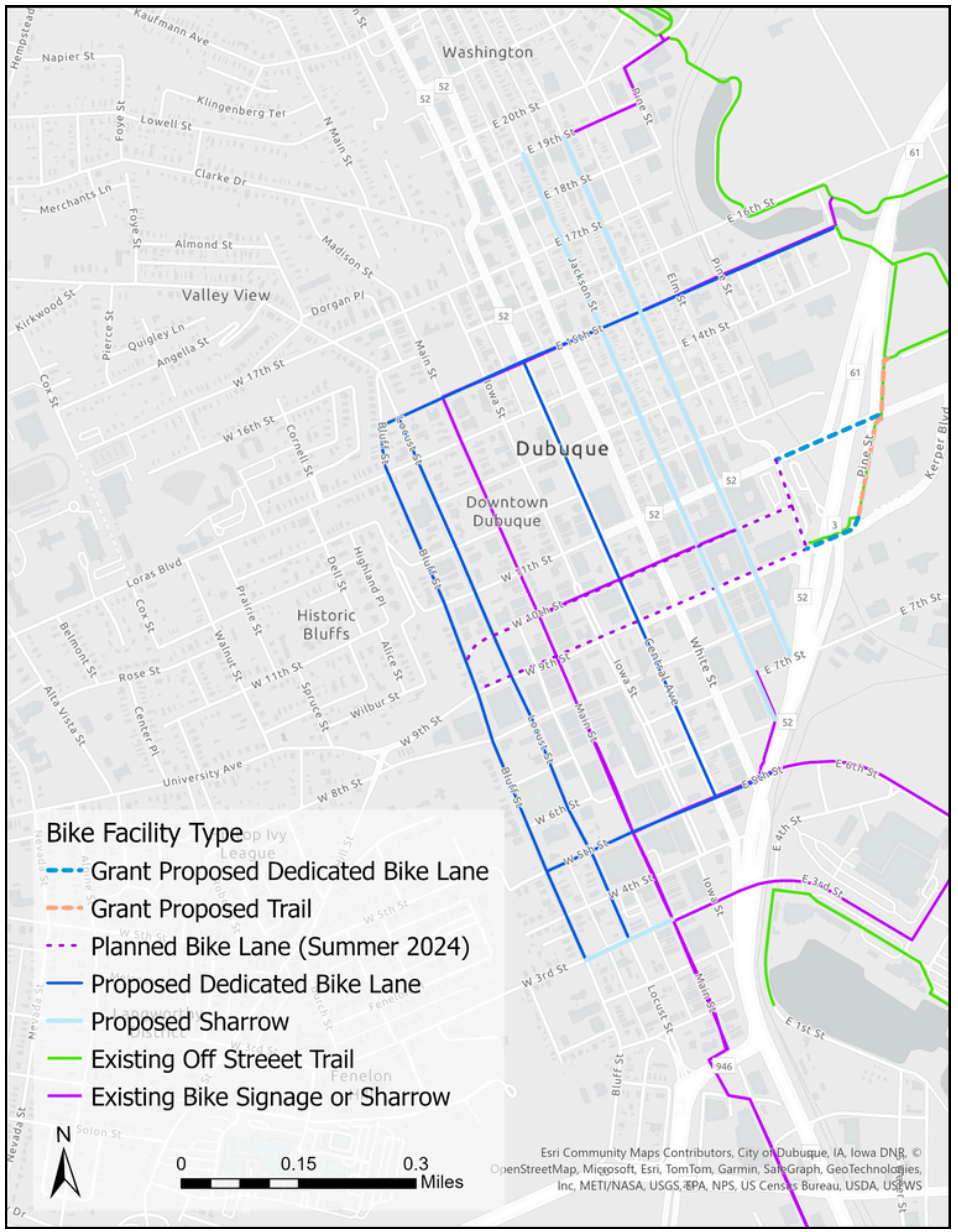


Figure 22: Proposed and existing bicycle routes and trails in downtown Dubuque

Parking Management

The downtown area's excess availability of on- and off-street parking provides great opportunities for active transportation infrastructure. With on-street metered and free parking lining all streets downtown, many of these spaces can be repurposed for the implementation of on-street bike lanes. The management of on-street parking will result in a more efficient use of valuable downtown space.

On-street parking will be removed from either one or both sides of the streets listed above, decreasing the total number of on-street parking spaces available in the downtown area. Nearby parking garages and lots can hold the number of automobiles that would have been parking on the side of the street. By redirecting traffic from on-street parking to off-street parking, there will be less traffic sharing the roads with bikers and pedestrians. To encourage downtown travelers to park in off-street locations, the city should increase the parking price of on-street meters and implement a first-hour free pricing system at all downtown parking garages. The first-hour free pricing system will incentivize short-term travelers to use parking garages as opposed to parking on-street. The city should also provide the public with a map showing walking distances from parking garages to popular downtown locations to give travelers a sense of how short the walk is from the parking garage to their desired location. After the pricing changes have been implemented and a map with walking distances has been created, the city should encourage the public to use off-street parking garages and lots rather than on-street parking meters through city publications, social media posts, and other channels.

5th Street and Bluff Street Parking Lot

Pedestrian Improvements

The recommended roadway re-designs include bicycle infrastructure and general streetscape improvements, such as lighting and trees, to promote pedestrian usage. Historically, streetscapes were places of commerce and gathering as they typically represent 25% to 30% of land area in cities (Michigan Economic Development Corporation, 2020). Now, streetscapes are used as transportation space for cars, taking away vital space for activity and alternative transportation modes. To create a more lively downtown space in Dubuque, one major strategy is to improve streetscapes, especially using street trees and lighting.

Street trees have a multitude of environmental, economic, and social benefits. Environmentally, street trees have been shown to mitigate flooding by reducing stormwater runoff (Mullaney, et al., 2015). This reduction in flooding also leads to economic benefits, with the annual economic value of this service being estimated from $2.78 to $47.85 per tree. In addition to the stormwater benefits, trees have benefits to air quality and provide shading and cooling effects during hotter months. Street trees reduce air pollution from cars by intercepting pollutants in their leaves and branches. Street trees also have social benefits, including making streets more desirable for walking, creating an identity of place for a city, and promoting physical activity (Tabatabaie, et al., 2023). Due to these benefits, street trees are a necessary component of improving streetscapes, leading to environmental, economic, and social benefits for residents of Dubuque.

Another important aspect of streetscape improvements is lighting. Street lighting has been shown to boost pedestrian comfortability as it makes the street feel like a safer place to walk, especially after dark when fewer people are around and visibility is reduced (Fotios, et al., 2015). Lighting is especially important during winter in Dubuque when the amount of light each day is shorter and many people must commute home from work or school in the dark (Rahm, et al., 2021). While there are benefits to street lighting, it can also be overdone. According to a study, street lighting is one of the largest energy consumers in cities, so energy efficient designs are necessary (Svechkina, et al., 2020). Therefore, it is recommended that street lighting is added on downtown blocks that have no or few streetlights, but not on those with extensive existing lighting. The 16 high priority city blocks recommended for street lighting additions are listed in the action table and shown in **Figure 24.**

Pedestrian infrastructure such as crosswalks, benches, and garbage bins to increase pedestrian comfort are other elements included in the action table. Since the downtown area has the highest active pedestrian population of the city, pedestrian crossings in this area should be painted with a highly visible ladder or zebra pattern so that pedestrians can cross the street safely. In addition, benches and trash receptacles should be placed in frequently-traveled or used areas to add to pedestrian comfortability.

Lastly, pedestrians should have priority over vehicles in traffic. To help with pedestrian comfortability when crossing streets, signs that state "No Parking Here to Corner" should be placed 10 feet from intersections with stop signs downtown. These signs will make crossing the street feel safer for pedestrians, as there will be no vehicles parked close to crosswalks blocking the view of oncoming traffic.

Figure 23: An example of a highly visible crosswalk (Car Free America, n.d.)

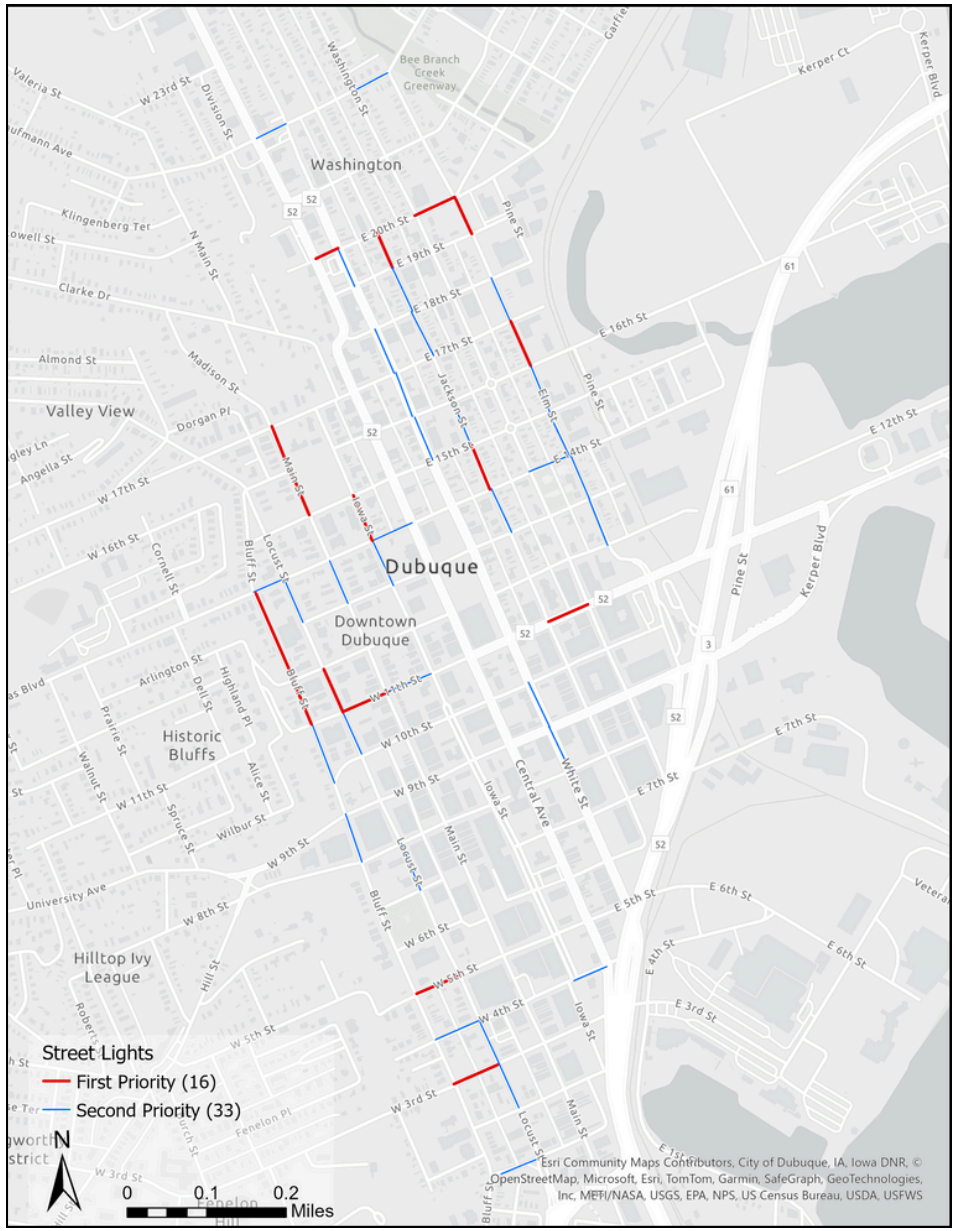


Figure 24: City blocks recommended for additional street lighting

Multimodal Amenities

Increasing multimodal amenities will improve connectivity and mobility for Dubuque residents. Driving, biking, walking, and public transit should be viewed holistically as they support one another in the overall transportation system. To help connect bike infrastructure to public transit, it is recommended that the city ensures there are available bike racks near existing public transit stops. The city should also increase the capacity of bike racks on the bus itself. Ensuring there are bike amenities close to public transit stops allows those transporting by bike to easily switch their mode of transportation to public transit, increasing their connectivity and mobility. The bus stops themselves should have shelter areas to cover residents from outside conditions while they wait for the bus. Having sheltered areas to wait could help encourage bus ridership.

In addition to enhancing the amenities above, the team is recommending the implementation of an e-bike rebate program. This program will assist bikers to navigate the steep bluff separating downtown and the west side.

E-Bike Rebate Program

This plan's recommended bicycle infrastructure improvements provide more opportunities for safe riding on a bicycle. However, there are other obstacles that take more creative solutions, such as navigating the bluff. One possible solution are electric bicycles (e-bikes) which are growing in popularity across the country. According to the Iowa DOT, an e-bike is a device with a saddle or seat for a rider, up to four wheels, equipped with fully operable pedals, and an electric motor of less than 750 watts. E-bikes are further broken into 3 classes, depending on how fast the e-bike can travel (about 20 to 28 miles-per-hour) and the amount of assistance the bicycle is providing its rider (Iowa DOT, 2023). To have a successful e-bike rebate program, there must be adequate biking infrastructure in the community. An e-bike program coincides nicely with the new infrastructure recommended by this plan.

Cities across the country have begun implementing e-bike rebate programs to encourage the use of e-bikes in their community. An e-bike rebate program provides financial assistance for the purchase of e-bikes, often through a post-purchase payment or discount at the time of purchase (Johnson et al., 2023).

Cities and towns are encouraging their residents to use e-bikes because they provide many benefits for their riders. Some of these benefits include improving public health (by promoting active travel) and traveling further than a traditional bicycle (MacArthur & Bennett, 2022; Johnson, et al., 2023).

The benefits of e-bikes can help alleviate many problems Dubuque faces and assist the city's broader alternative transportation and sustainability goals. E-bike's pedal assist function makes navigating hilly landscapes feasible and more convenient than a typical bicycle, providing Dubuque bicyclists a solution to traveling up and down the bluff (Reibold, 2019). They can also travel at higher speeds than a typical bicycle, helping riders keep up with vehicle traffic.

By giving residents an additional type of transportation and increasing urban mobility for all users, e-bikes can help replace short-range car trips with cheaper ones by e-bike. This is especially beneficial for Dubuque residents without access to vehicles (Jones, et al., 2024). This trip replacement can also lead to reduced greenhouse gas emissions and improved air quality, an important goal outlined in the City's Climate Action & Resiliency Plan (Phillips, et al., 2022; City of Dubuque, 2020). E-bike usage improves mental health and promotes recreational traveling, providing its users an opportunity to utilize the city's network of bike trails such as the Bee Branch Trail and the Mississippi River Trail (Shaw, 2023; Johnson, et al., 2023).

A downside of e-bikes is the high upfront costs that can discourage potential users from purchasing. Implementing an e-bike program can induce more purchases among residents, ultimately leading to more people reaping the benefits of e-bike usage (Jones, et al., 2024; MacArthur & Bennett, 2022).

With the benefits of better navigating the bluff, enhancing mobility, promoting physical and mental health, and impacts on sustainability and air quality, it is recommended that the city implements a pilot e-bike rebate program to financially assist and incentivize the residents of Dubuque to purchase an e-bike. More information on the recommended e-bike rebate program design can be found in **Appendix F**. A case study on Denver, Colorado's e-bike program can be found in **Appendix E**.

Action Steps

Multiple analyses have been conducted to create the recommendations for each project, with an evaluation of the city's transportation-related plans serving as proof of their necessity and potential effectiveness in attaining the goals and objectives of these plans. This plan's recommended action steps are practical and feasible for Dubuque. Each table below presents the strategies and actions for the project recommendations, related city plans, approximate costs, and the expected timeline of implementation. **Table 1** displays the key for the approximate cost of action items. **Table 2** displays the key for related plans.

$	Under approximately $49,999
$$	Approximately $50,000 to $149,999
$$$	Over approximately $150,000

Table 1: Key for approximate cost of implementation

View of downtown Dubuque from the top of the bluff

Strategy: Pedestrian Improvements

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 1.1 Paint crosswalks with ladder or zebra markings to provide safe places to cross the road.	DDMP, HMDMP, SRSP, WNP, CSP, EWCC, ID, PRPP, RAISE, BPNP	$ each	●●○○○
Action 1.2 Enforce on-street parking restrictions near intersections to avoid pedestrians walking into the roadway looking for traffic.	-	$	●●○○○
Action 1.3 In addition to the existing City Code 9-14-321.600(E), place signs that state "No Parking Here to Corner" 10 feet from intersections with stop signs downtown.	-	$ each	○○●○○
Action 1.4 Provide street lighting on the 16 downtown blocks that currently have zero street lights.	PDMP, DDMP, HMDMP, WNP, EWCC, ID, PRPP, RAISE	$ each	○○●●●
Action 1.5 Provide pedestrian infrastructure such as benches and trash receptacles to foster pedestrian comfortability.	PDMP, DDMP, HMDMP, SRSP, WNP. EWCC, ID, PRPP, BPNP	$ each	○○●●●
Action 1.6 Provide a buffered area of at least five feet with trees and space for grass between the street curb and sidewalk when streets are reconfigured and for all city and publicly developed sidewalk projects.	PDMP, DDMP, HMDMP, WNP, EWCC, ID, PRPP, RAISE	$$$	●●●●●

*Plan name key on page 57

Strategy: Multimodal Improvements

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 2.1 Increase the capacity of bicycle racks on public buses from a total of two to four.	-	$ each	○ ● ● ○ ○
Action 2.2 Provide shelters with benches at transit stops.	CACS	$ each	○ ● ● ○ ○
Action 2.3 Add bicycle racks near bus stops to promote multimodal travel.	PDMP, HMDMP, SRS, WNP, EWCC, ID, BPNP	$ each	○ ● ● ○ ○
Action 2.4 Provide an e-bike rebate program to help residents afford electronic bicycles.	-	$	○ ○ ● ● ●

*Plan name key on page 57

Strategy: Parking Management

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 3.1 Provide information on how long it takes to get from off-street parking garages and lots to areas of interest downtown to increase awareness of off-street parking availability.	-	$	
Action 3.2 Increase the pricing for on-street meters to discourage on-street parking.	MDBQ	$	
Action 3.3 Create a “first hour free” pricing system for parking garages and lots to encourage off-street parking for short-term users.	MDBQ	$	
Action 3.4 Promote the use of parking garages and lots through city publications, news releases, and more to encourage off-street parking.	-	$	

*Plan name key on page 57

Strategy: Bicycle Improvements

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 4.1 Transform 15th Street to have two buffered, dedicated on-street bike lanes from Sycamore Street to Bluff Street with northern bike lanes traveling westbound and southern bike lanes traveling eastbound. Remove all southside on-street parking spaces and make remaining northside parking spaces free of charge.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$$$	● ○ ○ ○ ○
Action 4.2 Add sharrows to Jackson Street, from 19th St to 6th St; Washington Street, from 19th St to 7th St; and to 3rd Street, from Bluff St to Main St.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$	● ○ ○ ○ ○
Action 4.3 Transform Bluff Street to have one buffered, dedicated on-street bike lane from West 5th Street to West 15th Street with the bike lane on the western side of the road traveling southbound. Remove all eastside on-street parking spaces.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$$	○ ● ○ ○ ○
Action 4.4 Transform Locust Street to have one buffered, dedicated on-street bike lane from West 5th Street to West 15th Street with the bike lanes on the eastern side of the road traveling northbound. Remove all westside on-street parking spaces.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$$	○ ● ○ ○ ○

*Plan name key on page 57

Strategy: Bicycle Improvements

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 4.5 Provide bicycle racks at public locations, such as parks and parking garages, and encourage private business to allow bike rack placement on nearby public street frontage.	PDMP, HMDMP, SRS, WNP, EWCC, ID, USEPA, BPNP	$ each	
Action 4.6 Transform West 5th Street to have two buffered, dedicated on-street bike lanes from Bluff Street to White Street with northern bike lanes traveling westbound and southern bike lanes traveling eastbound. Remove all on-street parking spaces.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$$	
Action 4.7 Transform Central Avenue to be a two-way road with two buffered, dedicated on-street bike lanes from West 5th Street to 15th Street with eastside bike lanes traveling northbound and westside bike lanes traveling southbound. Streetscape improvements such as streets and street lights should be added. Remove all on-street parking spaces.	SRS, CSP, EWCC, ID, RAISE, USEPA, MDBQ	$$$	

*Plan name key on page 57

Strategy: Bicycle Improvements

Action	Related Plans*	Cost	Timeline (Years 1-5)
Action 4.8 Provide a map of which streets are safest for bicyclists, including dedicated on-street bike lanes, trails, and sharrows.	-	$	○ ○ ○ ○ ●
Action 4.9 In addition to the roads listed above, connect the existing trails, such as the Bee Branch Trail, Mississippi River Trail, or Heritage Trail, to streets with bicycle lanes for better connectivity.	SRS, CSP, EWCC, ID, RAISE, MDBQ, BPNP	$$	○ ○ ○ ○ ●
Action 4.10 Place “Bikers Allowed Use of Full Lane” signs on roads with dedicated bike lanes and sharrows to increase awareness of bicyclists.	CSP, EWCC, ID, RAISE, USEPA, BPMP	$ each	● ● ● ● ●

*Plan name key on page 57

Related Plans Key

Related Plan Title	Shortened Title
Port of Dubuque Master Plan	PDMP
Downtown Dubuque Master Plan	DDMP
Historic Millwork District Master Plan	HMDMP
Dubuque Area Safe Routes to Schools Plan	SRSP
Washington Neighborhood Plan	WNP
Complete Streets Policy	CSP
East-West Corridor Connectivity Study	EWCC
Imagine Dubuque 2037: A Call to Action	ID

Related Plan Title	Shortened Title
Equitable Poverty Reduction and Prevention Plan	PRPP
Central Avenue Corridor Streetscape Master Plan	CACS
RAISE Grant	RAISE
USEPA Emerging Mobility Building Blocks Technical Assistance	USEPA
MoveDBQ: Smart Parking and Mobility Plan	MDBQ
Dubuque Regional Bicycle and Pedestrian Network Plan	BPNP

Table 2: Key for related City plans

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Appendix A: List of Stakeholders

Name	Description/Relevance
Mayor/City Council	The Mayor and City Council has the power to approve or disapprove of action plans and holds the power to direct city staff in amending plans.
City departments/bureaucrats, such as: Public Works, City Engineers, City Planners, Sustainability, Parking and Transit	The logistics of the plan will be based on workers from these departments, final plan implementation is directed by city staff, select city resources needed for the project will most likely come from bureaucracy members, and planners specifically know the network of existing plans and how they relate to this TAP.
Non-profits	Coordination with nonprofits that are centered around low-income populations, transportation, and racial/ethnic groups (non-native English speakers, immigrant population) is important for this TAP.
Other NGOs	Certain NGOs, such as environmental groups, could be a good supplement to the work with local non-profits.
East Central Intergovernmental Association	This COG has existing plans in place about the regional transportation network.
Existing transit agencies (The Jule, Region 8 RTA)	Coordination with existing transit agencies was completed as this plan is about alternative transportation.

Name	Description/Relevance
City maintenance workers (street cleaners and snowplows)	Although part of the bureaucracy, their role is slightly different. All roadways need to be large enough that it is feasible for large city vehicles like street cleaners and snowplows can drive on effectively, efficiently, and safely. When finding roadways for potential bike lanes, street width were taken into consideration. Additionally, snow cannot be piled onto the bike lanes on the sides of the road during the winter.
State government	Existing state laws in place were followed during the creation of the TAP.
Iowa DOT	Coordination with DOT may be required for any changes on state owned roadways.
Wisconsin/Illinois DOT	Coordination with DOT may be required for any changes on state owned roadways.
Neighborhood associations	Neighborhood associations may provide knowledge for what residents want in terms of type of transportation and what is already in place.
School districts	School districts may have knowledge on the transportation needs for ages 18 and under and could identify areas of the city where more bus routes are needed.

Name	Description/Relevance
Business owners	Business' foot traffic is often dependent on the transportation infrastructure surrounding them. Many downtown businesses incentivize driving by offering to pay for workers' parking. Therefore, this plan considered how roadway changes may affect business owners downtown.
Universities and colleges	Most higher education institutions in Dubuque do not have their own transportation services for their students so they rely on the transportation system in the city.
Bikers and community bike groups/coalitions	These groups are key stakeholders in bike infrastructure and would be a main group who has the potential to utilize the new bike infrastructure. They hold valuable information on the current state of biking in Dubuque and may know possible areas of the city that need more (or less) attention for bike lanes or trails.
Elderly and disabled groups	These groups are often reliant on public transportation to get them from place to place, therefore, their presence cannot be forgotten when determining diversity in transportation methods (specifically, custom routes from the Jule that provide homebound service and sidewalk connectivity).
Households with no vehicle access	We found that 7.8% of HHs in Dubuque have no vehicle access so we have emphasized transportation diversity to those areas.

Name	Description/Relevance
Children	Children should have safe routes of transportation throughout the city (e.g., sidewalks, sidewalk connectivity, crosswalks, safe/comfortable bike lanes) while keeping in mind their main methods to get to school or other local community facilities.
Work commuters	The plan has provided adequate room for workers who do need to drive to park their cars (non-residents). The TAP also plans for new modes of transportation for those workers who no longer want to drive their cars (residents).
Environmental justice communities	These communities have high concentrations of low-income and/or marginalized groups and have high GHG emissions or worse air quality due to high VMTs on the roadways near them.
Visitors and tourists	The TAP has made sure there is adequate room for visitors and tourists to park their cars. Additionally, implementing a walkable and bikeable downtown area promotes tourism.
Future developers	Future developers should be conscious of new roadway designs and how these may impact their developments.

Appendix B: Farmers' Market Event Materials

Discussion Guide

Hi, thank you for taking the time to stop and talk with us. We're from the University of Iowa and partnering with the City of Dubuque to write a plan that promotes different types of transportation.

1. What type of transportation you used to get to the farmer's market today?
   a. Drive [ ] b. Transit [ ] c. Walking [ ] d. Biking [ ] e. Other _____

If drive:

2. Did you carpool? How far was the drive for you today to the farmers market?

_____

3. What motivated you to drive this morning rather than travelling here by biking, walking, or public transit?
   a. Only mode I have [ ] b. No transit in my neighborhood [ ]c. Weather [ ]
   d. Other modes take too long Safety/Comfort [ ] e. Convenience [ ] f. Others

IF THEY SELECT WEATHER: How do you usually travel here when the weather is not bad?

_____

4. Did you have trouble finding parking for the farmers market? Or do you usually have trouble finding parking in downtown Dubuque?

_____

5. How far would you be willing to walk from your parking spot to the place you're going downtown?

_____

6. How do you feel about sharing the road with bikers? (Something like this) - Do they make you drive more carefully?

If other modes:

1. How long did it take you today to get to the farmers market?

_____

2. Why did you choose to (walk/bike/take public transit) to downtown today?

_____

3. Did you bike on the road, sidewalks, or trail?
   a. Road [ ] b. Sidewalks[ ] c. Trail [ ] d. others [ ]

_____

4. Do you feel safe (biking/walking/taking public transit) to downtown? Why do (don't) you feel safe?

_____

5. How long did it take you to get here today? (in minutes, preferably)

_____

Other questions:

1. What method of transportation do you use the most around Dubuque?
   a. Drive [ ] b. Transit[ ] c. Walking[ ] d. Biking [ ] e. Other _____

2. Are there any places that you frequently walk or bike to?

_____

3. Do you feel safe walking or biking around downtown (emphasize this is not as much about crime)? What makes you feel safe or unsafe when biking or walking?

_____

4. What would make you more likely to use a different method of transportation other than driving?

_____

5. What mode(s) of transport do you use to travel to destinations within 1-2 miles of your home for **recreational** trips such as for exercise, parks, or retail shopping?

---

6. What mode(s) of transport do you use to travel to destinations within 1-2 miles of your home for **utilitarian** trips such as for work, grocery shopping, travel, etc?

---

7. We have found that downtown Dubuque currently has a lot of parking availability that is often vacant, even at the peak demand times. This includes both on-street parking (meters) and off-street parking (parking lots and garages owned by the city). On roads with on-street parking, there are often spaces on both sides of the road as well. How would you feel if, on some streets, those on-street parking spots were converted into bicycle lanes?

a. Would you support this proposal? Why or why not?

---

b. Would you trade traffic speeds (downtown) for safety amongst bikers and walkers?

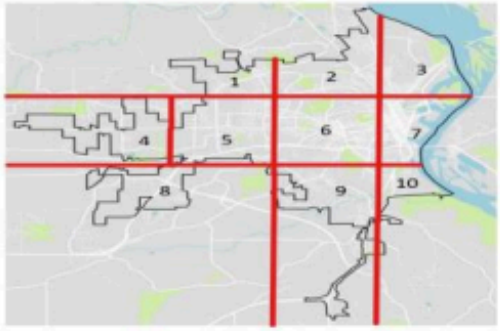
Demographic Questions:

So now I have some questions about you, if you don't feel comfortable answering any just let me know and we can skip to the next one.

1. How old are you?
   a. Under 18 [ ] b. 18-30 [ ] c.31-45 [ ] d. 46-60 [ ] e. 61+ [ ]
2. What is your gender?
   a. Female [ ] b. Male [ ] c. Non-binary [ ] d. Others [ ]_____
3. What is your race and ethnicity?
   a. White or Caucasian [ ] b. African American[ ] c. American Indian or Alaska Native [ ] d. Latino or Hispanic [ ] e. Asian[ ] f. Other [ ]_____

---

4. What area of Dubuque do you live in? Can you point to it on this map?



Follow up:

We will be hosting a public engagement event next Sunday, October 29th, at Backpocket Brewery in downtown Dubuque. We will be hosting focus groups to talk about your experiences with biking in Dubuque and looking for suggestions on how biking and walking can be improved throughout the city. A focus of this event will be on the current safety and comfort of biking and walking.

Would you be interested in attending this event?
If so, please provide an email address so we can contact you this week about RSVPing.
Email:

Appendix C: Experienced Users Event Materials

THE CITY OF DUBUQUE
Masterpiece on the Mississippi

IOWA
Initiative for Sustainable Communities

DUBUQUE ALTERNATIVE TRANSPORTATION VISIONING

You're invited!

What would a comfortable and safe transportation system look like in the city of Dubuque? We want to hear your opinion on the current alternative transportation system and your vision for the future of Dubuque!

October 29, 2023 | 2:30 PM

Ride your bike, take the bus, or walk to

Backpocket Brewery!

333 E 10th St, Dubuque, IA

Families are welcome!

One drink ticket will be provided for each participant who RSVPs:

*RSVP not required to attend the event

10.29.2023 Backpocket Discussion Guide

Opening Questions

1. How did you all travel to the event today?
2. For those of you that biked, what were the specific routes you used to get here? Did you have to travel on the sidewalk? Did you have to ride on a road without a bike lane? Trails? A mix of everything?
3. For those of you that walked, were you able to use a sidewalk the entire walk?
    - Did you have to take a route that was slightly longer in order to walk on a sidewalk?
    - Were you ever walking without a sidewalk?
    - Were there any large intersections you had to cross?
4. How long did it take you all to travel here today?
5. We requested that you travel to this event by something besides a vehicle. Do you usually use the mode you used to get here today often in your everyday life? For example, do you bike or walk for either recreational trips, such as going to a park, or daily use trips, like shopping, going to work, visiting people?
    - How often do you use these other modes? (2 trips a week? 1 trip every 2 weeks?)
    - Why don't you use them more often? (Are cars too convenient? Are the trips too far? Are routes/sidewalks not safe enough? Is the weather a barrier to walking/biking when it is cold? Are there no transit options in their neighborhood?)

Safety

6. Did you feel safe and comfortable from automobiles and traffic on your way here?
7. Did you ever feel unsafe? Why or why not?
8. How would you all describe safety and comfortability in your own words?
9. So, why do those things you just described make you feel more safe and comfortable than without those things?
10. A good example from a partner on this project is whether or not a road is safe enough that you would let your child use it independently. With that said, using your answers to the past few questions, is the route you took her a route that you would consider safe enough for your children (or other youth) to use?
11. How important is the feeling of safety and being comfortable to you when walking and biking in Dubuque? Specifically for bikers, this question is about biking on roads/roadways.
    - Why is this so important to you?
    - If you were to ever feel unsafe while walking and biking, would this discourage you from using these modes of transportation?
12. When walking and biking in Dubuque, what makes you feel safe and comfortable while commuting? Know that this question is not as much asking about crime, but more so about safety/comfortability from cars, traffic, etc.
    - Slower traffic speeds?

- A large buffer from the traffic?
- Separate facilities/infrastructure for biking and walking?
- Environment \ Green infrastructure; trees, parks, people

13. If you biked here, did you use a road with "sharrows?" Did these make you feel safe/comfortable by using your definition of safety/comfortability before?

Comfortability

14. How do neighborhood aesthetics play into the comfortability of walking?
    - For example, are you more likely to walk or bike in a neighborhood with more trees and less concrete and buildings?
    - Do more visibly appealing sidewalks, curbs, and street sides make you more willing to walk or bike along those roads?
15. How do you feel about the safety and comfortability that on-street parking gives to you as a pedestrian?
    - As a walker, do cars parked on the street, that are often very visible from the sidewalks, change your view on the area's aesthetics?
        - How so? What would you rather see than cars parked on the road?
    - As a biker, does traveling on a road with double-sided on-street parking make you more or less likely to travel on that road?
16. How do the hills in Dubuque affect you as a pedestrian trying to get from place to place?
    - Does the bluff influence you to drive?
    - Do you feel **safe** traveling up or down the bluff in the winter?

Transit

17. Is anyone here familiar with the bus system throughout Dubuque? Have you ever been to the station across the street?
    - If there are transit users, ask their general thoughts about the system and its connectivity
18. How do public transit, biking, and walking all fit together in a city like Dubuque? Does the hilly landscape play a role in this?
    - Is it convenient to use multiple types of transportation for one trip?
        - [For example, could you ride your bike from home to a bus stop, then get on the bus with your bike, then use your bike from where the bus drops you off?]
    - Is the current interconnectedness of the systems in Dubuque adequate to be actually functional for necessary trips, such as those to work or grocery shopping?

Future of Dubuque

19. Describe what your ideal bike system could look like: BUT, remember there must be a tradeoff. More bike lanes would mean less on-street parking availability. As both a driver and biker/walker, is this a trade you would be willing to make?
    - How would that impact downtown businesses?
        - How can we mitigate that?
20. It's likely that there will be residents opposed to the [discuss ideas they came up with]. What would your arguments be to people who oppose [those ideas] throughout Dubuque?
21. If you could pick one street running north/south and one street running east/west in downtown Dubuque to have a protected on-street bike lane, which street would you pick and why?

Appendix D: Our City, Our Future Event Posters

The following pages show the eight posters presented to the public at the Our City, Our Future public engagement event in Dubuque at the Multicultural Family Center on Saturday, April 6, 2024.

TRANSPORTATION IN DUBUQUE

25.2%

of households downtown do not have access to a car

Source: U.S. Census Bureau, ACS 2021 5-year estimates

69%

of on-street parking is vacant during the busiest time of the day

Source: MoveDBQ, in progress 2023

0 dedicated bike lanes

55%

of downtown blocks do not have street trees

77.2% DRIVE ALONE | 7.5% CAR POOL | 1.3% USE TRANSIT | 0.3% BIKE | 3.4% WALK | 9.4% WORK FROM HOME | 0.9% OTHER

Source: U.S. Census Bureau, ACS 2021 5-year estimates

ALTERNATIVE TRANSPORTATION PLAN GOALS

Well-connected bicycle and pedestrian network

Equitable and inclusive for all

Create space for alternative transportation

Adapt Dubuque's transportation system and promote sustainable, alternative transportation that is more equitable, well-connected, safe, and comfortable for all residents of the city.

WHAT ARE THE BENEFITS?

ECONOMIC GROWTH

COMMUTER AND RECREATIONAL BICYCLING IN IOWA GENERATES AN ESTIMATED **$400 million** IN ECONOMIC ACTIVITY

Source: Iowa Bicycle Coalition, 2011, "Economic and Health Benefits of Bicycling in Iowa"

SAFETY

THE ADDITION OF A BICYCLE LANE LEADS TO A **49% reduction** of crashes

Source: U.S. Department of Transportation Federal Highway Administration, "Bicycle Lanes"

SUSTAINABILITY

IN DUBUQUE, THE TRANSPORTATION SECTOR ACCOUNTS FOR **30% of all emissions**

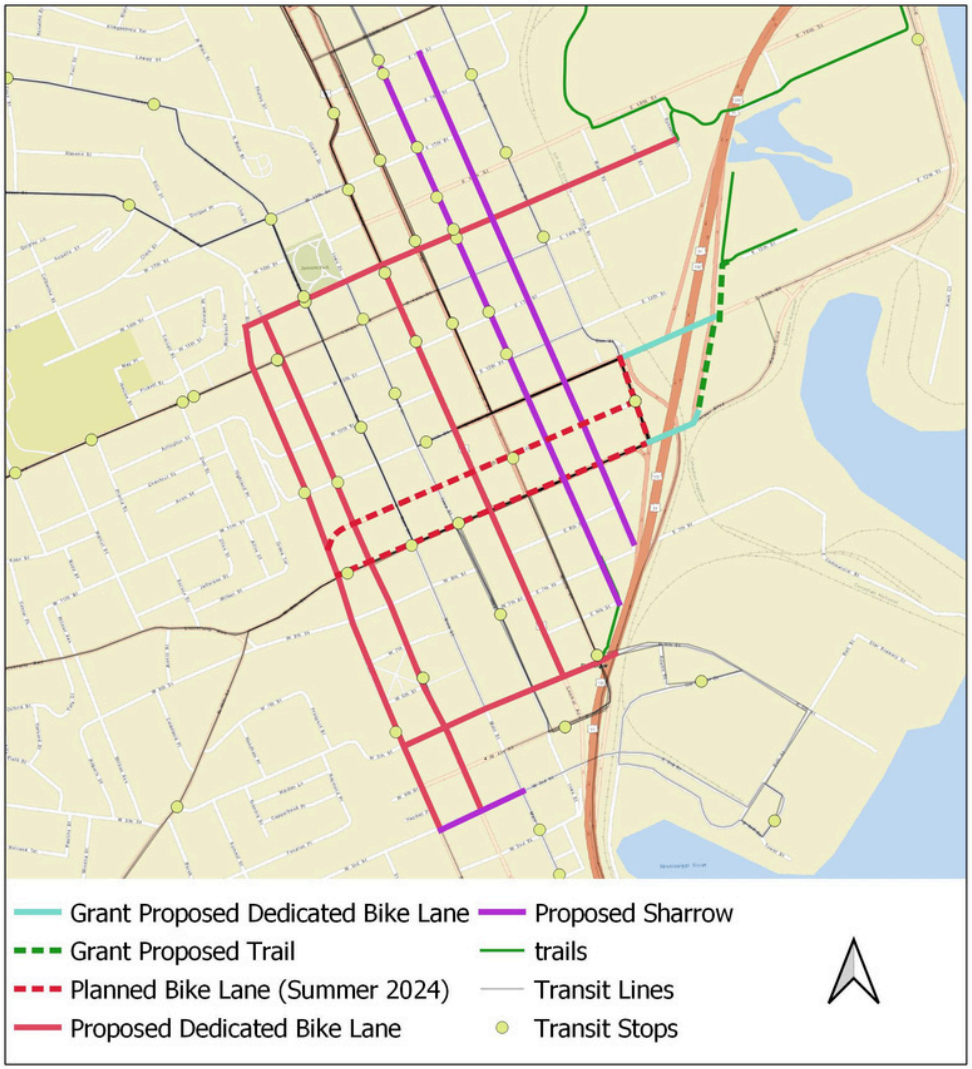
Source: City of Dubuque, 2022, "Community Greenhouse Gas Inventory Report"

PHYSICAL HEALTH

PEOPLE WHO LIVE NEAR TRAILS ARE **50% more likely** TO GET ENOUGH PHYSICAL ACTIVITY TO HELP THEM STAY HEALTHY

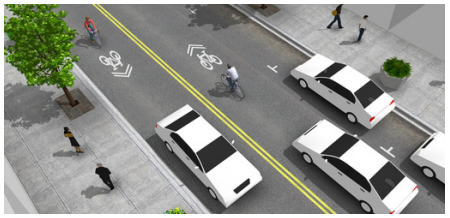
Source: National Recreation and Park Association, "Active Transportation and Public Health"

NEW TRANSPORT NETWORK SYSTEM



Dedicated Bike Lane

Sharrows



BIKE ROUTE PRIORITY PATHS: WHERE DO WE START?

CENTRAL AVENUE REDESIGN BEFORE AND AFTER:

Central Avenue's Parking Tradeoffs:

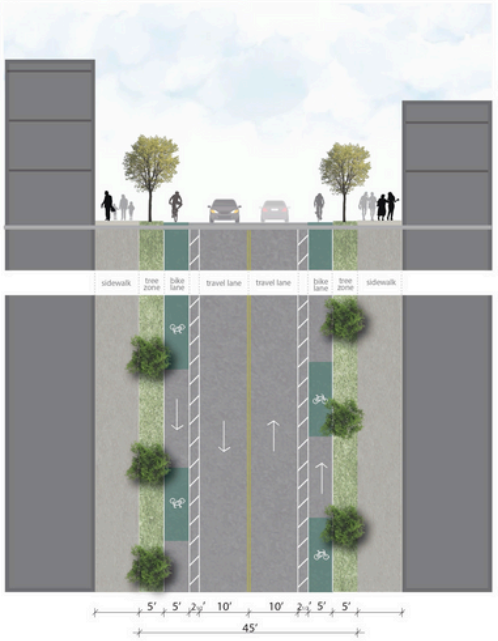
- Eliminates 38 eastside spaces
- Eliminates 29 westside spaces
- 3 nearby off-street parking options include Central Avenue Ramp, Iowa Street Ramp, and City Hall Lot

15TH STREET REDESIGN: BEFORE AND AFTER

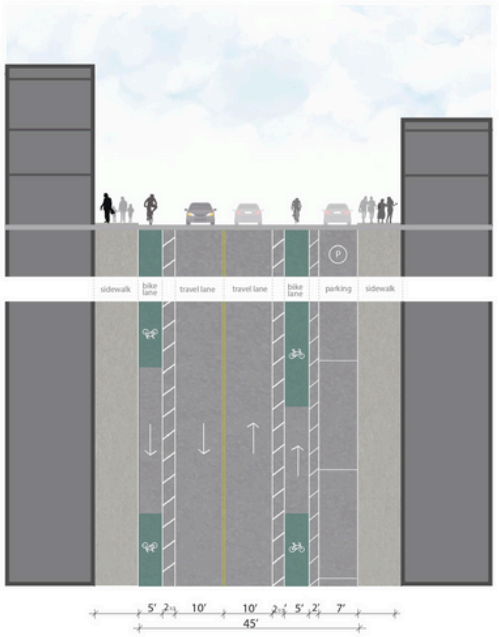
15th Street's Parking Tradeoffs:

- Eliminates 46 northside spaces
- Eliminates 34 southside spaces
- Our team recommends free parking on one side of the street for nearby residents and those wishing to utilize the recently beautified Jackson Park

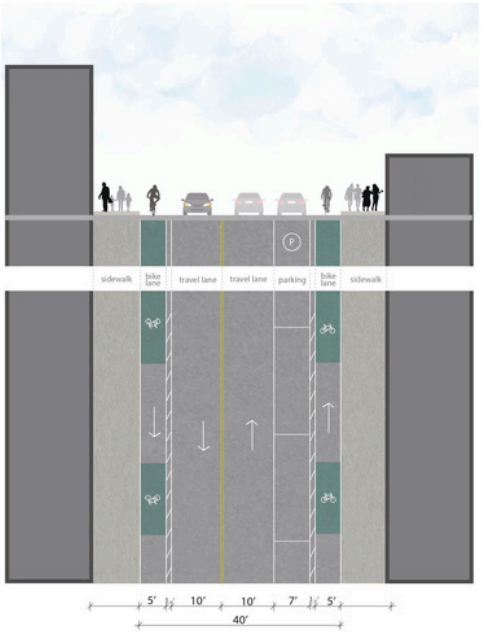
SCENARIO 1: 45-FOOT RIGHT OF WAY



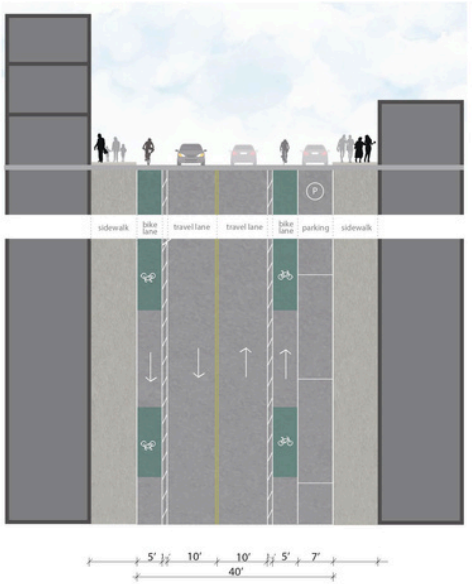
SCENARIO 2: 45-FOOT RIGHT OF WAY



SCENARIO 3: 40-FOOT RIGHT OF WAY



SCENARIO 4: 40-FOOT RIGHT OF WAY

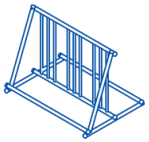


OTHER PROJECT RECOMMENDATIONS

STREETSCAPE IMPROVEMENTS

E-BIKE REBATE PROGRAM

INCREASED BIKE AMENITIES AND WAYFINDING



TRANSIT INFRASTRUCTURE IMPROVEMENT

WHAT IS AN E-BIKE REBATE?

An e-bike rebate program is a government or organization-sponsored initiative aimed at incentivizing the adoption of electric bicycles (e-bikes) by offering financial incentives or rebates to consumers who purchase them. These programs typically aim to promote sustainable transportation alternatives, reduce greenhouse gas emissions, alleviate traffic congestion, and improve public health.

E-BIKES IN OTHER CITIES:

CITY OF DENVER

- Funded through the city's Climate Protection Fund
- This fund is paid through a $0.25 sales tax.
- Offered $400 for all residents, $1,200 for income-qualified residents, and additional $500 for an e-cargo bike.

CITY OF TAMPA

- Funded through revenue from parking fees.

CITY OF OAKLAND

- Funded through grants.

CITY OF BERKLEY

- Funded through the city's climate equity fund, which provided about $250,000 for the pilot study.
- Additional fund from UC Berkley's Chancellor's Community Partnership Fund.

THANK YOU FOR YOUR PARTICIPATION!

Scan the QR Code or grab a paper to complete the final survey before you leave.

Appendix E: Research and Case Studies

Case Study: Street Transformation on LebuJemo Bike Corridor, Addis Ababa, Ethiopia, 2020

The city of Addis Ababa committed to constructing 100 km of bike lanes within three years as part of the Non-Motorized Transport Strategy through their Safe Cycling Program. The LebuJemo Bike Corridor was the program's first official step. The corridor's location linked numerous travel destinations and origins and was developed based on lessons learned from earlier initiatives in the city. The design of street transformation fostered a strong cycling culture in the city through the connected network. The six-lane street was rebuilt for the new street plan to enable a curbside bi-directional cycling facility on one side and restrict on-street parking to the other. This street's large travel lanes provided plenty of available space for the construction of this facility only for cyclists. The thermoplastic lane markings were complemented by curb cuts to designate conflict zones and green markings at all intersections throughout the corridor. Signs were placed to notify the public about the new street infrastructure. The before and after conditions of the street are depicted in **Figures 1 and 2.**

Figures 1 and 2: Examples of street transformations from Ethiopia (Global Designing Cities Initiative, 2023).

Case Study: E-Bike Rebate Program in Denver, CO

Denver, Colorado administers one of the most well-known e-bike rebate programs in the country, and they were one of the first cities to do so. The creation of their program originated from a community task force that instructed the City of Denver to evaluate how to create equitable, more sustainable transportation decisions for the residents of the city, and this included an evaluation of a potential e-bike rebate program. The City of Denver found that e-bikes cost just $0.07 per mile, while gasoline vehicles cost $0.25 per mile, making e-bikes an environmentally friendly and cost-effect mode of transportation (Salisbury, 2024).

Denver operates their e-bike rebate program as a point-of-sale rebate. Although the program now has four types of rebates available with differing qualifications, it started with just two types of rebates: a standard rebate and an income qualified rebate. Today, they offer any resident a $300 standard rebate and income qualified residents a $1,200 rebate (City of Denver Department of Climate Action, Sustainability & Resiliency, 2024). The program became so popular in the city that they expanded the types of rebates available to further include moderate-income qualified residents and adaptive rebates for those with disabilities.

Like the recommendations of this plan for the City of Dubuque, Denver partners with local bike shops in which rebates must be used to be deemed an eligible purchase.

Denver consistently runs into the same problem other cities do: the demand for the e-bike program is significantly more than the amount of available funding. Denver opens their online applications for the rebate every other month, about six times per year. About 10,000 people get online to apply during each of these periods, but the city only has the funds for about 1,000 residents to receive the rebates. This “problem” speaks to the success of the program as there are ten times the number of applicants as there are recipients. Denver’s funds for the program come from the City’s Climate Protection Fund, voted for by the residents of the city, that is paid through a $0.25 sales tax (Mike Salisbury, 2024). This funding source is more unique to Denver as the it was voted on by the public.

Since the program’s creation in 2022, the city has assisted in providing the public with over 8,000 vouchers. In other words, over 8,000 residents have received e-bikes as a result of this successful program. The city has spent over $75 million on the program and has over 30 bike shops

participating in the area. Denver requires rebate recipients to participate in a survey after a given amount of time to track their program's success (Salisbury, 2024). From these survey results, the city has discovered encouraging statistics that show their program is achieving many of its goals towards sustainability and equity:

- The average voucher redeemer replaced about 3.4 vehicle trips per week, amounting to about 180,000 VMT replaced per week;
- 29% of bike riders indicated they were new riders, showing that the program is inducing new purchases for first-time riders;
- 48% of vouchers and 67% of funding goes to income-qualified residents, increasing equity in transportation throughout the city;
- Almost half (46%) of redeemers live in what the city deems as “Disproportionately Impacted Communities;” and,
- Income qualified redeemers rode their e-bikes 50% more than those who redeemed a standard voucher, implying that lower-income recipients are replacing more trips as well.

Denver has seen success in this program for over two years straight, application cycle after application cycle. The details of their program has been mirrored by many cities across the country.

Denver’s program design (point-of-sale rebates, income qualified vouchers, local bike shops) has been used by cities such as Tampa, Florida (City of Tampa, 2024); Columbus, Ohio (Columbus E-Bikes, 2024); Raleigh, North Carolina (City of Raleigh, 2024); Boulder, CO (City of Boulder, 2024); and even the State of Connecticut (State of Connecticut, 2023). Cities of similar size and population to Dubuque (specifically Bloomington, IN, population of just under 80,000) are jumpstarting this program, too, as they have seen success in all other programs across the country (City of Bloomington, 2024). All these cities have the same problem that Denver was confronted with: the number of applicants per application cycle is always significantly higher than the number of rebates available due to funding constraints. This could be viewed as a good problem to have, though, as residents are clearly interested in becoming a rebate redeemer.

The City of Denver has suggested some key takeaways to their program that cities starting their own program should take note of to better their program when that time comes. In general, they recommend all cities:

- Keep the program simple for ease of administration;
- Utilize a point-of-sale rebate that is to be redeemed at local, participating bike shops;
- Conduct outreach to disadvantaged communities to encourage income-qualified residents to apply for a rebate;
- Have a data collection plan, often done through surveys; and,
- Ensure your city has safe biking infrastructure and secure bike storage for those to lock up their bikes.

In Dubuque, e-bike riders can utilize the newly implemented on-street bike lanes as a primary or secondary mode of transportation, ride recreationally on the many trails across the city, or even use the bike to help navigate the hilly landscape.

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Appendix F: E-Bike Rebate Program Design

E-Bike Rebate Program Design for Dubuque, IA

E-bikes programs are an effective way to lower the cost of e-bikes and incentivize community residents to purchase an e-bike. Costing as low as a few hundred dollars and up to many thousand dollars, the cost barrier to owning an e-bike can be substantial. As a response, over 160 e-bike incentive programs have been implemented throughout the U.S. and Canada. In the U.S., successful examples of cities implementing these programs include larger cities like Denver, CO and Tampa, FL, both of which have a program design proven to be successful and potential to be modeled after. After seeing the success of these programs on a larger scale, smaller cities are also beginning to start their own rebate programs in Bloomington, IN; Boulder, CO; and Columbus, OH. Cedar Rapids, IA has also proposed an e-bike rebate program specifically for those on their Family Self Sufficiency program, although this is yet to be officially adopted (Payne, 2023).

Program eligibility can vary by city, but, generally, to be eligible to participate, the purchaser must be a resident of the administrator's jurisdiction. For example, a program administrated by the City of Dubuque will have the eligibility requirement of being a resident of the city (among others).

One other common requirement of the program is to purchase a qualified e-bike from a local bike shop in Dubuque. This allows easy communication and program implementation between participants, the bike shop, and the city, and will benefit the local economy by encouraging spending to take place within the community as opposed to online shopping. Bike shops can also allow participants to demo bikes to ensure they are purchasing the bike that is the best fit for them. Bike shops should apply to the city to indicate they want to be a participating store in the program.

The most successful e-bike rebate programs use a point-of-purchase rebate; this means the rebate amount is immediately applied during the purchase of the e-bike, effectively lowering the upfront cost. This program setup is opposed to a post-purchase rebate design where the buyer pays full price and receives a check in the mail afterwards, or a tax credit design. Most cities use the point-of-purchase rebate for simplicity, effectiveness, and efficiency. Encouraging city efficiency, research has shown that the point-of-purchase design is 30% more effective than post-purchase rebates and tax credits. This has led researchers to recommend the use of point-of-purchase designs for administrators.

Like the proposed e-bike program in Cedar Rapids, most programs have income qualifications or low-income options to encourage low-income residents to purchase e-bikes that will lower their up-front costs, increase their mobility, and decrease transportation costs. Having these incentive programs will improve access to e-bikes for low-income individuals (Bigazzi & Berjisian, 2021). When determining rebate amounts, effective programs are “tiered;” one tier has a set rebate amount for the public and a different tier has a higher rebate amount for those that are low-income or income qualified, making the program more equitable (Bigazzi & Berjisian, 2021; Jones, et al., 2024). Income qualified residents can be determined by Area Median Income (AMI) (for example, 80% AMI or below) which requires proof of income and knowledge of the current AMI. For administrative ease, this qualification can also be participation in existing social welfare programs like SNAP, FSS, Section 8, or similar programs. This makes determining income-qualified residents easy for the administrator.

Funding an e-bike rebate program can be done through various sources. Cities are typically creative where their sources originate from and the first year of funding is typically lower than the following years as they use the first year as a pilot for the program. Tampa, FL dedicated $170,000 in their first year of the program using funds from their parking division’s parking revenues (Britt, 2024). Columbus, OH dedicated $250,000 in their first year using funds from their $14 million investment passed by the City Council to build safe, resilient communities (Columbus E-Bikes, 2024; City of Columbus, 2023). Cities in Colorado use a climate tax to fund their program, passed by the voters. The most comparable city to Dubuque is Bloomington, IN, who set aside just $30,000 for the first year of the program; this money came from the city's general fund (Gonzales, 2023). They dedicated 15 vouchers of $1,000 each to their low-income qualified residents and 30 vouchers of $500 for their standard voucher. They are evaluating the program annually to determine if it will need more funding to meet demand in the future.

Final E-Bike Program Recommendations for the City of Dubuque

The city has many options for a successful program, but research and case studies have shown that these design characteristics are best for an effective and efficient program. The City of Dubuque can tailor these attributes as they see fit for the city and its residents.

- **Eligibility:** Resident of the city and 18 years of age or older. Must agree to completing a survey after purchase for the city to use in the program's evaluation.
- **Rebate structure:** Rebates should be flat amounts for both standard and income-qualified vouchers. Point-of-purchase vouchers should be utilized to ensure participants are not paying full upfront costs for the e-bike.
- **Tiers:** Standard vouchers for residents that are not income qualified should range from $300 - $800. Income-qualified vouchers for low-income residents should have a rebate amount between $800 - $1,500. Final amounts for each voucher should be determined by total program funding available.
- **Income qualification:** Income-qualified vouchers should go to those residents who meet the eligibility criteria and are below 80% AMI (to be determined by proof of income). Standard vouchers should go to those who meet the eligibility criteria and do not meet the income-qualified criteria.
- **Purchase requirements:** Participants must agree to purchase their e-bike from a participating, local bike shop. Bike shops should apply to be a participant in the program. Vouchers are not valid if the purchase is not from a qualifying bike shop.
- **Funding source and amount:** Source and amount will ultimately be decided by city staff and City Council. Modeling from Bloomington, IN is recommended due to the cities' similarities in population and the size of Bloomington's pilot program. They used $30,000 from their general fund for 15 $1,000 income-qualified vouchers and 30 $500 standard vouchers.

The project team recommends the city evaluate the program by requiring the participants to respond to surveys asking questions about their new travel behaviors. These can include questions like indicating the number of trips used with the new e-bike, number of trips for recreation, number of trips for utilitarian functions like work or grocery shopping, number of car trips replaced by the e-bike, or even if the e-bike has helped them navigate the hill in Dubuque. The city can also gauge the program's success by analyzing the number of applicants versus vouchers distributed.

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Appendix G: Further Details on Bike Lane Selections

15th Street

We are proposing two buffered, dedicated bike lanes be placed on 15th Street from Sycamore Street to Bluff Street. 15th Street is currently designated by the city as a shared road, indicated by the city's four small bike signs throughout the proposed path. We want to increase this designation for the sake of safety and connectivity. 15th Street's bike lanes will connect to our proposed bike lanes on Bluff Street, Locust Street, Central Avenue, and our proposed sharrows on Jackson and Washington Streets. The connections to many north/south streets increase connectivity to the northernmost and southernmost places within the downtown area. There are currently six bus stops within one block of this route, allowing for greater access to public transit. 15th Street will be the vital bike lane that connects to Bee Branch Trail. This will allow residents from the neighborhoods north of downtown (e.g., North End, Point) a safe bike path to get to downtown's services and resources. The first dedicated bike lane will be on the north side of the street for those bikers westbound and the second dedicated bike lane will be on the south side of the street for those bikers eastbound.

15th Street's bike lane will connect to the Bee Branch Trail providing benefits for all users. Recreational and utilitarian users can now get downtown through the existing trail network. Neighborhoods north of downtown can utilize the trail and newly implemented bike lanes to access the services and resources downtown provides. The dedicated bike lanes on 15th Street will run adjacent to Jackson Park, a community attraction that has recently undergone a beautification process with the help of one of many neighborhood associations. Also adjacent to 15th Street's bike lane is Steeple Square, a nonprofit community attraction.

15th Street is generally uniform in width, making the implementation process cheaper and feasible. There are currently no center lines on 15th Street. Implementing bike lanes gives the city an opportunity to paint center lines and bike lanes on this street to increase vehicle, cyclist, and pedestrian safety. Not needing to remove or cover any existing paint also makes this street's implementation cheaper. Near the western end of the bike route are two bus stops on the corner of Jackson and Main Streets; this route will increase transit connectivity and give its users opportunities to get directly to a bus stop safely. 15th Street has sidewalks on both sides of the street for the entire proposed bike lanes.

The team recommends keeping the northern side of on-street parking along 15th Street and removing the southern side of on-street parking spaces. The estimated number of impacted parking spaces to be lost on the street's south side is 34. All parking spaces on the northside should be made free, and the team recommends the removal of the 12 on-street parking meters. Free parking can encourage drivers to visit Jackson Park and Steeple Square. Visiting the park can result in more visitors traveling downtown as well. Further, many residents on the eastern side of this street use street spaces to park their vehicles overnight given there is limited private parking space on their property.

Community input from the “Our City, Our Future” event was vital in deciding a bike lane design for 15th Street. This design was chosen based on the project team’s knowledge regarding the benefits and difficulties for bikers, drivers, and pedestrians if this design was implemented and the feedback the team received at the public engagement event. Many attendees chose this street design for safety, innovation, and ease of driving.

Bluff Street

Currently, Bluff Street is a one-way two-lane traffic road traveling south with on-street parking on both sides at the southwestern part of downtown. It is a minor arterial road according to the Iowa DOT standards. It has an average speed limit of 25 miles-per-hour with a 100% bike and pedestrian safety score. There are currently seven bus stops within one block of this route, allowing for greater access to public transit. This street was selected for the project due to these features, its connectivity to most streets in the eastern part of downtown and the aesthetic presence of the bluff. Despite the challenge posed by the bluff, it provides natural beauty while biking or walking. The project proposes a one-way dedicated bike lane from 15th Street to 5th Street on the western side of Bluff Street. These route will intersect with the proposed bike lanes on 5th and 15th Street. It also intersects with the city’s planned bike lanes on 9th and 10th Streets, adding more connectivity to biking within the city. A future transformation of the street to two traffic lanes will come with two buffered, dedicated bike lanes to ensure safe and comfortable cycling. An on-street dedicated bike lane was proposed considering the State’s biking selection guide and street AADT.

Bluff Street's dedicated bike lane provides access to a wide stretch of residential properties and access to the Carnegie-Stout Public Library and Washington Park. Access to light commercial activities is also provided by this street. Just south of the bike lane's boundaries are the Dubuque Elevator, a tourist and resident attraction, and multiple small businesses. Considering this, a safe and comfortable dedicated bike lane will increase the number of cyclists, especially children who enjoy visiting the library during the weekend. This could be done by narrowing the width of the automobile travel lanes (this slows down traffic) and transforming the on-street parking to provide room for a dedicated bike lane.

To give space for the dedicated bike lane, on-street parking should be removed from the east side of Bluff Street. The number of free and metered spaces on the west side will remain as is. The estimated number of impacted parking spaces to be lost on the east side is just 35. These spaces can be directed to the nearby parking lots or ramps such as the 9th Street and Bluff Street Lot, Locust Street Ramp (9th Street & Locust Street), 5th Street and Bluff Street Lot, 3rd Street and Locust Street Lot, or the 3rd Street and Main Street Lot. These parking lots and ramps all have the capacity to suit the entire 35 impacted on-street spaces. Additionally, cars can park at the remaining on-street parking spaces on streets perpendicular to Bluff Street.

Locust Street

Locust Street is a one-way street that runs from south to the north of the eastern part of downtown. It currently has two-lane traffic with on-street parking at both sides. It has an average speed limit of 25 miles-per-hour with 53.75% and 71.25% biking and pedestrian safety scores, respectively. It is a minor arterial road according to the Iowa DOT standards. This is opposite of the traffic direction of Bluff Street. It has an AADT of 6,200 as of 2021. There are currently ten bus stops within one block of this route, allowing for greater access to public transit. Locust Street is considered for the project due to these features, its location, its connectivity to many activity areas, and its intersection with the city's planned bike lanes on 9th and 10th Streets. The bike lanes will also intersect the plan's proposed bike lanes on 5th and 15th Streets. The project proposes a one-way dedicated, buffered bike lane on the east side of the street from 5th Street to 15th Street. A future transformation of the street to two traffic lanes will come with two buffered, dedicated bike lanes to ensure safe and comfortable cycling. An on-street dedicated bike lane was proposed considering the state's biking selection guide and street AADT.

Locust Street's dedicated bike lane provides access to a wide stretch of residential properties and access to the Carnegie-Stout Public Library, Washington Park, and the U.S. Post Office. Access to light commercial activities is also provided by this street. Just south of the bike lane's boundaries are multiple small businesses. Considering this, a safe and comfortable dedicated bike lane will increase the number of cyclists, especially children who enjoy visiting the library during the weekend. This could be done by narrowing the width of the travel lanes and transforming the section with on-street parking to provide room for a dedicated bike lane.

To give space for the dedicated bike lane, on-street parking should be removed from the western side of Locust Street. The number of free and metered spaces on the eastern side will remain as is. The number of impacted parking spaces to be lost on the east side is 42. These spaces can be directed to the nearby parking lots or ramps such as the 9th Street and Bluff Street Lot, Locust Street Ramp (9th Street & Locust Street), 5th Street and Bluff Street Lot, 3rd Street and Locust Street Lot, or the 3rd Street and Main Street Lot. These parking lots and ramps all have the capacity to suit the entire 42 impacted on-street spaces. Additionally, cars can park at the remaining on-street parking spaces on streets perpendicular to Bluff Street.

Community input from the "Our City, Our Future" event resulted in the project team making Locust Street our second priority, along with Bluff Street. Respondents at that event mentioned the benefits of having the north/south connection on these streets, rather than Central Avenue, because these streets see far less automobile traffic. Less traffic ultimately leads to a safer bikeway for bikers and even pedestrians along the sidewalks. Bluff Street and Locust Street also lead directly to the public library, some attendees pointed out.

West 5th Street

West 5th Street runs near the southern part of downtown. The street has a speed limit of 25 miles-per-hour. It is a local street with two-way two lanes and an on-street parking at both sides. It has an AADT of 610 as of 2021 and bike and pedestrian safety scores of 62% and 63%, respectively. There are currently two bus stops within one block of this route and two additional stops just outside of one block. The team proposes a dedicated bike lane on both sides of the street from Bluff Street to White Street. These bike lanes will intersect the project's proposed bike lanes on Bluff Street, Locust Street, and Central Avenue. The street transformation will be carried out to narrow the street width and convert all on-street parking to provide adequate space for a dedicated bike lane with a buffer.

West 5th Street was selected for the project as a connector considering its characteristics. It serves as a connector of the vertical streets selected for the project. This idea is to ensure the connectivity of Bluff Street to Locust Street and essentially both to Central Avenue. This will help in connecting the southern part of downtown to the central and northern parts of the city. It will further help in connecting these parts to the Bee Branch Trail and other existing bike trails.

It provides access to business areas downtown and the Five Flags Center. Placing a bike lane on this street will help residents get access to their jobs with an active transportation system. Its on-street meter parking is not widely used and, therefore, can provide a space for a dedicated bike lane with a buffer through street re-design.

To give space for the dedicated bike lane, on-street parking should be removed from both sides of West 5th Street. The total number of impacted parking spaces to be lost is 28 (11 on the north side and 17 on the south side). These small number of spaces on this short route can be directed to the nearby parking lots or ramps such as the 5th Street and Bluff Street Lot, 5th Street and Main Street Lot, 3rd Street and Main Street Lot, or the Iowa Street Ramp. These parking lots and ramps all have the capacity to suit the 28 impacted on-street spaces. Additionally, cars can park at the remaining on-street parking spaces on streets perpendicular to 5th Street.

W 5th Street was not presented at the “Our City, Our Future” community engagement events. This street was decided on by the project team to provide a southern connection to the recommended bike lane network of this plan.

Central Avenue

We are proposing two buffered, dedicated bike lanes be placed on Central Avenue from West 5th Street to 15th Street. Central Avenue’s bike lanes will connect to the dedicated bike lanes we propose on 5th and 15th Streets, improving connectivity from neighborhoods north and south of downtown. They will also intersect the city’s planned bike lanes on 9th and 10th Streets, adding more east to west connectivity. There are currently eight bus stops within one block of this proposed route, allowing for greater access to public transit. These lanes will connect those to Bee Branch Trail through its connection to 9th and 15th Streets’ bikes lanes. The first dedicated bike lane will be on the east side of the street for those bikers northbound and the second dedicated bike lane will be on the west side of the street for those bikers southbound.

We recommend that Central Avenue be converted from a one-way to a two-way street. Through community engagement, many respondents brought to attention the high speeds many automobiles travel at on this road. Narrowing the travel lanes and converting to a two-way street will be a natural traffic calming mechanism making traveling the road safer for everyone: walkers, bikers, and drivers included. The city is currently conducting a separate study about this possibility.

The conversion of Central Avenue will include improved urban design practices such as the addition of trees, greenspace, streetlights, and bike and pedestrian amenities. The addition of two bike lanes and better urban design will come from the space previously occupied by on-street parking spaces. The total amount of impacted parking spaces to be removed from Central Avenue from West 5th to 15th Streets is 67 spaces (38 eastside and 29 westside). This number was calculated from peak parking utilization percentages found in project Move DBQ. These spaces can be directed to the nearby parking lots or ramps such as City Hall Parking Lot (located on 12th St & Central Ave), Central Avenue Parking Ramp (10th St & Central Ave), or the Iowa Street Ramp (7th St & Iowa St). These parking ramps and lots all have the capacity to suit the entire 67 impacted on-street spaces. Additionally, cars can park at the remaining on-street parking spaces on streets perpendicular to Central Avenue.

Community opinion on Central Avenue transformation was mixed. At the event, the team presented two scenarios for Central Avenue: option 1 was two bike lanes (one on each side of the road) with on-street parking kept on the westside of the road, and option 2 was two bike lanes (one on each side of the road) with complete on-street parking removal and the addition of grass buffers and trees between the bike lanes and the adjacent sidewalks. Both options converted the road to two-way traffic, with no opposition from the public. Design option 2 had overwhelming support because many residents appreciated the added greenspace between the road and the sidewalk. As one respondent said, “it makes spaces more enjoyable.” Further, residents pointed out that this design could help with traffic calming on highly traveled Central Avenue and even shade the area better for walkers and bikers. For these reasons and the team’s expertise in road design, the project team opted to recommend option 2. However, some residents expressed concerns regarding complete removal of parking spaces and the impacts of that removal on nearby storefront businesses. For this reason, and the reasons listed under Bluff and Locust Streets, Central Avenue was moved to the last priority for this plan’s implementation.