DOWNTOWN **IMPLEMENTATION** PLAN

Marshalltown, Iowa . June 2021

Acknowledgements

PROJECT TEAM:

MARSHALLTOWN
IOWA

BOLTON & MENK
Real People. Real Solutions.

PREPARED FOR:

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WITH THANKS TO:

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Gary Thompson - At-Large City Council Member

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Public Participants

Thanks to all the community members that participated in the project by contributing valuable feedback and input along the way.

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Executive Summary

01

A plan for implementing the vision.

Project Scope of Work

Figure 1: Main Street Looking East, March 2021

BACKGROUND

In the fall of 2020, the City of Marshalltown issued an RFP for completion of Phase II of the Downtown Planning Study. Through a competitive selection process, Bolton & Menk was hired to complete the next phase of planning for the future of the downtown Central Business District (CBD). The purpose of this planning process was to take a deeper dive into the outcomes of the Downtown Master Plan completed in 2019 and explore in greater detail, the recommendations of the phase one plan. The outcome of this process is entitled the Downtown Implementation Plan, as the recommendations included in the following sections, describe how the City will implement the 2019 plan.

One of the critical success factors of the Downtown Implementation Plan was to not repeat the information gathering process or community input solicitation of the previous phase, but build upon it. The charge of the design team was to take the outcomes of the initial phase, test the recommendations, refine them and determine which recommendations should stay, change or go away entirely.

PROJECT COMPONENTS

The Downtown Implementation Plan includes four main elements:

1. **Angled Parking Analysis for on-street parking in the CBD**. Public input gathered in the Downtown Master Plan process suggested that community members sought to increase the quantity of on-street parking spaces and consider angled parking throughout downtown. While angled parking may be an appropriate parking type for some streets, there are pros and cons with it just like parallel parking and it should be implemented carefully, to the right dimensions and only in the right circumstance. This was studied in great detail, for every street in downtown. The parking and circulation map on **Page 33**, identifies the locations of where angled parking is

Figure 2: Perspective Rendering of Proposed Improvements at the Main St / Center St Intersection

recommended for downtown Marshalltown. Roadway cross sections for each parking configuration accompany the map and illustrate the minimum roadway dimensions needed to accommodate the parking and circulation combination. Information in **Section 03**, details specific recommendations relating to the parking in downtown.

2. **One-way to two-way conversion of Church Street and Linn Street**. This has long been the subject of debate when considering changes to downtown streets. As again explored in the Downtown Master Plan, there was considerable support for finally making the switch back to two-way traffic on Church and Linn Streets. While the reasoning for this initial change over twenty year ago can be debated, what is certain is that one-way streets are rarely beneficial in a downtown setting. One-way streets often encourage higher speeds and are a means of getting people through downtown, faster. The goal for downtown streets is to get people where they are going, safely. They are a means of getting to and from goods and services and shouldn't serve as a thoroughfare through downtown. **Section 04**, describes the incremental steps that are necessary for "flipping the switch" on Church and Linn Streets and converting them back to two-way streets. While this process may seem quick and easy, there are several factors that will need to be considered and planned for to make this transition happen. Key elements of that process include:

   - *Modifying stop control at signalized intersections. Where signals are warranted, such as Hwy 14/3rd Ave, this will require updating the traffic signal for two-way traffic. At other intersections it means re-evaluating the appropriate means at those intersections.*
   - *Adding bumpouts at certain intersections to improve the view-shed to on-coming traffic.*
   - *Trimming trees and removing obstructions that may previously not have been an issue for one-way traffic.*
   - *Widening certain segments of the roadway to allow two-way traffic and parked vehicles.*
   - *Re-striping the roadway and adding signage.*

   Community members and visitors alike will need education and reminders to this change, as it will be something new and different. It is imperative to roll-out each phase of implementing the two-way traffic change with adequate public outreach, education and signage.

3. **Pavement Assessment of roadway, sidewalk and alley pavement throughout the CBD.** Pavement conditions in downtown have deteriorated significantly in recent years due to the impact of natural disasters, heavy equipment and increased wear and tear. Understanding that the pavement in downtown is only a portion of the pavement resources throughout the community, it was imperative to develop a Pavement Management Plan (PMP) for downtown that considers various alternatives for repair or replacement. Data on the existing pavement conditions were collected and evaluated, then paired with different budget constraints to develop pavement management scenarios for improving conditions in downtown to an acceptable level. The outcomes of this study identified a sequential order for which segments of street pavement should be repaired/replaced, based on the existing conditions and anticipated life left in each particular segment. This information was then used to develop a phasing strategy for implementation of the plan recommendations. Refer to **Section 05** for an overview of the Pavement Assessment.

4. **Streetscape enhancements for right-of-way improvements throughout downtown**. Incorporating beautification enhancements back into downtown is pivotal to restoring its character. With the determination of parking and circulation improvements, street trees, landscaping, monumentation and decorative elements are incorporated into the streetscape design for the CBD. These are the elements that work together to create a 'sense of place' and will contribute greatly to the vitality of downtown Marshalltown by attracting visitors and generating more trips to downtown.

The design of streetscape enhancements needs to be executed thoughtfully and consider not only the implementation costs but also the life cycle maintenance and input costs associated. **Section 06** breaks down specific components of the streetscape enhancements recommended for downtown and further describes important details that should be considered with each project. The following narrative provides a summary of various recommendations for the Downtown Implementation Plan.

The Plan

PLAN RECOMMENDATIONS

Each section of this plan describes strategic improvement strategies that were derived from the previous planning study and again revisited with public input and a technical evaluation for what fits best for downtown and what will allow the City to successfully implement the goals of the Downtown Master Plan. The following provides an overview of some of the more significant changes that are recommended for Downtown Marshalltown:

ROADWAY AND UTILITY REPLACEMENT –

While the pavement assessment suggested a combination of repair / rehabilitation options, upon further examination of the existing water main network in downtown and coordination with Marshalltown Water Works, it was determined that water main replacement is warranted for every street in downtown when identified for replacement/repair. The existing water mains in downtown date back to the early 1900's and some of the newest water main is still nearly 80 years old.

In most instances the replacement of the water main will necessitate full reconstruction of the roadway pavement. As result, the recommendations and phasing costs included in this plan, reflect complete water main/ service replacement as well as full reconstruction of the streets and sidewalks for nearly every roadway segment in the CBD.

To understand the order-of-magnitude of construction costs, the replacement of all storm sewer and sanitary sewer is included for each project.

Figure 3: Perspective Rendering of Proposed Mid-Block Bumpout Along Main Street.

MAIN STREET PARKING –

Angled parking will be accommodated on the south side of the street, with parallel parking on the north side. The angled parking will wrap all four sides of the Courthouse square. The overall width of Main Street will be widened by two feet to accommodate the parking change.

BIKE FACILITIES / CIRCULATION –

On-street bike lanes will continue up Center Street, providing a strong north / south connection into downtown. With the changes to parking on Main Street, bike lanes will be removed from Main Street.

A two-way cycle track will be installed on State Street to serve as the primary east / west bicycle route through downtown.

PEDESTRIAN ALLEY IMPROVEMENTS –

Improving the walkability in downtown is a priority of this plan. One of the strategies for achieving this goal is to provide and enhance more options for pedestrians to get to their destination. Converting certain alleys to pedestrian only routes, will allow pedestrians to access public parking lots more efficiently.

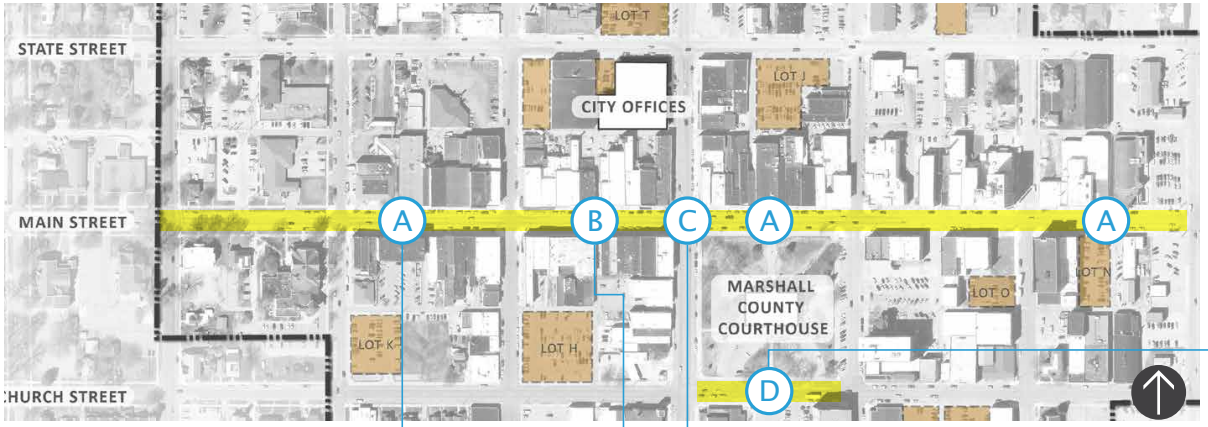
Removable bollards, pedestrian lighting, visual quality improvements and partial pavement patching is anticipated at the locations identified on the Pedestrian Alley & Walkability Diagram.

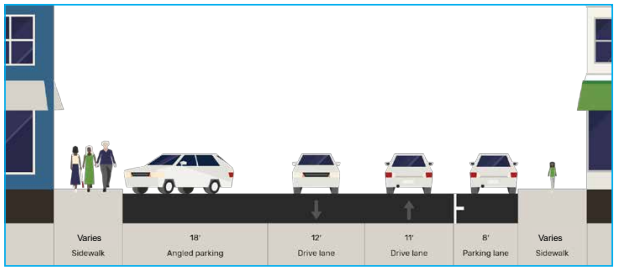
STREET TREES AND LANDSCAPING –

Street tree corridors are identified for State Street, Main Street and on all four sides of the Courthouse square. Street trees will be provided in landscape planter beds in certain instances, along with tree grates, as is proposed along State Street.

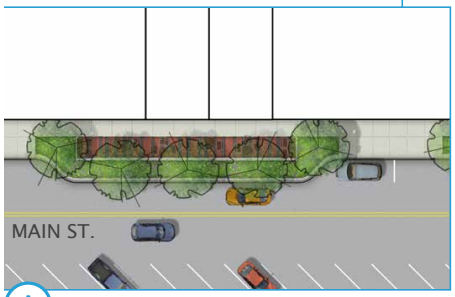
Specific recommendations for how and where street trees are planted is provided in the street tree section of the streetscape improvements. Landscape beds are planned along Main Street, around the square and at intersection and mid-block bumpouts throughout the CBD.

Figure 4: Example Image of Two-Way Cycle Track Proposed for State Street



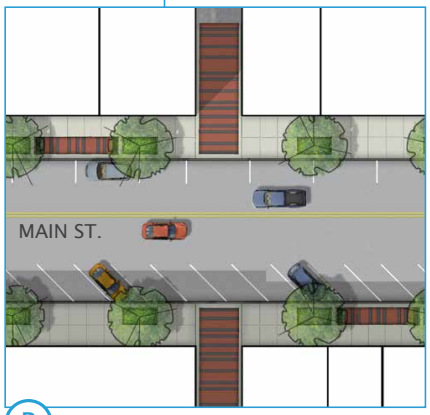


PROPOSED MAIN ST. TYPICAL SECTION



A MAIN ST. MID-BLOCK BUMPOUT

- EXISTING MID-BLOCK BUMPOUT IN FRONT OF BLACK TIRE BIKE CO COULD PROVIDE OUTDOOR SEATING AREA.
- SIMILAR DESIGN COULD BE REPLICATED ON OTHER BLOCKS



B MAIN ST. TYPICAL PLAN

- TYPICAL STREETSCAPE DESIGN ACCOMMODATES STREET TREES, LANDCAPE BEDS AND INTERMITTENT SEATING AREAS BETWEEN LANDSCAPE BEDS

C MAIN ST. & CENTER ST.

- EXPANDED BUMPOUTS CREATE SPACE FOR PEDESTRIAN AMENITIES AND INTERSECTION MONUMENTS
- DECORATIVE/SCULPTURAL LIGHTING AT ALL FOUR CORNERS OF COURTHOUSE SQUARE

D CHURCH ST. BUS STOP

- ACCOMMODATE TWO BUSES FOR TRANSFERS
- EXPAND PEDESTRIAN SPACE AND UPGRADE BUS STOP AMENITIES

Figure 5: Proposed Typical Streetscape Improvements for Main Street and the Courthouse Square

GATEWAYS & MONUMENTATION –

Architectural gateways and intersection markers are proposed at primary routes into the downtown core and at primary intersections in the CBD, as identified on the Intersection Improvement Diagram.

Public input suggests that these elements should be a combination of materials that complement the historic architecture of downtown Marshalltown, with a sophisticated take on industrial finishes. Each monument should include lighting and be built with long-lasting materials that require minimal continual maintenance and upkeep.

ROADWAY AND DECORATIVE LIGHTING –

Roadway lighting has recently been replaced throughout downtown, with the exception of the decorative roadway lighting previously installed on Main Street and around the square. For the most part, existing roadway lighting is intended to remain in place with each phase of the implementation plan. If a particular phase includes moving curb lines to accommodate the proposed design, light pole/footing locations may need to be adjusted accordingly.

Decorative/sculptural lighting is proposed at each intersection on the Courthouse square. This will consist of columns of LED lighting with integrated metal and/or masonry features.

Increased public safety and encouraging evening/nighttime use of downtown were goals of the Downtown Master Plan and adequate lighting will contribute greatly to successfully achieving that goal.

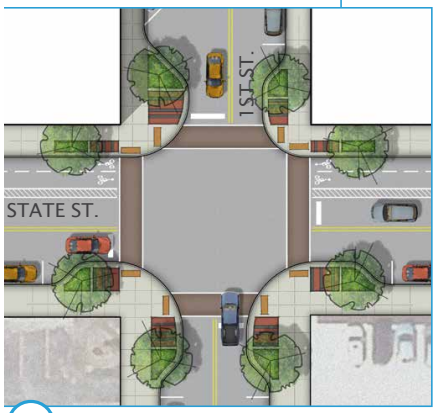
ONE-WAY TO TWO-WAY CONVERSIONS –

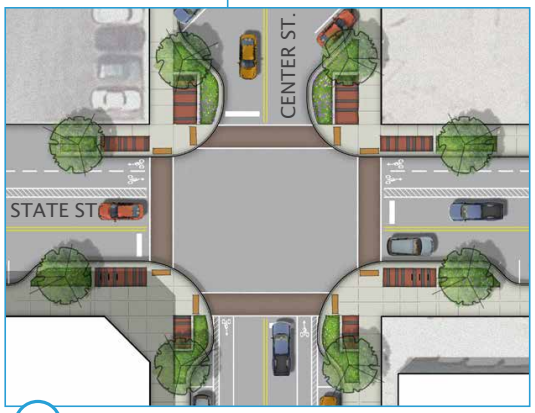
Both Linn Street and Church Street are proposed to be changed back to two-way traffic to improve circulation in and out of downtown and create safer streets with lower speeds. Specific steps to implementing this change are detailed in **Section 04**.

As part of implementing changes to the Center Street intersections on Linn and Church, circular intersections are proposed to replace the traditional, signalized intersections. Traffic signals are not warranted at these locations and a circular intersection would improve vehicular and pedestrian safety, while creating a stronger gateway entrance into downtown from the Center Street viaduct.

Figure 6: Example Image of Gateway or District Monument Proposed at Downtown Gateway Locations

PROPOSED STATE ST. TYPICAL SECTION





A STATE ST. & N. 1ST ST.
- BUMPOUTS WITH MID-LEVEL TREATMENT

B STATE ST. & CENTER ST.
- BUMPOUTS WITH WITH BICYCLE PARKING/ACCOMMODATIONS

C STATE ST. TYPICAL PLAN
- STREET TREES WITHIN SIDEWALK
- COMBINATION OF TREE GRATE AND AT-GRADE LANDSCAPE BEDS
- ACCOMMODATE "NODES" WHERE POSSIBLE
- INCORPORATE PARKING LOT BUFFERS AT SURFACE LOTS

Figure 7: Proposed Typical Streetscape Improvements for State Street

Figure 8: Perspective Rendering of Proposed Cycle Track on State Street

The Investment

CONSTRUCTION COST SUMMARY

Implementing the proposed recommendations of this plan will take commitment from the City Council and other community partners. There is a significant amount of disrepair in the CBD and when the proposed improvements are coupled with complete utility replacement and full depth concrete pavement reconstruction of the streets and sidewalks, the total cost of construction is estimated at approximately $35 Million. This is a significant investment and it will take several years to accomplish.

It is intended that this plan will be implemented in a series of phases. The location of each phase is identified on the Implementation Phasing Plan. Each phase was developed through analysis of data from the pavement assessment and considers the location, scale of project and overall cost for each segment or roadway in downtown. The following includes a cost summary of each project/phase identified on the phasing plan. The project costs include the estimated construction costs, including design/ engineering fees and construction contingency. A detailed breakdown of each project / phase is included in **Section 07 – Implementation Phasing**.

Figure 9: Perspective Rendering of Intersection Bumpout Amenities at Center St / State St Intersection

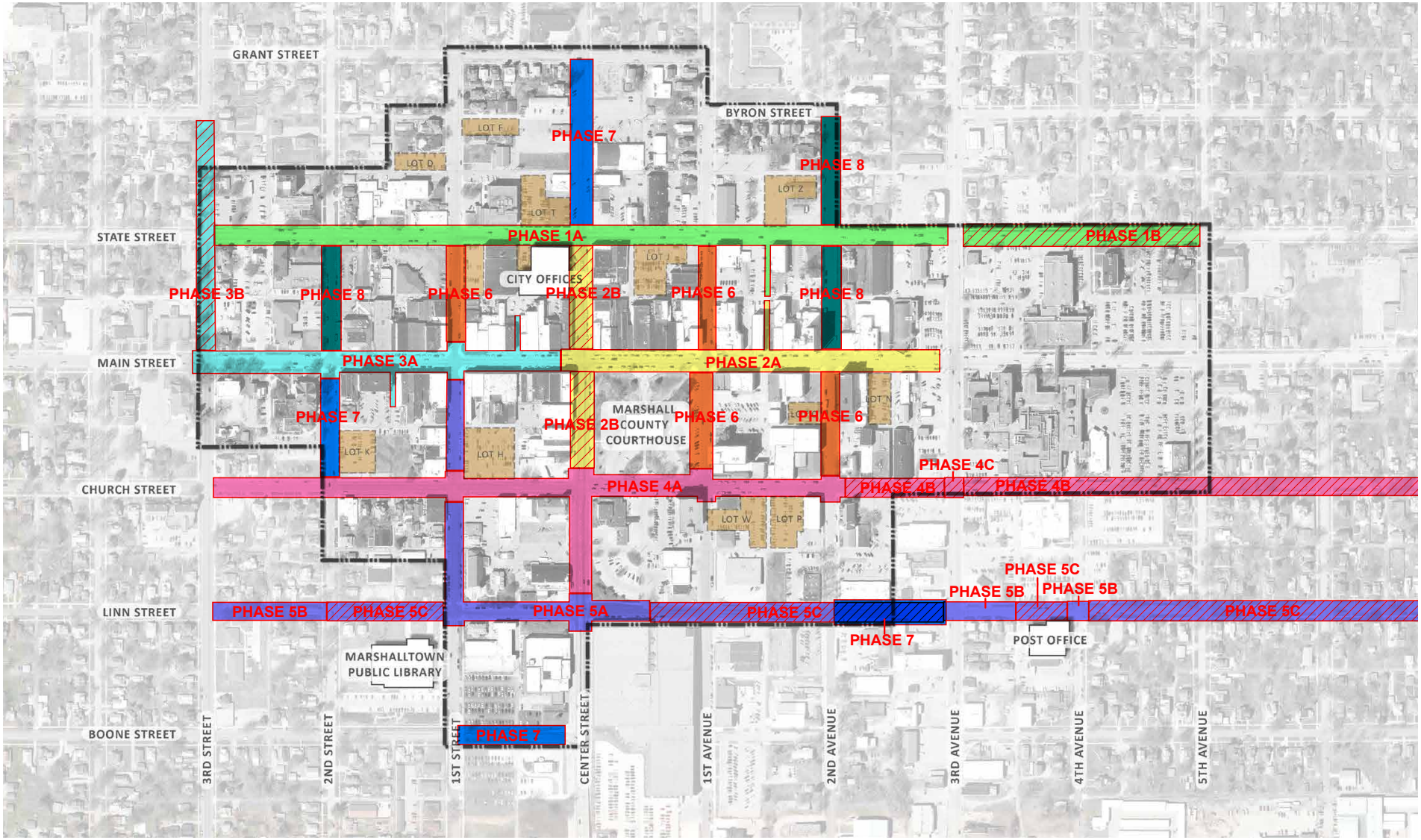


Figure 10: Implementation Phasing Plan

PHASE 1	PHASE 1A - STATE STREET	PHASE 1A - PEDESTRIAN ALLEY	**TOTAL PHASE 1A**		PHASE 1B - STATE STREET		**TOTAL PHASE 1**
Subtotal Construction	$ 4,515,368.00	$ 35,050.00	$ 4,550,418.00		$ 63,820.00		$ 4,614,238.00
Construction Contingencies 20%	$ 903,100.00	$ 7,000.00	$ 910,100.00		$ 12,800.00		$ 922,900.00
Opinion of estimated Construction Cost	$ 5,418,468.00	$ 42,050.00	$ 5,460,518.00		$ 76,620.00		$ 5,537,138.00
Subtotal Engineering (16.7%)	$ 904,000.00	$ 7,010.00	$ 911,010.00		$ 14,000.00		$ 925,010.00
TOTAL OPINION OF IMPROVEMENT COST	$ 6,322,468.00	$ 49,060.00	**$ 6,371,528.00**		$ 90,620.00		**$ 6,462,148.00**
COST PER BLOCK	$ 1,053,744.67				$ 45,310.00		

PHASE 2	PHASE 2A - MAIN STREET	PHASE 2A - PEDESTRIAN ALLEY	**TOTAL PHASE 2A**		PHASE 2B - CENTER STREET		**TOTAL PHASE 2**
Subtotal Construction	$ 2,801,202.00	$ 35,050.00	$ 2,836,252.00		$ 1,416,878.50		$ 4,253,130.50
Construction Contingencies 20%	$ 560,200.00	$ 7,000.00	$ 567,200.00		$ 283,400.00		$ 850,600.00
Opinion of estimated Construction Cost	$ 3,361,402.00	$ 42,050.00	$ 3,403,452.00		$ 1,700,278.50		$ 5,103,730.50
Subtotal Engineering (16.7%)	$ 561,000.00	$ 7,010.00	$ 568,010.00		$ 284,000.00		$ 852,010.00
TOTAL OPINION OF IMPROVEMENT COST	$ 3,922,402.00	$ 49,060.00	**$ 3,971,462.00**		$ 1,984,278.50		**$ 5,955,740.50**
COST PER BLOCK	$ 1,307,467.33				$ 992,139.25		

PHASE 3	PHASE 3A - MAIN STREET	PHASE 3A - PEDESTRIAN ALLEY	**TOTAL PHASE 3A**		PHASE 3B - 3RD STREET		**TOTAL PHASE 3**
Subtotal Construction	$ 2,807,305.50	$ 65,300.00	$ 2,872,605.50		$ 32,803.20		$ 2,905,408.70
Construction Contingencies 20%	$ 561,500.00	$ 13,100.00	$ 574,600.00		$ 6,600.00		$ 581,200.00
Opinion of estimated Construction Cost	$ 3,368,805.50	$ 78,400.00	$ 3,447,205.50		$ 39,403.20		$ 3,486,608.70
Subtotal Engineering (16.7%)	$ 562,000.00	$ 13,090.00	$ 575,090.00		$ 6,000.00		$ 581,090.00
TOTAL OPINION OF IMPROVEMENT COST	$ 3,930,805.50	$ 91,490.00	**$ 4,022,295.50**		$ 45,403.20		**$ 4,067,698.70**
COST PER BLOCK	$ 1,310,268.50				$ 45,403.20		

Figure 11: Phasing Cost Summary

PHASE 4	PHASE 4A - CHURCH STREET	PHASE 4B - CHURCH ST.	PHASE 4C - TRAFFIC SIGNAL		TOTAL PHASE 4
Subtotal Construction	$ 3,902,932.50	$ 134,120.00	$ 46,000.00		$ 4,083,052.50
Construction Contingencies 20%	$ 780,600.00	$ 26,800.00	$ 9,200.00		$ 816,600.00
Opinion of estimated Construction Cost	$ 4,683,532.50	$ 160,920.00	$ 55,200.00		$ 4,899,652.50
Subtotal Engineering (16.7%)	$ 782,000.00	$ 27,000.00	$ 9,000.00		$ 818,000.00
TOTAL OPINION OF IMPROVEMENT COST	$ 5,465,532.50	$ 187,920.00	**$ 64,200.00**		**$ 5,717,652.50**
COST PER BLOCK	$ 910,922.08	$ 37,584.00			

PHASE 5	PHASE 5A - LINN STREET	PHASE 5B - LINN STREET	PHASE 5C - LINN ST.		TOTAL PHASE 5
Subtotal Construction	$ 1,976,275.36	$ 856,114.66	$ 127,693.33		$ 2,960,083.36
Construction Contingencies 20%	$ 395,300.00	$ 171,200.00	$ 25,500.00		$ 592,000.00
Opinion of estimated Construction Cost	$ 2,371,575.36	$ 1,027,314.66	$ 153,193.33		$ 3,552,083.36
Subtotal Engineering (16.7%)	$ 395,000.00	$ 172,000.00	$ 25,000.00		$ 592,000.00
TOTAL OPINION OF IMPROVEMENT COST	$ 2,766,575.36	$ 1,199,314.66	**$ 178,193.33**		**$ 4,144,083.36**
COST PER BLOCK	$ 922,191.79	$ 599,657.33	$ 35,638.67		

PHASE 6	TOTAL PHASE 6
Subtotal Construction	$ 1,740,333.50
Construction Contingencies 20%	$ 348,100.00
Opinion of estimated Construction Cost	$ 2,088,433.50
Subtotal Engineering (16.7%)	$ 348,000.00
TOTAL OPINION OF IMPROVEMENT COST	**$ 2,436,433.50**
COST PER BLOCK	$ 609,108.38

Figure 12: Phasing Cost Summary (cont.)

PHASE 7	TOTAL PHASE 7
Subtotal Construction	$ 2,336,183.06
Construction Contingencies 20%	$ 467,200.00
Opinion of estimated Construction Cost	$ 2,803,383.06
Subtotal Engineering (16.7%)	$ 468,000.00
TOTAL OPINION OF IMPROVEMENT COST	**$ 3,271,383.06**
COST PER BLOCK	$ 817,845.77

PHASE 8	TOTAL PHASE 8
Subtotal Construction	$ 1,436,158.71
Construction Contingencies 20%	$ 287,200.00
Opinion of estimated Construction Cost	$ 1,723,358.71
Subtotal Engineering (16.7%)	$ 287,000.00
TOTAL OPINION OF IMPROVEMENT COST	**$ 2,010,358.71**
COST PER BLOCK	$ 670,119.57

Figure 13: Phasing Cost Summary (cont.)

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Introduction

02

"Breathe life back into downtown".

Implementation Plan Process

BACKGROUND

Downtown Marshalltown has historically been a place of activity, a blend of ethnic and cultural diversity, which caters to the function and vibrancy of the entire community. This is the place where residents from every corner of the community come together to shop, to dine, and to celebrate. There is a wealth of history here, it can be seen in the buildings that have stood the test of time, in the county courthouse and the downtown square and in the businesses that have survived good times and bad.

In the wake of the 2018 tornado, the city completed the 2019 Downtown Master Plan to develop the vision for how to rebuild the CBD and breathe new life into Marshalltown's urban core. Then in the summer of 2020, a derecho (visit https://en.m.wikipedia.org/wiki/Derecho for more information) cemented the need for a path forward, by wreaking additional havoc on the building facades, above ground utilities, street lights and whatever tree canopy that actually remained in the community. The 2019 plan presented not only beautification strategies and visual enhancements but rethinks the way downtown functions. Rethinking how vehicles and pedestrians circulate though downtown, how properties can be redeveloped, how buildings get "rebuilt", essentially rebuilding the foundation of downtown. When considering the life span of public infrastructure, determining the right approach for the future of downtown is essentially a once in a lifetime opportunity for the community.

PURPOSE OF THE PLAN

This document refines the recommendations of the 2019 Downtown Master Plan, provides additional details for implementing the master plan recommendations and identifies implementation phasing and budget expectations for constructing the proposed improvements. It is intended that this plan be implemented in a sequence that is based on the existing conditions of roadway pavement and utility infrastructure studied in the fall of 2020. The recommendations included herein are not tied to a specific fiscal or calendar year but rather are developed in a chronological order that considers the life span of existing pavements and the forecasted wear and tear that is anticipated to continue deteriorating the pavement.

The plan details vehicular and pedestrian circulation routes, parking modifications, streetscape enhancements and landscaping treatments to be incorporated into the design of downtown streets when they are to be replaced. This document is a tool to help the City of Marshalltown approach change in the CBD. There is a lot of work to do in downtown Marshalltown to restore its' character and to cater to long-term growth and success of its' many businesses. The outcomes detailed in this plan will set the City up for successfully implementing positive change in downtown.

The recommendations of this plan are specific and well defined and collectively are a part of a cohesive vision for downtown that considers different modes of transportation and different uses. Downtown is a system, that relies on many moving parts. Careful planning and execution of each improvement project will be critical to promoting the successful outcomes of subsequent phases.

Community Engagement

INPUT & EDUCATION OPPORTUNITIES

Developing a complete understanding for how the community uses downtown, what they value about it's historic and current conditions, as well as what they envision for its future, were important first steps in the community engagement process for the Downtown Implementation Plan. Equally important to soliciting input, was providing education into the major topics that would be explored, how information would be collected and what it would be used for. The following describes the various input and education opportunities and tools used throughout the planning process.

Community Input Survey – A community input survey was created to evaluate recommendations of the 2019 Downtown Master Plan, as well as more detailed components of the right-of-way and streetscape conditions/expectations in downtown. Over 240 responses were collected over a five-week period. A summary of common themes derived from the input survey is provided on the following page. A complete summary of the survey feedback can be found in the plan appendix.

Educational Video Series – Members of the design team were filmed at various locations within the CBD, describing the major components of the project. Each video was four to eight minutes in length and briefly covered what information was to be evaluated throughout the project and why it was significant to the process of developing an implementation plan for downtown. The four-part series included the following videos:

1. **Introduction:** *A General overview of the project and how to participate in the input process*
2. **One-Way to Two-Way Conversion:** *How to implement the recommendation of the Downtown Master Plan of converting Church and Linn Streets back to two-way traffic*
3. **Pavement Assessment:** *Understanding the approach to*

STEERING COMMITTEE - 13 PARTICIPANTS
(Monthly Meetings)

COMMUNITY INPUT SURVEY
(+/- 240 Participants)

FOUR-PART VIDEO SERIES
(+/- 700 Views)

VIRTUAL PUBLIC OPEN HOUSE
(+/- 50 Participants, 350+ Views)

IN-PERSON OPEN HOUSE WALKTHROUGH
(+/- 60 Participants)

CITY COUNCIL PRESENTATION

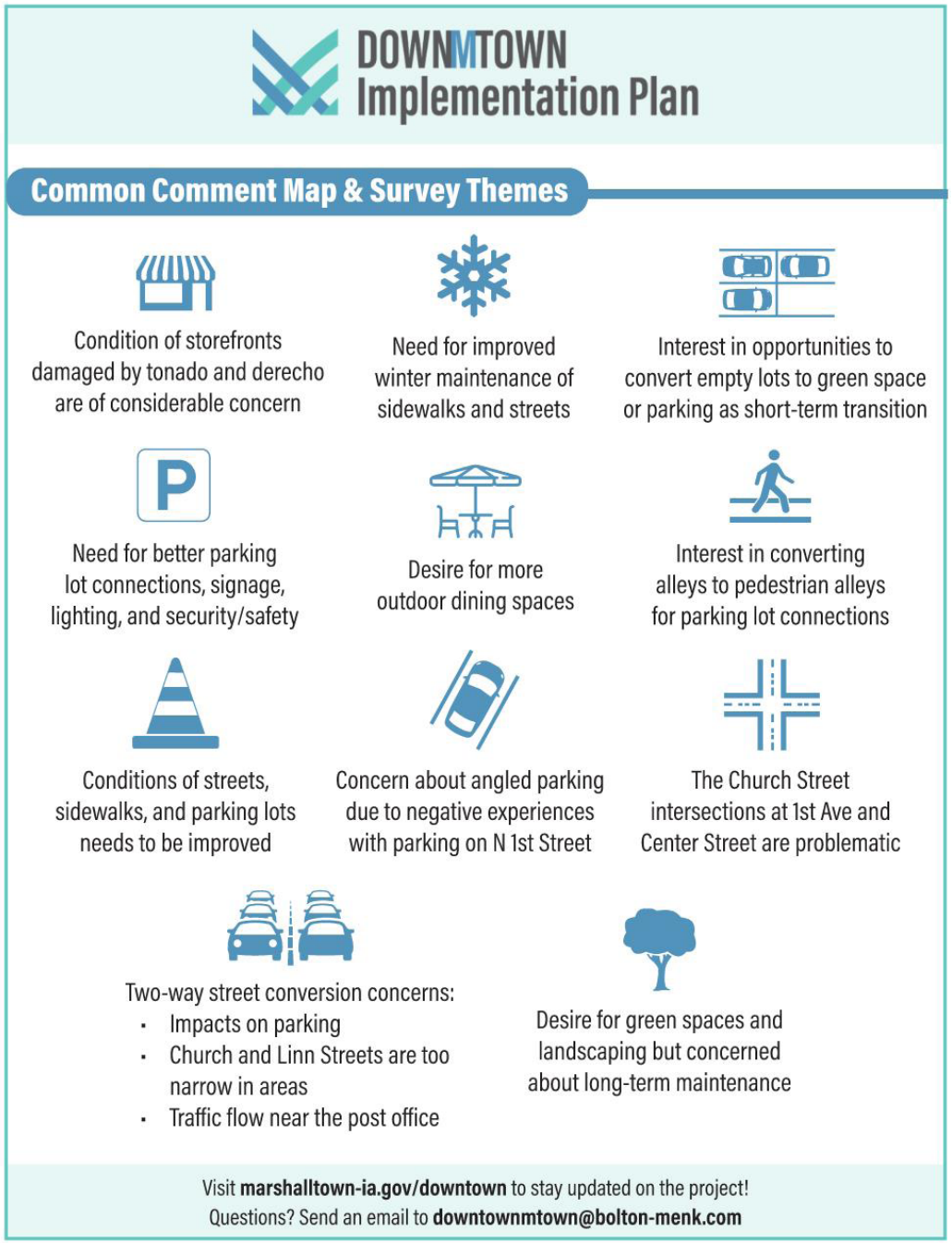

Figure 14: Community Input Survey - Common Themes

managing the pavement life cycle of downtown streets, alleys and sidewalks

4. **Streetscaping:** *Incorporating landscaping, beautification, pedestrian accommodations and vehicular circulation into a holistic improvement strategy to rebuild the vibrancy of downtown Marshalltown*

The purpose of the videos was to allow viewers to get a quick introduction to the project, develop a better understanding of the significance of the process and kick start thought generation about the future of downtown.

Steering Committee Meetings – 13 members of the Marshalltown community were selected to participate in the project Steering Committee. Participants included city staff, business owners, council members, active community members, community organization leaders and the mayor of Marshalltown. Throughout the duration of the project, this group held four meetings at critical project milestones to provide input, evaluate project progress and to review and discuss relevant topics important to the outcomes of the plan.

Online/Social Media Engagement – Presentation materials, project deliverables and regular updates were provided on the City's social media outlets throughout the duration of the project.

Virtual Open House – Due to the impact of COVID-19, it was imperative that community members be given an opportunity to participate in a project open-house from a remote location. To accommodate this, the design team presented the preliminary recommendations of the plan in a virtual presentation with approximately 50 community members in attendance. During the presentation, participants were polled for feedback regarding topics including:

1. *Circular Intersections at Church/Center and Linn/Center*
2. *Moving bike lanes from Main Street to State Street*
3. *Style of site furnishings*
4. *Including angled parking on Main Street*

In-Person Open House – Understanding that some community members may appreciate the option for an in-person open house event, the design team facilitated an opportunity for the public to view the presentation boards. This event coincided with the re-dedication open house of the newly renovated Veteran's Memorial Coliseum and was attended by approximately 50-60 people. During this event, community members were able to engage in conversations about the plan recommendations, ask questions and learn more about the project.

CONTINUED OUTREACH

What was learned from this process? In addition to the input survey summary, a general concern for public safety and the need for rehabilitation of not only the right-of-way and public infrastructure but also on private property was frequently expressed. In general, community input was supportive of the plan recommendations, but it was clear that additional outreach and education will be necessary during the design process of future projects. Specific topics that need to be discussed in further detail include:

- **Implementation of circular intersections at Church St/ Center St and Linn St/Center St.** *While the majority of participating community members expressed support for circular intersections at these two locations, providing opportunities for more education into the reasoning for and benefits of this recommendation is needed.*
- **Community-wide bicycle and pedestrian circulation.** *The City of Marshalltown has made great strides in strengthening bicycle and pedestrian circulation in town and to ensure this continues at a regional level. Not everyone understands the long-term vision of this approach. Continued outreach and education about the long-term visions for enhancing the local and regional trail system will be valuable to garnering support for future bicycle and pedestrian amenities throughout the community.*
- **Off-street public parking.** *When asked about why people don't use public parking lots more, a lot of answers centered on safety concerns, inadequate lighting, and poor pavement conditions. There will always be those who like to find a spot closer to their destination but with improved access to surface lots and increased safety and awareness, community members and visitors will be more likely to park in these other locations. As illustrated in the Downtown Master Plan, there are many resources for parking in downtown, over half of the land use in the CBD is dedicated to parking. However, more can be done to help promote the different parking resources available. Promotion of the City's public surface lots and improved signage can go a long way to increased usage of these locations. Reminding business owners of these resources and encouraging them and their employees to use these lots may free up spaces for visitors and patrons, in-turn increasing customer change over in downtown.*

Throughout the duration of the input gathering process, it was evident that community members are passionate about their downtown. People are eager to see positive change come to downtown and are excited about what the future holds.

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Parking & Circulation

03

Angled Parking Analysis

BACKGROUND

The Downtown Master Plan recommended that angle parking be considered for all streets within downtown. The existing street width information was compiled and analyzed to determine where angle parking best fit. Parking is not a one-size-fits-all solution. Each street, its surrounding land use, roadway geometrics, and planned bicycle facilities needed to be contemplated when recommending the appropriate on-street parking layout.

The research regarding the conversion of parallel parking to angled parking along with the preferred widths for the travel lane, parking, and bike lanes was also considered.

EXISTING ROADWAY INFORMATION

Generally arterial streets are designated because their primary purpose is to move traffic. Collectors serve the traffic mobility function, but also provide access to adjacent property. Local streets primarily serve adjacent property and should not have through traffic.

Per the Iowa DOT's Urban Federal Functional Classification Map, many of the streets in downtown Marshalltown are classified as collector or arterial roadways, with the remainder as local streets, see **Figure 15**. Main Street, 3rd Avenue (Hwy 14), and portions of 3rd Street and Center Street are arterial roadways. State Street, Church Street, and portions of Linn Street, 2nd Avenue, 1st Avenue, 1st Street, and 2nd Street are collector roadways.

The 2017 Annual Average Daily Traffic (AADT) volumes from the Iowa DOT for the downtown streets are provided in **Figure 16**. Main Street and State Street carry 3,500 to 5,000 vehicles/day. Church Street and Linn Street each carry approximately 2,000 vehicles/day in downtown. 3rd Street and Center Street both carry approximately 6,000 vehicles/day and 3rd Avenue (Hwy 14) carries 10,000 to 11,500 vehicles/day in downtown.

A review of crashes on Main Street for five years (2013-2017) from 2nd Street to 2nd Avenue showed that the existing parallel parking activity on Main St is experiencing parking related crashes. 14 of the 23 crashes on Main Street in the five-year period examined were parking related.

Today Marshalltown has angled parking in some areas of downtown. Three examples of this angled parking are shown in **Figure 17**. These areas are on: N. Center Street, N. 1st Street, and S. 1st Avenue. The existing angled parking on N. Center Street north of State Street and the existing angled parking on S 1st Avenue adjacent to the courthouse functions well. The existing angled parking on N. 1st Street which was painted during the Coliseum's renovation is tight and not functioning well. The street is 44' wide and the minimum street width for this type of parking should be 49' wide.

Figure 15: Functional Classification Map for Downtown. Source: Iowa Department of Transportation

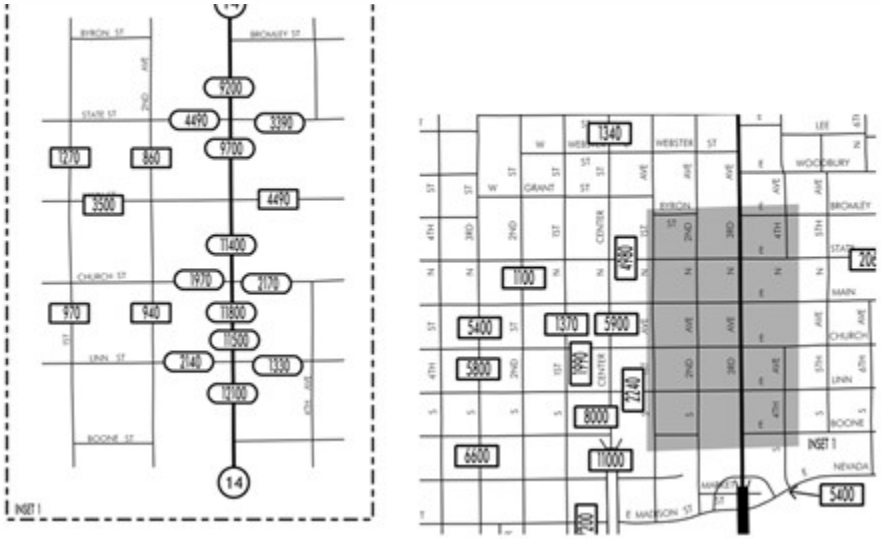


Figure 16: 2017 Average Daily Traffic (ADT) Volumes. Source: Iowa Department of Transportation

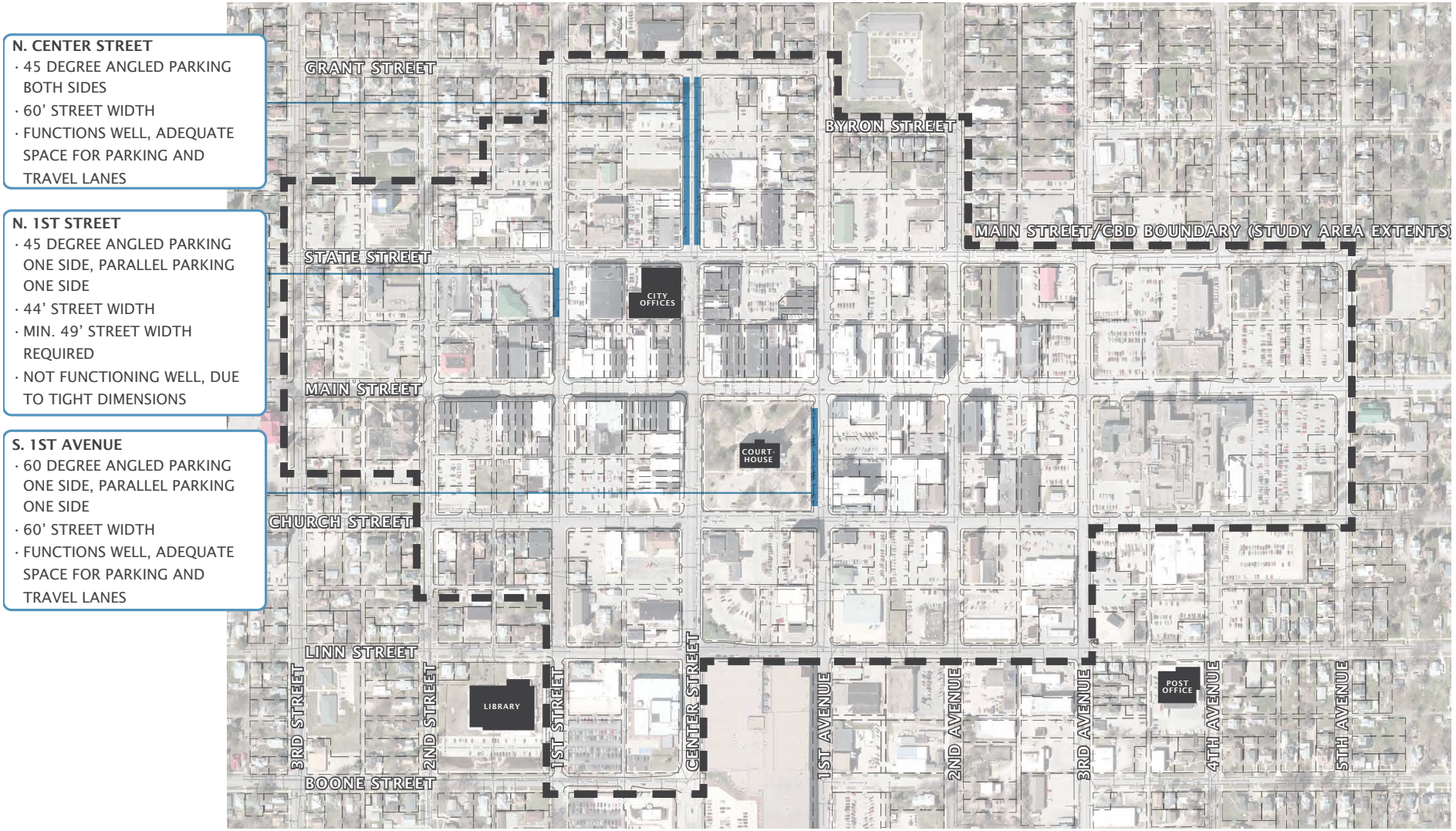
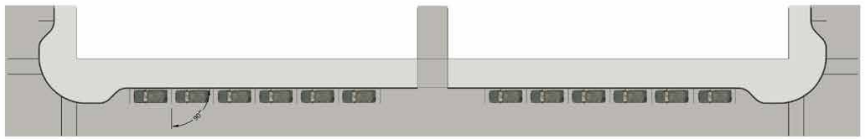


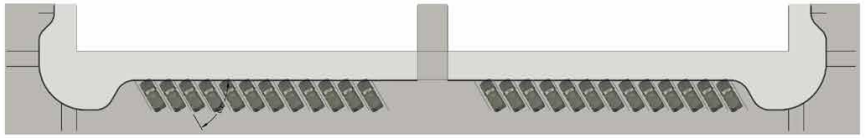
Figure 17: Example of Existing Angled Parking in Downtown

PARKING TYPES

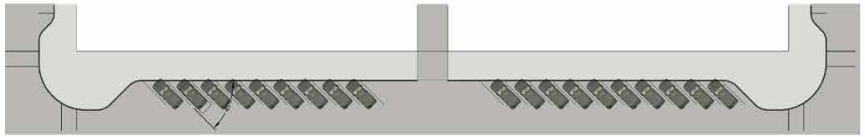
Three parking layouts were considered in different combinations for downtown: Parallel Parking, 60-degree angled parking, and 45-degree parking, see **Figure 18**. These parking types each have their own advantages and disadvantages as presented in **Table 1**. Special consideration was given to where angled parking was placed as it doesn't work everywhere.



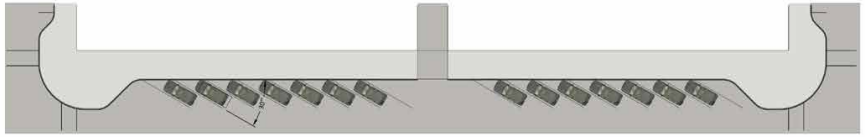
PARALLEL PARKING: 12 SPACES (EXISTING MAIN STREET PARKING)



60° ANGLED PARKING: 25 SPACES (REQUIRES MOST SPACE)



45° ANGLED PARKING: 19 SPACES (COMMONLY USED FOR ANGLED PARKING)



30° ANGLED PARKING: 14 SPACES (MARGINAL QUANTITY INCREASE)

Figure 18: Parking Type Comparison

	PARALLEL PARKING	HEAD-IN ANGLE PARKING
ADVANTAGES	• Requires the least amount roadway space (7' – 9')) • Most flexible to accommodate bicycle lanes (inside or outside parking lane) • Converting angle parking to parallel parking associated with 35 % crash reduction • On-coming traffic is more visible when exiting the stall • Safer than head-in angle parking for shared-lane bicycle facilities • Less striping required	• Driver and vehicle occupants do not have to exit into traffic lanes • Provides the greatest number of parking spaces • Drivers familiar with this type of parking • Does not impact parking flow when entering parking space • Provides a wider "buffer" between sidewalks and driving • lanes.
DISADVANTAGES	• Provides the fewest number of parking spaces • Drivers are familiar but uncomfortable with parallel parking • Drivers entering the parking space block traffic as they park • Drivers and occupants must exit vehicle into traffic lanes • "Dooring" is common along bicycle facilities	• Requires 15' to 20' of roadway space • Overhang from drivers pulling too far into the space can reduce the usable space on the sidewalk or impact bicycle facilities • Impacts street flow when exiting • Sight distance constraints can be unsafe for shared-lane cyclists as drivers leave space • Increased maintenance cost to stripe spaces

Table 1: Advantages and Disadvantages of Different Parking Types

ANGLED PARKING RESEARCH

Research has been conducted to study the impact of angled parking on roadway capacity and safety. This research assisted the decision-making process for where angled parking was ultimately recommended.

The Institute of Transportation Engineers (ITE) Traffic Engineering Handbook 7th Ed. states that "angled parking should not be placed on streets that continue to serve as arterial or collector streets due to the reduction of roadway capacity that comes with the parking per the Highway Capacity Manual."

The 2001 Oregon DOT Research - Safety Comparison of Angle and Parallel Parking provided a summary of various on-street parking studies from the 1970s to 1990s.

This research showed that parallel parking does have a statistically lower crash rate than angled parking, however the increases in crashes with angled parking could likely come from the increased in use. As angled parking is often in higher use areas. When the amount of parking or parking activity increase was taken into account there was not much statistical difference in crashes between angled and parallel parking. The crash increase is related to the increase in activity, no matter which type of on-street parking was used.

The researchers concluded that while angled parking clearly has a higher crash rate and frequency it is more likely due to the increased activity of parking rather than the characteristics of either type of parking. The researcher's summary was that "when the supply of parking is sufficient, the conversion of on-street parking from parallel to angled should not

be considered because the number of accidents will increase as a result of more parking activity because of more spaces." (Safety Evaluation of Converting On-Street Parking from Parallel to Angle (1991) – Nebraska)

A 2002 article published in the ITE Journal, "Changing on-street parallel parking to angle parking," studied the before and after safety impacts of parking changes and determined that the concern about high accident potentials with angled parking seems to be overcome if other operational conditions are met. The conditions included:

- *AADT Less than 12,000 vehicles/day*
- *Operating speeds of 15 to 20 mph, AND*
- *abutting retail or retail-service land use*

The most successful on-street parking changes from parallel to angled have been where there are several contiguous blocks of primary retail use. The introduction of angled parking will substantially reduce capacity on a street, therefore, if the segment with angled parking is part of a continuous route, then care must be taken to divert traffic to other adjacent segments as part of a parallel "diversion" route.

DESIGN PREFERENCES

The analysis for which type of parking fit best on each street started with a review of what was needed for parking stall width/length, travel lane width, and bike lane width based on the different design references available. Several design manuals were referenced to determine the design preferences for the street cross sections.

Iowa Statewide Urban Design and Specifications (SUDAS)

- *It is acceptable to have 11-foot-wide lanes on arterial streets when speeds are 30 mph or less.*
- *Local commercial streets should be no narrower than 11 feet. Local streets can have lane widths down to 10 foot wide in residential areas.*
- *The width of parallel parking stalls should be 8 feet.*
- *Streets with higher traffic volumes and higher speeds should have wider parking spaces or a combination of parking space and buffer zone.*
- *Bicycle Lanes: Dedicated bicycle lanes are used to separate higher speed vehicles from bicyclists to improve safety. Conflicts in shared lanes generally becomes problematic when vehicular volumes exceed 3,000 vehicles per day and operating speeds are 30 mph or greater.*

2018 INTERNATIONAL FIRECODE: Fire apparatus access roads shall have an unobstructed width of not less than 20 feet. This provides for:

- *One side residential parking on two-way street = 27' min*
- *Two side residential parking on two-way street = 34' min*

Institute of Transportation Engineers (ITE) Traffic Engineering Handbook provides the following for angle parking requirements:

- *18' long angle spaces with 12.5' drive lane behind for 45-degree parking*

PROPOSED PARKING PLAN

The research, existing street widths, design preferences for lane widths, parking stall lengths, and the desire for bicycle facilities resulted in the proposed parking plan shown in **Figure 19**. This plan balanced the desire for additional on-street parking with the desire for improved bicycle facilities.

Angled parking was focused on streets that meet min criteria of less than 12,000 vehicles/day, operating speeds of 15 to 20 mph, and abutting retail or retail-service land use. Parallel diversion routes for through vehicles are also provided with this plan.

Angled parking is provided in different striping configurations, angledparking on both sides or angled parking on one side and parallel parking on the other. Bike facilities were recommended with parallel parking only due to the safety concerns with on-street bike facilities and angled parking.

Due to the limitations of existing street width, angled parking could be placed on only one-side of the street or parallel parking could be placed on both sides of the streets. To better serve downtown businesses, it was determined that for streets where angled parking could fit on only one side, it was preferred to instead place parallel parking on both sides.

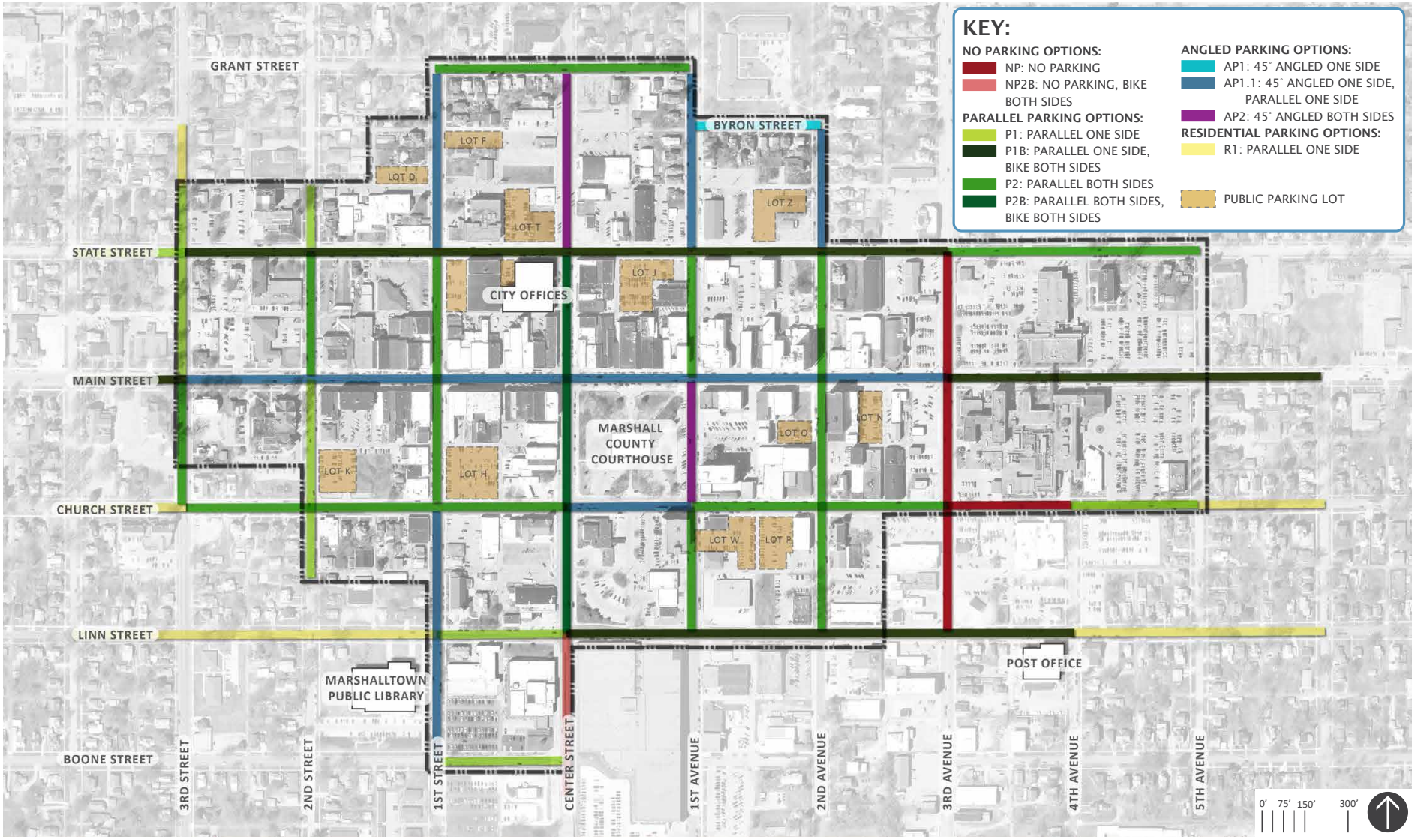
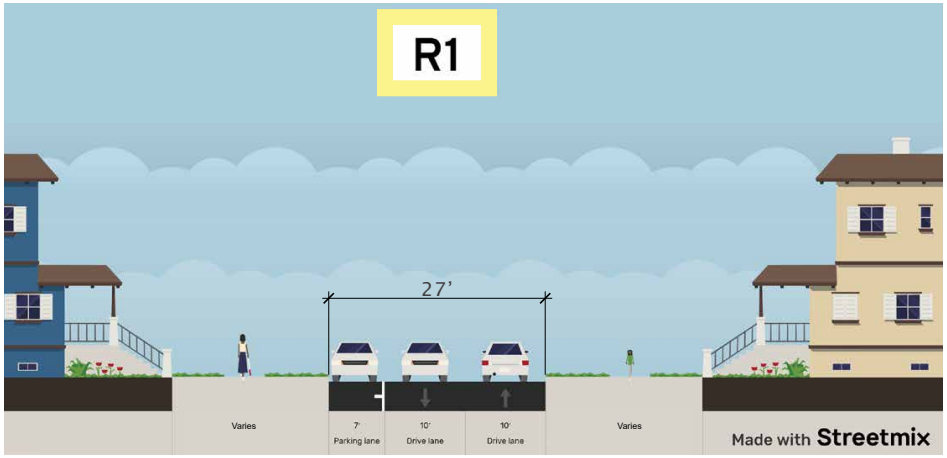
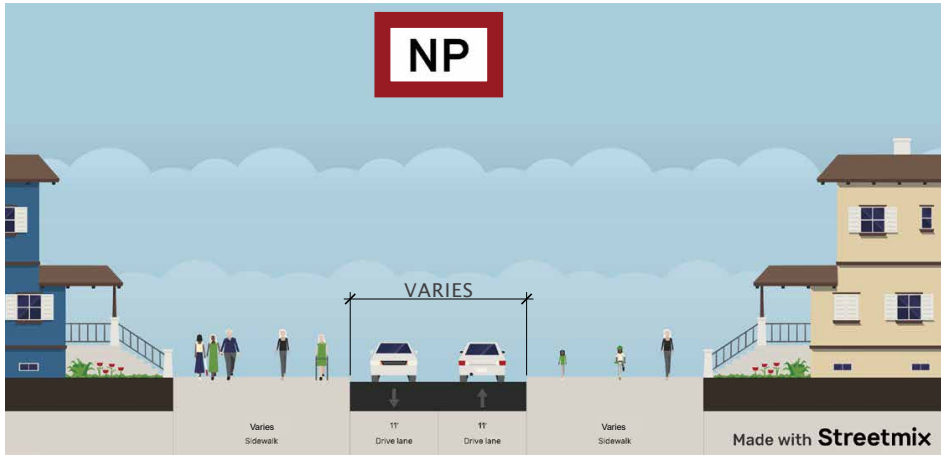


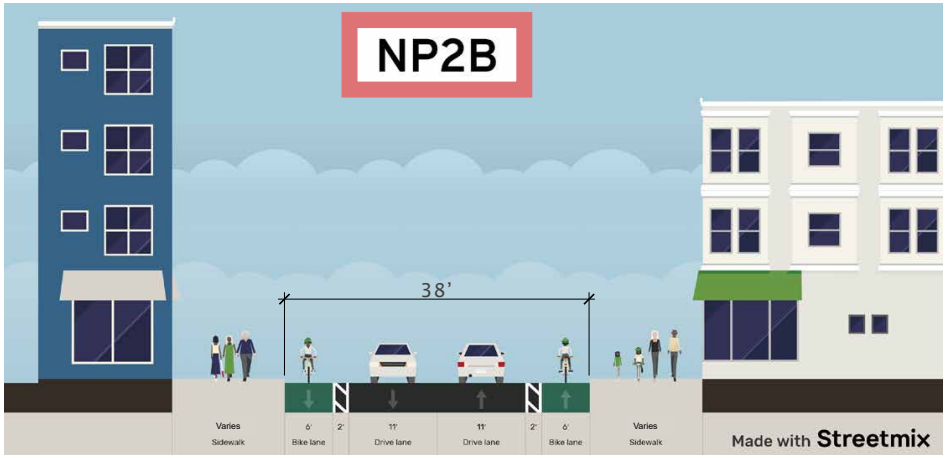
Figure 19: Proposed Parking Plan



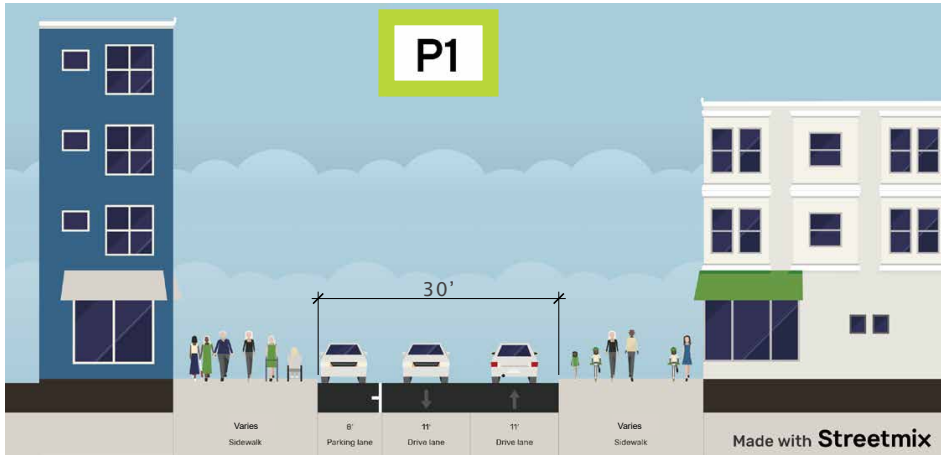
RESIDENTIAL - PARALLEL PARKING ONE SIDE



NO PARKING (STREET WIDTH VARIES)



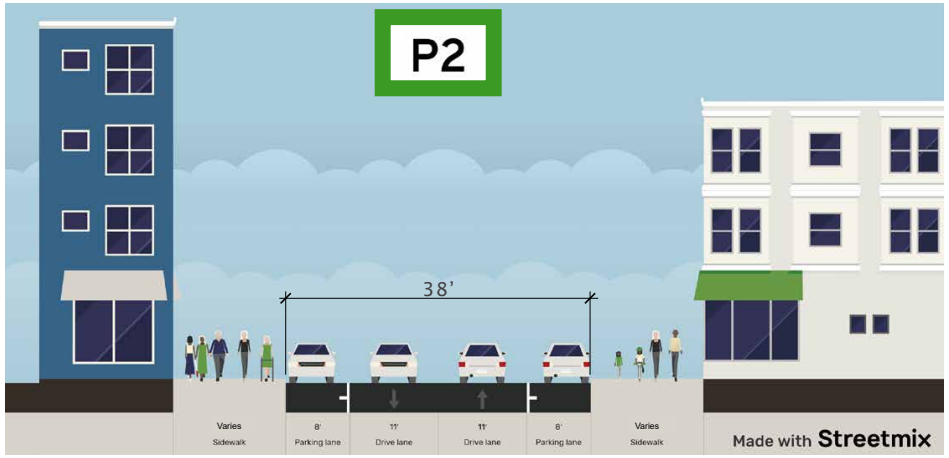
NO PARKING, BIKE LANES BOTH SIDES



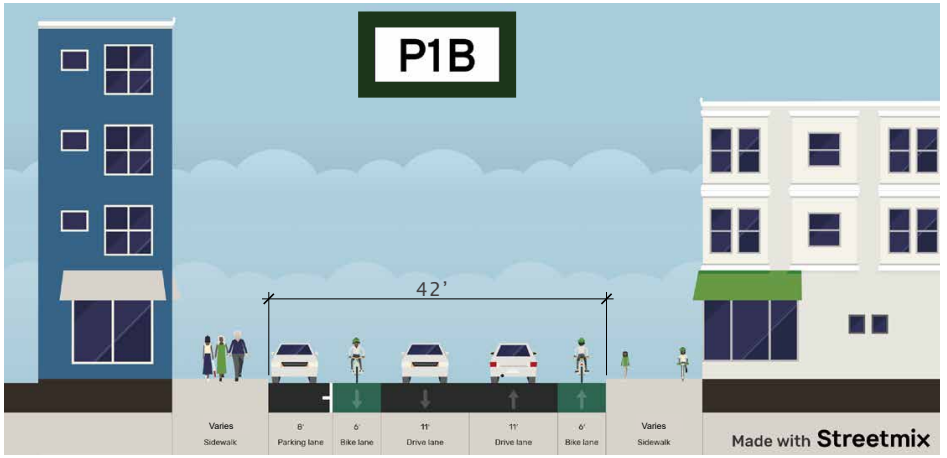
PARALLEL PARKING ONE SIDE

NOTE: DIMENSIONS SHOWN ARE MINIMUMS

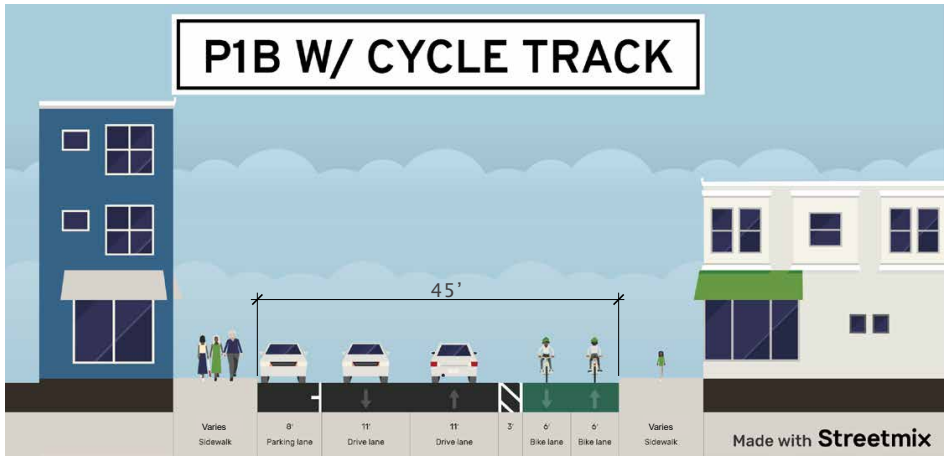
Figure 20: Typical Roadway Cross Sections A



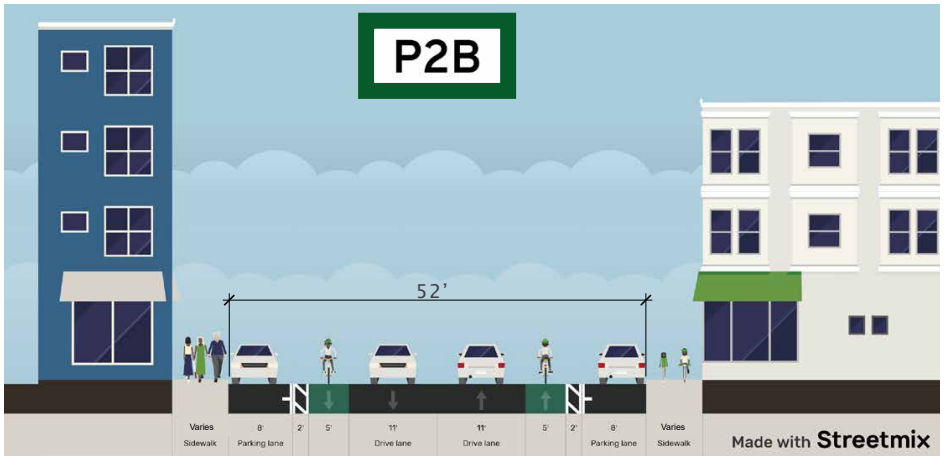
PARALLEL PARKING BOTH SIDES



PARALLEL PARKING ONE SIDE, BIKE LANES BOTH SIDES



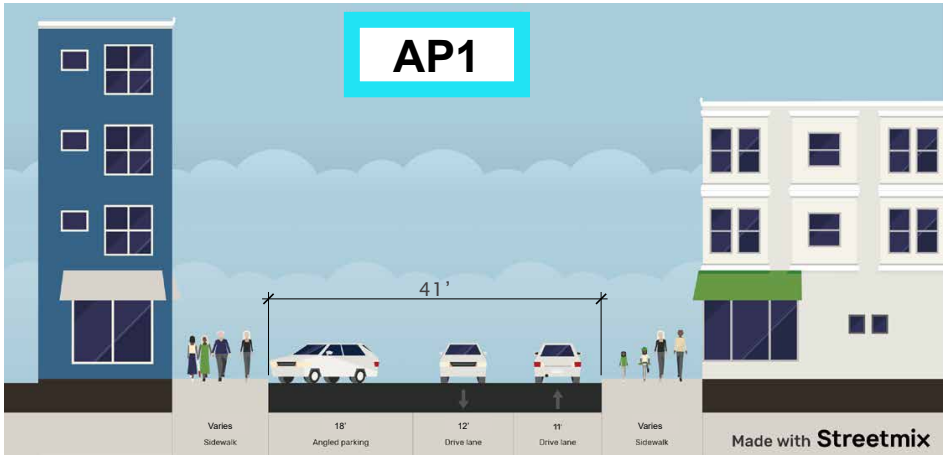
PARALLEL PARKING ONE SIDE, CYCLE TRACK ONE SIDE



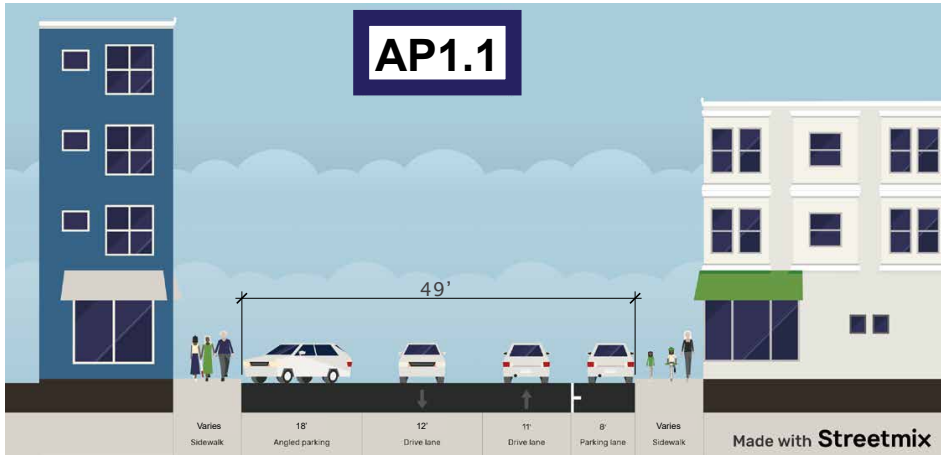
PARALLEL PARKING BOTH SIDES, BIKE LANES BOTH SIDES

NOTE: DIMENSIONS SHOWN ARE MINIMUMS

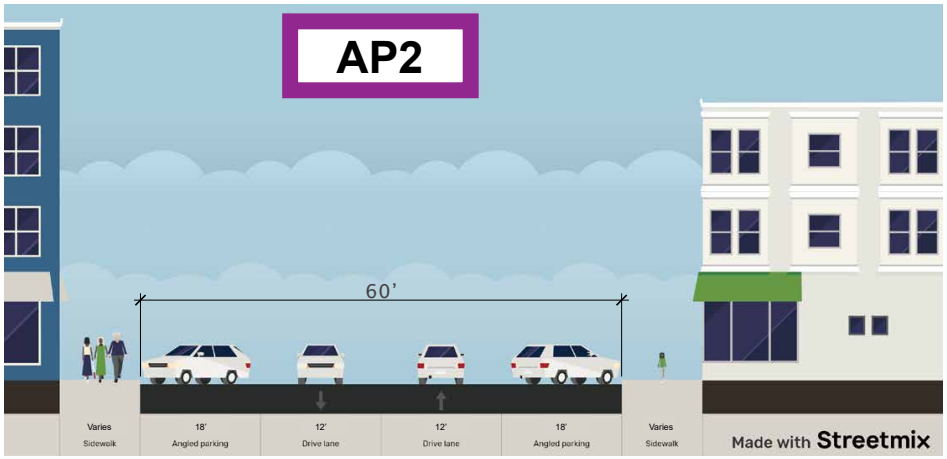
Figure 21: Typical Roadway Cross Sections B



45˚ ANGLED PARKING ONE SIDE



45˚ ANGLED PARKING ONE SIDE, PARALLEL PARKING ONE SIDE



45˚ ANGLED PARKING BOTH SIDES

NOTE: DIMENSIONS SHOWN ARE MINIMUMS

Figure 22: Typical Roadway Cross Sections C

Bicycle Facilities & Circulation

PLANNED BICYCLE FACILITIES

The city has the goal to improve downtown bike infrastructure which improves downtown's accessibility for people of all ages and abilities and broadens its appeal. **Figure 23** presents the planned and proposed bike facilities from the Downtown Master Plan. The proposed bicycle facilities were further examined.

With the goal of maintaining existing street widths, the ability to place bicycle facilities as proposed in the Downtown Master Plan had to be balanced with the desire to maximize on-street parking. This resulted in focusing the bicycle facilities on key streets in the downtown to create a north-south and east-west spine to connect to different destinations, see **Figure 24**. This allowed parking to be maximized on the other streets. The existing east-west bike facility on Main Street from 4th Avenue to 3rd Street is proposed to be removed and relocated to State Street. Center Street is proposed to serve as the main north-south connector through downtown.

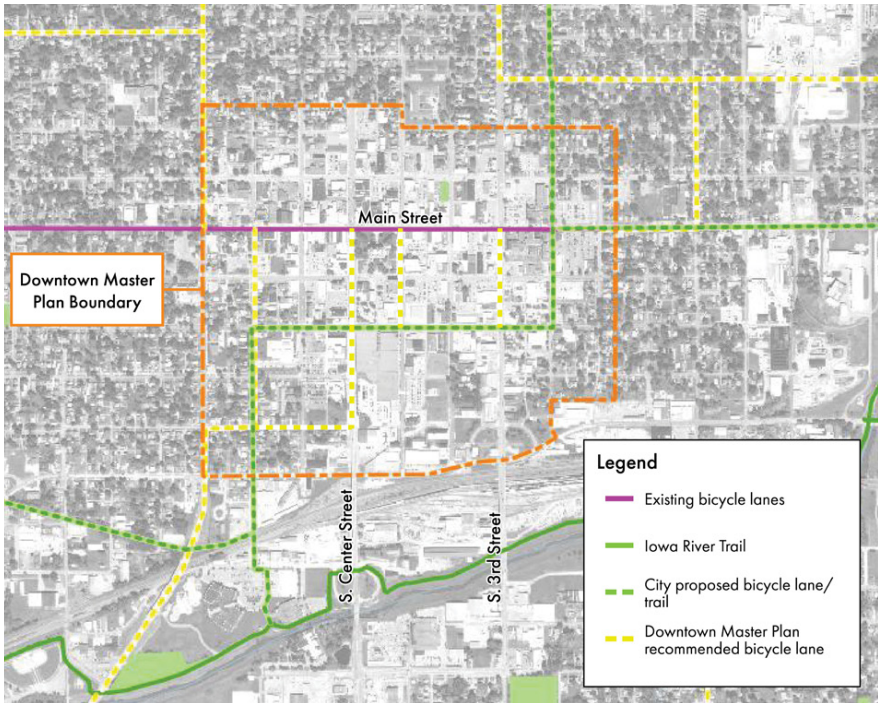


Figure 23: Planned and Proposed Bike Facilities Plan, Source: Downtown Master Plan

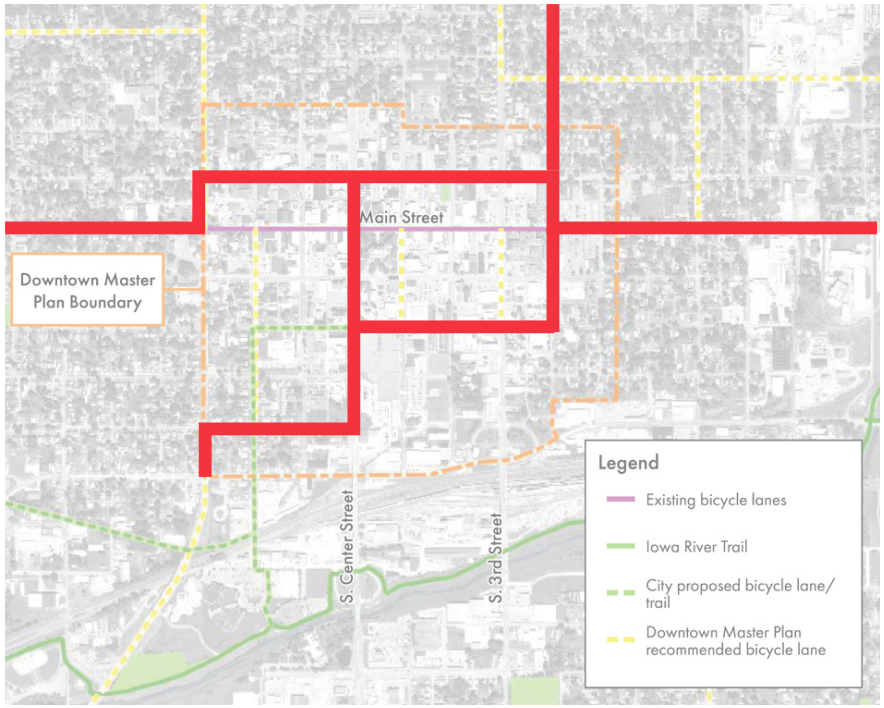


Figure 24: Revised Bike Facilities Plan

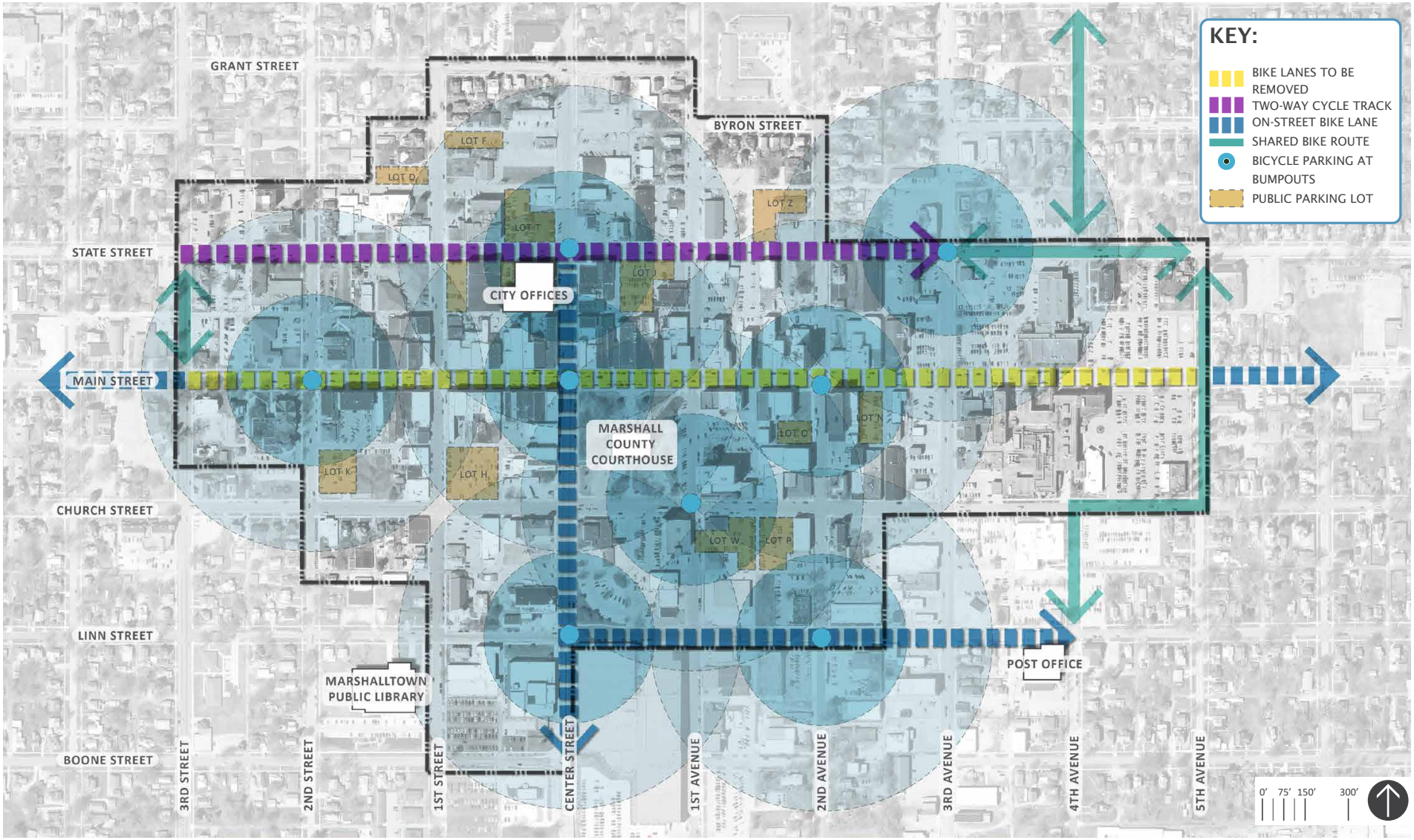


Figure 25: Bicycle Facilities Diagram

Pedestrian Connections & Walkability

CONNECTIONS TO PUBLIC PARKING LOTS

Utilizing alleys as pedestrian routes can provide a more efficient and direct connection to many of the public parking lots in downtown Marshalltown. As identified in the Downtown Master Plan, certain alleys were identified as having a greater positive impact on pedestrian circulation and a lower impact on vehicular need. Those alleys that were identified as possible pedestrian-only routes could be closed off to vehicular use and with relatively low to moderate improvements, could become more inviting spaces for pedestrian use. Removable bollards, pedestrian scale lighting and visual quality improvements could quickly transform these spaces into gathering spaces for outdoor dining or small events, or be transformed into pocket parks. The image to the right is an example of an existing alley that the City of Marshalltown has already transformed into a pedestrian space.

The map on the following page illustrates the proximity of alleys identified as potential pedestrian alleys and the location of public parking lots in the CBD. In a 1-2 minute walk, a pedestrian can get from a public parking lot to many areas in downtown quite easily. This proximity is important for business owners and employees working downtown to understand as well, to encourage more people to not park on the street and preserve the on-street parking for patrons and visitors to downtown.

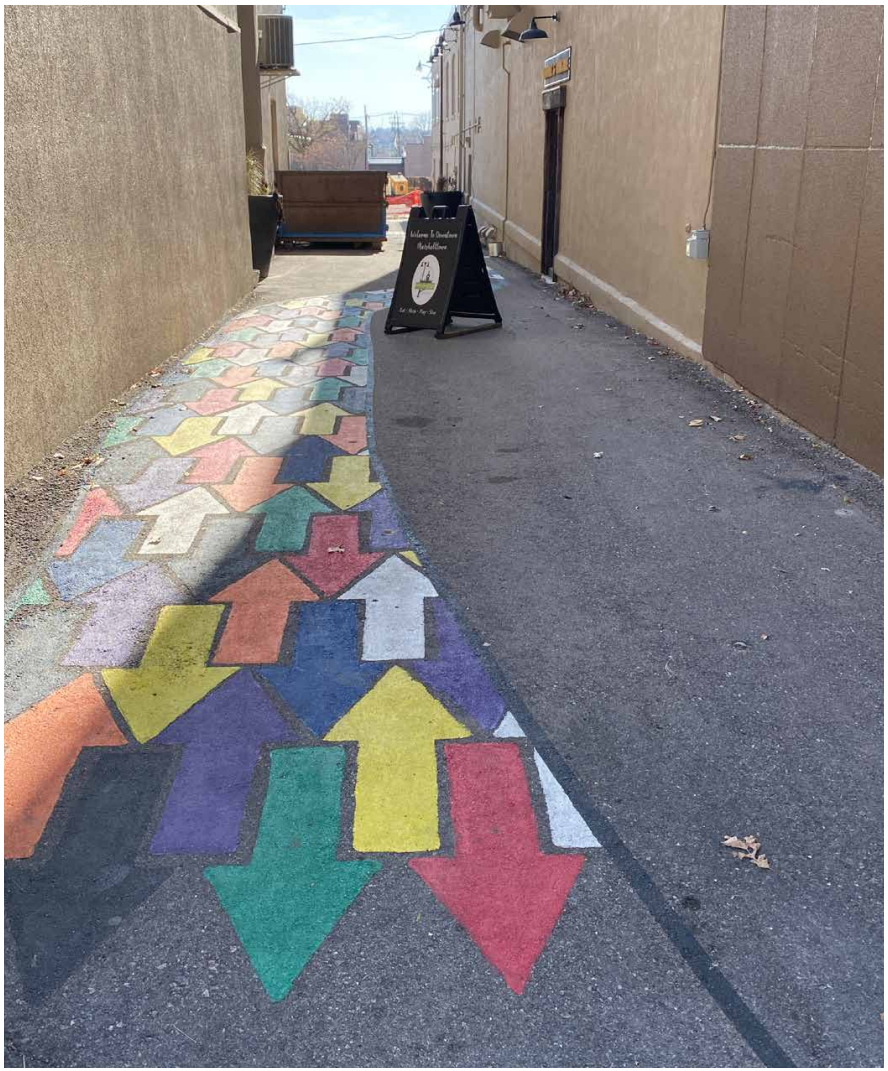


Figure 26: Pedestrian Alley Off of Main Street, March 2021

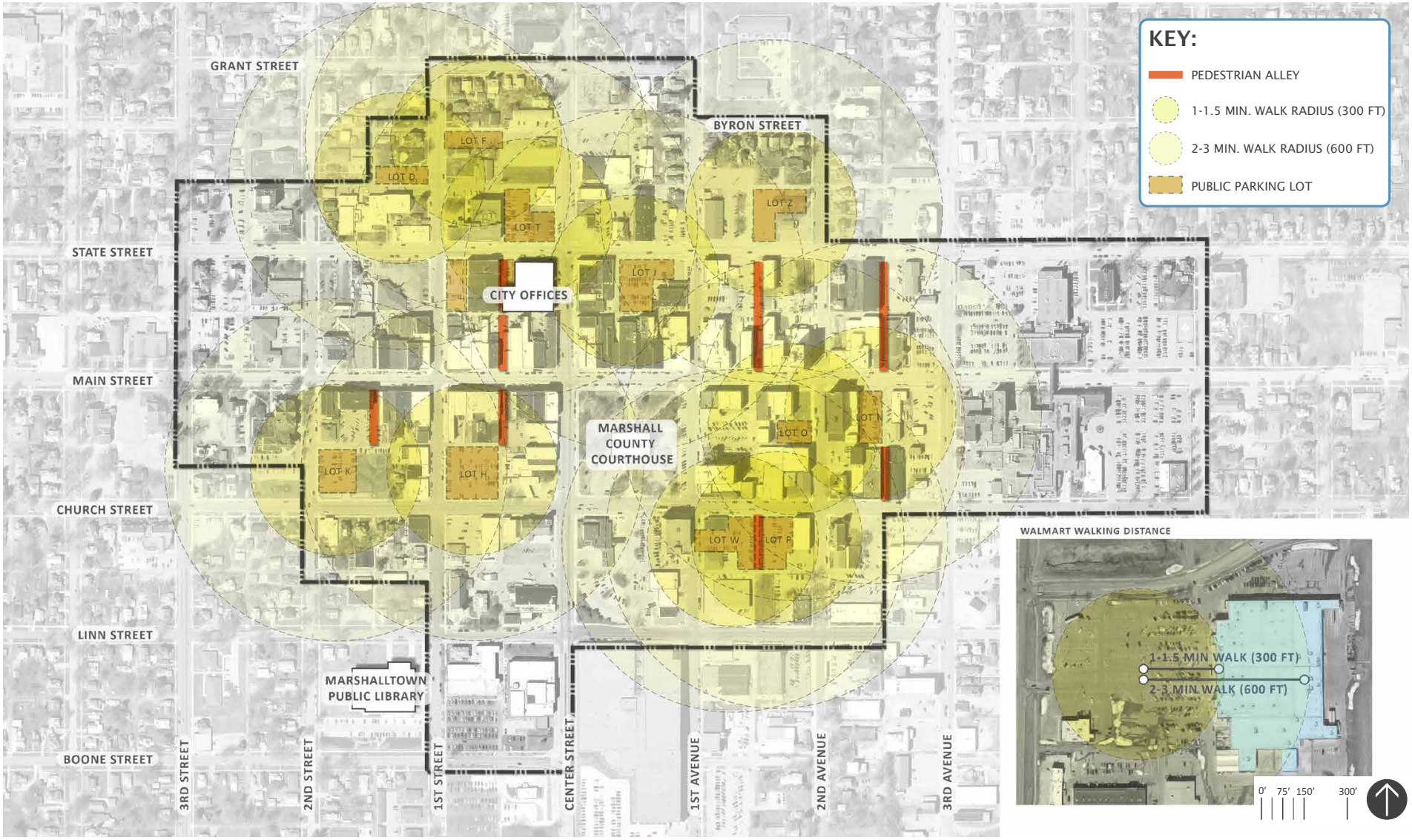


Figure 27: Pedestrian Alleys & Walkability Diagram

Church & Linn St Two-Way Conversion

04

Existing Conditions

BACKGROUND

The Downtown Master Plan recommended that Church Street from 7th Avenue to 9th Street and Linn Street from 8th Avenue to 9th Street be converted from one-way to two-way streets. An analysis and investigation into what changes would need to be implemented was conducted. This included collection of traffic counts at signalized and all-way stop controlled intersections, field review of each roadway corridor to document changes needed, re-distribution of existing volumes for two-way traffic, warrant analysis, and operations analysis. All of this information was gathered and summarized in an implementation phasing plan for this proposed conversion.

DATA COLLECTION

13-Hr traffic counts were collected on November 11, 2020 at the intersections of:

1. 3rd St/W Main St
2. 3rd St/W Church St
3. W Church St/Center St
4. W Church St/3rd Avenue (Hwy 14)
5. Linn St/4th Avenue
6. Linn St/3rd Avenue (Hwy 14)
7. Linn St/Center St

Existing Peak Hours Turning Movement counts are provided in the Appendix.

Field Review of each intersection along Church Street and Linn Street was conducted in November 2020 to document parking, signage, striping, intersection sight distances, driveway conflicts, and other street elements that would need to be addressed when these streets are changed from one-way to two-way. These changes are documented in **Table 7** as part of the proposed implementation phasing.

EXISTING ROADWAY INFORMATION

Church Street is a one-way westbound roadway that is classified as a collector roadway per the Iowa DOT's Urban Federal Functional Classification Map. Church Street has a speed limit of 30 MPH except for the downtown where Church Street is 20 MPH. In general, Church Street has two travel lanes and one or two on-street parking lanes as it traverses from 7th Avenue to 9th Street. According to the 2017 Annual Average Daily Traffic (AADT) volumes from the Iowa DOT, Church Street carries approximately 1,900 vehicles per day.

Linn Street is a one-way eastbound roadway that is classified as a local street except for Center Street to 3rd Avenue where it is classified as a collector roadway per the Iowa DOT's Urban Federal Functional Classification Map. From 9th Street to 3rd Avenue, Linn Street is 25 MPH, east of 3rd Avenue Linn Street is 25 MPH. In general, Linn Street has two travel lanes and one or two on-street parking lanes as it traverses from 8th Avenue to 9th Street. According to the 2017 Annual Average Daily Traffic (AADT) volumes from the Iowa DOT, Linn Street carries approximately 2,240 vehicles per day.

Analysis of Changes

ADJUSTMENT OF VOLUMES

Due to the COVID-19 pandemic, traffic flows have been down 10-15% across the state of Iowa. Traffic Counts collected in 2018 with the Highway 14 Study were compared to the traffic counts collected for this study. This comparison showed that the 2020 volumes were down 15% compared to the 2018 volumes. The turn movement counts for this one-way to two-way analysis were increased 15% to account for this difference.

RE-DISTRIBUTION OF VOLUMES

To analyze the impact of the conversion on traffic flow and determine necessary traffic control changes, the existing volumes were re-distributed to reflect two-way traffic on both Church Street and Linn Street. The traffic on these two streets was assumed to be split 50/50 based on the current two-way directional split at the intersection of 3rd Street and W. Main Street (an existing two-way street). 50% of the westbound traffic on Church Street was moved to Linn Street and 50% of the eastbound traffic on Linn Street was moved to Church Street. Turns to and from the side streets were adjusted accordingly. Re-distributed Peak Hour Turning Movement counts are provided in the Appendix.

TRAFFIC CONTROL WARRANTS

Signal

Traffic signal warrants have been developed as national guidelines to promote continuity of traffic control devices to ensure that traffic signals are installed at intersections that would benefit from their use.

Existing traffic signals are viewed slightly differently with lower volume thresholds than typical used to justify retaining an existing traffic signal. For signals that do not meet the 100% volume requirement, it's important to also determine if they meet the 60% volume requirements. Those signals that do not meet the 60% of volume requirements for Volume Warrants 1, 2, or 3 are no longer justified traffic signals and should be considered for removal.

The warrants from the Manual on Uniform Traffic Control Devices (MUTCD) included in this traffic signal study, are listed below:

- *Warrant 1: Eight-Hour Vehicular Volume*
- *Warrant 2: Four-Hour Vehicular Volume*
- *Warrant 3: Peak Hour*
- *Warrant 7: Crash Experience*

Re-distributed volumes were used with the warrants above. Results are shown in **Table 2**. The existing signals at Church Street/3rd Avenue (Hwy 14) and Linn Street/3rd Avenue (Hwy 14) are warranted with the re-distributed volumes. The existing signals at Church Street/Center Street and Linn Street/Center Street are not warranted and should be considered for removal. The results of the signal warrant analysis are documented in the Appendix.

All-Way Stop

An all-way stop analysis was also performed using the re-distributed volumes. The volume requirement was not met for the intersection of Church Street/3rd Street, Church Street/Center Street, Linn Street/3rd Street, Linn Street/Center Street, and Linn Street/4th Avenue. The recommended traffic control as a result of the AWSC warrants not being met is provided in **Table 2.**

The existing all-way stop at Church Street/3rd Street is recommended to remain and be modified for the new eastbound direction. This recommendation is based on poor sight distance for the new eastbound movement at this intersection due to the building at the back of the

sidewalk on the southwest corner.

A new all-way stop is recommended at the intersection of Church St/6th Avenue due to sight distance restrictions for side street traffic trying to see the new eastbound direction caused by to the vertical hill crest on Church St just west of this intersection.

Intersection		Existing Traffic Control	Warrant	SIGNAL		AWSC	Recommended Traffic Control	Reason
				100%	60%			
Church St	3rd St	AWSC	AWSC			Not Satisfied	**AWSC**	Poor Sight Distance
Church St	Center St	SIGNAL	1A	Not Satisfied	Not Satisfied	Not Satisfied	**Circular Intersection**	Signal and All-Way Stop not warranted. Existing angle crash problem
			1B	Not Satisfied	Not Satisfied			
			2	Not Satisfied	Not Satisfied			
			3	Not Satisfied	Not Satisfied			
			7	Not Satisfied	Not Satisfied			
Church St	3rd Ave (Hwy 14)	SIGNAL	1A	Not Satisfied	Not Satisfied		**SIGNAL**	Meets warrants
			1B	Not Satisfied	Satisfied			
			2	Not Satisfied	Not Satisfied			
			3	Not Satisfied	Not Satisfied			
			7	Satisfied	Satisfied			
Linn St	3rd St	TWSC				Not Satisfied	**TWSC**	AWSC not warranted.
Linn St	Center St	SIGNAL	1A	Not Satisfied	Not Satisfied	Not Satisfied	**Circular Intersection**	Signal and All-Way Stop not warranted. Existing angle crash problem
			1B	Not Satisfied	Not Satisfied			
			2	Not Satisfied	Not Satisfied			
			3	Not Satisfied	Not Satisfied			
			7	Not Satisfied	Not Satisfied			
Linn St	3rd Ave (Hwy 14)	SIGNAL	1A	Not Satisfied	Not Satisfied		**SIGNAL**	Meets warrants
			1B	Not Satisfied	Satisfied			
			2	Not Satisfied	Not Satisfied			
			3	Not Satisfied	Not Satisfied			
			7	Satisfied	Satisfied			
Linn St	4th Ave	AWSC	AWSC			Not Satisfied	**TWSC**	TWSC with bumpout on SW corner to improve sight distance.

Table 2 - Signal & All-Way Stop Retention Warrant Anayliss & Recommended Traffic Control

Circular Intersection

An alternative to signalization is the construction of a circular intersection. Circular intersections, or roundabouts, have been found to perform as good as or better than traffic signals during peak hours and are significantly more efficient than traffic signals during the off-peak hours. Neither a signal nor an all-way stop was warranted at the intersections of Linn Street/Center Street or Church Street/Center Street. Engineering judgement is that a two-way stop control is not appropriate for either of these intersections due to sight distance restrictions and higher pedestrian movements at these downtown intersections. A circular intersection is an alternative form of intersection control to traffic signal that should be considered.

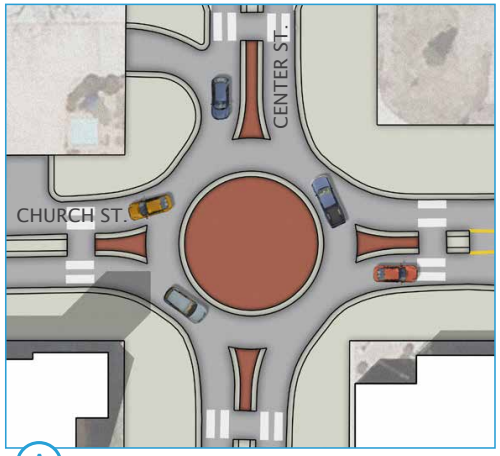
Circular intersections are a type of intersection characterized by a circular layout with a small center circle that is mountable and can be driven over. A circular intersection will fit within the existing intersection footprint, see **Figure 28.**

CIRCULAR INTERSECTIONS

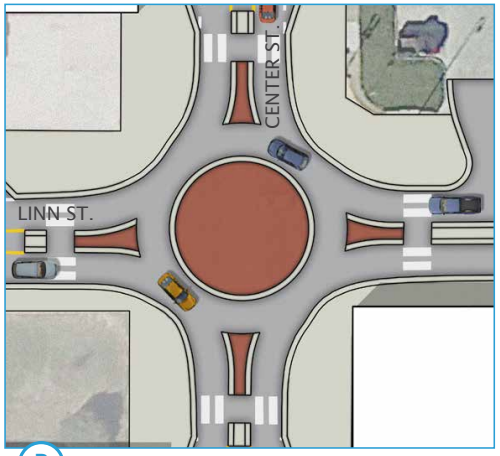
Circular intersections are a type of intersection characterized by a circular layout with a small center circle that is mountable and can be driven over. All traffic entering the circle yields to traffic on their left and turns right to travel counter clockwise around the circle. Regular cars and pickup trucks travel around the center circle, while larger trucks, trailers, and buses can drive over the center circle as needed.

Circular intersections improve safety by reducing the number of conflict points at the intersection from 32 to 8. Replacing a traffic signal with a circular intersection can reduce all crashes by 20% and injury related crashes by 65%.

EXISTING CHURCH ST. / CENTER ST. INTERSECTION



A **CHURCH + CENTER INTERSECTION**



B **LINN + CENTER INTERSECTION**

- ON-STREET PARKING, BUMPOUTS, DRIVE OVER CENTER TO ACCOMMODATE TURNING MOVEMENTS FOR LARGER VEHICLES
- SHORT CROSSING DISTANCES, PEDESTRIAN REFUGE SPACE

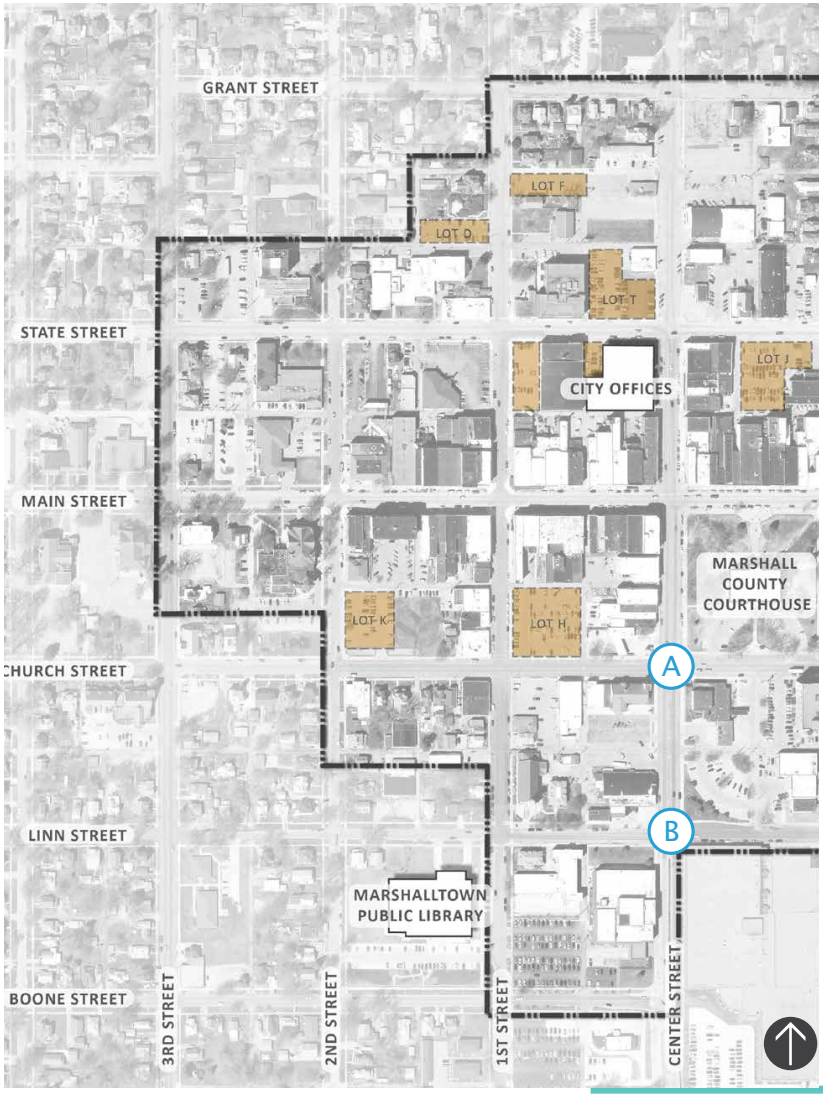


Figure 28 - Circular Intersection Information

SIGNAL VS. CIRCULAR INTERSECTION

Crash Analysis

A review of crashes at Linn Street/Center Street or Church Street/Center Street over the past 10 years shows that crash rates are higher than state averages at both intersections, see **Table 3**.

Intersection	Crash Rate	Statewide Average
Church St at Center St	2.08	0.8
Linn St at Center St	1.35	0.8

Table 3 - Intersection Crash Rates

Figure 29 presents the crashes by severity at each intersection. **Figure 30** shows the crashes by type that occurred at each intersection. 25% of crashes have resulted in injury with one fatality at Church. Over 50% of crashes at these intersections are Broadside/T-bone crashes which can lead to higher injuries.

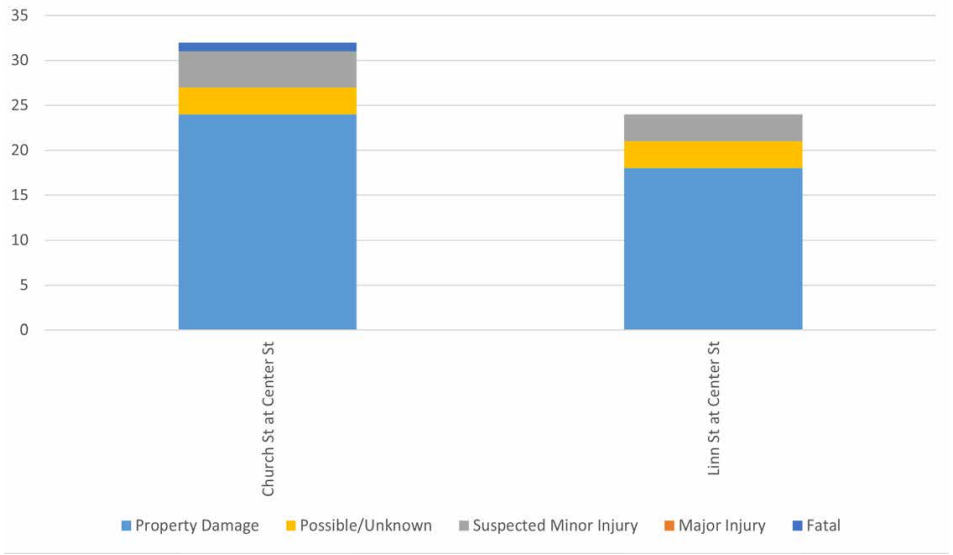


Figure 29 - Crash Severity by Intersection

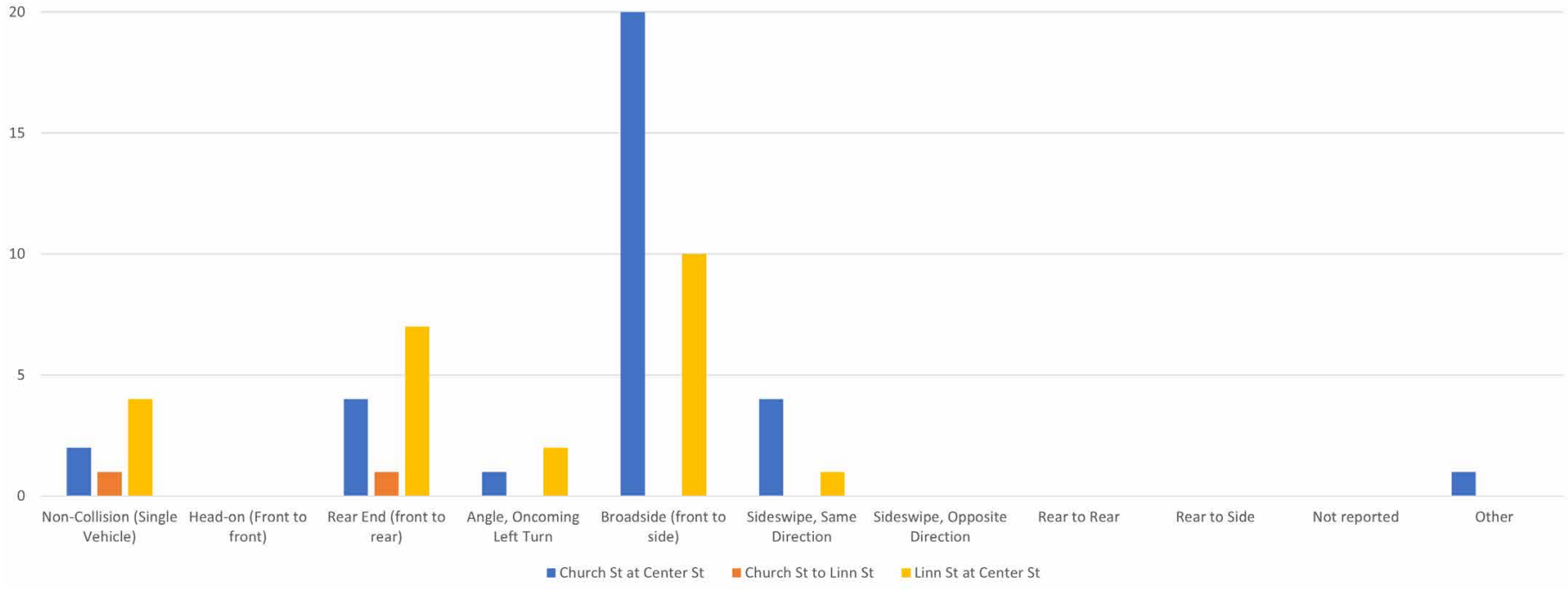


Figure 30 - Crash Type by Intersection

Operations Analysis

The traffic operations analysis for the Linn Street/Center Street or Church Street/Center Street intersections considers the following measures to determine the adequacy of the intersection design to meet acceptable operations: intersection delay/Level of Service (LOS) and volume-to-capacity ratios. An explanation of each of these measures is provided below:

The operational analysis results are described as a Level of Service (LOS) ranging from A to F, see **Table 4.** These letters serve to describe a range of operating conditions for different types of facilities. Levels of Service are calculated based on the Highway Capacity Manual 6th edition, which defines the level of service, based on control delay.

	SIGNALIZED INTERSECTION
LOS	Control Delay per Vehicle (sec.)
A	≤ 10
B	>10 and ≤20
C	>20 and ≤35
D	>35 and ≤55
E	>55 and ≤80
F	>80

Table 4 - Level of Service Criteria

Control delay is the delay experienced by vehicles slowing down as they are approaching the intersection, the wait time at the intersection, and the time for the vehicle to speed up through the intersection and enter into the traffic stream. The average intersection control delay is a volume weighted average of delay experienced by all motorists entering the intersection on all intersection approaches. The control delay was modeled within the analysis software, Trafficware Synchro.

The re-distributed 2020 turning movement counts were used to model the Linn Street/Center Street or Church Street/Center Street intersections to determine intersection traffic operations with a traffic signal and a circular intersection during the AM and PM peak hours. The operations and queue results are shown in **Table 5** below.

The overall intersection is operating at LOS A in the AM and PM peak hours with either traffic control option. The circular intersection reduces the maximum movement delay and queues at the intersections when compared to the traffic signal a signal can cause additional delay for drivers and pedestrians.

Intersection	Peak Hour	Intersection Delay (1.)		Maximum Delay-LOS (2.)		Limiting Movement (3.)	Max Approach Queue		
							Direction	Average Queue (ft)	Max Queue (ft)
Center St & Church St	AM	4	A	14	B	EBT	NBT/R	25	75
Signal	PM	6	A	18	B	EBL	SBT	75	150
Center St & Church St	AM	4	A	4	A	SB	NB	-	25
Circular Intersection	PM	5	A	6	A	SB	NB	-	25
Center St & Linn St	AM	3	A	14	B	WBT	NBT	50	100
Signal	PM	6	A	16	B	EBL	NBT	75	150
Center St & Linn St	AM	4	A	5	A	NB	NB	-	25
Circular Intersection	PM	6	A	6	A	NB	WB	-	50

Table 5 - LOS / Delay for Signal vs. Circular Intersection

Comparison Summary Matrix

A signal does not address the predominant type of crash, Broadside/T-bone crash, being experienced at the intersection. Circular intersections can improve safety by reducing the number of conflict points. Circular intersections also narrow the pedestrian crossing distance, slow traffic, and decrease queues and delay.

Replacing a traffic signal with a circular intersection has been shown to reduce all crashes by 20% and injury related crashes by 65%. **Table 6** presents a summary matrix comparing the pros and cons of the two traffic control options for Linn Street/Center Street or Church Street/Center Street.

Comparison Matrix of Intersection Control Options for Center Street & Church Street & Linn Street

Positive | Neutral | Negative | $ ⟷ $$$$ Low High

Option	Pedestrian Safety Impact	Vehicle Crash Reduction Impact	Driver Delay	Pedestrian Delay	Cost	Notes
Signal 	✓	–	✗	✗	$$$$	• Stops traffic and provides light to tell pedestrians for when it's okay to cross. • Waiting for light increases delay for pedestrians. • Can create traffic congestion, add travel time, and frustrate drivers. • Over 50% of crashes at intersections are broadside/T-bone crashes. A signal does not address these types of crashes.
Circular Intersection 	✓	✓	✓	✓	$$¢	• 50% less conflict points for vehicles and pedestrians when compared to a signal. • Significantly reduces broadside/T-bone crashes at intersection. • Narrows pedestrian crossing distance and allows pedestrians to cross one lane of traffic at a time. • Pedestrian delay is less with the number of sufficient gaps anticipated. • Slows traffic turning in intersection compared to signal or two-way stop condition. • Decreases delay and backups for vehicles at all approaches.

Table 6 - Comparison Matrix: Signal vs. Circular Intersection

One-Way to Two-Way Conversion Implementation

Figure 31 - Existing Image of Church St / Center St Intersection, March 2021

Overall, the conversion of Church Street and Linn Street from one to two-way is feasible with mostly minor changes along each block. Some more involved intersection traffic control redesign at select intersections and roadway widening is needed in select locations. Proper phasing is key.

IMPLEMENTATION PHASES

A plan for implementation was created to establish the ideal order for changes needed to implement the conversion of these two streets to two-way. In addition to the base signing and striping to be completed, other items were identified:

- *On the following map, items shown in orange, many of the items, are low cost, easy implementable items like trimming back vegetation or limiting parking near the intersection corners.*
- *Items shown in red, are where traffic control changes, like signal upgrades or new stop signs, are needed.*
- *The items shown in blue, the intersections of Center at Linn and Church, need traffic control changes and are proposed to be changed from traffic signals to circular intersections.*

An overall depiction of the changes needed in shown in **Figure 32**. A full description of the changes needed with each step of implementation is provided in the **Table 7**.

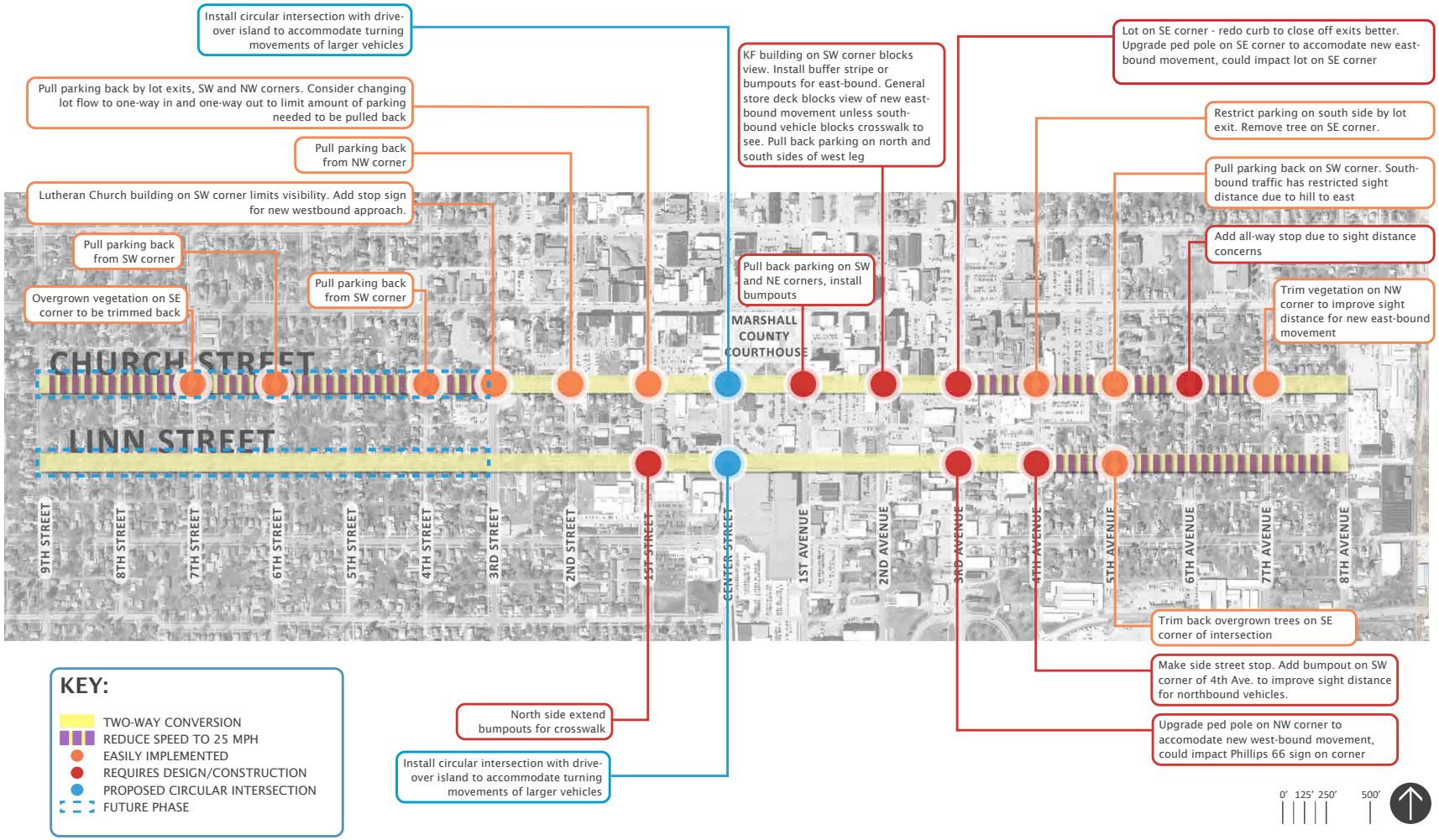


Figure 32 - One-Way to Two-Way Implementation Changes

Table 7 - One-Way to Two-Way Implementation Phasing

CHURCH ST.		1ST PHASE
7th Ave. to 3rd St.		
Step	Activity to Complete	Location / Notes
1	Trim Vegetation	7th St, 6th St, 4th St, By Wolfe Clinic Car Port (W. of 4th Ave), SE corner 4th Ave, 7th Ave NW corner
1	Parking Restrictions	6th St, 4th St, 2nd St, 1st St, Center St, 1st Ave, by lots east of 1st Ave, 2nd Ave (by KF building), SE corner 4th Ave, 5th Ave SW corner
2	Upgrade 3rd Ave Signal for EB	Upgrade ped pole on SE corner, may impact parking lot (bag heads until Step 3)
2	Center St/Church St Circular Intersection	Not Warranted based on volumes. On-Street parking and buildings at back of sidewalk limit visibility. Upgrade to circular intersection.
3	Add All-Way Stop at 6th Ave Intersection	Due to sight distance with new EB movement, need AWSC. Use temp stop ahead signs and flags on install.
3	Speed Limit Changes from 30 mph to 25 mph	3rd Ave to 7th Ave
3	Re-stripe Road for Two-Way traffic	3rd St to 3rd Ave, include buffer stripe for 2nd Ave
3	Remove One-Way signs & alternate parking signs	
3	Add Two-Way Traffic signs at main intersections	
3	Traffic signal turn on for new direction	
4	Bump outs on 1st Ave, 2nd Ave, Courthouse Transit Stop	Could just hatch out in the interim
4	Re-do parking lot curbs	S. Side of Church St, east of 3rd Ave
5	Parking Lot flow changes	Lot on SE corner 1st St/Church

LINN ST.		2ND PHASE
3rd St. to 8th Ave.		
Step	Activity to Complete	Location / Notes
1	Widen Linn St 8-10'	3rd Street to 2nd Street, to allow for parking on one side and two-way traffic
1	Widen Linn St 5'	1/2 block from 3rd Avenue east to the post office, to allow for bike lanes

LINN ST.		2ND PHASE (Cont.)
1	Bump out on SW corner 4th Ave/Linn	By post office
2	Trim Vegetation	5th Ave
3	Upgrade 3rd Ave Signal for WB	Upgrade ped pole on NE corner, may impact Phillips 66 sign
3	Center St/Linn St Circular Intersection	Not Warranted based on volume. Buildings at back of sidewalk limit visibility. Upgrade to circular intersection.
4	Add Two-Way Stop at 4th Ave Intersection	Not warranted based on volume. On Street parking limits visibility. Make side street stop. Pull back parking in front of post office on S. side of Linn St by adding bump out
4	Speed Limit Changes from 30 mph to 25 mph	4th Ave to 8th Ave
4	Re-stripe Road for Two-Way traffic	Includes bike lanes, Center to 4th Avenue
4	Remove One-Way signs & alternate parking signs	
4	Add Two-Way Traffic signs at main intersections	
4	Traffic signal turn on for new direction	
5	Bump outs at 1st St	

LINN ST.		3RD PHASE
9th St. to 3rd St.		
Step	**Activity to Complete**	**Location / Notes**
1	Widen Linn St 3-5'	9th St to 3rd St, to allow for parking on one side and two-way traffic
2	Remove One-Way signs & alternate parking signs	9th St to 3rd St
2	Re-stripe Road for Two-Way traffic	9th St to 3rd St
2	Add Two-Way Traffic signs at main intersections	9th St to 3rd St

CHURCH ST.		3RD PHASE
9th St. to 3rd St.		
1	Trim Vegetation	7th St, 6th St, 4th St
1	Parking Restrictions	6th St, 4th St,
2	Speed Limit Changes from 30 mph to 25 mph	9th St to 3rd St
2	Remove One-Way signs & alternate parking signs	9th St to 3rd St
2	Re-stripe Road for Two-Way traffic	9th St to 3rd St
2	Add Two-Way Traffic signs at main intersections	9th St to 3rd St
2	Add EB Stop Sign at 3rd St	Not warranted based on volumes, but needed due to sight distance with Lutheran Church on SW corner

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Pavement Assessment

05

"Rebuild the character of our downtown."

Pavement Management

BACKGROUND

A key component of the Downtown Implementation Plan is the pavement assessment for all streets, sidewalk and alleys located in the CBD. The pavement assessment was requested to determine a scope and timeline for future maintenance/reconstruction of the pavement. The assessment plays a critical role in helping guide future projects in the downtown area through the creation of a pavement management program (PMP). The PMP evaluates the condition of all the existing pavement and utilizes a cost/benefit approach to recommending repair/reconstruction options to maximize the pavement condition in the area. Pavement Management is a program that carries out an important City policy. The policy objective is to improve not only street conditions, but the aesthetic value throughout the entire CBD in Marshalltown.

ASSESSMENT METHODOLOGY

Using pavement management methodology, Bolton & Menk created a capital improvement program wihich recommends using the right rehabilitation treatment at the right time in coordination with the overall vision of the Downtown Implementation Plan.

An inventory of the City's streets, sidewalks and alleys was developed using existing City mapping and information, along with information from the Iowa Pavement Management Program (IPMP). Maps of current roadway conditions were generated utilizing pavement condition data provided by the IPMP. The IPMP was established in 1999 through a partnership with Iowa State University, Iowa State University's Institute for Transportation (INTRANS) and the Center for Transportation Research and Education (CTRE). IPMP helps support the management, planning and programing needs for local transportation agencies. Starting in 2013 IPMP has collected data for every mile of roadway in Iowa on a bi-annual basis. Beginning in 2020 the data will be collected every four years instead of every two.

The data that was collected included the functional performance, structural performance and the amount of cracking that is present in all roadway pavements. This included items like roughness, faulting, joint spalling, number and size of patches, types of cracks and failure locations. All of the data is then aggregated together to develop a Pavement Condition Index (PCI). The PCI values range from 0-100 with 100 being a brand new roadway and 0 being complete roadway failure.

The date utilized for the pavement assessment was collected in 2018. Bolton & Menk worked with the City to adjust the data for any roadway work completed between 2018 and 2021. We also looked at the streets that were heavily utilized as haul routes during both the tornado and derecho debris cleanup. These streets; Main St, State St and Center St all had their existing PCI values reduced by 10 points to account for the additional traffic load placed on them in the past 3 years.

The conditions of the sidewalk and ADA ramp were determined as part of the recently completed ADA transition plan. Each block of sidewalk was given a condition index which ranged from Generally Accessible to Not Accessible. This accessibility rating was based on the percent of barriers to accessibility in each section of roadway. The map on the following page , from the ADA Transition Plan, shows the central business district and the associated rating for all the segments.

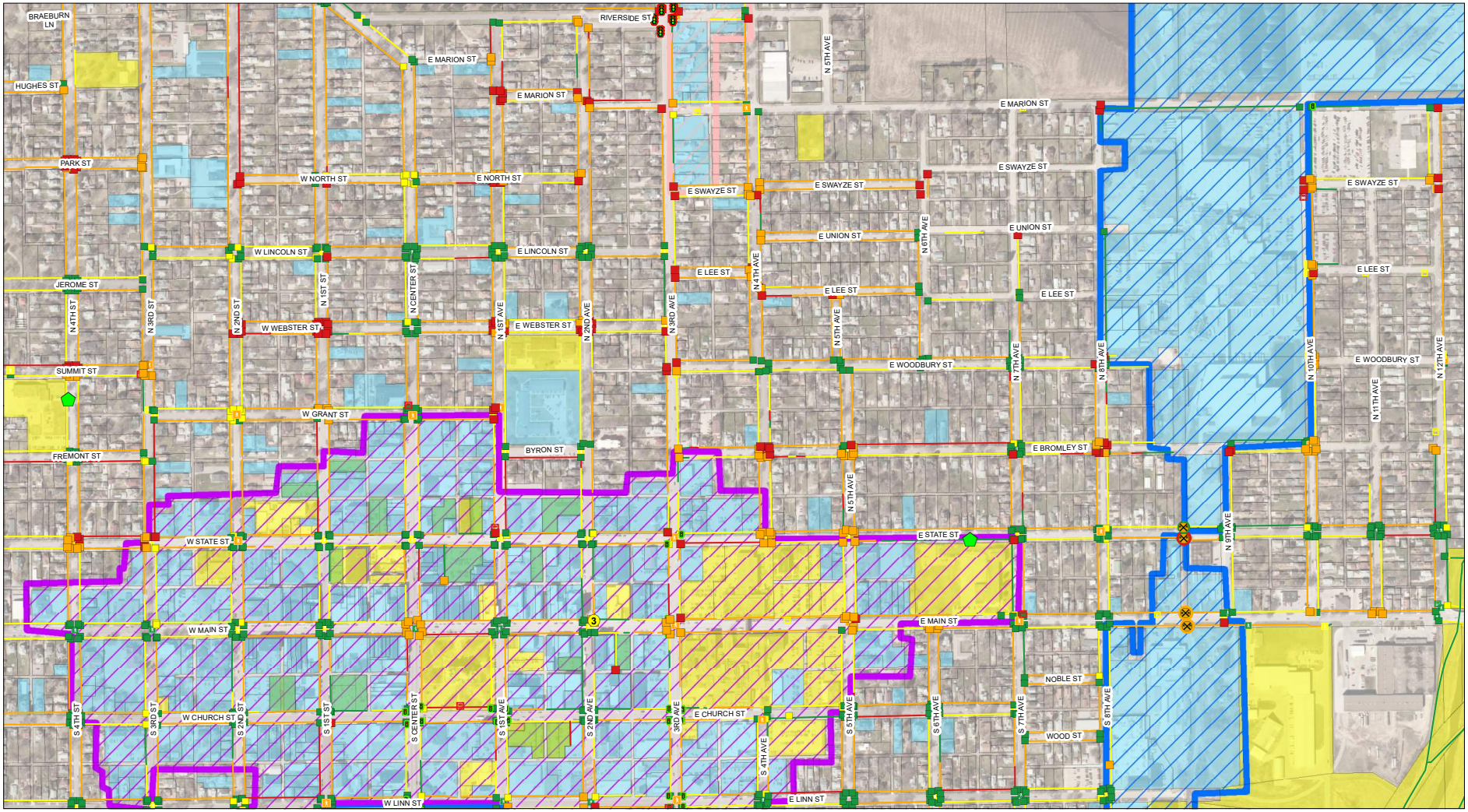

Figure 33 - ADA Self-Evaluation Plan. Source: Marshalltown ADA Transition Plan

In addition to the street and sidewalk pavement, a visual assessment of the alleys was completed. Alleys were ranked based on the visual inspection of the pavement. Ranking included good, fair and poor. The figure below shows the alley inventory.

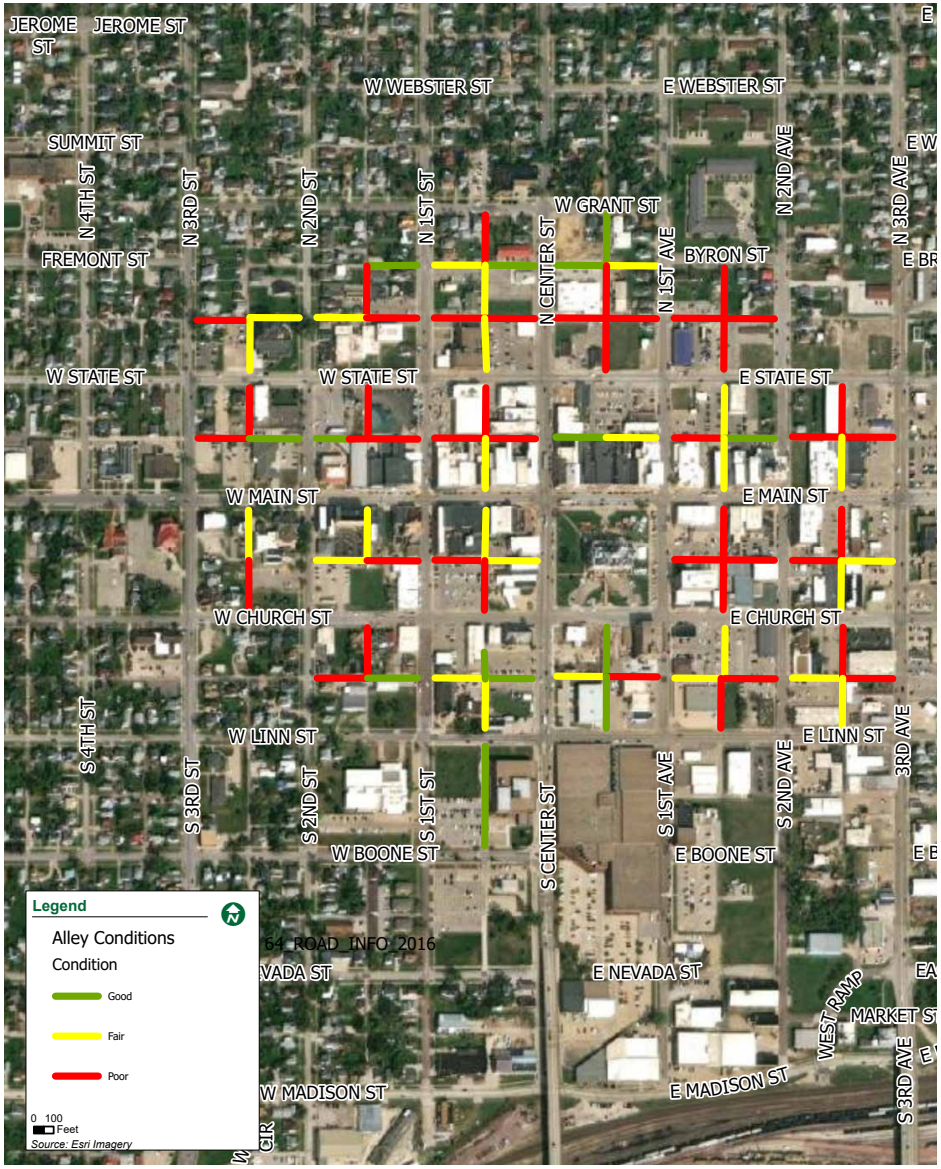

Figure 34 - Alley Conditions Inventory, February 2021

The inventory of the City's current roadway conditions in the CBD showed an average PCI value of 49. This results in a total network rating in the CBD of fair. Soon, many of the streets in the City will begin to reach their terminal ages or already have, or in some cases will have deteriorated due to other environmental or construction factors. As these streets expire, the City will need to restore them to serviceable levels. This can be done through rehabilitation or reconstruction. Rehabilitation involves improving an existing street, typically through localized repairs or re-surfacing. Reconstruction, on the other hand, is the complete replacement of a street. Both rehabilitation and reconstruction are expensive options so it's critical to have a guide for when to apply the various type of treatments. Bolton & Menk worked with the City Public Works staff to develop a list of treatment options that would be utilized in the CDB. There are several methods utilized in other areas of town that were deemed not appropriate in the CBD due to the proximity of buildings, impact to businesses or material availability.

When a preservation treatment is properly applied, it is expected to economically extend the cost of the pavement by addressing the existing distresses such as cracking. In addition, it is expected to prevent future distresses that shorten a pavement's service life. However, those preservation treatments are not typically expected to strengthen the structure of a pavement. Preservation treatments need to be applied at the right time to maximize the expected benefits.

Rehabilitation treatments should be used to enhance the pavement structure and restore heavily deteriorated pavements to an acceptable condition. Three different procedural decision-making steps are typically utilized to select the most appropriate treatment method for a pavement under consideration:

1. *Evaluate the existing conditions*
2. *Determine technically feasible treatment options*
3. *Analyze those feasible options and select the most appropriate treatment*

Using the existing condition data, technically feasible treatment alternatives are recommended. Rehabilitation or replacement treatments are considered when structural deterioration is observed. With no evidence of pavement structural deterioration, preservation treatments are typically considered. Among the feasible treatment alternatives, the most

appropriate treatment is selected.

The purpose of this analysis is to establish a pavement management system whereby the City of Marshalltown can maximize the preservation of pavement, which will provide the greatest benefit to the users given the budget established by policymakers. To do so, pavements should be preserved before they degrade to the point of reconstruction. The worse pavements get, the more expensive they are to fix.

IPMP software DTIMS was utilized to analyze pavement and create a recommended construction program. In the software, each treatment option for pavement rehabilitation or reconstruction is given a set of criteria that tell the software when it can be selected, the cost for the treatment and effects of the treatment. The treatment table used for the downtown pavement assessment is shown below.

Type of Treatment	Treatment	Description	Cost	Trigger	Effect
Reconstruction	Full HMA Reconstruction	Complete reconstruction of existing roadway utilizing full depth asphalt	$39.23/SF	Poor PCI or failed roadway	All values reset to maximum
	Full PCC Reconstruction	Complete reconstruction of existing roadway utilizing full depth Concrete	$39.95/SF	Poor PCI or failed roadway	All values reset to maximum
Major Rehabilitation	Mill & Overlay	1.5 to 3 inches of asphalt pavement is milled off and then a new overlay of 3 inches of asphalt is placed on the surface. Repairs surface issues and improves structural character.	$9.42/SF	PCI >40 & <60, Surface = ACC, Moderate Cracking	Adds 75 to PCI without going over 100 and resets IRI
	Full Depth Concrete Patching	Areas of the street in bad repair are removed and replaced. This may include patching, full panel replacement, and full depth repairs at joints. Slightly improves overall condition and helps extend life by addressing problem areas before they spread	$6.69/SF	PCI >40 & <60, Surface = PCC, Cracking >50%	Adds 20 to existing PCI, 40% reduction in cracking
Restoration/Preservation	Joint Sealing	All pavement joints are sealed to prevent moisture from entering the pavement structure including routing and sealing random cracks.	$3.25/LF	Applied every 5 years after last work completed	Maintains existing condition

Table 7 - Pavement Management Plan Treatment Types

Both a one-million dollar per year and two-million dollar per year budget were utilized when considering the recommended improvements. The one-million dollar budget scenario maintained the existing PCI data but did not show an improvement in the overall PCI for the downtown CBD district. The two-million dollar did show an improvement to the overall PCI rating for the CBD. Five-million and ten-million dollar scenarios were also ran to analyze at what point the different options catch up to each other. Understanding that these two budgets were unfeasible, they were not used for further planning. The chart below shows the differences between the budget scenarios used while developing the PMP.

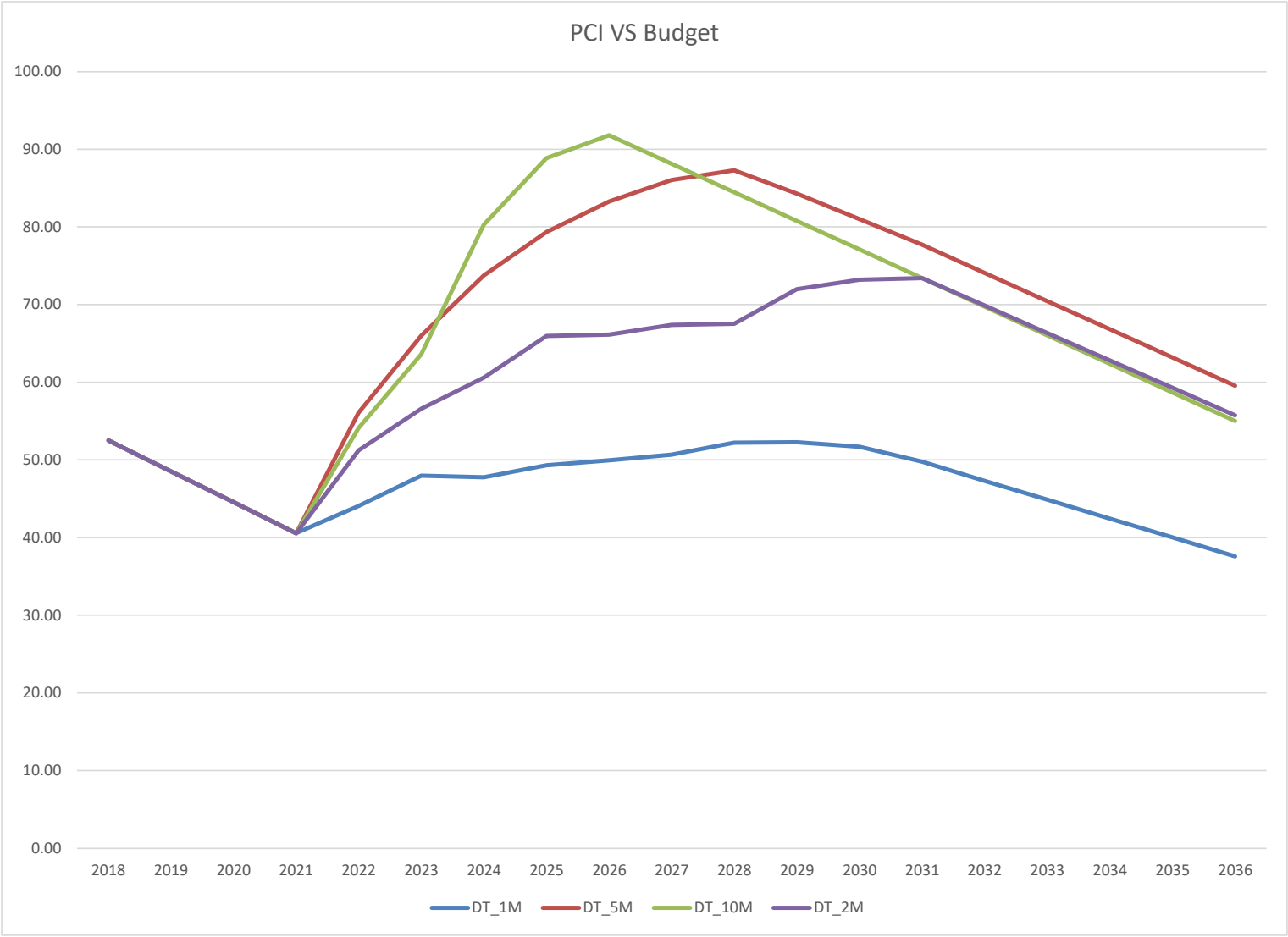

Figure 35 - PCI Value vs. Budget Comparison

Utilizing a goal of increasing the PCI value the two-million dollar budget per year is the recommended budget scenario for the downtown area. The budget was projected out to 2028 but it's recommended to be reran every 4 years when new data is available from the condition of the roadways from INTRANS.

The final step of the pavement assessment was to help the City of Marshalltown develop a capital improvement plan (CIP). The recommended construction program from DTIMS for both the $1M and the $2M budgets are shown below.

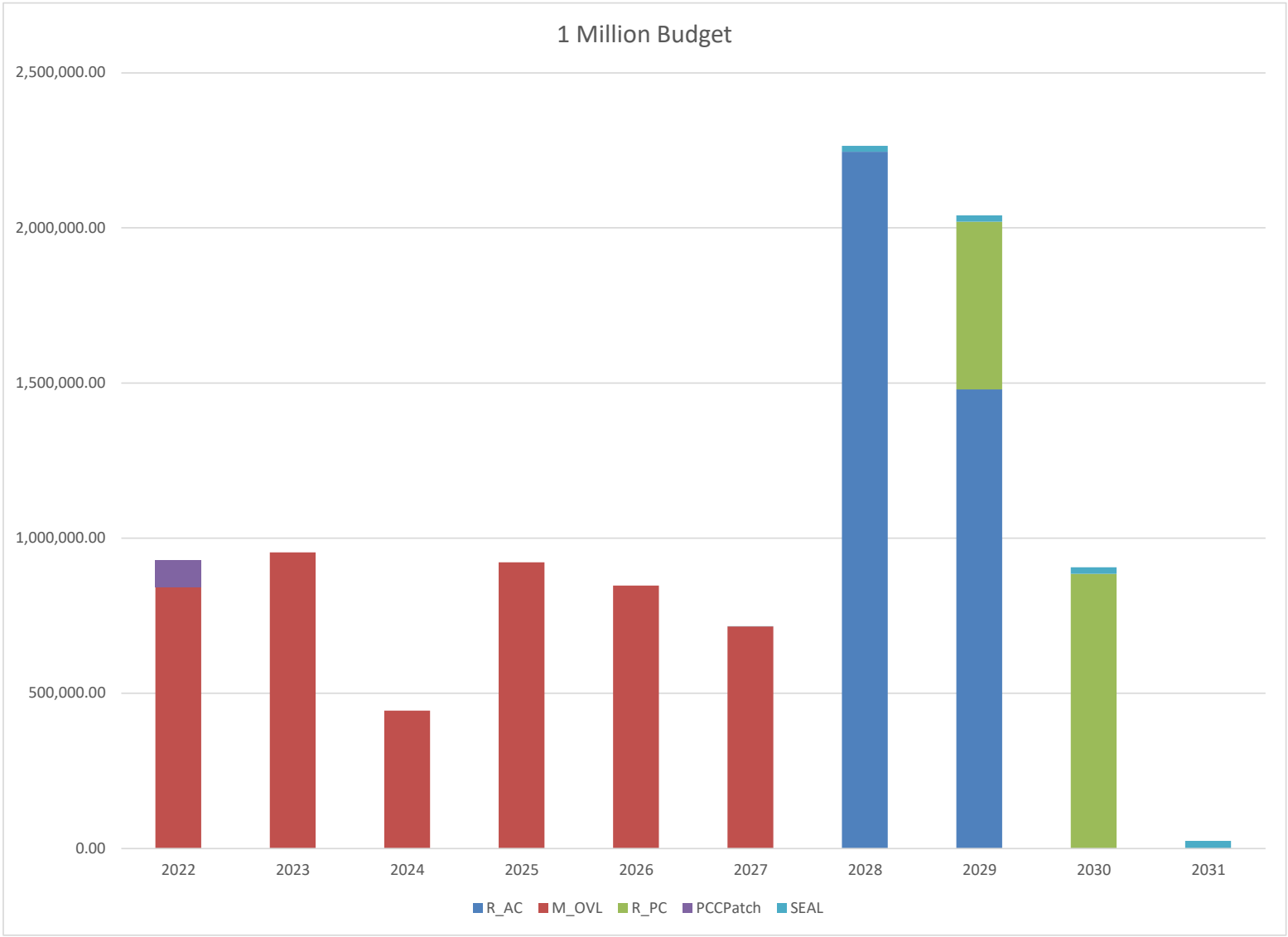

Figure 36 - One Million Dollar Annual Budget Scenario

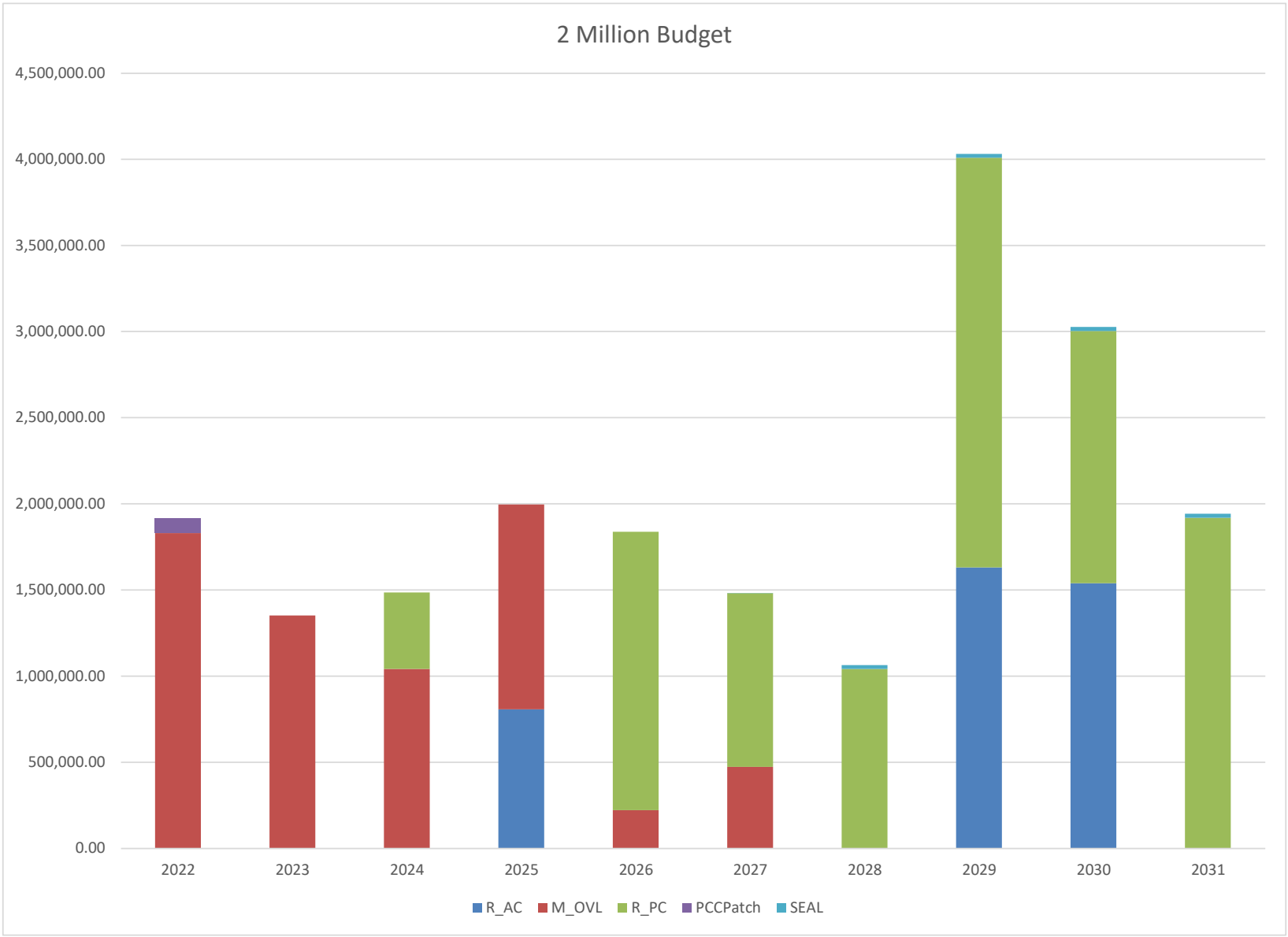

Figure 37 - Two Million Dollar Annual Budget Scenario

The recommended construction programs were then compared to the overall goals for the entire CBD as determined by the steering committee for the project. The steering committee looked at much more than pavement condition. Their priorities for the CBD included items such as pedestrian and bike connectivity, streetscaping concepts, parking configuration and locations, one-way to two-way conversion for Church and Linn Streets and beautification.

With the steering committee's vision in place we evaluated how the recommended construction program from DTIMS correlated with the overall project vision. We were able to take the implementation priorities for the CBD and line them up with the recommended repairs from DTIMS. This process helped create the final Capital Improvement Plan for downtown Marshalltown.

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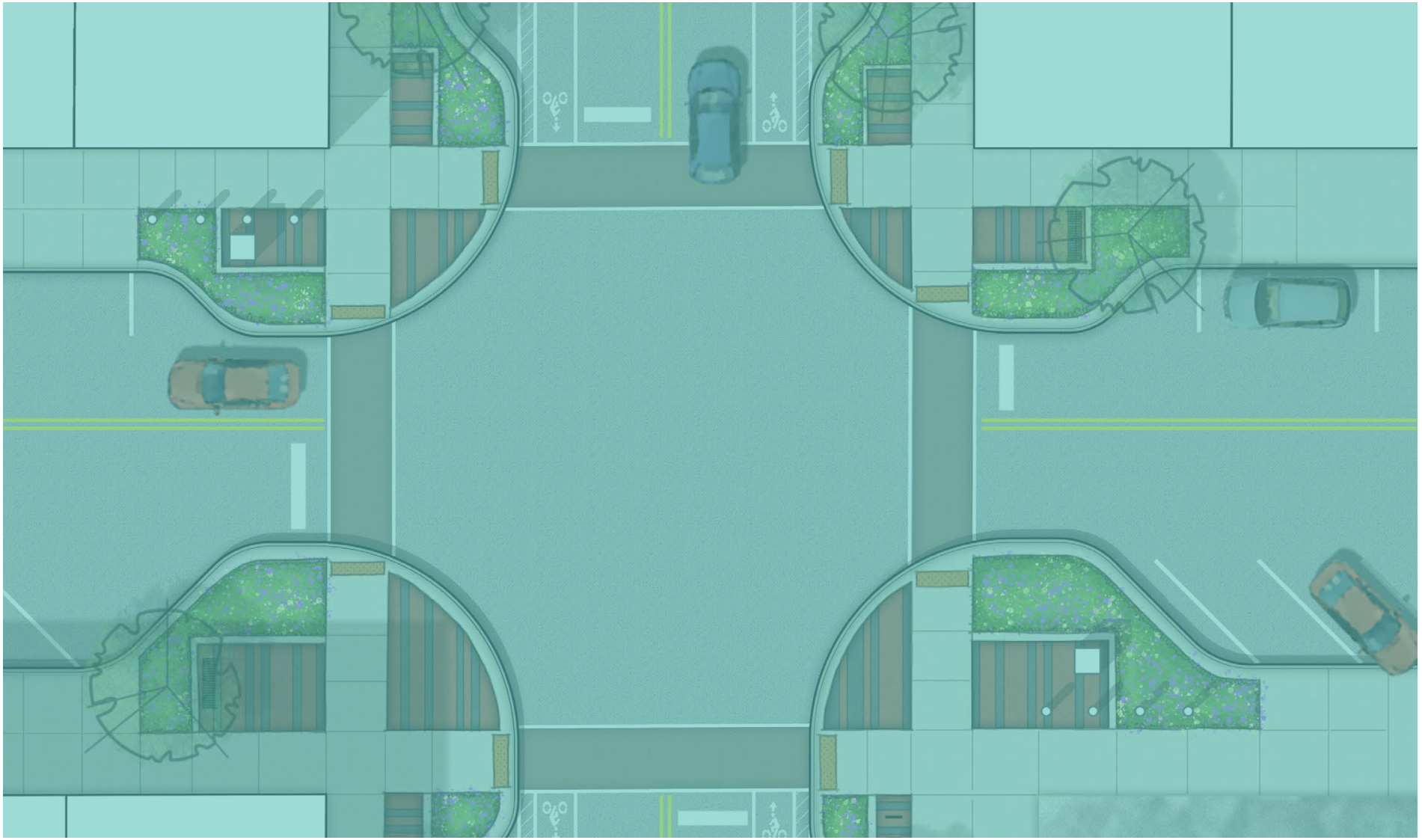
Streetscape Improvements

06



Intersections

IMPROVING SAFETY & AESTHETICS

Improving intersections in the CBD is a key component of the Downtown Implementation Plan. Current conditions include numerous instances of obstructed sight lines caused by building edges, parked vehicles and from signage and poles near intersections. The primary goal of improving intersections is to improve public safety and accessibility. A secondary goal is to enhance the visual quality at each location.

Similarly to the approach taken with the streetscape design, all intersections are not treated equal. Intersections around the Courthouse square and along major routes identified as 'primary' are intended to have a higher level of finish with the incorporation of unit pavers, landscape planter beds and at specific locations, gateway / district monuments and decorative lighting. The intersections of Church St / Center St and Linn St / Center St are identified as circular intersections in-lieu of the current signalized intersection. **Section 04** describes the design intent and process of implementing this change in more detail.

Bumpouts or curb extensions are recommended at every intersection in the CBD where on-street parking exists. Currently in downtown, bumpouts are installed on Main Street. These are locations where the curb line extends into the roadway, reducing the width of the overall roadway pavement. The travel lanes are not reduced by the bumpout, as only the width otherwise given to the parking lane is taken away. Bumpouts shorten crosswalk distances and allow pedestrians and drivers to see each other more easily, by pulling the pedestrian out from behind parked vehicles.

Another important aspect of the proposed intersection design is utilizing the expanded pedestrian and sidewalk space for decorative pavement, landscape planter beds and for placing site furnishings. With the exception of Main Street and Center Street, sidewalks in downtown Marshalltown are not overly wide and do not afford a lot of space for landscaping and benches, lighting and other amenities. Increasing space for these items caters to the overall streetscape approach in downtown and allow opportunities for expanding pedestrian accommodations currently lacking in the CBD.

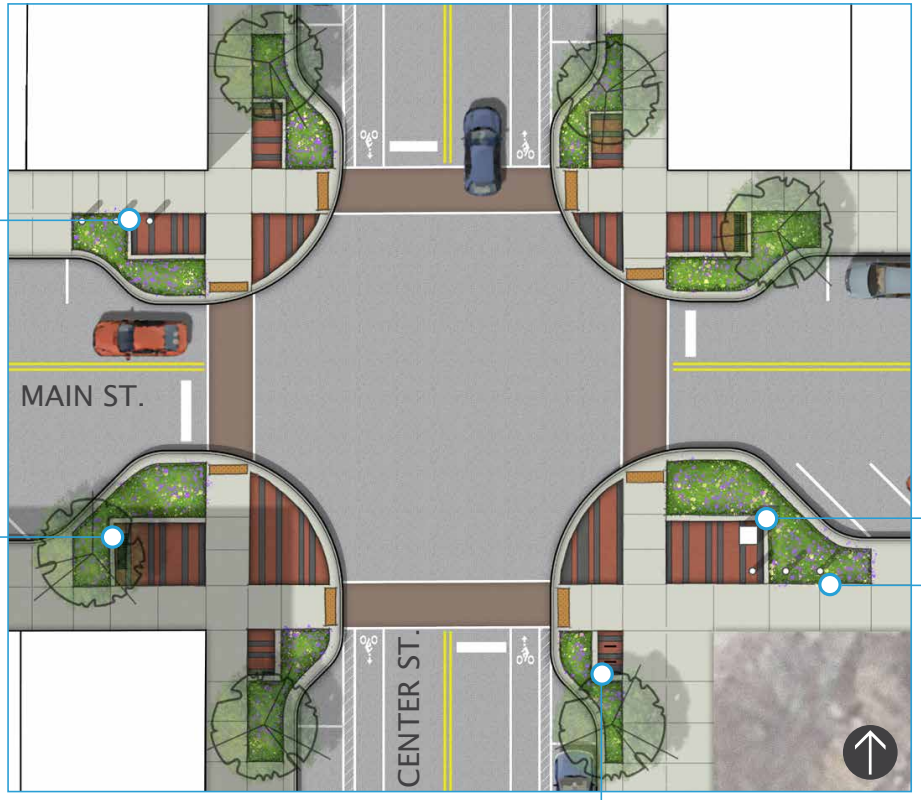
Figure 38: Existing Conditions at Intersection of 1st Ave and Church St, March 2021

Figure 39: Intersection Improvement Diagram

DECORATIVE PAVING

DECORATIVE PAVING

SEATING AREA



BIKE RACKS

MONUMENT/DISTRICT SIGN

ARTISTIC LIGHTING

Figure 40: Proposed Intersection Design with Character Imagery at Main St / Center St Intersection

Street Trees & Landscaping

BRINGING BACK THE URBAN TREE CANOPY

Re-establishing the urban tree canopy of Marshalltown is important to bringing back the old-growth, historic character of many of the community's neighborhoods. Established trees help to reduce the scale of the urban right-of-way and create a more comfortable and inviting pedestrian space. Incorporating trees into the design of the sidewalks and bumpouts in downtown will overtime, create a comfortable sidewalk environment in summer months, add visual interest to the street, allow for holiday lighting and contribute to traffic calming. With the loss of so many trees due to recent natural disasters, it may be desirable to line the downtown streets with trees but careful consideration for where trees are planted, what species are planted and how each tree is planted are all important to establishing mature, healthy urban trees.

STREET TREE PLANTING

Traditionally, urban streets do not present the best growing environment for trees. As a result, additional thought must be given to how each tree is planted, particularly with the soil medium and root zone of the tree. With close proximity to the street, compaction to the subsoils will occur over time and greatly reduce the ability for roots to grow and expand freely. The available moisture and oxygen to those roots becomes marginalized and thus the health of the tree is negatively impacted. By removing a larger volume of soil around the root zone of the tree and replacing it with structural soil, the growing medium of the tree can now hold moisture and maintain porous space for the roots to move. Structural soil is a combination of clean aggregate, topsoil, organic material and a binder to help retain soil moisture. The rock in the soil adds a structural component which will reduce compaction, allowing the soil to breathe and hold water. As the tree grows, roots are able to expand under the sidewalk and are less likely to girdle at the tree planter and put pressure on the adjacent pavement.

A structural soil zone should be established for each street tree. Ideally the total volume of structural soil would target anywhere from 15 – 30 cubic yards of soil per tree. If there is an opportunity to connect planting areas with structural soil, this would provide a more efficient installation of the material but that may not be possible due to the spacing of the trees.

Larger planting areas, the right planting soil and the right tree species all go together to promoting a healthy and mature street tree corridor. When considering species, the design should focus less on establishing a rhythm or balance, but build in diversity into the species mix, as suggested by the Downtown Master Plan. Disease and pests can wipe out a single species of tree so planting a mix will reduce the potential for widespread die off. Equally important is the size and shape of the tree. Trees that are too large will not only struggle to grow well in a confined space, they will also likely impact surrounding vegetation and buildings. Trees with oval, pyramidal, and narrower growth habits will fit the streetscape better and cause fewer issues with their surroundings. The following includes a list of recommended canopy and ornamental tree species for consideration in downtown Marshalltown, which was adapted from the Downtown Master Plan:

- *American Horbeam* | *Carpinus caroliniana*
- *Ginkgo* | *Ginkgo biloba (male only)*
- *Sugar Maple* | *Acer saccharum*
- *Autumn Brilliance Serviceberry* | *Amelanchier x grandiflora (single stem/tree form)*
- *Columnar English Oak* | *Quercus robur 'Fastigiata'*
- *Hackberry* | *Celtis occidentalis*
- *American Linden* | *Tilia americana*
- *Honeylocust* | *Gleditsia triacanthos (thornless/seedless only)*

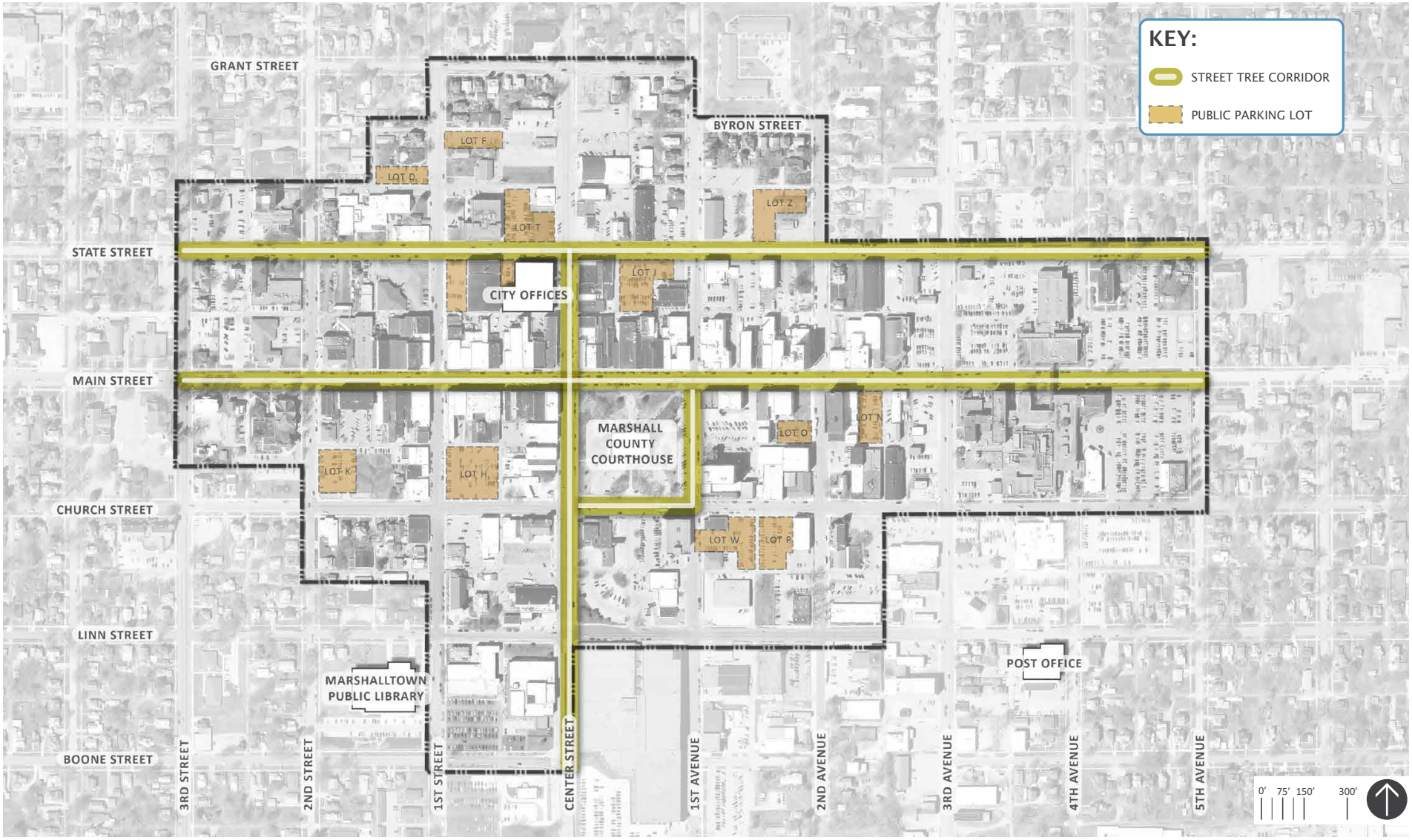


Figure 41: Street Tree Corridor Diagram

- *Kentucky Coffeetree* | *Gymnocladus dioicus (male/seedless only)*
- *Sweetgum* | *Liquidambar styraciflua (male/seedless only)*
- *Blackgum* | *Nyssa slyvatica*
- *London Planetree* | *Platanus x acerfolia*
- *Swamp White Oak* | *Quercus bicolor*
- *Scarlet Oak* | *Quercus coccinea*
- *Accolade Elm* | *Ulmus japonica x Ulmus wilsoniana*
- *Flowering Crabapple* | *Malus spp.*
- *Japanese Tree Lilac* | *Syringa reticulata*

Figure 42: Example Image, Landscape Bed with Planter Curb and Railing

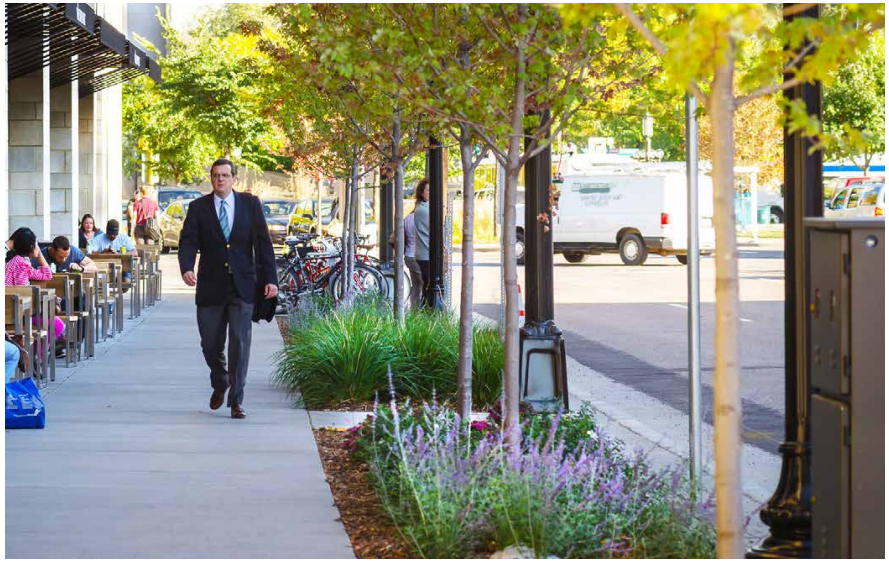


Figure 43: Example Image, Landscape Bed with Street Trees

URBAN LANDSCAPING

Incorporating plant material into the design for downtown will be achieved at a variety of scales and forms including:

- *Hanging baskets along Main Street*
- *Landscape beds within the sidewalks on Main Street, State Street, all four sides of the Courthouse Square, and along Center Street*
- *Intersection bumpout landscape beds and primary intersections*
- *Above grade planter pots*

Landscape beds should consist of a variety of drought tolerant perennial forbs, grass and shrub species that are appropriate for USDA Zone 5a or colder. Seasonal color, long bloom periods and lower maintenance input should be considered when selecting plant species. Plants that will require extensive pruning and dead-heading should be avoided. Perennials and grasses with heights over 3' tall should be avoided or used sparingly in order to not encroach on sight lines and to create safe and comfortable spaces. Trees and shrubs planted at intersection bumpouts should preserve sight triangles at each intersection and provide clear lines of sight to oncoming traffic. Spacing of all plant material should respect the mature growth size of each plant, doing so will help prevent beds from becoming overcrowded and looking messy or unkept.

Similarly to the care given to planting trees, preparing landscape beds with 12" – 18" of amended planting soil consisting of 50-60% sand, 15-25% quality topsoil low in clay content and 10-20% compost. Beds should be finished with 3"-4" of double processed hardwood mulch to reduce erosion, maintain soil moisture and reduce the ability for weed seed to settle in and germinate. Maintaining the mulch layer annually will greatly reduce the amount of maintenance needed to weed the bed, as well as the need for supplemental watering.

Site Furnishings

Figure 44: Example Image, Sidewalk Bench Seating

OVERVIEW

People visit downtown for a number of different reasons. People live in this space, work here, dine here, shop here or just simplify pass-through downtown, by car, foot and bicycle. As such this space needs to be flexible and accommodating. To accommodate pedestrians, site furnishings should be visible and abundant. This is a space that will accumulate litter, so providing a place for people to put it, is very important. Similarly, it is important to encourage visitors to spend time here, even if that means just taking a break on a bench or eating lunch at a café table. Provide seating opportunities on every block in the central business district. When siting the location of bench or wall seating, consider the surroundings of each space. People want to feel comfortable and safe when sitting along the street or sidewalk, so ensuring that people won't need to turn their back to oncoming vehicles or too close to parked cars or passing pedestrians will encourage increased use of the bench or seat wall.

LOCATION IS EVERYTHING

As illustrated on the bicycle facilities map on **page 38**, key locations are identified for placing bicycle parking. These locations are chosen to evenly distribute bicycle parking throughout downtown and are within close walking proximity to proposed bicycle circulation routes in the CBD. As improvement projects are finished and bicycle circulation increases, the need for additional bicycle parking at other locations should be evaluated. Certain restaurants/bars, coffee shops and stores may see increase traffic from the cycling community and may warrant additional bike racks.

Figure 45: Site Furnishing Character Imagery

CONSISTENT STYLING

The style of site furnishings should be consistent throughout downtown. Choosing bike racks, litter receptacles and benches that are the same color and have a similar style will strengthen the character of downtown. Having multiple styles of benches or different finishes should be avoided. The city should also avoid allowing property owners to put out their own benches or chairs on the sidewalk. The exception to this rule would be if a business has an outdoor dining space in which they remove their tables/chairs daily.

Community input suggested that the site furnishings in downtown should give a nod to the historic character of downtown but in a sophisticated and simplified form. Avoid styled that are overly ornate, as well as forms that are overly contemporary.

Decorative Pavement

OVERVIEW

The incorporation of decorative pavements is a common element among successful streetscapes and attractive urban spaces. This can be as simple as a scoring pattern in traditional concrete pavement or more commonly, by the use of concrete or clay unit pavers and/or colored concrete pavement. These features can be used to define or draw attention to pedestrian spaces or simply add visual interest to streets, sidewalks and crosswalks.

Historically, unit pavers have been incorporated into sidewalks and crosswalks in downtown Marshalltown, primarily around the Courthouse square and on Main Street. At the intersection of Main St and Center St, there are also engraved granite memorial / dedication pavers in-laid in the sidewalk paying tribute to specific organizations and Marshalltown citizens.

DESIGN INTENT

While collecting community input on what the streetscape design should consist of, there was considerable support for integrating decorative materials / treatments into the overall design for downtown. Similarly, participants described that this should be done selectively at key locations.

As illustrated in the typical streetscape improvement illustrations in Section 01 – Executive Summary, concrete unit pavers are proposed within downtown sidewalks for specific streets, at intersection bumpouts and expanded pedestrian areas in the CBD. Colored concrete crosswalks are shown at primary intersections as shown on the Intersection

Figure 46: Existing Memorial / Dedication Pavers at Main St / Center St Intersection, March 2021

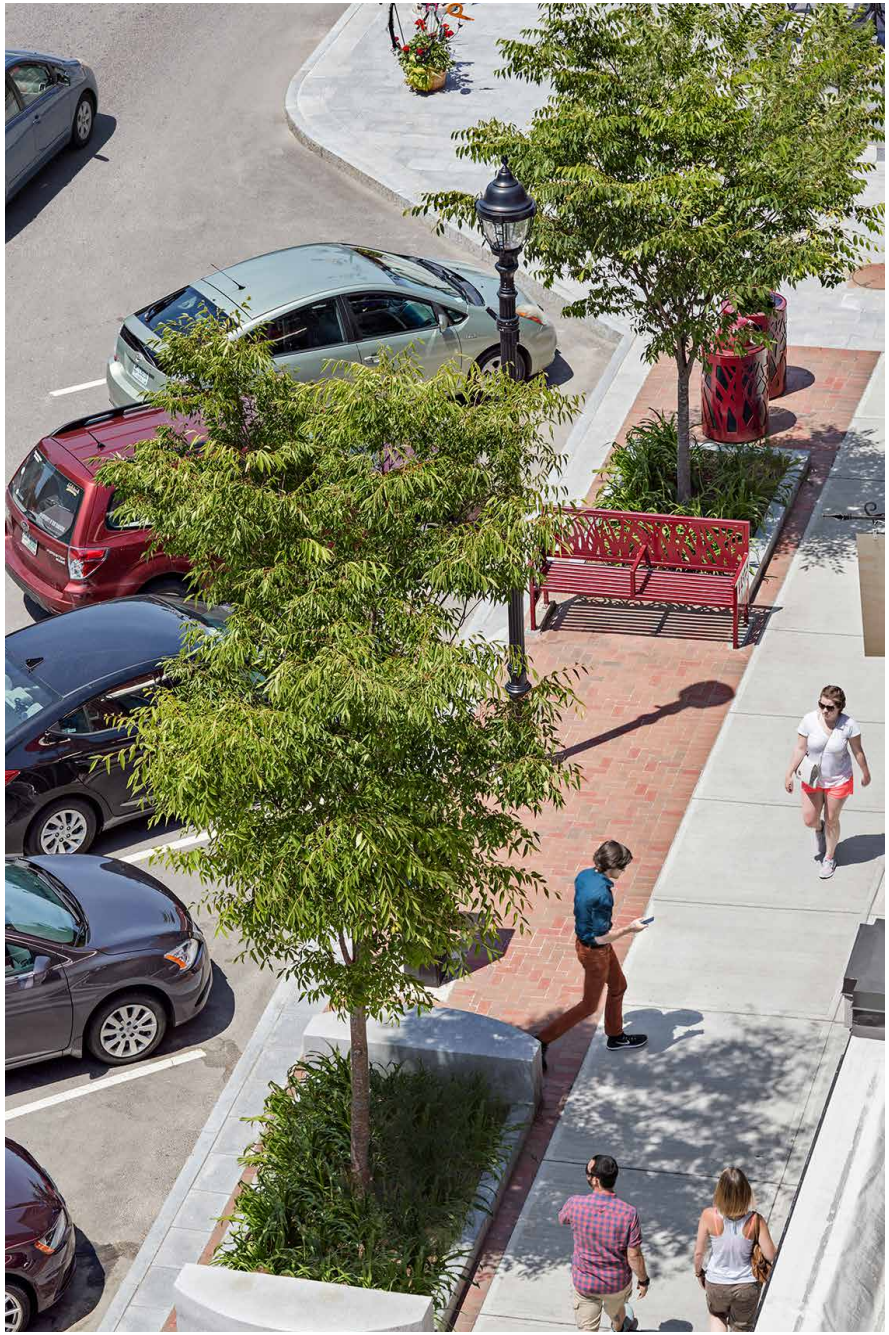


Figure 47: Character Image of Using Decorative Pavers to Define Sidewalk Use Zones

Improvement Diagram on **page 67**.

IMPLEMENTATION/DETAILING

The pattern, style and color of unit pavers and for the colored concrete crosswalks should compliment the overall character of downtown and similarly to site furnishings, give a nod to the historic context of the CBD. The following includes a brief description of the design intent for using decorative pavements in downtown and considerations for promoting long-term success of the implementation:

Concrete Unit Pavers –

- *Only pavers with a minimal beveled edge, tight joints, and complying with ADA guidelines may be used.*
- *Where used in the sidewalks or pedestrian spaces, 6 CM or 7CM thickness should only be used.*
- *In areas of limited vehicular use, pavers may be set on a sand setting bed, with a poured-in-place concrete base.*
- *In areas intended for vehicular use, pavers should be installed on an asphalt setting bed with a neoprene mastic, over a concrete base.*
- *The concrete base beneath the pavers must be doweled to adjacent pavements to reduce differential settlement where the two surfaces meet.*
- *Pavers must be installed per SUDAS and manufacturer standards for installation, as this will ensure that strict installation practices and tight tolerances for finished work are met.*

Colored Concrete –

- *Colored concrete should be specified / installed as integral mix concrete, with the color being evenly distributed into the mix at the plant or in the truck. This will ensure that the color is incorporated*

into the entire cross-section of the pavement and not just at the surface.

- *Large expanses or continuous runs of colored concrete should be avoided. It is difficult to get consistent coloring with colored concrete and slight variations from truck to truck is common. In the event that an area of the pavement needs to be replaced, smaller areas that are not abutting another colored slab will not be as noticeable should there be slight color variations.*
- *Shades of red, blue and green colored concrete should be avoided as these colors tend to fade more and often don't maintain their original color as they age.*

MEMORIAL/DEDICATION PAVERS

The reuse of the existing memorial / dedication pavers came up multiple times during the community outreach process. It is important to community members that these items are not forgotten or destroyed and that consideration for them be planned into the streetscape design.

While currently being used in the pavement design of the sidewalks, repurposing the memorial pavers into the face of seatwalls the architectural gateways/monuments may be a better long-term home for these features. Bringing them up off the ground plane makes them more visible and will promote the longevity of the materials.

If intermediate improvements are made to the sidewalks, the memorial pavers should be salvaged and stored for later use and detailed into the streetscape design when possible.

Figure 48: Character Image of Contrasting Unit Pavers Used In a Streetscape

Figure 49: Character Image of Unit Paver Color and Pattern Complimenting the Historic Context of the Space

Implementation/ Phasing

07

Project Phasing

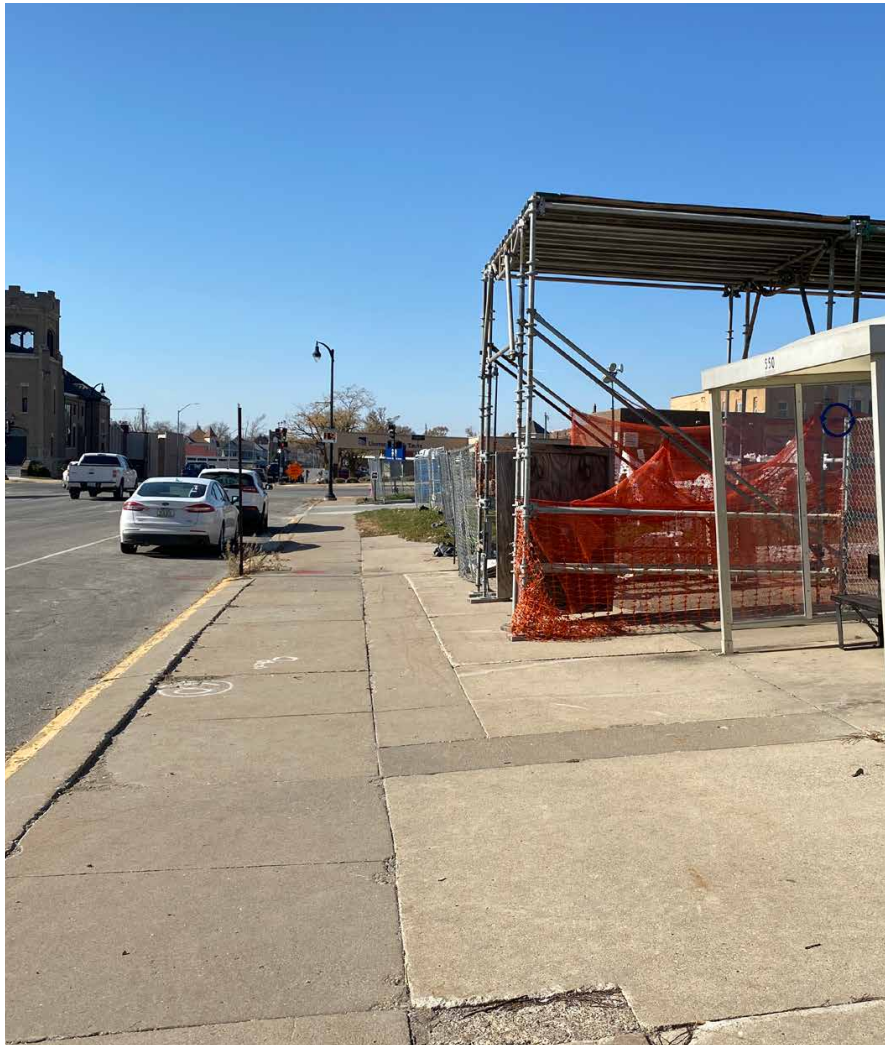


Figure 50: Construction of Court House Entrance and Bus Stop On Church Street, March 2021

SUMMARY

The execution of projects in downtown is important but it will take time. As previously described in this plan, the proposed improvements are intended to be implemented in phases. Each phase is developed following the sequence resulting from the pavement management plan. The extents of each phase were determined purposefully, to promote efficiency in the construction process, minimize disturbance to downtown businesses and to work with subsequent or previous phases.

The following table identifies each phase of construction for the Downtown Implementation Plan, along with a description of the specific improvements per phase and the anticipated project cost. Per the phasing cost summary on **pages 17-19**, the project cost includes design and construction. While these recommendations are specific, the construction costs should be used for budgetary purposes only. Additional study, changes to project extents and timing are likely to change / adjust based on many other factors.

PHASE	PROJECT DESCRIPTION	COST EST.
1A	**1A. State Street: 3rd St - 3rd Ave** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction 45' width (face to face), new curb and gutter to accommodate proposed cross section* ▪ *Striping and signage for roadway and two-way cycle track* **Sidewalks:** ▪ *Min. 10' wide sidewalk, both sides* ▪ *Street trees with tree grates* **Amenities:** ▪ *Street trees w/tree grates* ▪ *Landscape beds at mid-block locations where space and adjacent uses present opportunities* ▪ *Intersection bumpouts landscape beds and concrete unit pavers at primary intersections* ▪ *District marker at State St. / Center St. intersection* ▪ *Provide bike racks, bike racks and litter receptacles at Center St. intersection* **Pedestrian alley improvements:** ▪ *Removable bollards at each end, pedestrian scale lighting, misc. visual quality improvements, and site furnishings* ▪ *Patching of alley pavement where needed* **Crosswalks:** ▪ *Colored concrete crosswalks at intersections of State St. / Main St.*	**$6.4 Million**
1B	**1B. State Street 3rd Ave - 5th Ave** **Roadway:** ▪ *Curb and gutter to remain in place* ▪ *Striping and signage for roadway and on-street parallel parking and bike sharrows for shared bicycle facility* **Sidewalks:** ▪ *5' wide sidewalk on north side of street with boulevard landscaping and street trees*	**$100,000**

PHASE	PROJECT DESCRIPTION	COST EST.
2A	**2A. Main Street: Center St - 3rd Ave** **Roadway & Utilities** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction 49' width (face to face), new curb and gutter to accommodate AP1.1 Cross Section: angled parking on south side, parallel parking on north side* ▪ *Striping and signage for roadway* **Sidewalks:** ▪ *New concrete sidewalks both sides* ▪ *12" – 18" concrete band behind back of curb* **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb, ornamental railing (only on courthouse square blocks)* ▪ *Concrete unit pavers between street trees and landscape beds* ▪ *Intersection bumpouts landscape beds and concrete unit pavers at primary intersections* ▪ *District marker at Center St. / Main St. and 1st Ave. intersections* ▪ *Gateway monument at Main St. / 3rd Ave. intersection* ▪ *Sculptural accent lighting at Center St. and 1st Ave. intersections* ▪ *Provide bike racks, bike racks and litter receptacles at Center St. intersection* ▪ *Salvage and relocate existing roadway lighting w/ new footings, wire and conduit* ▪ *Basement vault and coal chute repair/filling where encountered* **Pedestrian alley improvements:** ▪ *Removable bollards at each end, pedestrian scale lighting, misc. visual quality improvements, and site furnishings* ▪ *Patching of alley pavement where needed* **Crosswalks:** ▪ *Colored concrete crosswalks at intersections of Center St. / Main St., 1st Ave. / Main St.*	**$4 Million**

PHASE	PROJECT DESCRIPTION	COST EST.
2B	**2B. Center Street: State St Intersection - Church St Intersection** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction 56' width (face to face), new curb and gutter* ▪ *Striping and signage for roadway* **Sidewalks:** ▪ *New concrete sidewalks both sides* ▪ *12" – 18" concrete band behind back of curb* **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb, ornamental railing (only on courthouse square blocks)* ▪ *Concrete unit pavers between street trees and landscape beds* ▪ *Intersection bumpouts landscape beds and concrete unit pavers at primary intersections* ▪ *Basement vault and coal chute repair/filling where encountered*	**$2 Million**
3A	**3A. Main Street: 3rd St - Center St** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction 49' width (face to face), new curb and gutter to accommodate AP1.1 Cross Section: angled parking on south side, parallel parking on north side* ▪ *Striping and signage for roadway* **Sidewalks:** ▪ *New concrete sidewalks both sides* ▪ *12" – 18" concrete band behind back of curb*	**$4 Million**

PHASE	PROJECT DESCRIPTION	COST EST.
3A	**3A. Main Street: 3rd St - Center St (continued)** **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb* ▪ *Concrete unit pavers between street trees and landscape beds* ▪ *Intersection bumpouts landscape beds and concrete unit pavers at primary intersections* ▪ *Gateway monument at 2nd St. / Main St. intersection* ▪ *Provide bike racks, bike racks and litter receptacles at intersection bumpouts and pedestrian alleys* ▪ *Salvage and relocate existing roadway lighting w/ new footings, wire and conduit* ▪ *Basement vault and coal chute repair/filling where encountered* **Pedestrian alley improvements:** ▪ *Removable bollards at each end, pedestrian scale lighting, misc. visual quality improvements, and site furnishings* ▪ *Patching of alley pavement where needed* **Crosswalks:** ▪ *Colored concrete crosswalks at intersections of 1st St. / Main St.*	
3B	**3B. Main Street: 3rd St - Center St (continued)** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction, width varies on 3rd St, 30' from Fremont St. to State St., 37' from State St. to Main St.* ▪ *New curb and gutter to accommodate* ▪ *Striping and signage for roadway* **Sidewalks:** ▪ *New concrete sidewalks both sides, 5' width*	**$45,000**

PHASE	PROJECT DESCRIPTION	COST EST.
4A	**4A. Church Street: 3rd St - 2nd Ave** **Mini Roundabout at Center St. Intersection** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction 49' width (face to face), new curb and gutter to accommodate AP1.1 cross section from Center St. to 1st Ave.: angled parking on south side, parallel parking on north side. Add bumpouts at every intersection with on-street parking* ▪ *Partial curb and gutter replacement remainder of Church St. and on Center St.* ▪ *49' width (face to face) from Center St. to 1st Ave., 45' width (face to face), 56' width (face to face) on Center St.* ▪ *Signage and striping for two-way traffic and revised parking configuration* **Sidewalks:** ▪ *New concrete sidewalks both sides* ▪ *12" – 18" concrete band behind back of curb on Church St. from Center St. to 1st Ave.* **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb, ornamental railing (only on courthouse square blocks) on Church St. from Center St. to 1st Ave.* ▪ *Concrete unit pavers between street trees and landscape beds* ▪ *Intersection bumpouts landscape beds and concrete unit pavers at primary intersections* ▪ *District marker at Center St. / Church St. and 1st Ave. intersections* ▪ *Sculptural accent lighting at Center St. and 1st Ave. intersections* ▪ *Provide bike racks, bike racks and litter receptacles at Center St. intersection* ▪ *Salvage and relocate existing roadway lighting w/ new footings, wire and conduit where curbs are moved* **Crosswalks:** ▪ *Colored concrete crosswalks at intersections of Center St. / Church St., 1st Ave. / Church St.*	**$5.5 Million**

PHASE	PROJECT DESCRIPTION	COST EST.
4B	**4B. Church Street: 2nd Ave - 3rd Ave, 3rd Ave - 8th Ave** **Roadway:** ▪ *Curb and gutter to remain in place* ▪ *Striping and signage for two-way traffic and on-street parallel parking* ▪ *Add all-way stop at 6th Ave. intersection* **Sidewalks:** ▪ *Partial sidewalk patching / replacement*	**$190,000**
4C	**4C. 3rd Ave Intersection** ▪ *Upgrade 3rd Ave traffic signal for two-way traffic on Church St.*	**$64,000**
5A	**5A. Linn Street: 1st St - Center St, 1st St: Main St - Linn St** **Mini Roundabout at Center St. Intersection** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction* ▪ *Partial curb and gutter replacement* ▪ *Signage and striping for two-way traffic* **Sidewalks:** ▪ *New concrete sidewalks both sides* **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb, ornamental railing (only on courthouse square blocks) on Church St. from Center St. to 1st Ave.* ▪ *Concrete unit pavers between street trees and landscape beds* ▪ *Landscape beds and concrete unit pavers at Center St. intersection* ▪ *Gateway monument at Center St. / Linn St. intersection* ▪ *Salvage and relocate existing roadway lighting w/ new footings, wire and conduit where curbs are moved*	**$2.8 Million**

PHASE	PROJECT DESCRIPTION	COST EST.
5B	**5B. Linn Street: 3rd Ave Traffic Signal, 3rd Ave - 4th Ave, 3rd St - 2nd St** ▪ *Upgrade 3rd Ave traffic signal for two-way traffic on Linn St.* **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction* ▪ *Partial curb and gutter replacement* ▪ *Signage and striping for two-way traffic* ▪ *Widen roadway from 3rd St to 2nd St to 30' width* ▪ *Widen roadway for 1/2 block from 3rd Ave to Post Office to accomodate bike lanes to 4th Ave* ▪ *Add bumpouts at 4th Ave intersection, make all way stop* **Sidewalks:** ▪ *Partial sidewalk patching / replacement*	**$1.2 Million**
5C	**5C. Linn Street: 2nd St - 1st St, 1st Ave - 2nd Ave, Post Office to 8th Ave** **Roadway & Utilities:** ▪ *Curb and gutter to remain in place* ▪ *Signage and striping for two-way traffic and on-street parallel parking* **Sidewalks:** ▪ *Partial sidewlak patching / replacement*	**$180,000**

PHASE	PROJECT DESCRIPTION	COST EST.
6	**6. 1st St from State St - Main St, 1st Ave from State St - Church St, 2nd Ave from Main St - Church St** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction* ▪ *Partial curb and gutter replacement* ▪ *Signage and striping* **Sidewalks:** ▪ *New concrete sidewalks both sides* **Amenities:** ▪ *Street trees w/ combination of tree grate, landscape beds, planter curb, ornamental railing (only on courthouse square blocks) on 1st Ave from Main St - Church St*	**$2.4 Million**
7	**7. 2nd St from Main St - Church St, Boone St from 1st St - Center St, Center St from Grant St - State St, Linn St from 2nd Ave - 3rd Ave** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction* ▪ *Partial curb and gutter replacement* ▪ *Signage and striping* **Sidewalks:** ▪ *New concrete sidewalks both sides*	**$3.3 Million**
8	**8. 2nd St from State St - Main St, 2nd Ave from Byron St - Main St** **Roadway & Utilities:** ▪ *Full utility replacement including: storm sewer, sanitary sewer and water main* ▪ *PCC roadway reconstruction* ▪ *Partial curb and gutter replacement* ▪ *Signage and striping* **Sidewalks:** ▪ *New concrete sidewalks both sides*	**$2 Million**

Research & Sources

- **2019 Marshalltown Downtown Master Plan.** *https://www.marshalltown-ia.gov/702/2019-Master-Plan*
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- **2018 INTERNATIONAL FIRECODE.** *https://codes.iccsafe.org/content/IFC2018*
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