



# 15th Street Corridor Improvements City of Cheyenne

August 24, 2022

**DRAFT**



STUDIOPLAATS





August 24th, 2022

Mr. Domenic Bravo  
President & CEO  
Visit Cheyenne Wyoming  
One Depot Square  
121 W. 15th Street, Suite 202  
Cheyenne, WY 82001

Re; 15th Street Corridor Improvements

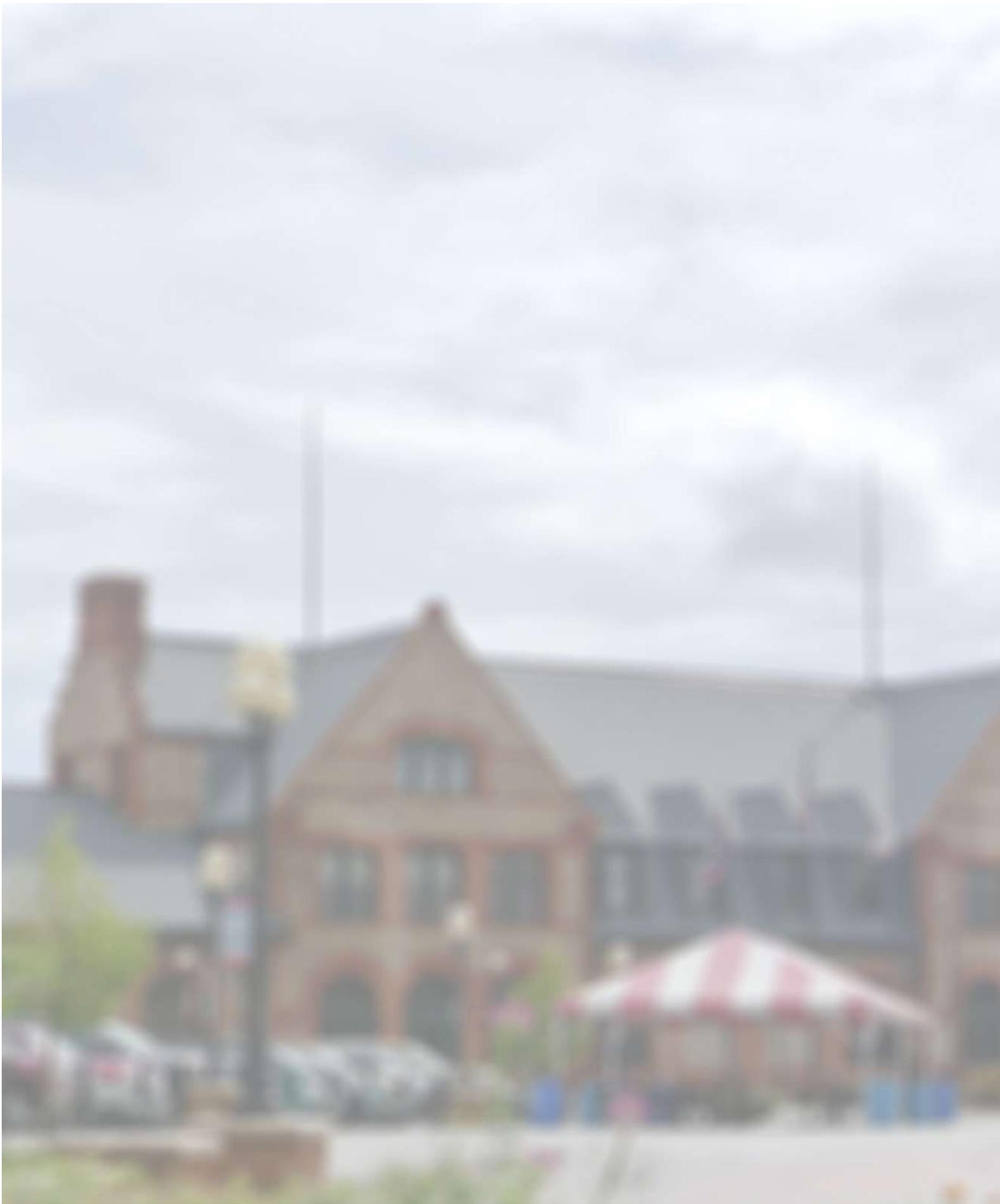
Dear Mr. Bravo,

This report has been prepared for the City of Cheyenne by Plan One/Architects in conjunction with Martin and Martin and StudioPlaats. This executive summary covers the efforts and concepts behind the 15th Street Corridor Improvements. For the purpose of this study, the 15th Street Corridor is the area between Bent Avenue and Capital Avenue along 15th Street.

It has been a pleasure working with your leadership group and staff. The following information shows a great level of enthusiasm and forward thinking by your organization, all geared towards providing opportunities for your community, both residents and tourists. We hope to see project implementation and experience the project soon.

Sincerely,

Britt Morgan, AIA, Vice President  
Plan One/Architects



# INDEX

---

**Executive Summary**

**1**

**Civil Narrative**

**2**

**Landscape Narrative**

**3**

**Architectural Narrative**

**4**

Precedent Studies

Phase 1A

Phase 1B

Phase 2

Roundhouse - Future Phases

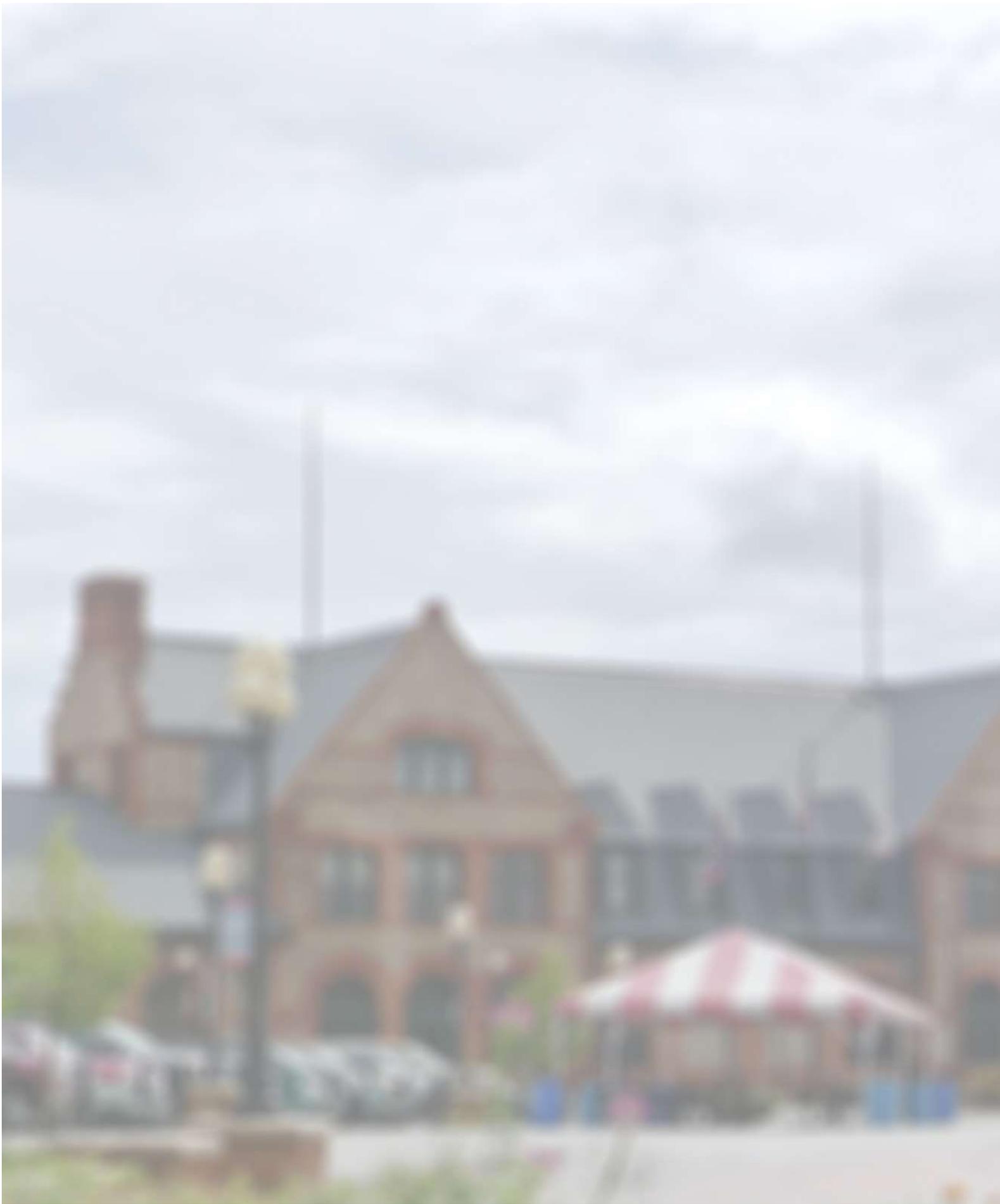
**Appendix**

**5**

Meeting Minutes

Traffic Report Study

Full Conceptual Imagery



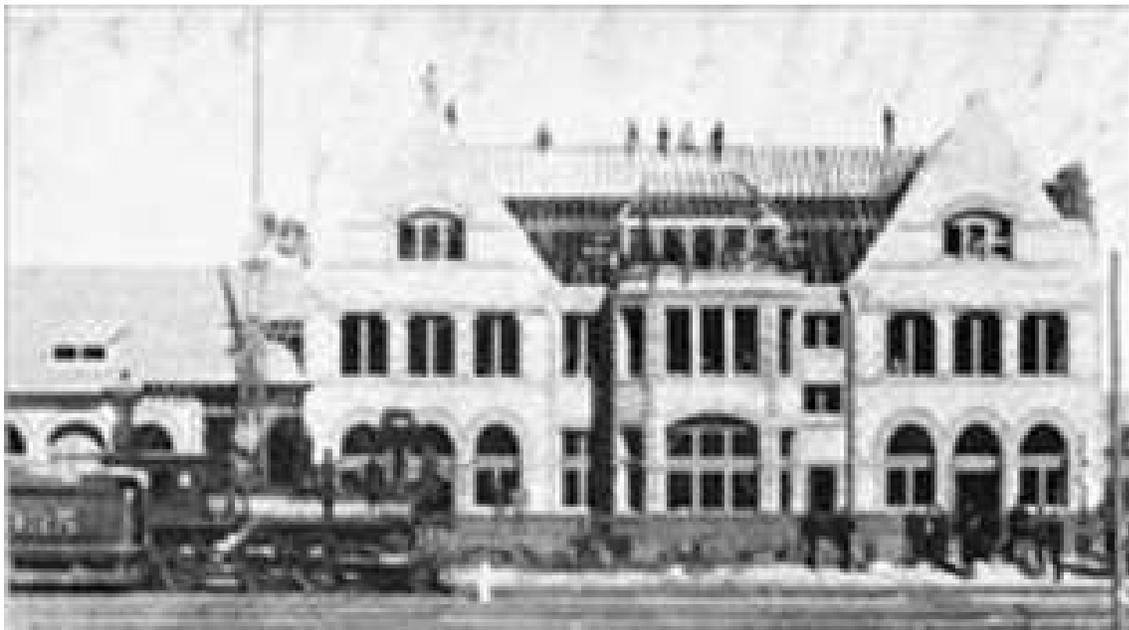


# Executive Summary

**History of the Railroad in Cheyenne:** Whether it was to be known as Crow Creek, Iron City, or the Magic City of the Prairie, Cheyenne’s history starts with the Union Pacific Railroad. General Grenville Dodge established the Union Pacific Railroad town site that we know as Cheyenne on July 4, 1867, and just five days later the “end-of-tracks town” had a population of nine. The settlement took off quickly with the first framed house erected on July 25th with construction of Fort D.A. Russel commencing soon after. By August 10th, Cheyenne’s population had grown to approximately 600 people.

The first tracks reached Cheyenne in November of 1867 at which time Cheyenne had an estimated population of 4,000 and 200 established businesses. Survival of an end-of-tracks town was not always guaranteed. Fortunately that was not the case with Cheyenne. Fort D.A. Russel and the construction of the Kansas Pacific Railroad’s expansion towards Denver helped establish Cheyenne as a permanent settlement.

As Cheyenne matured during the late 1800’s it developed into a cultural as well as economic hub. The railroad afforded residents of Cheyenne access to the latest news, fashion, furnishings, and entertainment from the East, which made it a unique addition to the otherwise Wild West. The Cheyenne Club, opened in 1880, and the opera house, constructed in 1882, were two of the notable social venues of their times.



*Historical Photograph of the Original Train Depot on 15th Street.*

**Benefits to the Community:**

The proposed 15th Street Corridor Improvements project is a means of honoring the rich history and growth the Union Pacific Railroad has afforded Cheyenne since its very beginnings. By looking to preserve that history in a manner that fits with our 21st Century lifestyle, we hope to embody the essence of what the railroad has meant to the City of Cheyenne throughout the years. It will become the 'Railroad Capitol' destination for railroad enthusiasts and community members alike. The project is intended to revitalize 15th Street by drawing the community and visitors to the area. With the expansion of the Greater Cheyenne Greenway and improved traffic flow, it will benefit the community and local businesses. The project will also provide better fencing between the active train yard and additional street lighting to improve the security of the area. With temporary closures between Carey Avenue and Capitol Avenue, it will support and expand the events throughout the year at the Depot. It will celebrate Cheyenne's Railroad Heritage with historically refurbished railcars and become an interactive experience.



*Aerial Image of 15th Street*

**Proximity, Location and Synergy:** 15th Street is the perfect location for positioning the refurbished rail cars. With its proximity to an active railyard which has approximately 80 trains per day, and historic Depot, it highlights the juxtaposition of the railways history and present. Part of the project includes a bridge over to the Roundhouse which provides a unique opportunity for visitor's to view an active railyard in an accessible and safe manner. This project will also provide synergy between the Reed Avenue and Historic West Edge Projects to create a cohesive downtown experience.



**Purpose of this Report:** In order to arrive at a conceptual plan for the improvements, a number of options were contemplated and evaluated. The street sections were evaluated to maximize parking, and provide optimal vehicle, pedestrian, and bike circulation. The team met with the community and business members to understand their concerns; and reviewed case studies of other communities that have integrated their railways or railcars into interactive experiences.

**Master Plan Documents and Adjacent Projects:** The City of Cheyenne has a number of exciting plans for the future and has developed a number of forward-thinking master plan documents which have been reviewed and integrated into this project.

### Reed Avenue Rail Corridor

**Master Plan:** The City of Cheyenne worked with the Cheyenne Metropolitan Planning Organization and consultants to develop the Reed Avenue Corridor Master Plan in April 2018. The plan looked at revitalizing the Reed Avenue Rail Corridor and removing barriers for redevelopment. Most recently, funding has been approved through the 6th Penny Tax for the proposed improvements along Reed Avenue.

### Cheyenne On-Street Bicycle Plan and Greenway Plan

**Update:** The City of Cheyenne worked with Alta Planning & Design and Environmental Planning Group to update the Greater Cheyenne Greenway Plan in 2012. The plan provides the Cheyenne area with projects, programs, and policies necessary to create a first-class on-street bicycling system. The 15th Street Corridor Improvements would expand the systems already in place.



*Concept image illustrating the Reed Avenue Corridor.*



**Traffic Study:** One of the critical aspects of the project was understanding the current traffic flow and use of 15th Street and the impact any changes might have. Sustainable Traffic Solutions, Inc. provided current traffic counts as well as projected traffic counts for the project. They reviewed two options for 15th Street including closing off a portion between Capitol Avenue and Carey Avenue. Option 1 would make 15th Street one-way eastbound from Bent Avenue to Carey Avenue. In Option 2, 15th Street from Pioneer Avenue to Carey Avenue would be one-way eastbound and 15th Street would be one-way westbound from Pioneer Avenue to Bent Avenue. The purpose of making 15th Street one-way was to maximize parking along 15th and integrating the greenway. STS recommends Option 1 be implemented to close 15th Street. The intersection operation is expected to be similar for both options, but Option 1 will cause less confusion for motorists. The Level of Service does not significantly change from the current operation. The full Traffic Study Report is included in Appendix XXX.

**Community Engagement:** To engage the community, Plan One held a public meeting to present the conceptual ideas of the feasibility study on May 11, 2022. For the two hours that we were there, we had about 40 people come in to discuss the project and review the presentation. On June 15, 2022, Plan One also met with different community members and business partners with a staked interest in the project. The main concern from both groups was parking and safety. The businesses wanted adequate parking for their employees and wanted to maintain semi-trailer parking in the area. They also wanted to increase visitation and maximize/protect the existing commerce along 15th Street. After the meeting, various members walked along 15th Street reviewing different ideas and opportunities. Some of the ideas that came out of the meeting included changing the alignment of the railcar plaza to encapsulate Gunslingers and limit the intrusion into the existing parking lot. Another idea was to have seasonal closure of 15th Street between Carey Avenue and Capital Avenue instead of permanently. The business owners also proposed changing the one-way to run eastbound instead of westbound. It was an amazing opportunity to have so many community members and City Staff together to review the project in person and have open discussions for the benefit of the project. Presentations are included in Appendix XXXX.



*3D Model of Entire Site - Showing Extent of 15th Street Improvements*

**Visitor and Community Enhancement:** One of the key ideas for the project is to incorporate refurbished railcars as part of the visitor experience along 15th Street. This will help create active spaces that people will visit and gather. Right now, 15th Street is full of static spaces like parking lots that people move through, but do not interact with. With the proposed changes to 15th Street, we will create safe places for pedestrians, bicyclists and vehicular traffic that people will want to utilize.

**Phase 1A:** Nearest to the Depot and the Museum, the railcars would be historically restored to provide the visitor with a historic perspective of the trains that were active through Cheyenne. The goal is to have an engine as part of this experience, whether it is the Big Boy, or the engine from the Botanic Gardens. There would be a viewing platform to access the trains for the public. This phase would also include improvements to 15th Street like street lighting, and new fence along the rail yard.

**Phase 1B:** Further down, a plaza would be created that would house additional train cars that could be leased for businesses. The plaza is integrated with Gunslingers and the plan would also include a central restroom building. The plaza is a multi-use destination for community engagement and socialization. It activates the area for people to gather and interact with the space. While parking lots are necessary, creating buffer zones with landscaping, fencing, and pathways create a more pleasant environment to gather and traverse.

**Phase 1C:** Additional railcars to be added for additional leasable area. These could be community spaces, rental lodging, whiskey tasting rooms, the possibilities are endless. These areas create a safe buffer and an aesthetic buffer between the street, pathways and parking.



*Concept Image of Phase 1A: Main Engine with Elevated Boardwalk.*



*Concept Image of Phase 1B: Multiple Traincars in "Horseshoe" Pattern Creating an Outdoor Plaza.*



*Aerial Image of the Edge of Phase 1B with the Opportunity for more Outdoor Plaza*

**Phase 2:** Provide a pedestrian overpass and viewing platform from the Depot to the Roundhouse. Provide glass for viewing and benches for sitting. This overpass provides an opportunity for the public to safely view and active railyard.



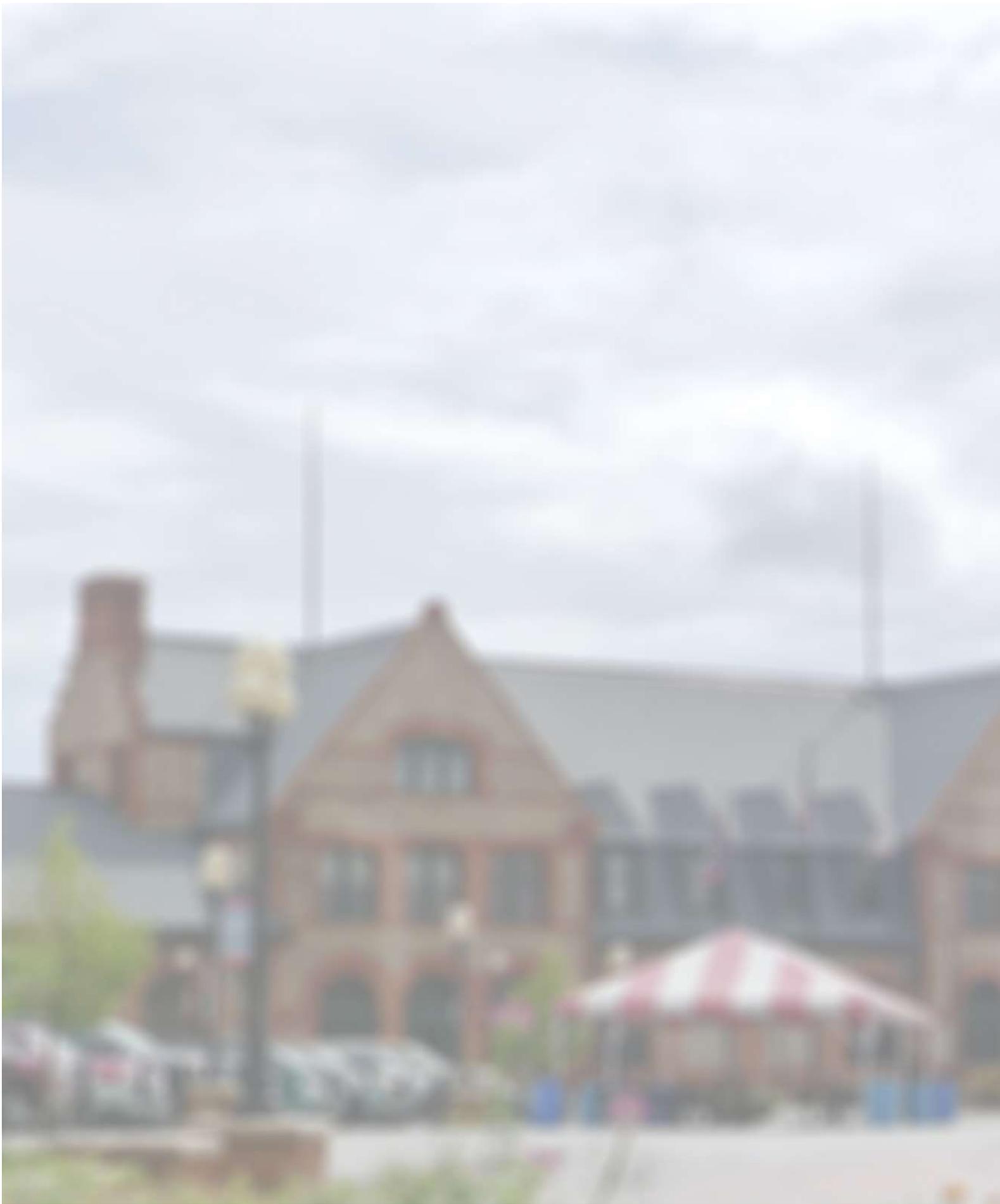
*Image to the Left: Concept image illustrating a new covered bridge that could lead to the existing round house.*

*Image to the Right: This interior concept of the covered walkway would have multiple viewing points with glazing to look out above over the active railway.*



**Buildable Area:** One of the goals of the project is to maintain the current flow line of the south curb along 15th Street. This limits our 'buildable area.' The train cars will need to be installed south of this line. This also limits the street section for the project. In the right-of-way, the goal is to accommodate one-lane traffic, diagonal parking, fire truck access, and the greenway.

**Vehicular Circulation & Parking:** The City is in negotiations with Union Pacific to purchase the property between Bent Avenue and O Neil Avenue for additional parking.





## Civil Narrative

**General:** 15th Street is located south of downtown Cheyenne, just north of the Union Pacific Railroad railyard. The project includes the redevelopment of City Property situated between 15th street and the rail yard fence. The development will extend from the intersection of 15th Street and Bent Avenue and the existing Depot near the intersection of 15th Street and Capitol Avenue. The proposed development includes the installation of several rail car static displays and additional rail cars that are intended to be used for lodging, retail, and food sales.

**Domestic Water:** The Cheyenne Board of Public Utilities is the domestic water service provider to the site. There is an existing water meter near the Gunslingers facility and fire hydrants located along the length of 15th Street at each block. There is a 12-inch Ductile Iron Pipe in 15th Street from Bent to Capital with several laterals down the cross streets. Domestic water demands for the proposed development would be limited to the rail cars designated to be used for lodging or retail. Minor irrigation demands are also anticipated. It is assumed that there is sufficient capacity for the proposed development within 15th Street.

Connections to the existing water system will require review by the Cheyenne Board of Public Utilities and a permit to Construct. All new facilities will be equipped with backflow preventers per Wyoming Department of Environmental Quality Rules and Regulations.

Fire flows are anticipated and will need to be calculated based on the construction type of the rail cars. Building fire service lines are required to be a separate connection to water mains. There are enough fire hydrants along 15th Street to provide overall site coverage and new hydrants are not anticipated.

The City of Cheyenne requires that the site plan be reviewed and signed by the Fire Department, verifying the required fire flow and locations of fire hydrants, building fire line, and fire department connection. Construction plans for water mains, domestic taps, fire lines, water meters, and fire hydrants are submitted to the City of Cheyenne during the Engineering Plan Review Process.

**Sanitary Sewer:** The Cheyenne Board of Public Utilities is the agency that accepts sanitary sewerage from the College. Existing sanitary sewer infrastructure in 15th Street includes a 12-inch Vitrified Clay Pipe (VCP) from Thomes Avenue to Pioneer Avenue and a 14-inch VCP main from Capitol Avenue to Pioneer Avenue. At the intersection of 15th Street and Pioneer Avenue, wastewater is conveyed southeast under the Union Pacific Railroad railyard. As the proposed wastewater demands are anticipated to be minimal, there appears to be sufficient capacity in the existing sanitary sewer system for the proposed development.

Sanitary sewer service lines are anticipated for all rail cars intended to be used for lodging, retail, or food sales. Cars with food prep or kitchenettes will be routed through a grease interceptor prior to discharging into the sanitary sewer main.

**Storm Sewer:** There is existing storm sewer along the length of 15th Street. Currently, 15th street has a cross slope, from south to north, such that all runoff is conveyed to the northern curb line and routed to various curb inlets. According to the Laramie County Floodplain maps, the project area does not currently lie in a FEMA of City floodplain or floodway. It is anticipated that the majority of the proposed project area can be drainage via sheet flow from the south to the north and directly into 15th Street. For isolated pockets, area drains and small storm sewers may be utilized to prevent ponding.

If future imperviousness is maintained to a level equal to, or less than the current site imperviousness, then detention will not be required. However, it is the desire of the City Engineering department to provide Low Impact Development (LID) features where practical. Anticipated LID features include; bioswales, bioretention, sand filters, and proprietary systems (Stormceptor™, Filterra™, and EcoPure BioFilters™).

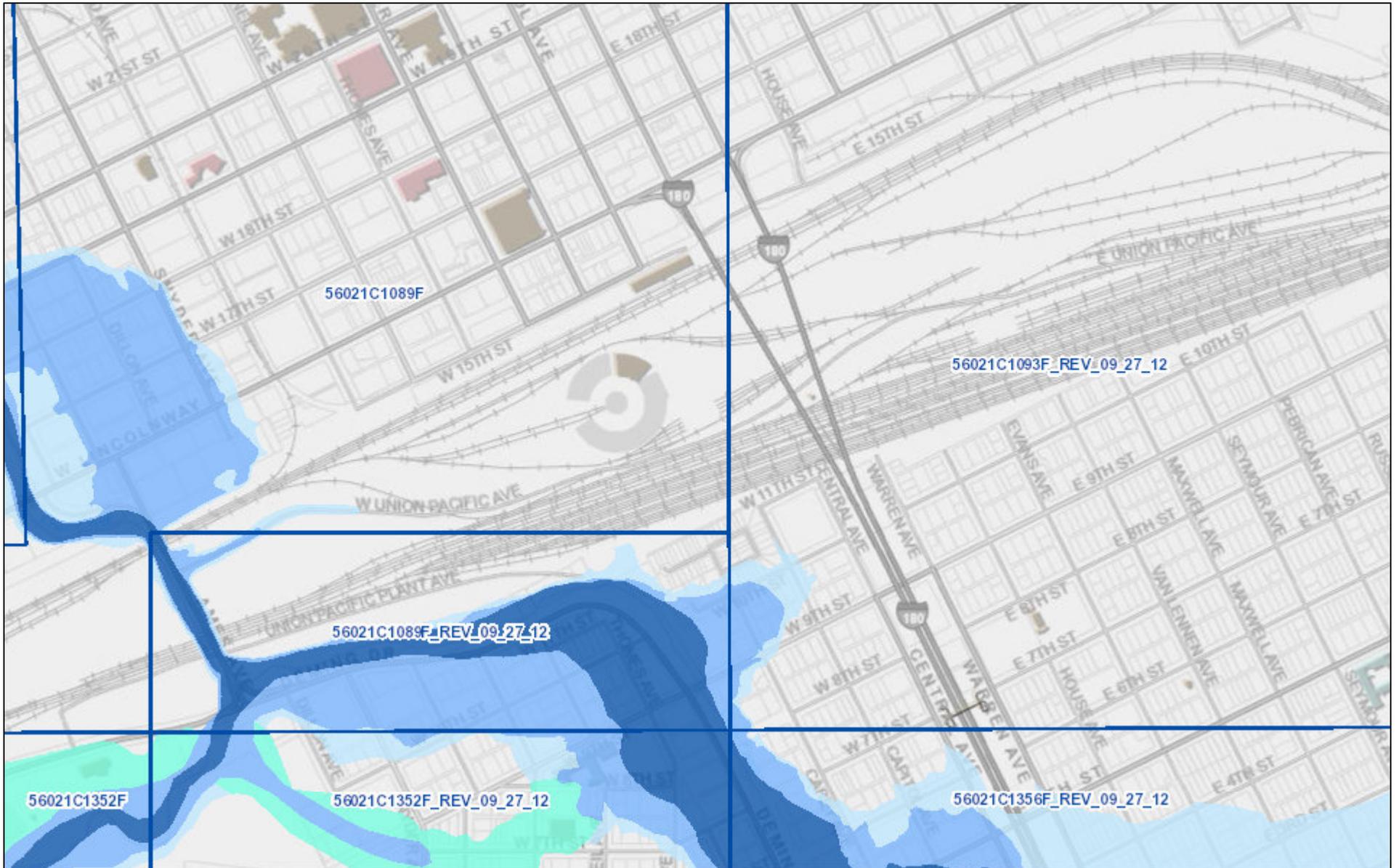
**Site Grading:** Currently, the site is generally flat. This will facilitate the development of accessible plazas and courtyards, however, may present drainage challenges. This can be overcome by additional area drains and local depressions. Plazas and turning areas should be maximum of 2% slope in any direction while paths should have a maximum slope of 5% with a cross slope no more than 2%.

**Site Layout and Circulation (Parking):** Landscape Architect and Architect to provide input on

**Roadways:** Minimal improvements are anticipated within 15th Street beyond restriping and adjustment to existing parking lanes and drive lanes. It is expected that the road will be converted to a one-way drive with on-street diagonal parking similar to adjacent roads. Additional improvements may be along the southern curb line and sidewalk for pedestrian improvements as well as patching within the street for new utility connections.

**Railroad Car Foundations:** Standard rails/ties will be utilized for the foundations for all rail cars. These designs should be based on standard railroad details and dimensions but not specifically designed for operating trains

# Laramie County Floodplain Map



8/17/2022



**Weather Stations**

-  USGS Streamflow
-  NRCS SnoTel



NWS Coop



Web Cameras



FEMA Firm Panel Index

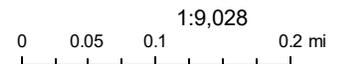
**Special Flood Hazard Areas**

-  FEMA FLOODWAY
-  FEMA 100YR FLOODPLAIN

-  FEMA 500YR FLOODPLAIN
-  CITY/CNTY 100YR FLOODPLAIN

**Current Warnings**

-  Flash Flood Warning
-  Special Marine Warning
-  Severe Thunderstorm Warning
-  Tornado Warning



Cheyenne and Laramie County GIS Cooperative



**LEGEND**

- △ CONTROL POINT
- FOUND 1½" ALUMINUM CAP PLS 5910
- FOUND 1½" ALUMINUM CAP LS 3881
- ◆ FOUND NAIL
- ⊗ FOUND CHISELED "X"

**TOPOGRAPHIC SURVEY FOR 15TH STREET**

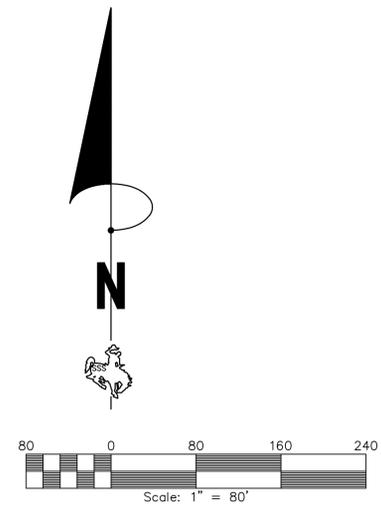
SITUATED IN LOT 1, BLOCK 1,  
DEPOT CENTER ADDITION  
and ORIGINAL CITY,  
CITY OF CHEYENNE,  
LARAMIE COUNTY, WYOMING

PREPARED April, 2022

**CERTIFICATE OF SURVEYOR**

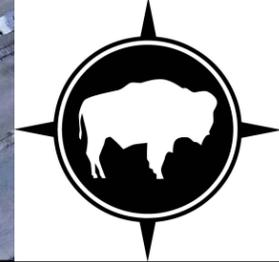
I, Jeffrey B. Jones, A Professional Land Surveyor in the State of Wyoming, for and on behalf of Steil Surveying Services, LLC, hereby state, to the best of my knowledge, information and belief, that this map was prepared from field notes taken during an actual survey made by me or under my direct supervision; and that this map correctly shows the results of said survey and that the monuments found or set are as shown.

BASIS OF BEARINGS:  
WYOMING STATE PLANE COORDINATES,  
EAST ZONE, NAD83-2011,  
US SURVEY FEET, DISTANCES ARE GRID  
DISTANCES.  
IMAGE AND ELEVATIONS ACQUIRED WITH  
USE OF UAV (DRONE). EXPECTED  
ACCURACY IS +/- 1/8" CONTOUR  
INTERVAL AT 1 SIGMA.

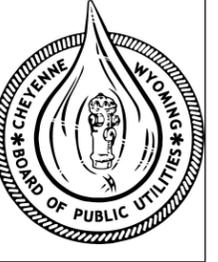


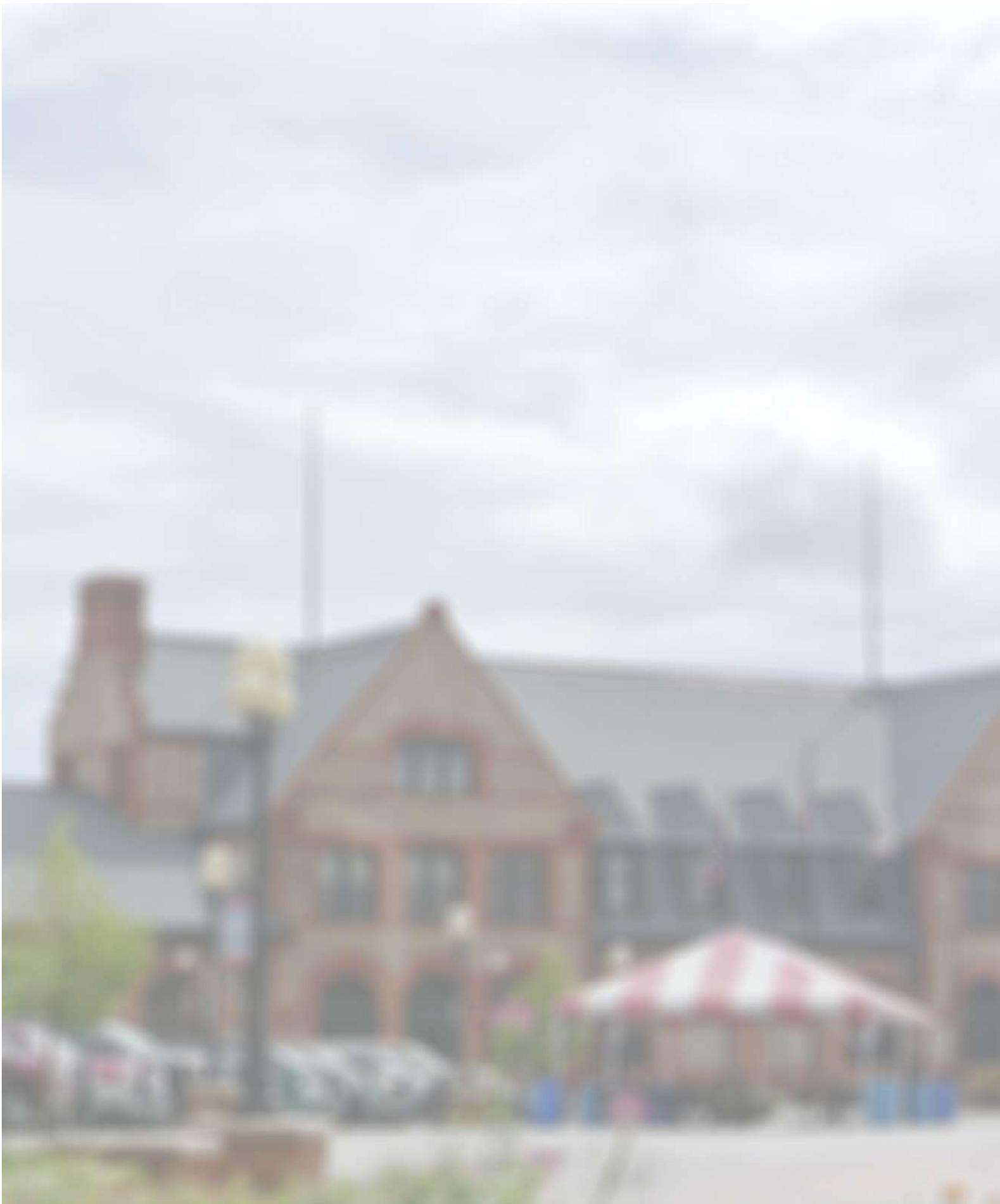
**STEIL SURVEYING SERVICES, LLC**  
PROFESSIONAL LAND SURVEYORS  
PLANNING & DEVELOPMENT SPECIALISTS  
1102 WEST 19th ST. CHEYENNE, WY. 82001 ◦ (307) 634-7273  
756 GILCHRIST ST. WHEATLAND, WY. 82201 ◦ (307) 322-9789  
www.SteilSurvey.com ◦ info@SteilSurvey.com

# 15th Street - Bent to Capitol



THIS MAP IS MADE POSSIBLE THROUGH THE CHEYENNE AND LARAMIE COUNTY GIS COOPERATIVE (CLCGISC) AND IS FOR DISPLAY PURPOSES ONLY. THE CLCGISC INVOKES ITS SOVEREIGN AND GOVERNMENTAL IMMUNITY IN ALLOWING ACCESS TO OR USE OF THIS DATA. MAKES NO WARRANTIES AS TO THE VALIDITY, AND ASSUMES NO LIABILITY ASSOCIATED WITH THE USE OR MISUSE OF THIS INFORMATION.







## Landscape Narrative

## 1.6. Cycle Tracks

### Design Summary

A cycle track is an exclusive bicycle facility that combines the user experience of a separated path with the on-street infrastructure of a conventional bike lane. Recommended cycle track width:

- 7-foot minimum to allow passing.

### Discussion

Cycle tracks provide space that is intended to be exclusively or primarily for bicycles, and are separated from vehicle travel lanes, parking lanes and sidewalks. Cycle tracks can be either one-way or two-way, on one or both sides of a street, and are separated from vehicles and pedestrians by pavement markings or coloring, bollards, curbs/medians or a combination of these elements.

Cycle tracks provide:

- Increased comfort for bicyclists.
- Greater clarity about expected behavior.
- Fewer conflicts between bicycles and parked cars as cyclists ride inside the parking lane.
- Space to reduce the danger of ‘car dooring.’

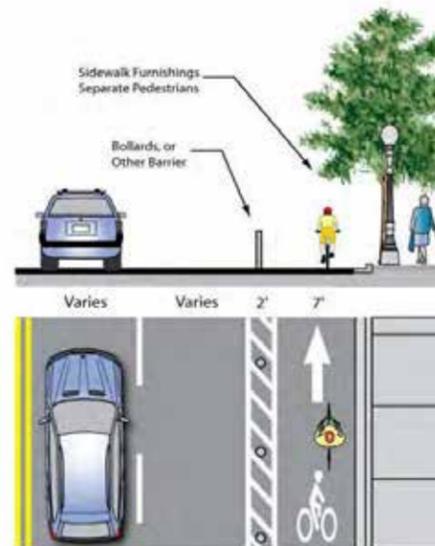
Danish research has shown that cycle tracks can increase bicycle ridership 18-20%, compared with the 5-7% increase associated with bike lanes.

However, disadvantages of cycle tracks include:

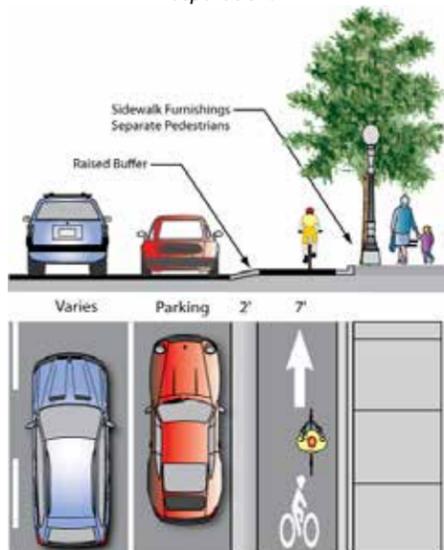
- Increased vulnerability at intersections. Greater design emphasis is required to provide sufficient sight lines at intersections and for the treatment of pedestrian crossings of the cycle track.
- Regular street sweeping trucks and snow removal vehicles cannot maintain the cycle track; requires smaller sweepers.
- Conflicts with pedestrians and bus passengers can occur, particularly on cycle tracks that are un-differentiated from the sidewalk or that are between the sidewalk and a transit stop.

Cycle tracks should be placed along slower speed urban/suburban streets with long blocks and few driveways or mid-block access points for vehicles. Cycle tracks located on one-way streets will have fewer potential conflicts than those on two-way streets. A two-way cycle track is desirable when there are more destinations on one side of a street or if the cycle track will connect to a shared-use path or bicycle facility on one side of the street.

### Guidance



*Recommended cycle track design without parking, using striping and flexible bollard separation.*



*Recommended cycle track design with on-street parking.*

## 1.4.1. Guidelines for Bike Lanes

### Buffered Bike Lanes

### Design Summary

Guidelines for buffer width varies:

- 2.6 feet (London and Brussels).
- 1.6-2.5 feet (CROW Guide).

### Discussion

Bike lanes on high-volume or high-speed roadways can be uncomfortable for cyclists, as automobiles pass or are parked too close to bicyclists. Buffered bike lanes are designed to increase the space between the bike lanes and the travel lane or parked cars.

This treatment is appropriate on roadways with higher automobile volumes and speeds, bike lanes adjacent to parked cars, and roadways with a high volume of truck or oversized vehicle traffic. Frequency of right turns by motor vehicles at major intersections should determine whether continuous or truncated buffer striping should be used approaching the intersection.

Advantages of buffered bike lanes:

- Provides cushion of space to mitigate friction with motor vehicles on streets with narrow bike lanes.
- Provides space for cyclists to pass one another without encroaching into the travel lane.
- Provides space for cyclists to avoid potential obstacles in the bike lanes, including drainage inlets, manholes, trash cans or debris.
- Parking side buffer provides cyclists with space to avoid the ‘door zone’ of parked cars.
- Provides motorists greater shy distances from cyclists in the bike lane.

Disadvantages / potential hazards

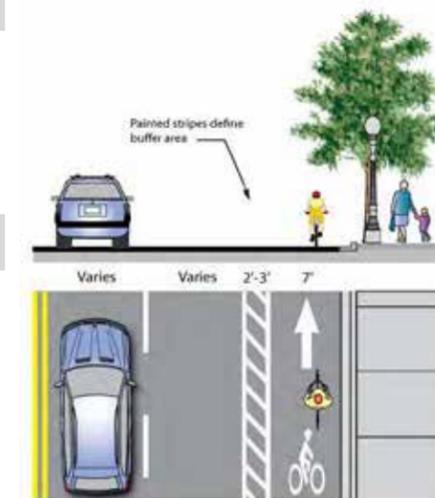
- Requires additional roadway space.
- Requires additional maintenance for the buffer striping.
- Frequency of parking turnover should be considered prior to installing buffered bike lanes.

### Guidance

The City of Portland, Oregon included this treatment in the Bikeway Design Best Practices for the Bicycle Master Plan for 2030. Buffered bike lanes are currently used in many locations including Seattle, Washington; San Francisco, California; Ft Collins, Colorado and New York, New York.

See also:

- NACTO. 2010. *Urban Bikeway Design Guide*.



*Recommended buffered bike lane design.*



*Buffered bike lanes protect cyclists from fast-moving traffic*

### 3.1. Off-Street Facility Design

#### Design Summary

##### Width:

- 10-foot is the minimum width for a two-way shared-use path and is only recommended for low traffic situations. Most existing greenways in Cheyenne are 10' wide.
- 12-foot or greater width is recommended for high-use areas, or in situations with high concentrations of multiple users such as joggers, bicyclists, rollerbladers and pedestrians.

##### Lateral Clearance:

- A two-foot or wider shoulder on both sides.

##### Overhead Clearance:

- Clearance to overhead obstructions should be 8 feet minimum, with 10 feet recommended.

##### Design Speed:

- The maximum design speed for bike paths is 20 miles per hour. Speed bumps or other surface irregularities should not be used to slow bicycles. Cheyenne's bike path network currently does not have a posted speed limit, but this information is included on the Greenways and Trails Map.

##### Grade:

- The recommended maximum gradient is 5%. Steeper grades can be tolerated for short distances (500 feet max).

#### Discussion

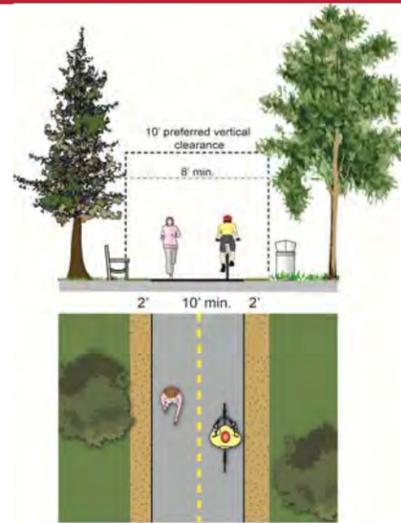
A hard surface should be used for multi-use trails. Concrete, while more expensive than asphalt, is the hardest of all trail surfaces and lasts the longest. However, joggers and runners prefer surfaces such as asphalt or decomposed granite due to its relative softness. While most asphalt is black, dyes (such as reddish pigments) can be added to increase the aesthetic value of the trail itself. A soft shoulder adjacent to a hard surface trail can accommodate several different user types.

When concrete is used, the trail should be designed and built using the narrowest possible expansion joints to minimize the disturbance to wheeled users on the trail.

#### Guidance

See also:

- U.S. Access Board, 2007. *Public Rights-of-Way Accessibility Guidelines (PROWAG)*.
- FHWA. 2001. *Designing Sidewalks and Trails for Access*.
- City of Cheyenne. 2009. *Parks and Recreation Design Standards – Appendix C: Trail and Greenway Information*



Recommended shared-use path design.



Cheyenne's greenway facilities have sufficient width to accommodate a variety of users.

### 1.6.3. Two-Way Cycle Tracks

#### Design Summary

- 12-foot minimum to allow passing, 14-foot recommended.
- Striped center line to separate bi-directional traffic.
- Pavement markings should indicate direction.

#### Discussion

A two-way cycle track is desirable when more destinations are on one side of a street (therefore preventing additional crossings), if the facility connects to a path or other bicycle facility on one side of the street, or if there is not enough room for a cycle track on both sides of the road.

Bi-directional cycle tracks are acceptable in the following situations:

- On a street with few intersections or without access on one side (e.g., along a waterway or rail line).
- On a one-way street with fewer than one intersection every 100 feet.
- On two-way streets where left-hand turns are prohibited, and with a limited number of intersections and driveway entrances.

Two-way cycle tracks have many similar design characteristics as one-way tracks; they are physically separated from cars and pedestrians, and require similar amenities at driveway and side-street crossings.

Two-way cycle tracks require a higher level of control at intersections to allow for a variety of turning movements. These movements should be guided by a separated signal for bicycles and for motor vehicles. Transitions onto bi-directional cycle tracks should be simple and easy to use, to deter bicyclists from continuing to ride against the flow of traffic.

However, two-way facilities can present unique challenges because drivers will not be expecting multi-directional bicycle traffic and bicyclists riding against roadway traffic may surprise pedestrians and drivers at intersections.

#### Guidance

- Alta Planning + Design, 2009. *Cycle Tracks: Lessons Learned*.
- CROW. 2006. *Record 25: Design Manual for Bicycle Traffic*.
- Vélo Québec. 2003. *Technical Handbook of Bikeway Design*.



Two-way cycle track with dividing line.



Directional markings on cycle track.



Pavement markings indicate travel direction at a minor roadway crossing on this cycle track in Paris, France.

## 1.6.2. Cycle Track Separation

### Discussion

#### Parking Placement:

Where on-street parking exists, the cycle track should be placed between the parking and the sidewalk. The cycle track should be placed with a 2-foot buffer between parking and the sidewalk to minimize the hazard of 'dooring' cyclists. Drainage inlets should be provided adjacent to the sidewalk curb to facilitate run-off. This technique is common in Copenhagen.

#### Channelization:

Cycle tracks can be at street-level, provided that there is a physical separation between cyclists and motor vehicles. The curb creates the separated space, as well as preventing passengers from opening doors into the cycle track and discouraging pedestrians from walking on the facility.

#### Mountable Curb:

Cycle tracks can be grade-separated from the roadway. The cycle track should be two or three inches above street-level, and the sidewalk should be an additional two to three inches above that. Where cyclists may enter or leave the cycle track, or where motorists cross at a driveway, the curb should be mountable with a small ramp, allowing cyclist turning movements.

#### Bollards and Pavement Markings:

In addition to grade separation or channelization, the cycle track should have signage, pavement markings and/or different coloration or texture, to indicate that the facility is provided for bicycle use. Signage, in addition to flexible bollards, can add to the physical separation of the facility, shown in this example from New York, New York.



Cycle track with a parking buffer, Copenhagen.



Cycle track with curb separation, Amsterdam.



Mountable curb, Copenhagen.



Cycle track with bollard separation, New York City.

### Guidance

A buffer is not required of a cycle track wider than seven feet, but is recommended where possible. The CROW *Design Manual for Bicycle Traffic* recommends that the buffer area inside built-up areas should be a minimum of 1.1 feet. If the buffer is a fence or other taller obstacle, a minimum of two feet shy distance is recommended on either side.

## 2.5. Colored Bike Lanes

### Design Summary

- Use colored pavement through entire merge area.
- Dashed lines can be used to indicate that automobiles are crossing the bike lane.
- Signage reminds drivers to yield to cyclists in the bike lane.

### Discussion

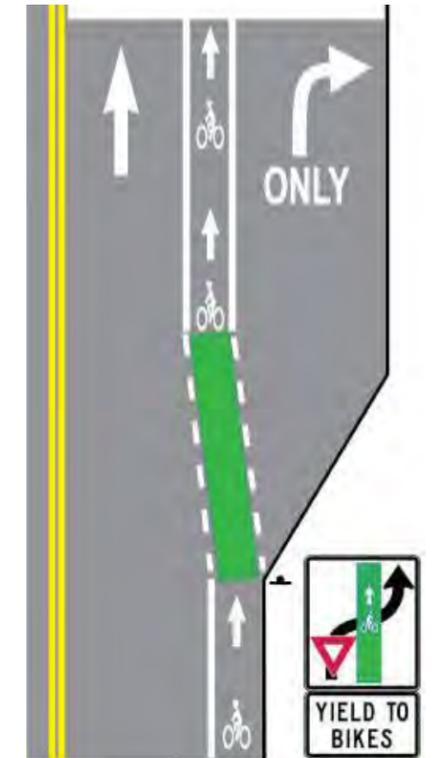
Cyclists are especially vulnerable at locations where the volume of conflicting vehicle traffic is high, and where the vehicle/bicycle conflict area is long. Some cities are using colored bike lanes to guide cyclists through major vehicle/bicycle conflict points. These conflict areas are locations where motorists and cyclists must cross each other's path (e.g., at intersections or merge areas). Colored bike lanes typically extend through the entire bicycle/vehicle conflict zone (e.g., through the entire intersection, or through the transition zone where motorists cross a bike lane to enter a dedicated right turn lane.

Advantages of colored bike lanes at conflict points:

- Draws attention to conflict areas
- Increases motorist yielding behavior
- Emphasizes expectation of bicyclists on the road

### Guidance

Colored bike lanes are successfully used in many cities, including Portland, OR, Philadelphia, PA, Cambridge, MA, Toronto, Ontario, Vancouver, BC and Tempe, AZ. This treatment typically includes signage alerting motorists of vehicle/bicycle conflict points. Green bike lanes were granted interim approval for optional use by the FHWA in April 2011 and will be included in future editions of the MUTCD.



Recommended colored bike box design.



Portland, Oregon has implemented green bike lanes, which are used to highlight potential motor vehicle/bicycle conflict areas.

### 3.1.4. Trails Along Roadways

#### Design Summary

Where a shared-use path must be adjacent to a roadway, a five-foot minimum buffer should separate the path from the edge of the roadway, or a physical barrier of sufficient height should be installed.

Shared use paths may be considered along roadways under the following conditions:

- The path will generally be separated from all motor vehicle traffic.
- Bicycle and pedestrian use is anticipated to be high.
- To provide continuity with an existing path through a roadway corridor.
- The path can be terminated at each end onto streets or trails with good bicycle and pedestrian facilities.
- There is adequate access to local cross-streets and other facilities along the route.
- Any needed grade separation structures do not add substantial out-of-direction travel.



Trails directly adjacent to roadways can enhance cyclist safety and comfort.

#### Discussion

Concerns about shared use paths directly adjacent to roadways (e.g., with minimal or no separation) include:

- Half of bicycle traffic may ride against the flow of vehicle traffic, contrary to the rules of the road.
- When the path ends, cyclists riding against traffic tend to continue to travel on the wrong side of the street, as do cyclists who are accessing the path. Wrong-way bicycle travel is a major cause of crashes.
- At intersections, motorists crossing the path often do not notice bicyclists approaching from certain directions, especially where sight distances are poor.
- Bicyclists are required to stop or yield at cross-streets and driveways, unless otherwise posted. Based on the operating principles of bicycles, the use of yield conditions should be utilized where possible to improve compliance with traffic control devices.
- Stopped vehicles on a cross-street or driveway may block the path.
- Because of the closeness of vehicle traffic to opposing bicycle traffic, barriers are often necessary to separate motorists from cyclists. These barriers serve as obstructions, complicate facility maintenance and waste available right-of-way.
- Paths directly adjacent to high-volume roadways diminish users' experience by placing them in an uncomfortable environment.
- As bicyclists gain experience and realize some of the advantages of riding on the roadway, some riders stop using paths adjacent to roadways. Bicyclists may also tend to prefer the roadway as pedestrian traffic on the shared use path increases due to its location next to a roadway. When designing a bikeway network, the presence of a nearby or parallel path should not be used as a reason to not provide adequate shoulder or bike lane width on the roadway, as the on-street bicycle facility will generally be superior to the "sidepath" for experienced cyclists and those who are cycling for transportation purposes. Bike lanes should be provided as an alternate (more transportation-oriented) facility whenever possible.

#### Guidance

See also:

- AASHTO 1999. *Guide for the Development of Bicycle Facilities*.

### 1.4.2. Guidelines for Bike Lanes

#### Contraflow Bike Lane

#### Design Summary

- The contraflow lane should be 5.0 feet to 6.5 feet and marked with a solid double yellow line and appropriate signage.
- Bike lane markings should be clearly visible to ensure that the contraflow lane is exclusively for bicycles.
- Coloration should be considered on the bike lane.

#### Discussion

Contraflow bike lanes provide bi-directional bicycle access along a roadway that is one-way for automobile traffic. This treatment can provide direct access and connectivity for bicyclists, avoiding detours and reducing travel distances for cyclists.

Advantages of contraflow bike lanes:

- Provides direct access and connectivity for bicycles traveling in both directions.
- Influences motorist choice of routes without limiting bicycle traffic.
- Cyclists do not have to make detours as a result of one-way traffic.

Disadvantages / potential hazards:

- Contraflow lanes violate driver expectancy and may require additional traffic controls/signage to minimize potential conflict
- Space requirements may require reallocation of roadway space from parking or travel lanes. Parking should not be provided on the curb side of the contraflow bike lane.
- The lane could be illegally used by motorists for loading or parking.
- Conversion from a two-way street requires elimination of one direction of automobile traffic
- Public outreach should be conducted prior to implementation of this treatment.

#### Guidance

This treatment is a federally-recognized design standard, and present in some state department of transportation manuals, such as the *Wisconsin Bicycle Facility Design Handbook*.

The City of Portland, OR included this treatment in the Bikeway Design Best Practices for the *Portland Bicycle Plan for 2030*. Contraflow bike lanes are currently used in Olympia and Seattle, Washington as well as Madison, Wisconsin; Cambridge, Massachusetts; San Francisco, California; and Portland, Oregon.



Recommended contraflow bike lane design.

## 1.5. Bicycle Boulevards

### Design Summary

- Roadway width varies depending on roadway configuration.
- Use MUTCD D11-1 “Bike Route” sign as specified for shared roadways.
- Shared lane markings may be applied.
- Intersection treatments, traffic calming, and traffic diversions can be utilized to improve the cycling environment, as recommended in the following pages.

### Discussion

Treatments for bicycle boulevards include five “application levels” based on their level of physical intensity, with Level 1 representing the least physically-intensive treatments that could be implemented at relatively low cost. Identifying appropriate application levels for individual bicycle boulevards typically requires engineering review and community consultation to determine the desired roadway function within the context of the roadway network.

Traffic calming and other treatments along the corridor reduce vehicle speeds so that motorists and bicyclists generally travel at the same speed, creating a more comfortable environment for all users. Bicycle boulevards incorporate treatments to facilitate convenient crossings where the route crosses a major street. They work best in well-connected street grids where riders can follow reasonably direct and logical routes and when higher-order parallel streets exist to serve through vehicle traffic.

Bicycle boulevards/bike routes can be treated with shared lane markings, directional signage, traffic diverters, chicanes, chokers, and /or other traffic calming devices to reduce vehicle speeds or volumes.

Bicycle boulevards can employ a variety of treatments from signage to traffic calming and pavement stencils. The level of treatment provided at a specific location depends on several factors, which are discussed in greater detail in this section.



Recommended design for bike routes/ bicycle boulevards.



Bicycle boulevards are low-speed streets that provide a comfortable and pleasant experience for cyclists.

## 1.4.1. Guidelines for Bike Lanes

### Bike Lane Without On-Street Parking

#### Design Summary

##### Bike Lane Width:

- Four-foot minimum when no curb and gutter is present.
- Five-foot minimum when adjacent to curb and gutter.

##### Recommended Width:

- Six-feet where right-of-way allows.

##### Maximum Width:

- Eight-feet adjacent to arterials with high travel speeds (45 mph+).



Recommend bike lane without on-street parking design.

#### Discussion

Wider bike lanes are desirable in certain circumstances such as on higher speed arterials (40 mph+) where a wider bike lane can increase separation between passing vehicles and cyclists. Wide bike lanes are also appropriate in areas with high bicycle use. A bike lane width of six to eight feet makes it possible for bicyclists to pass each other without leaving the bike lane. Appropriate signing and stenciling is important with wide bike lanes to ensure motorists do not mistake the lane for a vehicle lane or parking lane.

# ARTICLE 6 DESIGN REGULATIONS

## 6.2 PARKING, LOT ACCESS AND CIRCULATION

- (b) All parking areas shall have an 8' perimeter buffer used to screen the area from adjacent residential uses.
- (c) Individual parking blocks shall be no larger than 50 spaces for any one use.

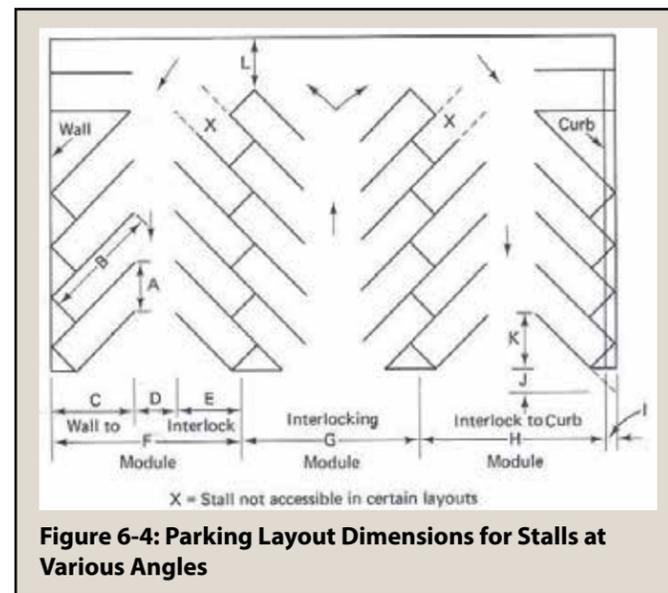
5. *Exceptions.* The Director may approve exceptions to these design and location standards for lots under 10 spaces where:
- (a) It is reasonably necessary to accommodate infill development;
  - (b) There has been no recent investment and is no anticipated investment in the public streetscape that will be negatively impacted by the proposed alternative location and design; and
  - (c) The exception presents the least deviation from the standards necessary, and otherwise furthers the design objectives of this section.

b. **Dimensional Requirements.**

**TABLE 6-6: PARKING STALL DIMENSIONS AND LAYOUT**

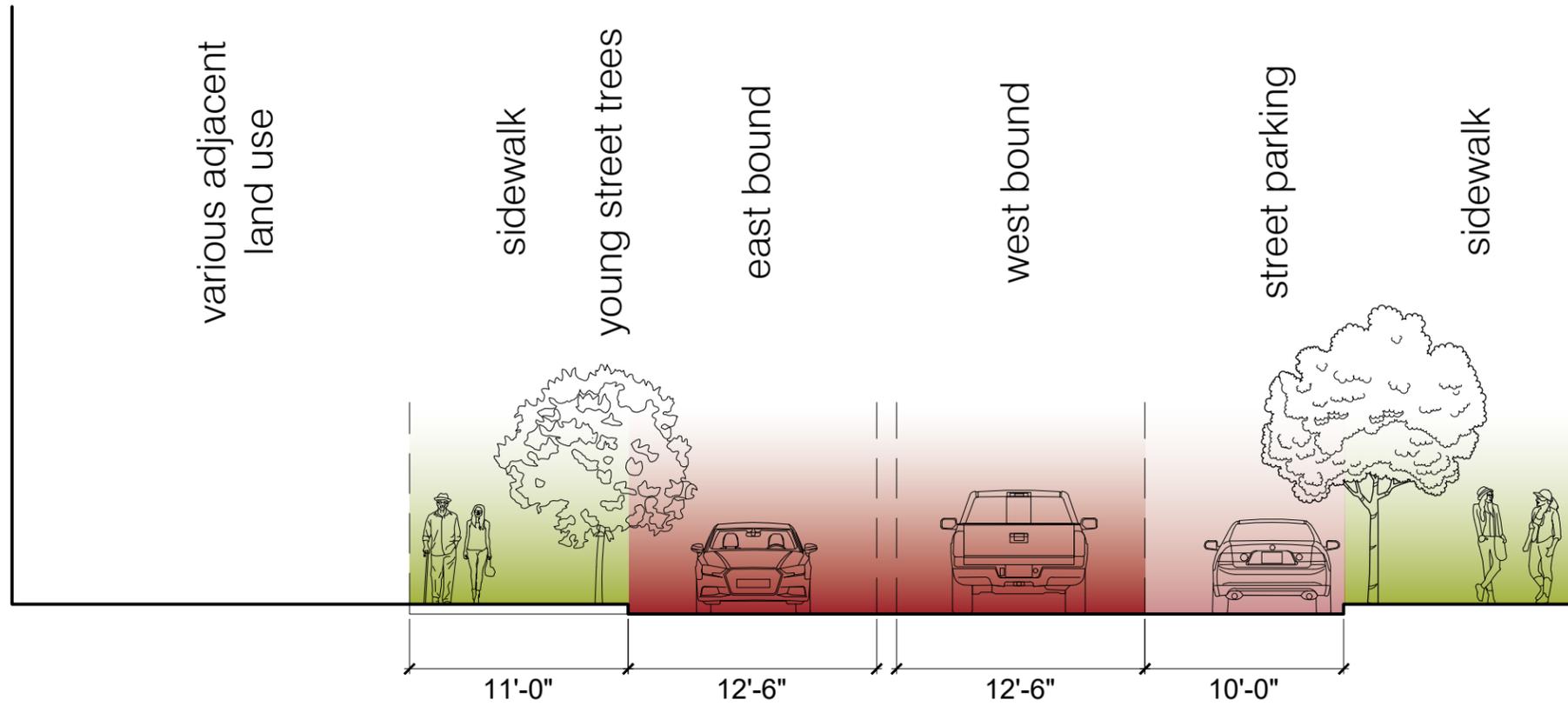
Parking Angle / Width (A)	Width Parallel to Aisle (K)	Depth to Wall (C)	Depth to Interlock (E)	Aisle Width* (D)	Module** (F, G, H)		Bumper Overhang (typical) (I)
					Wall to Wall	Interlock to Interlock (G)	
45° / 9.0'	12.7'	19.5'	16.5'	12'	51'	45'	2.3'
45° / 9.5'	13.4'	19.5'	16.5'	11'	50'	44'	2.3'
60° / 9.0'	10.4'	20.5'	18.5'	16'	57'	53'	2.3'
60° / 9.5'	11.0'	20.5'	18.5'	15'	56'	52'	2.3'
75° / 9.0'	9.3'	20.0'	19.0'	23'	63'	61'	2.5'
75° / 9.5'	9.8'	20.0'	19.0'	22'	62'	60'	2.5'
90° / 9.0'***	9.0'	18.5'	18.5'	26'	63'	63'	2.5'
90° / 9.5'***	9.5'	18.5'	18.5'	25'	62'	62'	2.5'

\* Measured between ends of stall lines.  
 \*\* Rounded to the nearest foot.  
 \*\*\* For back-in parking, aisle width may be reduced 4.0'.



- c. **Grading and Surfacing.** All parking, circulation and loading areas shall be graded for proper drainage and be paved, unless specified otherwise in these regulations. The maximum grade shall not exceed 8%. The maximum desirable grade in any direction is 5%.

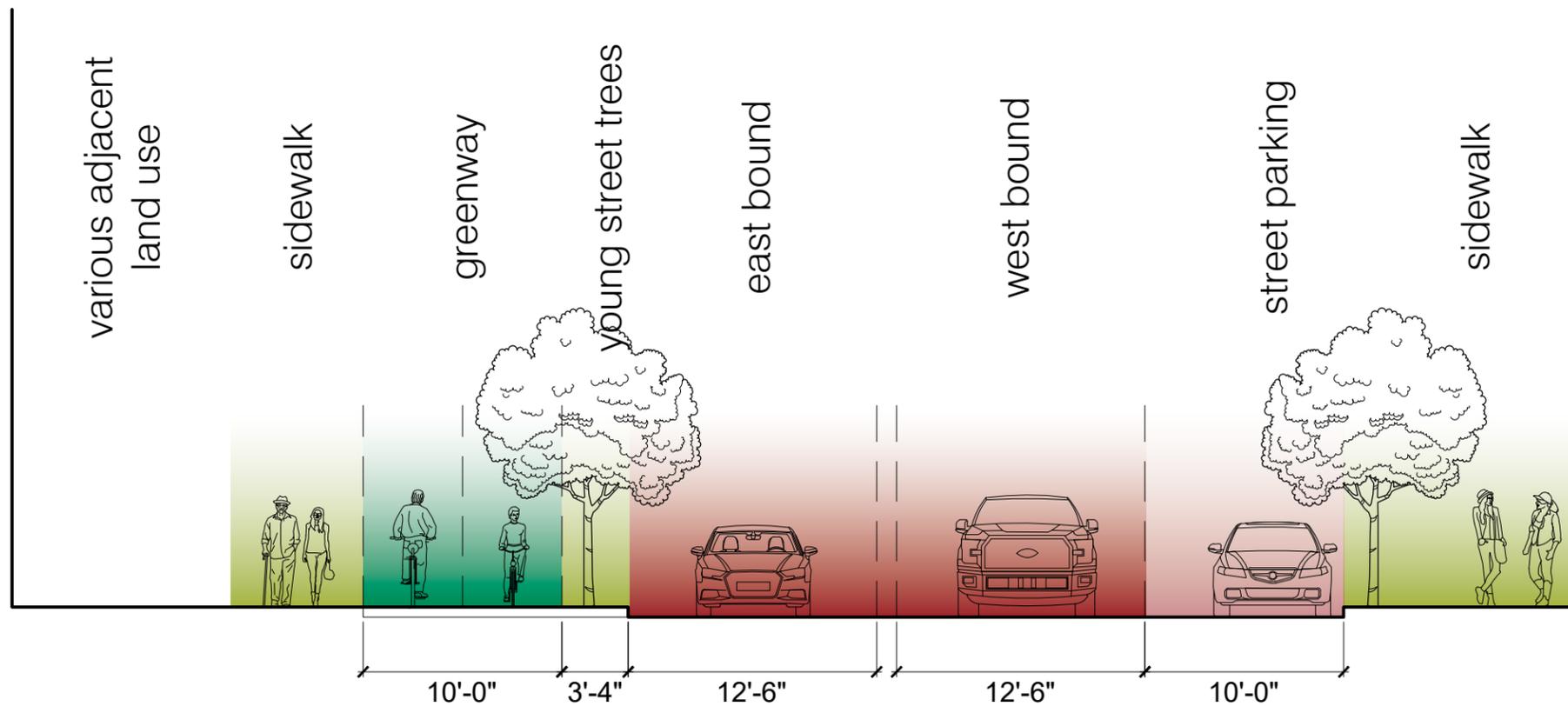
South Buildings



North Buildings

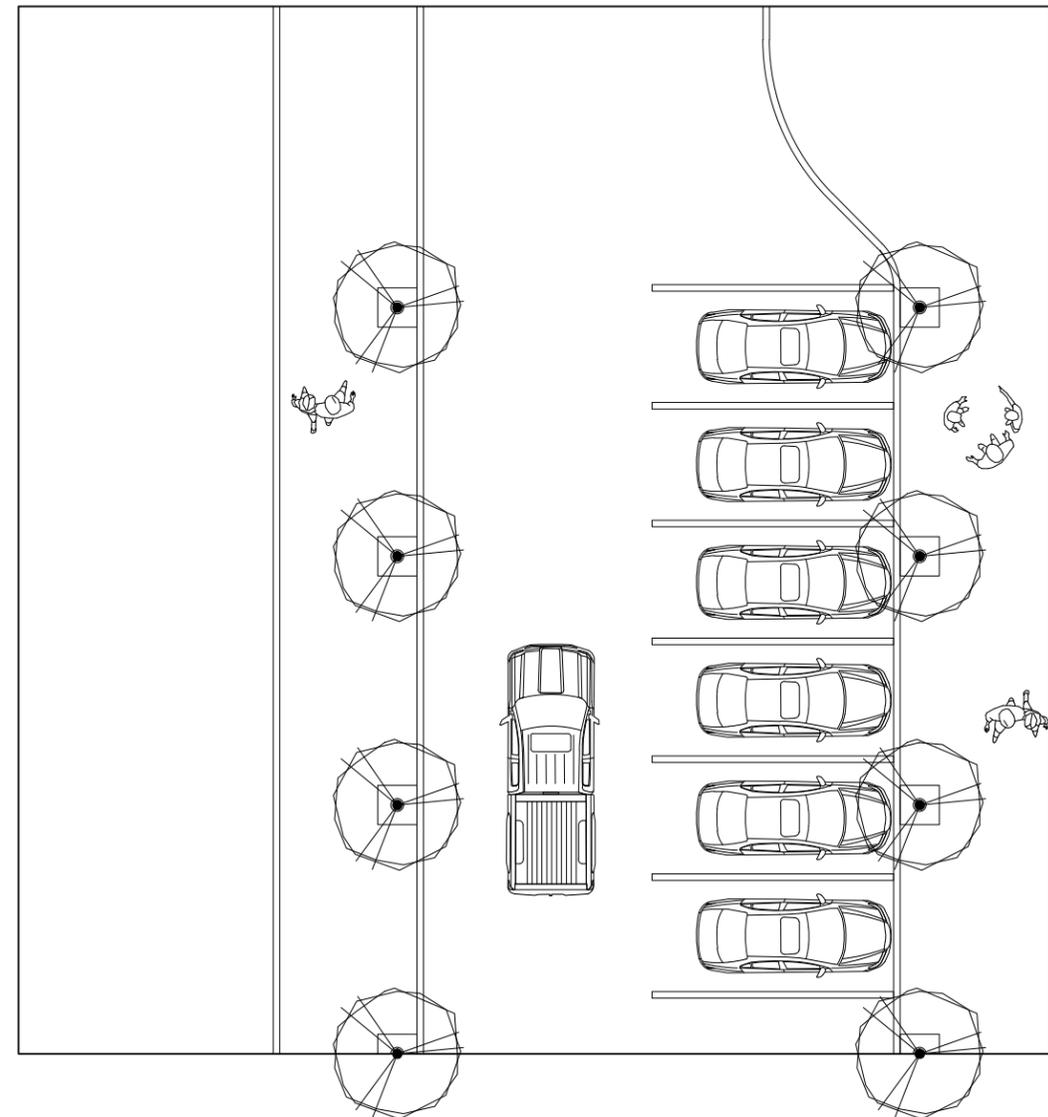
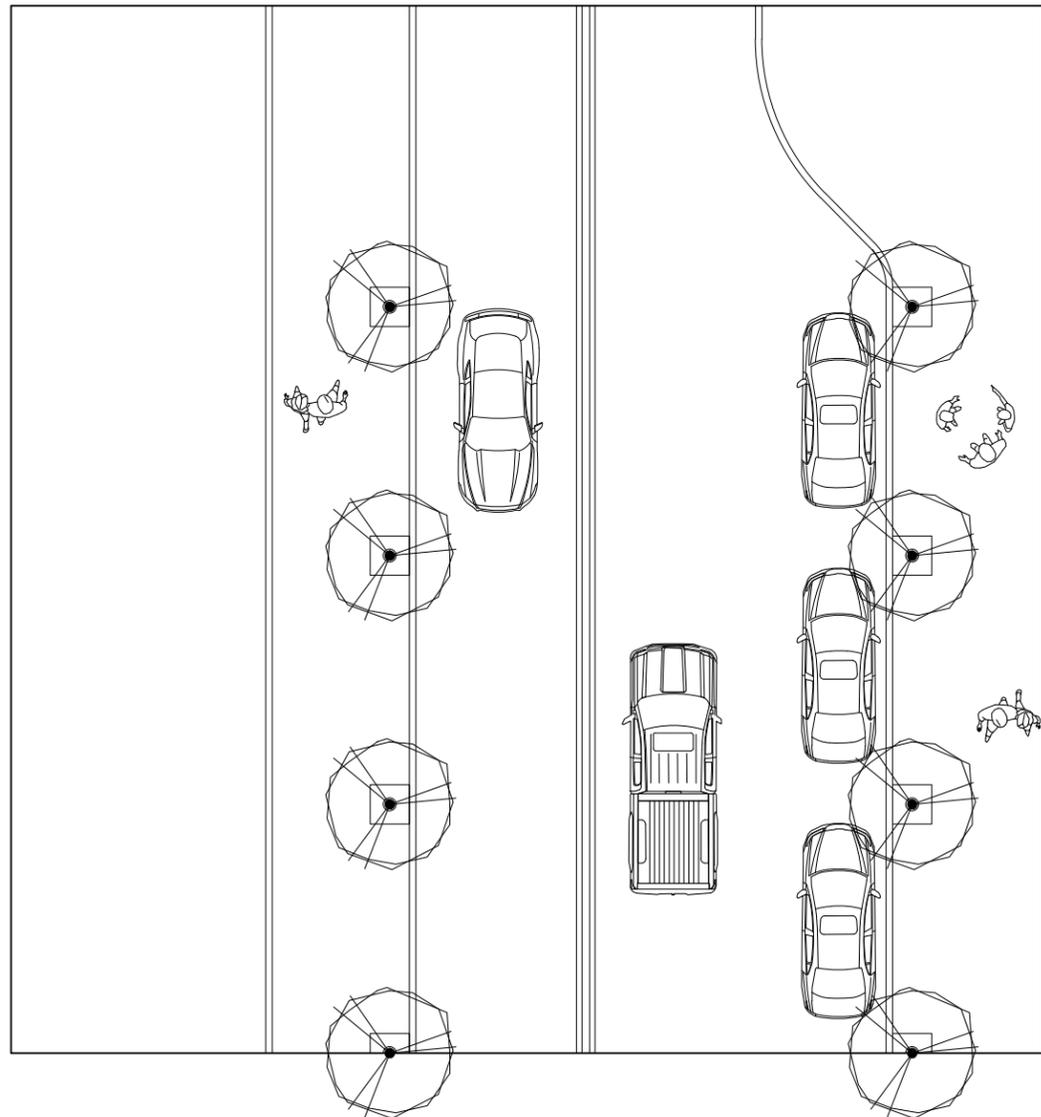
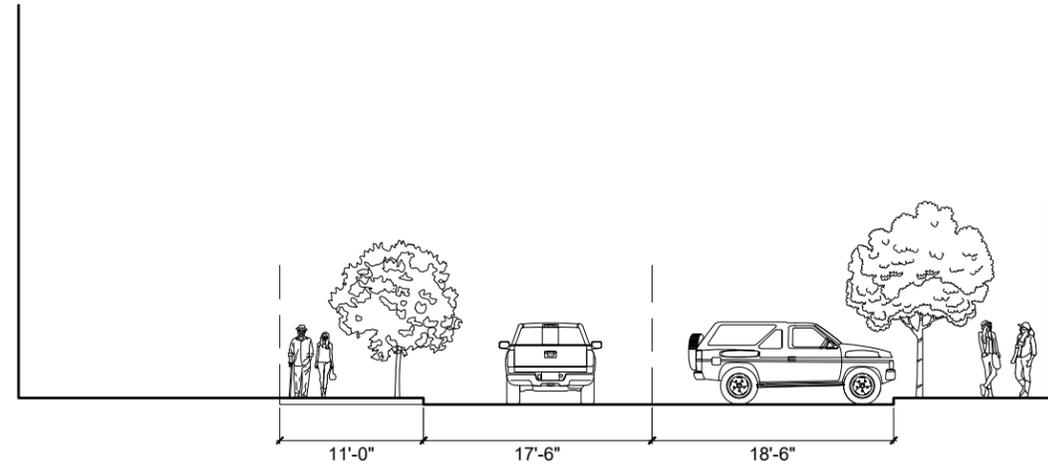
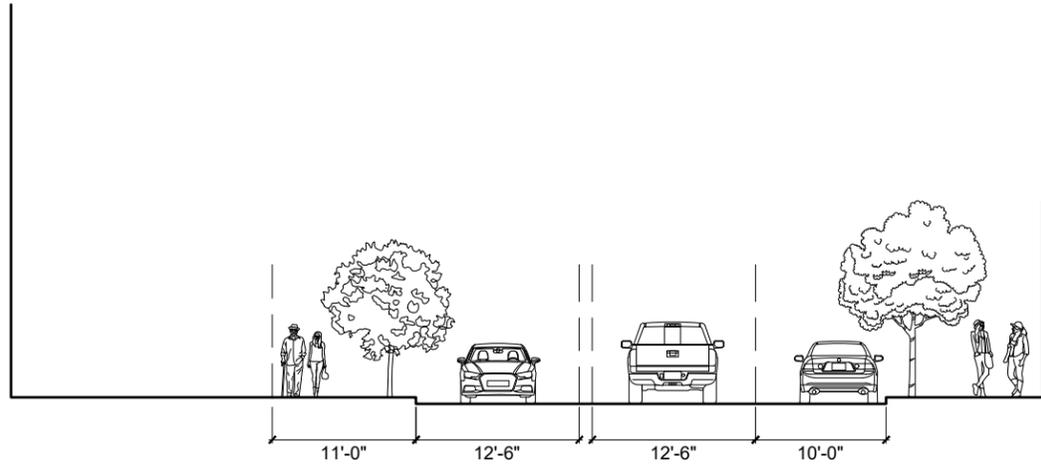
**Existing Section**

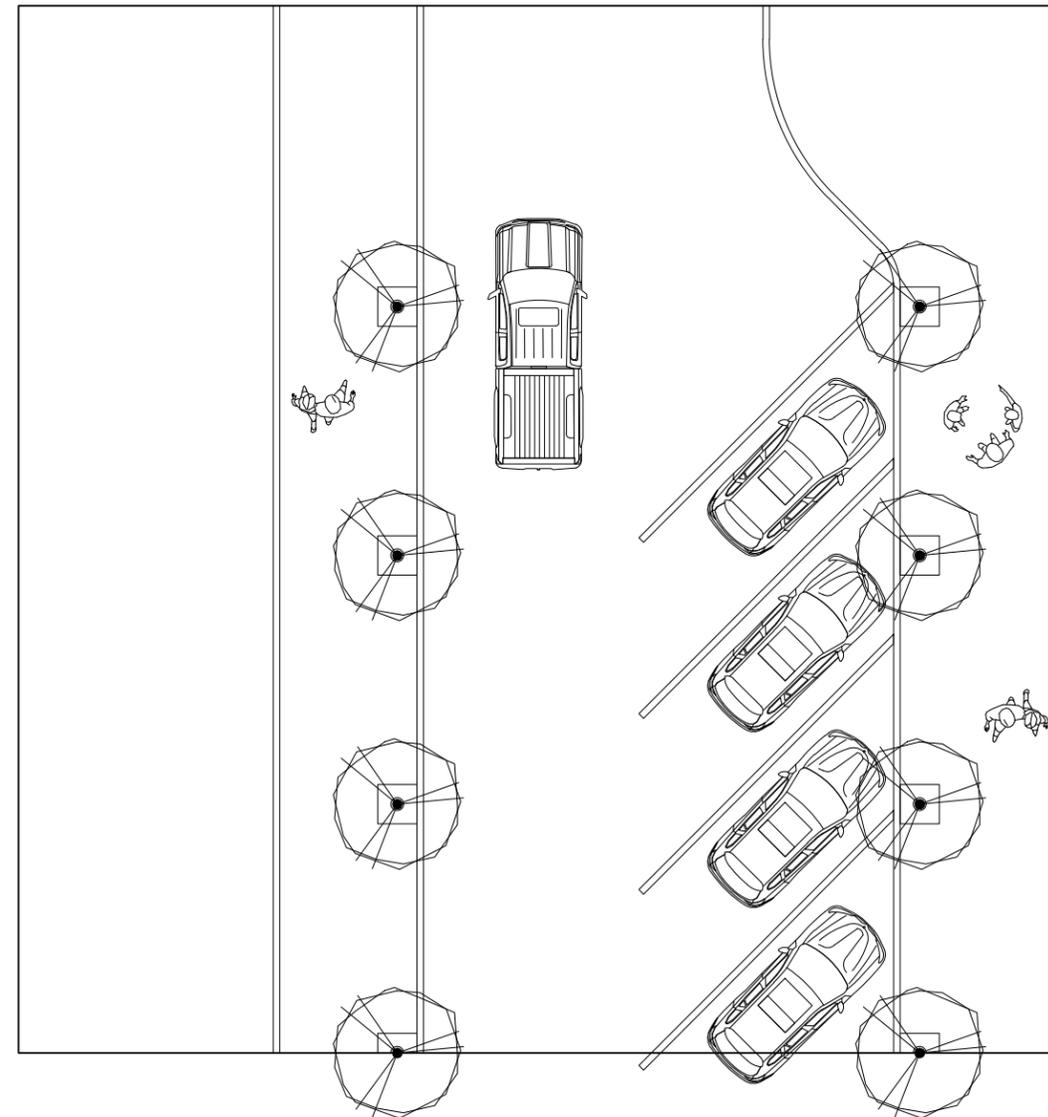
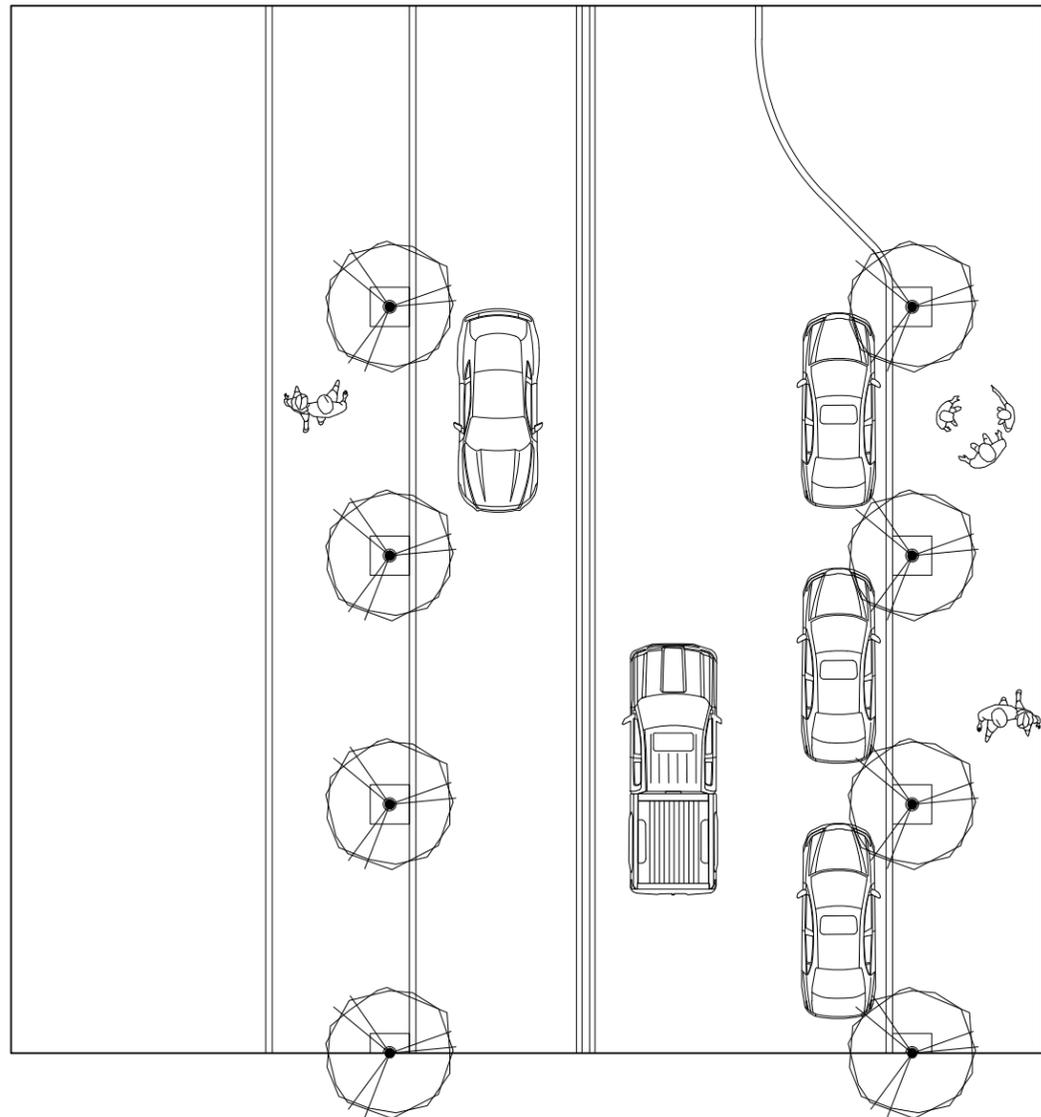
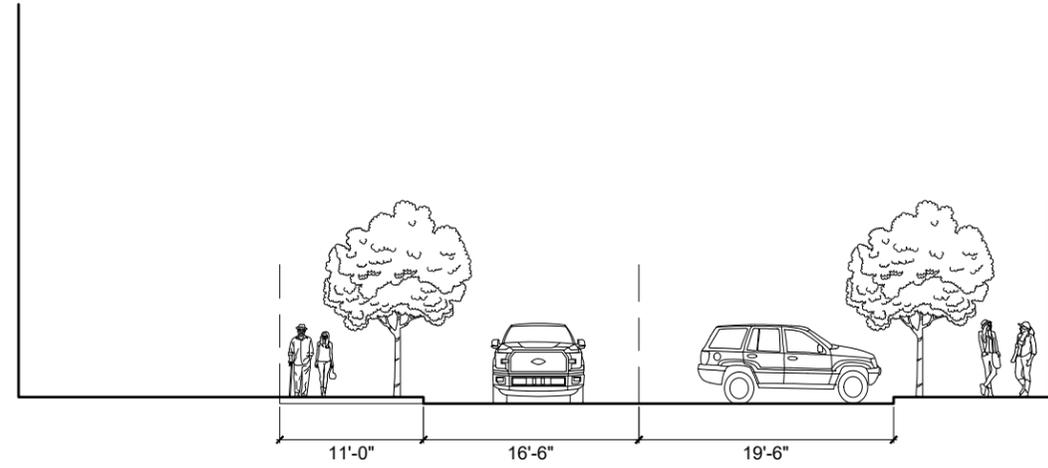
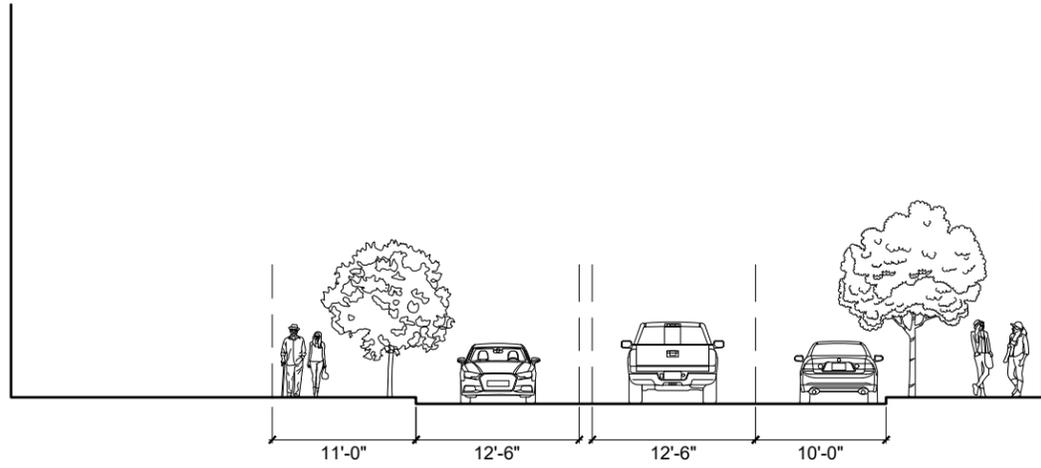
South Buildings

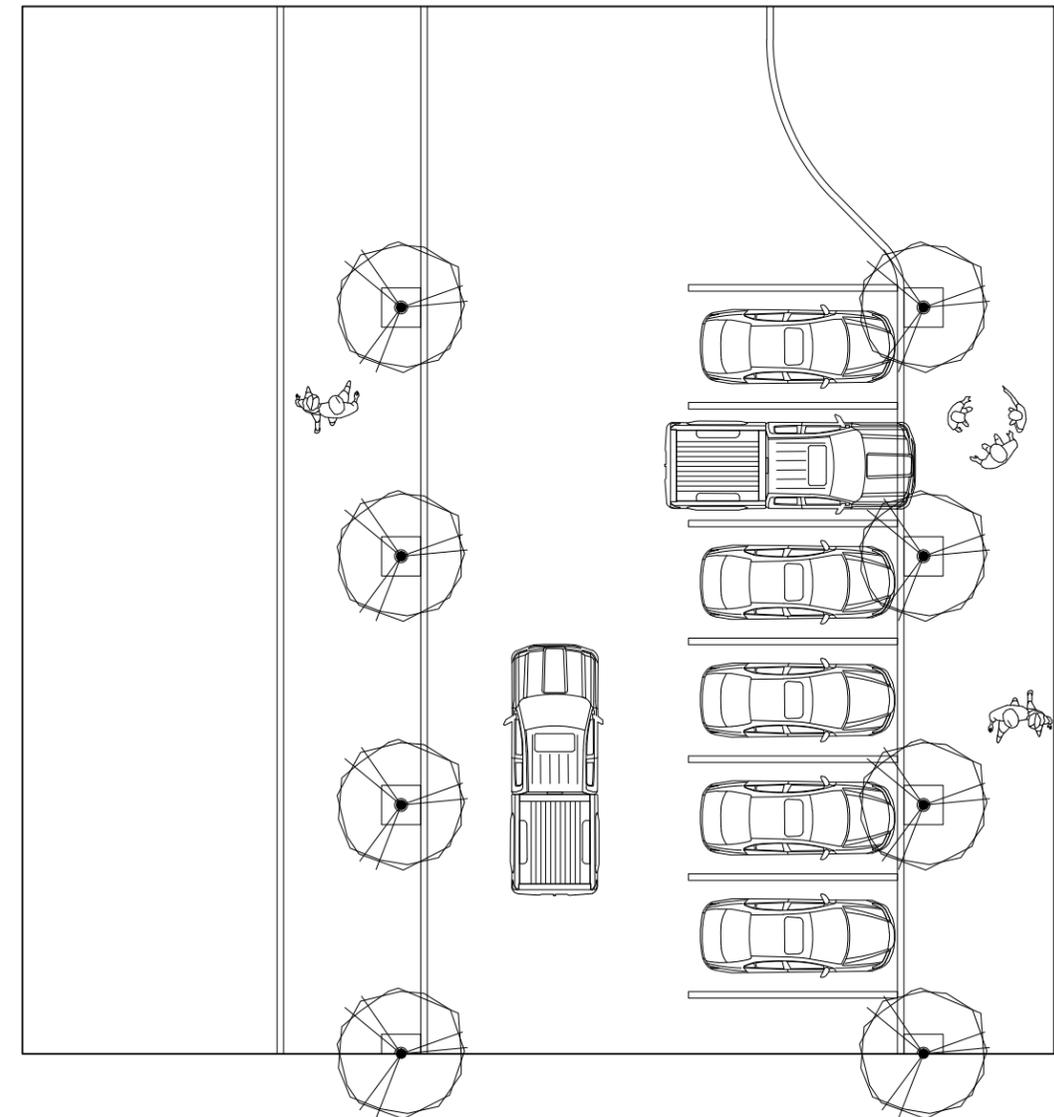
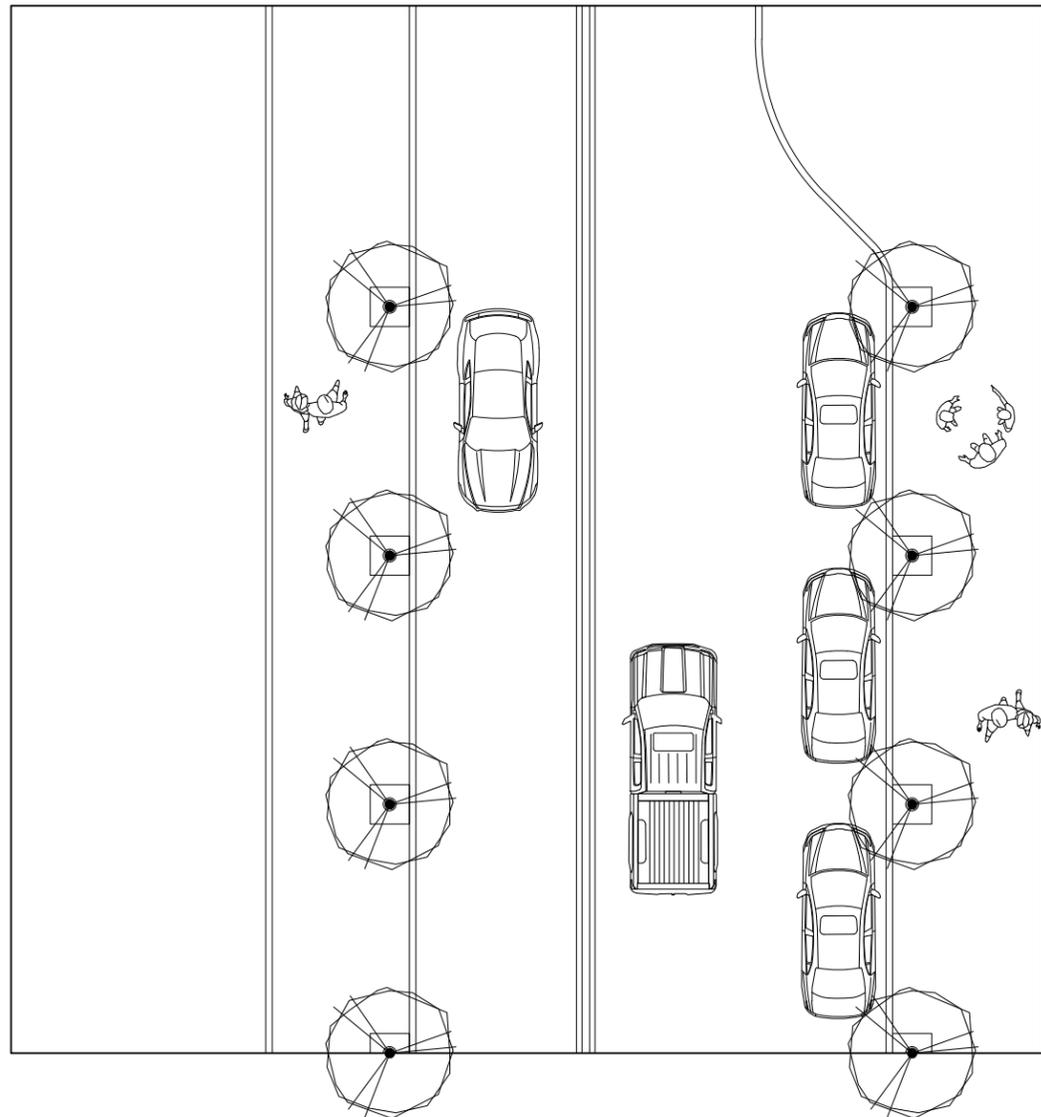
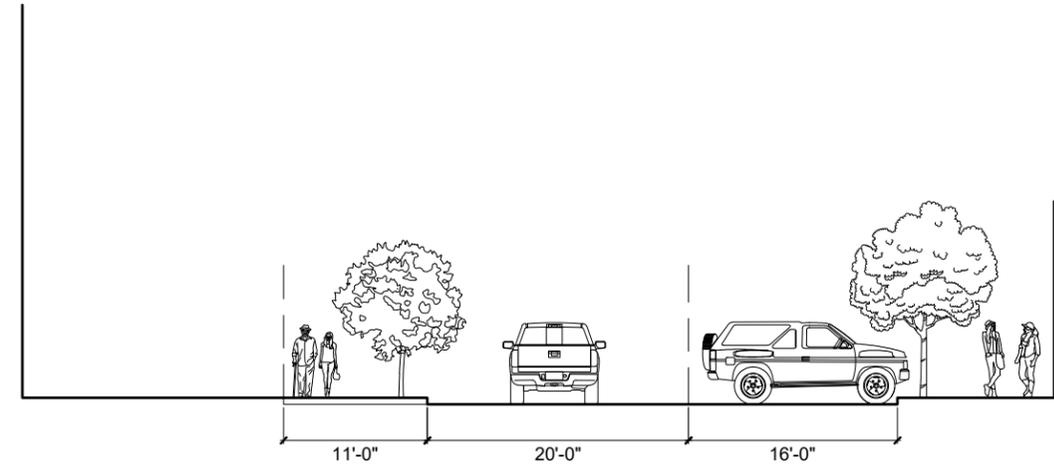
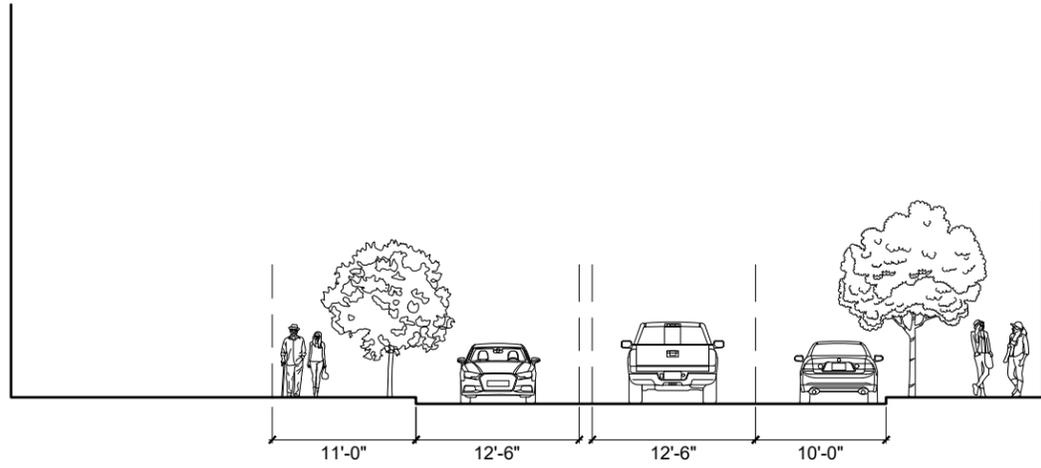


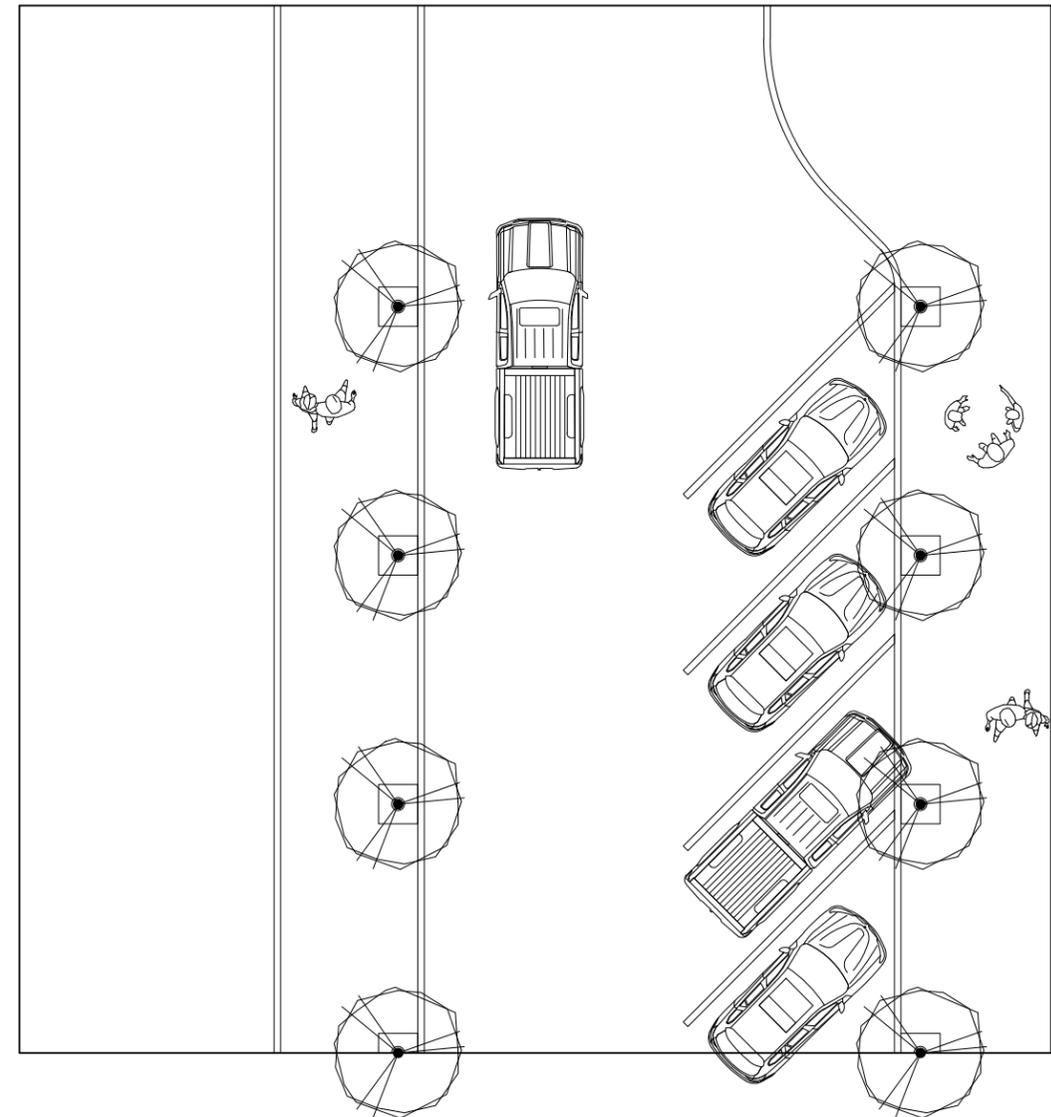
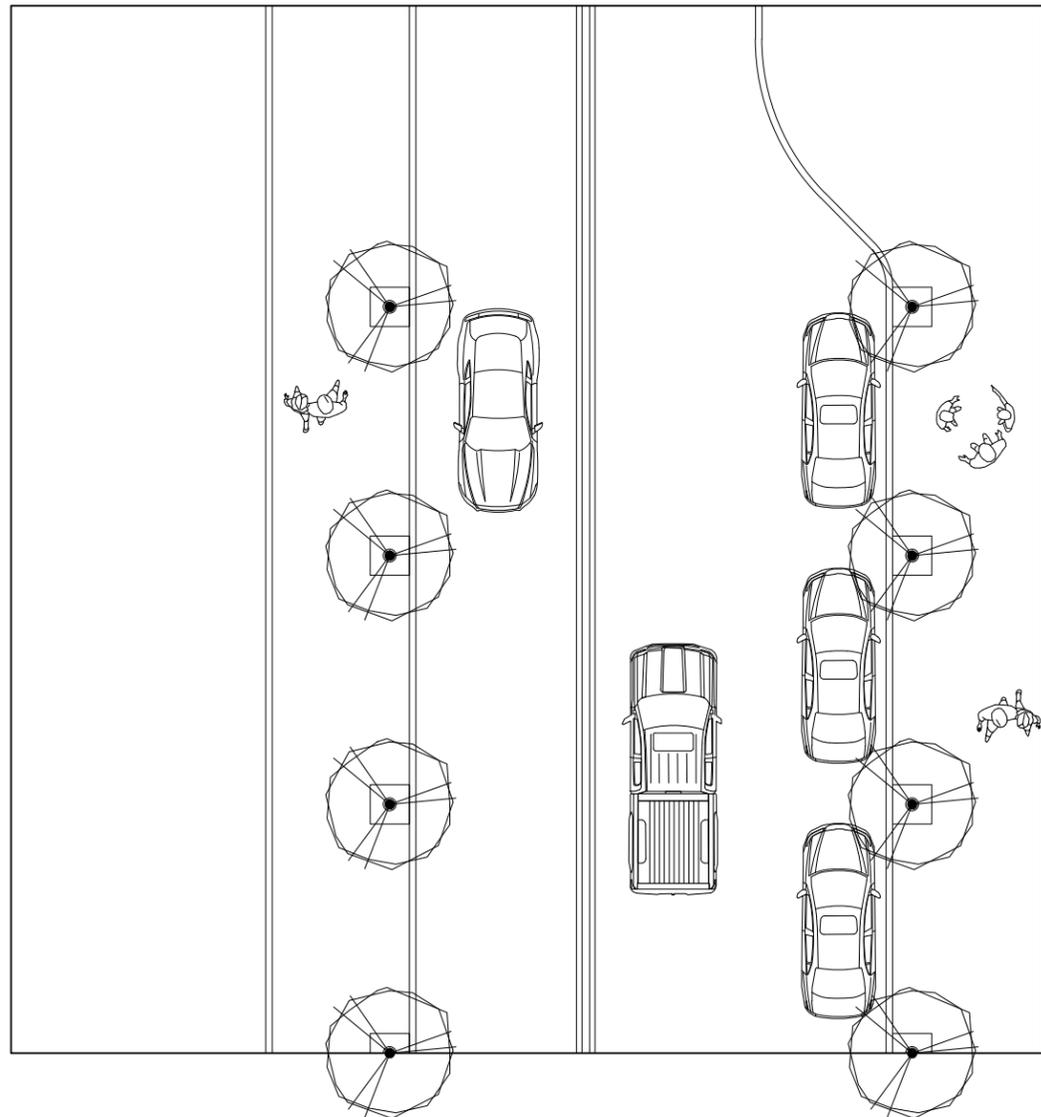
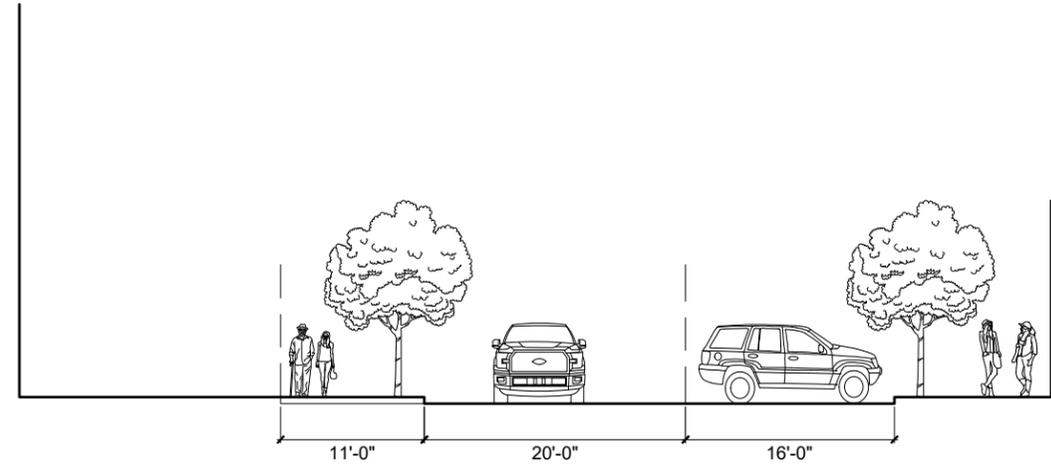
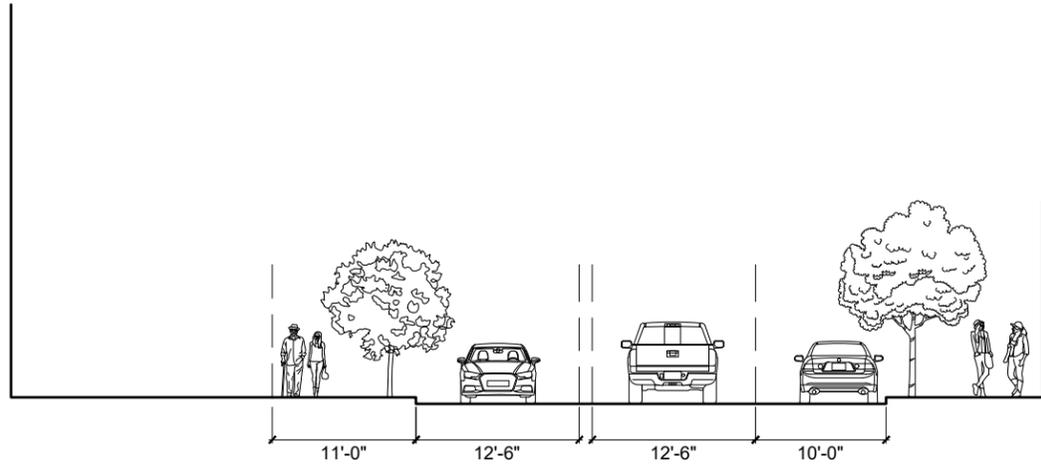
North Buildings

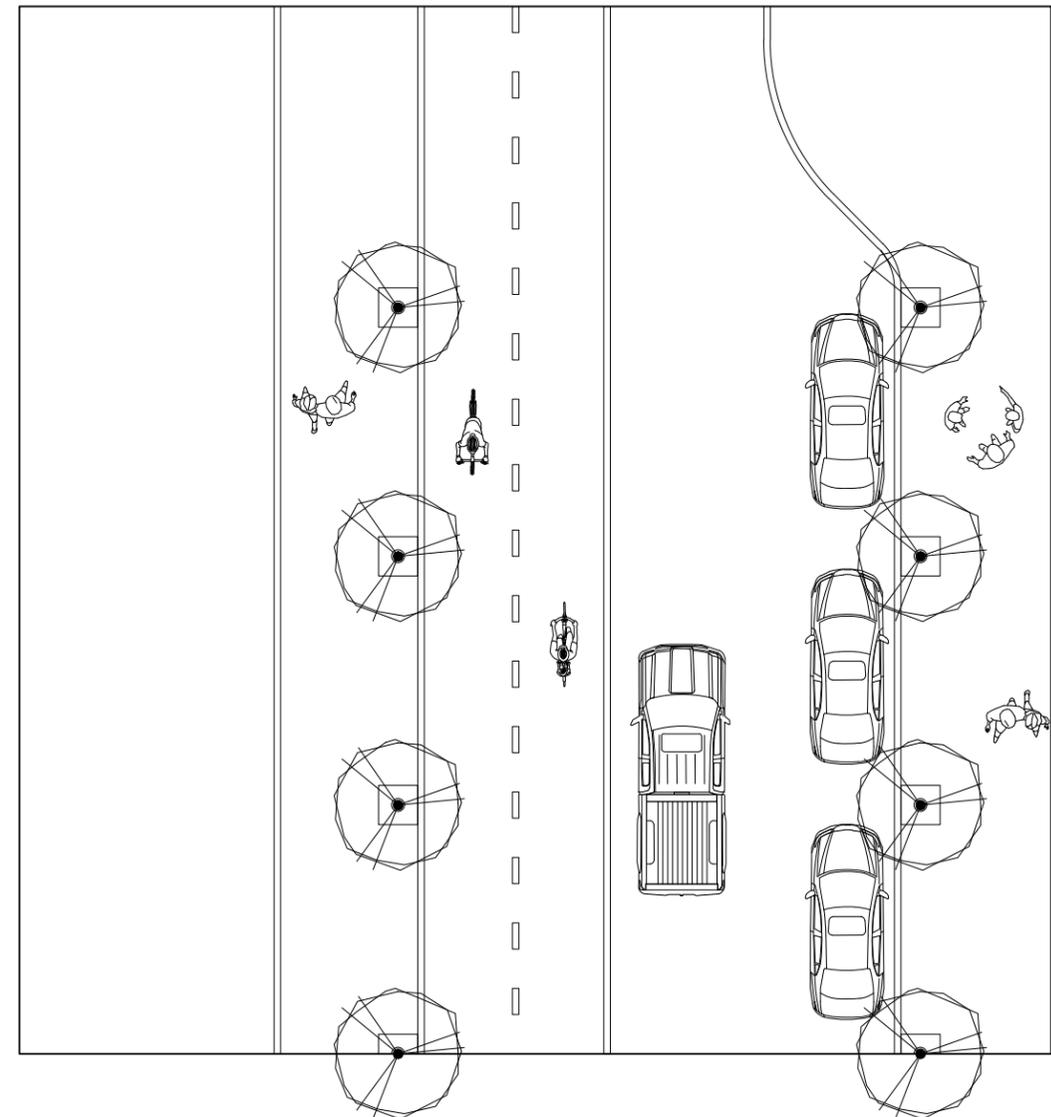
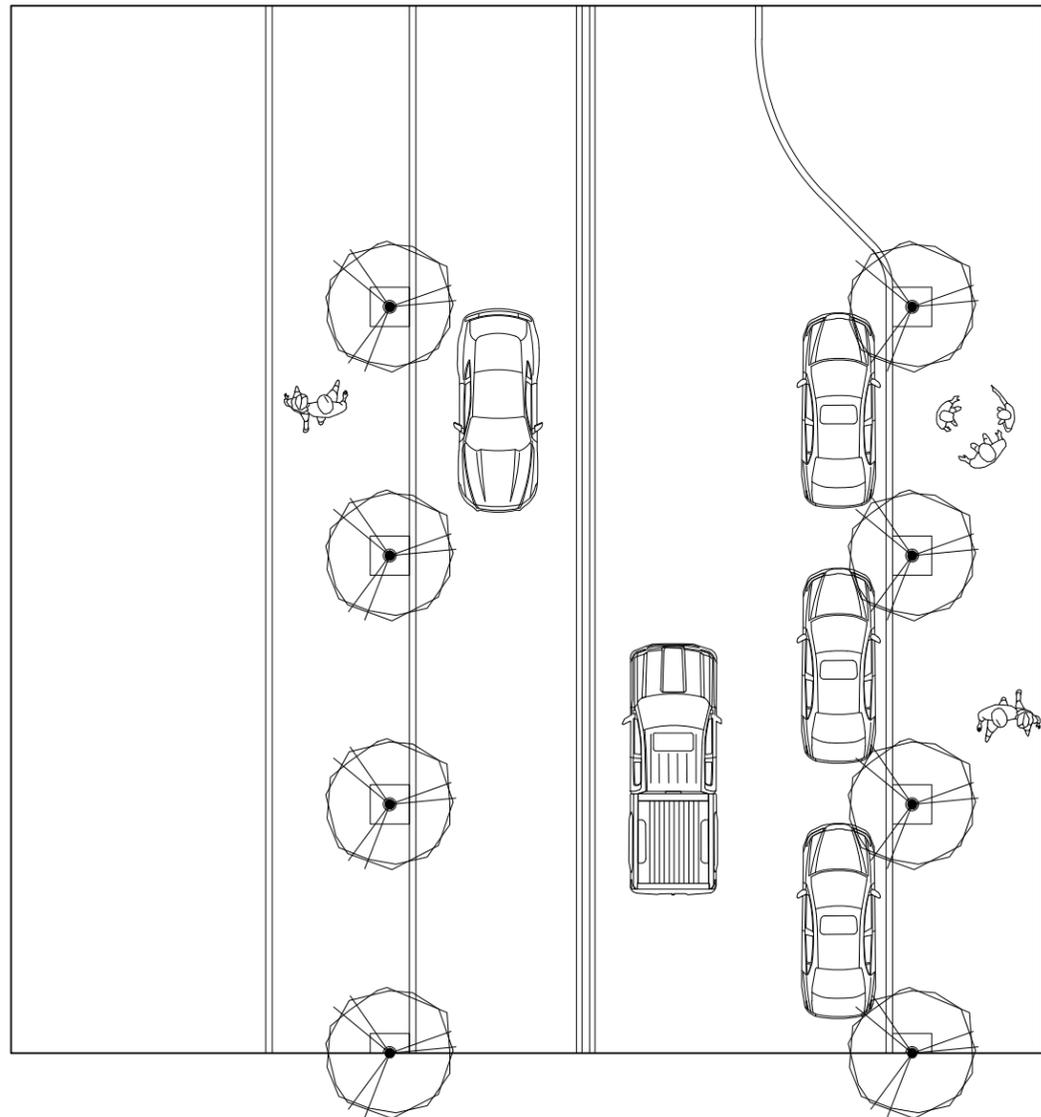
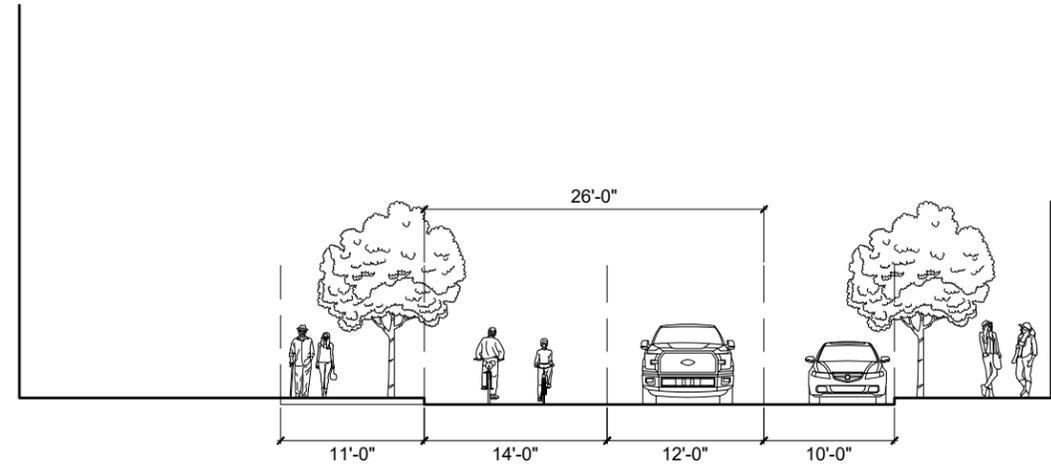
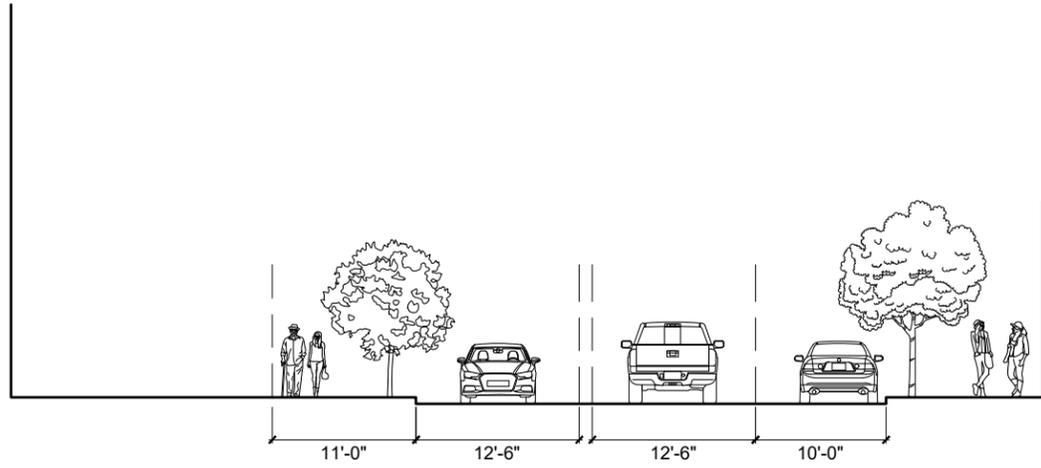
**5/11 Section**

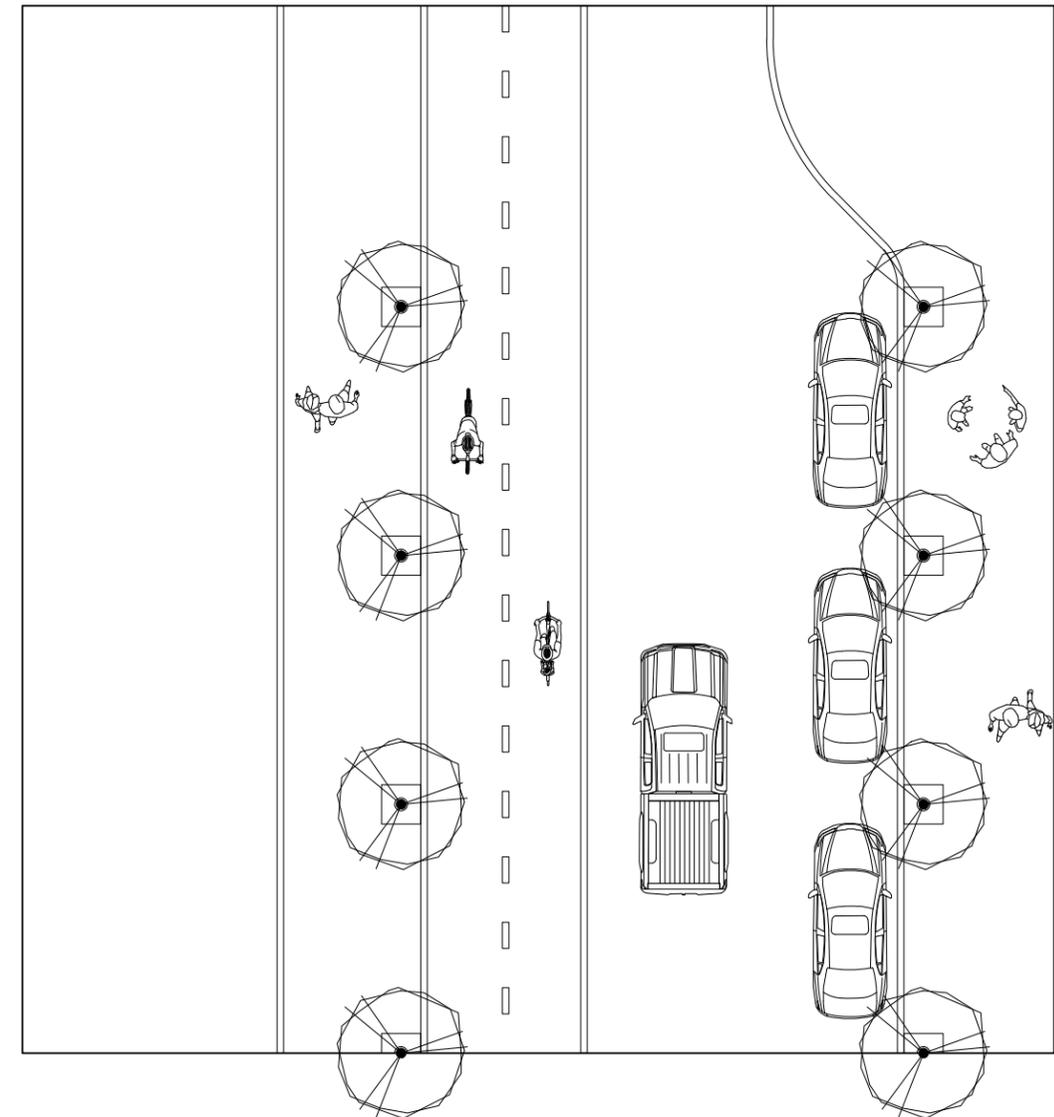
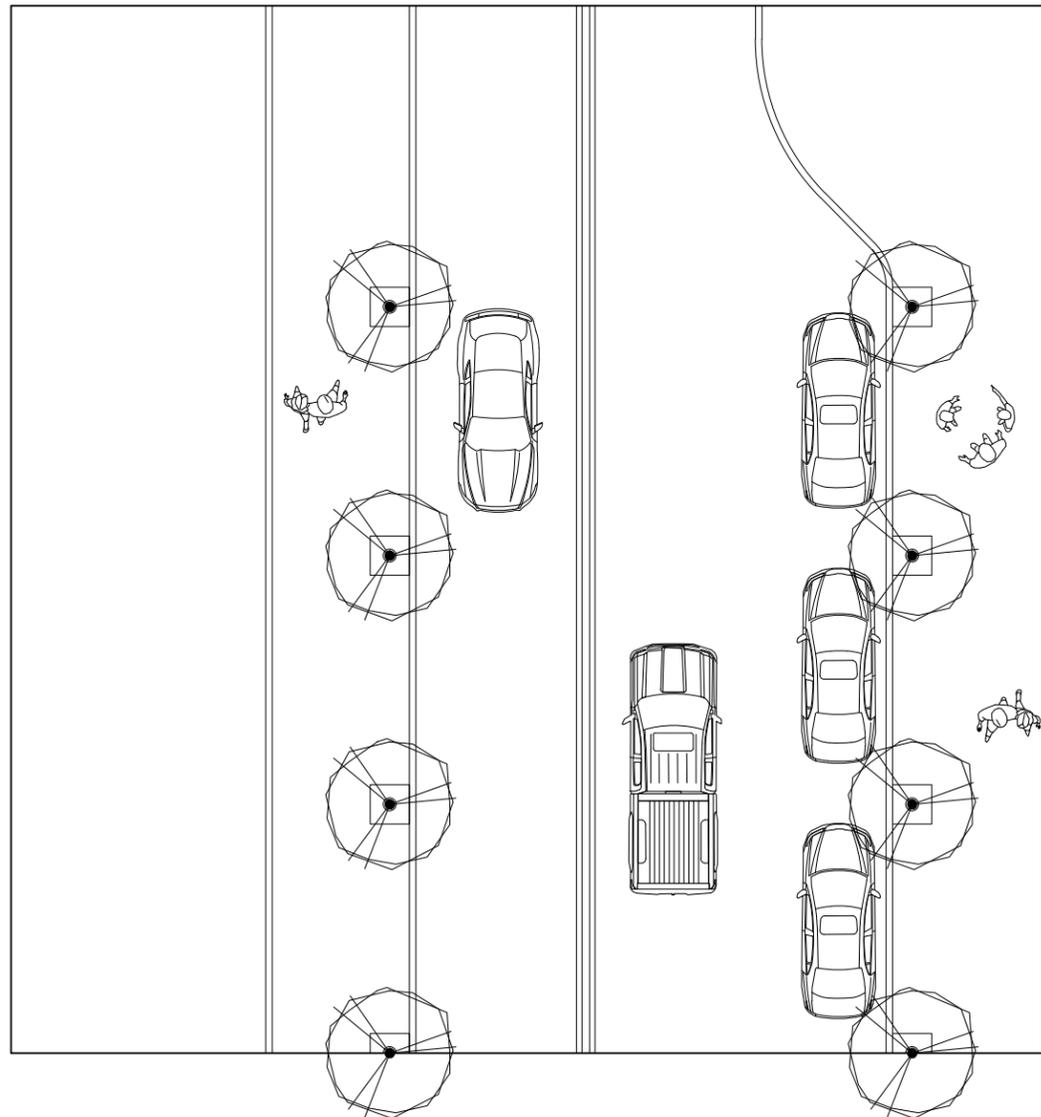
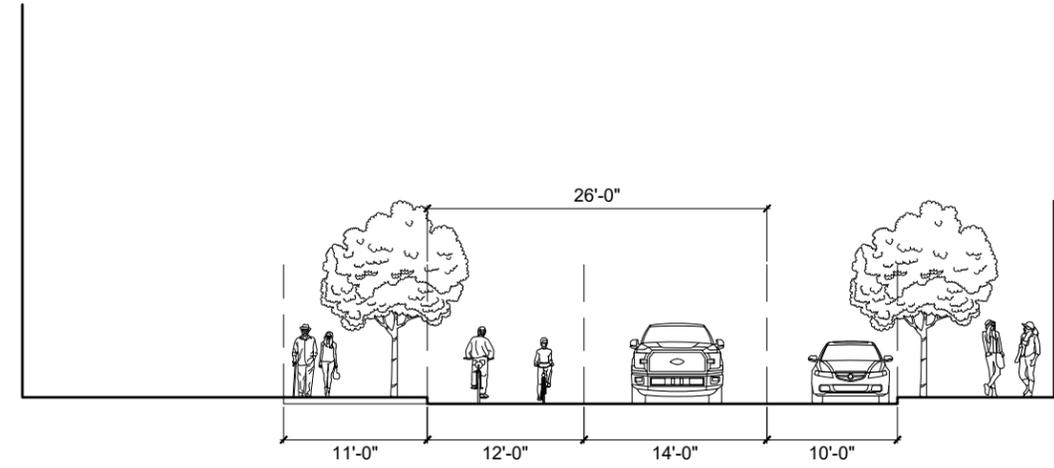
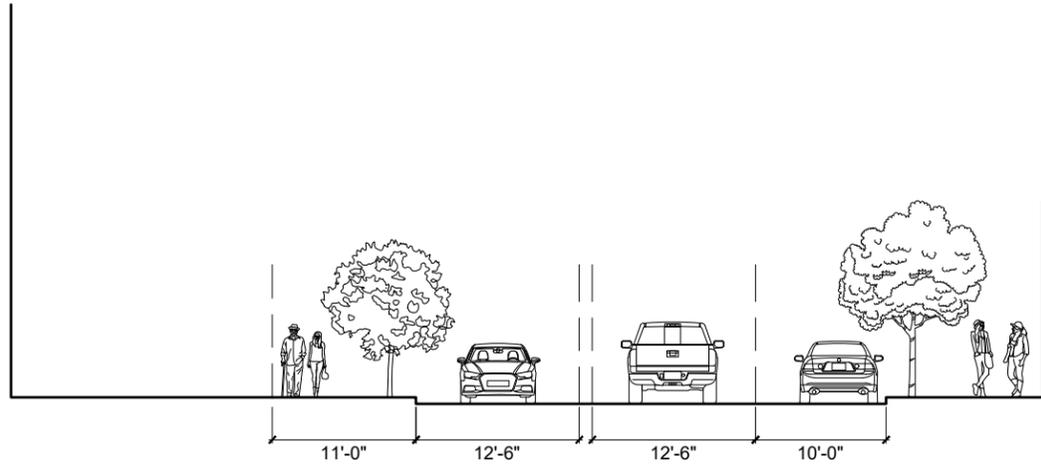


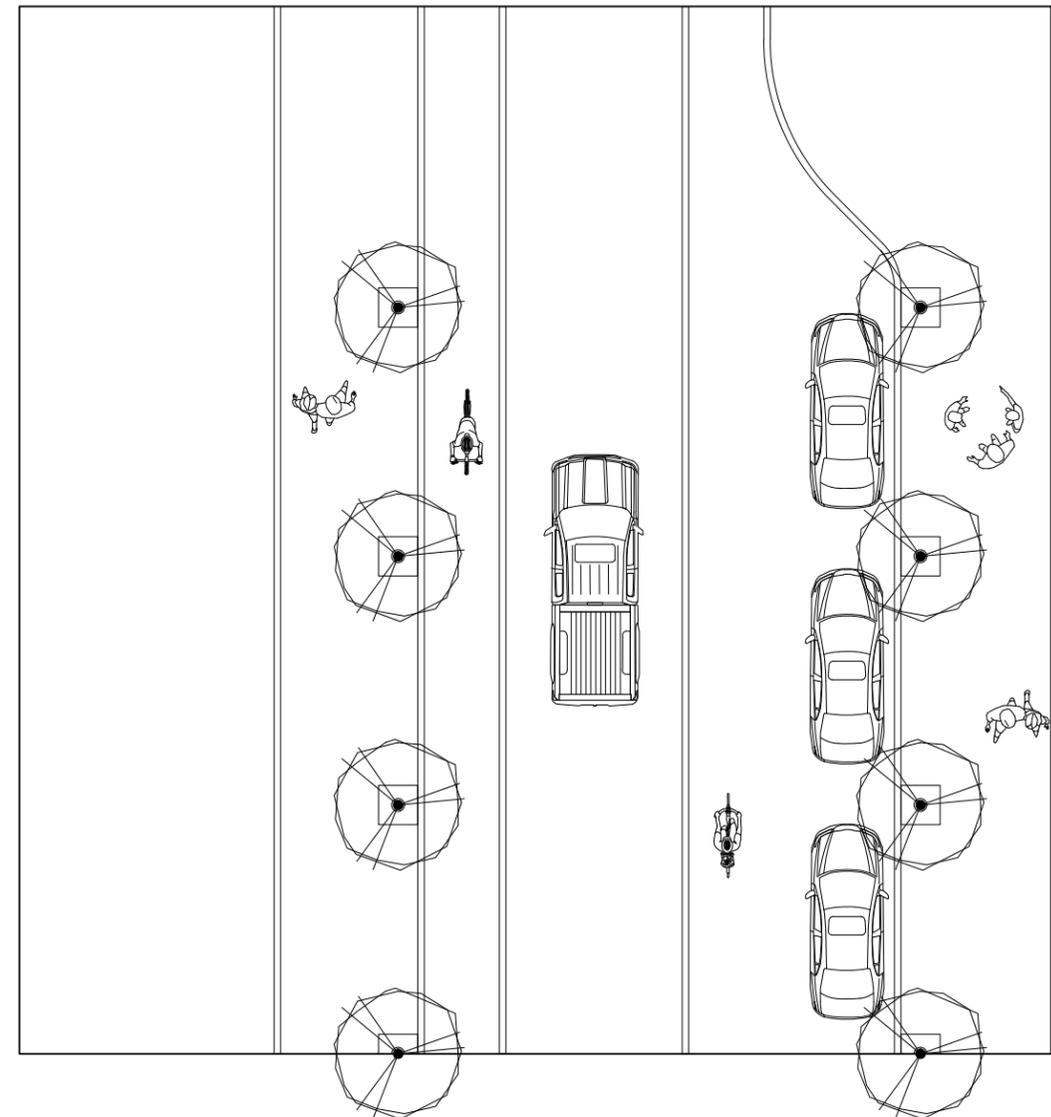
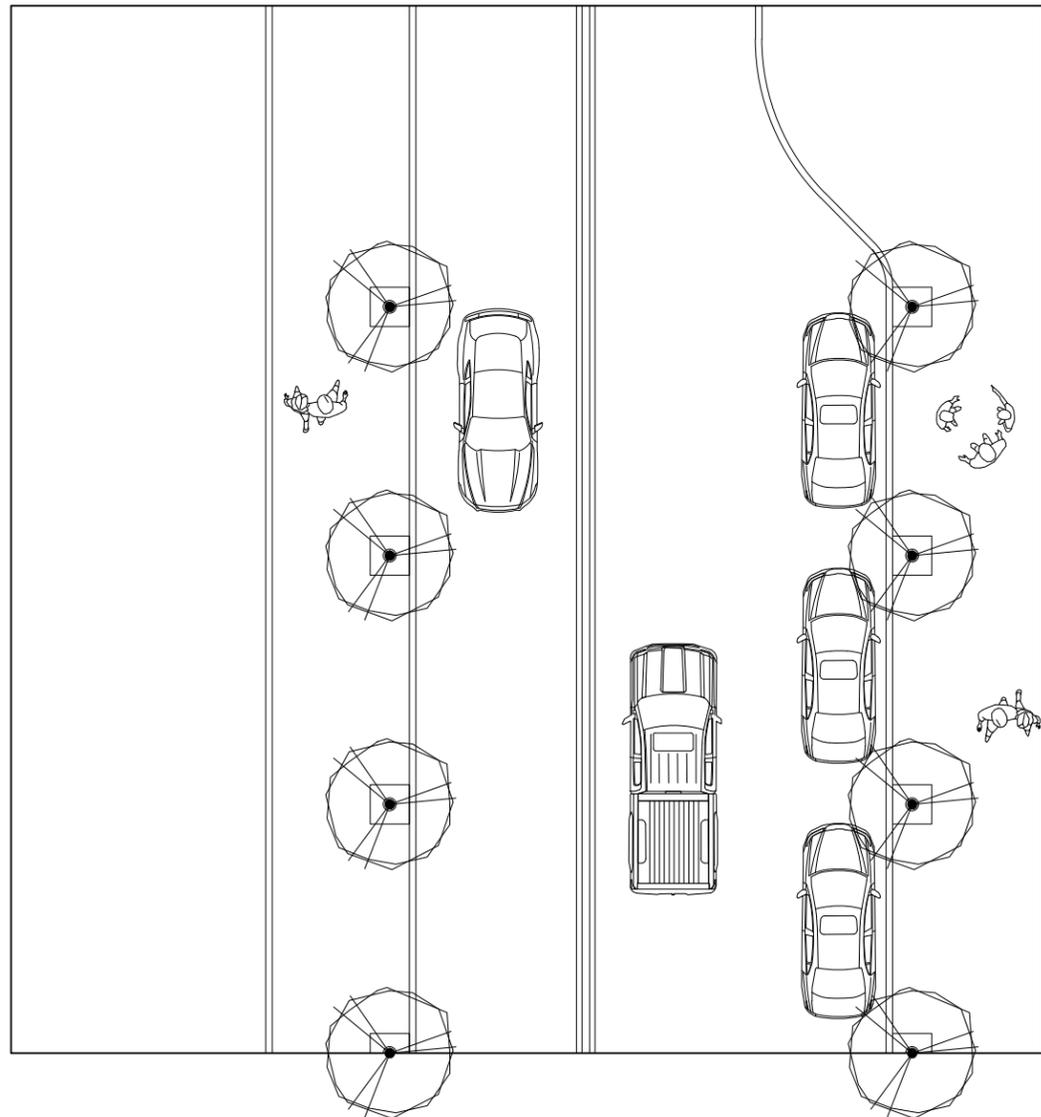
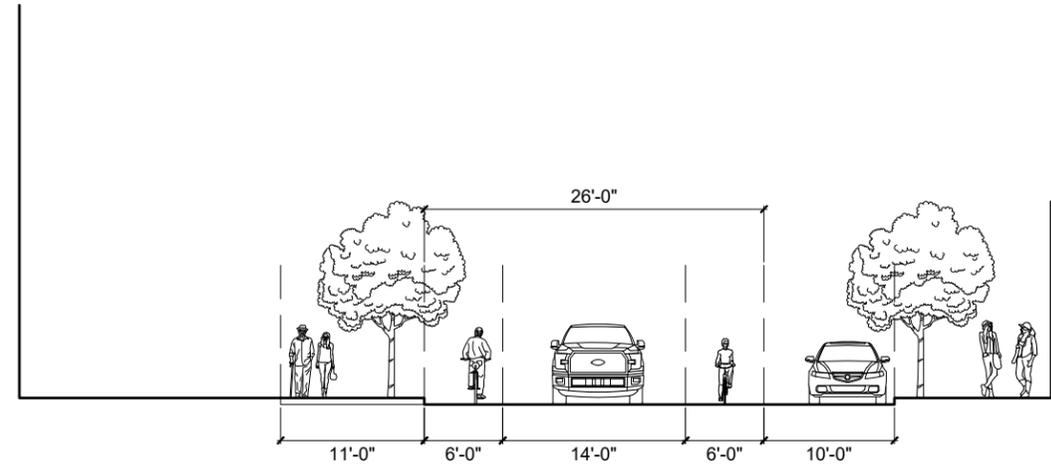
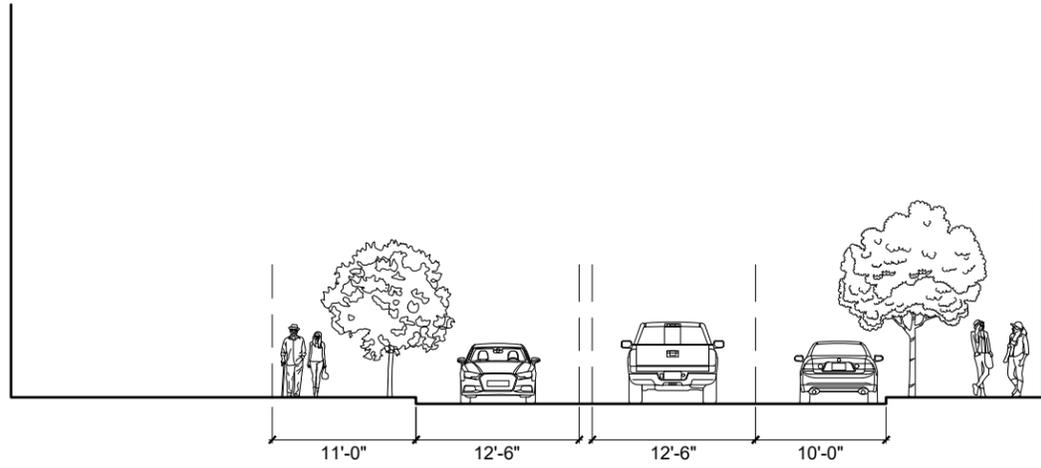




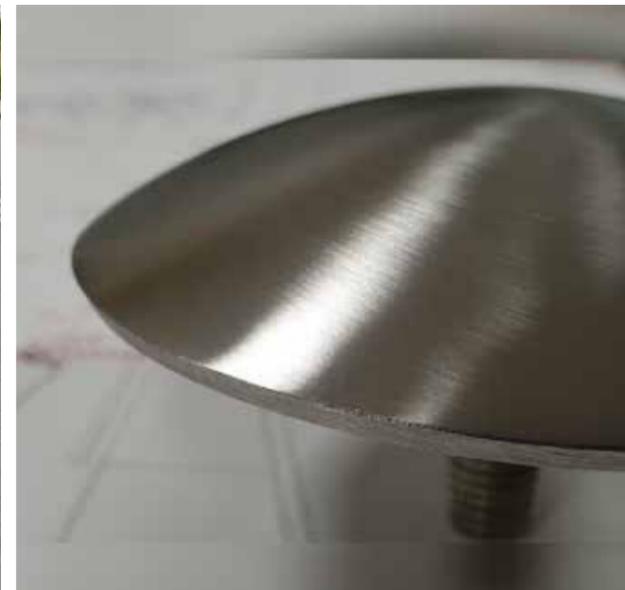
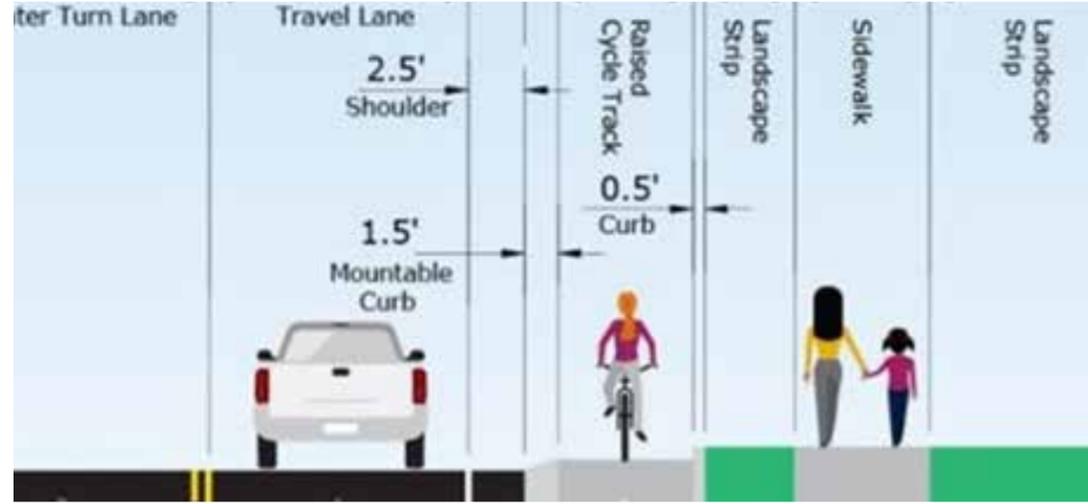


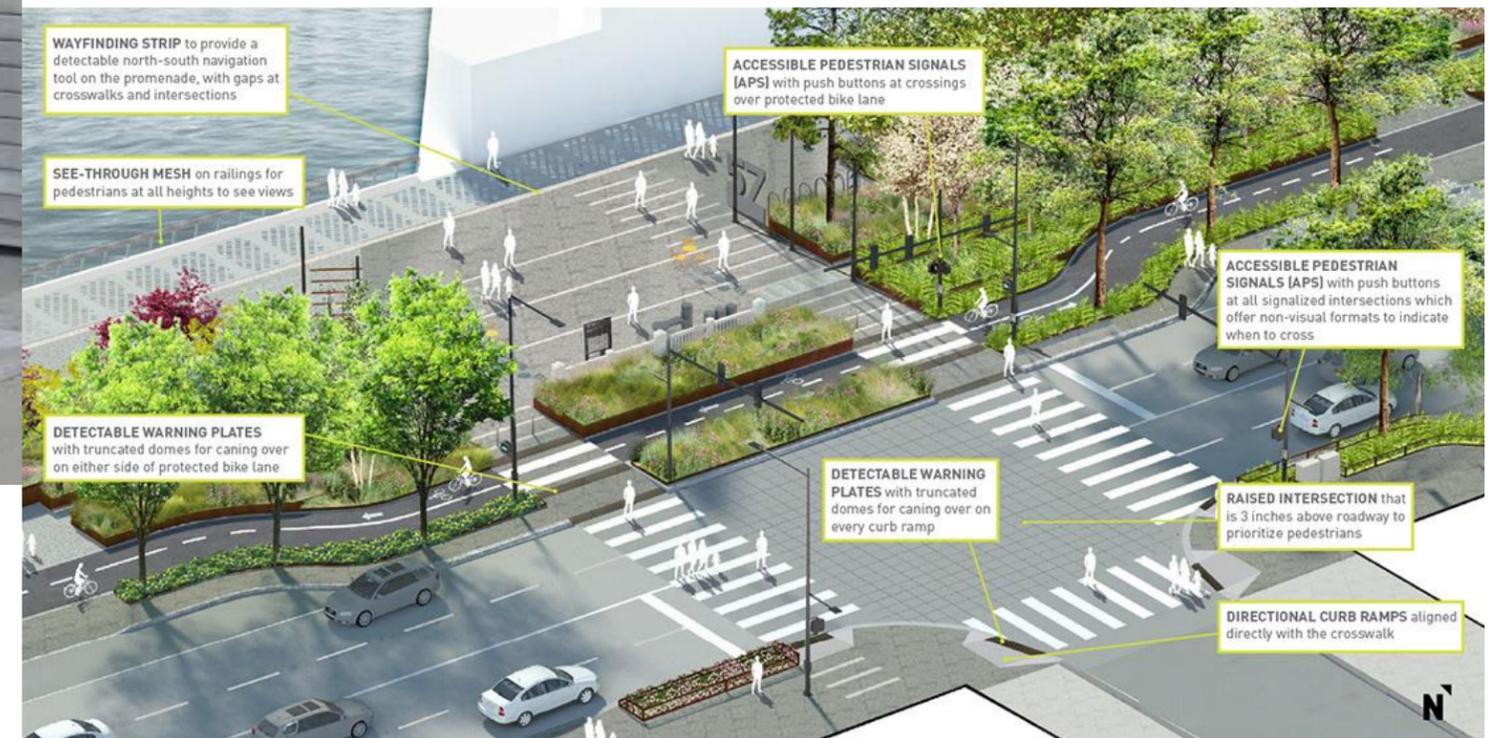


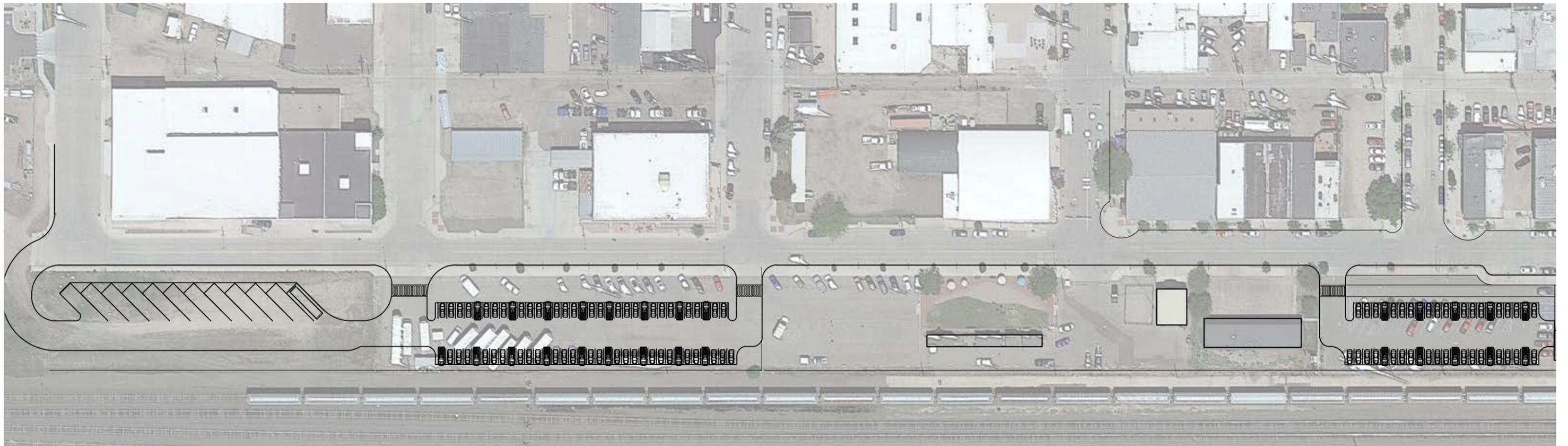
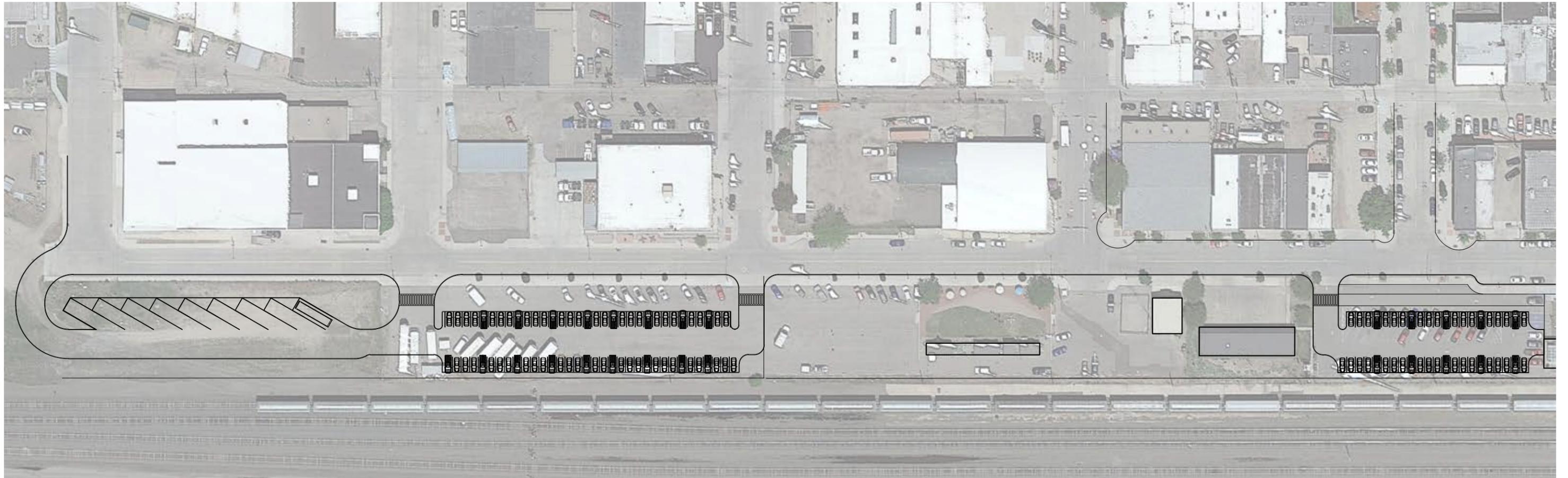


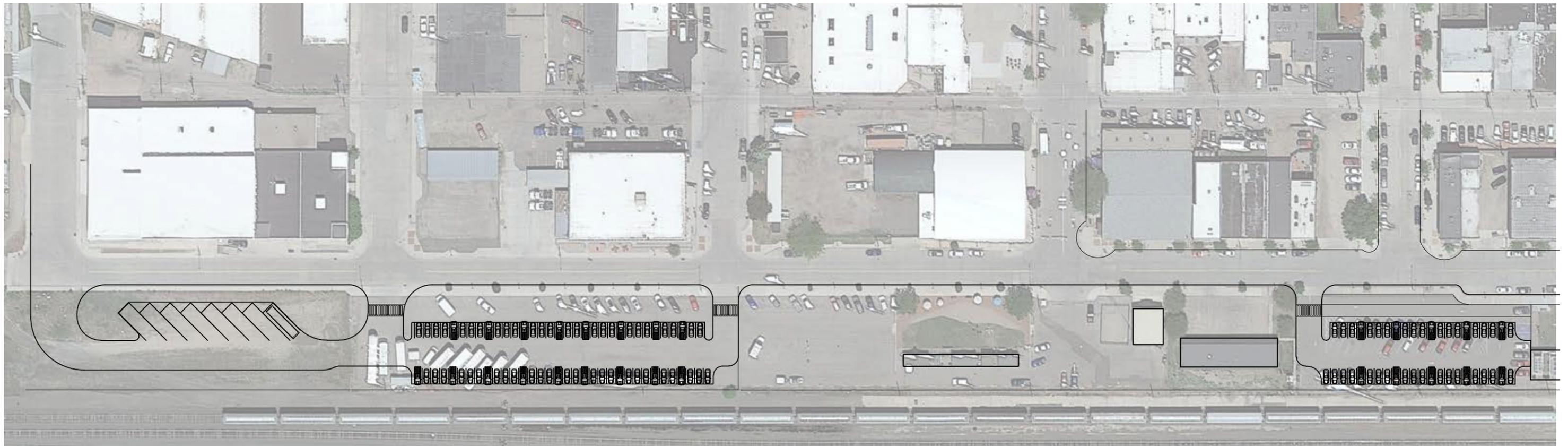
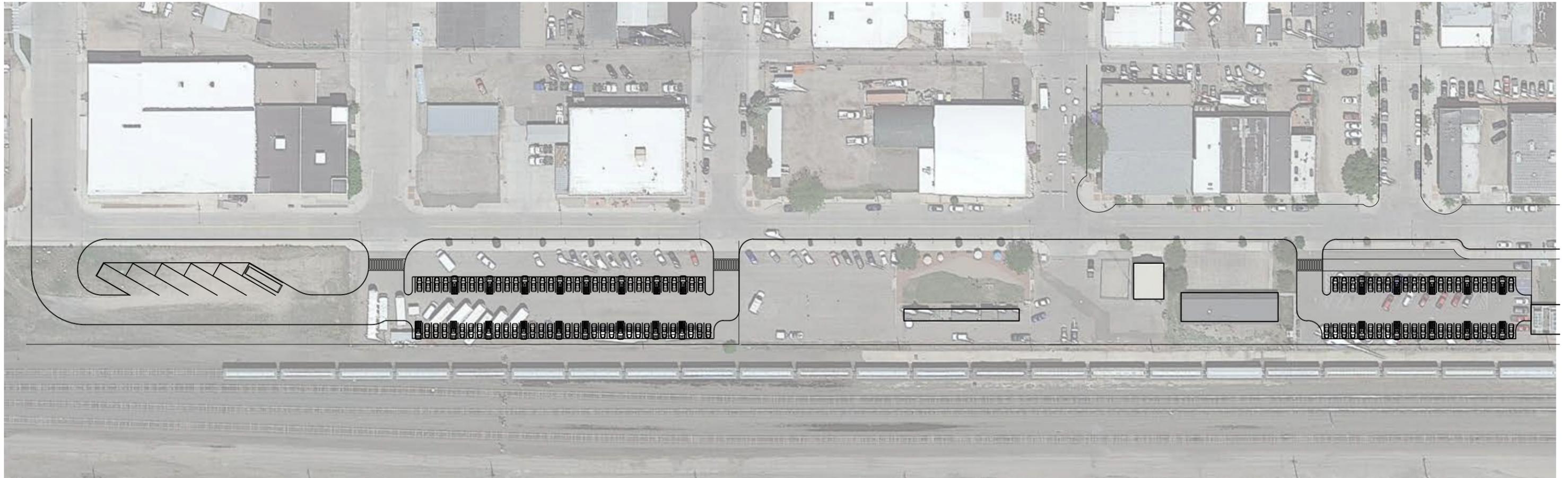


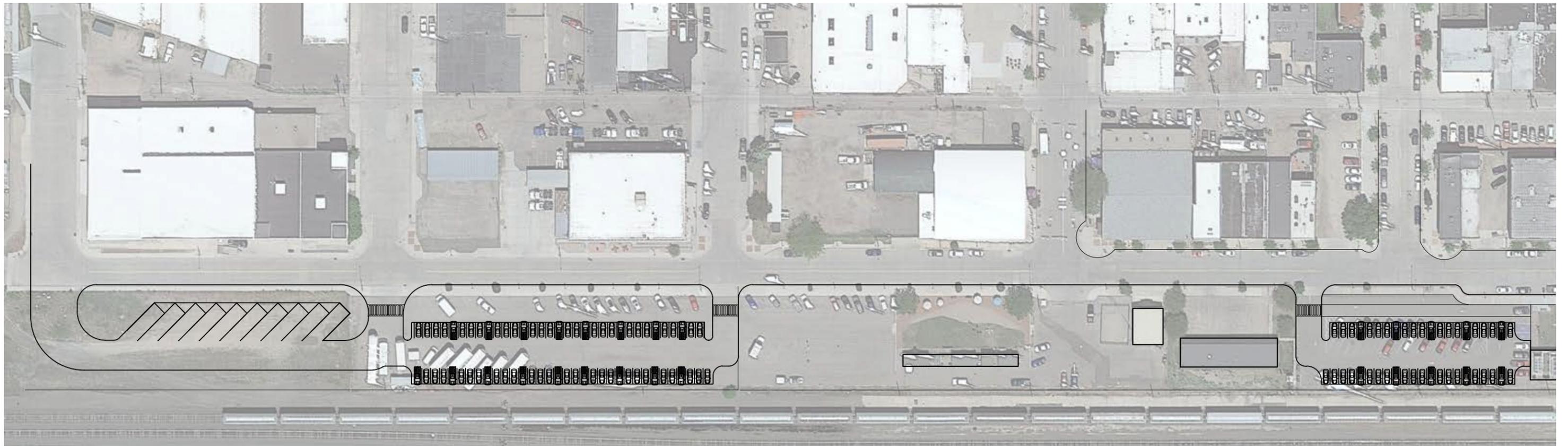
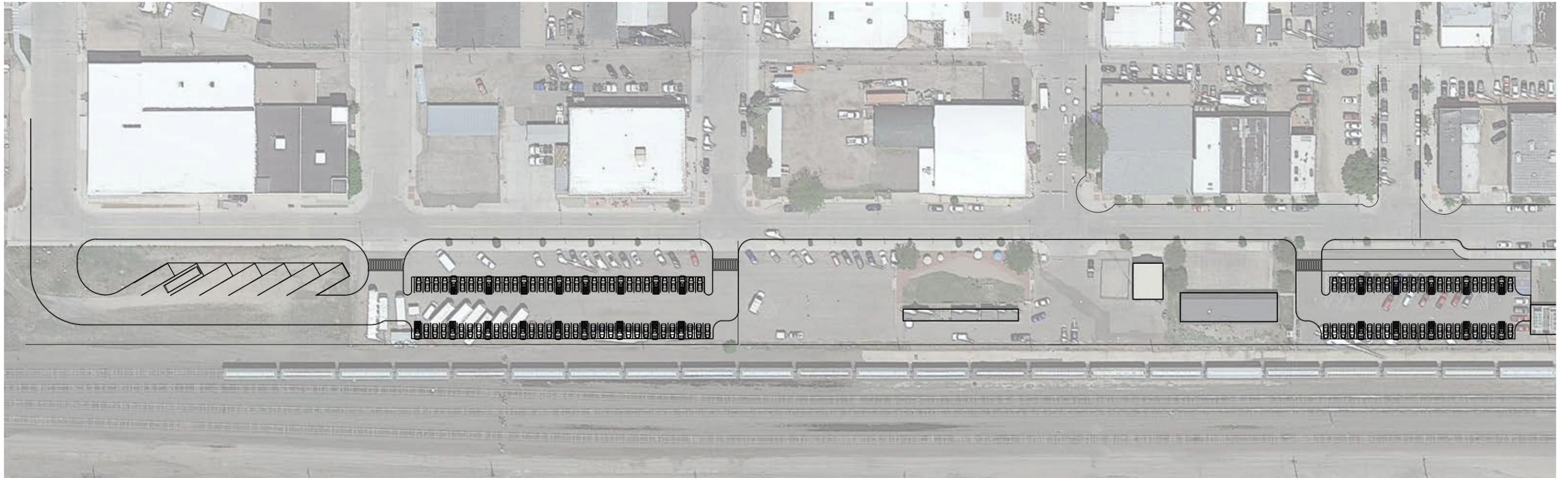


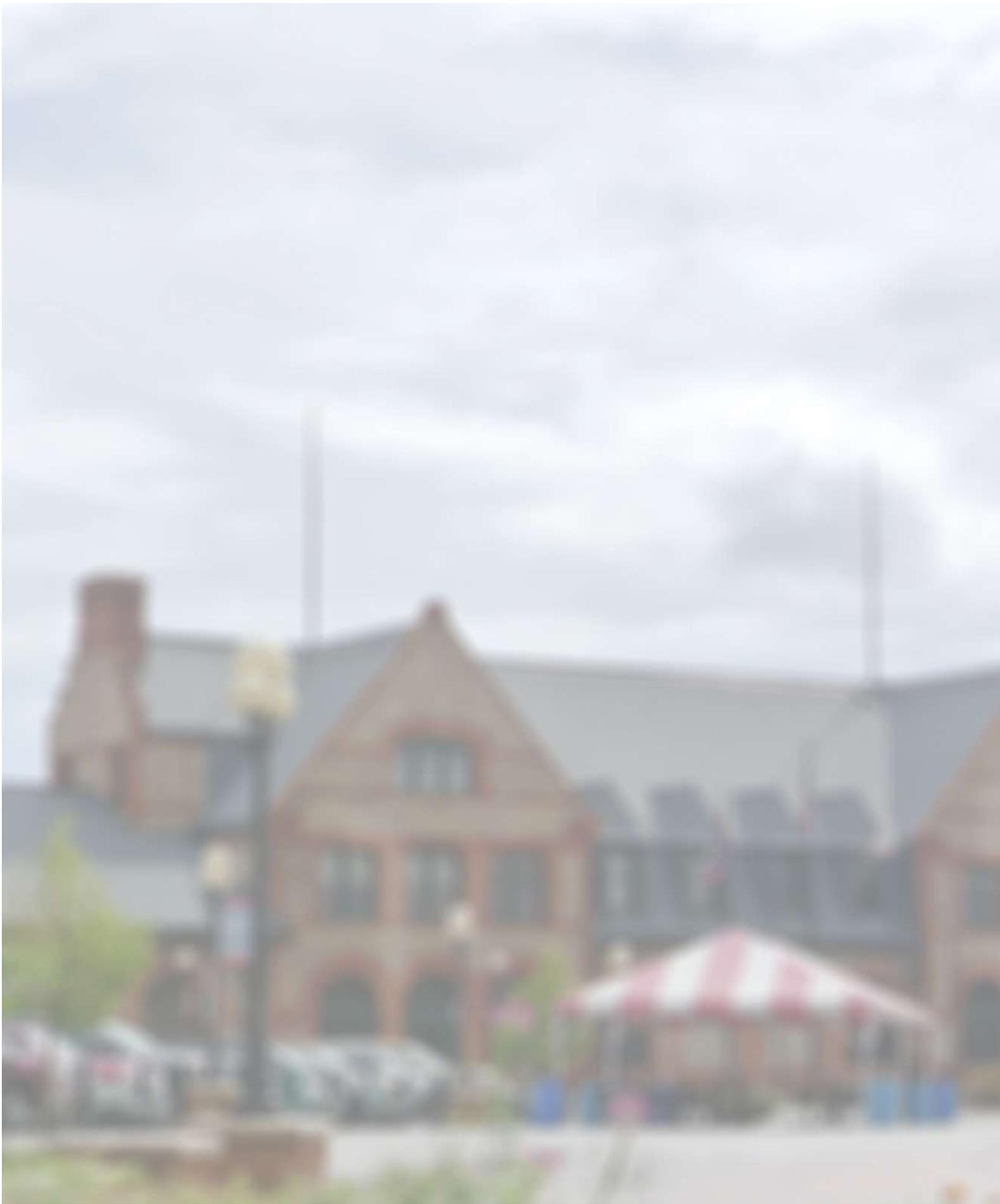














# 4

## Architectural Narrative

Precedent Studies

Phase 1A

Phase 1B

Phase 2

Roundhouse - Future Phases

# 4

## ARCHITECTURAL NARRATIVE

### Architectural Narrative:

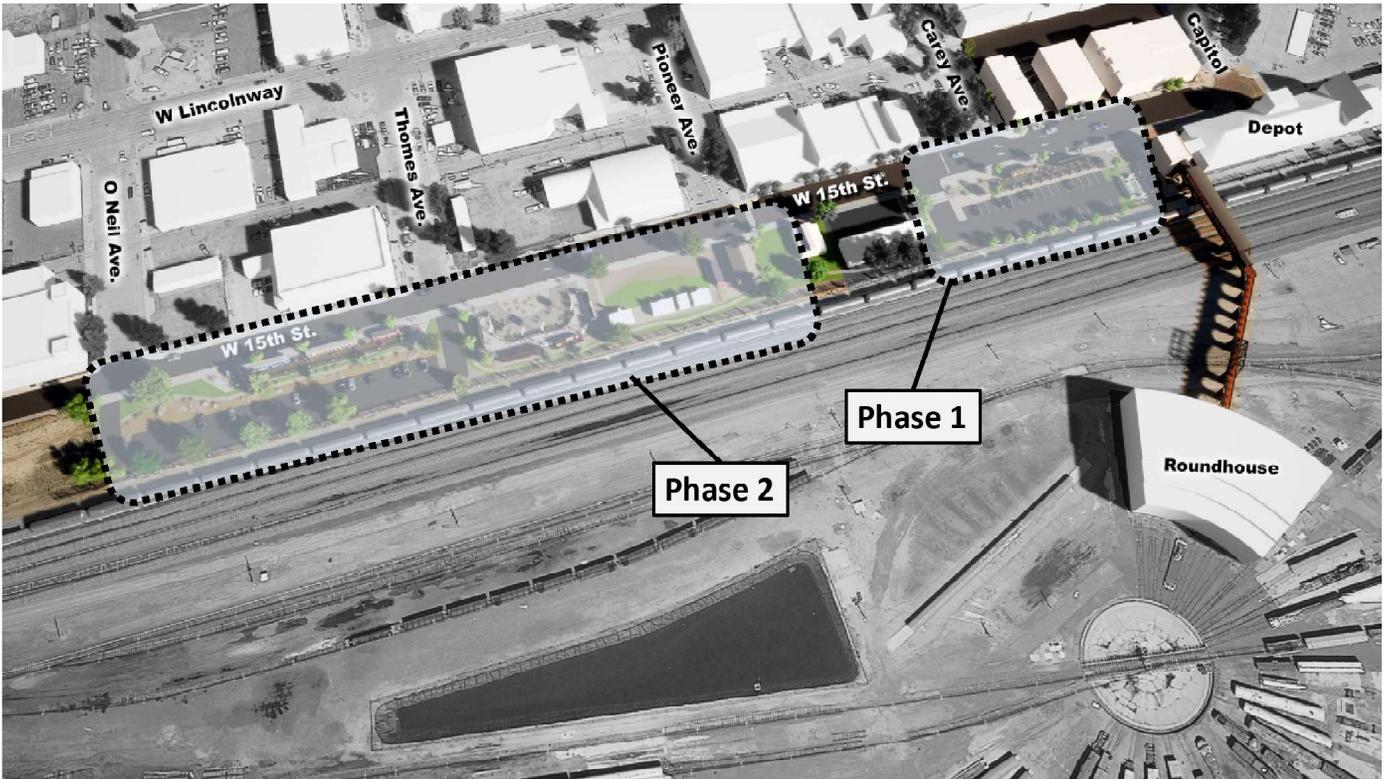
**Precedent Studies:** Exploring previous examples of converted railway traincars was an important aspect of this project. The design team was able to garner a lot of different examples from across the United States. These all began to inform the team what styles, architectural language, and types of projects could be successful in Cheyenne, and ultimately led to the conceptual images that were created.

Some of the precedent images...

WORK IN PROGRESS

*Images Opposite Page: These are some of the existing railway cars that are candidates to be renovated, transported, and installed at one of the new 15th street sites. A 3rd party team who specializes in historic preservation and the relocation of railway cars will need to be contracted by the City to facilitate the move.*





WORK IN PROGRESS



*Image above: This photograph illustrates a particular importance concept for renovating railway cars. It looks as though the historic nature of the car was preserved, while providing a new modern roof structure that incorporates the car and provides a shelter for the user. This concept was used in creating the imagery for phase 1B, which could potentially be the “food court” or “outdoor courtyard”.*

*Image to the Right: Another view of the dining area with the railway car abutting the raised boardwalk. This particular location is complete with outdoor seating and a full bar, all made possible by the roof structure overhead.*



*Photo to the right: This group of railway cars was renovated, complete with a raised boardwalk, to become a series of leasable retail spaces. These types of ideas have been examined for the 15th street project, although preserving the historical integrity of the train cars is of utmost importance.*



*Photo to the right: This is a continuation of the photograph above. The boardwalk ties the railway cars together, providing a unified experience. This has been a main concept for all phases of the 15th street improvement project.*



*Photo to the right: This railway car sits by itself, and has received a full renovation, complete with a private deck/entrance. Although not necessarily appropriate for the 15th street project, the idea of providing more private spaces for patrons was explored.*





*Photo to the left: This railway car was renovated into a diner restaurant, with an elevated boardwalk providing patrons easy access. The car itself maintains its historical aesthetic, lending to the experience.*



*Photo to the left: This railway car looks as though it is still in operation. The faux track, lights, and fencing all lend to the appearance. Having outdoor tables nearby gives the user an authentic close up view of the train; another idea that the 15th street improvements hope to capitalize on.*



*Photo to the left: Another idea, quite different than restaurant/dining, is that of a private dwelling. This railway car received a complete interior renovation, which can likely be rented out to the public for overnight usage. This particular idea could be realized in the phase 2 portion of the 15th street project.*





























Roundhouse Concept: XXX

WORK IN PROGRESS



**WORK IN PROGRESS**

WORK IN PROGRESS

PROGRESS