

ENHANCING WALK ABILITY IN MEDORA

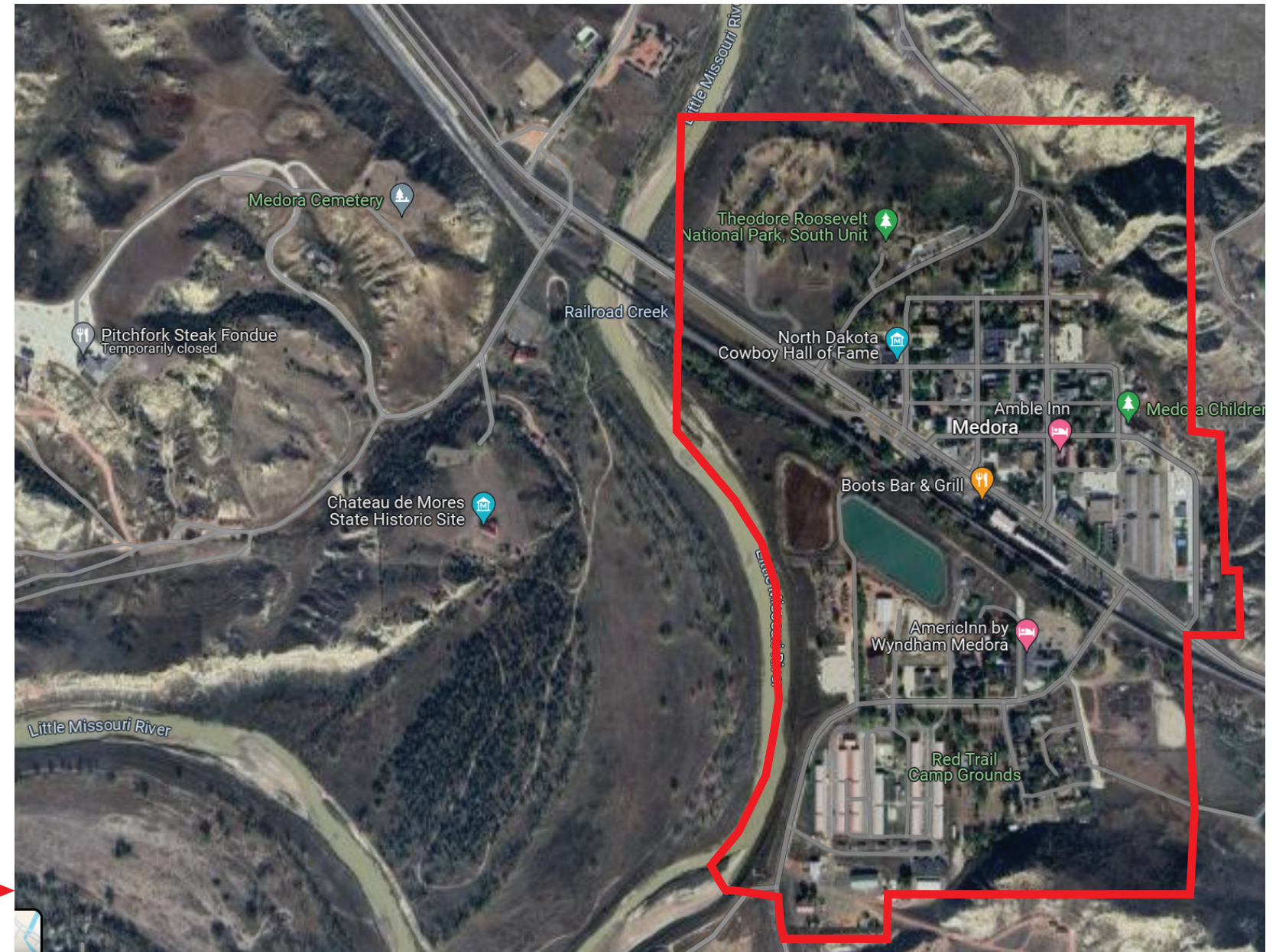
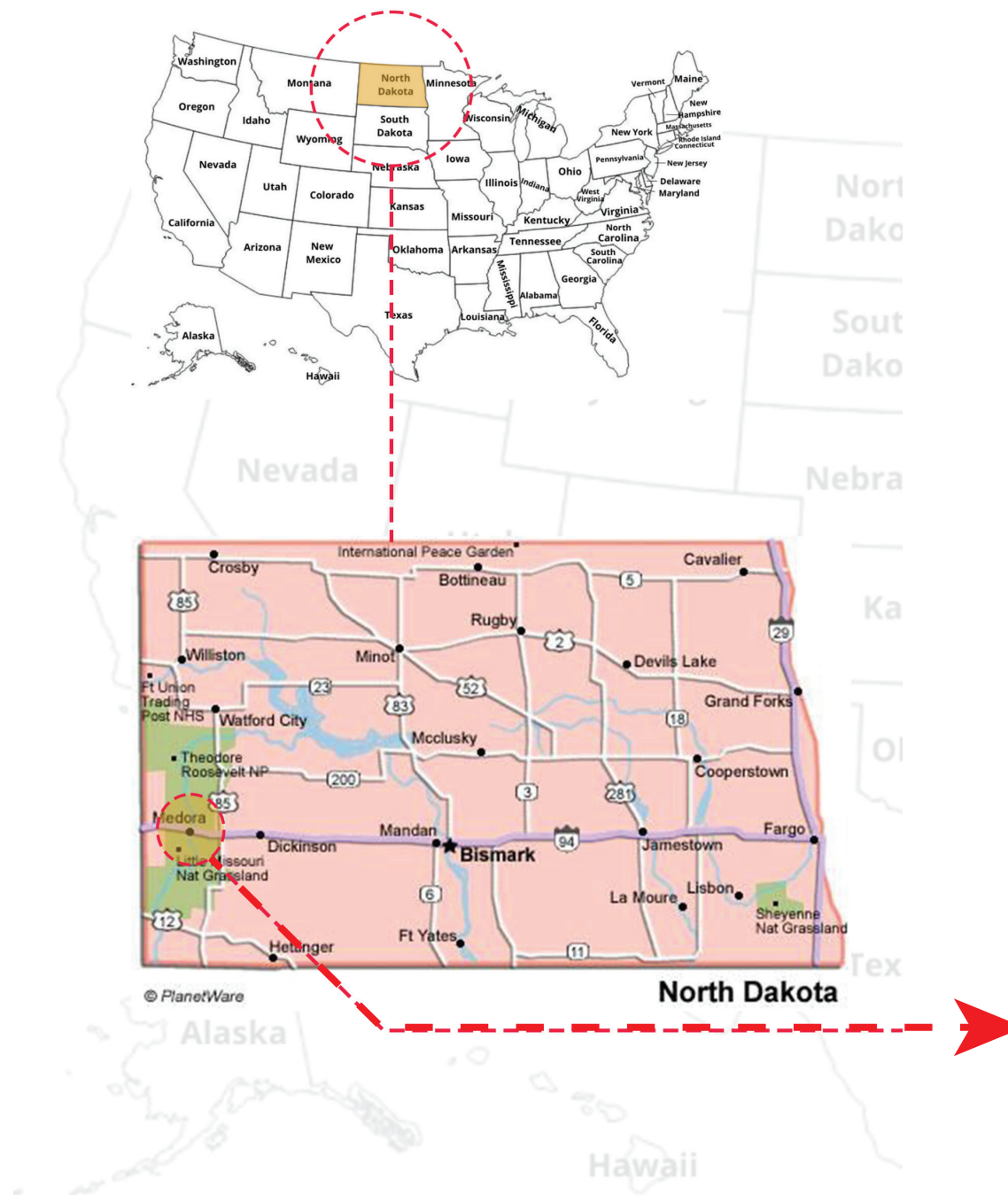
Analyzing Mobile Phone Data to Improve Walk ability and Identify Critical Infrastructure Needs For Rapid Growth



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Spring 2024

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Site Location



Medora , North Dakota





Medora Musical outdoor Theatre

Theodore Roosevelt National Park

What's makes the Medora Beautiful?



Maah Daah Hey Trail

Badlands of Medora

What's makes the Medora Beautiful?



Horse Riding Area

Theodore Roosevelt Presidential Library

What's makes the Medora Beautiful?



Narrow sidewalks

Lack of Canopy Street Tree for Buffer

Drainage towards River

Current Problem Facing

Current Problem Facing

Theodore Roosevelt Presidential Library



After completion of Theodore Presidential Library it is expected
So it can be said Medora is going an urbanization.

Will Increase
No. of Visitors

So, the town needs to **enhance its walk ability, amenities, and infrastructure** to maintain the growing number of visitors

No Safe Crossing Markup



Problem Statements

How can Medora effectively balance the provision of necessary amenities for its growing number of tourists while simultaneously enhancing the city's walkability to sustain and potentially increase visitor numbers?

Introduction about Medora City





Theodore Roosevelt National Park

(Source: Google)



Badlands View
(Source :Google)



City View
(Source: Google)



View from National Park

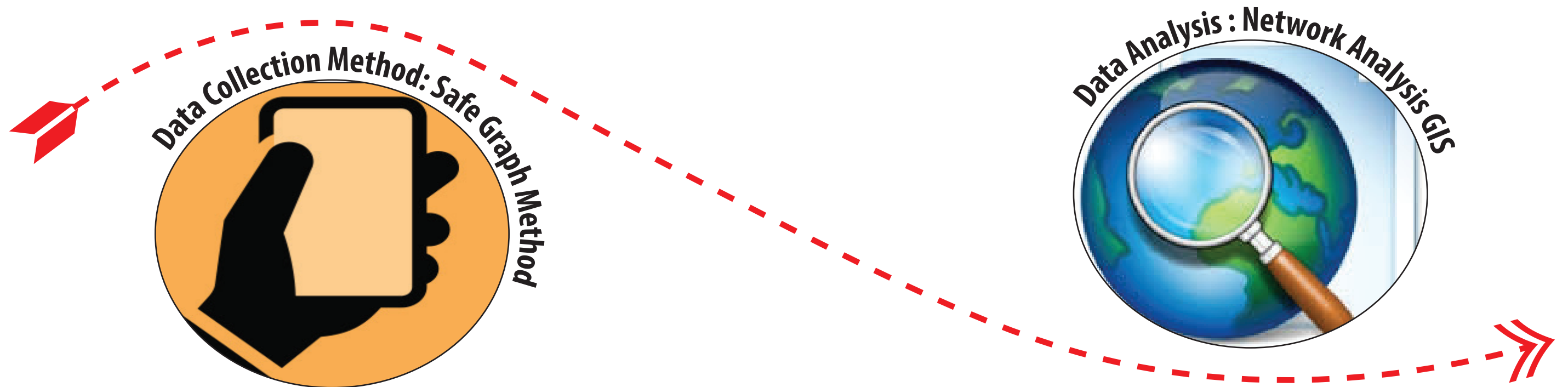
Research Methodology

PREMISE:

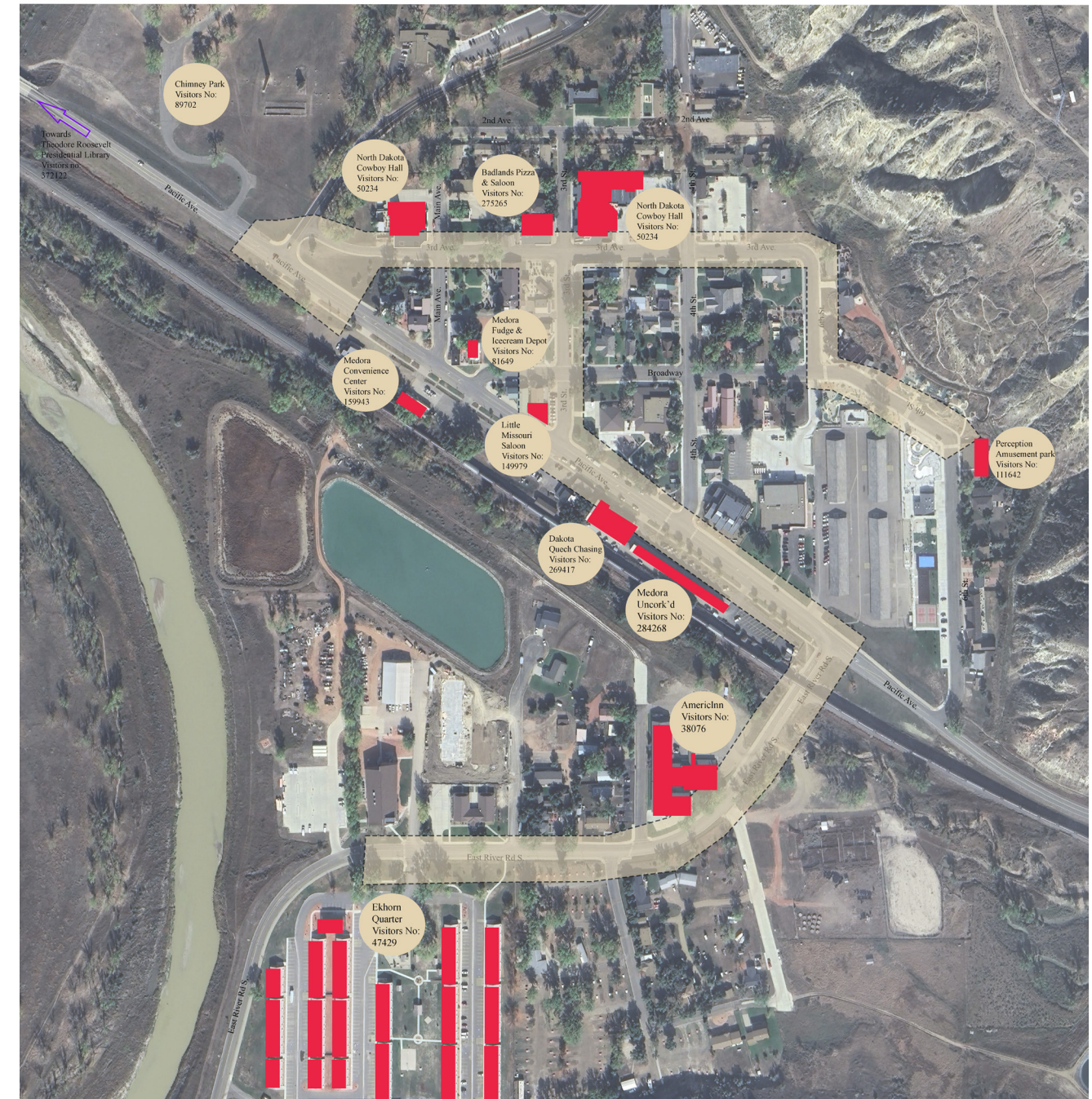
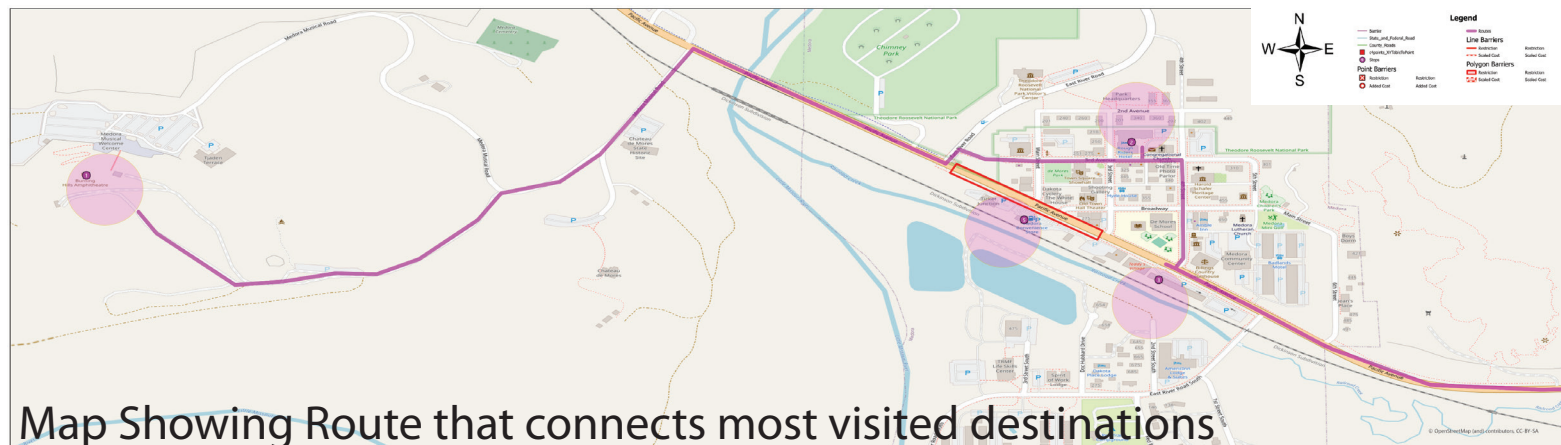
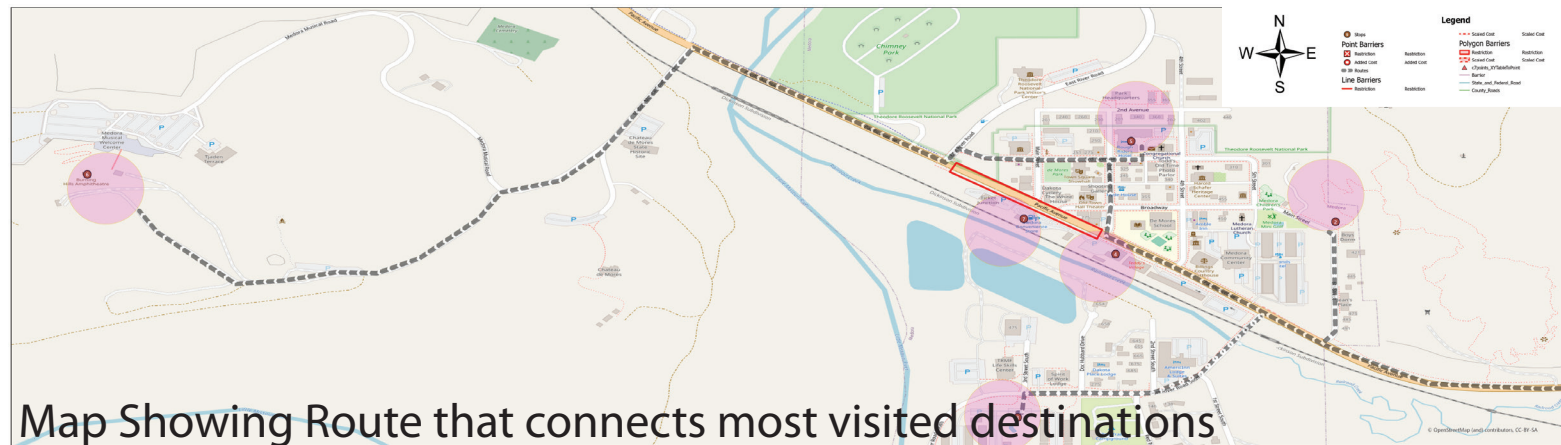
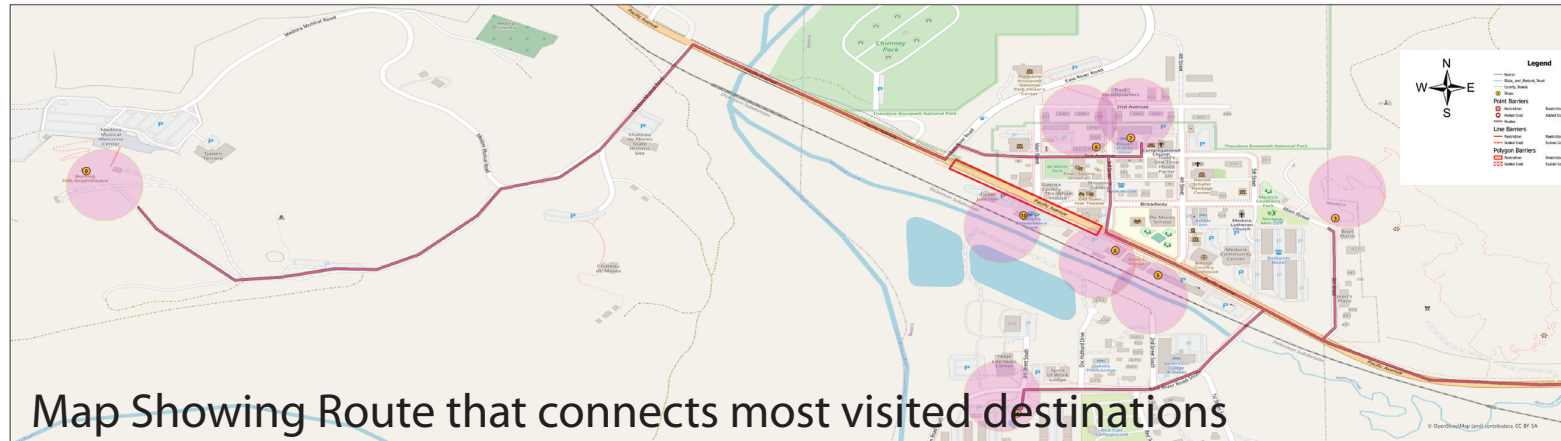
This thesis focuses on Medora, North Dakota, which is undergoing rapid growth in its city life. We realize the need to improve city walking and determine what critical items the city requires. As the city grows, it is critical to have places where people can stroll freely, making the city a good and sustainable place to live.

RESEARCH METHODOLOGY:








We use **mobile phone data** to learn about **how people travel about the city, identify congested regions, and determine where the city needs to improve its infrastructure**. We aim to understand how people walk and how traffic moves in Medora by looking at anonymized cell phone data. These data are evaluated using ArcGIS to determine the shortest and safest path connecting all the high-potential sites. This enables us to design smart plans based on data to improve walking and guarantee that the city builds the correct things as it grows.



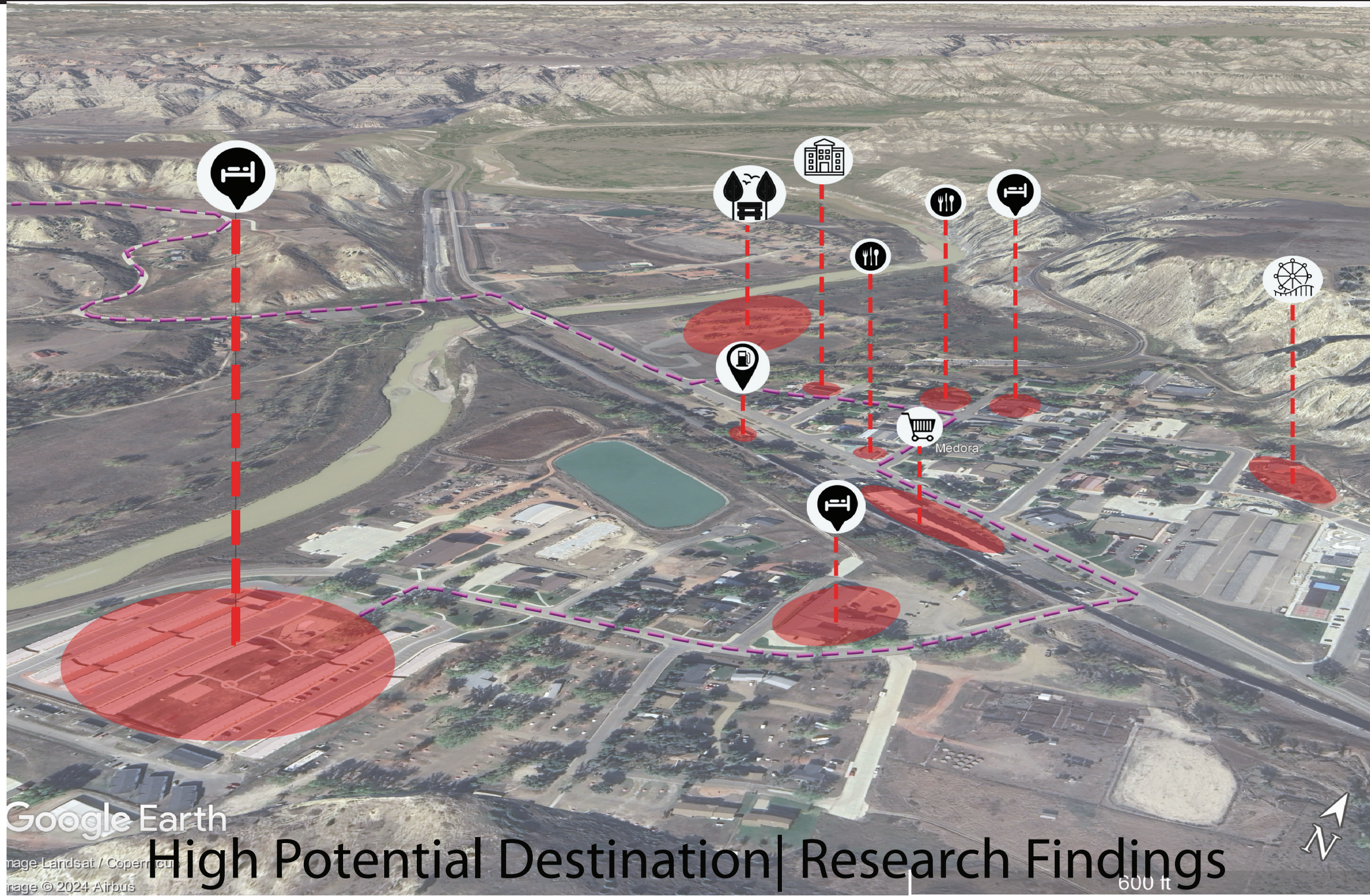
Research Analysis



Research Findings

-  Accommodation
-  Shopping/Grocery
-  Amusement Park
-  Park
-  Restaurant
-  Hall
-  Gasoline Stations

Category	No of Visitors per Year
Traveler Accommodation:	128071
Shopping/Grocery :	1295867
Amusement Park :	111642
Gasoline Station:	159943
Restaurant :	275265
Hall :	50234



Google Earth

Image Landsat / Copernicus
Image © 2024 Airbus

High Potential Destination | Research Findings

600 ft



Identified Project Objectives

1. Pedestrian Walk Ability
2. Identifying Critical Infrastructure Needs
3. Community Involvement

OBJ 1 : Pedestrian Walkability Pedestrian Pathway

Inventory

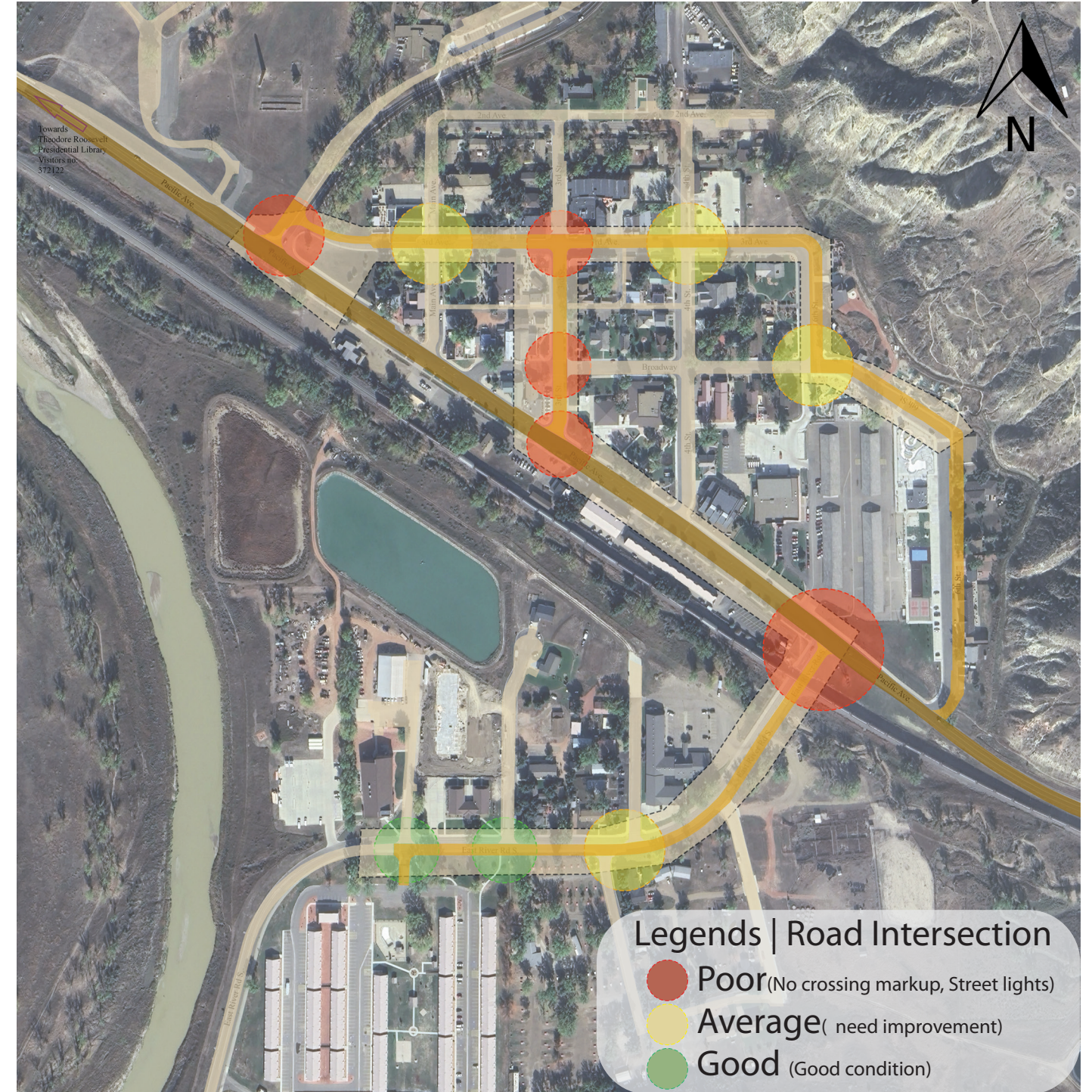
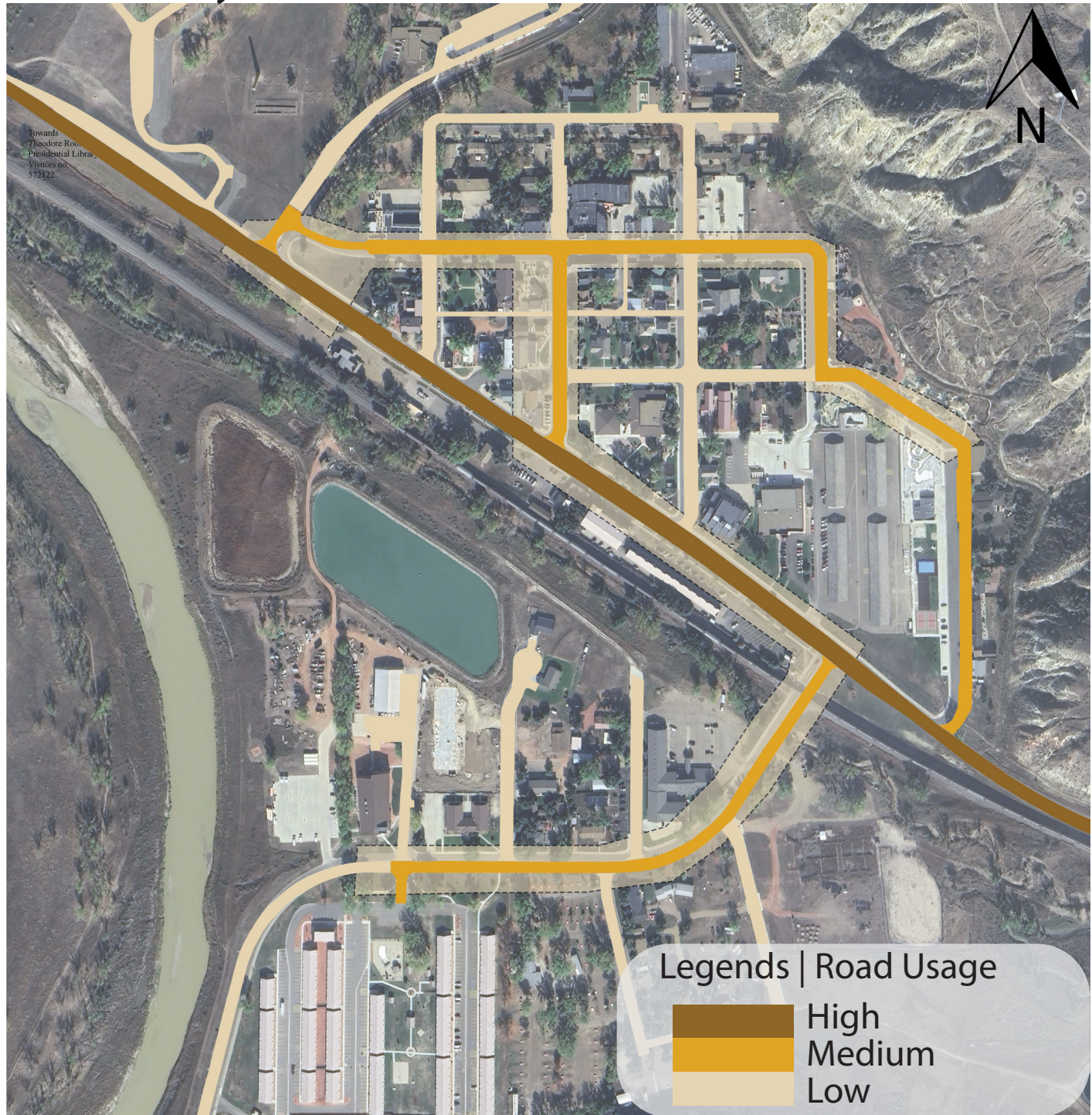
Analysis



OBJ 1 : Pedestrian Walkability Road Intersection

Inventory

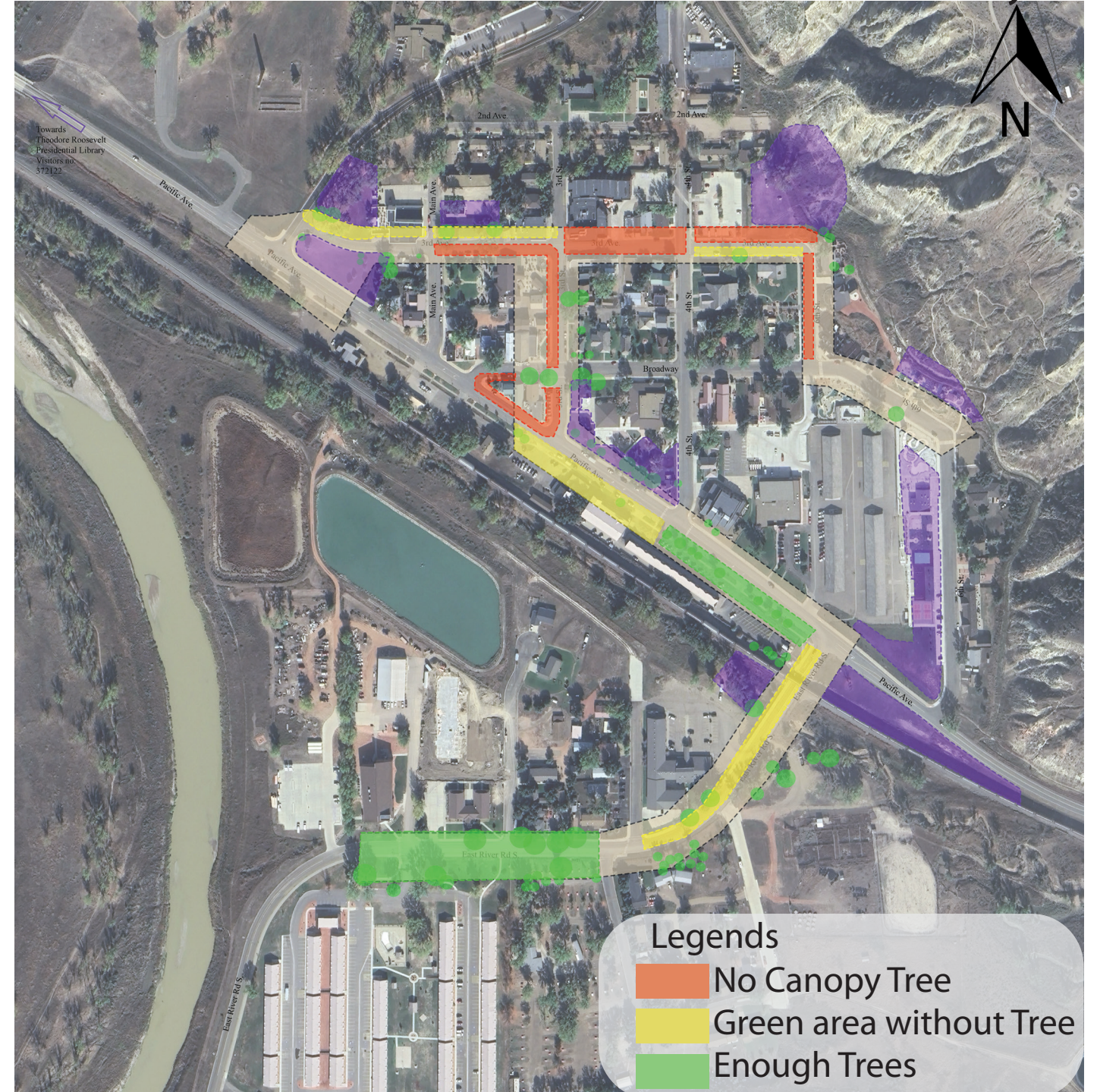
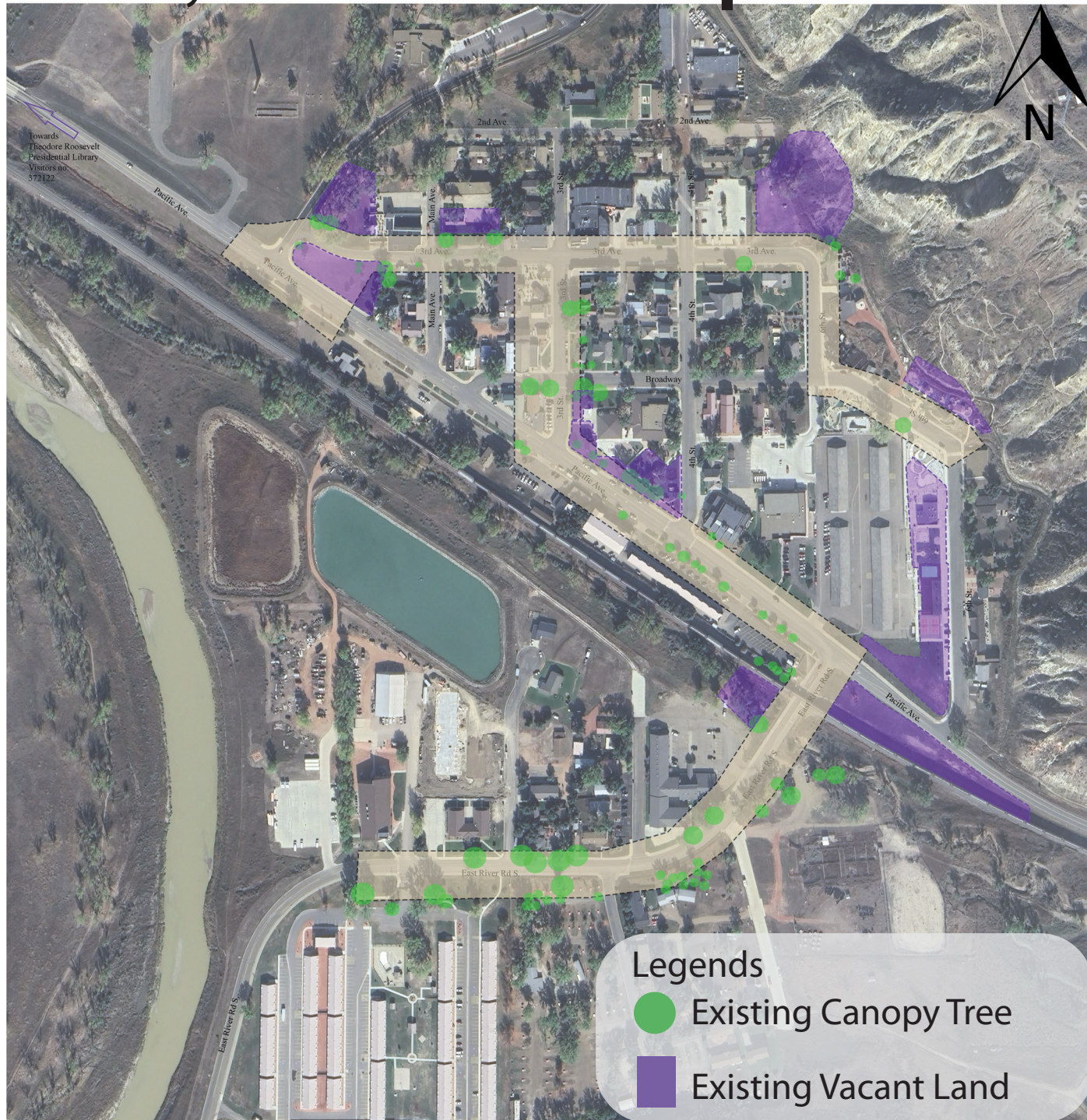
Analysis



OBJ 2 : Identifying Critical Infrastructure Landscape & Manmade Structure

Inventory

Analysis

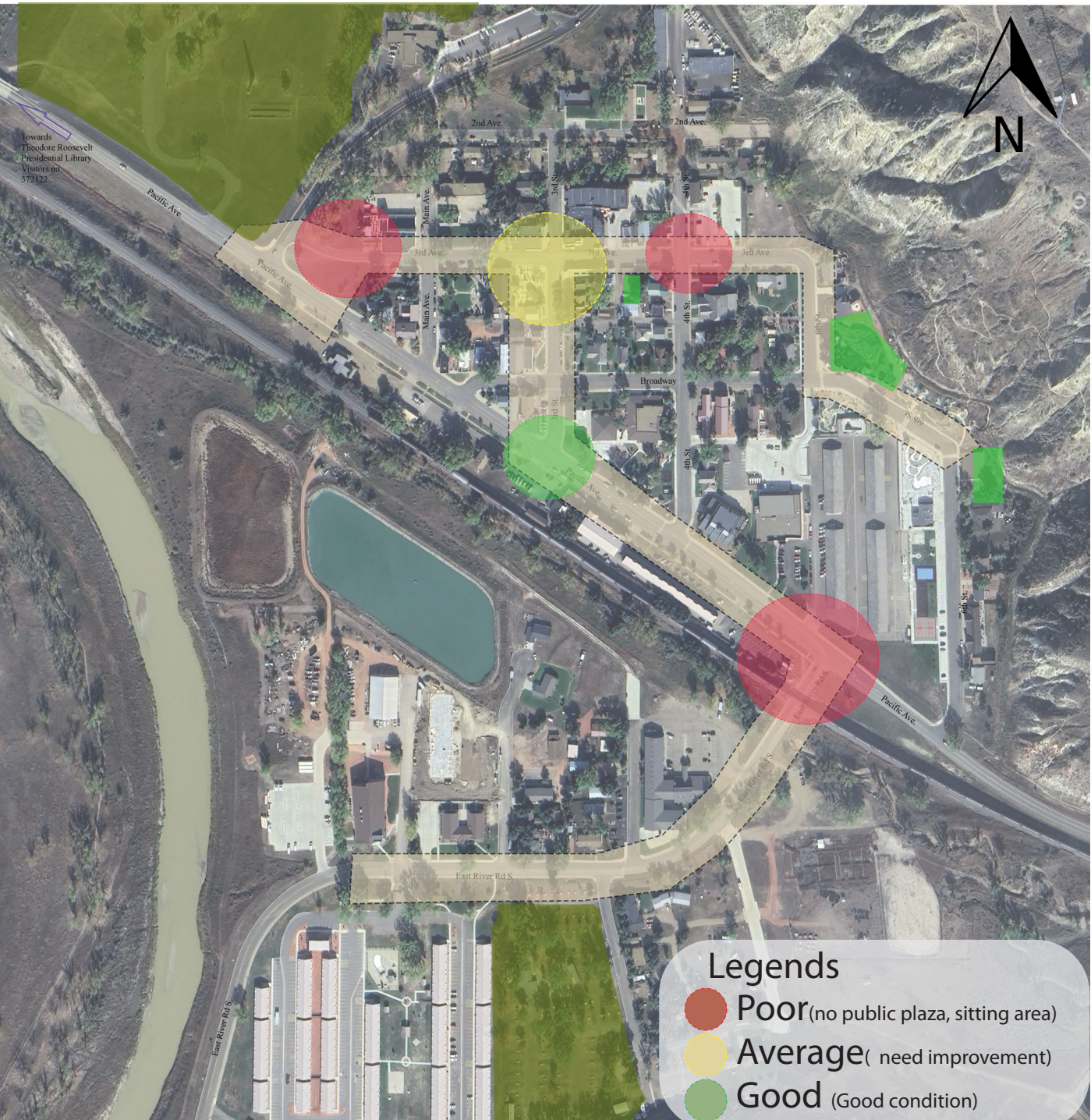


OBJ 3 : Community Involvement

Community Involvement

Inventory

Analysis



Program Elements

OBJ 1 : Pedestrian Walk ability

- 1.1 Proper Crossing Markup
- 1.2 Increasing Side Walks Width
- 1.3 Street Furniture(Benches,Streetlights)
- 1.4 Street Signage
- 1.5 Bicycle Lane
- 1.6 Curb Ramps
- 1.7 Elevated Crossing Pathway
- 1.8 Entry Gate
- 1.9 Green Buffer Between Streets & Sidewalks

OBJ 2 : Identifying Critical Infrastructure Needs

- 2.1 Emergency Service Center
- 2.2 Storm Water Management(Rainwater, Bioswale, Roofgarden)
- 2.3 Additional Gas Station
- 2.4 Bike Rent Area
- 2.5 Canopy Trees on the Sides
- 2.6 Water body (Water Fountain, Water Treatment)
- 2.7 Parking

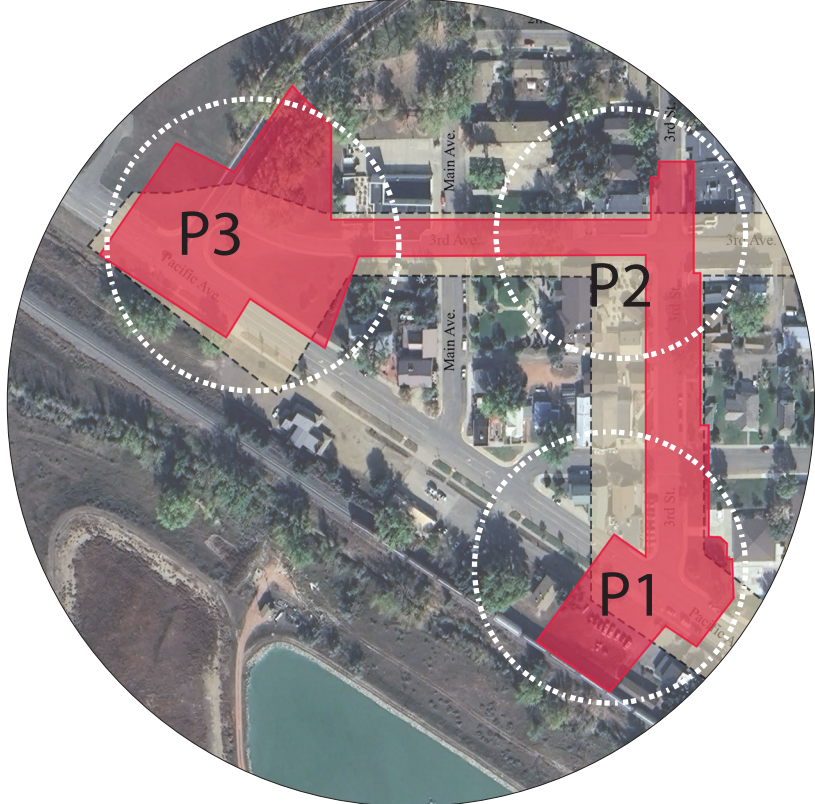
OBJ 3 : Community Involvement

- 3.1 Playground
- 3.2 Community Gathering Spaces
- 3.3 Communities Libraries
- 3.4 Communities Garden
- 3.5 Flexible Communities Event Spaces
- 3.6 Public Plazas

Vision Plan

The neighborhood faces several issues that impact daily life. There are no proper pedestrian pathways, making it challenging for people to walk safely. Most areas lack greenery, and there are no parks for residents to enjoy. The absence of critical infrastructures is noticeable, affecting the overall functioning of the community. Crossing intersections need improvement for better safety and efficiency. Moreover, there is a lack of proper signage, making navigation difficult, and no designated community gathering spaces, hindering social interactions. Addressing these concerns is essential for creating a more comfortable and vibrant living environment.

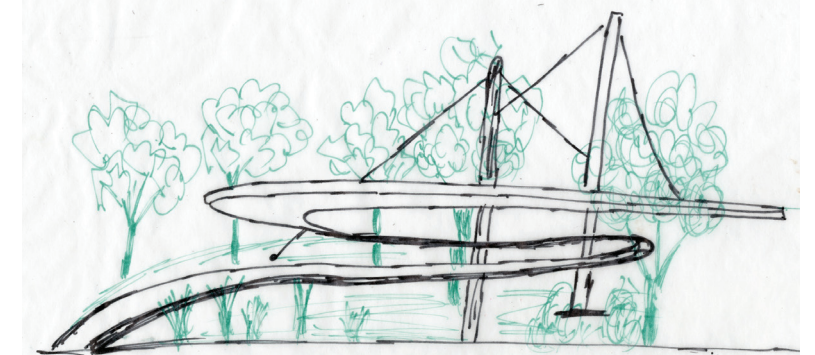
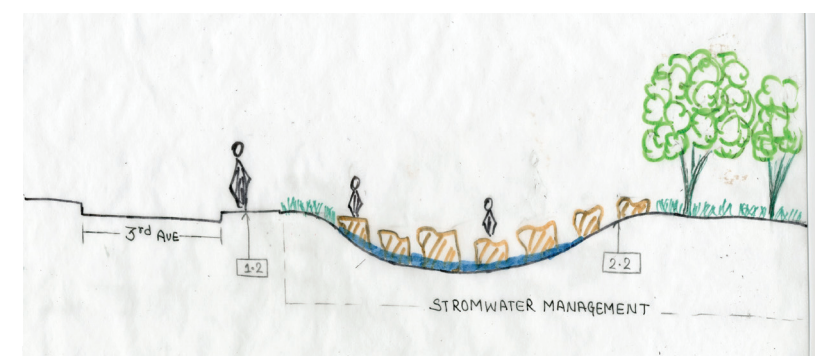
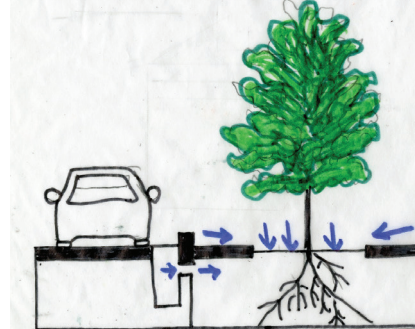
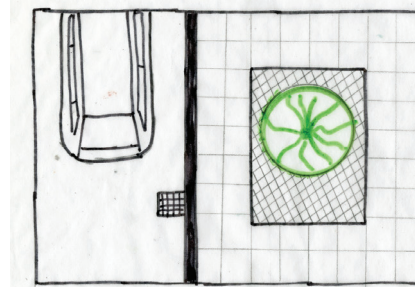
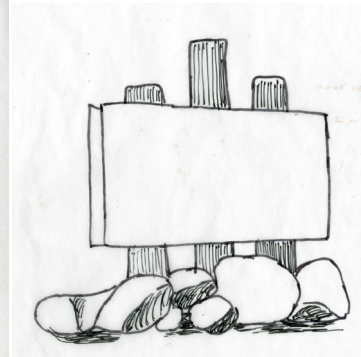
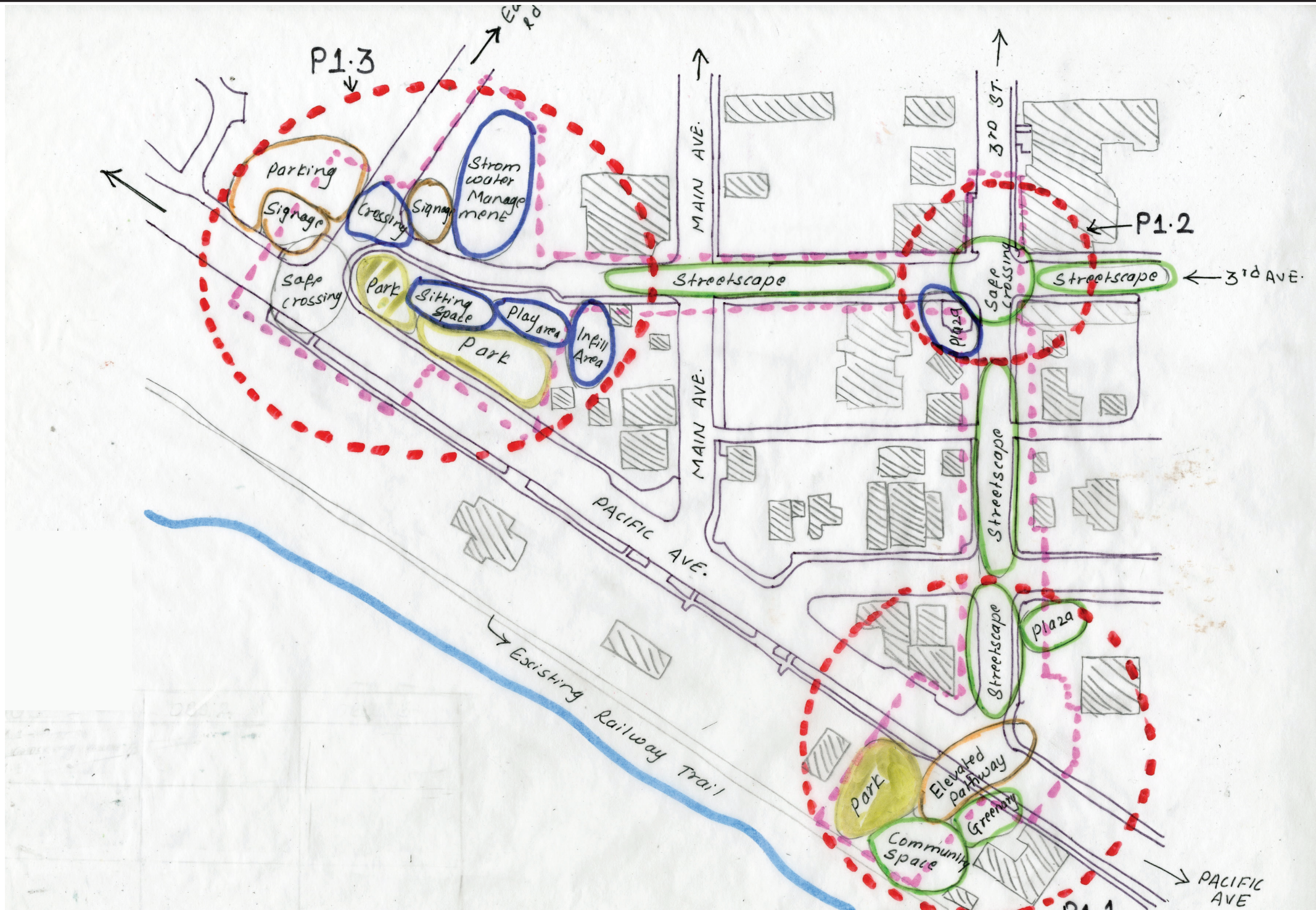
Thesis Site Location



The area is subdivided into 3 regions.

- P1 Gateway Medora:
Enhancing Arrival Experiences
- P2 Intersection Revival:
Transforming Crossroads for Community
- P3 Nature's Resilience Park:
Innovating Storm water management

Design Concept



Masterplan



P2 Intersection Revival: Transforming Crossroads for Community



P1 Gateway Medora: Enhancing Arrival Experiences

KEY NOTES:

- 1. Pedestrian Bridge
- 2. Public Plaza



P3 Nature's Resilience Park: Innovating Storm water Management

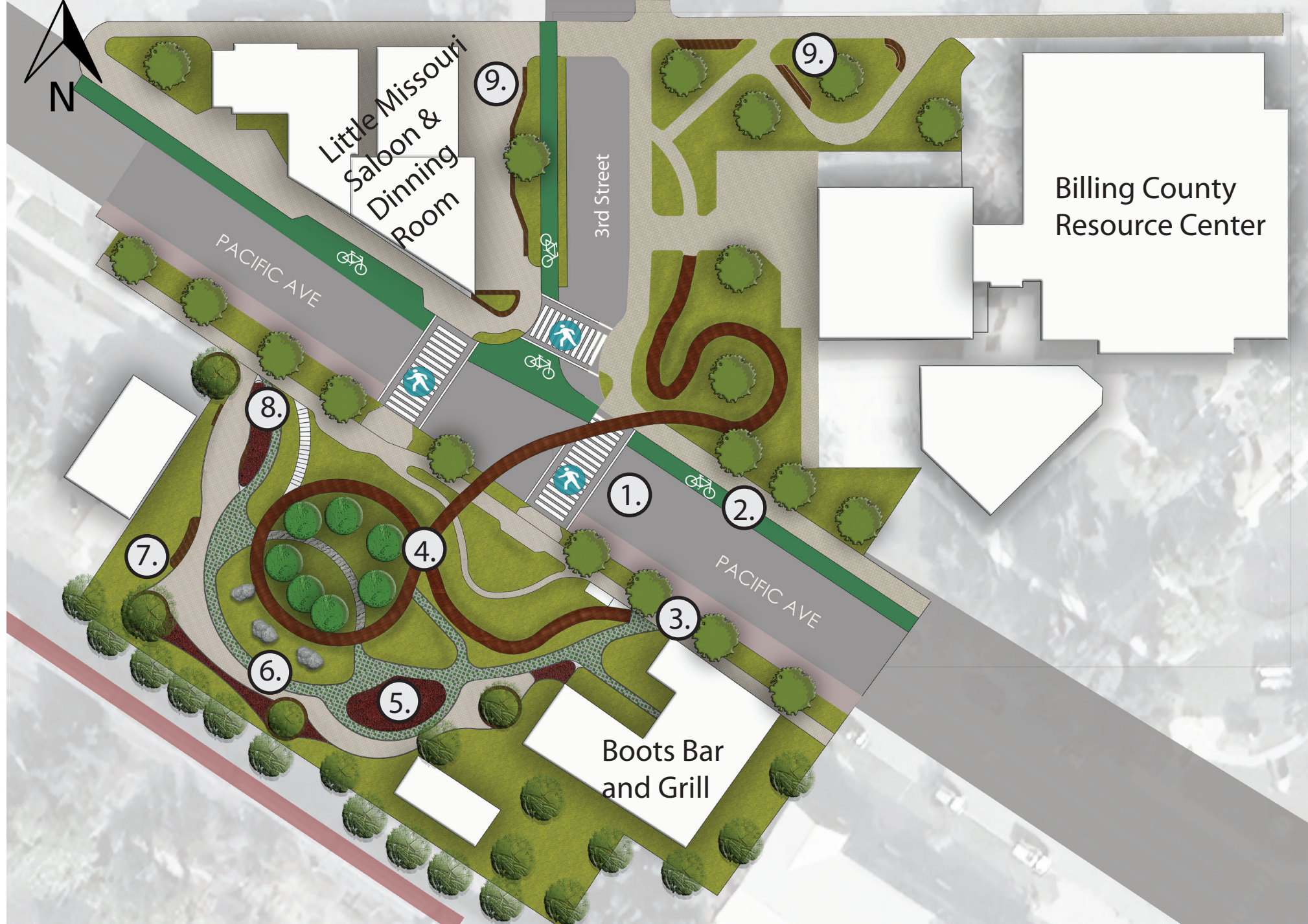
KEY NOTES:

- 1. Children's Playing Area
- 2. Silcrete Rock Sitting Area
- 3. Parking
- 4. Storm water Collection

Explanation

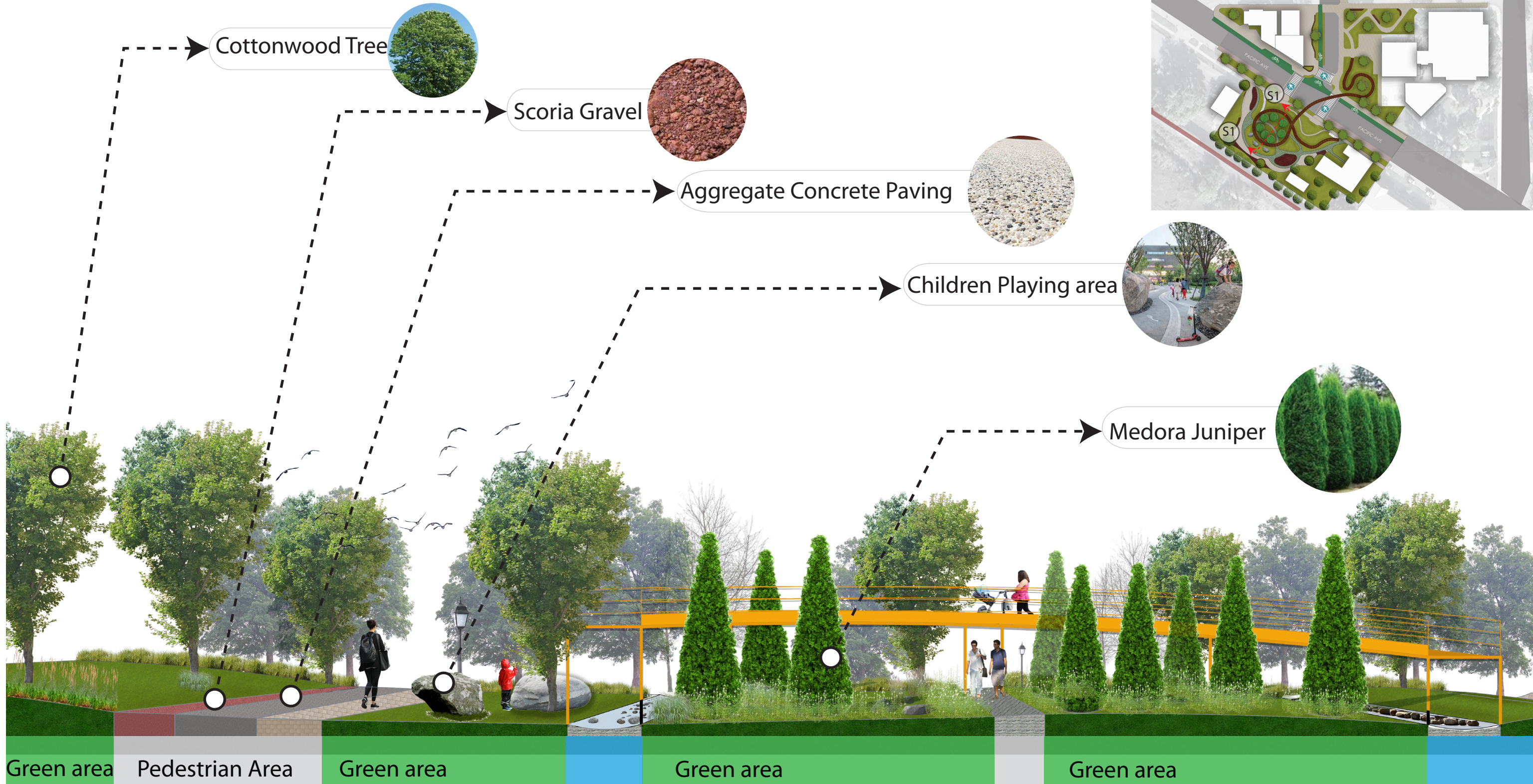
- Discontinuity among pedestrians identified in site analysis
 - Dedicated walkway needed for safe passage
 - Existing pathways too narrow
 - Widening to minimum of 6 feet necessary for enhanced safety and usability
-
- Current streets lack sufficient canopy trees
 - Recommendation to introduce additional canopy trees
 - Aim: Enhance the overall street environment
-
- Lack of community gathering spaces and playgrounds tailored for adults
 - Absence of community libraries noted
 - Proposal to incorporate these elements for enhanced diversity and inclusivity of recreational

Site Plan of P1 Gateway Medora



Site Plan Key

- ① Safe Crossing Design
- ② Bicycle Lane
- ③ Canopy Tree
- ④ Elevated Pedestrian Bridge
- ⑤ Scoria Gravel
- ⑥ Stone Boulder for Children Playing
- ⑦ Sitting Area
- ⑧ Stairs toward Bridge
- ⑨ Public Plaza



Sectional Elevation at S1/S1



Cottonwood

Medora Juniper

Silver Sage

Scoria Gravel

Stone Boulder

Blue Grama

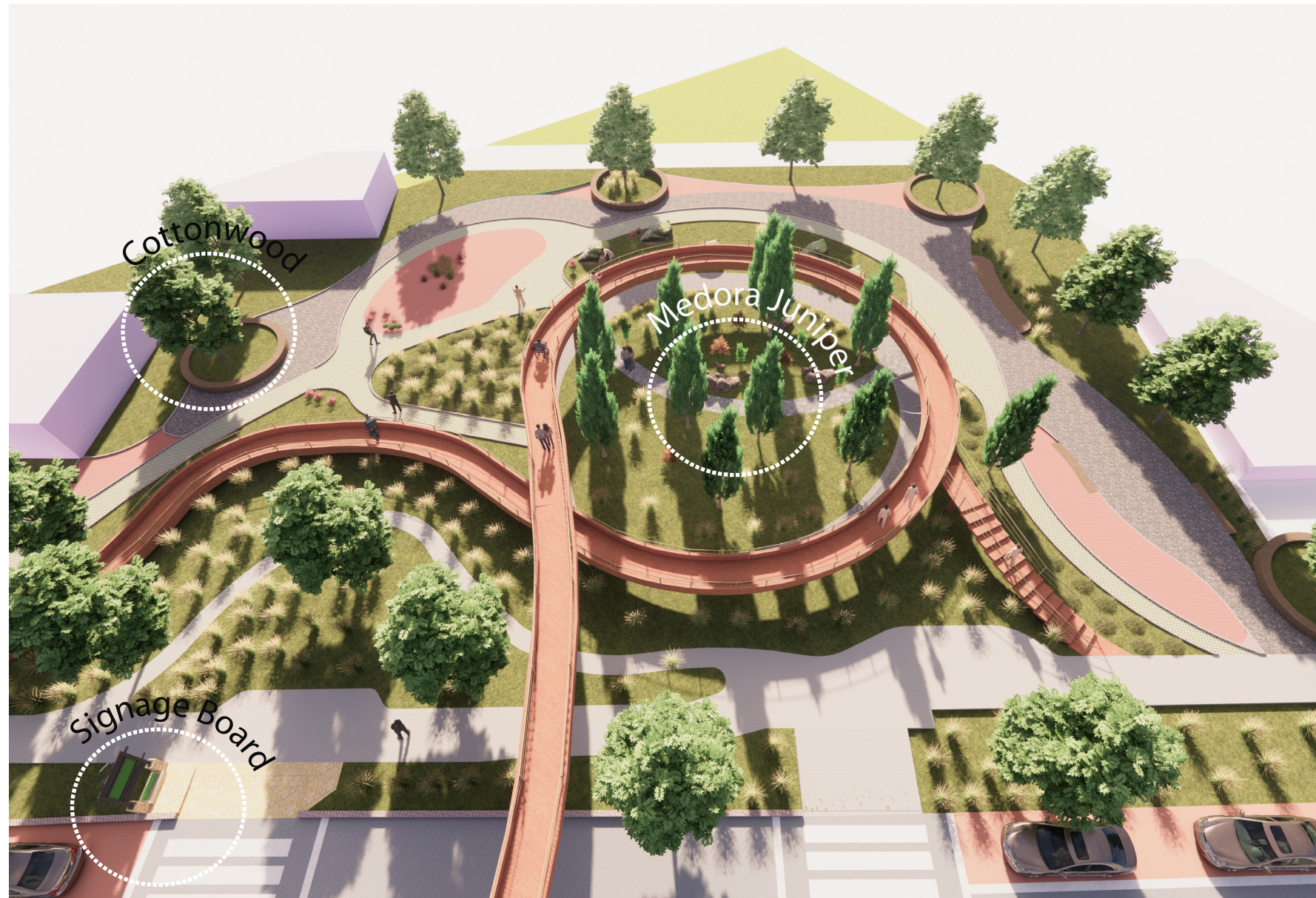
Bridge in shape of Tree
Support for
pedestrians

Sitting Area

P1.1 | View from Seating Space near Boots Bar & Grill

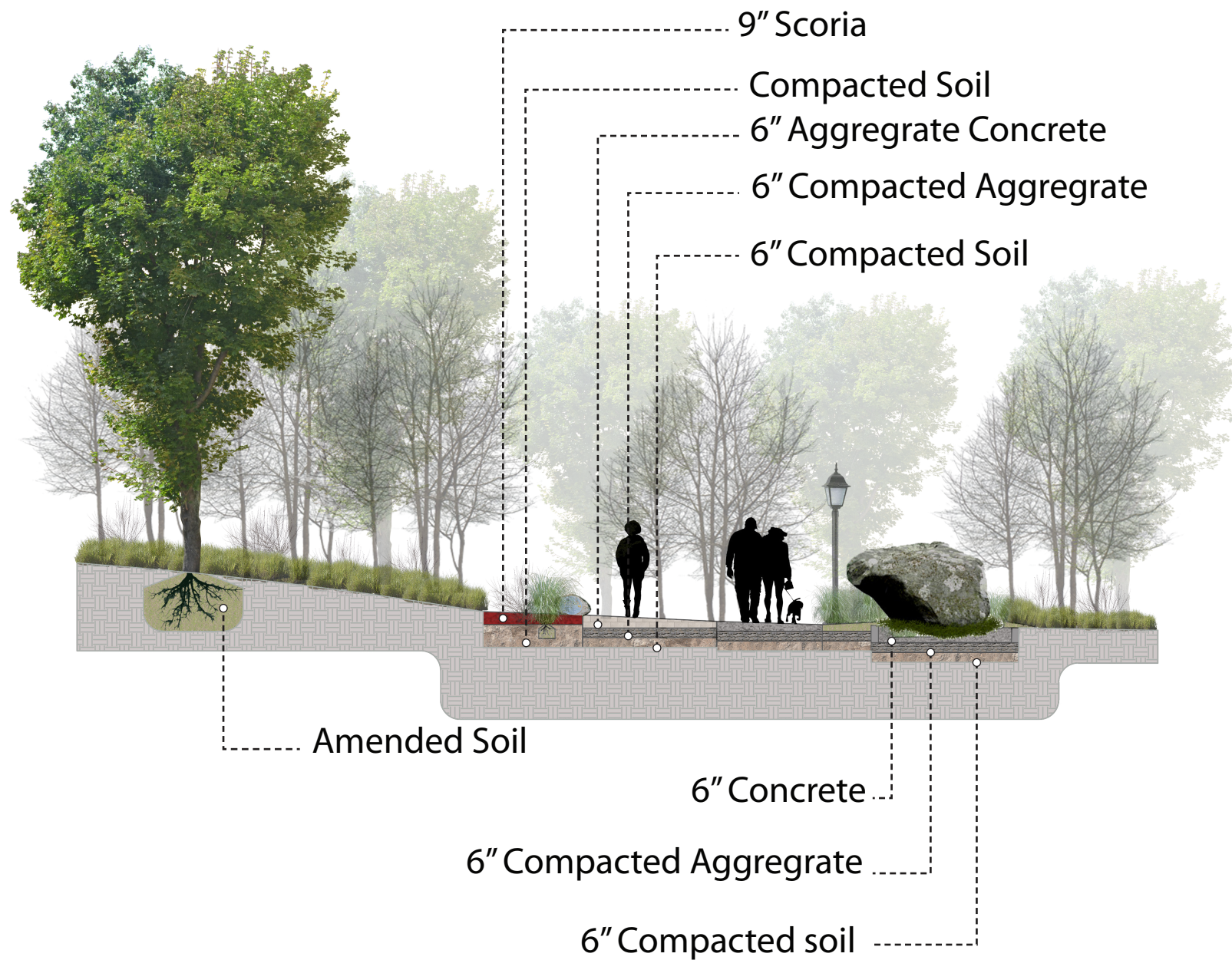
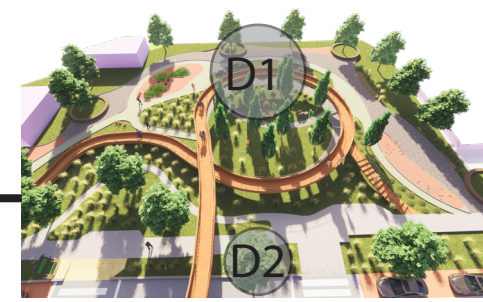
Why elevated bridge is **NEEDED?**

- For **Landmark**
- Bridge shaped like a **snake for natural integration**
- Offers **breathtaking views** of Medora landscape from its highest point
- Circular loop with **evergreen trees and walkway for serene experience**
- Attracts visitors to enjoy the **beauty of the city and nature.**

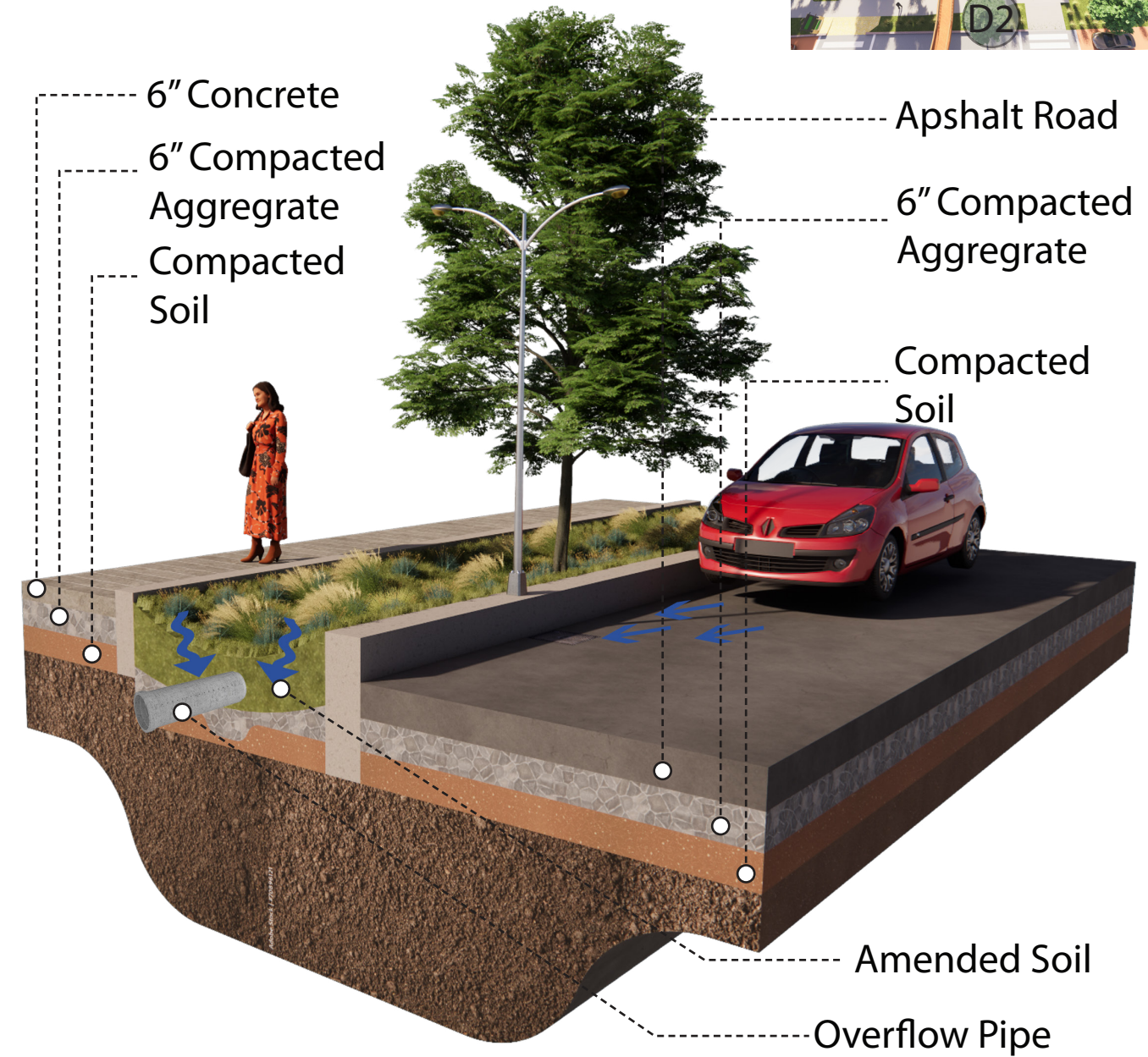


P1.2| Aerial View of Elevated Bridge

Construction Detail Drawing

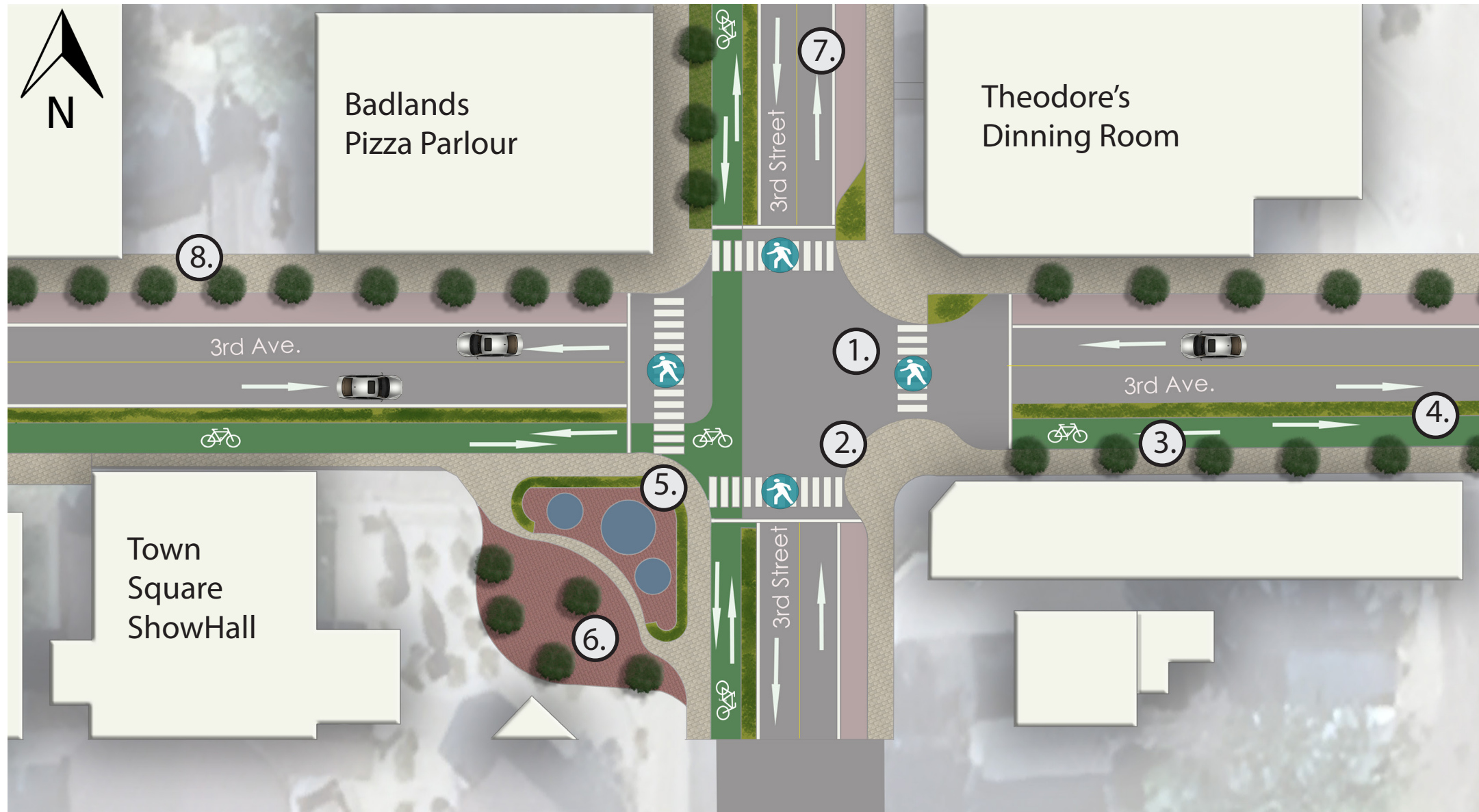


D1 | Detail Drawing at Paving



D2 | Detail Drawing of Bioswale

Site Plan of P2 Intersection Revival



Site Plan Key

- ① Safe Crossing Design
- ② Curb Extension
- ③ Bicycle Lane
- ④ Green Buffer Area
- ⑤ Water Fountain
- ⑥ Public Plaza
- ⑦ Street Parking
- ⑧ Street Canopy



Traffic Lights For Vehicles

Traffic Lights for Pedestrian

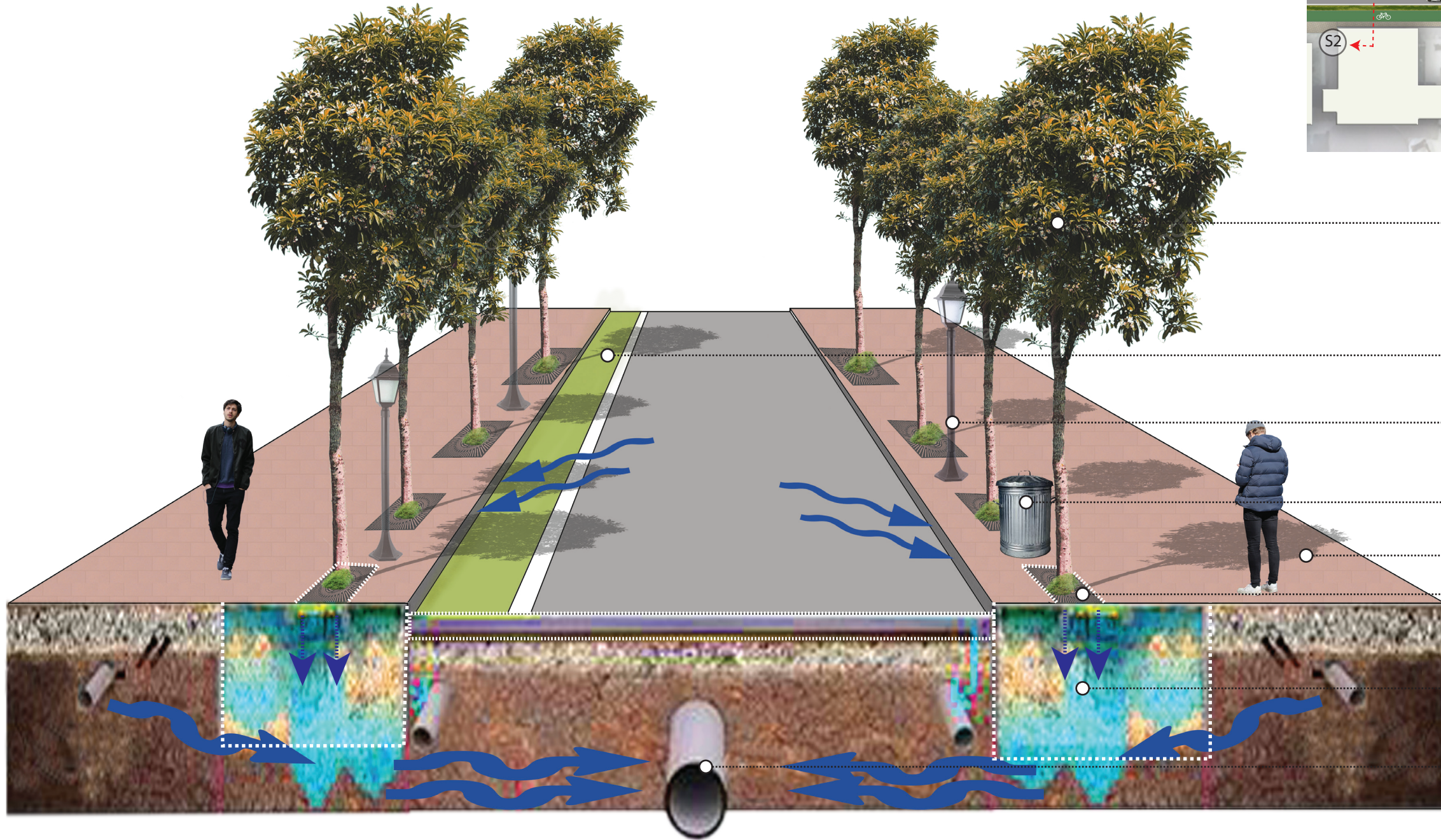
Water Fountain

Bicycle Lane

pairie Rose

Safe Crossing Markup

P2.1 | Looking NW from 3rd Street to show Safe Crossing Design



- Quaking Aspen
- Bicycle Lane
- Light for Street
- Trash Bin
- Pedestrian Walkway
- Tree Pit
- Water Collection
- Overflow Pipe

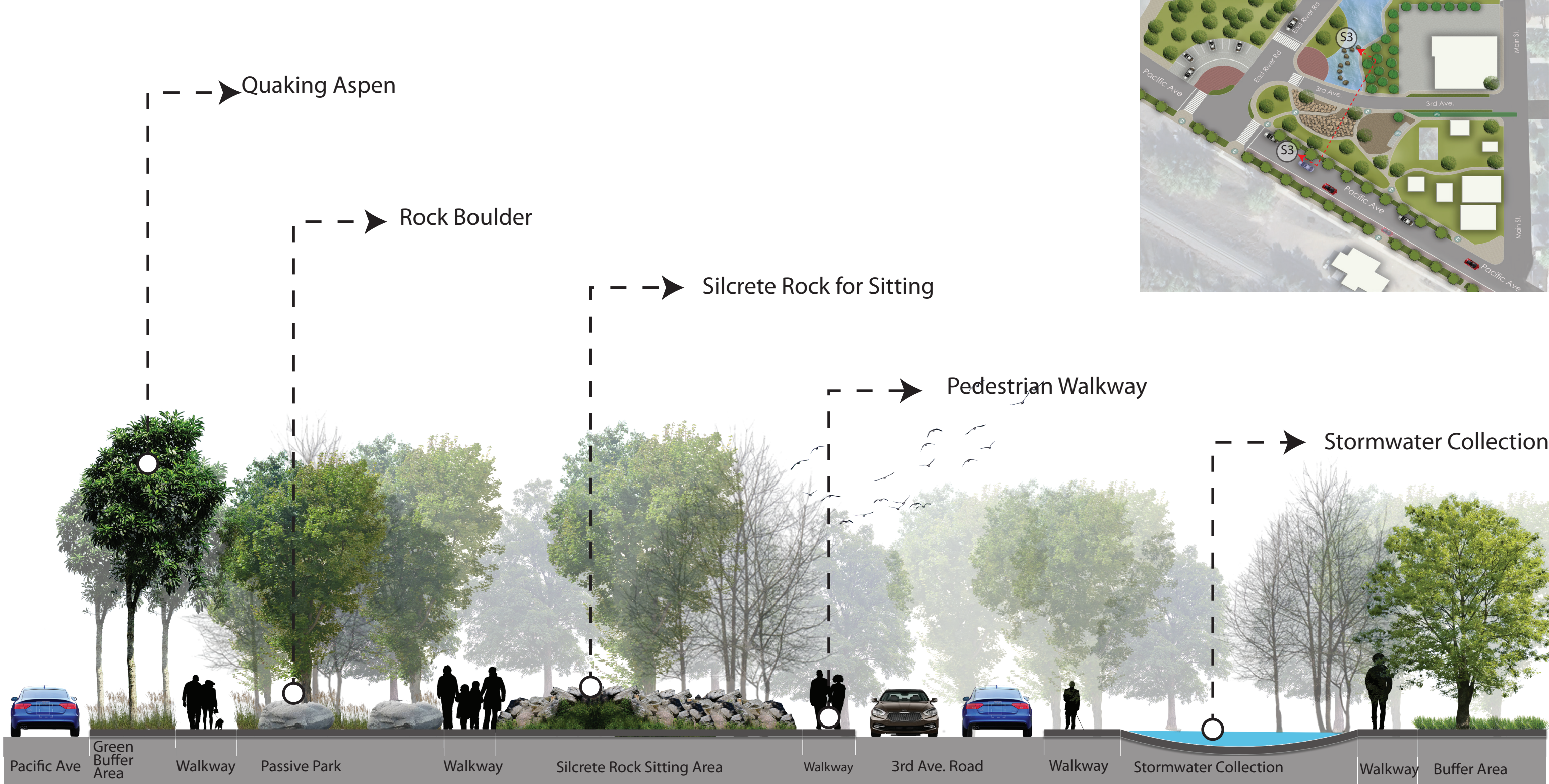
Axonometric Sectional Elevation at S2/S2

Site Plan of P3 (Nature's Resilience Park)



Site Plan Key

- ① Pedestrian Walkway
- ② Green Buffer Area
- ③ Passive Park
- ④ Silcrete Rock for Sitting
- ⑤ Children Playing Area
- ⑥ Bicycle Parking
- ⑦ Emergency Service Building
- ⑧ Bicycle Lane
- ⑨ Safe Crossing Design
- ⑩ Signage Area
- ⑪ Parking
- ⑫ Strom water Collection Area
- ⑬ Green Buffer with Canopy Trees



Sectional Elevation at S3/S3



Quaking Aspen

Cottonwood Tree

Stone Paving for Walkway

Stone Boulder

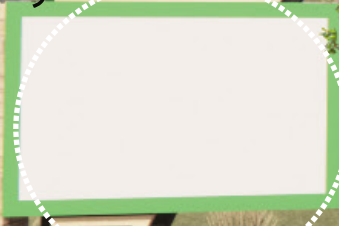
Bicycle Parking

Blue Grama

P3.1 | Looking NW from Sidewalk of Pacific Ave
Showing Buffer between Street and Walkway



Signage Board



Scoria Gravel



Stone Boulder



Playing Area



P3.2 | View at Stromwater Collection

Determining Project Success

OBJ 1

Pedestrian Walk Ability

- Expanding pedestrian walkways to 6 feet promotes unrestricted walking
- Introducing a bicycle lane within the city boosts exploration of Medora City
- Incorporating green buffers between streets and sidewalks fosters a healthier environment for pedestrians.



OBJ 2

Identifying Critical Infrastructure Needs

- Enhanced drainage system directs water to a stormwater collection pond, preventing river pollution
- Addition of bioswale will improve the water quality.
- Establishing an Emergency Service Center to provide critical care for those in need.



OBJ 3

Community Involvement

- Increase in public plaza
- Addition of passive park with children's playing area which will increase the public involvement on that area



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Thank You!!!
For your attention

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Spring 2024

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