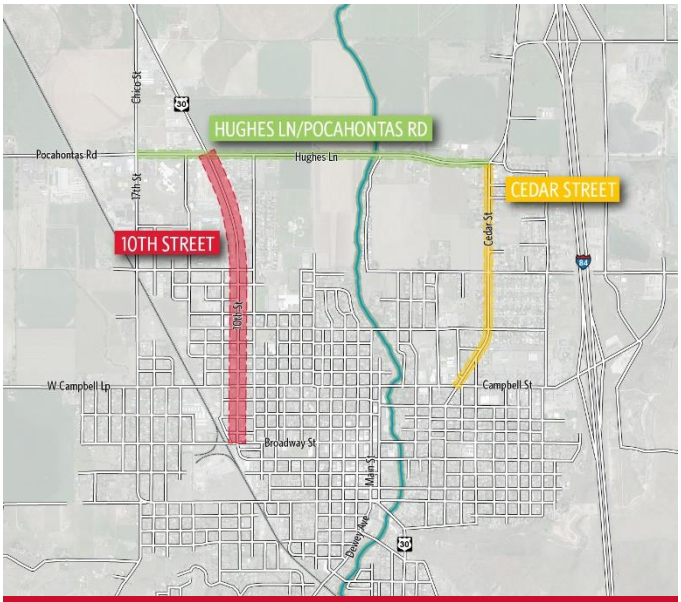
Appendix I. Technical Memorandum #1: Public Involvement Plan

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Tech Memo #1: Public Involvement Plan

Northern Baker Transportation Improvement Plan

Baker City, OR
October 19, 2020

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Acronyms and Abbreviations

NBTIP	Northern Baker Transportation Improvement Plan
ODOT	Oregon Department of Transportation
PIP	Public Involvement Plan
PMT	Project Management Team
TAC	Technical Advisory Committee

1 Introduction

This Public Involvement Plan (PIP) (Task 1.4) will guide stakeholder engagement and public involvement during the development of Baker City's Northern Baker Transportation Improvement Plan (NBTIP). The PIP reflects commitments from Baker City to coordinate and perform outreach activities designed to provide interested parties an opportunity to have input on the NBTIP.

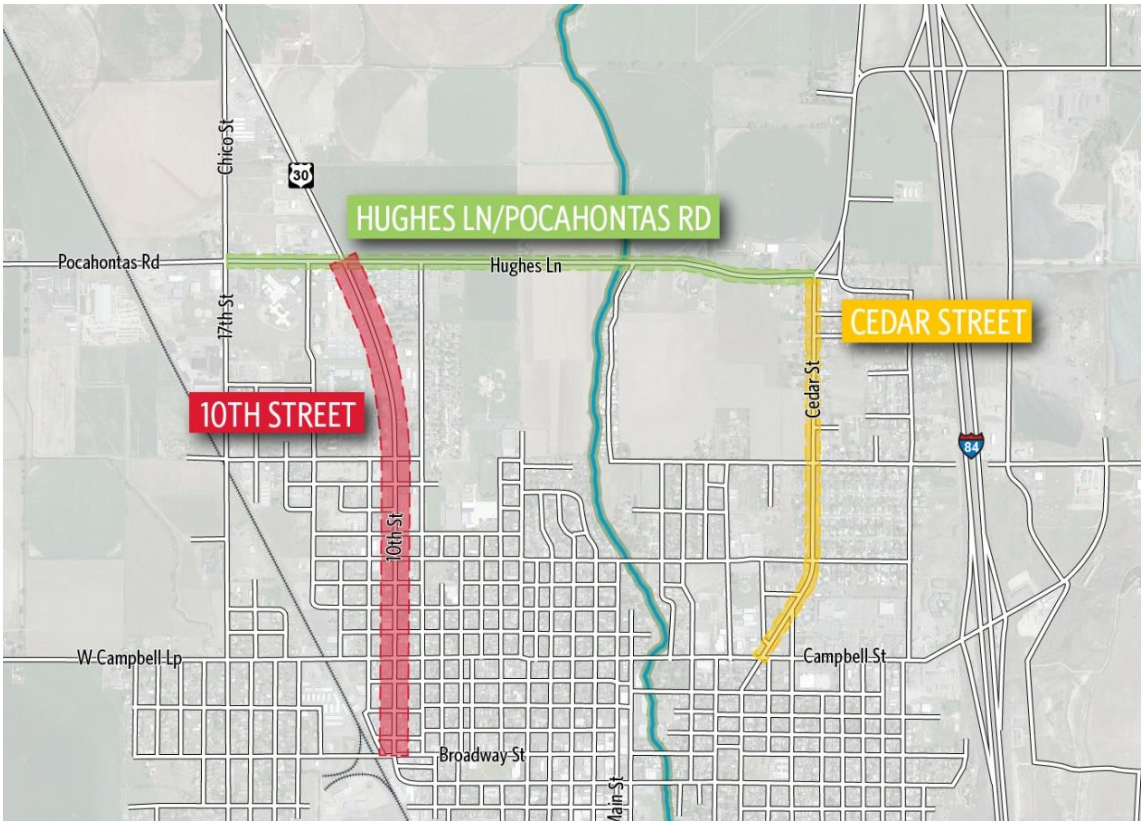
2 Project Description and Project Area

The NBTIP is a long-range plan that will deliver a community vision for three transportation corridors in order to foster sustainable economic growth and safe, equitable transportation choices:

- 10th Street from Broadway Street (US 30) to Hughes Lane
- Pocahontas Road from 17th Street to 10th Street
- Hughes Lane from 10th Street to Cedar Street
- Cedar Street from Hughes Lane to Campbell Street

The plan will identify recommended concept designs that address current deficiencies and meet future needs of these key roadways in Baker City.

Figure 1. Project Area



3 Public Involvement Purpose and Goals

The purpose of the public involvement program is to share information and gather input on the needs and issues of interested parties, stakeholders, and the general public.

The project's public involvement and communication goals are to:

- Communicate complete, accurate, understandable, and timely information to the public throughout the duration of the project.
- Actively seek input from a broad, diverse audience of potentially affected and/or interested individuals, residents, businesses, property owners, and community organizations prior to key project milestones.
- Demonstrate how public input has influenced the planning process.
- Comply with Civil Rights Act of 1964 Title VI requirements. Title VI and its implementing regulations provide that no person shall be subjected to discrimination on the basis of race, color, or national origin under any program or activity that received federal financial assistance.
- Ensure that public involvement strategies are consistent with applicable state and federal laws and requirements and is sensitive to local policies, goals, and objectives.

4 Audiences

The public involvement process will seek to engage the following types of affected and interested people and organizations:

- Elected officials
- Property owners
- Residents
- Business organizations, associations, and Chamber of Commerce
- Area businesses, such as agricultural equipment suppliers
- Freight interests
- Project area medical and hospital complexes
- Downtown and historic Baker City interests
- Housing and community development interests
- Recreation interests, such as Baker Sports Complex and YMCA
- Bicycle and pedestrian interests
- Environmental interests
- Accessibility groups
- Senior services
- Organizations representing low-income groups and Spanish speakers
- Health interests
- Tourism interests
- School district, Baker High School and Baker Middle School, including students
- Blue Mountain Community College
- General public
- Local media

5 Key Messages

These initial key messages will guide the project team as they communicate about the project both in written materials and when talking to the public. The messages will be refined as the project progresses to reflect community input.

- The Northern Baker Transportation Improvement Plan is a long range plan that will identify roadway improvement concepts on 10th Street, Hughes Lane and Cedar Street that meets the City's evolving needs.
- The plan will seek to improve facilities and safety for the increasing number of people who walk and bike in the project area, including better connections.
- The plan will seek to improve traffic safety and flow, and freight mobility.
- There are many important factors that can impact local transportation needs. During the planning process, the team will consider changing land uses, development conditions, funding opportunities, and environmental conditions, among others.

- The City is committed to engaging the community as we develop a vision for the study roadways, identify important transportation needs and deficiencies and develop solutions.
- The team will employ tools and strategies to attract a broad, diverse audience to participate conveniently and accessibly.

6 Decision-Making Process

The City Council and County Board of Commissioners are the project's final decision makers. The Project Management Team (PMT) will make recommendations to the City Council and Board of Commissioners based on technical analysis and stakeholder input.

The City will form a Technical Advisory Committee (TAC) to review work products and provide technical and inter-jurisdictional guidance. The TAC will advise the PMT who will make recommendations to the City Council and County Board of Commissioners, who will adopt the plan. Public input is considered throughout the decision-making process as illustrated in the following graphic:

Figure 2. Decision-Making Process

7 Refined Project Schedule

The project kicked off in September 2020 and is anticipated to finish in September 2021 according to the project schedule shown below.

Figure 3. Project Schedule

8 Project Team Member Roles and Responsibilities for Public Involvement

The following team members have key roles in implementing the public involvement strategies.

8.1 Baker City/County Team Members

- **Michelle Owen, Public Works Director**. Michelle will oversee the City-led public involvement activities, such as developing an interested parties list, hosting the project website, securing meeting venues, publicizing community meetings, and hosting and summarizing online open house and workshops.
- **Holly Kerns, Planning Director**. Holly will collaborate with Michelle to delivery City-led public involvement activities.
- **Stacy Duman, Public Works Data Analyst/Management Assistant**. Stacy will support Michelle and Holly with the City-led public involvement activities listed above.

8.2 Consultant Team Members

- **Beth Wemple, Deputy Project Manager/Senior Planner**. Beth is coordinating the team effort for the development of the NBTIP and will provide Quality Control (QC) of public involvement deliverables.
- **Stacy Thomas, Public Engagement Lead**. Stacy provides general oversight for the public involvement program including developing the PIP, initial project website content, community meetings strategy and materials.
- **Oliver Kuehne, Planning Lead**. Oliver will prepare materials for the two Youth Workshops and will help to develop the approach for the community workshops.

Two members of the consultant team will attend in-person events in Baker City. Depending on project needs and schedule, either Andy Johnson, Beth Wemple and/or Stacy Thomas will attend.

9 Planned Public Involvement Strategies

Strategy	Description	Lead	Timing
Interested Parties List	A list of interested stakeholders, including the TAC, project area businesses, community organizations and residents, used for notification of the project, updates and public input opportunities	City	Fall 2020
Comment Collection, Analysis and Responses	The City will log, analyze and provide responses to public comments, and share them with the Consultant team.	City	Ongoing
Webpage	A project webpage will be the primary source for public information and will include a project overview, area map, schedule, document and public meeting information.	City – host and maintain HDR – initial content	Launch Fall 2020
Flyers	Project flyers will announce the community open house and workshops (in-person and online).	HDR – produce City – distribute	One month prior to each event
Media Notices	Media notices will announce community open house and workshops (in-person and online).	HDR – produce City – distribute	One month prior to each event
Youth Workshops	Two youth workshops (one for 5th – 8th graders and one for high school students) will collect input about safe routes to school, particularly transit, bicycle, pedestrian, or skateboarding connections.	HDR	January 2021
Community Open House (in-person and online)	The project will host an open house to involve the community in the creative visioning and problem-solving process.	HDR – in-person City – online	January 2021
Community Workshop #1 (in-person and online)	The project will host a community workshop to introduce the land use and transportation concepts and to involve the public and stakeholders in reviewing and assessing preliminary design concepts.	HDR – in-person City – online	Early March 2021
Community Workshop #2 (in-person and online)	The project will host a community workshop to seek public input and collaboration on the proposed solutions.	HDR – in-person City – online	Late April 2021

Appendix II. Transportation Technical Standards Coordination Memorandum

Memo

Date:	Monday, October 05, 2020
Project:	Northern Baker Transportation Improvement Plan
To:	ODOT
From:	Jeremy Jackson, Lewis Kelley, Beth Wemple
Subject:	Task 2.3 Transportation Technical Standards Coordination Memo

Introduction

The primary objective of the Northern Baker Transportation Improvement Plan (NBTIP) is to deliver community focused, multimodal practical solutions that prioritize safety for all modes and users on US 30 (10th Street), Cedar Street, and Hughes Lane/Pocahontas Road in Baker City.

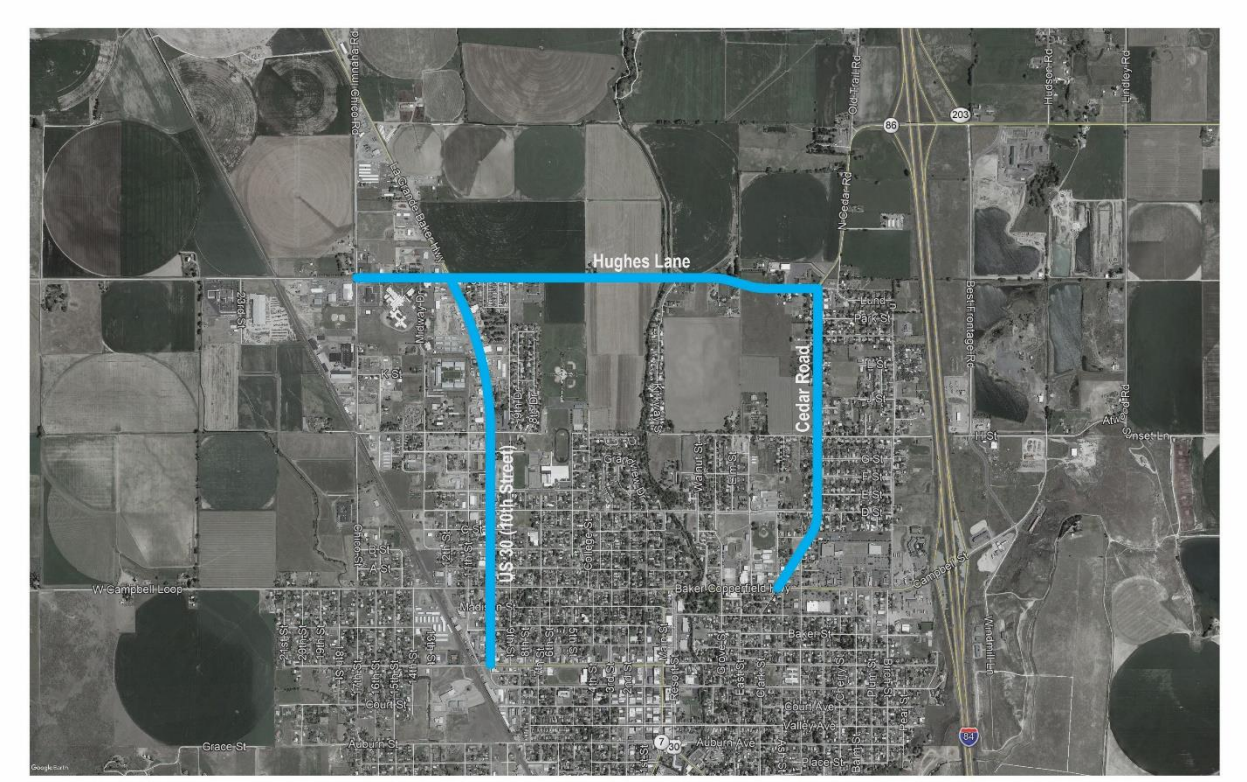
The purpose of this memo is to provide a set of methods and assumptions for documenting or evaluating existing and future:

- Motor vehicle operations
- Freight mobility routes and local truck routes
- Active Transportation: Bicycle Level of Traffic Stress (BLTS) and Pedestrian Level of Traffic Stress (PLTS) assessments
- Transit facilities, and
- Safety conditions

This memo also describes the proposed type and extent of analysis to support Technical Memorandum #2: Context and Site Analysis Memorandum. The project area includes the three project corridors: 10th Street between Broadway Street and Hughes Lane/Pocahontas Road, Pocahontas Road/Hughes Lane between 17th Street and Cedar Street, and Cedar Street between Hughes Lane and Campbell Street. The project area and project corridors are shown in Figure 1.

The following existing and future conditions, methods, and assumptions support the NBTIP and will follow the Oregon Department of Transportation (ODOT) *Analysis Procedures Manual* (APM).

Figure 1: Project Corridors



Existing and Future Motor Vehicle Operations

Traffic Data Collection

Traffic data collection was performed by ODOT and occurred in July and August 2020. The data has been provided to HDR. Data collection consisted of 16-hour intersection turning movement counts and 24-hour volume, classification, speed, and gap data. Turning movement counts are consistent with APM requirements, including a 15-minute breakdown of pedestrians, bicyclists, passenger vehicles, and heavy vehicles.

Weekday, 16-hour turning movement counts were collected between 6 AM and 10 PM at the following intersections:

- 10th Street at Hughes Lane/Pocahontas Road (unsignalized)
- 10th Street and E Street (unsignalized)
- 10th Street and D Street (unsignalized)
- 10th Street and Campbell Street (signal)
- 10th Street and Broadway Street (unsignalized)

Weekday, 24-hour volume and classification counts were collected at the following locations:

- 10th Street (Materials received from ODOT did not include location, please provide)
- Hughes Lane (Materials received from ODOT did not include location, please provide)
- Cedar Street (Materials received from ODOT did not include location, please provide)

The 24-hour tube counts also included speed and gap data at each location.

Analysis Years and Scenarios

Traffic operational analysis will be conducted for both the AM and PM peak periods for:

- Existing Year = 2020
- Future Year = 2040

The future year of 2040 is consistent with the ODOT planning horizon. The scenarios that will be analyzed for the Project include:

- Existing Year = Existing year conditions
- Future Year No-Build = Future year conditions with Transportation System Plan (TSP) identified improvements
- Future Year Build = Future year conditions with TSP identified improvements and proposed concept design

Existing Year Volume Development

All existing year volumes were collected between July 15, 2020 and August 13, 2020. While it is understood that data collection occurred during the ongoing COVID-19 pandemic, preliminary discussions with ODOT have indicated that the traffic data is sufficient for planning purposes. It should be noted that COVID-19 related stay at home orders and business closures have been less restrictive in rural areas and impacts to traffic in the project area are likely not as significant compared to more urban areas of the state.

Existing year volumes will be seasonally adjusted to the 30th highest hour (30HV) consistent with APM methodology. Since an on-site automatic traffic recorder (ATR) is not available at or near the project area, the 30HV will be developed using the ATR Characteristic Table or ATR Seasonal Trend Table methods.

Future Year Volume Development

Traffic volume forecasts for the Future Year 2040 will follow APM procedures and will be developed for the project area in coordination with ODOT and City staff. The population of Baker City has changed very little in the past 20 years and the current ODOT Future Highway Volume Table shows annual growth rates on 10th Street ranging from 0.1 to 0.6 percent. Future land use and transportation connections in the project area will be considered when determining growth rates for future volume development.

Traffic Operations Analysis

A traffic operations analysis for the four study intersections will be performed for existing and future conditions using Synchro (version 10) and will follow the recommendations and procedures included in the APM. Synchro will primarily be used to determine v/c ratios for comparison to ODOT mobility thresholds consistent with the Oregon Highway Plan (OHP) and the Highway Design Manual (HDM). Highway Capacity Manual (HCM) compliant LOS results will also be provided using Synchro.

The study intersections are:

- 10th Street/Hughes Lane/Pocahontas Road
- 10th Street/E Street
- 10th Street/Campbell Street
- 10th Street/Broadway Street

Existing and Future Freight Mobility and Local Truck Routes

Existing Conditions Descriptive Analysis

Information provided by the City, County, and ODOT will be used to map and summarize the existing freight, local truck, and priority snowplow routes alongside key freight facilities within the Project Area. The descriptions will include:

- Map and text description for freight, local truck, and snowplow routes.
- Summary of the heavy and medium truck intersection turning volumes from the 16-hour turning movement counts.
- Summary of the heavy and medium truck segment volumes from the 24-hour tube counts.

Future Freight Conditions

The future freight conditions will be documented within the preliminary and revised concept designs for the 10th Street, Hughes Lane, and Cedar Street corridors. Freight considerations will be integrated into designs for these streets and included in the graphical concept roadway cross sections and overall corridor street designs. Elements covering the freight considerations may include:

- Access improvements
- Freight accommodative turning radii

Future Freight Solutions

Based on information discovered during the existing conditions assessment and proposed concept designs, the consultant team will provide a documented list of recommended freight related improvements to be included in future corridor improvement projects. Information provided will include:

- One map along with tabular descriptions of the freight access improvements.
- Recommended phasing of freight improvements.
- Conceptual cost estimates of freight improvements.

Freight Stakeholder Packet

The consultant team will develop a Freight Stakeholder Packet with information that highlights proposed improvements to state facilities consistent with Oregon Revised Statutes 366.215. Information provided within the packet will consist of the following information:

- One location map including highway mile points showcasing proposed transportation improvements.
- A brief summary of the problem, describing the need for and importance of the proposed changes to state facilities.
- A brief description of the project proposals.
- One diagram of existing roadway cross sections with information including travel lanes, shoulders, bike facilities, medians, parking, and curb-to-curb dimensions.
- Specific information on pinch points on state highway facilities near the proposed project.
- One diagram of the proposed roadway cross sections along with any existing or proposed structures or obstacles in the right-of-way, including medians, landscaping, signs and other roadway features.

Existing and Future Active Transportation

Existing Conditions Descriptive Analysis

Information provided by the City, County, and ODOT will be used to map and summarize the active transportation network including sidewalks, bicycle facilities, and multiuse paths within the project area and broader Baker City network. The descriptions will include:

Project Area

- Map and text describing the results of the BLTS and PLTS analysis that will be conducted following ODOT AMP guidelines. The BLTS and PLTS analyses will cover the following streets within the project area:
    - 10th Street from Broadway Street to Hughes Lane
    - Hughes Lane from 10th Street to Cedar Street and Pocahontas from 10th Street to 17th Street/Chico Street
    - Cedar Street from Hughes Lane to Campbell Street
- Text and map descriptions of active transportation deficiencies found after reviewing previously identified projects within the 2013 TSP, 2005 Baker County TSP, and the 2016 Interchange Area Management Plan.

Baker City

- A map and text describing how the existing active transportation facilities within the project area are connected and relate to the wider active transportation network within Baker City.

The BLTS and PLTS analyses will be conducted at the roadway segment level per ODOT APM section 14 Multimodal Analysis. BLTS and PLTS procedures include:

- BLTS
    - The study roadways will be split into several segments where roadway and land use characteristics provide for natural breaks.
        - Hughes Lane/Pocahontas Road – 3 segments

- Between Cedar Street and Kirkway Street
- Between Kirkway Street and 10th Street
- Between 10th Street and 17th Street

▪ Cedar Street – 3 segments

- Between Hughes Street and H Street
- Between H Street and D Street
- Between D Street and Campbell Street

▪ 10th Street – 3 segments

- Between Hughes Street and E Street
- Between E Street and Campbell Street
- Between Campbell Street and Broadway

o Study Intersections will be limited to the end points of each roadway segment identified above for the intersection approach and crossing analysis

▪ 10th Street and Hughes Lane

▪ 10th Street and E Street

▪ 10th Street and Campbell Street

▪ 10th Street and Broadway Street

▪ Hughes Lane and 17th Street

▪ Hughes Lane and Kirkway Street

▪ Hughes Lane and Cedar Street

▪ Cedar Street and H Street

▪ Cedar Street and D Street

▪ Cedar Street and Campbell Street

o Information will be gathered on roadway segment, intersection approach, and crossing characteristics including the presence and type of bicycle facilities, shoulder width, outside travel lane width, grade, pavement conditions, any obstructions present in the roadway or bicycle lane, on-street parking, number of

travel and turn lanes, and the speed and volume of vehicle traffic. Data will be compiled from materials provided by the City of Baker City, taken from online aerial imagery, or Google Street View. There will be no in-field data collection for this analysis.

- Each characteristic will be ranked into four classifications, BLTS 1 representing good conditions and BLTS 4 representing very poor conditions based on the scoring criteria found in ODOT APM section 14.4.4 for roadways, 14.4.5 for intersection approaches and 14.4.6 for intersection crossings.
- An overall BLTS score from 1 (good) to 4 (very poor) for each roadway segment and intersection approach and crossing will be calculated from a weighted scoring of the individual characteristic scores.

- PLTS
  - The study roadways will be split into several segments where roadway and land use characteristics provide for natural breaks.
    - Hughes Lane/Pocahontas Road – 3 segments
      - Between Cedar Street and Kirkway Street
      - Between Kirkway Street and 10th Street
      - Between 10th Street and 17th Street
    - Cedar Street – 3 segments
      - Between Hughes Street and H Street
      - Between H Street and D Street
      - Between D Street and Campbell Street
    - 10th Street – 3 segments
      - Between Hughes Street and E Street
      - Between E Street and Campbell Street
      - Between Campbell Street and Broadway
  - Study Intersections will be limited to the end points of each roadway segment identified above for the intersection approach and crossing analysis
    - 10th Street and Hughes Lane
    - 10th Street and E Street

- 10th Street and Campbell Street
- 10th Street and Broadway Street
- Pocahontas Road and 17th Street
- Hughes Lane and Kirkway Street
- Hughes Lane and Cedar Street
- Cedar Street and H Street
- Cedar Street and D Street
- Cedar Street and Campbell Street

- Information will be gathered on roadway segments and intersection crossing characteristics including the presence and type of bicycle facilities, outside travel lane width, landscape buffers, presence of sidewalks or multiuse paths, general land use, vehicle travel speeds, and presence of street lighting. Data will be compiled from materials provided by the City of Baker City, taken from online aerial imagery, or Google Street View. There will be no in-field data collection for this analysis.
- Each characteristic will be ranked into four classifications, PLTS 1 representing good conditions and PLTS 4 representing very poor conditions based on the scoring criteria found in ODOT APM section 14.5.6 for roadway segments and 14.5.10 for intersection crossings.
- Each roadway segment and intersection crossing will receive an overall PLTS score from 1 (good) to 4 (very poor) for each roadway segment and intersection will be calculated from a weighted scoring of the individual characteristic scores.

Future Active Transportation Conditions

The future active transportation conditions will be documented within the preliminary and revised concept designs for the 10th Street, Hughes Lane, and Cedar Street corridors. Conceptual active transportation facility designs will be included in the graphical concept roadway cross sections and overall corridor street designs. Elements that will be highlighted may include:

- Placement of new streetscape elements, including bicycle lanes, bicycle racks, pedestrian amenities, sidewalks, and multiuse facilities.
- Pathway access points, overlooks, footbridges, and pedestrian crossings.
- School crossing locations and improved pedestrian access to schools.

Future Active Transportation Solutions

Based on information discovered during the existing conditions assessment, deficiencies analysis, and recommendations found during the toolbox development and proposed concept designs, the consultant team will provide a documented list of recommended active transportation facilities to be included in future corridor improvement projects. Information provided will include:

- Analysis to compare the proposed concept design BLTS and PLTS to those found during the existing conditions assessment.
- One map along with tabular descriptions of the active transportation connectivity improvements.
    - Included in the map and descriptions will be recommendations for state highway crossing enhancements based on the revised design concepts for each of the three corridors. These recommendations will follow National Cooperative Highway Research Program Report 562 guidance.
- Recommended phasing of active transportation improvements.
- Conceptual cost estimates of active transportation improvements.

Existing and Future Transit Facilities

Existing Conditions Descriptive Analysis

Information provided by the City, County, ODOT, and local transit partners will be used to map and summarize the existing transit facilities, routes, service, and ridership. The descriptions shall include:

Project Area

- Map and text description of the existing transit facilities and services. Analysis will focus on:
    - Transit stop and facility locations
    - Transit service and schedules
    - Transit ridership

Baker City

- Tabular data from the Census data focused on commute patterns and behavior will be examined and summarized. Census data will be used to compare against existing transit services to identify underserved areas and unmet needs. Specific census data that will be used for this analysis may include:
    - Title VI populations
    - Low or no car households
    - Employment characteristics
    - Commute characteristics
    - Population statistics within a quarter mile of transit service
- A map and text describing how the existing transit facilities and services within the project area provide connections within Baker City and to the wider Eastern Oregon region.

Transit Strengths and Weaknesses

The main service provider in Baker County is NEO Transit, which operates a mix of fixed route trolley buses within Baker City, Paratransit, intercity regional connectors, and dial-a-ride services. A qualitative assessment of the existing mix of transit service strengths and weaknesses will be undertaken, concentrating on a select subset of facilities within the project area. Transit facilities to be examined will include a total of four facilities taken from a mix of the services operating in the project area. Transit facilities may include a mix of bus stops, park-and-rides, and intercity transit centers.

The assessment will consist of examining current access conditions, available amenities at transit facilities, placement of bus stops along study roadways, and any other physical conditions that may assist in understanding opportunities for improvement.

Future Transit Conditions

The future transit conditions will be documented within the preliminary and revised concept designs for the 10th Street, Hughes Lane, and Cedar Street corridors. Transit facility designs for these streets will be included in the graphical concept roadway cross sections and overall corridor street designs. Elements covering the placement of new streetscape elements that will be highlighted may include:

- Transit stops
- Transit signs or benches
- Improved access points to transit

Future Transit Solutions

Based on information discovered during the existing conditions assessment, strengths and weaknesses assessment, and recommendations found during the toolbox development and proposed concept designs, the consultant team will provide a documented list of recommended transit facilities to be included in future corridor improvement projects. Information provided will include:

- One map along with tabular descriptions of the transit related improvements.
- Recommended phasing of transit improvements.
- Conceptual cost estimates of transit improvements.

Active Transportation and Transit Toolbox

Based on the findings from the Existing Conditions analysis of active transportation facilities, transit facilities, and the local context of Baker City, the consultant team will develop a toolbox showcasing appropriate active transportation and transit facilities designs for the Baker City context. Examples will consist of a combined 15 sample design elements addressing active transportation and transit needs for the community. These samples will be summarized in a graphical form and accompanied with brief text descriptions providing the following information:

- General description
- Pros and cons of design elements
- Use cases
- Necessary right-of-way considerations
- Other unique factors to consider

Existing and Future Safety Conditions

Existing Conditions Descriptive Analysis

2014 to 2018 ODOT crash data will be used to summarize existing crash conditions on the project corridors. The existing conditions descriptive analysis will summarize the number, type, and severity of crashes, contributing factors, time of day and day of week for the following facilities:

- Project area as a whole (i.e., all crashes combined):
    - 10th Street from Broadway Street to Hughes Lane
    - Hughes Lane from 10th Street to Cedar Street and Pocahontas from 10th Street to 17th Street/Chico Street
    - Cedar Street from Hughes Lane to Campbell Street
- Each project corridor individually (i.e., all crashes on 10th Street only, all crashes on Hughes Lane only, all crashes on Cedar Street, only)
- 10th Street:
    - The intersections of:
        - 10th Street/Hughes Lane/Pocahontas Road

- 10th Street/E Street
- 10th Street/Campbell Street
- 10th Street/Broadway Street

o The segments of 10th Street between

- Broadway Street and Campbell Street
- Campbell Street to E Street
- E Street to Hughes Lane/Pocahontas Road

ODOT's decoder tool will be used for this analysis.

The team will also review crash data for the same period provided by Baker City and provide a qualitative summary of major similarities and differences in the crash trends. The team will not summarize the Baker City data nor will the team merge the Baker City data with the ODOT data.

Existing Conditions Safety Priority Index System (SPIS)

As per the APM, the three most recent SPIS Site listings will be reviewed to determine if any of the project corridors or project corridor intersections have locations listed in the top 5 percent or top 10 percent.

Existing Conditions Crash Rate Assessment

2014 to 2018 crash rates will be calculated at the four project intersections and for each project corridor individually. The crash rates will be calculated according to the procedures in the ODOT APM. The segment crash rates will be compared to information in the most current version of ODOT's Crash Rate Table II. The intersection crash rates will be compared to Exhibit 4-1: Intersection Crash per MEV by Land Type and Control Type from the ODOT APM.

The segment crash rate analysis will exclude all crashes coded at intersections or within 50 feet of the center of the intersections. Typically, intersection crashes are assumed to be at the intersection and within 250 feet of the intersection; however, because of the relatively short block lengths on 10th Street (approx. 325 feet) and the low traffic volumes 50 feet is assumed.

Existing Conditions Ranking of Sites with Potential for Safety Improvement

The APM identifies that the Critical Crash Rate and Excess Proportion Methods are applicable as a tool for network screening if more than 5 sites are in the project area. Given only three corridors and four project intersections, these methods will not be applied in this analysis.

Instead sites with potential for safety improvement will be identified using the crash rate comparison to statewide averages and identifying if any locations are on the state SPIS list.

Future Safety Conditions

Where possible, the safety effects of project solution concepts will be reported using Crash Modification Factors (CMFs) from ODOT's All Roads Transportation Safety (ARTS) Program[1] information or the FHWA CMF Clearinghouse. The most applicable CMF per treatment will be selected and information about the CMF reported (i.e., context, crash type or severity influenced, application boundaries).

If multiple treatments are applied at one location, and CMFs are available for each treatment, the safety effects of the combined treatments will be estimated by multiplying the CMFs. Up to three CMFs will be multiplied per location and the most conservative estimate of the benefits will be provided.

If a CMF is not available for a given treatment, a qualitative discussion of influence of the treatment on crashes will be provided based on the following criteria:

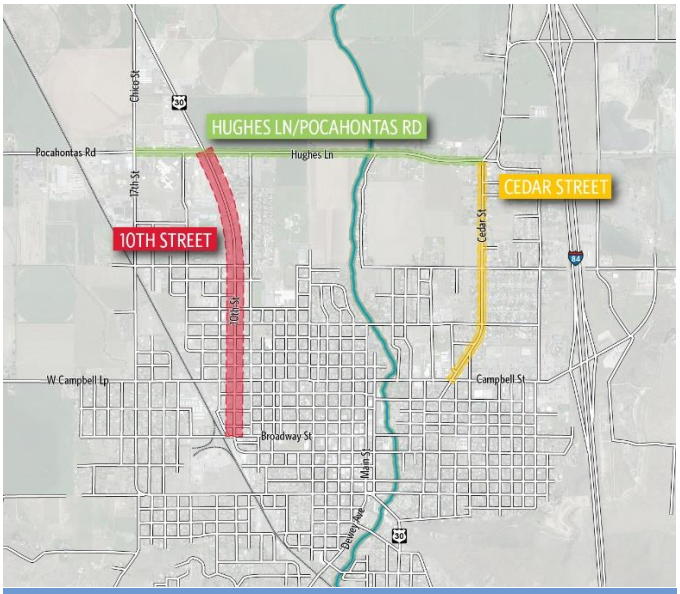
- Exposure – will the treatment change the number of people traveling through the location.
- Probability – will the treatment reduce the complexity and potential conflicts at the location.
- Consequence – will the treatment reduce the potential severity of a crash if a crash occurs.

The HSM predictive method will not be used for this project.

[1] https://www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx

Appendix III. Technical Memorandum #2: Context & Site Analysis

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Tech Memo #2: Context & Site Analysis

Northern Baker Transportation Improvement Plan

Baker City, Oregon

February 8, 2021

Contents

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Appendices

Acronyms and Abbreviations

ACS	American Communities Survey
ADA	Americans with Disabilities Act
ADT	average daily traffic
APM	Analysis Procedures Manual
BLTS	Bicycle Level of Traffic Stress
C-G	General Commercial
ECSI	Environmental Cleanup Sites
HCM	Highway Capacity Manual
I	General Industrial
IAMP	Interchange Area Management Plan
LOS	Level-of-Service
LTS	Level of Traffic Stress
LUST	Leaking Underground Storage Tanks
mph	miles per hour
NBTIP	Northern Baker Transportation Improvement Plan
NEO Transit	Northeast Oregon Public Transit
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
PLTS	Pedestrian Level of Traffic Stress
R-HD	High Density Residential
R-MD	Medium Density Residential
RMV	Real Market Value
ROW	right-of-way
SPIS	Safety Priority Index System
TSP	Transportation System Plan
US30	U.S. Highway 30
v/c	volume-to-capacity
WhMd	Wheeled Mobility Device

1 Introduction

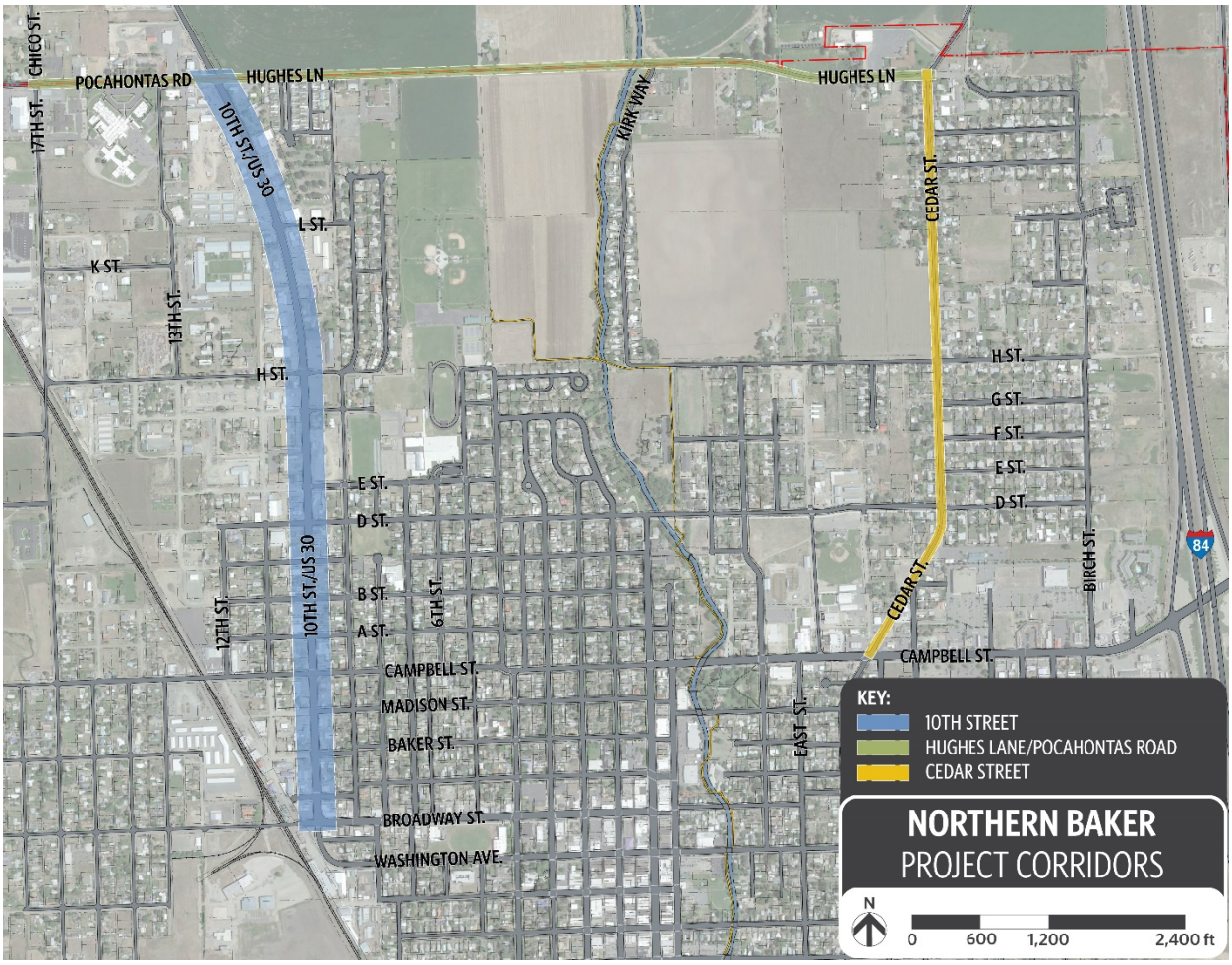
The Northern Baker Transportation Improvement Plan (NBTIP) is being undertaken by Baker City in partnership with the Oregon Department of Transportation (ODOT) to develop and present a vision to revitalize a section of U.S. Highway 30 (10th Street or US30) within the city limits. The project will also focus on Cedar Street and Hughes Lane/Pocahontas Road. The project will consider new street design cross sections for all three corridors with the purpose to better accommodate multimodal; accommodating all modes of travel including walking, cycling, motor vehicles, and freight– travel demand along these corridors. The study corridors are shown in Figure 1-1.

This memorandum provides an overview of the existing conditions of the three identified corridors in Baker City and includes:

- Existing transportation conditions including a review of past transportation plans and relevant local and state policies, and a toolbox of potential treatments for the study area.
- Natural and cultural assessment including Goal 5 (an inventory of local resources such as wildlife habitat and wetlands) and an overview of natural hazards, hazardous materials, and cultural and historic sites.
- Focused land use assessment along 10th Street between Hughes Lane and Broadway Street including policies influencing development along the corridor.

The information explored will offer a foundation for reimagining the project corridors and provide context for conceptual designs during later tasks. At the end of this planning process, the Baker City Council will adopt the final NBTIP. The final plan will reflect a set of designs that have been agreed upon in coordination with Baker County and ODOT. Once adopted, the opportunities presented in the final NBTIP can be capitalized on through the identified funding sources in the Baker City Transportation System Plan. The Baker City Council will work with Baker County and ODOT to identify proper funding sources and a timeline for designing and building the project opportunities identified in the NBTIP.

Figure 1-1. Project Area



2 Summary of Findings

A brief summary of findings is provided:

- Traffic Operations – Existing year (2020) traffic operations meet ODOT volume-to-capacity ratio mobility targets and Level of Service C or better.
- Freight – A high volume of medium trucks appeared in the traffic counts conducted, likely due to the industrial and agricultural concentration in the community. As a District Highway, 10th Street (US30) is not designated as a National Freight, Oregon Highway Freight, High Clearance, or Reduction Review Route. However, due to agricultural activity and related farm equipment movement along the corridor, the hole-in-the-air[1] should still be considered during the design phase.

[1] Hole-in-the-air describes the area needed to accommodate legal and permitted over-dimension loads. The concept applies to the airspace above a road's right-of-way and generally states that both sides of the travel way should remain free of at-grade or vertical obstructions. This allows people operating larger vehicles ample room to maneuver on the roadway without obstacles that might hinder.

- Active Transportation – Most roadways examined within the Bicycle Level of Traffic Stress (BLTS) and Pedestrian Level of Traffic Stress (PLTS) analysis found Level of Traffic Stress (LTS) ratings of 3 and 4, which represent moderate to high stress environments for active users.
- Transit – Local fixed route service provides a high level of community coverage and links important community resources together.
- Safety – No fatalities were recorded in the project area. The crash rate calculations did not identify any crash hot spots using ODOT's crash rate rating system.
- Right-of-way (ROW) and Utilities – All three roadways have ROW beyond current usage. Cedar and 10th streets have obstacles, including trees, signage and landscaping within the ROW that will need to be considered. All three roadways have underground and overhead utilities in the ROW that will need to be addressed during the design phase.
- Previously Planned Projects – All three roadways include several planned projects identified for funding that should be taken into consideration during the design phase. These projects include intersection safety improvements and improved facilities for pedestrians and bicyclists and will help to inform the design process and resulting design concept for this project. A summary of these projects can be found in Section 3.7.
- ODOT Blueprint for Urban Design (BUD) – The BUD applies to 10th Street (US30) and provides design guidance that will need to be followed during the design phase.
- Natural and Cultural Assessment – The Powder River is identified as a riparian area with a flood zone along the southern edge of Hughes Street. Several hazardous material sites are identified along 10th Street. An analysis of available demographic data identified several block groups have a concentration of households living below the poverty threshold and potentially transit-dependent populations.
- 10th Street Land Use – Current land use along 10th Street is predominately commercial featuring primarily auto-oriented development. The commercial uses fit within the existing commercial zoning along 10th Street. Only a handful of parcels feature residential or institutional uses. The uses allowed under the commercial zoning offer flexible opportunities for development and redevelopment along the corridor.

3 Transportation Context

This section provides an overview of the existing transportation conditions on 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road. The topics discussed in this section include:

- Motor vehicle operations including freight, heavy vehicle, and farm equipment travel routes

- Active transportation conditions along the three corridors and connectivity to the broader transportation network
- Existing transit service operations, ridership, and conditions at a selection of stops
- Crash frequency and severity along the three corridors
- ROW, physical and utility constraints
- Deficiencies identified in past planning projects including from past Transportation System Plans (TSP)
- Applications of ODOT's BUD for this project
- A toolbox of suggested facility design solutions that could be applied to the corridors to specifically address bicycle and transit needs

3.1 Motor Vehicle Operations

This section provides a summary of motor vehicle operations at the four study intersections along 10th Street:

- 10th Street/Hughes Lane - unsignalized
- 10th Street/E Street - unsignalized
- 10th Street/Broadway Street - unsignalized
- 10th Street/Campbell Street - signalized

A traffic analysis was performed for existing conditions following the recommendations and procedures included in Chapters 5, 12, and 13 of the ODOT Analysis Procedures Manual (APM). Detailed analysis output is provided in Appendix A.

Traffic data collection was performed by ODOT and occurred in July 2020 for the study area intersections. While data collection occurred during the ongoing COVID-19 pandemic, ODOT has indicated that the traffic data is sufficient for planning purposes. For reference, the 2019 average daily traffic (ADT) on 10th Street south of Hughes Lane was 4,300 vehicles per day. The traffic count data collected south of Hughes Lane for this project was approximately 5,000 vehicles per day, which is consistent with the seasonal variations in traffic in areas where volumes typically peak in the summer months. Although summer events in Baker County were cancelled in 2020 due to COVID-19 related stay-at-home orders, many of these events occur on or near Campbell Street and Main Street. The increase in event related traffic volumes generally occurs on these higher-volume routes as opposed to 10th Street.

Data collection consisted of 16-hour intersection turning movement counts and included a 15-minute breakdown of pedestrians, bicyclists, passenger vehicles, and heavy vehicles. Based on the count data provided, the peak hour was determined to occur between 12:00 PM and 1:00 PM at all intersections except at 10th Street/Hughes Lane, which had a peak hour of 12:45 PM to 1:45 PM. With the traffic counts occurring in mid-July, no seasonal adjustments to the existing volumes were required per APM procedures.

Traffic analysis was performed to determine volume-to-capacity (v/c) ratios for comparison to ODOT mobility thresholds consistent with Action 1F.1 of the Oregon Highway Plan (OHP). ODOT mobility standards provide acceptable v/c ratios for project development and design. The 10th Street corridor is located within the limits of Baker City and designated as a District Highway by the OHP. The OHP mobility targets for existing conditions are an overall intersection v/c ratio of 0.95 for the signalized intersection at 10th Street/Campbell Street, and a 0.95 v/c ratio for the unsignalized state highway and local street approaches at the Broadway Street, E Street, and Hughes Lane intersections. Highway Capacity Manual (HCM) compliant Level-of-Service (LOS) results have also been provided.

Table 3-1 summarizes the existing year peak hour operational results. Based on the existing conditions analysis, all study area intersections currently meet OHP mobility targets. The unsignalized intersections are also operating at LOS C or better, and the signalized intersection at Campbell Street is operating at LOS A.

Table 3-1. Existing Year (2020) Peak Hour Operations

Unsignalized Intersection[1]	Major Street v/c	Minor Street		LOS
		v/c	Delay (s)	
10th Street & Hughes Lane	0.09	0.49	22.8	C
10th Street & E Street	0.08	0.21	14.3	B
10th Street & Broadway Street	0.14	0.15	11.6	C
Signalized Intersection[2]	**v/c**		**Delay (s)**	**LOS**
10th Street & Campbell Street	0.26		6.2	A

[1] Unsignalized intersection LOS based on worst stop-controlled movement.
[2] Signalized intersection LOS based on overall intersection operations.

3.2 Freight/Heavy Vehicles

This section summarizes the existing freight routes and activity related to the movement of freight.

3.2.1 Freight and Snowplow Routes

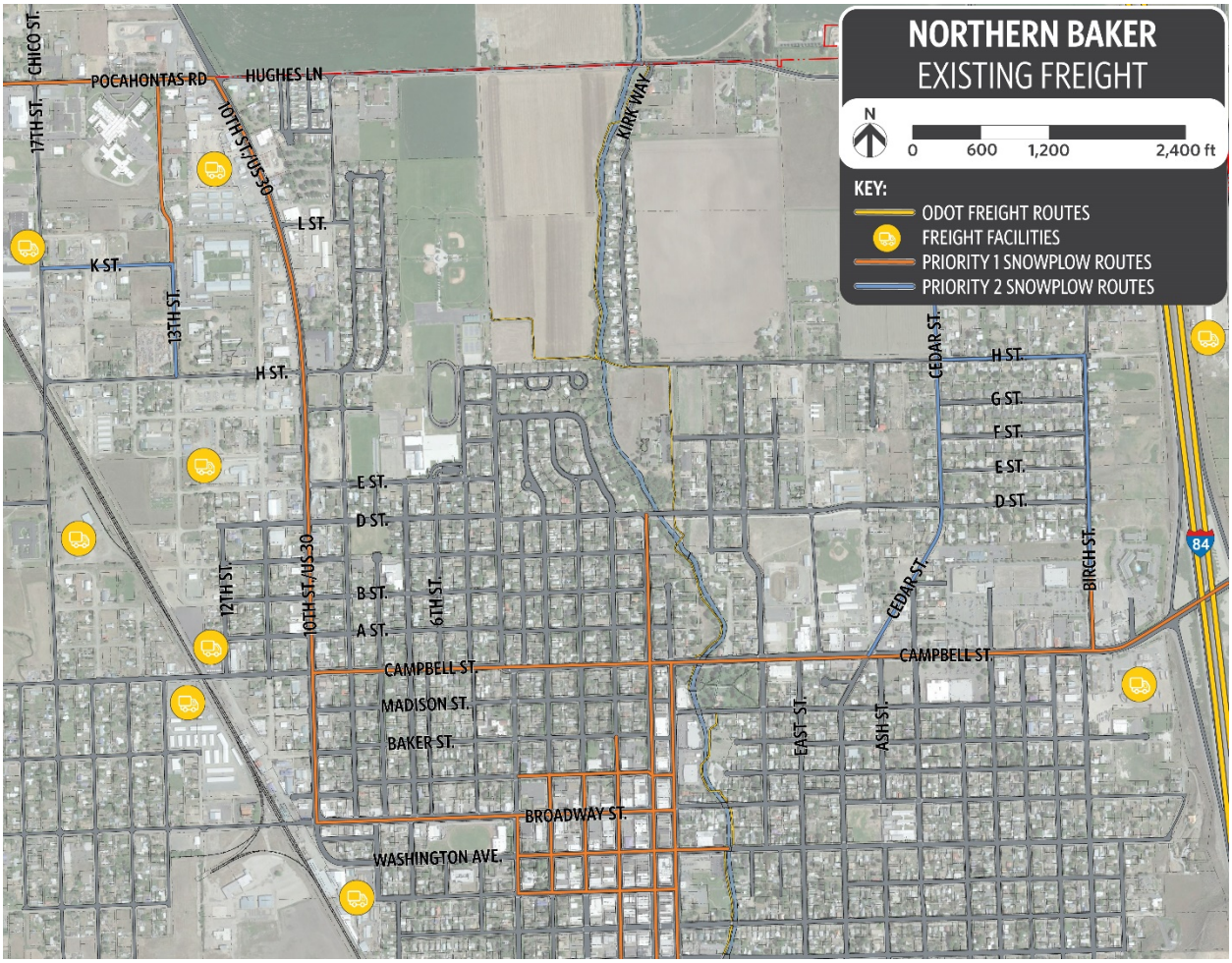
Figure 3-1 shows the freight system, facilities likely to be used by larger vehicles (UPS, truck stops, Marvin Wood Products) throughout the community and local snowplow routes. The 2013 Baker City TSP does not designate any of the project corridors as freight routes. Interstate 84 is the primary ODOT designated freight route through the area. In addition, 10th Street (US30), is designated a District Highway. According to ODOT's TransGIS tool, US30 does not show up as an OHP Freight Route, Reduction Review Route, or High Clearance Route.

While US30 is not listed as any of these ODOT designations, the hole-in-the-air concept usually applied to Reduction Review Routes should be a consideration during the design phase because of the concentration of agricultural activity and farm equipment traveling along 10th Street. The concept of hole-in-the-air applies to the airspace above a road's ROW and generally states that both sides of the travelled way should remain free of

at-grade or vertical obstructions. This allows people operating larger vehicles ample room to maneuver on the roadway without obstacles that might hinder movement.

Baker City designates three priority levels for snowplowing. Figure 3-1 shows the priority 1 and 2 routes within the study area. In the project study area, all of 10th Street and Pocahontas Road from 10th Street to 17th Street are priority 1 routes, meaning that they receive plowing before most streets in Baker City. Cedar Street is a priority 2 snowplow route while Hughes Lane is maintained by Baker County and not represented in the figure.

Figure 3-1. Freight and Snowplow Routes



Freight Counts

The 24-hour vehicle classification counts were collected on each of the project corridors. Table 3-2 shows medium and heavy truck volumes taken from the 24-hour counts. Medium trucks include farm equipment, buses, trucks pulling horse trailers, RVs, and dual axle pickup trucks; heavy trucks are trucks with four or more axles. As shown in Table 3-2, medium trucks represent approximately 20 percent of vehicle volumes for the three corridors while heavy trucks range from 3 to 7 percent of vehicle volumes.

Table 3-2. 24-hour Classification Counts

Location	Direction	Total Volume	Medium Truck Volume	Medium Truck %	Heavy Truck Volume	Heavy Truck %
10th Street south of Hughes Lane	NB	2,453	434	18%	100	4%
	SB	2,527	481	19%	95	4%
	Total	**4,980**	**915**	**18%**	**195**	**4%**
Cedar Street south of Hughes Lane	NB	1,424	228	16%	41	3%
	SB	1,499	227	15%	37	2%
	Total	**2,923**	**455**	**16%**	**78**	**3%**
Hughes Lane east of 10th Street	EB	1,592	288	18%	136	9%
	WB	1,425	338	24%	76	5%
	Total	**3,016**	**626**	**21%**	**212**	**7%**

- 16-hour turning movement counts for medium and heavy trucks were collected at the four study intersections along 10th Street (Appendix B). The collected counts include turning movements by medium and heavy truck classifications. These data show that for heavy and medium duty truck traffic at 10th Street/Hughes Lane/Pocahontas Road, the two highest proportions of heavy truck movements involve vehicles entering the intersection from the westbound direction, taking left turns from Hughes Lane onto southbound 10th Street and vehicles entering the intersection from the southbound direction, taking left turns from 10th Street onto eastbound Hughes Lane.
- 10th Street/E Street – Heavy truck volumes only represent one or two percent of traffic volumes at this location. A high proportion of medium trucks are traveling southbound on 10th and making right turns onto E Street heading westbound or traveling northbound on 10th and making left turns onto E Street heading west.
- 10th Street/Campbell Street – The highest proportion of truck movements are westbound vehicles turning right from Campbell Street to northbound 10th Street.
- 10th Street/Broadway Street – Most heavy truck volumes follow the designated US30 route through the intersection.

3.3 Active Transportation

This section summarizes the existing bicycle and pedestrian networks found in Baker City along with a targeted analysis of existing conditions on 10th Street, Cedar Street and Hughes Lane/Pocahontas Road. For the three project roadways, BLTS and PLTS analyses were performed and findings presented.

3.3.1 Baker City Network Overview

Baker City's bicycle and pedestrian networks are comprehensive for the size of community. A generally well-connected street grid supports direct active transportation connections through most parts of the community, while off-street assets (e.g., Leo Adler

Memorial Parkway Trail) provide additional links to key destinations. Most roadways are designated local streets with relatively low vehicle volumes. Many of these local streets feature sidewalks; where sidewalks are missing, lower vehicle speeds and volumes create an environment more conducive to walking.

The weakest part of the network exists on Baker City's collectors and arterials, characterized by a fragmented sidewalk network and minimal bicycle infrastructure. However, Baker City is making progress in filling gaps including recent projects on Campbell Street that added sidewalks and bike lanes, and on D Street that added sidewalks between Cedar Street and Grandview Drive. The 2013 TSP concentrated a large portion of analysis and project dollars towards building out a full active transportation network. Overall, the TSP identified 45 individual pedestrian, 4 bicycle and 14 multi-use projects for funding. The TSP provides maps (Figures 2-1 and 2-2) for each of these projects. A full list of TSP-identified projects for 10th Street, Cedar Street and Hughes Lane/Pocahontas Road is available in Section 3.7of this memorandum.

Corridor Overviews

- 10th Street (US30)
  - Classified as an Urban Business Arterial, the roadway features vehicle volumes just under of 5,000 ADT and four general purpose travel lanes along the entire corridor length.
  - Bike lanes are missing from the entire length of the corridor.
  - North of E Street, sidewalks are almost completely missing on both sides of 10th Street. South of E Street the sidewalk network is more complete with only sporadic gaps in the curb tight sidewalks.
  - Most sidewalks are not Americans with Disabilities Act (ADA) compliant because ADA-compliant curb ramps are lacking at most intersections.
- Hughes Lane/Pocahontas Road
  - Classified as an arterial, the roadway features vehicle volumes of 3,000 ADT.
  - No sidewalks are present, however a striped bike lane measuring 6 feet wide is present along Hughes Lane in both east and west directions. A 10-foot-wide gravel shoulder is also present.
  - A connection to the Leo Adler Memorial Parkway Trail exists at the intersection with Kirkway Street. No crossing improvements are present.
- Cedar Street
  - Classified as a Collector, vehicle volumes are approximately 3,000 ADT.
  - The intersection with Hughes Lane features geometries that allow turning movements at relatively high speeds, presenting potential safety issues for people walking and bicycling. In addition to the geometry, the speed limit north of the intersection is marked as 45 miles per hour (mph), and vehicles may still be traveling at these higher speeds when approaching the intersection in the southbound direction.

- The entire length of the roadway is missing bike lanes and sidewalks, however both sides of the street feature a paved and gravel shoulder up to 10 feet wide that is useable by people walking and bicycling.
- The speed limit from Hughes Lane to H Street is 35 mph. South of H Street the speed limit is 25 mph providing a potentially greater level of comfort for vulnerable roadway users.

BLTS and PLTS

(LTS is a key indicator in measuring how comfortable a roadway segment or intersection is for an active transportation user to navigate. LTS objectively measures several roadway factors including traffic volumes, speeds, and the presence and quality of bicycle and pedestrian facilities to produce an LTS rating.

Ratings are measured 1 through 4 with 1 representing the most comfortable environment for active transportation users. Each rating definition is presented from ODOT's APM:

- **PLTS 1**- Represents little to no traffic stress and requires little attention to the traffic situation. This is suitable for all users including children 10 years or younger, groups of people and people using a wheeled mobility device (WhMD). The facility is a sidewalk or shared-use path with a buffer between the pedestrian and motor vehicle facility. Pedestrians feel safe and comfortable on the pedestrian facility. Motor vehicles are either far from the pedestrian facility and/or traveling at a low speed and volume. All users are willing to use this facility.
- **PLTS 2**- Represents little traffic stress but requires more attention to the traffic situation than of which young children may be capable. This would be suitable for children over 10, teens, and adults. All users should be able to use the facility but, some factors may limit people using WhMDs. Sidewalk condition should be good with limited areas of fair condition. Roadways may have higher speeds and/or higher volumes. Most users are willing to use this facility.
- **PLTS 3**- Represents moderate stress and is suitable for adults. An able-bodied adult would feel uncomfortable but safe using this facility. This includes higher speed roadways with smaller buffers. Small areas in the facility may be impassable for a person using a WhMD and/or requires the user to travel on the shoulder/bike lane/street. Some users are willing to use this facility.
- **PLTS 4**- Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility. Traffic speeds are moderate to high with narrow or no pedestrian facilities provided. Typical locations include high speed, multilane roadways with narrow sidewalks, and buffers. This also includes facilities with no sidewalk. This could include evident trails next to roads or 'cut through' trails. Only the most confident or trip-purpose driven users will use this facility.
- **BLTS 1**- Represents little traffic stress and requires less attention, so is suitable for all cyclists. This includes children that are trained to safely cross intersections (around 10 years old/5th grade) alone and supervising-riding parents of younger children. Generally, the age of 10 is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there

is no more than one lane in each direction. Intersections are easily crossed by children and adults. Typical locations include residential local streets and separated bike paths/cycle tracks.

- **BLTS 2**- Represents little traffic stress but requires more attention than young children would be expected to deal with, so is suitable for teen and adult cyclists with adequate bike handling skills. Traffic speeds are slightly higher, but speed differentials are still low, and roadways can be up to three lanes wide for both directions. Intersections are not difficult to cross for most teenagers and adults. Typical locations include collector-level streets with bike lanes or a central business district.
- **BLTS 3**- Represents moderate stress and is suitable for most observant adult cyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways.
- **BLTS 4**- Represents high stress and suitable for experienced and skilled cyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide for both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes.

The ODOT APM designates target LTS ratings that roadways should meet in maximizing active transportation mode share. For bicycles, BLTS 2 is often the target that generally appeals to most potential riders. Near schools, a BLTS 1 is desirable for elementary schools while BLTS 2 is allowable for middle and high schools. For pedestrians, a PLTS 2 is generally the minimum target for pedestrian routes. Roadways within a quarter mile of schools should use a target PLTS 1 for elementary schools and PLTS 2 for middle and high schools. Roadways near medical facilities should also have a target of PLTS 1.

At intersections, a BLTS approach rating is provided. The primary factor in rating an intersection approach is the number of turn lanes present, the number of vehicle lanes a bicyclist may need to cross when approaching the intersection, and traffic speeds. A PLTS crossing rating is also calculated. The primary factors in rating pedestrian crossings include the presence of formalized (e.g., marked) crossings, lighting, number of vehicle lanes being traversed, vehicle volumes, and vehicle speeds.

Table 3-3 reports the BLTS and PLTS ratings for roadway segments and intersections. Figure 3-2 shows the LTS ratings as a map. The LTS ratings for segments are scored based on the worst performing roadway characteristic. For example, a roadway may score BLTS 2 based on volumes but BLTS 4 based on bicycle facility type and thus the segment will receive an overall score of BLTS 4. The full LTS ratings that includes scoring for individual roadway characteristics are provided in Appendix C.

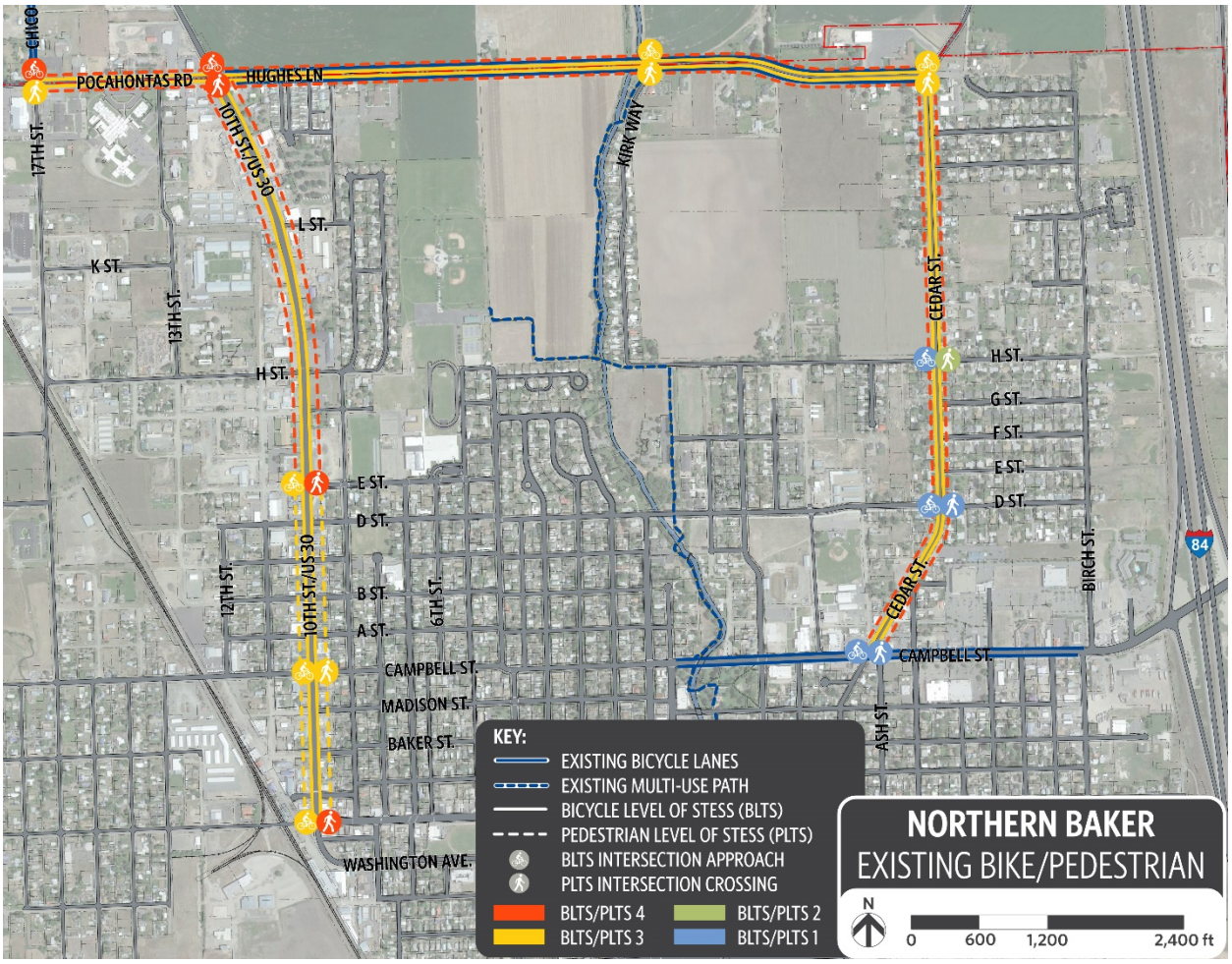
Table 3-3. BLTS and PLTS Ratings

Location	BLTS Rating	BLTS Approach Rating	PLTS Rating	PLTS Crossing Rating
10th Street (US 30)				
Hughes Lane to E Street	3	-	4	-
E Street to Campbell Street	3	-	3	-
Campbell Street to Broadway	3	-	3	-
Hughes Lane/Pocahontas Road				
17th Street to 10th Street	3	-	4	-
10th Street to Kirkway Street	3	-	4	-
Kirkway Street to Cedar Street	3	-	4	-
Cedar Street				
Hughes Lane to H Street	3	-	4	-
H Street to D Street	3	-	4	-
D Street to Campbell Street	3	-	4	-
Intersections				
10th Street/Hughes Lane	-	4	-	4
10th Street/E Street	-	3	-	4
10th Street/Campbell Street	-	3	-	3
10th Street/Broadway Street	-	3	-	4
Pocahontas Road/17th Street	-	4	-	3
Hughes Lane/Kirkway Street	-	3	-	3
Hughes Lane/Cedar Street	-	3	-	3
Cedar Street/H Street	-	1	-	2
Cedar Street/D Street	-	1	-	1
Cedar Street/Campbell Street	-	1	-	1

Based on the ODOT APM methodology, roadway segments generally rank LTS 3 and 4 for both bicycles and pedestrians primarily due to a combination of higher speeds and missing active transportation infrastructure. Key findings include the following:

- 10th Street – The lack of ADA-compliant curb ramps at intersections limits the corridor south of E Street from scoring higher than PLTS 3. The lack of marked bike lanes adjacent to multiple vehicle lanes in each direction limits the BLTS rating to 4.
- Cedar Street – Despite the lack of bike lanes and sidewalks, intersection ratings south of H Street perform well due of the lower vehicle speeds and less-complex intersection configurations. The lack of sidewalks results in a PLTS 4 score for the corridor's entirety.
- Hughes Lane – The lack of sidewalks results in a PLTS 4 score for the corridor's entirety.

Figure 3-2. Existing Bicycle and Pedestrian Level of Traffic Stress Results



3.4 Transit

Baker City features both local and regional transit services. This section provides a summary of those transit services, their relation to the primary corridors focused on in this project and existing facilities along those corridors.

3.4.1 Regional Service

Baker City is connected to the wider Eastern Oregon region through several regional transit services. Northeast Oregon Public Transit (NEO Transit) operates the Baker City Connector service, a shuttle service providing once per week service between Baker City and several other Eastern Oregon communities including Haines, North Powder, La Grande, and Halfway. All these services pick-up and drop-off from the NEO Transit offices on the east side of Cedar Street just north of C Street. The La Grande connector provides daily weekday trips between La Grande and Baker City with one shuttle in each direction in the morning and another in the evening. Grant County Transportation District also runs a shuttle service twice per month connecting Baker City to John Day. These shuttles are not meant as commuter services, rather they function as a lifeline

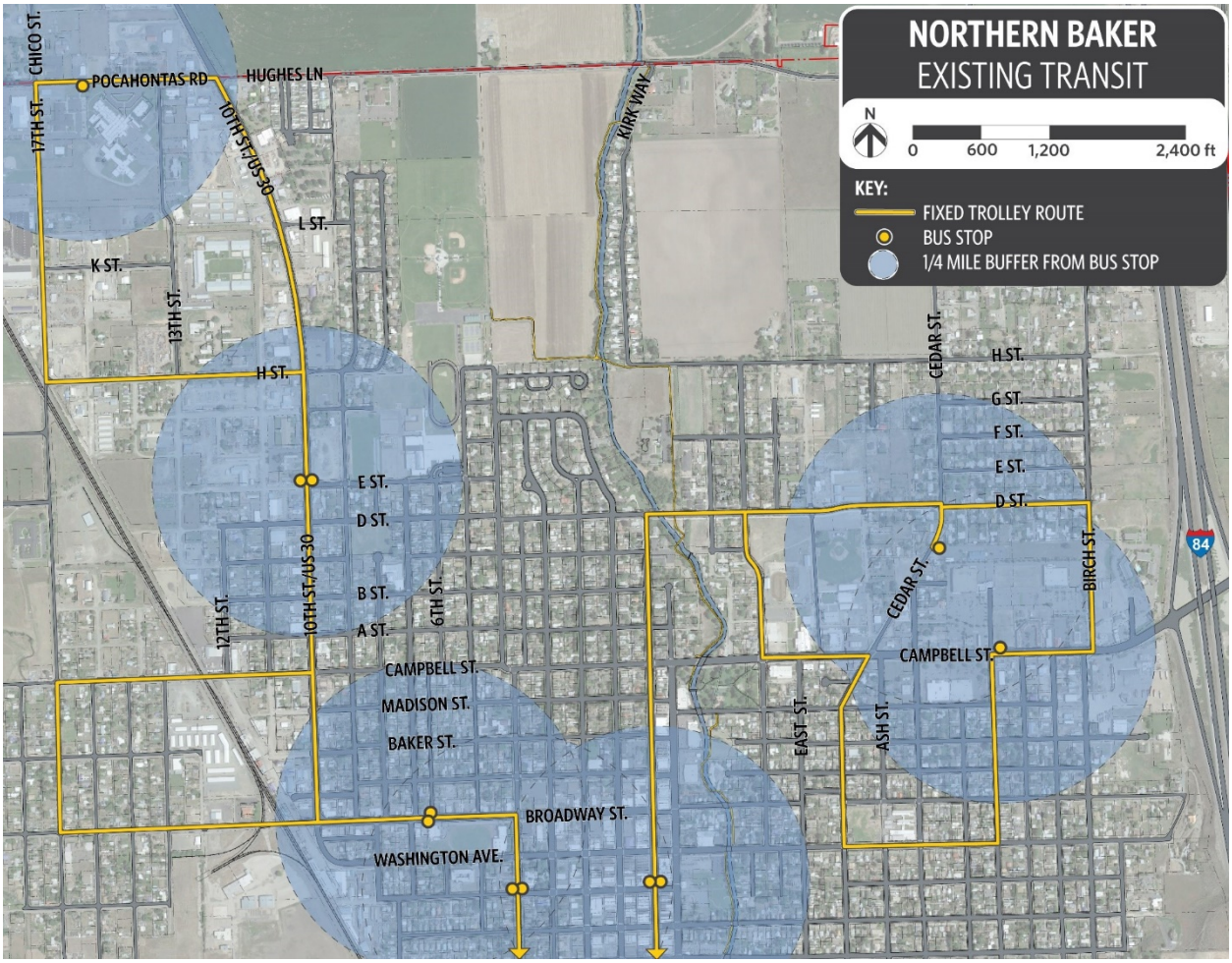
interconnecting these communities to vital services concentrated in Baker City or La Grande.

3.4.2 Local Service

NEO Transit operates a fixed route trolley bus service that provides connections throughout Baker City. Figure 3-3 shows the fixed route service and the nine primary stops in town. Three of the stops are on the study corridors: 10th Street/E Street intersection, Pocahontas Road at Saint Alphonsus Medical Center, and Cedar Street at NEO Transit offices. The stop at the NEO Transit offices functions as a park-and-ride transit center connecting to the regional shuttle services operated by NEO Transit. Even with only a handful of stops, service coverage for the city is relatively high as the bus can be waved down at any point along its route. This means that a large portion of Baker City residents are within a 0.25-mile walk or ride of transit service.

The fixed route service operates from 8 AM through 5 PM on weekdays with a headway of 50 minutes in each direction. A single ride costs $1.00, an all-day pass $3.00 and a monthly pass $35.00. NEO Transit operates additional flexible route services within Baker City, including Paratransit and a dial-a-ride service. The cost for the flexible services is the same as for the fixed route service.

Figure 3-3. Existing Baker City Fixed-Route Transit Service



3.4.3 Transit Use and Demographic Findings

As a small urban area of approximately 10,000 people that extends approximately one mile in each direction from the historic downtown, transit usage is relatively low. According to NEO Transit, the average yearly ridership for the fixed route service was approximately 19,000 people over the last four years. This is the equivalent of approximately two rides per year for each person living in Baker City.

Table 3-4 shows a summary of mode of travel and travel time data for Baker City. This data is from the Census Bureau's five-year American Communities Survey (ACS). According to the survey, 5.5 percent of households do not have access to a vehicle, and 82 percent of work commutes are under 15 minutes. The primary mode to work is drive alone; transit is not used for commute trips in Baker City.

Table 3-4. Summary of Transportation Related Data – 5-year ACS

Field	Estimate
Baker City	
Total Population	9,738
Workers 16 and over	3,730
Total Employees	4,264
No Vehicle Households	5.5%
Commute Mode to Work	
Drove Alone	71%
Carpooled	14%
Public Transit	0%
Walked	7%
Bicycled	1%
Travel Time to Work (All Modes)	
< 5 minutes	14. 5%
5 – 9 minutes	48.6%
10 – 14 minutes	19%
15 – 24 minutes	8.9%
> 25 minutes	9%

3.4.4 Transit Facilities

This section provides a brief summary and assessment of the existing transit stops within the project area. Nine designated bus stops exist for the fixed route service. Figure 3-4 shows the bus stops and fixed route transit service. The following summarizes facilities at the three stops located on project streets.

10th Street and E Street Stop

This segment of 10th Street has limited sidewalks on either side of the road to the North of E Street and sidewalks only on the west side of 10th Street on the block immediately south of the stop. Similarly, there are no sidewalks on E Street west of 10th Street; however east of 10th Street there are sidewalks on both sides of the street connecting to the Baker High School.

Figure 3-4. 10th Street Bus Stop at E Street

Source: Google Earth

The stops feature only the signs, gravel waiting areas, and overhead lights along 10th Street. There are no shelters or bike racks. The stop is near the Human Services Department, Baker High School, and restaurants which are all important links to community destinations. However, there are no crosswalks across 10th Street in this location, making crossing potentially more difficult.

The lack of completed sidewalks and low level of stop amenities for either side of the street make the location less than inviting and difficult to see. As shown in Figure 3-4, a woman walking within the parking lane along 10th Street near the stop is barely visible.

Pocahontas Road at Saint Alphonsus Medical Center

The stop at Saint Alphonsus Medical Center is in the parking lot near the front entrance to the medical center. Sidewalks offer a high level of connectivity to the medical center complex. Beyond the medical center, Pocahontas Road does not have sidewalks or bike lanes; thus, providing limited connectivity for bicyclists and pedestrians to the surrounding businesses and parks. Additionally, there are no crosswalks on Pocahontas Road to facilitate convenient and safe crossings to the bus stop. Lighting is present along the roadway approximately every 500 feet.

NEO Transit Park-and-Ride

The park-and-ride is located on the east side of Cedar Street just north of C Street. The location functions as the offices, bus barn, transit center for NEO Transit's regional services, and a stop on the fixed route service within Baker City. Centralizing all of these into one location provides a strong connection between the local and regional services. The location is one-quarter mile north of Campbell Street where a strip of commercial services exists including an Albertsons, Safeway, Rite Aid, and the Baker County Fairgrounds. Access to the surrounding neighborhood and commercial strip is primarily provided via Cedar Street.

Access to the park-and-ride is off Cedar Street. The street has a striped shoulder featuring a combined paved and gravel shoulder that functions as a pedestrian walkway. There are no sidewalks onto the property. Street lighting is located every 250 feet.

3.5 Safety

This section provides a summary of ODOT and Baker City crash data (2014-2018) for the project area. The full crash statistics from ODOT are provided in Appendix D. The ODOT and Baker City crash data should be considered independently. The data were not evaluated to determine if there was redundancy in the crash reports.

3.5.1 Corridor Crashes

As shown in Table 3-5, there were 52 crashes within the project area between 2014 and 2018. Just over 50 percent of crashes happened along 10th Street, 28 percent occurred on Cedar Street, and 23 percent on Hughes Lane/Pocahontas Road. Overall, the highest number of crashes occurred on Wednesdays (32 percent of the total). In addition, the highest number of crashes per day was between 12:00 PM to 2:00 PM (28 percent). The time of day concentration matches the single peak hour weekday traffic counts for the project area. Crashes in the table below may show up twice and recorded as occurring on two streets. For example, a crash at the intersection of Cedar Street and Hughes Lane will be associated in the crash history of both streets.

Table 3-5. Total Crashes by Roadway

Corridor	Crashes	Fatal (K)	Serious Injury (A)	Moderate Injury (B)	Minor Injury (C)	Property Damage Only
Project Area	52	0	2	12	14	24
10th Street	28	0	2	9	6	11
Cedar Street	12	0	0	2	7	3
Hughes Lane/Pocahontas Road	12	0	0	1	1	10

.

Two serious injury crashes occurred within the project area, both of which took place on 10th Street. No fatalities were recorded during the analysis years. Within the project area, Property Damage Only are the largest portion of crashes at 42 percent while 27 percent feature minor injury crashes and 23 percent feature moderate injury crashes. The most

crashes resulting in moderate injuries occurred on 10th Street with nine while Cedar Street featured the most crashes resulting in minor injuries with seven.

The three most common collision types involved were turning movement at 32 percent, angle at 25 percent and rear-end crashes at 19 percent. Failing to yield the ROW was the most common contributing factor at 35 percent, followed by driving too fast at 14 percent, and following too closely at 10 percent.

10th Street Crash Summary

Table 3-6 summarizes the crashes along 10th Street by segment. As shown, 46 percent of all crashes along 10th Street occurred between Broadway Street and Campbell Street. The highest concentration of moderate injury crashes occurred on segment 3, representing 25 percent of all crashes along 10th Street.

The most common crash types were turning movement (36 percent) and angle collisions (32 percent). Most of the turning movement crashes occurred between Broadway Street and Campbell Street with failure to yield (22 percent) the most contributing factor of all crashes.

Table 3-6. 10th Street Segment Crash Summary

Reported Stat	10th Segment 1: Broadway to Campbell Street	10th Segment 2: Campbell to E Street	10th Segment 3: E St to Hughes Lane
Fatal	0	0	0
Injury A (Incapacitated)	0	1	1
Injury B (Moderate Injury)	0	0	2
Injury C (Minor Injury)	0	3	0
No Injury (Complaint of Pain)	0	0	0
Property Damage	2	1	2
Total	**2**	**5**	**4**

Table 3-7 summarizes crashes by severity at the four study intersections on 10th Street. Five of the seven total moderate injury crashes were recorded at Hughes Lane/Pocahontas Road and two at Campbell Street. Considering all the intersection crashes, the most common crash types were turning (50 percent) and angle collisions (40 percent). The most common contributing factor was failing to yield the ROW (50 percent).

Table 3-7. 10th Street Intersection Crashes

Reported Stat	10th & Hughes Lane/ Pocahontas Road	10th & Campbell Street	10th & Broadway Street	10th & E Street
Fatal	0	0	0	0
Injury A (Incapacitated)	0	0	0	0

Reported Stat	10th & Hughes Lane/ Pocahontas Road	10th & Campbell Street	10th & Broadway Street	10th & E Street
Injury B (Moderate Injury)	5	2	0	0
Injury C (Minor Injury)	0	3	0	0
No Injury (Complaint of Pain)	0	0	0	0
Property Damage	2	3	3	0
Total	**7**	**8**	**3**	**0**

SPIS Rankings

ODOT collects crash statistics and prioritizes high crash locations using their Safety Priority Index System (SPIS) for all public roads in Oregon. As of the latest 2018 report, which includes crash data for the previous three-year period, there were no top 10 percent SPIS sites on the project roadways. The highest priority location is the intersection of 10th Street and A Street, which is ranked with an SPIS score of 43 and a priority percentage of 85 percent. For reference, the top scoring SPIS site in Region 5 is on US395 in Umatilla County with a score of 76.

Crash Rate Assessment

Local crash rates for all the locations examined are lower than the average crash rate for similar facility types across Oregon. Crash rates for the project roadways and four study intersections were calculated using the ODOT APM methodology. The local rates are shown in Table 3-8 and compared to ODOT statewide average crash rates for similar roadway classifications or intersection configuration. Crash rates for roadway segments represent the number of crashes per million vehicle miles traveled along the segment while for intersections the rate represents crashes per million vehicles entering the intersection. The average crash rate is calculated using a five-year running average for both the local roadways and the ODOT rates used for comparison. The latest information available is for 2018 and includes crash data from 2014 through 2018.

This information is taken from the ODOT Crash Rate Table II[2] for the roadway segments and Exhibit 4-1: Intersection Crash Rates for intersections. The ODOT TransGIS tool was consulted to determine the roadway classification of the roadways for comparison against the statewide average crash rates found in the ODOT Crash Rate Table II.

[2] Crash Rate Table II provides annual crash rates by roadway functional classification over a five-year period which are used to calculate the average crash rate

Table 3-8. Average Crash Rates (2014-2018)

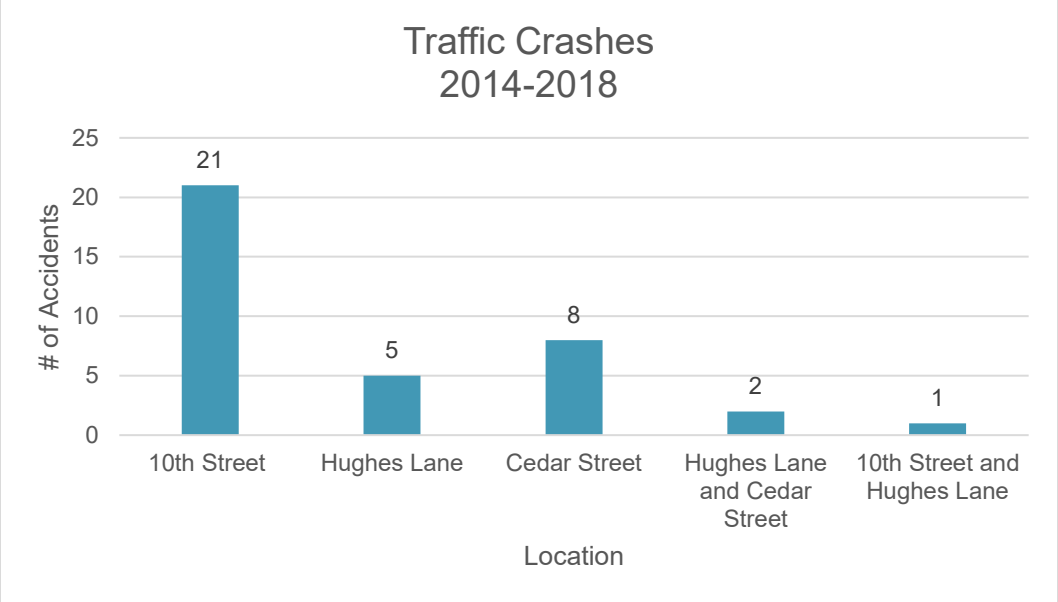
Location	Crash Rate	Intersection Type	Roadway Classi-fication	Statewide Average Crash Rate	Δ between Crash Rates	Over or Under Average Crash Rate
Roadway Segments						
Cedar Street	0.56	-	Urban Minor Arterial	1.93*	-1.37	Under
Hughes Lane/Pocahontas Road	0.37	-	Urban Minor Arterial	1.93*	-1.56	Under
10th Segment 1: Broadway Street to Campbell Street	0.74	-	Urban Minor Arterial	1.93*	-1.19	Under
10th Segment 2: Campbell Street to E Street	1.04	-	Urban Minor Arterial	1.93*	-.89	Under
10th Segment 3: E Street to Hughes Lane	0.63	-	Urban Minor Arterial	1.93*	-1.30	Under
Intersections						
10th Street/Hughes Lane	0.12	Urban 4ST†	-	0.198**	-0.08	Under
10th Street/Campbell Street	0.11	Urban 4SG††	-	0..477**	-0.37	Under
10th Street/Broadway Street	0.06	Urban 4ST†	-	0.198**	-0.14	Under
10th Street/E Street	0	Urban 4ST†	-	0.198**	-0.20	Under

* ODOT Crash Rate Table II five-year average
**Rates from Exhibit 4-1: Intersection Crash Rates found in Chapter 4 of the ODOT APM
†Urban, four-legged, minor stop-controlled intersection
††Urban, four-legged signalized

Baker City Crash Data

Crash data provided by Baker City is summarized in Figure 3-5. Between 2014 and 2018, the city recorded 37 crashes (34 along the corridors and three at intersections) with 14 injuries. According to the city data, the three top crash causes include failure to obey traffic control device (16 percent), failure to yield (14 percent), and followed to closely and unsafe left turn (11 percent). Zero fatalities were recorded in the City data.

Figure 3-5. Baker City Crash Data Summary



3.6 Utilities/ROW

This section briefly summarizes existing ROW constraints and underground utility lines. Maps of the project roadways displaying these features are provided in Appendix E.

3.6.1 10th Street

ROW along 10th Street is approximately 80 feet wide. On the west side of the roadway, the ROW runs along the existing curb while the ROW extends east of the curb line approximately 10 to 12 feet on the east side of the street. South of G Street, buildings abut the ROW along 10th Street and become more prominent south of D Street. Many properties along the east side of 10th Street have parking lots, business signs, and other features that appear within the ROW. Utility poles are found on both sides of 10th Street with those on the west side outside the ROW and those on the east side within the ROW.

Within the northern segment from Hughes Lane to E Street, water, stormwater, and sewer facilities run within or just outside the western ROW extent for almost the entire segment. South of H Street, the sewer lines run primarily within alleyways half a block off 10th Street. Within the southern segment from E Street to Broadway Street, water and stormwater are present and run primarily along the west side of the roadway within the ROW.

3.6.2 Hughes Lane/Pocahontas Road

Along Pocahontas Road, ROW is approximately 60 feet wide with approximately 10 feet of excess ROW on the north side of the roadway. On the south side, ROW is tight to the roadway shoulder. There are sewer, water, and stormwater facilities run along the south side of the roadway. Overhead power lines are sited south of the roadway just outside the ROW.

Hughes Lane between 10th Street and Cedar Street has an approximately 60-foot-wide ROW with excess ROW along the north side of the roadway (approximately 5 to 6 feet). ROW on the south side runs parallel with the edge of the shoulder. Water and stormwater facilities run along the length of the roadway generally under the centerline or eastbound lane. Overhead power lines are sited south of the roadway just outside the ROW from 10th Street until they cross to the north side of Hughes Lane approximately 1,300 feet west of Cedar Street. The power lines sited to the north appear within the ROW.

Two major constraints for the roadway are found near Kirkway Street. The first is a bridge over the Powder River. The bridge deck is 38 feet wide compared to the shoulder-to-shoulder width of approximately 52 feet for the rest of Hughes Lane. There are currently no details in the Baker City TSP regarding improvements or replacement of the bridge. The next phase of this project will address possible design solutions for the bridge. The second constraint is the combination of the Powder River and Corral Irrigation ditch. The ditch runs just to the north of Hughes Lane for 1,000 feet from the Powder River until the roadway curves slightly south.

3.6.3 Cedar Street

Cedar Street ROW is approximately 60 feet wide with excess ROW on the east side of the roadway measuring approximately 10 feet. This side of the roadway appears to feature many large trees, landscaped features, and fencing within the ROW. Stormwater and water facilities are present for almost the entire extent of the roadway, with pipes crossing under the street several times. Sewer facilities are present for only a small extent of the roadway between H Street and D Street. Overhead power lines are sited on the east side of Cedar Street from Hughes Lane until approximately J Street and appear within the ROW. South of H Street the overhead power lines are sited west of the roadway just outside of the ROW.

3.7 Deficiencies and Planned Improvements from Past Projects

This section summarizes previous planning efforts and identified deficiencies along the three project corridors. The information in this section was taken from the 2013 Baker City TSP, the 2005 Baker County TSP, and the 2016 Interchange Area Management Plan (IAMP). The projects listed below will help to inform the design process and resulting design concept for this project. The information is summarized in Table 3-9and in Figure 3-6.

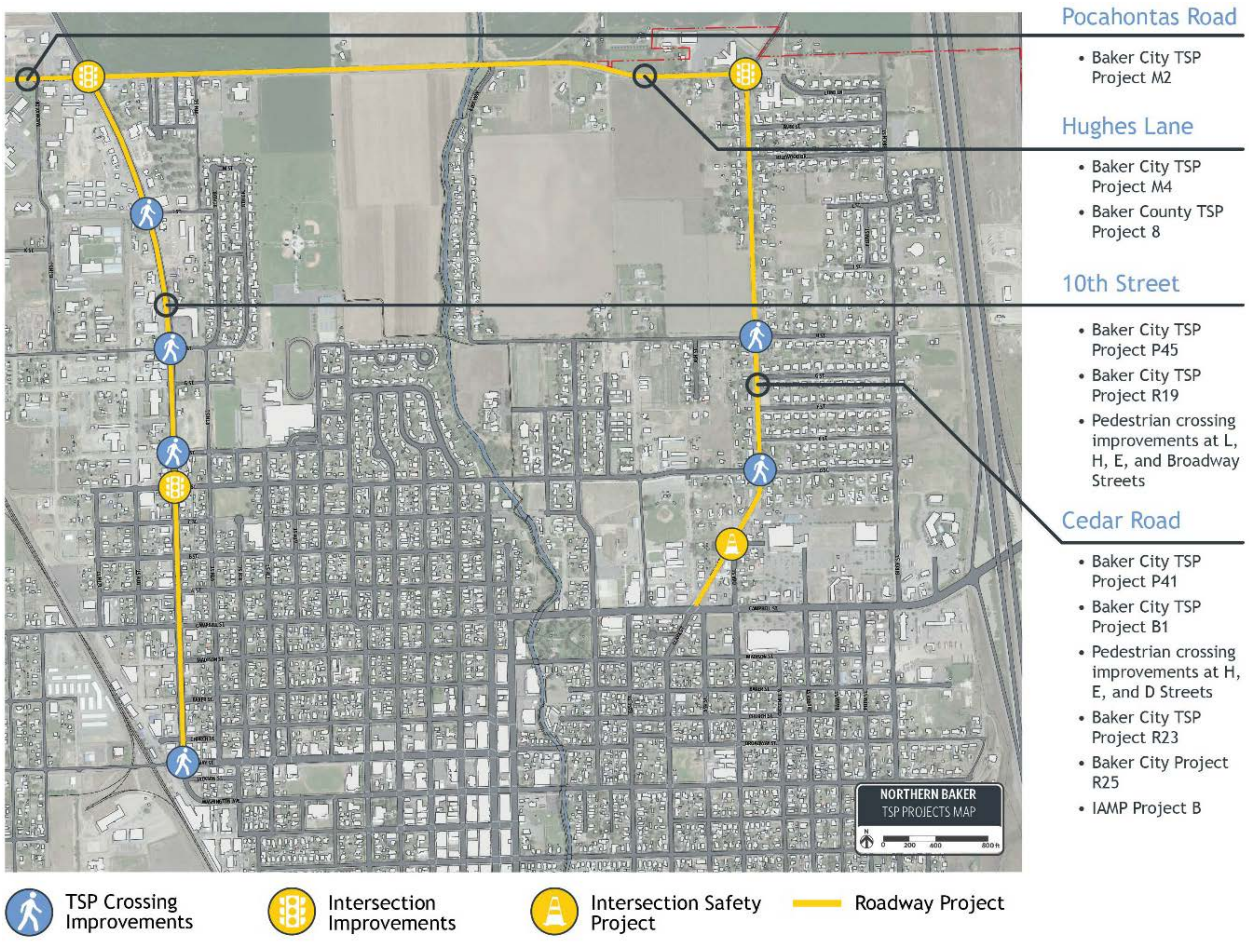
Table 3-9. Previously Identified Projects

Location	Description	Source	Cost Estimate*
10th Street			
Hughes Lane/10th Street	Intersection Signalization	Baker County TSP, Project 8	$200,000
Intersection of L, H, E, and Broadway Streets	Intersection Pedestrian Crossing Improvements	Baker City TSP - Identified in TSP Figure 2-1	N/A

Location	Description	Source	Cost Estimate*
10th Street/D Street	Intersection Signalization	Baker City TSP, Project R19	$533,000
10th Street/C Street	Remove half signal	Baker City TSP, Project R19	
10th Street from Broadway to Hughes Lane	Pedestrian network improvement - Sidewalk infill	Baker City TSP, Project P45	$316,000
Pocahontas/Hughes Lane			
17th Avenue from Indiana Avenue to Pocahontas Road	Multi-use path	Baker City TSP, Project M4	$309,000
Hughes Lane/Pocahontas Road from Settlers Loop to Cedar Street	17th Ave Multi-use path including tie-in to Pocahontas multi-use path at the intersection with 17th Avenue	Baker City TSP, Project M2	$1,169,000
Cedar Street			
Hughes Lane/Cedar Street	Intersection Improvements: • Phase 1 - Eastbound right turn lane • Phase 2 - Southbound right turn lane • Phase 3 - All-way stop improvement • Phase 4 - Signalization	I-84 IA, Project B	• Phase 1 - $160,000 • Phase 2 - $200,000 • Phase 3 - $220,000 • Phase 4 - $300,000
Hughes Lane/Cedar Street	Endorsement of the IAMP intersection improvements above	Baker City TSP, Project R23	$4,723,000
Cedar Street from Campbell Street to Hughes Lane	Sidewalk infill and crossing improvements at H and D Streets	Baker City TSP, Project R23	$754,000
Cedar Street from Campbell Street to Hughes Lane	Bike lane - signing and striping	Baker City TSP, Project R23	$35,000
Cedar Street/B Street	Intersection Safety improvement	Baker City TSP, Project R23	$50,000

*Cost estimates include engineering and construction

Figure 3-6. Past Identified Projects



3.8 ODOT Blueprint for Urban Design Review

The ODOT BUD is the definitive resource for urban design on the Oregon State highway system used to plan, design, and construct roadway facilities on the system. The BUD builds on existing design manuals including ODOT's Highway Design Manual for use when designing projects in urban settings on the state highway system. Updated urban design criteria related to the land use surrounding a design project and a framework for design flexibility within an urban context are included. The document follows federal guidelines and principles in utilizing and applying performance based, context sensitive and practical design solutions to provide flexible design options for accommodating all modes of transportation into an urban roadway project.

The specific design criteria are determined by the urban contexts of each project as listed within the BUD document in Chapter 2. In reviewing the BUD for design guidance, the three primary corridors of this project are classified as:

- 10th Street (US 30)
  - TSP Designation – Urban Business Arterial
  - Oregon Highway Plan Classification – Urban Minor Arterial
  - BUD applies as a designated U.S. Highway route

  - BUD Land Use Context – Urban Mix and Commercial Corridor
- Cedar Street
  - TSP Designation – Collector
  - BUD does not apply along the corridor within the NBTIP project area
- Hughes Lane/Pocahontas Road
  - TSP Designation – Arterial
  - BUD does not apply along the corridor within the NBTIP project area

3.8.1 BUD Guidance for 10th Street (US 30)

Section 2.1.2 and Table 2-2 of the BUD specify the designated land use context that would apply for 10th Street. Below are the definitions as they appear in the BUD.

Urban Mix

The Urban Mix land use context features a well-connected roadway network and may extend for long distances through an urban area. Commercial uses front the street with residential neighborhoods on top of or immediately behind the commercial land use.

Commercial Corridor

The Commercial Corridor land use context consists mostly of commercial and industrial uses with large building footprints and large parking lots set within large blocks and featuring a disconnected or sparse roadway network.

Table 3-10. BUD Urban Context Matrix Table 2-2

Table 2-2: ODOT Urban Context Matrix

Land Use Context	Setbacks Distance from the building to the property line	Building Orientation Buildings with front doors that can be accessed from the sidewalks along a pedestrian path	Land Use Existing or future mix of land uses	Building Coverage Percent of area adjacent to right-of-way with buildings, as opposed to parking, landscape, or other uses	Parking Location of parking in relation to the buildings along the right-of-way	Block Size Average size of blocks adjacent to the right-of-way
Urban Mix	Shallow	Some	Commercial fronting, residential behind or above	Medium	Mostly off-street/Single row in front/ In back/ On side	Small to medium blocks
Commercial Corridor	Medium to Large	Sparse	Commercial, Institutional, Industrial	Low	Off-street/In front	Large blocks, not well defined

For this project, 10th Street between H Street and Hughes Lane is within a Commercial Corridor context while 10th Street between Broadway Street and H Street is within an Urban Mix context.

As part of the La Grande – Baker Highway, 10th Street is designated as a District Highway. The primary function is to provide connections and links between small urbanized areas, rural centers, and urban hubs while serving local access and traffic.

Section 2.4 of the BUD provides an outline of how the land use context and roadway classification should be applied together. Table 2-6 of the BUD should be consulted during the design phase as it provides design criteria for each designated land use context including but not limited to:

- Target Speeds – 25 to 35 mph depending on Urban Context designation
- Travel Lanes – begin with minimal widths, consider roadway characteristics
- Median – optional, typically used for safety and operations management
- Bicycle Facilities – begin with separated facilities, consider roadway characteristics
- Sidewalks – ample space for sidewalk activity, continuous ,and buffered

Beyond the design criteria outlined within the BUD, Chapter 3 of the BUD covers how local conditions can be integrated into the design process to allow flexibility in the application of the BUD design criteria and should be consulted during the design phase of the NBTIP project.

Below is a summary for each of the land use contexts found along 10th Street.

Urban Mix

Vehicle speeds should be maintained between 25 and 35 mph to best serve all users. Transit stops should be placed in proximity to key destinations while bicycle and pedestrian facilities should be relatively wide and comfortable to serve anticipated users. Where lower speeds cannot be achieved, a buffer between travel lanes and active modes should be considered. Curbside use may include loading, parking, and other uses. Landscaping and street trees following ODOT placement and spacing guidelines are appropriate.

Commercial Corridor

Multimodal access must be balanced with vehicle and freight throughput with vehicle speeds typically between 30 and 35 mph. Medians should be used to facilitate and manage access to commercial destinations. Bicycle and pedestrian facilities should be separated from travel lanes by a buffer with transit served at curbside.

Factors to Consider Prior to Design

Table 2-5 of the BUD features several considerations that can impact the design process. These factors include the level of access management along the corridor, the levels of freight and transit activity, and any special emergency route designations such as being a Seismic Lifeline Route.

3.9 Active Transportation and Transit Toolbox

This section contains a selection (not exhaustive list) of bicycle, pedestrian, and transit design elements that Baker City may consider during the design phase for this project. The Project Team compiled the list presented in Table 3-10 upon consulting several design guides relevant to Baker City's needs and context including FHWA's *Small Town*

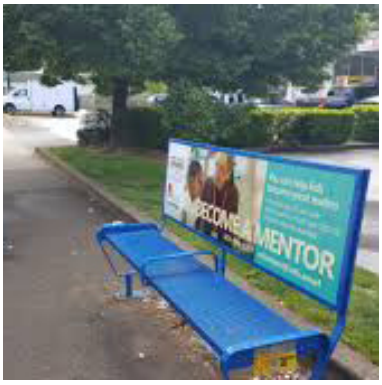
and Rural Mulitmodal Networks Guide and *Separated Bike Lane Planning and Design Guide*, ODOT's *BUD*, and NACTO's *Urban Street Design Guide, Urban Bikeway Design Guide, and Transit Street Design Guide*.

Table 3-11. Active Transportation and Transit Toolbox

Treatment	Example	Purpose	Design Considerations	Opportunities and Constraints
Paved Shoulder		A clear paved shoulder with buffered lane markings provides a separate space on the roadway for bicycles and pedestrians in low volume, rural environments.	• min. 4 ft with min. 1.5 ft buffer • Minimal ROW impact	• Appropriate for a mix of volumes and speeds with the right separation • Can be used as an Intermediate treatment prior to investing in curb, gutter and sidewalk
Shared Use Path		A pathway physically separated from the roadway, facilitating bi-directional travel for people walking and bicycling.	• 8-12 ft width • 5 ft separation from roadway • Requires 13 to 17 feet of ROW	• Appropriate for higher speed and volume roadways • ROW requirement may be a significant constraint • Best in cases with minimal driveway or intersection crossings
Rectangular Rapid Flash Beacon		User-actuated LED warning signs that increase safety and comfort for pedestrians crossing a street.	• HAS-17-072 provides guidance on specific conditions for application • No ROW impacts	• May be used at mid-block or unsignalized crossings • Appropriate for two-lane or multi-lane roadways

Treatment	Example	Purpose	Design Considerations	Opportunities and Constraints
Pedestrian Lane		Similar to a paved shoulder, but exclusively for pedestrian use. The treatment is meant as a temporary or interim solution.	• 5-8 ft width • Optional buffer • Pedestrian markings recommended • Minimal ROW impacts	• Appropriate for roadways with lower to moderate vehicle volumes and speeds • Does not require curb, gutter sidewalk • Requires maintenance such as sweeping and snow removal
Shared Lane Marking "Sharrow"		A bicycle symbol placed in the middle of a travel lane (on roadways where bicyclists and motor vehicles share the same space) to increase motorists' awareness of bicyclists.	• Placing the sharrow between vehicle wheelpaths reduces ongoing maintenance needs • No ROW Impact	• Appropriate for lower volume, lower speed streets • Minimal investment • Does not require additional ROW • May have limited impact toward increasing ridership, particularly if placed on higher-volume/ speed roadways
Bicycle Lane		A marked lane that provides exclusive space for bicyclists.	• Min. 6 ft • Optional buffer • Requires 12 ft of ROW	• Appropriate for roadways with moderate vehicle and speeds
Intersection Bicycle Lane Crossing Markings		Used to highlight conflict zones at intersections, and the intended path of a bicycle through the intersection.	• No ROW impacts • Dashed lines following MUTCD 3B.08	• Appropriate for moderate to high vehicle volume environments where additional visibility is warranted • May require routine maintenance to maintain visibility • May utilize a combination of striping and coloring

Treatment	Example	Purpose	Design Considerations	Opportunities and Constraints
Buffered Bicycle Lane		Similar to a bike lane but provides additional delineated separation from motor vehicles.	• 2-4 ft striped buffer	• Appropriate in environments with high vehicle volumes and speeds • Wider buffers may necessitate additional markings (e.g., hash marks) to discourage motor vehicle intrusion into the buffer area
Separated Bicycle Lane		A physically separated bicycle lane consisting of a physical barrier between the bike lane and adjacent vehicle travel lane. Physical barrier may consist of bollards, flexible delineator posts, planters, or on-street parking.	• 5-7 ft bike lane • 1-3 ft separation from traffic. The minimum is allowable with a mountable or vertical curb face	• Yield the greatest potential to increase user comfort (and potentially safety) on higher-volume and higher-speed roadways • Design consideration should account for driveway and intersection sight lines, loading zones, ongoing maintenance, snow removal
Bicycle and Right Turn Mixing Zone		An area where bicyclists and right-turning vehicles merge into a single lane upstream from an intersection. Enables bicyclists to avoid “right-hook” crashes	• May be appropriate depending on future intersection configurations. • No ROW impacts • 60 ft long transition • No ROW impacts	• Can be deployed on lower volume streets to reduce vehicle speeds and increase comfort for people walking and bicycling • Requires coordination with maintenance and snowplow crews • Locate where there is enough visibility and lighting • Not appropriate for roadways with more than two general purpose travel lanes

Treatment	Example	Purpose	Design Considerations	Opportunities and Constraints
Curb Extension		An extension of the curb (usually the width of the parking lane) that provides pedestrians greater visibility at an intersection.	• May be located at an intersection of at a mid-block crossing • No ROW impact	• More feasible where an on-street parking lane exists
Designated Bus loading Zone (a no parking zone exclusively for buses to pull-out of traffic)		A designated, curb-tight, zone for buses to pull-out of the travel lane. Works well where existing on-street parking runs parallel to the travel lane.	• Minimum length and width depends on anticipated transit vehicle usage • No ROW impacts	• May be appropriate at existing transit stops
Bus Stop Facilities		Bus stops may include seating, signage, shelters, route maps, fare information, schedule and bike racks. Shelters provide protection from snow and rain.	• Seating should be affixed • Accessibility should be considered in design	• Seating should be considered at stops with high numbers of seniors or children • Placement should not block pedestrian movement along the sidewalk

The following design features can be implemented specifically within the 10th Street corridor to improve bicycle and pedestrian safety and comfort.

- **Bikeways.** Where ROW is adequate and speeds are above 25 mph or traffic volumes high, buffered bike lanes, separated bicycle lanes, raised bike lanes or separated paths should be considered. While the bicycle lanes required for Urban Arterials provide an important option for bicyclists, only the most confident bicyclists are likely to use them, given the speed and volume of traffic on 10th Street. A broader cross-section of community members would be more likely to use separated pathways or even shared roadways on parallel streets with fewer cars and slower vehicle speeds.

- **Crosswalks.** Legal crosswalks exist in all legs of all intersections in Oregon. Crosswalks may be marked or unmarked or have signs or control devices to manage movement. Two parallel painted lines are generally not enough of a distinguishing marking for crosswalks. At a minimum, a ladder pattern type of striping or painting inside the crosswalk area is recommended to improve visibility.
- **Improved Connections to Adjacent Areas.** Where possible, secondary or parallel streets along major roads can help address community-wide transportation needs. Where connections are not possible, jurisdictions can require through the development approval process bicycle and pedestrian connections and internal private shopping streets that mimic public streets and meet desired block standard parameters.

4 Natural and Cultural Assessment

Existing data and maps were reviewed to determine the presence of natural and cultural resources in the project area. The topics included in this discussion include the following:

- Goal 5 natural resource areas, including wetlands, riparian areas, and wildlife habitat
- Natural hazards, including floodplains and floodways
- Known hazardous materials sites
- Known cultural and historic resources
- Topographic constraints (i.e., steep slopes)
- Socioeconomic considerations, Title VI populations, and Environmental Justice in and adjacent to the study area

4.1 Goal 5 Resources

A review of the U.S. Fish and Wildlife National Wetland Inventory Mapper revealed multiple water resources in the study area, including the Powder River, New Home Ditch, and Corral Ditch. Wetlands are present immediately adjacent to the study area; however, none fall within the boundary of the study area (Figure 4-1).

Because the Powder River traverses the study area, riparian habitat is present. There is no designated critical habitat of any species listed as threatened or endangered under the Endangered Species Act present in the study area. A review of the U.S. Fish and Wildlife Information for Planning and Consultation was completed. Two species are listed with the potential to occur in the study area: bull trout (*Salvelinus confluentus*) and Howell's spectacular thelypody (*Thelypodium howelli ssp. Spectabilis*). The StreamNet Mapper shows no record of bull trout in the Powder River but shows redband trout are a resident fish found year-round in the Powder River. The Baker City Comprehensive Plan lists the Powder River as a recreation resource both as habitat for game fish, and for swimming and other related activities. Additional investigation to determine the ordinary high-water mark and jurisdiction of both ditches and the Powder River may be required.

4.2 Natural Hazards

The study area overlaps with the 100-year Federal Emergency Management Agency floodplain of the Powder River below Hughes Lane (Figure 4-1). The flood hazard zones in the study area include AH (area inundated by the base flood with flood depths of 1 to 3 feet; base flood elevations determined), AO (area inundated by the base flood with flood depths of 1 to 3 feet; average depths determined), and AE (area inundated by the base flood with base flood elevations determined). Areas within Federal Emergency Management Agency flood zones are subject to additional development regulations in the City of Baker City's Development Code.

4.3 Hazardous Materials Sites

A search of the Oregon Department of Environmental Quality's Facility Profiler was completed to determine presence of potential hazardous materials sites within the study area. There is one hazardous waste generator, four Environmental Cleanup Sites (ECSI), and three Leaking Underground Storage Tanks (LUST) in the study area (Table 4-1). Further investigation will be required to determine the extent of hazardous materials present in the study area and how it may affect the project.

Table 4-1. Hazardous Materials Sites in the Study Area

Facility Type	ID#	Facility Name	Address	Status
Hazardous Waste Generator	1895	S&S Auto Center	3610 10th Street	Active
ECSI	3138	Williams Cleaners & Laundry (former)	3175 10th Street	Suspect site requiring further investigation
ECSI	4068	General Farm Supply	2975 10th Street	No further action required
ECSI	5512	Union Service Station (former)	2000 1st Street	Suspect site requiring further investigation
ECSI	5509	Edge Service Station (former)	2901 Broadway Avenue	Suspect site requiring further investigation
LUST	01-13-0637	-	1994 Main Street	Active
LUST	01-04-1602	-	2024 Washington Street	Closed
LUST	01-13-1006	-	2000 Main Street	Active

4.4 Cultural and Historic Sites

The Oregon Historic Sites Database was reviewed to determine if any potential historic resources are present in the study area, however, none were listed. There is a designated Historic District in the City of Baker City (Figure 4-1) nearby but it does not overlap the study area. There may be buildings or sites located within the study area that have not been evaluated for historic eligibility and require a historic resources survey for further investigation.

Cultural sites and/or resources are not listed in online databases accessible to the public. A search for cultural resources from the City of Baker City and Baker County did not reveal any documented sites or resources in the study area. Most of the study area is developed, and the probability of encountering intact archaeological artifacts is low in those areas. The probability is higher in the undeveloped portions of the study area. Further investigation, including a cultural resources survey, would be required to determine areas of concern.

In addition to cultural and historic resources, Section 4(f) and Section 6(f) resources need to be investigated. Section 4(f) resources are recreation areas, parks, and wildlife refuges that are publicly owned or open to the public. Section 6(f) resources are those properties that were acquired or developed with grants from the Land and Water Conservation Fund and are prohibited from conversion to a non-recreational purpose. It does not appear that any existing Section 4(f) or Section 6(f) recreation resources overlap with the study area.

4.5 Topographic Constraints

The terrain in the study area is relatively flat, especially on the existing roadways (10th Street, Hughes Lane, Washington Avenue, Clark Street and Cedar Street). The land immediately surrounding Hughes Lane (10 to 15 feet wide on each side of the roadway) varies from gentle to steep slopes. The Powder River has steep slopes associated with its banks, including some areas characterized as very steep. Steep slopes are considered sensitive lands in the City of Baker City Comprehensive Plan and may be subject to additional development regulations.

4.6 Socioeconomic and Environmental Justice Considerations

Several businesses and residences located within the study area may be affected through modifications to access from the project, both temporarily during construction and permanently with the proposed NBTIP improvements. Maintaining viable connectivity to existing businesses, restaurants, places of worship, and residences along the study area will be important for the project to avoid adverse socioeconomic impacts to the surrounding area.

For the purpose of this assessment and as defined by U.S. Department of Transportation and FHWA guidance, “low-income” populations are those whose median household incomes are at or below the U.S. Department of Health and Human Services poverty guidelines and “minority” populations are defined as persons who are Black, Hispanic or Latino[3], Asian American, American Indian and Alaska Native, or Native Hawaiian or other Pacific Islander (USDOT 2012; FHWA 2012). Collectively, low-income and minority populations are referred to as “environmental justice populations.” U.S. Census Bureau data, including ACS estimates, provide indicators of population characteristics within specific geographic areas, but do not provide conclusive determination of low-income or minority status of individuals potentially affected by the project.

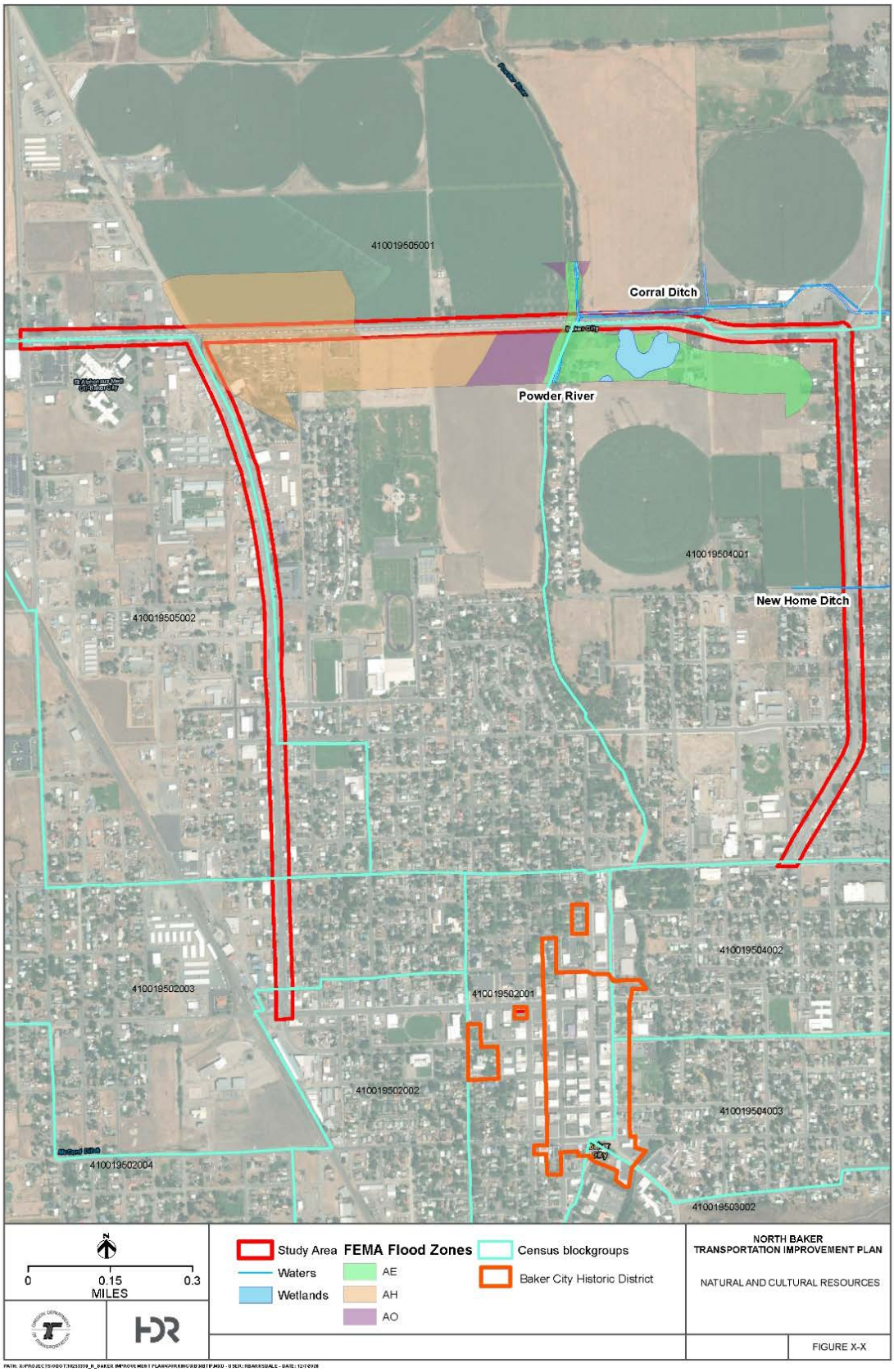
[3] White and non-white Hispanic or Latino populations are considered minority populations.

The potential for high low-income and high minority populations in or near the project area was assessed by identifying the Census blockgroups with low-income or minority populations that were 150 percent or more than those in the surrounding county. EPA's *Promising Practices for EJ Methodologies in NEPA Reviews* (2016) notes that what constitutes a "meaningfully greater" low-income or minority population (for purposes of environmental justice assessments) generally refers to when the percentage of low-income or minority populations in a selected geographic unit (i.e., census tract or blockgroup) exceeds that of an appropriate reference community (e.g., state or county) by a reasonable subjective threshold.

Census data were reviewed from the study area, which includes 10 blockgroups. Data from each blockgroup was compared against census data for Baker County to determine presence of meaningfully greater populations of minority, low-income, elderly, handicapped, and transit-dependent populations. In summary:

- Of the households in 2018 in Baker County, 14.67 percent were below the poverty level. Two blockgroups within the study area (410019502.002 and 410019503.002) exceed 150 percent of the county population living below the poverty threshold.
- Minority populations from 2010 and 2020 in Baker County were 7.38 percent and 10.33 percent, respectively. One blockgroup (410019502.002) exceeded 150 percent of the county minority population for both years.
- In 2020, the senior population in Baker County was equal to 26.92 percent. None of the blockgroups within the study area exceed the county population by 150 percent.
- In 2018, 39.08 percent of households in Baker County had at least one person with a disability. No blockgroups exceed the county population by 150 percent.
- In 2018 owner households with no vehicles in Baker County were 2.06 percent, and renter households with no vehicles were 18.15 percent. Four blockgroups exceed the county population by 150 percent for both owner and renter households (410019502.003, 410019502.002, 410019504.001, 410019504.002), indicating there may be presence of transit-dependent populations. Additional research to confirm presence of environmental justice populations in the study area may be required.

Figure 4-1. Natural and Cultural Resources in and adjacent to the Study Area



5 10th Street Sub-Area

This section presents a land use assessment for the 10th Street Sub-area (Sub-area). The Sub-area includes tax lots adjacent to 10th Street between Hughes Lane/Pocahontas Road at the northern extent and Broadway Street (US30) at the southern extent. It also includes tax lots adjacent to Pocahontas Road between 10th Street at the eastern extent and 17th Street/Chico Street on the western extent. Information includes a description of current zoning, existing land uses, and vacant and developable land. This section also explores the regulatory environment governing land use in the area. The land use assessment for the Sub-area will inform project alternatives analysis and preparation and refinement of concept plans in Tasks 4.1 and 4.3 of this project. Some of the information complements the summaries of natural and cultural assessment in the 10th Street Sub-area associated with Section 4.

5.1 Vacant and Redevelopable Areas

An inventory of developed and redevelopable land adjacent to 10th Street and Pocahontas Road within the Sub-area was produced using Baker County Tax Assessor data. The tax assessor's information provides the basis for a basic land use inventory and development status.

Each tax lot was given a "development status" of either vacant, redevelopable, or developed. These designations were assigned based on the County tax assessor's data, aerial photography, and staff input. Criteria for these categories are as follows:

- Vacant – vacant tax lots have minimal to no existing development, as identified by tax assessor data or aerial photography. Vacant tax lots were identified as those with a tax assessor Real Market Value (RMV) Improvement value of less than $10,000, and a minimum lot size of 5,000 square feet.
- Redevelopable – redevelopable tax lots have some form of current development but have the potential for additional improvements through developing underutilized portions of the site or reconstructing the site altogether. Redevelopable lots were identified as those with the RMV Land value is twice that of the RMV Improvement value.
- Developed – tax lots with a developed designation are assumed fully developed and unavailable for additional uses. Any tax lot that was not previously identified as vacant or redevelopable was assumed developed.

Note that environmental constraints, dedicated public ROWs, streets and public utility easements have not been factored into this analysis.

Figure 5-1 and Figure 5-2 illustrate the location and development status of tax lots within the Sub-area. As shown, most of the lots adjacent to 10th Street and Pocahontas Road are developed, with vacant or redevelopable lots along the corridor found primarily north of H Street. Of the vacant and redevelopable lots in the corridor, the largest are found north of H Street. Most of the uses identified on lots shown as vacant or redevelopable consist of outdoor storage or parking areas used in connection with an adjacent business.

Figure 5-1. Vacant and Redevelopable Areas Map – 10th Street North Segment

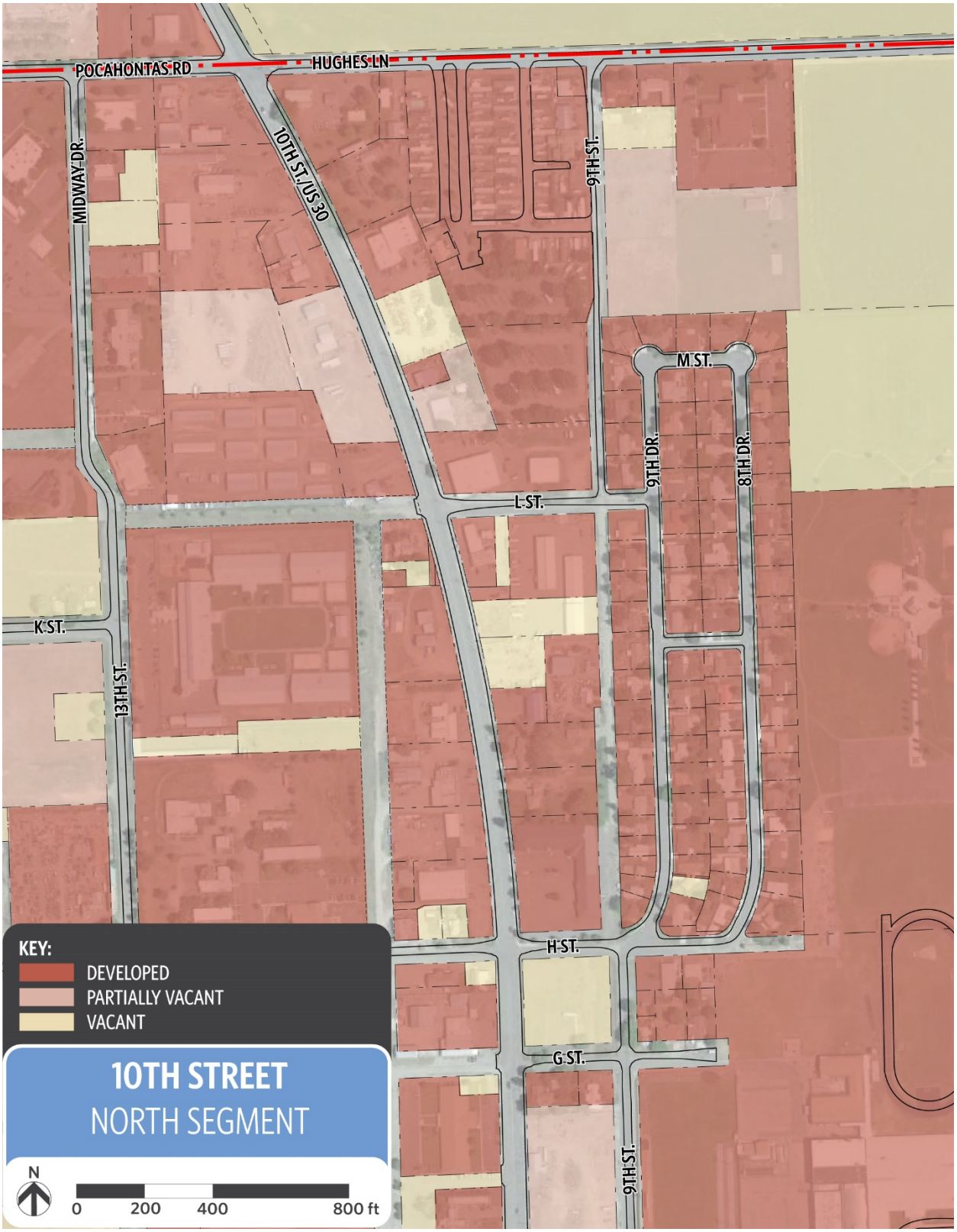
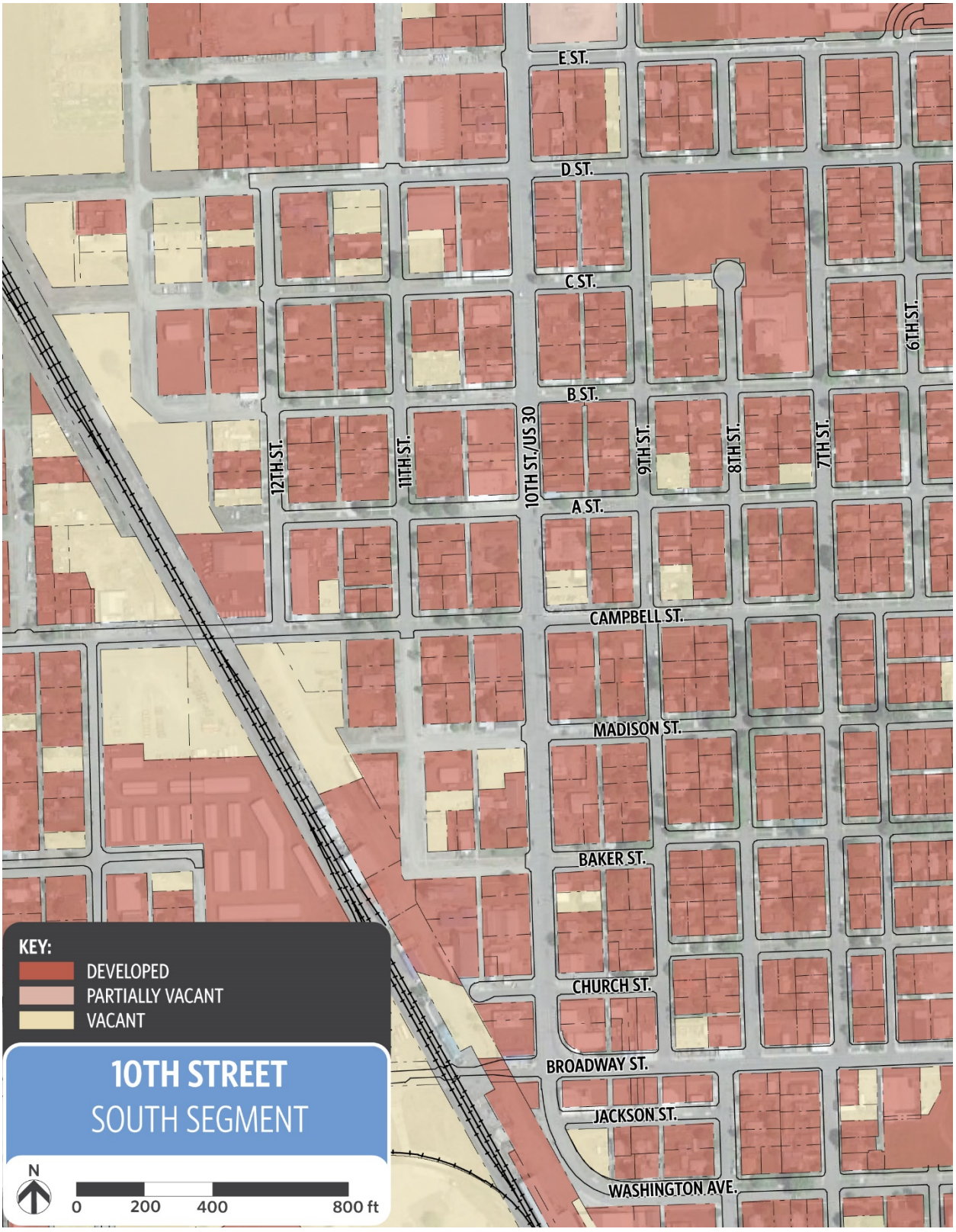


Figure 5-2. Vacant and Redevelopable Areas Map – 10th Street South Segment



5.1.1 Current Uses

Current use data is based on property class codes. Property class codes are the basis of the classification system used by counties to categorize current uses. Each lot or parcel is classified in accordance with ORS 308.215 and based on the highest and best use of the property.

Figure 5-3 and Figure 5-4 show the current land uses as recorded and categorized by Baker County Tax Assessor data. As shown, commercial uses comprise most of the current uses adjacent to 10th Street and Pocahontas Road. Every block along the 10th Street corridor includes at least one commercial use, while some blocks consist entirely of commercial uses. Residential and institutional/other[4] uses are not concentrated in any particular area along 10th Street; they are found sporadically and typically not adjacent to other like uses. Adjacent to Pocahontas Road are primarily institutional uses, with some commercial uses present. There are no residential uses along Pocahontas Road.

[4] Other uses include those that are tax exempt (i.e., land owned by a city, county, state or federal government, cemeteries or benevolent/fraternal organizations).

Figure 5-3. Current Uses – 10th Street North Segment

Figure 5-4. Current Uses – 10th Street South Segment

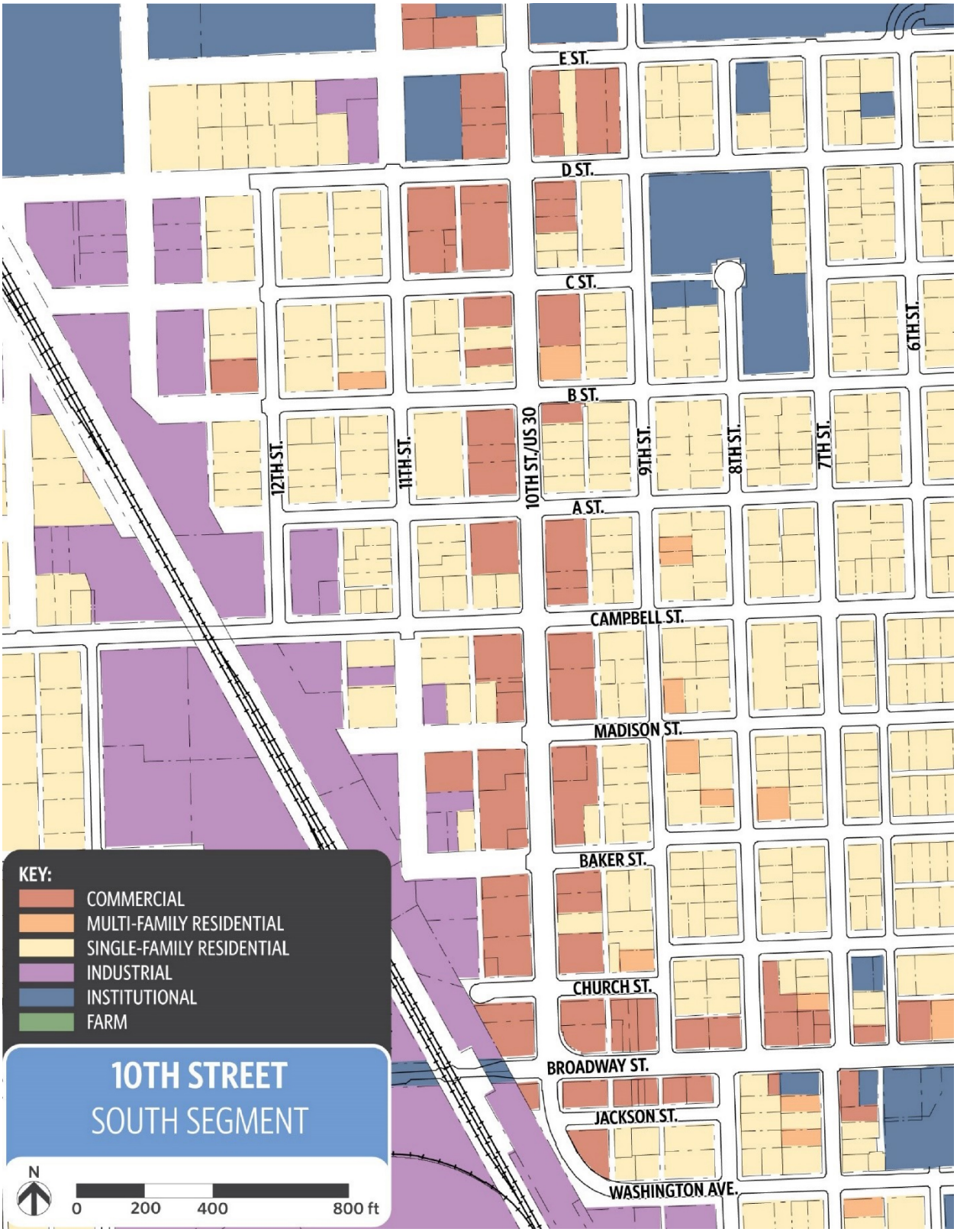


Table 5-1 shows how many tax lots in each use category that are vacant, and thereby has the potential for development, or if there is an opportunity for redevelopment, pursuant to the criteria explained above. As shown in Table 5-1, most of the tax lots in the Sub-area are currently developed. Commercial uses comprise most current uses in the Sub-area and over 80 percent of these tax lots are developed. The remainder includes a mix of residential and institutional/other uses found in the corridor. Approximately 19 percent of tax lots in the Sub-area are considered vacant or redevelopable based on the definitions above.

Table 5-1. Development Status by Current Use

Current Use	Developed	Redevelopable	Vacant	Total
	Number of Tax Lots			
Single-family Residential	15	0	0	**15**
Multi-family Residential	1	0	0	**1**
Commercial	62	4	14	**81**
Institutional/Other	9	1	1	**10**
Total	**87**	**5**	**15**	**107**

5.2 Development Potential/Regulatory Conditions/Development Code

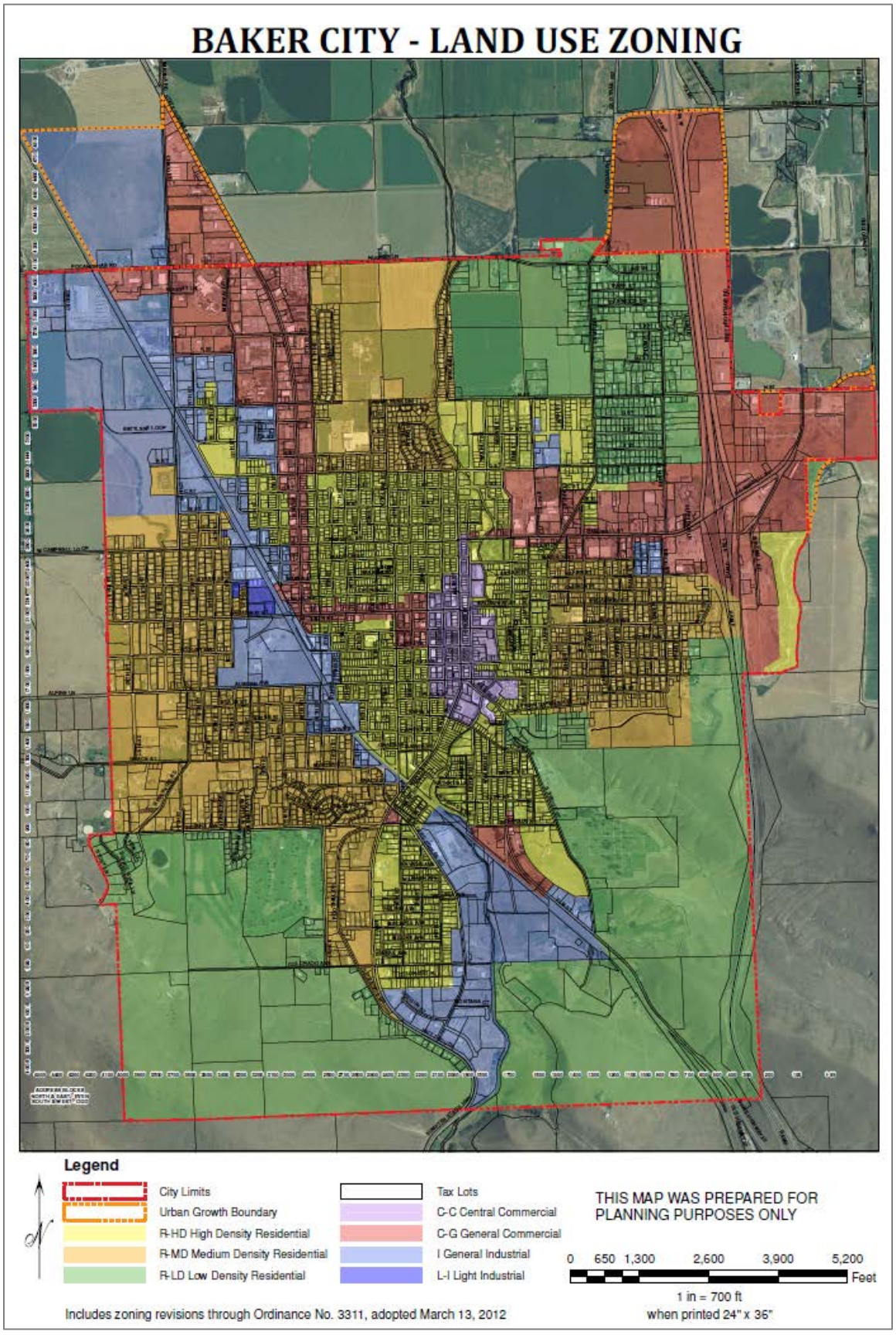
Land within the City of Baker City is subject to the City's land use and development regulations. The Baker City Comprehensive Plan provides the policy basis for the City's land use requirements, which are implemented in part through the City of Baker City Development Code (Development Code).

5.2.1 Zoning Designations

The City's Development Code implements the policies established in the City's Comprehensive Plan. It regulates development through zoning and provisions that apply generally to all development and specifically to land divisions within the City. The City's zoning requirements establish allowed uses and associated development regulations, permitted uses and lot standards.

Figure 5-5 shows the location of zoning districts within the Sub-area. Lots within the Sub-area that are adjacent to 10th Street and Pocahontas Road are all zoned General Commercial (C-G). There is a mix of zones near the Sub-area, including General Industrial (I), High Density Residential (R-HD), Medium Density Residential (R-MD), and additional C-G zoning. While these zones are not directly adjacent to the 10th Street Sub-area nor reviewed as part of this assessment, they speak to the character of land uses in the area and indicate the types of trips through the corridor.

Figure 5-5. Baker City Zoning Map



5.2.2 Current Development

The Sub-area is a commercial corridor that features primarily automotive-oriented types of development. Commercial corridors are typically characterized as commercial areas located outside of the downtown area and oriented to main thoroughfares. These areas are developed in a linear fashion, as opposed to nodal or compact development, and attract uses that depend on access to an arterial or that benefit from drive-by traffic. Site and building design are generally scaled to cater to automobiles with design features such as drive-through facilities, medium or large parking areas, and greater separation between buildings and the street. Automotive-oriented development areas may also successfully accommodate other modes of transportation such as transit, bicycling or walking, depending in part on public investments, the regulatory environment and how recent the area was developed.

Development Types Summary

Current development in the Sub-area is predominantly commercial, but also includes a mix of institutional and residential development. Commercial development in the Sub-area includes retail in strip commercial developments, automobile service, automobile parts and sales, local restaurants/bars, and fast-food chains. Other types of commercial development include outdoor storage facilities and agricultural equipment sales and supplies. Institutional development in the corridor includes a mix of medical providers, religious institutions, government office space, and service oriented government services There is a limited amount of existing low-density, single-family residential development that was likely constructed prior to current zoning provisions due to its age and the fact that single family residential is not an allowed use pursuant to the current city requirements.[5]

The development pattern in the Sub-area is generally automobile-oriented in terms of its location, site layout, and building design. Commercial and institutional developments share several site layout and building design features and, except for the hospital on Pocahontas Road, are largely indistinguishable from each other. Individual lots consist mostly of small to medium buildings that are one-story in height. The buildings primarily feature single-tenant spaces; however, there are also a limited number of multi-tenant spaces. Most buildings feature moderate setbacks from the street. Where buildings are separated from the street, the setback area typically features small parking areas. Most of the parking areas feature paved surfaces; however, unpaved parking areas also exist in the northern part of the Sub-area.

Streetscape Summary

Between H Street and Broadway Street, 10th Street intersections are generally provided at regular intervals of approximately 330 feet. There are limited street intersections on 10th Street between H Street and Hughes Lane/Pocahontas Road; the space between intersections exceed 1,000 feet. Intersection spacing for the portion of Pocahontas Road within the Sub-area ranges between 500 and 1,000 feet.

[5] Single-family development is allowed if lawfully existing as of 2/13/2004 and is only allowed to expand only as a conditional use in the zone.

Most lots adjacent to 10th Street and Pocahontas Road have direct access to the street via one or more driveways. Lots with more than one driveway access are generally located north of H Street. The size and spacing of driveways vary between lots. Consolidated access between multiple lots is uncommon due in part to a combination of modest building setbacks and smaller parking areas.

Curbing is provided along 10th Street, however the availability of sidewalks is limited in terms of consistency and design. Available sidewalks on 10th Street are usually curb-tight and not separated from the street by a planter strip or other form of buffer. Some parking areas are located directly adjacent to 10th Street, interrupting the continuity of the sidewalk network and reducing pedestrian circulation and safety. On-street parking is provided along the 10th Street corridor without signage or street markings. However, based on aerial and street imagery and anecdotal evidence, it is not used regularly. The low utilization of on-street parking is likely due to the prevalent availability of on-site parking areas for businesses. There is no sidewalk, curb, or on-street parking along Pocahontas Road.

5.2.3 Development Potential

The amount and location of vacant and redevelopable areas within the Sub-area provides insight into the transformational opportunity in an area. Areas that are mostly vacant have a high degree of transformational potential, largely due to the lack of barriers associated with the built environment. For example, constructing a new road is generally easier than relocating an existing one. Conversely, areas with a lack of vacant or redevelopable areas will likely remain unchanged over the planning horizon, particularly if it includes recently developed parcels and/or the improvement value of the development in the area is relatively high. In situations with a lack of vacant or redevelopable areas, rising land values and public investments can contribute towards making portions of the area more likely to redevelop in the longer term.

Figure 5-1 and Figure 5-2 in Section 5.1, Vacant and Redevelopable Areas Maps , depict vacant and redevelopable properties in the Sub-area. Generally, vacant areas include lots or parcels that do not have existing buildings, and on-site improvements are minimal or not present. Redevelopable areas typically have older buildings that have some potential to be removed and replaced with new buildings or would possibly need to undergo tenant improvements to comply with building standards before new development can occur. Section 5.1 provides additional details on how vacant and redevelopable areas are defined.

Only a few vacant or redevelopable parcels exist that are located adjacent to 10th Street and Pocahontas Road. These areas comprise less than one-fifth (~16 acres) of tax lots within the Sub-area. Most of the identified vacant or redevelopable properties consist of outdoor storage or parking areas used in connection with adjacent business. Only two lots were identified as vacant or redevelopable and over 2 acres in size. These include a lot located on 10th Street north of L Street that features minimal building improvements with the remainder of the site undeveloped and used for outdoor storage. The second lot, located on Pocahontas Road across from the hospital, is an undeveloped greenfield. The remaining four-fifths (~70 acres) of 10th Street Sub-area is developed and consists primarily of commercial uses, but also includes some existing residential and institutional uses.

Vacant and redevelopable lots in the Sub-area represent the greatest potential for new development to occur in the area. The type and intensity of the uses allowed are determined by the use and development standards as provided in the City's zoning regulations and are described in the following section.

5.2.4 Regulatory Environment

As discussed in Section 5.2.2, land use and development in the Sub-area are subject to City regulations, as provided in the City's Development Code. Because future development and redevelopment in the Sub-area will be subject to Development Code provisions, knowing the zoning, permitted uses and lot standards in the area provides information about the type and intensity of uses that can be expected.

Use Standards

All lots adjacent to 10th Street and Pocahontas Road are zoned C-G, which accommodates a range of commercial uses in the community generally. The C-G zone is intended to:

- Support commercial areas outside or adjacent to the central business area.
- Promote efficient use of land and urban services.
- Create a mixture of land uses that encourages employment and housing options near one another.
- Provide formal and informal community gathering places and opportunities for socialization.
- Encourage pedestrian-oriented development.
- Provide connections to, and appropriate transitions between, residential areas and commercial areas.
- Accommodate automobile-oriented uses with appropriate design standards.

The C-G zone conditionally permits or allows a wide range of uses under the residential, commercial, industrial, and institutional use categories. Permitted residential uses include dwellings built in conjunction with commercial use. Stand-alone duplex and multi-family residential development are allowed conditionally. New single-family development is not permitted.

Permitted commercial uses in the zone include offices, retail sales and services, vacation rentals, commercial educational services, and parking facilities. Permitted uses that are subject to standards include drive-through or similar facilities, quick vehicle servicing, or vehicle repair. Uses that are allowed conditionally include shopping centers with three or more establishments, commercial uses with 80,000 square feet or more of building space, major event entertainment, and commercial outdoor recreation uses.

Industrial uses that are fully enclosed are also permitted in the C-G zone. Industrial uses that are not fully enclosed or wholesale sales that are fully enclosed and larger than 40,000 square feet of floor area are allowed conditionally in the zone. All institutional uses except for detention facilities, new religious institutions and new schools, are permitted in the C-G zone.

Zone Development Standards

Lot development standards provide basic standards that regulate lot size, building setbacks and height, maximum building coverage requirements, and minimum landscape requirements. There is no minimum lot size requirement for non-residential uses in the C-G zone, however development must conform to minimum lot width (20 feet) and depth (twice the width) requirements. Structures are limited to 40 feet in height unless upper floor residential uses are also proposed, in which case the height restriction is 50 feet. Up to 93 percent of a site can be built with buildings. A minimum of 7 percent of the site is required to be landscaped. The zone does not have a minimum or maximum setback requirement for new buildings.

New development that is subject to Site Design Review (see Review Procedures below) must also comply with additional provisions that regulate building orientation, architectural design, pedestrian amenities, and special use standards for specified uses. Building orientation standards generally require main building entrances be oriented towards a street unless certain provision can be met. Architectural design standards regulate pedestrian orientation (on-site circulation, glazing, weather protection, etc.), design compatibility (building size, roof design, relationship to adjacent spaces), and “human-scale” building requirements. One or more pedestrian amenities, such as a plaza, sitting space, public art, building canopy, or bus shelter, are required as part of new development or redevelopment. Special use standards only apply to specific types of uses, including drive-up/drive-in/drive-through facilities, large format retail stores over 80,000 square feet, and self-service storage facilities, among others.

Community Design Standards

Community design standards found in Article 3 of the Development Code apply to most development depending on the review and application type and are in addition to the underlying development standards from the underlying zone. These standards regulate access and circulation, landscaping, parking, and public facilities, among others.

Access and circulation provisions regulate both vehicular and pedestrian access and circulation. Vehicular standards seek to manage access to land uses and on-site circulation, and preserve the transportation system in terms of safety, capacity, and function. Pedestrian standards seek to ensure safe, direct, and convenient pedestrian circulation through the provision of a continuous pedestrian system.

The landscape provisions regulate on-site landscaping, street trees, fences, and walls. On-site landscaping provisions seek to limit the removal of significant trees and other vegetation. There are also specific landscape requirements for parking areas and adjoining land use zones. Street trees are required along designated streets. Provisions for fences and walls regulate allowed height and materials.

All proposed uses and buildings must meet parking space and loading area requirements. The Development Code requires minimum vehicle and bicycle parking spaces and loading spaces for each use based on a scaling characteristic that estimates the parking demand of the use. For example, vehicle service repair uses requires a minimum of two spaces or as determined through a conditional use permit. Where possible, general parking standards require vehicle parking areas be located behind or

on the side of a building. The width of vehicle parking areas is limited to 50 percent of the lot frontage.

The City's public facilities provisions provide standards for public and private transportation facilities and utilities. These requirements are intended to provide for attractive and safe streets that can reasonably accommodate vehicle traffic from planned growth and provide a range of transportation options. Unless specifically exempted, all development is required to comply with the public facility requirements. This includes street design standards that regulate ROW width and the provision of sidewalks, bicycle lanes, planter strips, and travel lanes based on the street's functional classification. In the City's TSP, 10th Street and Pocahontas Road are classified as an Urban Arterial. Street standards for arterials are summarized in Table 5-2. Improvements for sidewalks may be exempted where the City finds that it would be impractical for new development to construct.

Table 5-2. Urban Arterial Street Standards

Table 3.4.100.F Street Standards from the Adopted Transportation System Plan											
				Within Curb-to-Curb Area							
Street Type	Ave. Daily Trips (ADT)	Right-of-Way Width	Curb-to-Curb Paved Width	Motor Vehicle Travel Lanes	Median/ Center Turn Lane	Bike Lanes	On-Street Parking	Curb	Planting Strips, or Swales	Side-walks	Multi-Use Paths
URBAN ARTERIALS: 8,000 - 30,000 ADT											
Urban Arterial Street *(50ft Paving with No Parking)*		80ft	50ft w/ 14ft raised median	2 at 12ft	14ft	2 at 6ft	none	6in	6ft	8ft	
Urban Arterial Street *(with Parking on Both Sides)*		80ft	64ft w/14ft raised median	2 at 12ft	12ft - 14ft	2 at 5ft - 6ft	8ft parallel (both sides)	6in	None	7ft	

Source: Table 3.4.100.F, City of Baker City Development Code

Review Procedures

Most development is subject to either a Land Use Review or Site Design Review. Land Use Review is conducted for development that does not require Site Design Review and ensures compliance with basic land use and development standards. Minor improvements that meet the criteria for Land Use Review, such as non-residential additions up 1,000 square feet or 20 percent of existing structure size, do not require Site Design Review and are reviewed as a Type I (Administrative review by City Planning Official) application.

Site Design Review applies to all other development that exceeds the specified thresholds for Land Use Review. Site Design Review is conducted as a Type I (Administrative review by City Planning Official) application unless specific criteria are met. Commercial or industrial development that abuts a residential zone is reviewed as a Type II (Administrative with public notice by City Planning Official) application. Development that meets the definition of "Large Format Retail Sales" requires a traffic impact study or when the Planning Director determines the development will generate

substantial public interest or includes unusual circumstances are reviewed as a Type III (Quasi-judicial review at a public hearing before the Planning Commission) application.

A traffic impact study may also be required as part of a development application, change in use or change in access, when one of more listed actions occur. The Development Code specifies that a professional licensed engineer must prepare the traffic impact study.

5.2.5 Land Use Opportunities

Site design is especially important for people walking and bicycling on high volume roadways or crossing busy intersections. Proper designs can improve safety for all people who use the roadway and make the overall transportation network work better. Specific designs can be used in various combinations to balance mobility, accessibility, safety, and comfort in the area.

The following on-site design elements can be considered for the Sub-area[6]. The design elements focus on supporting and encouraging pedestrian activity, including pedestrian linkages between different land uses. These opportunities can be implemented through a combination of modifying existing zoning regulations, applying an overlay zone to the area, and/or updating the standards in the Comprehensive Plan.

Adjacent Land Use

The following on-site design elements can be implemented to support walking and bicycling. The design elements focus on supporting and encouraging pedestrian activity, including providing pedestrians with linkages between different land uses.

- **Enhanced Landscape Standards.** Landscape standards in Chapter 3.2 (Landscaping, Street Trees, Fences and Walls) of the Development Code can be enhanced. Enhanced landscaping standards, including for off-street parking areas, can be applied to new development or redevelopment. Landscaping should be provided between parking areas and adjacent pathways and streets to provide separation. Minimum landscape requirements should be applied to the interior portion of large parking areas. Interior landscaping improves the appearance of parking lots, provides much needed shade (particularly important in Eastern Oregon's warm climate), and creates options and/or incentives for low impact development approach stormwater facilities.
- **More Efficient Use of Parking.** The amount of parking required for development, either as required by the Development Code or by market demands, is the biggest determining factor for a building's footprint on the site and has a significant effect on the cost of development. Reducing the minimum parking requirements and/or providing a process to waive parking requirements in Chapter 3.3 (Parking and Loading) allows commercial developers the opportunity to use less space for parking and/or to construct other buildings for

[6] Note, some design elements, such as slip lane islands, currently exist in some capacity within the Sub-area. These design elements are described and included here in part because they are best practices for improving safety. Even where they exist today, 10th Street does not implement these tools consistently or could potentially be improved further to meet design goals.

other uses or businesses. It also helps reduce the overall cost of construction. Implementing parking maximums with the flexibility to grant modifications to the standards would discourage builders from over-parking their sites and would encourage a closer study of parking supply and demand.

- **Enhanced Pedestrian Connections.** Poor bicycle and pedestrian connectivity often force people to drive. Deficient or non-existent connections between adjacent buildings in commercial areas discourages people from walking or bicycling between businesses. The City could improve conditions along the corridor over time by requiring new and redevelopment to provide pedestrian walkways through sites, connecting building entrances and the public sidewalk, with safe crossings of streets, drives, and parking areas. Updates to Chapter 3.1 (Access and Circulation) would help address on-site improvements and Chapter 3.4 (Public Facilities) would address off-site improvements.

Appendix A. Traffic Operations

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	66	120	45	73	34	130	70	30	19	83	2
Future Vol, veh/h	3	66	120	45	73	34	130	70	30	19	83	2
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	0	-	-	-	100	-	0	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	81	81	81	99	99	99	65	65	65
Heavy Vehicles, %	11	11	11	12	12	12	10	10	10	15	15	15
Mvmt Flow	3	71	129	56	90	42	131	71	30	29	128	3

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	602	551	131	622	522	71	131	0	0	101	0	0
Stage 1	188	188	-	333	333	-	-	-	-	-	-	-
Stage 2	414	363	-	289	189	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.22	6.62	6.32	4.2	-	-	4.25	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.608	4.108	3.408	2.29	-	-	2.335	-	-
Pot Cap-1 Maneuver	399	430	895	385	445	964	1406	-	-	1414	-	-
Stage 1	793	728	-	660	626	-	-	-	-	-	-	-
Stage 2	598	609	-	698	725	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	288	382	894	259	395	964	1406	-	-	1414	-	-
Mov Cap-2 Maneuver	288	382	-	259	395	-	-	-	-	-	-	-
Stage 1	719	713	-	599	568	-	-	-	-	-	-	-
Stage 2	436	552	-	526	710	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.3	22.8	4.4	1.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1406	-	-	377	894	386	1414	-	-
HCM Lane V/C Ratio	0.093	-	-	0.197	0.144	0.486	0.021	-	-
HCM Control Delay (s)	7.8	-	-	16.9	9.7	22.8	7.6	-	-
HCM Lane LOS	A	-	-	C	A	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.7	0.5	2.6	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↕			↕	
Traffic Vol, veh/h	2	3	6	5	3	14	11	317	5	14	330	3
Future Vol, veh/h	2	3	6	5	3	14	11	317	5	14	330	3
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	55	55	55	85	85	85	69	69	69
Heavy Vehicles, %	9	9	9	0	0	0	6	6	6	5	5	5
Mvmt Flow	2	3	7	9	5	25	13	373	6	20	478	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	735	925	241	683	924	190	482	0	0	379	0	0
Stage 1	520	520	-	402	402	-	-	-	-	-	-	-
Stage 2	215	405	-	281	522	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.5	6.5	6.9	4.22	-	-	4.2	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.5	4	3.3	2.26	-	-	2.25	-	-
Pot Cap-1 Maneuver	295	256	739	339	271	826	1049	-	-	1155	-	-
Stage 1	490	513	-	601	604	-	-	-	-	-	-	-
Stage 2	748	580	-	708	534	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	273	246	739	323	260	826	1049	-	-	1155	-	-
Mov Cap-2 Maneuver	273	246	-	323	260	-	-	-	-	-	-	-
Stage 1	482	501	-	591	594	-	-	-	-	-	-	-
Stage 2	707	571	-	680	521	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	12.8	0.4	0.4
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1049	-	-	398	500	1155	-	-
HCM Lane V/C Ratio	0.012	-	-	0.03	0.08	0.018	-	-
HCM Control Delay (s)	8.5	0.1	-	14.3	12.8	8.2	0.1	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.3	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	61	18	12	50	88	19	238	31	100	218	13
Future Volume (veh/h)	13	61	18	12	50	88	19	238	31	100	218	13
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1699	1750	1750	1606	1750	1750	1636	1750	1750	1620	1750
Adj Flow Rate, veh/h	16	77	23	14	57	101	22	274	36	137	299	18
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.79	0.79	0.79	0.87	0.87	0.87	0.87	0.87	0.87	0.73	0.73	0.73
Percent Heavy Veh, %	3	3	3	9	9	9	7	7	7	8	8	8
Cap, veh/h	163	268	73	143	122	193	174	1317	166	500	968	60
Arrive On Green	0.21	0.23	0.21	0.21	0.23	0.21	0.49	0.50	0.49	0.49	0.50	0.49
Sat Flow, veh/h	114	1169	317	59	534	844	76	2611	330	613	1920	118
Grp Volume(v), veh/h	116	0	0	172	0	0	176	0	156	233	0	221
Grp Sat Flow(s),veh/h/ln	1601	0	0	1437	0	0	1588	0	1430	1198	0	1453
Q Serve(g_s), s	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.8	1.8	0.0	2.7
Cycle Q Clear(g_c), s	1.8	0.0	0.0	3.2	0.0	0.0	1.8	0.0	1.8	3.6	0.0	2.7
Prop In Lane	0.14		0.20	0.08		0.59	0.12		0.23	0.59		0.08
Lane Grp Cap(c), veh/h	476	0	0	435	0	0	909	0	721	775	0	733
V/C Ratio(X)	0.24	0.00	0.00	0.40	0.00	0.00	0.19	0.00	0.22	0.30	0.00	0.30
Avail Cap(c_a), veh/h	1496	0	0	1365	0	0	2193	0	1931	1783	0	1963
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.7	0.0	0.0	10.3	0.0	0.0	4.1	0.0	4.2	4.6	0.0	4.4
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.3	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.3	0.0	0.0	0.9	0.0	0.8	1.3	0.0	1.1
LnGrp Delay(d),s/veh	9.9	0.0	0.0	10.7	0.0	0.0	4.4	0.0	4.5	5.0	0.0	4.8
LnGrp LOS	A			B			A		A	A		A
Approach Vol, veh/h		116			172			332			454	
Approach Delay, s/veh		9.9			10.7			4.4			5.0	
Approach LOS		A			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		19.1		10.9		19.1		10.9
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.0		26.0		40.0		26.0
Max Q Clear Time (g_c+I1), s		3.8		3.8		5.6		5.2
Green Ext Time (p_c), s		6.2		0.4		9.0		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	6.2
HCM 2010 LOS	A

2020 Existing

Existing Year 2020 - 12:00-1:00 PM

Cycle Length (C) = 75 seconds
Total Lost Time (L) = 8 seconds

Critical Movement	HCM 2010 Adjusted Flow	HCM 2010 Sat Flow	Flow Ratio
WBLTR	150	1437	0.10
SBLTR	331	2651	0.12
		Sum of Flow Ratios	***0.23***

Xc = Sum of Critical Flow Ratios * (C/C-L)

Xc = ***0.26***

	Vol	Sat Flow	Ratio
EBT	92	1600	0.06
WBT	150	1437	0.10
NBLTR	288	3017	0.10
SBLTR	331	2651	0.12

MOVEMENT SUMMARY

Site: 101 [10th_Broadway_Existing]

2020 Existing
12:00 - 1:00 PM
Site Category: (None)
Stop (Two-Way)

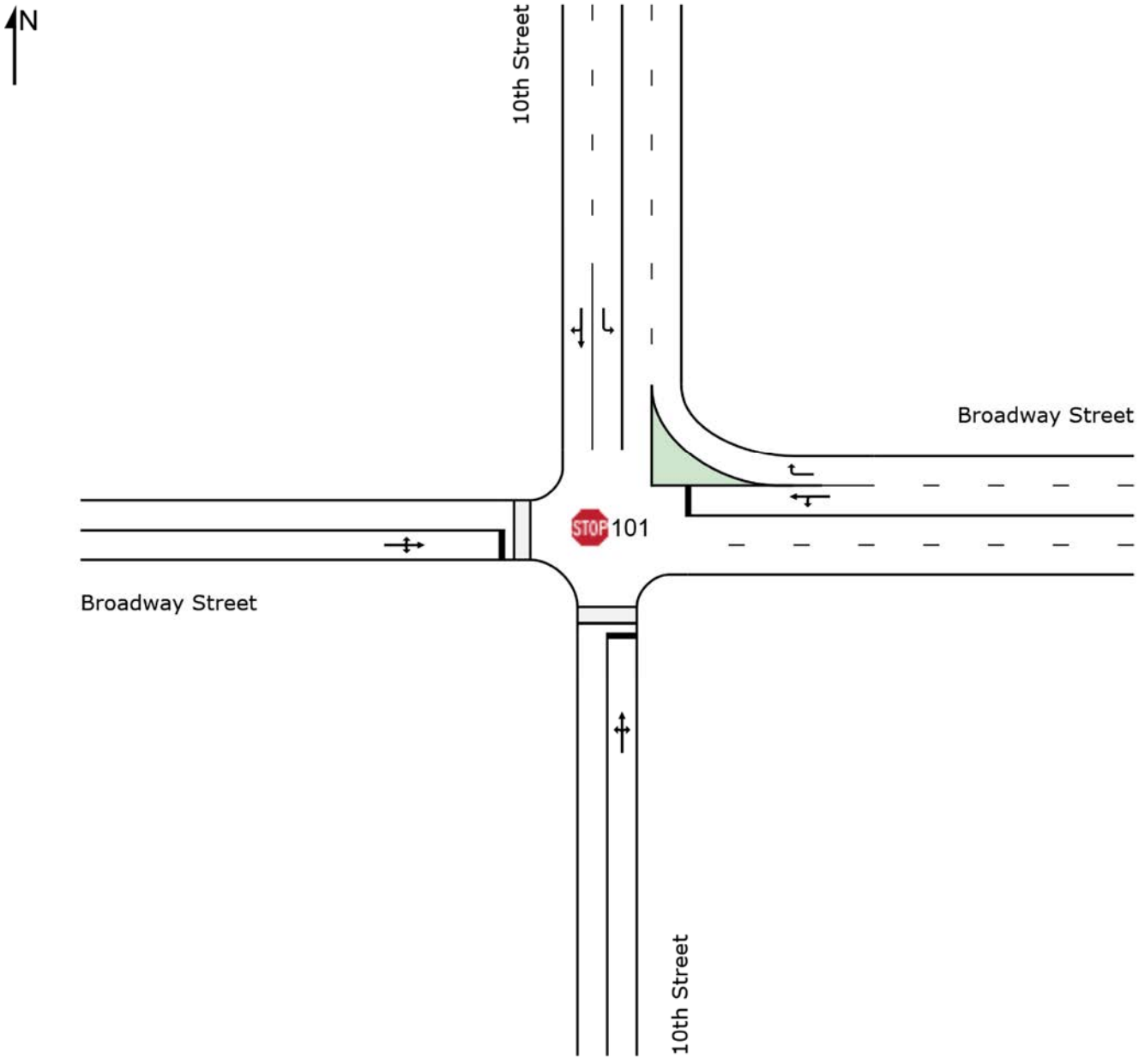
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 10th Street												
3	L2	2	3.0	0.059	9.7	LOS A	0.2	5.3	0.33	0.25	0.33	20.8
8	T1	27	3.0	0.059	11.9	LOS B	0.2	5.3	0.33	0.25	0.33	21.0
18	R2	6	3.0	0.059	9.0	LOS A	0.2	5.3	0.33	0.25	0.33	20.9
Approach		36	3.0	0.059	11.3	LOS B	0.2	5.3	0.33	0.25	0.33	21.0
East: Broadway Street												
1	L2	9	6.0	0.091	11.1	LOS B	0.3	8.6	0.41	0.32	0.41	24.0
6	T1	52	6.0	0.091	10.9	LOS B	0.3	8.6	0.41	0.32	0.41	24.1
16	R2	198	6.0	0.141	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	28.8
Approach		259	6.0	0.141	2.6	LOS A	0.3	8.6	0.10	0.07	0.10	27.6
North: 10th Street												
7	L2	210	6.0	0.133	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	28.2
4	T1	42	6.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	29.3
14	R2	26	6.0	0.044	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	29.1
Approach		277	6.0	0.133	0.0	NA	0.0	0.0	0.00	0.00	0.00	28.4
West: Broadway Street												
5	L2	25	1.0	0.149	13.0	LOS B	0.6	14.9	0.38	0.31	0.38	20.9
2	T1	65	1.0	0.149	11.2	LOS B	0.6	14.9	0.38	0.31	0.38	21.0
12	R2	6	1.0	0.149	9.5	LOS A	0.6	14.9	0.38	0.31	0.38	20.9
Approach		96	1.0	0.149	11.6	LOS B	0.6	14.9	0.38	0.31	0.38	20.9
All Vehicles		668	5.1	0.149	3.3	NA	0.6	14.9	0.11	0.09	0.11	26.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [10th_Broadway_Existing]

2020 Existing
12:00 - 1:00 PM
Site Category: (None)
Stop (Two-Way)



Appendix B. Freight Counts

16-hour Turning Movement Counts

Entering Direction	NW-E	NW-SE	NW-W	E-SE	E-W	E-NW	SE-E	SE-W	SE-NW	W-E	W-SE	W-NW
Movement	**SBL**	**SBT**	**SBR**	**WBR**	**WBT**	**WBL**	**NBL**	**NBR**	**NBT**	**EBT**	**EBL**	**EBR**
10th Street & Hughes Lane												
Med Truck	21	67	19	32	57	17	42	82	68	62	85	13
HV Truck	29	16	0	21	38	33	29	3	12	30	5	3
Total Volume	305	851	84	416	873	373	478	1157	782	814	1271	76
Medium Truck %	7%	8%	23%	8%	7%	5%	9%	7%	9%	8%	7%	17%
Heavy Truck %	10%	2%	0%	5%	4%	9%	6%	0%	2%	4%	0%	4%
Entering Direction	**N-E**	**N-S**	**N-W**	**E-N**	**E-S**	**E-W**	**S-N**	**S-E**	**S-W**	**W-N**	**W-E**	**W-S**
Movement	**SBL**	**SBT**	**SBR**	**WBR**	**WBL**	**WBT**	**NBT**	**NBR**	**NBL**	**EBL**	**EBT**	**EBR**
10th Street & E Street												
Med Truck	3	156	6	4	2	2	176	3	12	2	3	12
HV Truck	0	33	0	0	0	0	27	0	1	0	0	2
Total Volume	135	3393	42	123	74	16	3281	97	83	22	20	86
Medium Truck %	2%	5%	14%	3%	3%	13%	5%	3%	14%	9%	15%	14%
Heavy Truck %	0%	1%	0%	0%	0%	0%	1%	0%	1%	0%	0%	2%
Entering Direction	**N-E**	**N-S**	**N-W**	**E-N**	**E-S**	**E-W**	**S-N**	**S-E**	**S-W**	**W-N**	**W-E**	**W-S**
Movement	**SBL**	**SBT**	**SBR**	**WBR**	**WBL**	**WBT**	**NBT**	**NBR**	**NBL**	**EBL**	**EBT**	**EBR**
10th Street & Campbell Street												
Med Truck	91	136	6	82	7	31	163	9	18	23	35	9
HV Truck	10	15	1	7	1	2	10	3	6	0	8	1
Total Volume	1040	2179	161	960	191	600	2091	289	232	175	662	218
Medium Truck %	9%	6%	4%	9%	4%	5%	8%	3%	8%	13%	5%	4%
Heavy Truck %	1%	1%	1%	1%	1%	0%	0%	1%	3%	0%	1%	0%
Entering Direction	**N-E**	**N-S**	**N-W**	**E-N**	**E-S**	**E-W**	**S-N**	**S-E**	**S-W**	**W-N**	**W-E**	**W-S**
Movement	**SBL**	**SBT**	**SBR**	**WBR**	**WBL**	**WBT**	**NBT**	**NBR**	**NBL**	**EBL**	**EBT**	**EBR**
10th Street & Broadway Street												
Med Truck	107	21	2	110	2	25	15	0	2	6	12	1
HV Truck	19	0	2	10	0	1	2	1	0	1	0	2
Total Volume	2013	314	239	1949	48	368	187	35	21	168	401	50
Medium Truck %	5%	7%	1%	6%	4%	7%	8%	0%	10%	4%	3%	2%
Heavy Truck %	1%	0%	1%	1%	0%	0%	1%	3%	0%	1%	0%	4%

Appendix C. BLTS and PLTS Ratings

Roadway Segment BLTS and PLTS

Location	10th Street (US30)			Hughes Lane / Pocahontas Road			Cedar Street		
	Hughes Lane to E Street	E Street to Campbell Street	Campbell Street to Broadway	17th Street to 10th Street	10th Street to Kirkway Street	Kirkway Street to Cedar Street	Hughes Lane to H Street	H Street to D Street	D Street to Campbell Street
BLTS Ratings for individual Roadway Characteristics									
Bike Lane + Shoulder	BLTS 3	BLTS 2	BLTS 2	BLTS 3	BLTS 3	BLTS 3	BLTS 2	BLTS 2	BLTS 2
Travel Lanes	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 2	BLTS 2
Vehicle Volumes	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3
Posted Speed	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3
Obstructions	BLTS 3	BLTS 2	BLTS 2	BLTS 3	BLTS 3	BLTS 3	BLTS 2	BLTS 2	BLTS 2
PLTS Ratings for individual Roadway Characteristics									
Sidewalk Width	PLTS 4	PLTS 3	PLTS 3	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4
Sidewalk Condition	PLTS 4	PLTS 3	PLTS 3	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 4
Physical Buffer	PLTS 4	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 2
Posted Speed	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 2
Total Buffering Width	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 2	PLTS 2	PLTS 2	PLTS 2	PLTS 2
Number of Travel Lanes	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 2	PLTS 2	PLTS 2	PLTS 2	PLTS 2
General Land Use	PLTS 3	PLTS 1	PLTS 1	PLTS 3	PLTS 2	PLTS 2	PLTS 1	PLTS 1	PLTS 1

Intersection BLTS Approach and PLTS Crossing Ratings

Intersection	10th Street (US30)				Hughes Lane / Pocahontas Road			Cedar Street		
	10th Street and Hughes Lane	10th Street and E Street	10th Street and Campbell Street	10th Street and Broadway	Pocahontas Road and 17th Street	Hughes Lane and Kirkway Street	Hughes Lane and Cedar Street	Cedar Street and H Street	Cedar Street and D Street	Cedar Street and Campbell Street
BLTS Approach Rating										
Right Turn Lanes	BLTS 3	N/A	N/A	BLTS 3	N/A	N/A	N/A	N/A	N/A	N/A
Bike Lane Approach Alignment	BLTS 3	N/A	N/A	BLTS 3	N/A	N/A	N/A	N/A	N/A	N/A
Left Turn Lane	BLTS 4	N/A	N/A	BLTS 3	BLTS 4	N/A	N/A	N/A	N/A	N/A
Posted Speed	BLTS 4	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 1	BLTS 1	BLTS 1
Vehicle Volumes	BLTS 4	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 1	BLTS 1	BLTS 1
Travel Lanes	BLTS 4	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 3	BLTS 1	BLTS 1	BLTS 1
PLTS Crossing Rating										
Posted Speed	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 1	PLTS 1
Travel Lanes Crossed	PLTS 4	PLTS 4	PLTS 4	PLTS 4	PLTS 3	PLTS 3	PLTS 3	PLTS 2	PLTS 1	PLTS 1
Crossing Enhancement Adj.*	-0.50	-0.50	-1.00	0.00	-0.50	0.00	-0.50	-1.00	-1.00	-1.00
*Maximum adjustment to PLTS 2										

Appendix D. Crash Statistics

Roadway Crash Statistics

Reported Stat	Project Area Totals	Cedar Street	Hughes Lane / Pocahontas Road	10th Street
Crash Totals	**52**	12	12	28
Day of Week				
Sunday	**4**	2	0	2
Monday	**9**	2	3	4
Tuesday	**6**	1	1	4
Wednesday	**17**	2	4	11
Thursday	**3**	2	1	0
Friday	**10**	2	2	6
Saturday	**3**	1	1	1
Time of Day				
12:00:00 - 5:00 AM	**0**	0	0	0
6:00 AM	**3**	1	2	0
7:00 AM	**1**	1	0	0
8:00 AM	**4**	0	1	3
9:00 AM	**4**	2	2	0
10:00 AM	**3**	0	1	2
11:00 AM	**1**	1	0	0
12:00 PM	**7**	2	1	4
1:00 PM	**8**	1	1	6
2:00 PM	**5**	0	1	4
3:00 PM	**6**	0	2	4
4:00 PM	**3**	2	0	1
5:00 PM	**3**	0	0	3
6:00 PM	**3**	1	1	1
7:00 PM	**1**	1	0	0
8:00:00 - 11:00 PM	**0**	0	0	0
Crash Severity - Injury Type				
Fatal	**0**	0	0	0
Injury A (Incapacitated)	**2**	0	0	2
Injury B (Moderate Injury)	**12**	2	1	9
Injury C (Minor Injury)	**14**	7	1	6
Property Damage	**24**	3	10	11
Collision Type				
Angle	**13**	2	6	9
Head-on	**3**	1	2	0
Rear-End	**10**	4	2	4
Sideswipe-Meeting	**1**	0	0	1
Sideswipe-Overtaking	**3**	1	1	1
Turning Movement	**17**	4	3	10
Non-Collision	**1**	0	1	0
Fixed Object	**2**	0	1	1
Backing	**2**	0	0	2

Roadway Crash Statistics

Reported Stat	Project Area Totals		Cedar Street	Hughes Lane / Pocahontas Road	10th Street
Contributing Factors					
Too Fast for Cond.	**7**		3	3	1
Failed to Yield	**18**		2	5	11
Passed Stop Sign	**3**		1	1	1
Disregarded Traffic Signal	**2**		0	0	2
Wrong Side Driving	**1**		0	1	0
Improper Overtaking	**1**		0	1	0
Followed Too Closely	**5**		2	0	3
Improper Turn	**4**		1	0	3
Driver Error - Other	**2**		0	0	2
Other - Not Driver Error	**1**		1	0	0
Improper Lane Change	**1**		0	0	1
Driver Sleepy	**1**		0	0	1
Non-motorist in Roadway	**1**		0	0	1
Inattention	**3**		1	1	1
Failed to Avoid Vehicle Ahead	**1**		1	0	0
Careless Driving	**1**		0	0	1

10th Street Segment Crash Statistics

Reported Stat	10th Segment 1: Broadway to Campbell	10th Segment 2: Campbell to E St	10th Segment 3: E St to Hughes Ln
Crash Totals	2	5	4
Day of Week			
Sunday	0	2	0
Monday	0	0	0
Tuesday	0	1	2
Wednesday	1	2	2
Thursday	0	0	0
Friday	1	0	0
Saturday	0	0	0
Time of Day			
12:00:00 - 5:00 AM	0	0	0
6:00 AM	0	0	0
7:00 AM	0	0	0
8:00 AM	0	0	0
9:00 AM	0	0	0
10:00 AM	0	0	1
11:00 AM	0	1	0
12:00 PM	1	0	1
1:00 PM	0	2	1
2:00 PM	0	0	1
3:00 PM	0	1	0
4:00 PM	0	0	0
5:00 PM	1	0	0
6:00 PM	0	1	0
7:00 PM	0	0	0
8:00:00 - 11:00 PM	0	0	0
Crash Severity - Injury Type			
Fatal	0	0	0
Injury A (Incapacitated)	0	1	1
Injury B (Moderate Injury)	0	0	2
Injury C (Minor Injury)	0	3	0
No Injury (Complaint of Pain)	0	0	0
Property Damage	2	1	1
Collision Type			
Angle	0	2	0
Head-on	0	0	0
Rear-End	0	1	2
Sideswipe-Meeting	0	1	0
Sideswipe-Overtaking	1	0	0
Turning Movement	0	0	1
Non-Collision	0	0	0
Fixed Object	1	1	1
Backing	0	0	0
Contributing Factors			
Too Fast for Cond.	0	0	0
Failed to Yield	0	2	0
Passed Stop Sign	0	0	0

10th Street Segment Crash Statistics

Reported Stat	10th Segment 1: Broadway to Campbell	10th Segment 2: Campbell to E St	10th Segment 3: E St to Hughes Ln
Disregarded Traffic Signal	0	0	0
Wrong Side Driving	0	0	0
Improper Overtaking	0	0	0
Followed Too Closely	0	0	3
Improper Turn	0	0	1
Driver Error - Other	1	1	0
Other - Not Driver Error	0	0	0
Improper Lane Change	1	0	0
Driver Sleepy	0	1	0
Non-motorist in Roadway	0	0	0
Inattention	0	0	0
Failed to Avoid Vehicle Ahead	0	0	0
Careless Driving	0	1	0

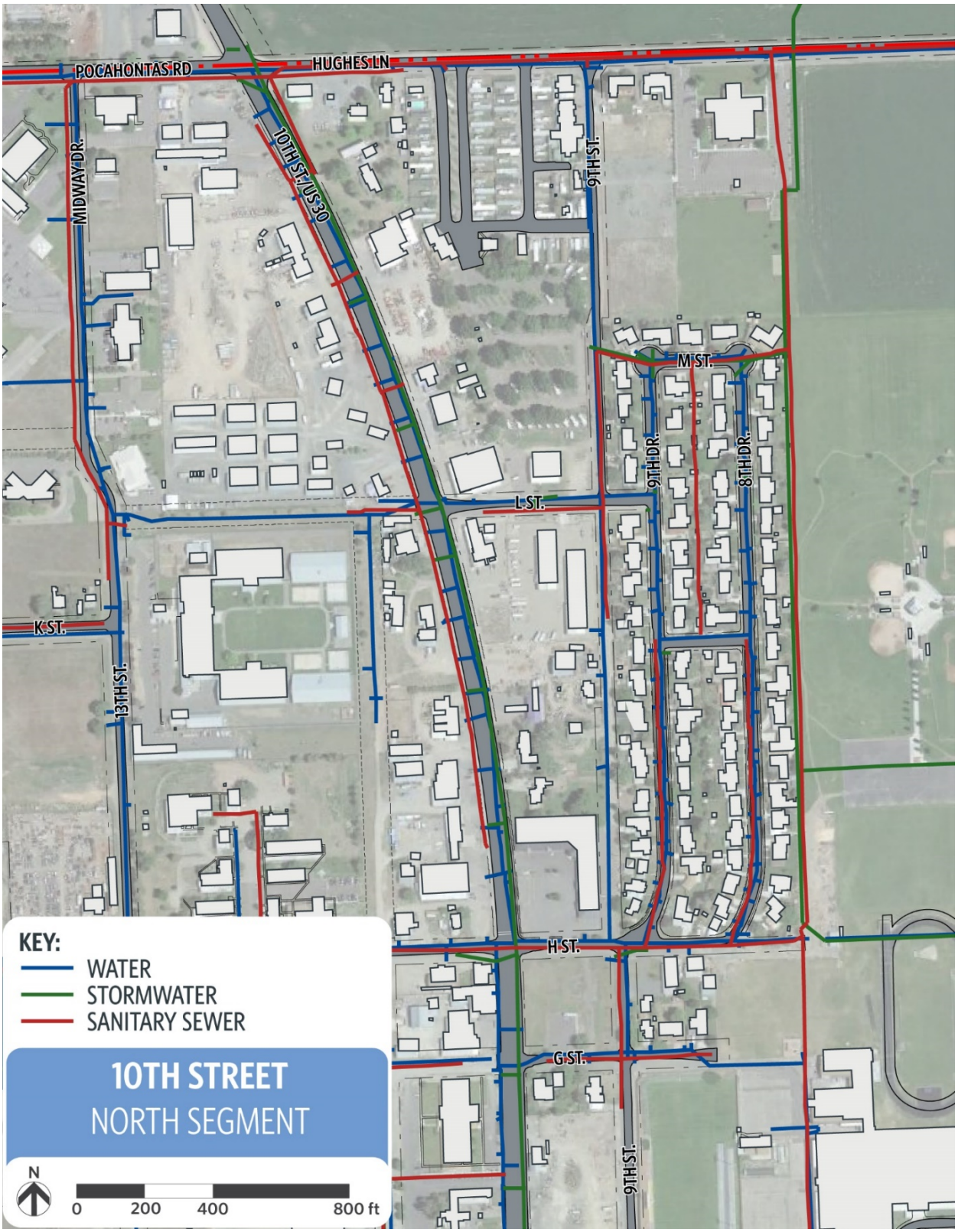
Intersection Level Crash Statistics

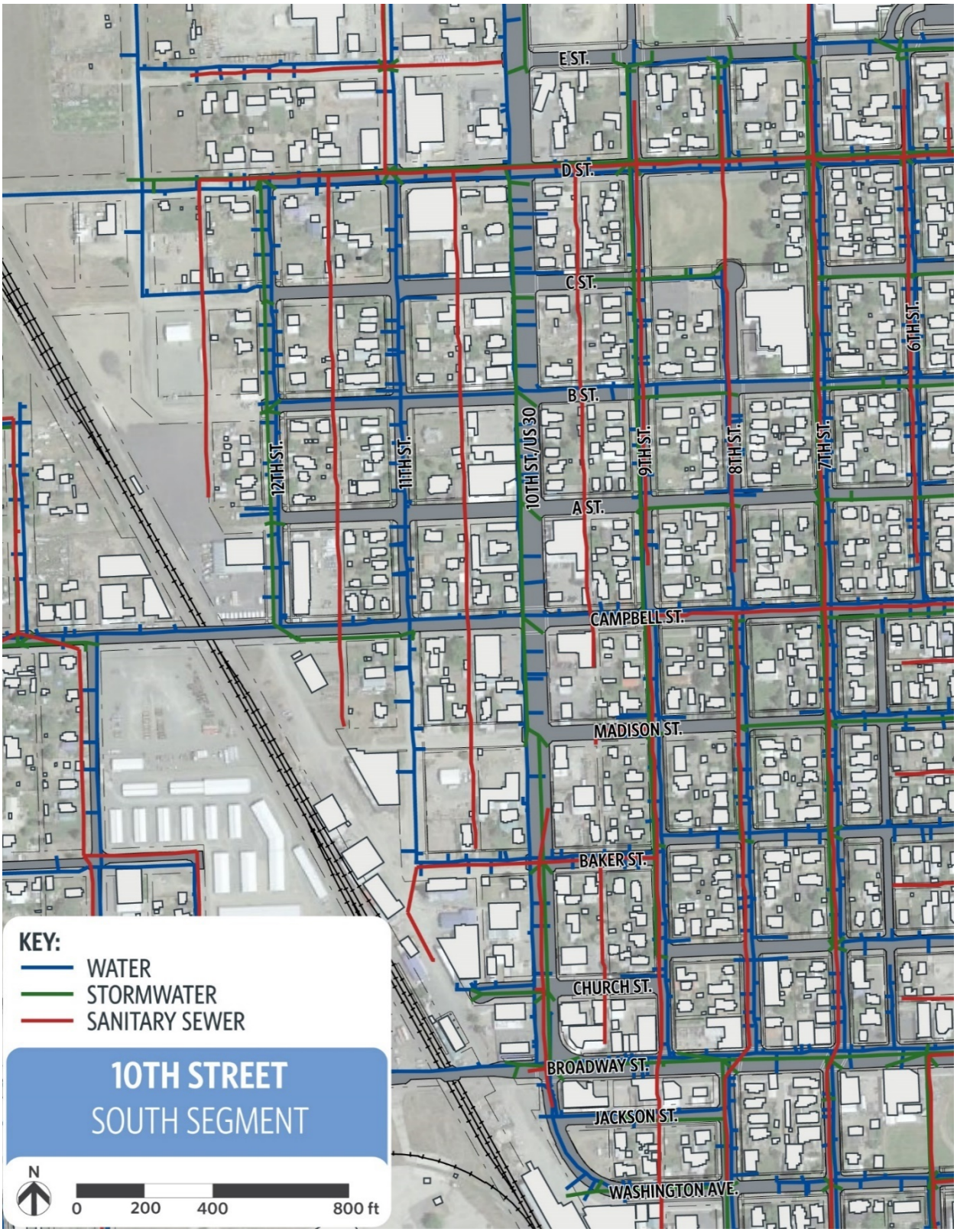
Reported Stat	10th & Hughes/ Pocahontas	10th & Campbell	10th & Broadway	10th & E Street
Crash Total	7	8	3	0
Day of Week				
Sunday	0	0	0	0
Monday	2	2	1	0
Tuesday	1	0	0	0
Wednesday	3	1	2	0
Thursday	0	0	0	0
Friday	1	4	0	0
Saturday	0	1	0	0
Time of Day				
12:00:00 - 5:00 AM	0	0	0	0
6:00 AM	0	0	0	0
7:00 AM	0	0	0	0
8:00 AM	1	2	0	0
9:00 AM	0	0	0	0
10:00 AM	0	0	0	0
11:00 AM	0	0	0	0
12:00 PM	0	1	1	0
1:00 PM	1	1	1	0
2:00 PM	2	1	0	0
3:00 PM	2	2	0	0
4:00 PM	0	1	0	0
5:00 PM	1	0	1	0
6:00 PM	0	0	0	0
7:00 PM	0	0	0	0
8:00:00 - 11:00 PM	0	0	0	0
Crash Severity - Injury Type				
Fatal	0	0	0	0
Injury A (Incapacitated)	0	0	0	0
Injury B (Moderate Injury)	5	2	0	0
Injury C (Minor Injury)	0	3	0	0
No Injury (Complaint of Pain)	0	0	0	0
Property Damage	2	3	3	0
Collision Type				
Angle	4	2	1	0
Head-on	0	0	0	0
Rear-End	2	0	0	0
Sideswipe-Meeting	0	0	0	0
Sideswipe-Overtaking	0	0	0	0
Turning Movement	1	6	2	0
Non-Collision	0	0	0	0
Fixed Object	0	0	0	0
Backing	0	0	0	0

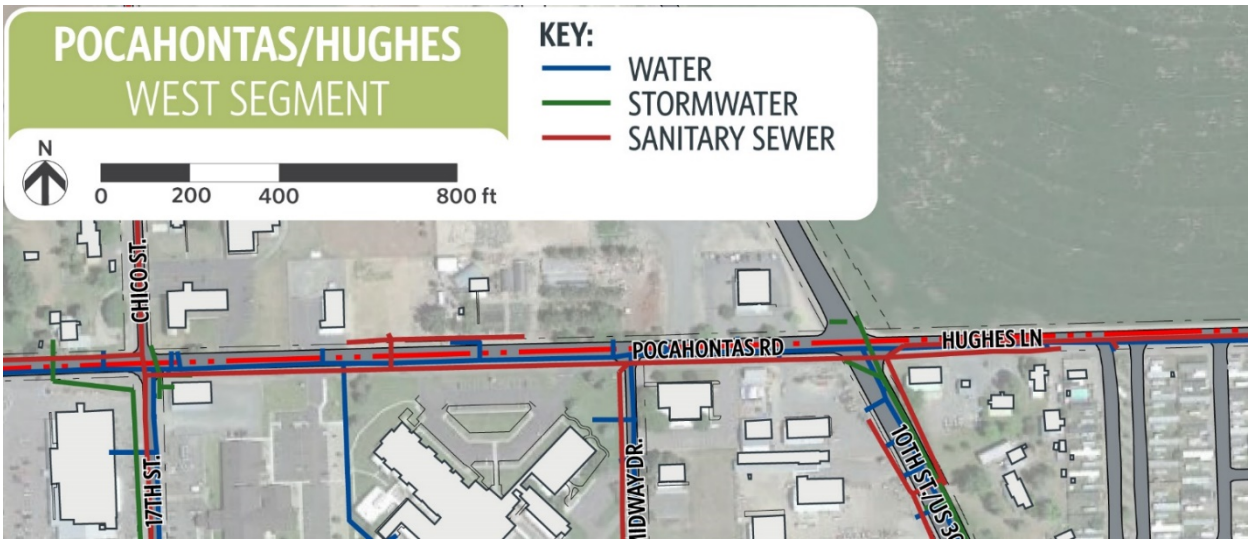
Intersection Level Crash Statistics

Reported Stat	10th & Hughes/ Pocahontas	10th & Campbell	10th & Broadway	10th & E Street
Contributing Factors				
Too Fast for Cond.	2	0	0	0
Failed to Yield	3	5	1	0
Passed Stop Sign	1	0	0	0
Disregarded Traffic Signal	0	2	0	0
Wrong Side Driving	0	0	0	0
Improper Overtaking	0	0	0	0
Followed Too Closely	0	0	0	0
Improper Turn	0	0	2	0
Driver Error - Other	0	0	0	0
Other - Not Driver Error	0	0	0	0
Improper Lane Change	0	0	0	0
Driver Sleepy	0	0	0	0
Non-motorist in Roadway	0	1	0	0
Inattention	1	0	0	0
Failed to Avoid Vehicle Ahead	0	0	0	0
Careless Driving	0	0	0	0

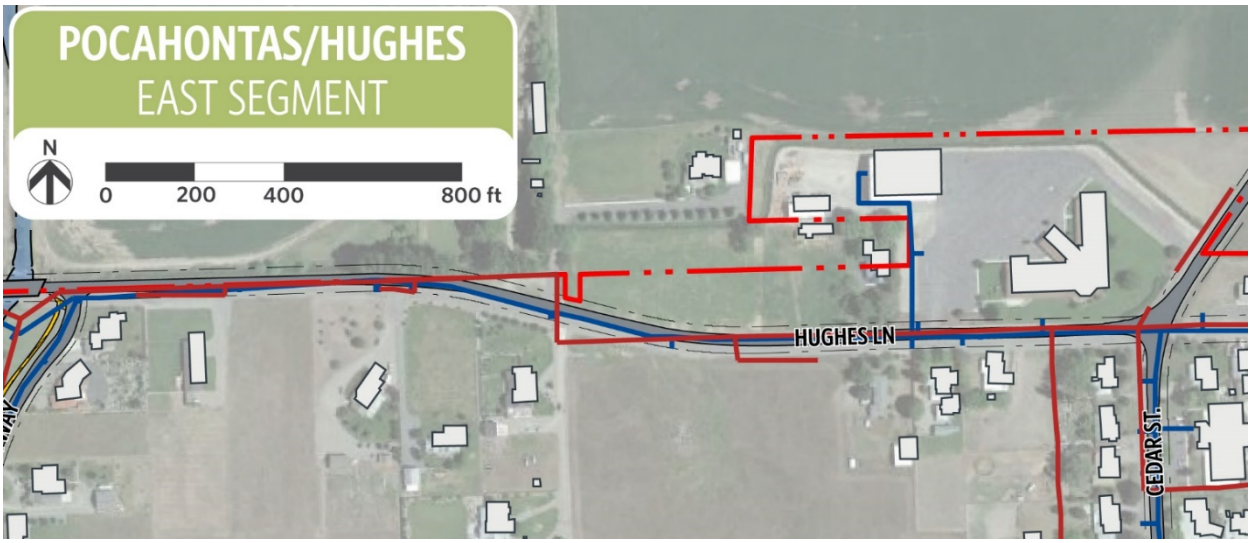
Appendix E. ROW and Utility Maps

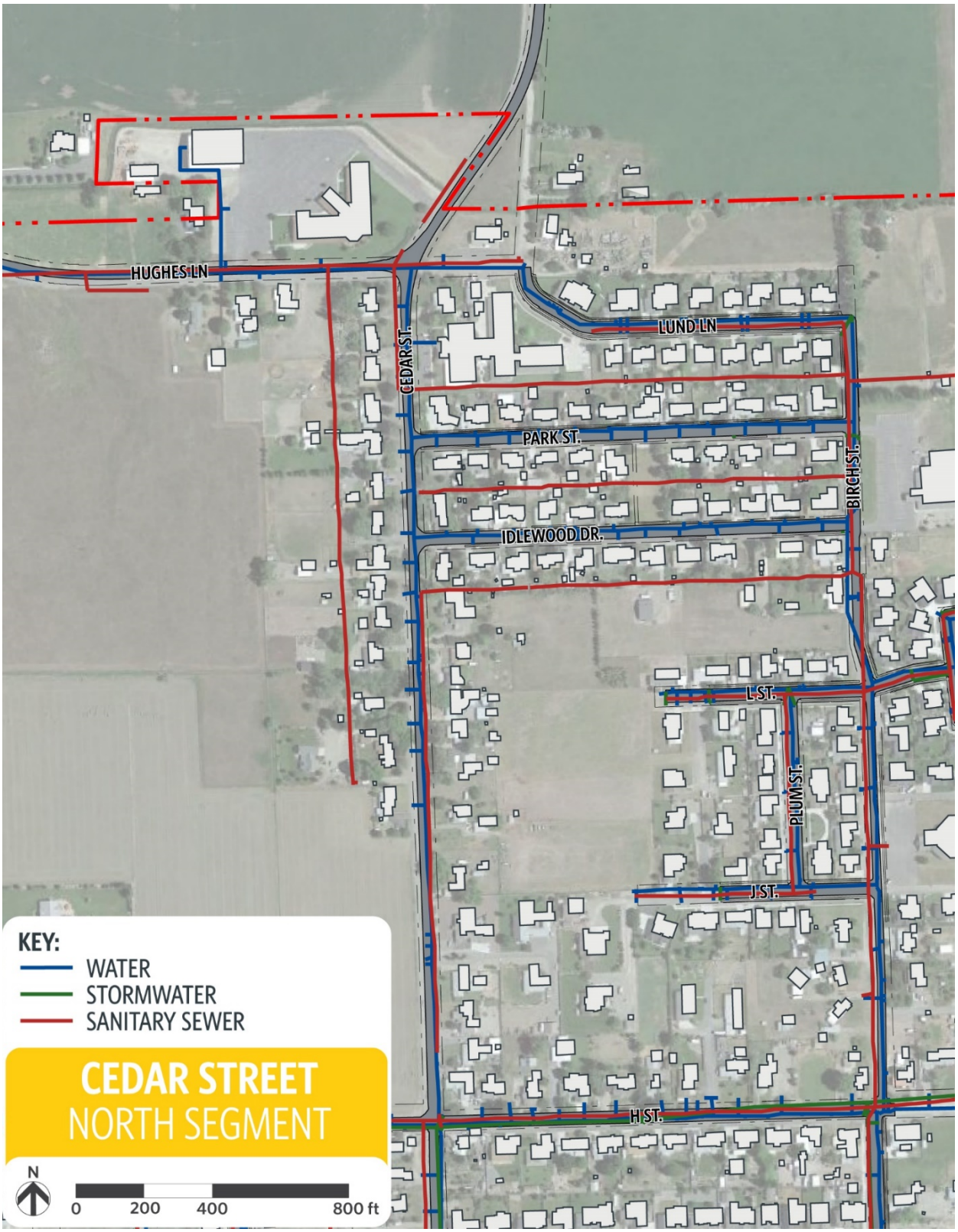

POCAHONTAS RD
HUGHES LN
MIDWAY DR.
10TH ST./US 30
9TH ST.
M ST.
9TH DR.
8TH DR.
L ST.
K ST.
13TH ST.
H ST.
G ST.
9TH ST.
KEY:
WATER
STORMWATER
SANITARY SEWER
10TH STREET
NORTH SEGMENT
N
0
200
400
800 ft

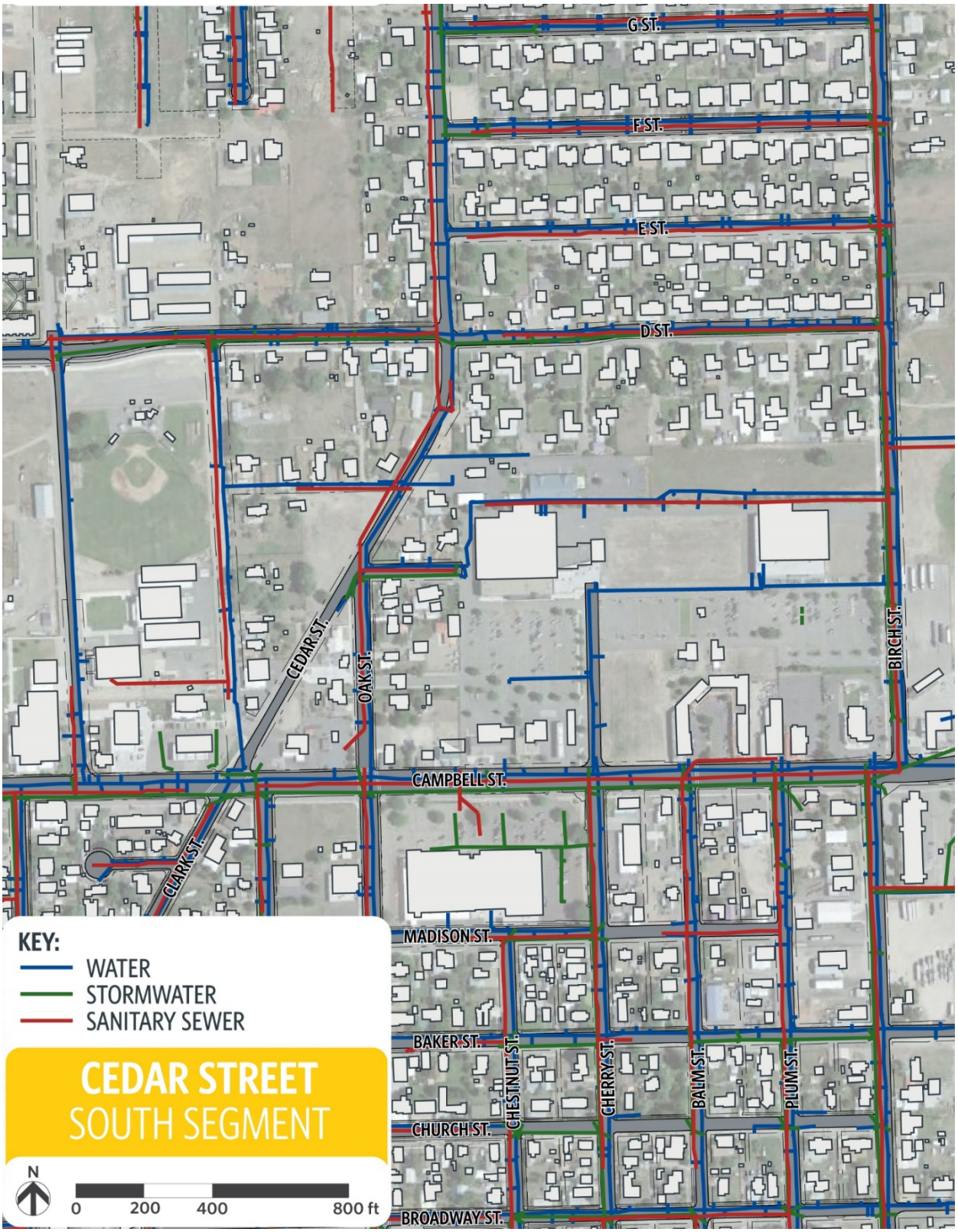

E ST.
D ST.
C ST.
B ST.
A ST.
CAMPBELL ST.
MADISON ST.
BAKER ST.
CHURCH ST.
BROADWAY ST.
JACKSON ST.
WASHINGTON AVE.
12TH ST.
11TH ST.
10TH ST./US 30
9TH ST.
8TH ST.
7TH ST.
6TH ST.
KEY:
WATER
STORMWATER
SANITARY SEWER
10TH STREET
SOUTH SEGMENT
N
0
200
400
800 ft


POCAHONTAS/HUGHES
WEST SEGMENT
KEY:
WATER
STORMWATER
SANITARY SEWER
N
0
200
400
800 ft
CHICO ST.
17TH ST.
POCAHONTAS RD
HUGHES LN
MIDWAY DR.
10TH ST./US-3


POCAHONTAS/HUGHES
CENTER SEGMENT
N
0
200
400
800 ft
HUGHES LN
9TH ST.

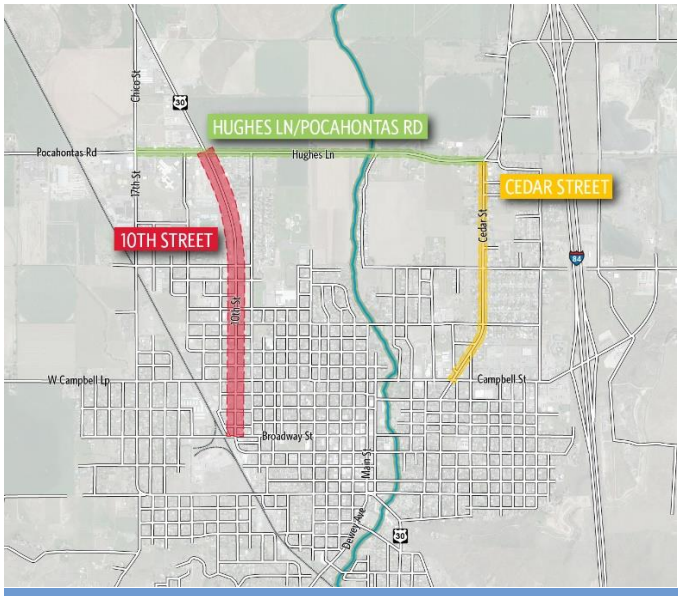

POCAHONTAS/HUGHES
EAST SEGMENT
N
0
200
400
800 ft
HUGHES LN
CEDAR ST.


HUGHES LN
CEDAR ST.
LUND LN
PARK ST.
BIRCH ST.
IDLEWOOD DR.
L ST.
PLUM ST.
J ST.
H ST.
KEY:
WATER
STORMWATER
SANITARY SEWER
CEDAR STREET
NORTH SEGMENT
N
0
200
400
800 ft


G ST.
F ST.
E ST.
D ST.
CEDAR ST.
OAK ST.
BIRCH ST.
CAMPBELL ST.
CLARK ST.
MADISON ST.
BAKER ST.
CHESTNUT ST.
CHERRY ST.
BALM ST.
PLUM ST.
CHURCH ST.
BROADWAY ST.
KEY:
WATER
STORMWATER
SANITARY SEWER
CEDAR STREET
SOUTH SEGMENT
N
0
200
400
800 ft

Appendix IV. Technical Memorandum #3: Vision Statement & Guiding Principles

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Tech Memo #3: Vision Statement & Guiding Principles

Northern Baker Transportation Improvement Plan

Baker City, Oregon
February 3, 2021

Contents

Tables

Figures

Acronyms and Abbreviations

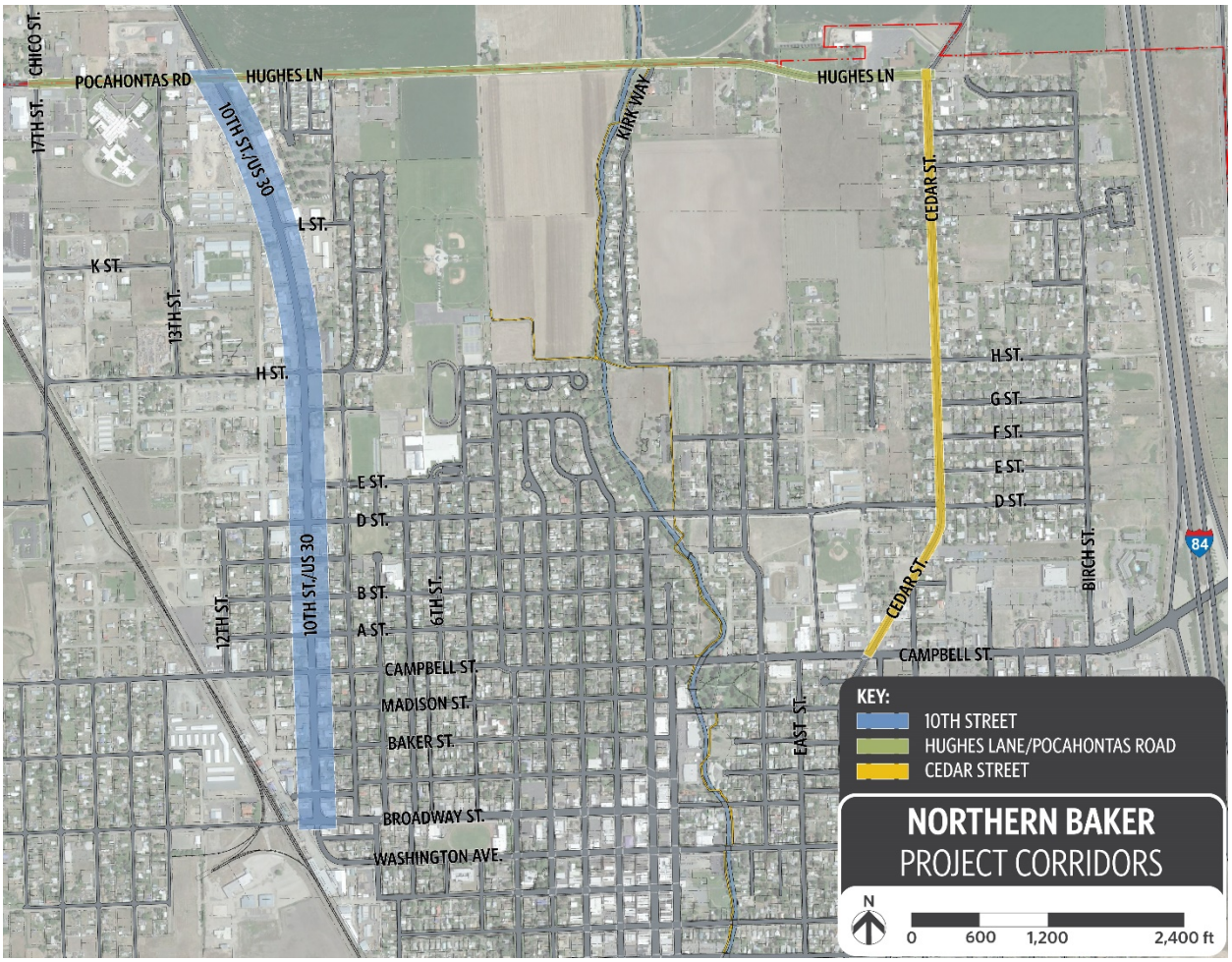
BLTS	Bicycle Level of Traffic Stress
BUD	Blueprint for Urban Design
NBTIP	Northern Baker Transportation Improvement Plan
ODOT	Oregon Department of Transportation
PLTS	Pedestrian Level of Traffic Stress
ROW	Right-of-Way

1 Introduction

The Northern Baker Transportation Improvement Plan (NBTIP) is being undertaken by Baker City and Baker County in partnership with the Oregon Department of Transportation (ODOT) in order to develop and present a vision to revitalize a section of US30 (10th Street) within the city limits. The project will also focus on Cedar Street and Hughes Lane/Pocahontas Road. The project will develop new street design cross sections for all three corridors with the purpose to better accommodate multimodal travel demand along these corridors. The study corridors are shown in Figure 1-1.

This memorandum summarizes pertinent background information, provides a draft vision statement and draft guiding principles, and introduces preliminary evaluation criteria.

Figure 1-1. Project Area



2 Overview of Background Information

Tech Memo #2: Context & Site Analysis provides an in-depth summary of existing conditions along and around the project corridors. It includes a review of existing transportation conditions and pertinent transportation plans and local and state policies; a natural and cultural assessment; and a land-use assessment of properties along the 10th Street corridor.

The findings presented in Tech Memo #2 provide a foundation for the information included in this memorandum. The following is an overview of the key findings:

- Traffic Operations – Traffic operations fall within acceptable Vehicle to Capacity ratios and Level of Service C or greater.
- Freight – Traffic counts show a high volume of medium truck traffic on the project corridors. While designated as a District Highway, 10th Street (US30) is not designated as a National Freight, Oregon Highway Freight, High Clearance or Reduction Review Route. However, due to agricultural activity and related farm equipment movement along the corridor, the Oregon Revised Statute 366.215 (the hole-in-the-air) should still be considered during the design phase, even though coordination with the Mobility Advisory Committee is not required.
- Active Transportation – The Pedestrian Level of Traffic Stress (PLTS) and Bicycle Level of Traffic Stress (BLTS) analysis found that the majority of facilities are moderate to high stress environments for active users.
- Transit – Local fixed route service provides for a high level of community coverage and links together important community resources.
- Safety – No fatalities were recorded in the project area. The crash rate calculations did not identify any crash hot spots using ODOT's crash rate rating system.
- Right-of-Way (ROW) and Utilities – The three project corridors have ROW beyond current usage. The Cedar Street and 10th Street ROW include potential obstacles (e.g. trees, signage, landscaping). All three corridors have underground and overhead utilities in the ROW.
- Previously planned projects – Several projects have been identified for the three project corridors and should be taken into consideration during the design phase.
- ODOT Blueprint for Urban Design (BUD) – The BUD applies to 10th Street (US30) and provides design guidance that will need to be followed during the design phase.
- Natural and Cultural Assessment – The Powder River is identified as a riparian area with a flood zone along the southern edge of Hughes Street. Several hazardous material sites are identified along 10th Street. An analysis of available demographic data found that several block groups have a concentration of households living below the poverty threshold and potentially transit dependent populations.
- 10th Street Land Use – Current land use along 10th Street is predominantly auto-oriented commercial development in accordance with the existing zoning. A small number of parcels include residential or institutional uses.

3 Vision Statement and Guiding Principles

The following vision statement and guiding principles have been reviewed, discussed, and accepted by the project Technical Advisory Committee and Project Management Team.

3.1 Vision Statement

The NBTIP guides improvements for the three project area corridors. The three corridors remain unique in character and context, are aesthetically pleasing, and allow for safe and comfortable travel along and across the corridors by all modes. The three corridors facilitate community interaction by fostering the unique characteristics of each corridor: vibrant commercial activity along 10th Street; livable neighborhoods along Cedar Street; and the rural edge along Hughes Lane/Pocahontas Road. The project plan leads to safe travel and improved quality of life in Baker City.

3.2 Guiding Principles

The purpose of the project is to develop a vision to revitalize 10th Street and to improve the walking and bicycling environment on Cedar Street and Hughes Lane/Pocahontas Road. The following section establishes a set of guiding principles intended to support design decisions aligned with the project's purpose.

Due to the unique characteristics and contexts of the three project corridors, a set of guiding principles for each corridor is presented below, preceded by a set of overarching project-wide guiding principles.

Draft Project-Wide Guiding Principles

- Property owners, stakeholders, and the public are meaningfully engaged.
- Public input is respected and considered.
- Safety is improved for people traveling on foot, on bicycle, by bus, by car, or by truck.
- All modes of travel are accommodated to provide equitable transportation choices.
- Recommendations focus on context-sensitive/practical design solutions tailored to the existing constrained built environment and mindful of the anticipated mix of modes of travel.
- Recommendations remove barriers for people bicycling and walking, and support an active, healthy lifestyle.
- Recommendations foster environmental stewardship.
- Recommendations reflect the desired community identity.
- Recommendations for intersections meet traveler expectation, avoid unusual or off-set configurations, and consider options to clarify travel through unusual intersections.

Draft Guiding Principles for 10th Street

- East-west connectivity is improved, especially for people walking and bicycling along routes accessing civic uses (e.g., high school, sports complex, hospital, YMCA).
- Business vitality of the corridor is protected and enhanced.
- Continued movement of heavy vehicles, including freight, snowplows, and agricultural equipment, is protected.
- Recommendations are flexible enough to allow for future development and redevelopment.
- Corridor aesthetics are improved to provide a unique sense of place and foster vibrant commercial activity.

Draft Guiding Principles for Hughes Lane/Pocahontas Road

- The northern terminus of Leo Adler Memorial Parkway is improved to express a sense of arrival and facilitate safe connectivity for people walking and bicycling.
- Corridor aesthetics are improved to protect and celebrate the rural edge along the corridor.
- Safe connection to and from the sports complex is provided to address ingress and egress from parking facilities to Hughes Lane.
- Recreational use of Powder River Bridge at Hughes Lane is taken into consideration.

Draft Guiding Principles for Cedar Street

- East-west connectivity is improved to facilitate travel through and across intersections, especially for people walking and bicycling.
- Community livability along the corridor is protected and enhanced.
- Corridor aesthetics are improved to provide a unique sense of place and protect the residential character.
- Travel speeds for safe and secure multimodal travel is encouraged through appropriate design treatments.

4 Project Evaluation Criteria

The three project corridors, 10th Street, Hughes Lane/Pocahontas Road, and Cedar Street are distinct in terms of transportation function, location within the urban fabric, and character of the built (or unbuilt) context. Therefore, not all criteria are equally applicable or relevant for all three corridors. The project evaluation criteria introduced here reflect the unique character of each project corridor.

- The criteria are considerations intended to gauge the degree to which the proposed design recommendations, which are to be developed in Task 4 of this project, achieve the goals encapsulated in the project vision and guiding principles. The evaluation criteria are: Feasibility of implementation
- ROW constraints
- Built environment constraints
- Environmental impacts and mitigation
- Conceptual cost estimate
- Safety and comfort for all modes of travel
- Connectivity across corridor
- Level of public and stakeholder support
- Community identity and aesthetics
- Business vitality/community livability

5 Next Steps

The guiding principles and evaluation criteria introduced in this memorandum will guide the development of the preliminary and revised concept design in the upcoming Task 4. The guiding principles provide the framework and will guide design decisions every step of the way. The design team will use the evaluation criteria at key junctures to gauge the degree to which the design concepts achieve the goals embedded in the guiding principles. The team will complete a Project Evaluation Criteria Matrix for each alternative, listing the criteria, providing a qualitative score of good, average, or poor, and providing comments elaborating on and justifying the scoring. Table 5-1 includes a sample Project Evaluation Criteria Matrix.

Table 5-1. Sample Project Evaluation Criteria Matrix

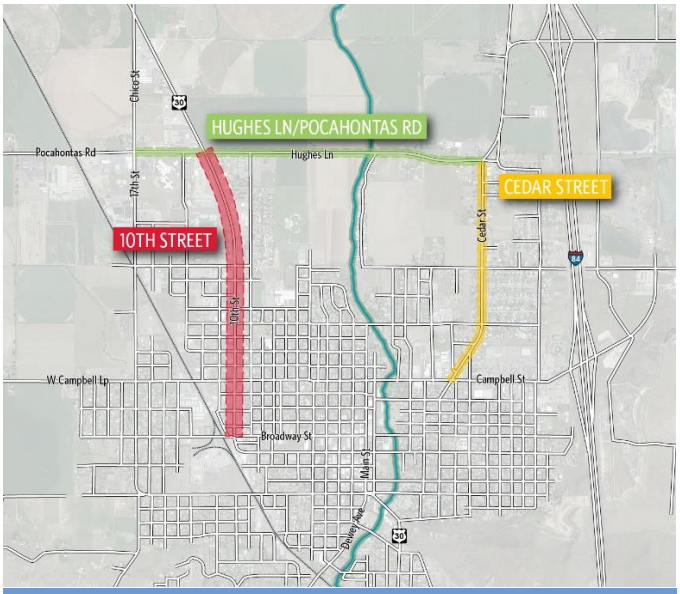
Criteria		10th Street (Alternative 1)	Comments
1	Feasibility of implementation	●	The proposed design can easily be phased
2	ROW constraints	○	Requires additional ROW along a quarter of the corridor
3	Built environment constraints	◐	No impacts on buildings but some impacts on parking and access
4	Environmental impacts and mitigation	◐	Space constrained design limits options for stormwater treatment
5	Conceptual cost estimate	●	Cost-efficient recommendations
6	Safety and comfort for all modes of travel	●	Design eliminates/mitigates key risk factors
7	Connectivity across corridor	◐	Improved quality of crossings, but frequency is less than desired
8	Level of public and stakeholder support	●	Design received broad acceptance during public engagement events
9	Community identity and aesthetics	●	Includes design elements that create a cohesive look and feel in-line with the desired character
10	Business vitality/community livability	◐	Improved conditions for businesses, though some adverse impacts due to roadway widening

Key:

● = good
◐ = average
○ = poor
n/a = criterion is not relevant/does not apply

Appendix V. Technical Memorandum #4: Preliminary Concept Design

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Technical Memo #4: Preliminary Concept Design

Northern Baker Transportation Improvement Plan

Baker City, Oregon
March 22, 2021

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Appendices

Acronyms and Abbreviations

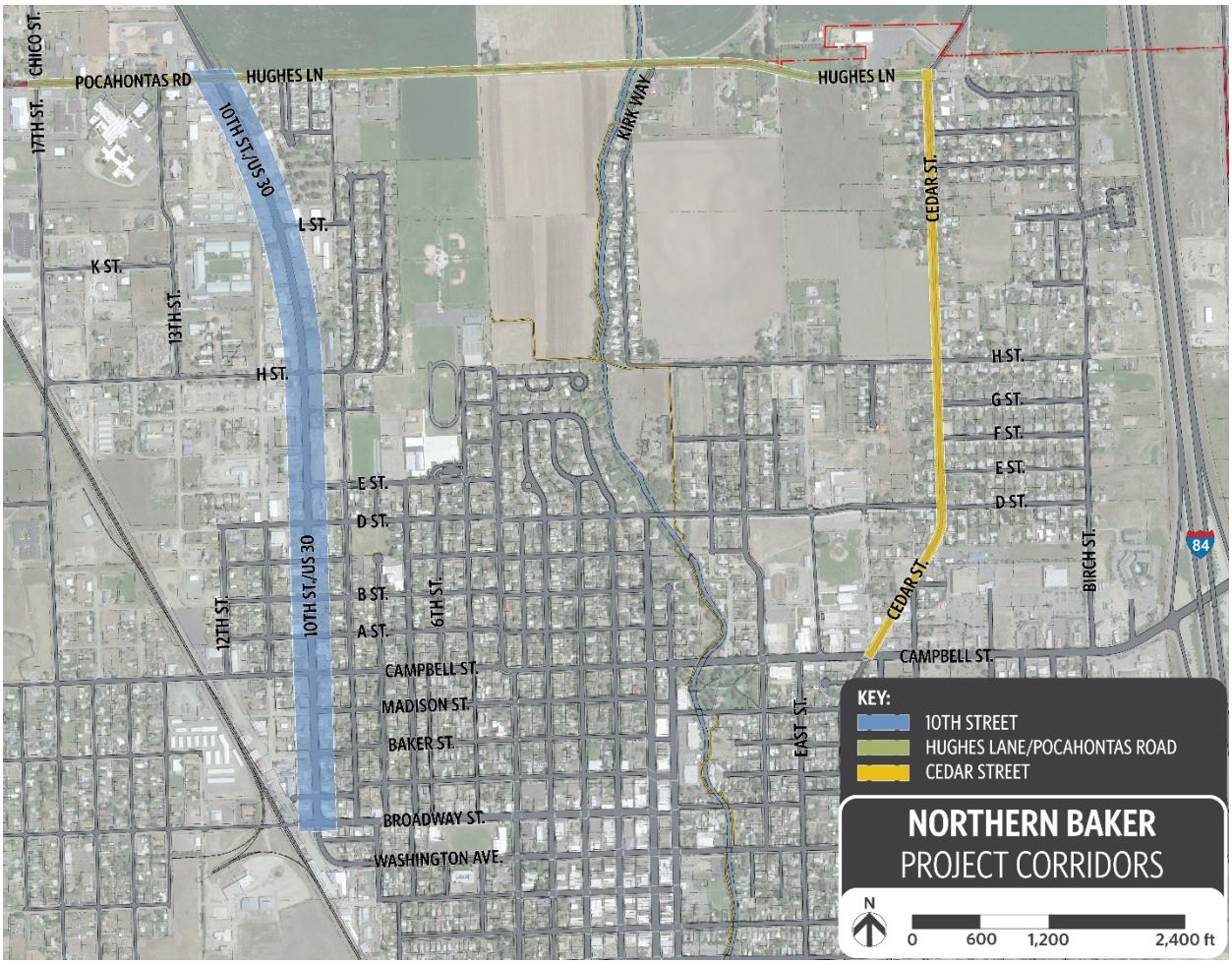
NBTIP	North Baker Transportation Improvement Plan
ODOT	Oregon Department of Transportation
ROW	Right-of-Way
TAC	Technical Advisory Committee
TM	Technical Memo

1 Introduction

The Northern Baker Transportation Improvement Plan (NBTIP) is being undertaken by Baker City and Baker County in partnership with the Oregon Department of Transportation (ODOT) in order to develop and present a vision to revitalize a section of US30 (10th Street) within the city limits. The project also focuses on Cedar Street and Hughes Lane/Pocahontas Road. The project will develop new street design cross sections for all three corridors with the purpose to better accommodate multimodal travel demand and provide equitable access to destinations along these corridors for people of all ages and abilities, including the typically underserved and most vulnerable. The study corridors are shown in Figure 1-1.

The purpose of this technical memo is to summarize preliminary design concepts for all three corridors and provide draft land use scenarios for the 10th Street corridor.

Figure 1-1. Project Area

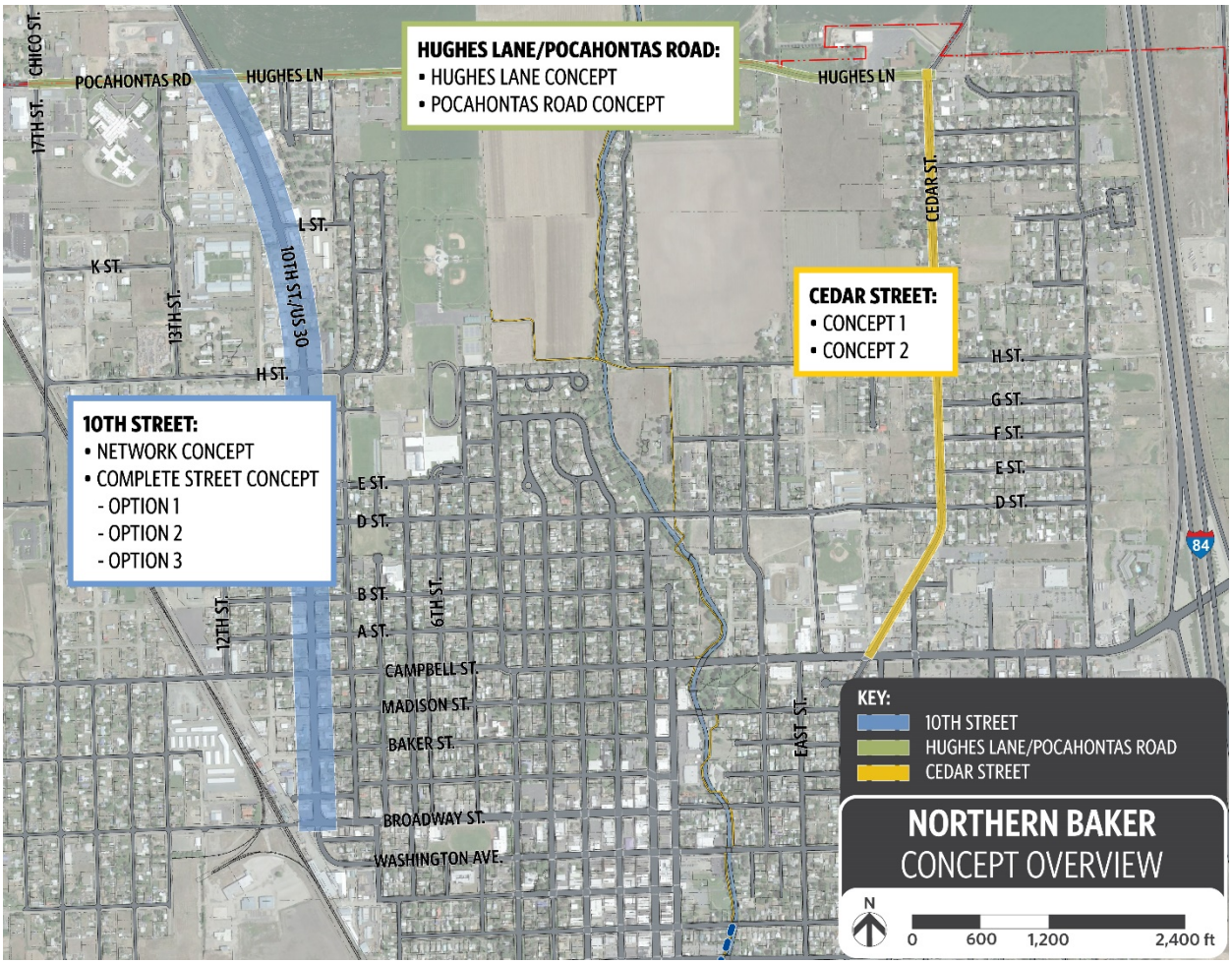


2 Preliminary Design Concepts

This section describes and depicts design concepts for all three corridors, includes typical cross sections of the existing conditions for reference, and provides initial evaluations of the concepts based on the evaluation criteria established in Technical Memo (TM) #3. The preliminary design concepts propose improvements intended to ensure equitable access to transportation options for all ages and abilities. These improvements include facilities for people walking and bicycling along the project corridors, and suggested connections to and enhancements of the larger network of streets and pathways to allow for safe and comfortable travel by all modes.

There are multiple concepts for each corridor: two concepts for 10th Street (one with three options), two concepts for Cedar Street, and one concept each for Hughes Lane/Pocahontas Road. Figure 2-1 provides an overview of the preliminary design concepts proposed for each corridor.

Figure 2-1. Concept Overview



2.1 Design Concepts for 10th Street

2.1.1 Existing Conditions

Currently, 10th Street provides two travel lanes in each direction, with curbside parking provided approximately between Broadway Street and H Street. While the right-of-way (ROW) is consistent at approximately 80 feet, the curb-to-curb distance changes at H Street. The curb-to-curb distance is approximately 66 feet south of H Street (Figure 2-2) and narrows slightly to approximately 60 feet north of H Street (Figure 2-3).

Figure 2-2. Existing Typical Condition South of H Street

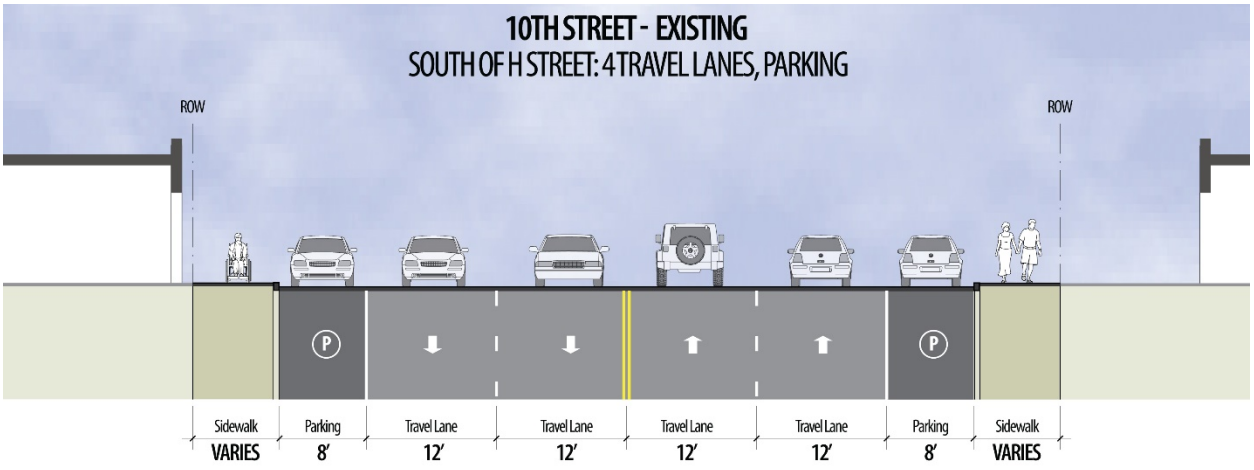
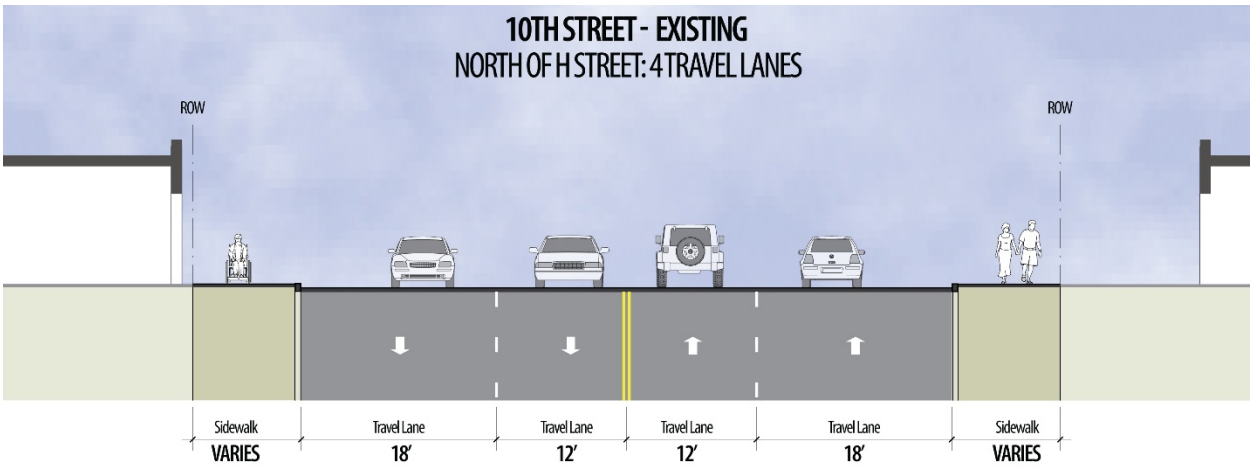


Figure 2-3. Existing Typical Condition North of H Street



2.1.2 Network Concept

2.1.2.1 Network Concept Description

The network concept proposes different approaches for the segments north and south of H Street due to the change in curb-to-curb width and the level of interconnectedness of the surrounding street grid. The network concept maintains the existing four travel lanes, but instead of accommodating bicycles for the entirety of the corridor, the concept relies on improvements to cross streets and parallel streets to provide for non-motorized circulation and access south of H Street (see Figure 2-4).

South of H Street, the network concept keeps the existing cross section largely unchanged (see Figure 2-5). The network concept proposes that parallel streets, 9th Street and 11th Street, serve as low-stress bicycle routes in the form of bicycle boulevards; low volume and low speed neighborhood streets with signage and pavement markings that indicate to motorists and cyclists alike that the street is to be shared by all modes. Since not all street ROWs west of 10th Street are improved, this concept would require the paving of several street segments along 11th Street, E Street, and Baker Street.

The network concept also proposes connecting to the larger non-motorized network. This could be achieved by designating Campbell Street as a bicycle boulevard between 17th Street and Main Street to create links to the planned shared-use path along 17th Street to the west and Leo Adler Memorial Parkway to the east. Similarly, designating H Street as a bicycle boulevard from 17th Street to 8th Drive would create a connection to the planned 17th Street shared-use path and could create a link to Leo Adler Memorial Parkway with a suggested trail connection around the north end of Baker City High School.

To provide adequate access to destinations on 10th Street, frequent and enhanced crossings would improve the street network's east/west connectivity and minimize out of direction travel for non-motorized travelers. The exact nature of these enhancements will be developed as the project proceeds. However, example treatments include curb extensions to minimize crossing distances, high visibility crosswalk markings, and appropriate signage alerting motorists to crossing pedestrians and bicyclists.

The existing street grid north of H Street is less interconnected and does not provide for adequate access to 10th Street utilizing parallel routes. The network concept, therefore, proposes to include buffered bicycle lanes on 10th Street between Pocahontas Road/Hughes Lane and H Street (see Figure 2-6). Buffered bicycle lanes can be accommodated within the existing roadway width by slightly narrowing the inside travel lanes. This approach will require particular care in designing the intersection of 10th Street and H Street to ensure a safe transition for bicyclists.

NETWORK CONCEPT CONSIDERATIONS:

- Transition of bicycle traffic from parallel routes south of H Street to on-street north of H Street.
- Concept requires capital investment to pave and improve neighborhood streets to function as bicycle boulevards; further studies may be needed to identify connections to the larger non-motorized network, including additional designated

bicycle boulevards or new pathway links (elements that are beyond the scope of this project and would require additional funding sources to plan, design, and construct).

Figure 2-4. 10th Street Network Concept

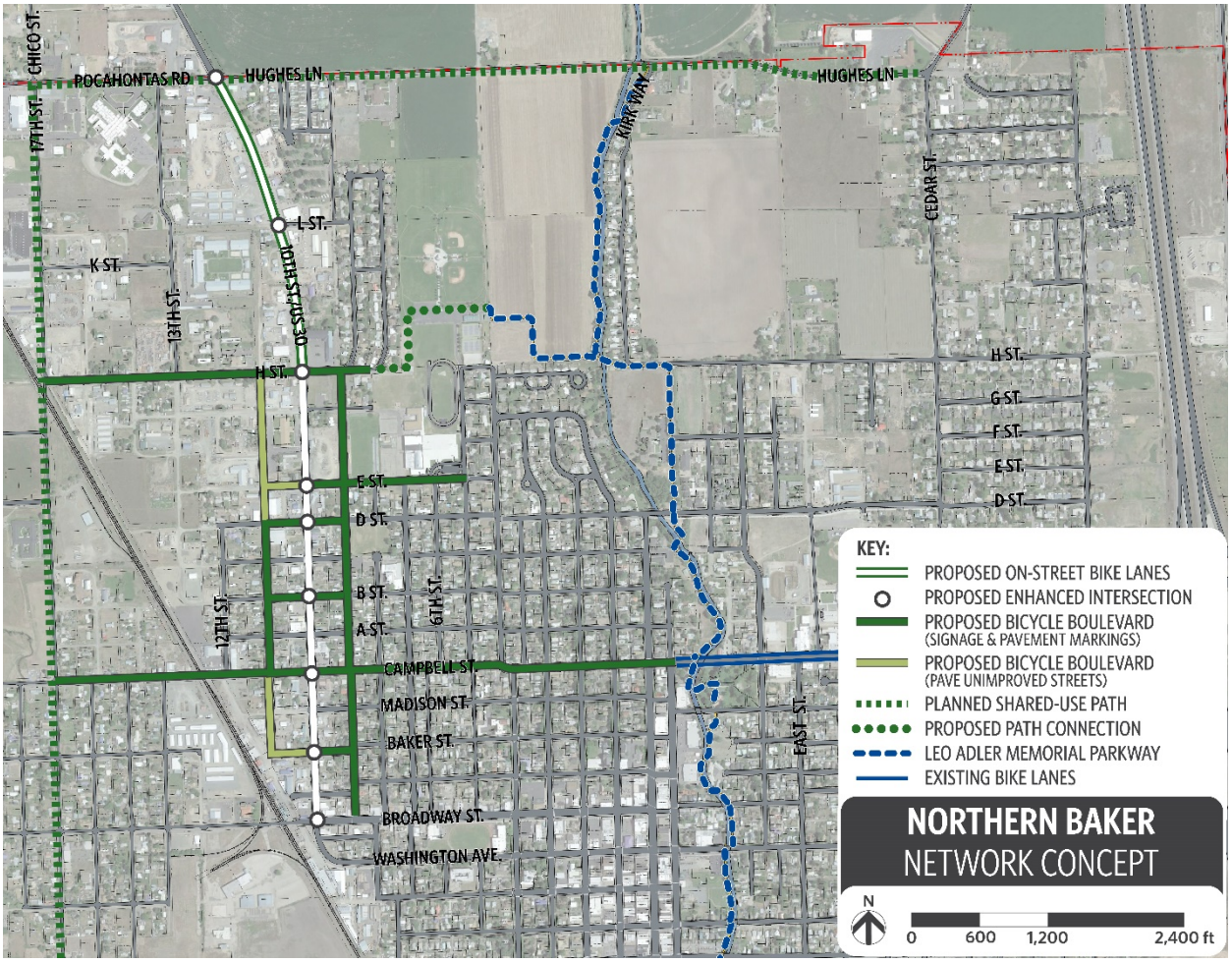


Figure 2-5. Proposed Network Concept Condition South of H Street

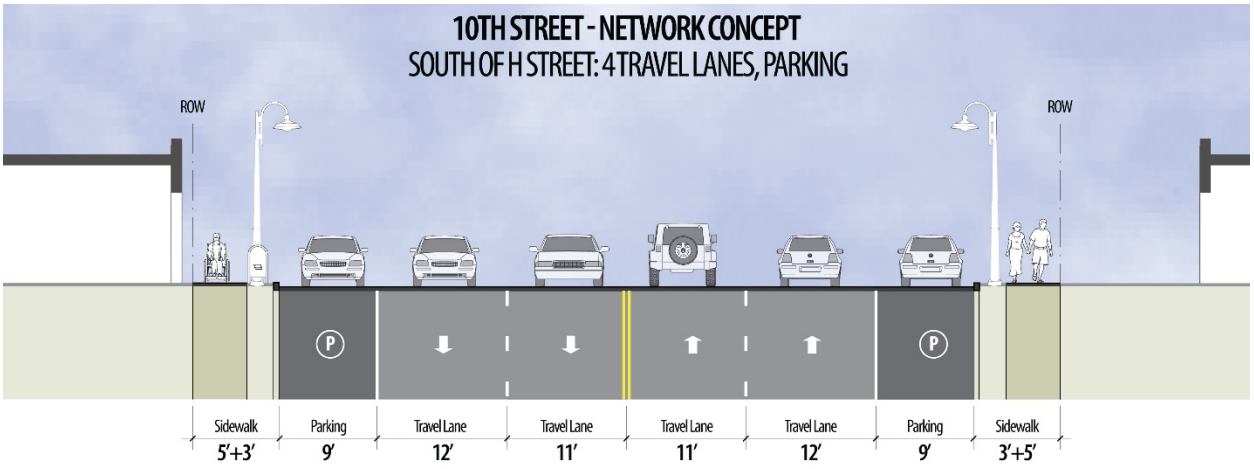
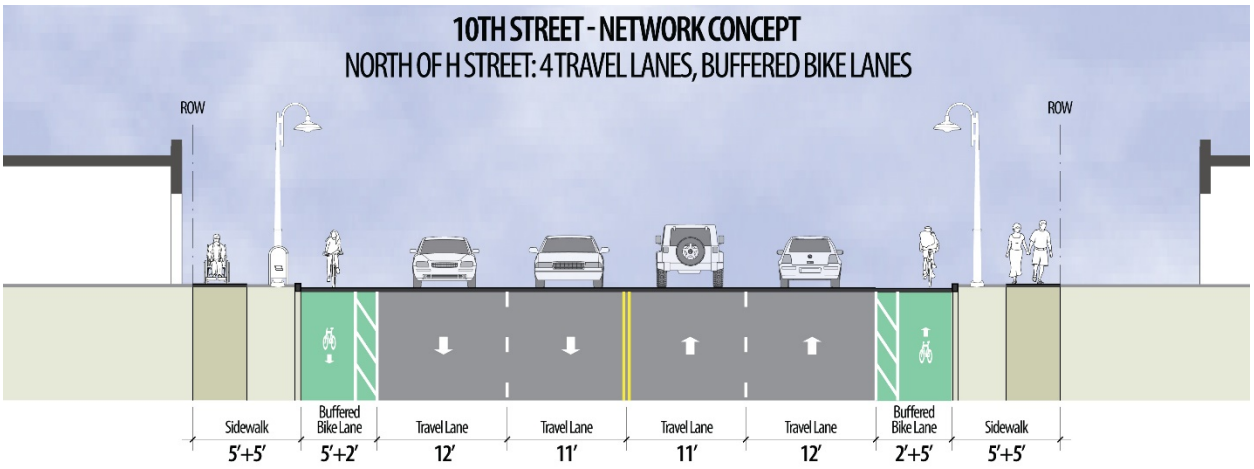


Figure 2-6. Proposed Network Concept Condition North of H Street



2.1.2.2 Network Concept Evaluation

Table 2-1 provides an initial evaluation of the concept based on the evaluation criteria established in TM #3.

Table 2-1. 10th Street Network Concept Evaluation

Criteria		Network Concept	Comments
1	Feasibility of implementation	●	Minimal impacts on 10th Street – restriping and intersection improvements; does rely on improving adjacent streets
2	ROW constraints	●	No ROW impacts anticipated
3	Built environment constraints	●	No impacts on 10th Street anticipated; required improvements on adjacent streets may impact access (e.g., on 11th Street between D Street and H Street)
4	Environmental impacts and mitigation	●	No impacts anticipated
5	Conceptual cost estimate	◐	Major cost factors include intersection enhancements and improving adjacent streets; requires additional funding sources
6	Safety and comfort for all modes of travel	◐/○	Lack of direct bike access to destinations on 10th Street south of H Street requires out of direction travel
7	Connectivity across corridor	●	Improved quality and frequency of crossings
8	Level of public and stakeholder support	TBD	Evaluation forthcoming based on upcoming TAC meeting and virtual community workshop
9	Community identity and aesthetics	◐	Largely maintains status quo with some opportunities at enhanced intersections
10	Business vitality/community livability	◐	No measurable change to existing conditions

Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

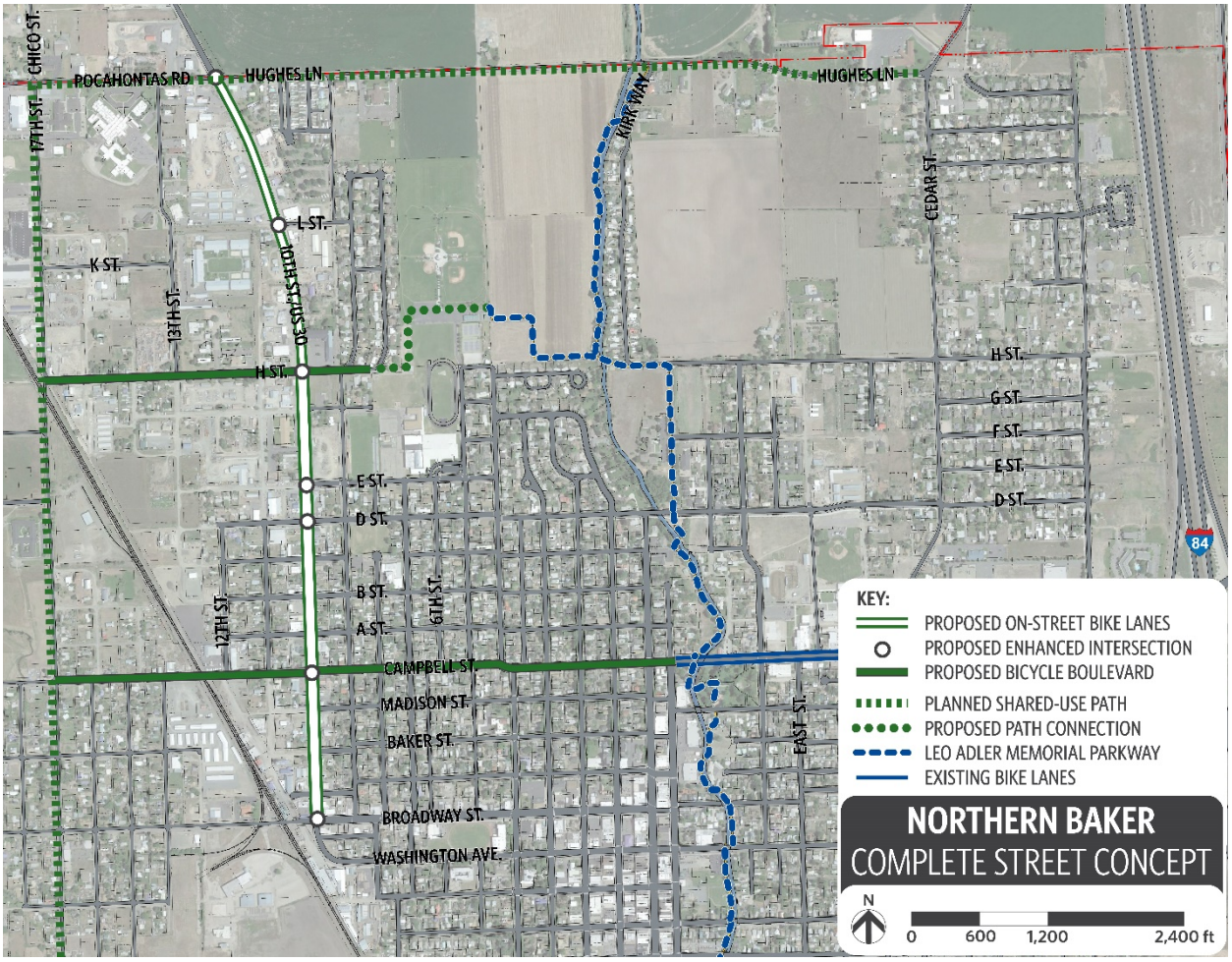
2.1.3 Complete Street Concept

2.1.3.1 Complete Street Concept Description

The complete street concept includes all modes of travel on 10th Street and proposes to maintain the existing curb-to-curb distance. Like the network concept, the complete street concept also proposes connections to the larger non-motorized network, which could be achieved by designating H Street and Campbell Street as bicycle boulevards to provide links to the planned 17th Street shared-use path and Leo Adler Memorial Parkway (further studies may be needed to identify connections to the larger non-motorized network, including additional designated bicycle boulevards or new pathway links). The complete street concept also proposes enhanced crossings, however at a greater spacing as this concept is less reliant on east/west connectivity than the network concept. Figure 2-7 provides an overview of the proposed improvements and connections.

The complete street concept includes a three-lane cross section with one travel lane in each direction and a center turn lane or left turn lane. Three options of the complete street concept, discussed below, include different bicycle facilities.

Figure 2-7. 10th Street Complete Street Concept



2.1.3.2 Complete Street Concept - Option 1

This option proposes parking protected bike lanes which are bike lanes located on the curb side of the parking lane placing parked cars as physical barriers between moving traffic and bicyclists. A striped buffer between parked cars and the bike lane provides space for passengers to open the car door and step in or out of the vehicle (see Figure 2-8).

Due to the narrower roadway width north of H Street, this concept proposes parking on one side only, with a buffered bike lane provided on the other side (see Figure 2-9).

COMPLETE STREET CONCEPT - OPTION 1 CONSIDERATIONS:

- Location of parking north of H Street could be on either side of the street and subject to land-use context
- Buffered bike lane north of H Street lacks protection from parked cars. A protective barrier could be added but might complicate maintenance/snow removal.

Figure 2-8. Proposed Complete Street Concept - Option 1 Condition South of H Street

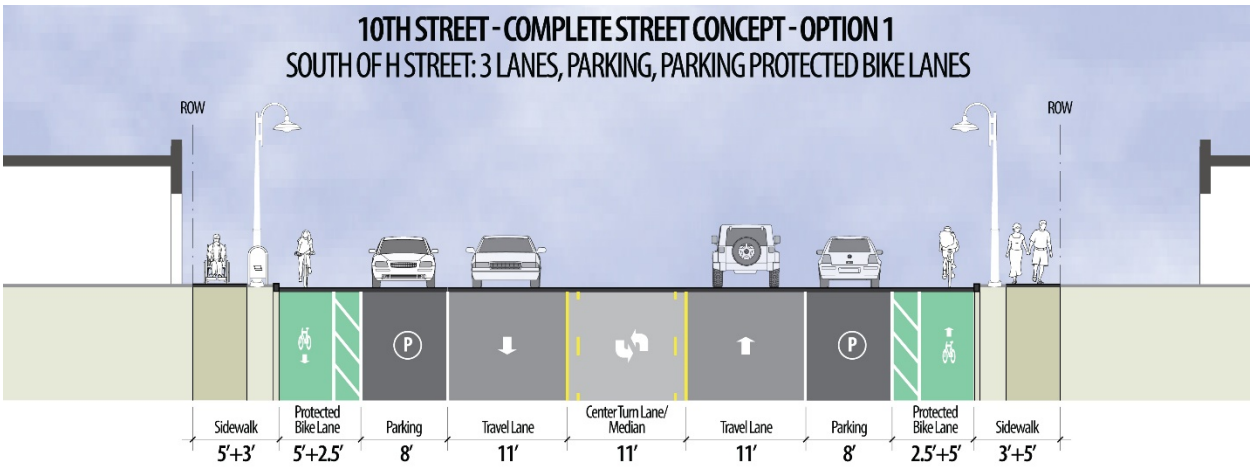
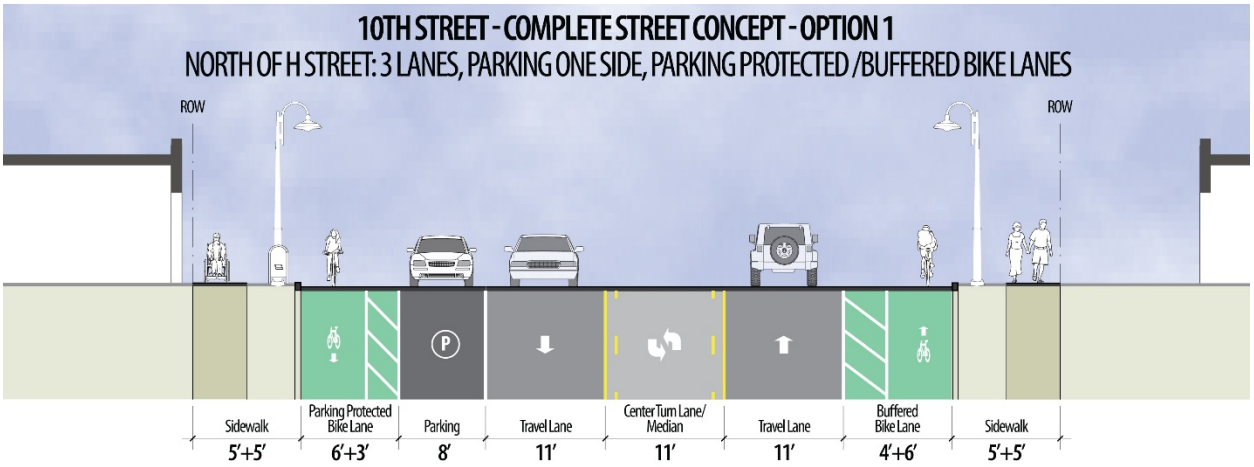


Figure 2-9. Proposed Complete Street Concept - Option 1 Condition North of H Street



2.1.3.3 Complete Street Concept - Option 2

This option proposes raised bike lanes which are bike lanes physically separated by a low curb located on the curb side of the parking lane. A buffer between parked cars and the raised bike lane provides physical space for passengers to open the car door and step into or out of the vehicle (see Figure 2-10).

Due to the narrower roadway width north of H Street, this concept proposes parking on one side only (see Figure 2-11).

COMPLETE STREET OPTION 2 CONSIDERATIONS

- Stormwater and snow removal to be considered due to the new raised curb line.
- Location of parking north of H Street could be on either side of the street subject to land-use context.

Figure 2-10. Proposed Complete Street Concept - Option 2 Condition South of H Street

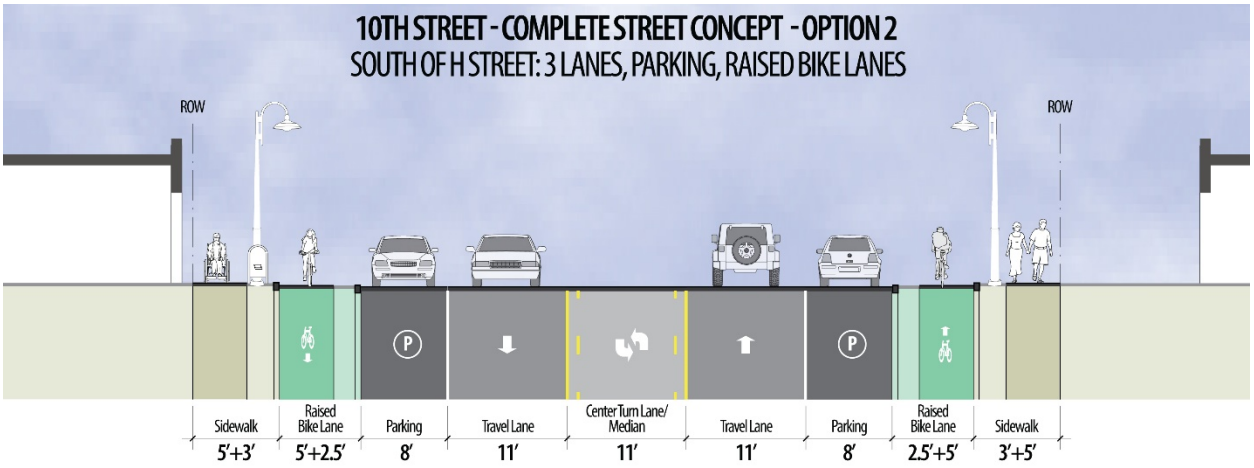
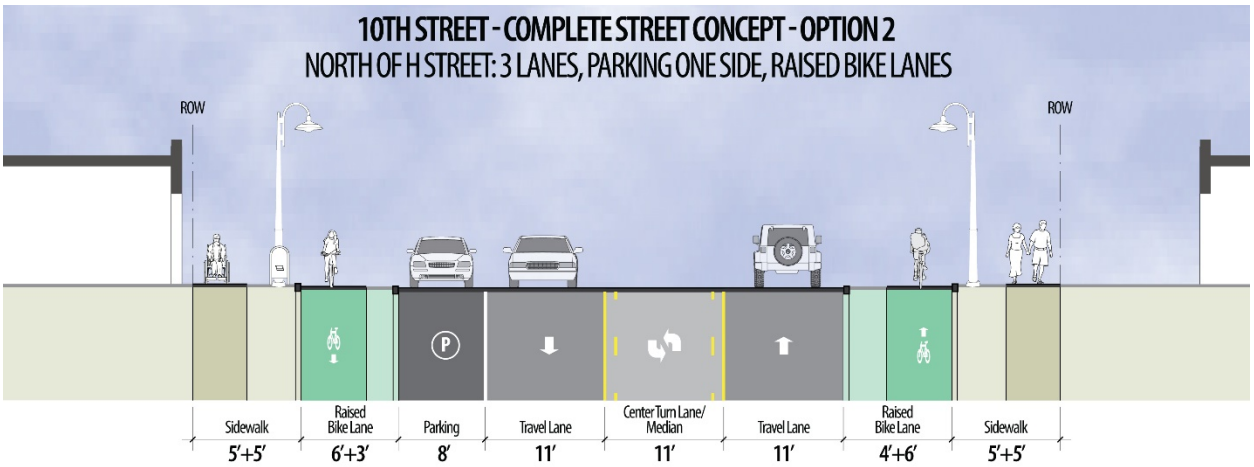


Figure 2-11. Proposed Complete Street Concept - Option 2 Condition North of H Street



2.1.3.4 Complete Street Concept - Option 3

This option proposes a two-way raised cycle track on the west side of 10th Street. The cycle track would be separated from the roadway by a planted buffer, wide enough to accommodate street trees. South of H Street, parking is provided on both sides (see Figure 2-12), whereas north of H Street, parking would be provided on the east side only (see Figure 2-13).

COMPLETE STREET CONCEPT - OPTION 3 CONSIDERATIONS:

- Intersection and driveway cuts need to be designed to minimize conflicts and alert drivers to expect bicyclists traveling in both directions.
- Intersections need to be designed to facilitate intuitive turn movements of bicyclists and minimize conflicts; treatments may include bike boxes, two-stage turn queue boxes, or protected waiting areas.

Figure 2-12. Proposed Complete Street Concept - Option 3 Condition South of H Street

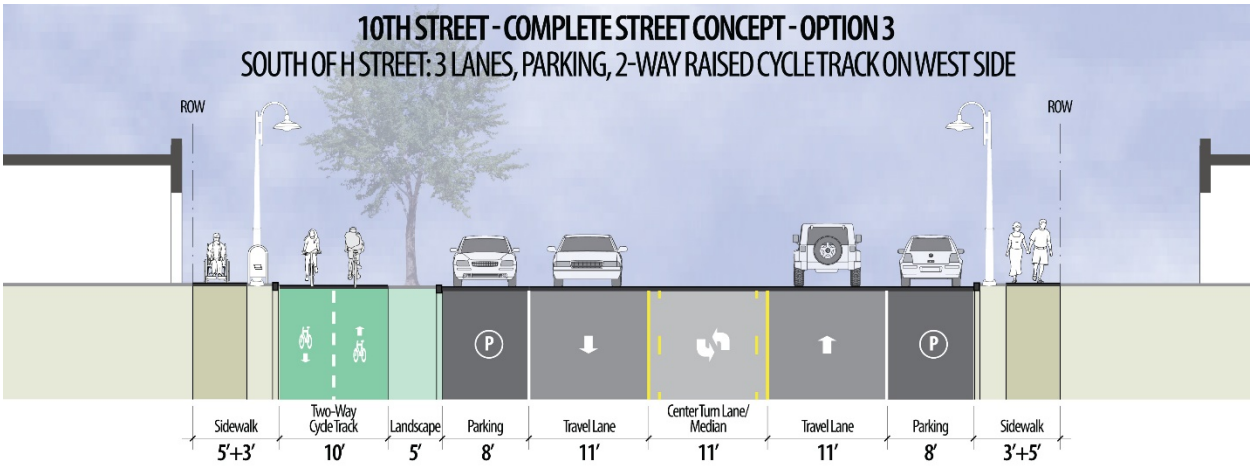
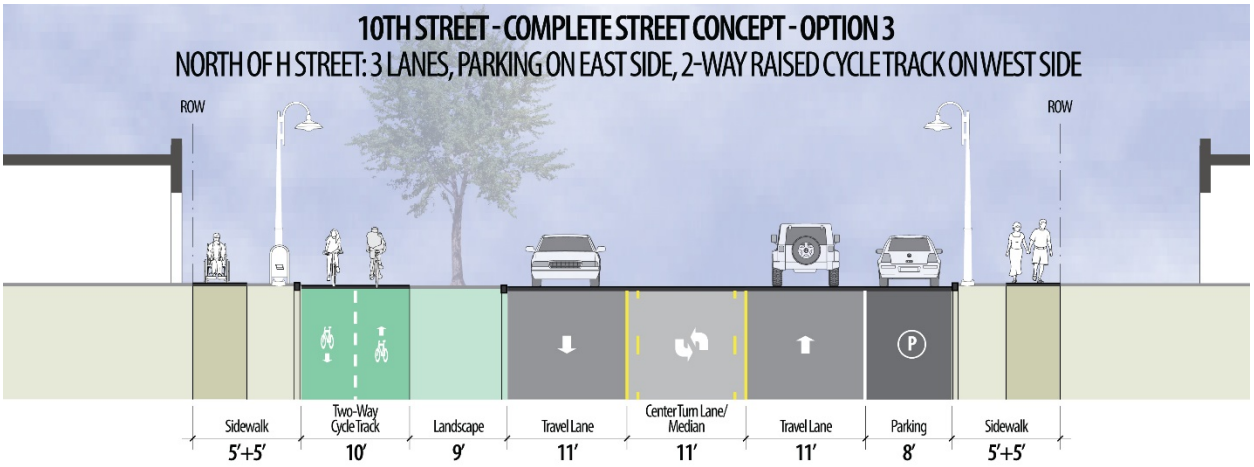


Figure 2-13. Proposed Complete Street Concept - Option 3 Condition North of H Street



2.1.3.5 Complete Street Concept Evaluation

Table 2-2 provides an initial evaluation of the complete street concept options based on the evaluation criteria established in TM #3.

Table 2-2. 10th Street Complete Street Concept Evaluation

Criteria		Option 1	Option 2	Option 3	Comments
1	Feasibility of implementation	●	◐	◐	Options 2 and 3 require new curbs for raised bike facilities/buffers
2	ROW constraints	●	●	●	No ROW impacts anticipated
3	Built environment constraints	●	●	◐	Constraints to access on west side in Option 3 to be expected
4	Environmental impacts and mitigation	●	●	●	No impacts anticipated; Option 3 allows for addition of street trees
5	Conceptual cost estimate	●	◐	◐	Low cost in Option 1 (restriping); Options 2 and 3 include new curbs with potential implications on stormwater
6	Safety and comfort for all modes of travel	●	●	●	All three options provide significantly enhanced safety and comfort; intersection design will be key
7	Connectivity across corridor	●	●	●	Improved quality and frequency of crossings
8	Level of public and stakeholder support	TBD	TBD	TBD	Evaluation forthcoming based on upcoming TAC meeting and virtual community workshop
9	Community identity and aesthetics	●	●	●	Substantial opportunities for aesthetic enhancements, especially in Option 3
10	Business vitality/community livability	●	●	◐	Balance between vehicular access constraints on west side (Option 3) and improved environment for peds/bikes

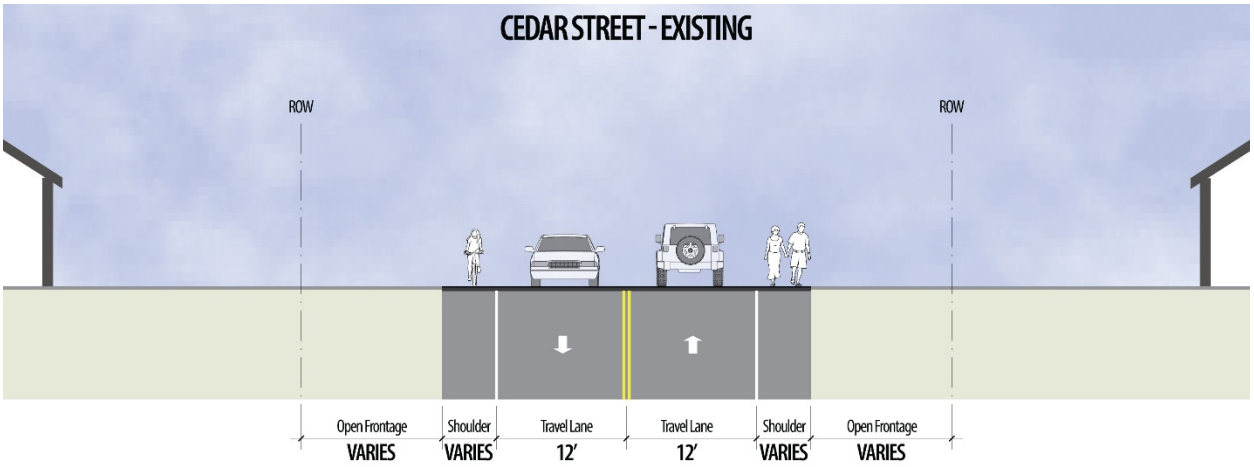
Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

2.2 Design Concepts for Cedar Street

2.2.1 Existing Conditions

Currently, Cedar Street provides one travel lane in each direction, along with paved shoulders of varying width (see Figure 2-14). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Figure 2-14. Existing Typical Condition on Cedar Street



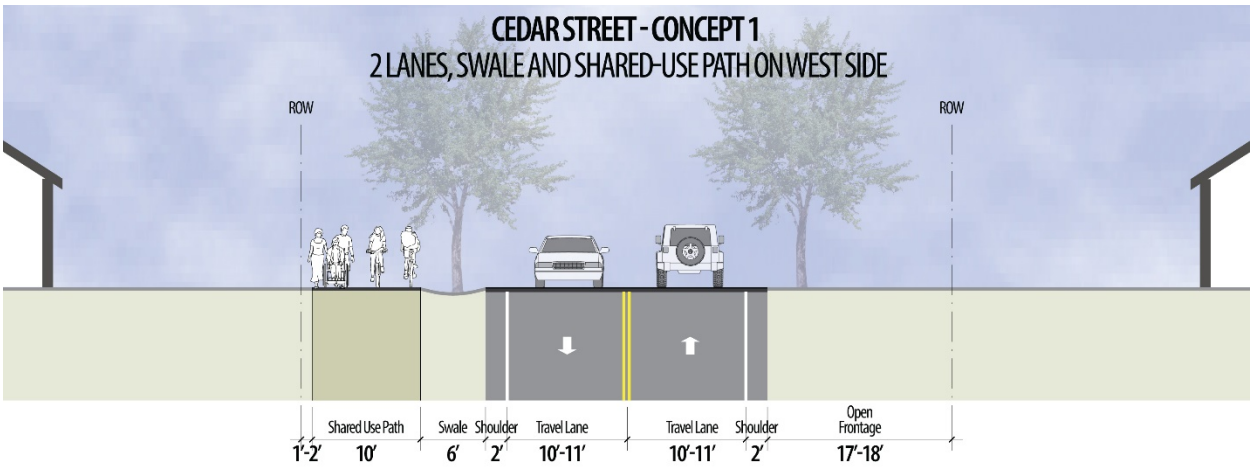
2.2.2 Cedar Street Concept 1 Description

Concept 1 maintains the two-lane cross section and proposes a paved shared-use path on the west side, separated from the roadway by a landscaped swale (see Figure 2-15).

CONCEPT 1 CONSIDERATIONS:

- Exact location of the existing street centerline within the ROW is unclear; exact roadway location needs to be confirmed to determine the remaining available width.
- Physical obstacles, such as mature trees in the open frontage, may complicate the addition of the path.

Figure 2-15. Proposed Concept 1 Condition



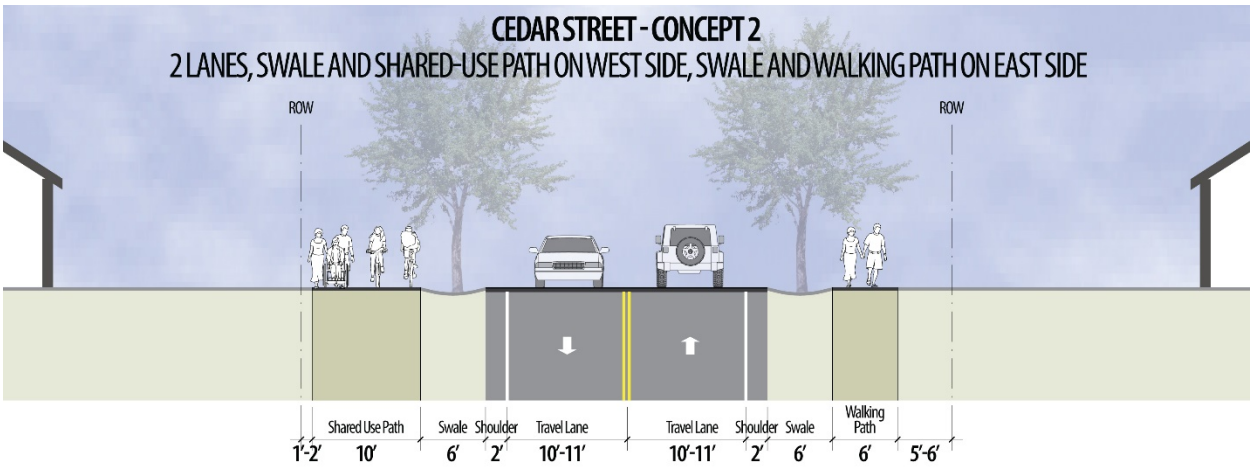
2.2.3 Cedar Street Concept 2 Description

Concept 2 maintains the two-lane cross section and proposes a paved walking path on the east side and includes the paved shared-use path on the west side proposed in Concept 1. Both paths are separated from the roadway by a landscaped swale (see Figure 2-16).

CONCEPT 2 CONSIDERATIONS:

- Exact location of the existing street centerline within the ROW is unclear; exact roadway location needs to be confirmed to determine the remaining available width.
- Physical obstacles, such as mature trees in the open frontage, may complicate the addition of the paths,

Figure 2-16. Proposed Concept 2 Condition



2.2.4 Cedar Street Concept Evaluation

Table 2-3 provides an initial evaluation of the concept based on the evaluation criteria established in TM #3.

Table 2-3. Cedar Street Concept Evaluation

Criteria		Concept 1	Concept 2	Comments
1	Feasibility of implementation	●	●	Subject to determination of centerline location and physical obstacles
2	ROW constraints	●	●	No or minimal impacts anticipated
3	Built environment constraints	◐	◐	Some impacts may occur where private improvements extend into the ROW
4	Environmental impacts and mitigation	●	●	Some loss of tree canopy anticipated; swales provide opportunity for additional trees/plantings
5	Conceptual cost estimate	●	●	
6	Safety and comfort for all modes of travel	◐	●	Concept 2 provides walking routes on both sides; Concept 1 requires crossing the street
7	Connectivity across corridor	◐	◐	Some intersection enhancements anticipated; locations TBD
8	Level of public and stakeholder support	TBD	TBD	Evaluation forthcoming based on upcoming TAC meeting and virtual community workshop
9	Community identity and aesthetics	●	●	Swales provide opportunity for street trees and public art
10	Business vitality/community livability	●	●	Improved livability by providing walking/biking amenities

Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

2.3 Design Concepts for Hughes Lane/Pocahontas Road

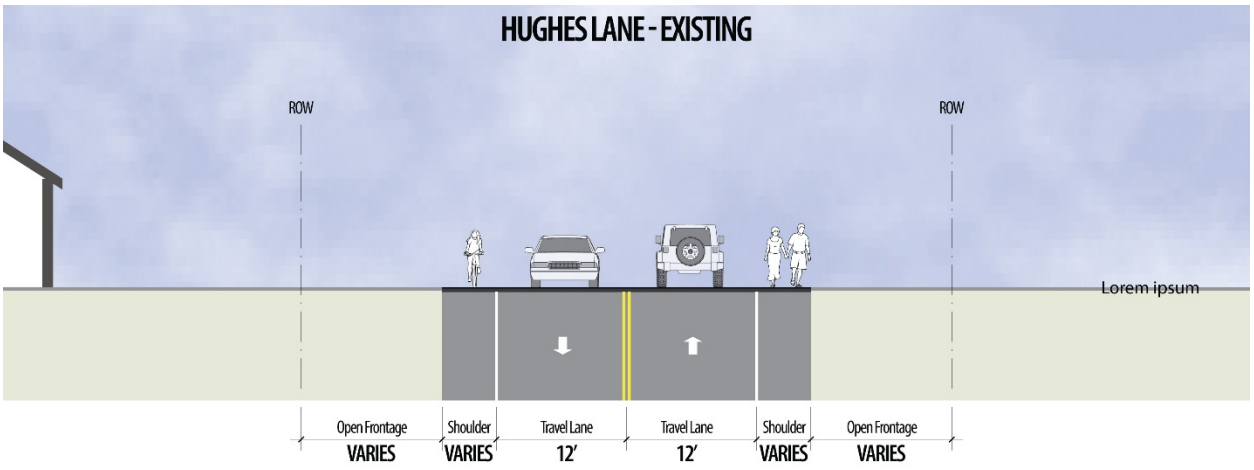
While part of the same study corridor, Hughes Lane and Pocahontas Road differ in terms on context and existing cross section. The following describes existing conditions and concepts for both roadways.

2.3.1 Hughes Lane

2.3.1.1 Existing Conditions

Currently, Hughes Lane provides one travel lane in each direction, along with paved shoulders of varying width (see Figure 2-17). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Figure 2-17. Existing Typical Condition



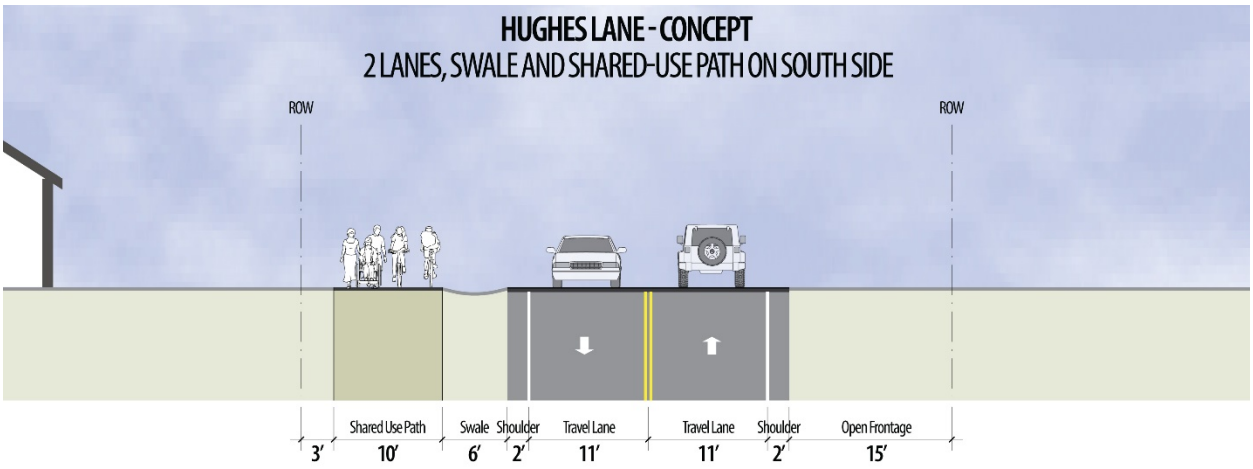
2.3.1.2 Concept Description

The proposed concept maintains the two-lane cross section and includes a paved shared-use path on the south side, separated from the roadway by a landscaped swale (see Figure 2-18).

CONCEPT CONSIDERATIONS:

- Exact location of the existing street centerline within the ROW is unclear; exact roadway location needs to be confirmed to determine the remaining available width.
- Physical obstacles, such as transmission poles in the open frontage, may complicate the addition of the path.
- The existing bridge crossing the Powder River lacks the width to accommodate the shared-use path. A new ped/bike bridge across the river has been discussed, and this concept should be designed to connect with the new proposed crossing.

Figure 2-18. Proposed Concept Condition



2.3.1.3 Hughes Lane Concept Evaluation

Table 2-4 provides an initial evaluation of the concept based on the evaluation criteria established in TM #3.

Table 2-4. Hughes Lane Concept Evaluation

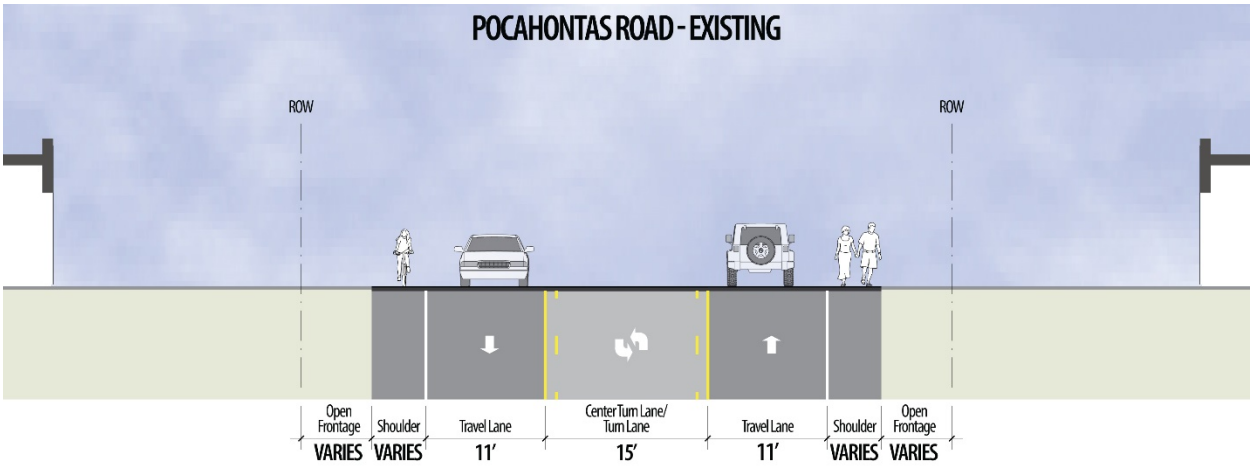
Criteria		Concept	Comments
1	Feasibility of implementation	●	Subject to determination of centerline location and transmission line pole locations
2	ROW constraints	●	No impacts anticipated
3	Built environment constraints	◐	Some impacts may occur where private improvements extend into the ROW
4	Environmental impacts and mitigation	●	Minimal impacts anticipated; the proposed swale would likely be an improvement over existing conditions
5	Conceptual cost estimate	●	Subject to determination of transmission line pole locations
6	Safety and comfort for all modes of travel	●	Provides off-street facility for non-motorized travelers
7	Connectivity across corridor	◐	Minimal change
8	Level of public and stakeholder support	TBD	Evaluation forthcoming based on upcoming TAC meeting and virtual community workshop
9	Community identity and aesthetics	●	Swales provide opportunity for street trees and public art
10	Business vitality/community livability	●	Improved livability by providing walking/biking amenities
Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply			

2.3.2 Pocahontas Road

2.3.2.1 Existing Conditions

Currently, Pocahontas Road provides one travel lane in each direction and a center turn lane, along with paved shoulders of varying width (see Figure 2-19). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section, there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Figure 2-19. Existing Typical Condition



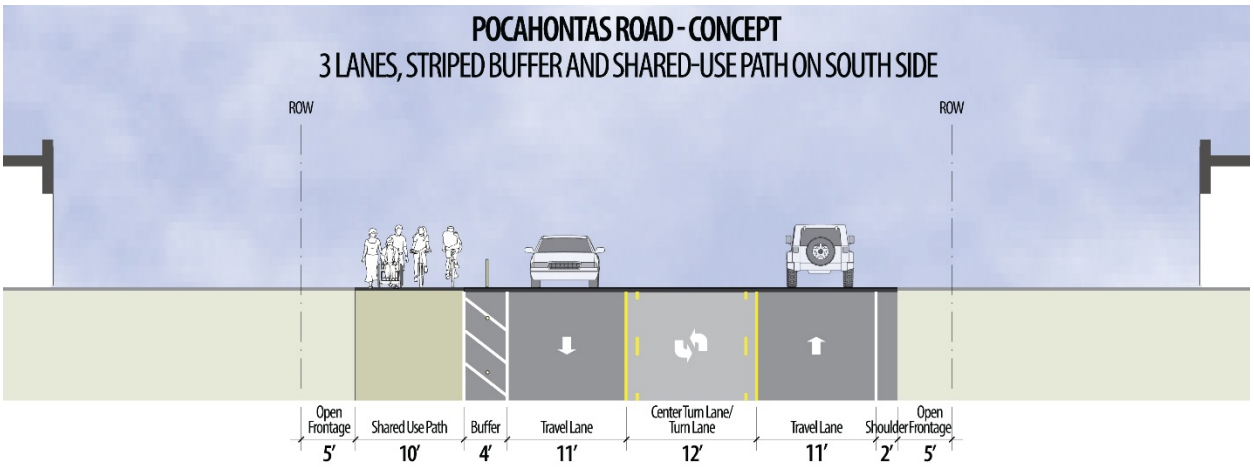
2.3.2.2 Concept Description

The proposed concept maintains the three-lane cross section, though slightly narrowed and shifted northward, and includes a paved shared-use path on the south side separated from the roadway by striped buffer enhanced with physical separators, such as delineator posts or concrete curbs (see Figure 2-20).

CONCEPT CONSIDERATIONS:

- Exact location of the existing street centerline within the ROW is unclear; exact roadway location needs to be confirmed to determine the remaining available width.
- Physical obstacles, such as transmission poles in the open frontage, may complicate the addition of the path.
- Enhancements to the striped buffer with physical elements should be considered to enhance comfort and safety of path users. These elements may be permanent or removable barriers or delineators. The desired visual or physical separation of path users from vehicular traffic should be balanced with space requirements of overly wide farming equipment traveling the corridor and path access for snowplows.

Figure 2-20. Proposed Concept Condition



2.3.2.3 Pocahontas Road Lane Concept Evaluation

Table 2-5 provides an initial evaluation of the concept based on the evaluation criteria established in TM #3.

Table 2-5. Pocahontas Road Concept Evaluation

Criteria		Concept	Comments
1	Feasibility of implementation	●	Subject to determination of centerline location and transmission line pole locations
2	ROW constraints	●	No impacts anticipated
3	Built environment constraints	◐	Some impacts may occur where private improvements extend into the ROW
4	Environmental impacts and mitigation	●	Minimal change
5	Conceptual cost estimate	◐	Subject to determination of transmission line pole locations; requires shifting roadway and restriping to fit the shared-use path between the roadway and transmission poles
6	Safety and comfort for all modes of travel	◐	Provides facility for non-motorized travelers; comfort and safety subject to additional protective barriers, balanced with space needs of farming equipment
7	Connectivity across corridor	◐	Minimal change
8	Level of public and stakeholder support	TBD	Evaluation forthcoming based on upcoming TAC meeting and virtual community workshop
9	Community identity and aesthetics	◐	
10	Business vitality/community livability	◐	Modest improvements by providing walking/biking amenities

Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

3 Draft Land Use Scenarios

Draft Land Use Scenarios memo by Angelo Planning Group is included as Appendix A to this memo. This information and any revisions will be folded into TM #5. The initial findings do not suggest any significant transportation implications. All design concepts presented in Section 2 are likely compatible with the various land use scenarios, allowing for a selection of the preferred concept designs for 10th Street largely independent from adjacent land use considerations.

4 Next Steps

The preliminary concept designs and land use scenarios included in this memo will be presented, reviewed, and discussed at the upcoming TAC meeting on March 30, 2021, and the virtual community workshop on March 31, 2021. At those events, we will solicit feedback about the concept designs to the inform the evaluation process and identify the preferred concepts to be further explored and presented in TM #5 with additional details and more refined graphic representation.

There will be more opportunities for feedback and revisions after the completion of TM #5.

Appendix A. Draft Land Use Scenarios

LAND USE SCENARIOS

This section provides two land use scenarios for potential development or redevelopment adjacent to 10th Street. The scenarios focus on a commercial land use scenario, with two development options, and a scenario featuring mixed residential and commercial uses. The purpose of the land use scenarios is to inform demand for transportation needs and provide an illustrative concept of what type of development can occur in the corridor.

The underlying assumption is that within a 20-year planning horizon there are opportunities within the corridor for development and redevelopment to happen on vacant and underutilized lots. The intent of the land use scenarios is to present a relatively intense level of development that seeks to maximize what is allowed by the City of Baker City Development Code (Development Code) within the context of a typical lot adjacent to 10th Street. The foundation for these scenarios is the current availability of land - for lots identified as vacant or redevelopable according to the land use assessment in *Technical Memorandum #2: Context and Site Analysis*-as well as the existence of non-conforming uses, such as single-family development, and the likelihood they will be replaced with higher intensity uses over time.

Scenarios presented here are hypothetical and account for the fact that the potential development or redevelopment adjacent to 10th Street will need to comply with the requirements of the underlying zoning, including parking and landscaping. The City's current Development Code regulates commercial or mixed-use development within the General Commercial (C-G) zone. External variables to a lot or parcel's development potential such as current market conditions are not factored into these land use scenarios.[1]

Development Code Requirements

To understand the parameters under which the land use scenarios were developed, this section includes a brief review what the City's current Development Code allows and requires.

Land use and development along 10th Street are subject to City regulations as provided in the Development Code. Because future development and redevelopment in the area will be subject to the Development Code provisions, knowledge of the zoning, permitted uses, and lot standards in the area provides predictive information about the type and intensity of uses that can be expected.

Use Standards

All lots adjacent to 10th Street are zoned C-G. The purpose of the C-G zone is to accommodate a range of uses in the community generally. The zone permits or allows conditionally a wide range of residential, commercial, industrial, and institutional types of development. Table 1 provides a summary of uses that are allowed or permitted conditionally in the C-G zone.

Table 1: General Commercial Use Summary

Use Type	Allowed	Permitted Conditionally
Residential	Dwellings that are constructed in conjunction with commercial uses.	Stand-alone duplexes or multi-family development.

[1] More information on Baker City's current and forecasted economic conditions can be found in the City's *Economic Opportunity Analysis*, completed in 2019.

Use Type	Allowed	Permitted Conditionally
Commercial	A wide range of commercial uses, including offices, retail sales and services, vacation rentals, commercial education facilities, and parking facilities. Some uses such as drive-through facilities, vehicle servicing, and vehicle repair are subject to additional use-specific standards.	Shopping centers with three or more establishments, commercial uses with 80,000 square feet or more of building space, major event entertainment, and commercial outdoor recreational uses.
Institutional	All institutional uses except detention facilities, new religious institutions, and new schools.	n/a
Industrial	Industrial uses that are fully enclosed.	Industrial uses that are not fully enclosed or wholesale sales that are fully enclosed and larger than 40,000 square feet.

As summarized in the table, commercial and mixed-use development types are allowed within the zone. Although institutional and industrial development are both allowed in the C-G zone, these types of uses are not considered for the purpose of the land use scenarios. There are existing major institutional developments nearby, including a St. Alphonsus Medical Center and the Powder River Correctional Facility. Industrial uses are assumed to locate in industrial zones due to an adequate supply of industrial land as identified in the City's Economic Opportunity Analysis, completed in 2019.

Similarly, development with only residential uses and multi-tenant commercial developments, which are conditional uses in the C-G zone, were not used for the land use scenarios. A conditional use development is required to meet additional standards and mitigate identified impacts. It also requires Planning Commission approval at a public hearing. As a result, there generally must be sufficient demand for a conditional uses in order to recover the associated costs.

Development Standards

Parking Requirements

The minimum parking requirement is one of the largest factors in determining the intensity and design of a use. Areas dedicated to surface parking typically require large amounts of space. It is not uncommon for more than half a site to be utilized for parking and maneuvering.

Table 2 provides a summary of parking requirements for multi-family and retail/service uses. As shown in the table, minimum parking requirements for multi-family development vary depending on the number of bedrooms associated with a residential development. The requirements range from one space per studio or one-bedroom dwelling, up to two spaces per three-bedroom dwelling. Minimum parking requirements for retail sales and service use types vary depending on the type of commercial use. The two most common types of commercial uses in the corridor include retail and restaurant development. Retail development requires two spaces per 1,000 square feet, while restaurant uses require eight spaces per 1,000 square feet.

Table 2: Parking Standards Summary

Use	Minimum Parking Standard
Multi-family	1 space per 1 studio or 1-bedroom unit 1.5 spaces per 2-bedroom unit 2 spaces per 3-bedroom unit
Retail	2 spaces per 1,000 square feet
Restaurants	8 spaces per 1,000 square feet

The land use scenarios assume each required parking space utilizes approximately 250 square feet of space. This assumption is based on the parking stall requirements for a 90-degree parking space plus a portion of required drive aisle.

Landscape Requirements

Minimum landscape requirements also contribute to how much of a lot or parcel can be dedicated to a use. For the C-G zone, a minimum of seven percent of a lot area is required to be landscaped. As a result, the amount of space required for landscaping is deducted from the area of each land use scenario.

Parking standards in the Development Code require a minimum of five percent of a parking area to be landscaped. Landscaping that is required for the parking areas is not in addition to the overall minimum landscape requirement.

Lot Requirements

The City's Development Code encourages buildings to be located close to the street and provide a system of walkways that connect the building with the parking area, the street, and other buildings or amenities on the site. Walkways in the C-G zone are required to be six-feet wide.

The C-G zone has a zero-foot setback requirement that allows for buildings to be constructed close to the street. However, the Development Code also requires new development to include a pedestrian amenity such as a plaza, sitting space, canopies, public art with seating, or bus shelters. The Development Code provides general criteria for the types and configurations of a pedestrian amenity, but it does not specify a minimum area required to be dedicated to the amenity.

The land use scenarios assume approximately 50 square feet of area per required parking space would be necessary to satisfy walkway and pedestrian amenity requirements. This would account for walkways that connect parking to the structure and also leave some space for a pedestrian amenity such as a small plaza or wider sidewalks.

Existing Conditions

The land use scenarios presented in this section are based on common lot characteristics for existing areas along the corridor. Areas that were identified as vacant or redevelopable according to the land use assessment in *Technical Memorandum #2: Context and Site Analysis* were reviewed to inform how a new commercial or mixed-use development could be developed. Similarly, lots that were identified as having current single-family development, a nonconforming use in the C-G zone, were also considered as potential sites for future, higher-intensity development .

The land use assessment in *Technical Memorandum #2: Context and Site Analysis* identified a limited number of lots or parcels that are currently vacant or considered to have redevelopment potential.[2] Lot sizes for vacant and redevelopable lots range from approximately 2.13 acres to 0.16 acres.[3] The average size of vacant or developable lots adjacent to 10th Street is just under one acre (0.77 acres). Vacant lots in the corridor are smaller than redevelopable lots on average; vacant lot size average 0.64 acres and redevelopable lot size average 1.51 acres.

The land use assessment in *Technical Memorandum #2: Context and Site Analysis* also identified a limited number of lots or parcels that are currently developed with single-family residential uses. (Single-family residential uses are a non-conforming use in the C-G and are allowed to continue, rebuild within the same footprint, or may expand up to 20% through a conditional use review if certain eligibility and approval criteria are met.[4] Lot sizes for these areas range from approximately 1.21 acres to 0.07 acres. The average size of individual lots is 0.32 acres. However smaller lots are more likely to be contiguous with one or more additional lots on the corridor, allowing for the possibility of lot consolidation as part of new development.

Land Use Scenarios

Assumptions

Based on the above code interpretation, the land use scenarios include the following assumptions:

- All land use scenarios assume a lot size of approximately 0.75 acres. This generally reflects the size of vacant properties in the corridor. It also reflects that redevelopable properties, which are generally larger, could still redevelop and retain a portion of the site for current uses.
- All land use scenarios are assumed to provide the minimum required amount of landscaping.
- Parking areas are assumed to require 250 square feet of area per required parking space. This accounts for the parking stall and drive aisle.
- Other site amenities such as on-site circulation and pedestrian amenities are assumed to require 50 square feet of area per parking stall. This accounts for larger parking areas requiring more extensive site circulation and more intensive uses requiring larger pedestrian amenities.
- Seven percent of the lot area is dedicated to meeting the minimum landscape requirement. This is inclusive of the parking landscape requirements.

Commercial Use Scenario 1a

The commercial land use scenario 1a assumes a relatively intense commercial use for a 0.75-acre site. Examples of this type of use include a medium size retail chain such Dollar Tree or Ace Hardware stores. As such, the scenario uses a retail development type, which has the lower parking requirements from the Development Code.

[2] A lot or parcel is assumed to be redevelopable if the market value for the land is valued at two time or more of the value of the current structures on it. See *Technical Memorandum #2: Context and Site Analysis* for more information on vacant and redevelopable along the 10th Street corridor.

[3] The lot at the corner of 10th Street and E Street was identified as vacant in *Technical Memorandum #2: Context and Site Analysis* but is not factored as part of lot characteristics due to interested from the local school district with using the property to support school functions.

[4] Single-family development that was constructed prior to 2/13/04 can expand by up to 20% through a conditional use review process.

With 0.75 acres available, the site would be able to support approximately 19,000 square feet of retail commercial space. The use would be required to provide a minimum of 38 parking spaces, encompassing approximately 9,500 square feet of space. Walkways and pedestrian amenities would comprise of approximately 1,900 square feet. Approximately 2,250 square feet of the overall site would be landscaped in conformance with the Development Code requirements.

Table 3: Commercial Land Use Scenario 1 Summary

Characteristic	Size
Lot	0.75 acres
Structure	19,000 square feet (58%)
Parking Spaces	38 stalls
Parking Area	9,500 square feet (29%)
Landscaping	2,287 square feet (7%)
Walkways/Amenities	1,900 square feet (6%)

Figure 1: Commercial Land Use Scenario 1a Example

Commercial Use Scenario 1b

The commercial land use scenario 1b assumes a restaurant use for the site. Examples of this type of use include a brewery or sit-down restaurant.

With 0.75 acres available, the site would be able to support approximately 8,900 square feet of restaurant commercial space. The use would be required to provide a minimum of 71 parking spaces,

encompassing approximately 17,800 square feet of space. Walkways and pedestrian amenities would comprise of approximately 3,560 square feet. Approximately 2,250 square feet of the overall site would be landscaped in conformance with the Development Code requirements.

Table 4: Commercial Land Use Scenario 1b Summary

Characteristic	Size
Lot	0.75 acres
Structure	8,900 square feet (27%)
Parking Spaces	71 stalls
Parking Area	17,800 square feet (54%)
Landscaping	2,287 square feet (7%)
Walkways/Amenities	3,560 square feet (11%)

Figure 2: Commercial Land Use Scenario 1b Example

Mixed-use Scenario

The mixed-use scenario assumes an even mix between commercial and residential uses. The Development Code does not specify the location of multi-family housing as part of development; only that it is permitted in conjunction with a commercial use. This would provide flexibility with site design. For this land use scenario, commercial uses are located at the ground floor with residential spaces above. Discussions with City staff have noted there is a relatively low supply of multi-family housing

currently. Though Baker City's population is projected to increase moderately, there is a possibility of a shift in demand for multi-family housing types over the next 20 years.

With 0.75 acres available, the site would be able to support a total of approximately 20,500 square feet of uses. Both the commercial and residential uses would comprise of approximately 10,250 square feet of space apiece. The residential use is assumed to comprise of a total of 11 dwelling units with one two-bedroom apartment and the remainder a mix of studio and 1-bedroom apartments. Table 5 provides a summary of the composition of apartment types associated with the mixed-use scenario. The uses would be required to provide a minimum of 32 parking spaces, encompassing approximately 8,000 square feet of space. Walkways and pedestrian amenities would comprise of approximately 1,600 square feet. Approximately 2,200 square feet of the overall site would be landscaped.

Table 5: Residential Dwelling Composition Summary

Type	Size (sq. ft.)	Units	Total (sq. ft.)
Studio & one-bedroom	750	9	7,300
Two-bedroom	1,250	1	1,250
Other			575
TOTAL			9,125

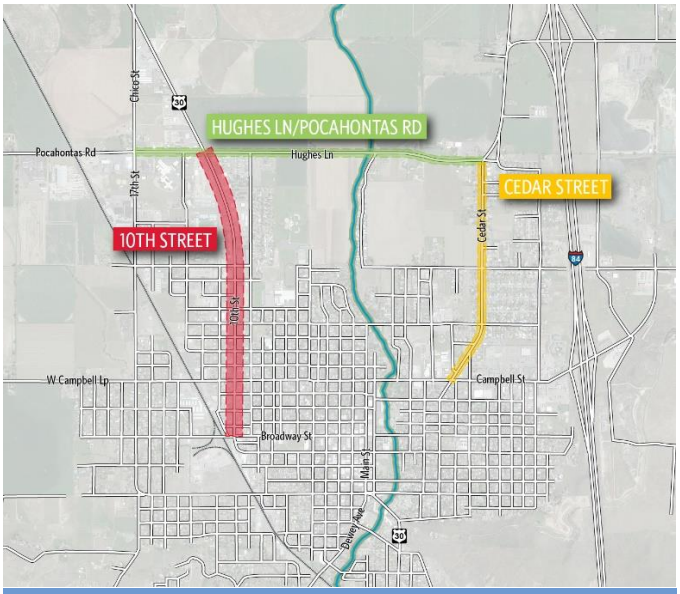
Table 6: Mixed-Use Land Use Scenario Summary

Characteristic	Size
Lot	0.75 acres
Retail Structure	10,250 square feet
Residential Structure	10,250 square feet
Lot Coverage	10,250 square feet (32%)
Parking Spaces	32 stalls
Parking Area	8,000 square feet (24%)
Landscaping	2,287 square feet (7%)
Walkways/Amenities	1,600 square feet (5%)

Figure 3: Mixed-Use Scenario Example

Appendix VI. Technical Memorandum #5: Revised Design Concept

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Technical Memo #5: Revised Design Concept

Northern Baker Transportation Improvement Plan

Baker City, Oregon
October 25, 2021

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Acronyms and Abbreviations

HAWK	high-intensity activated crosswalk
NEO Transit	Northeast Public Transit
NBTIP	North Baker Transportation Improvement Plan
ODOT	Oregon Department of Transportation
ROW	Right-of-Way
RRFB	Rectangular Rapid Flashing Beacon
SUP	Shared-use Path
TAC	Technical Advisory Committee
TM	Technical Memo
TSP	Transportation System Plan

1 Introduction

The Northern Baker Transportation Improvement Plan (NBTIP) is being undertaken by Baker City and Baker County in partnership with the Oregon Department of Transportation (ODOT) to develop and present a vision to revitalize a section of US30 (10th Street) within the city limits. The project also focuses on Cedar Street and Hughes Lane/Pocahontas Road. The study corridors are shown in Figure 1-1.

The project considered and evaluated a range of concepts for all three corridors with the purpose to better accommodate multimodal travel demand and provide equitable access to destinations along these corridors for people of all ages and abilities, including the typically underserved and most vulnerable. This technical memo presents the preferred concepts for each corridor informed by technical analysis and stakeholder and community feedback.

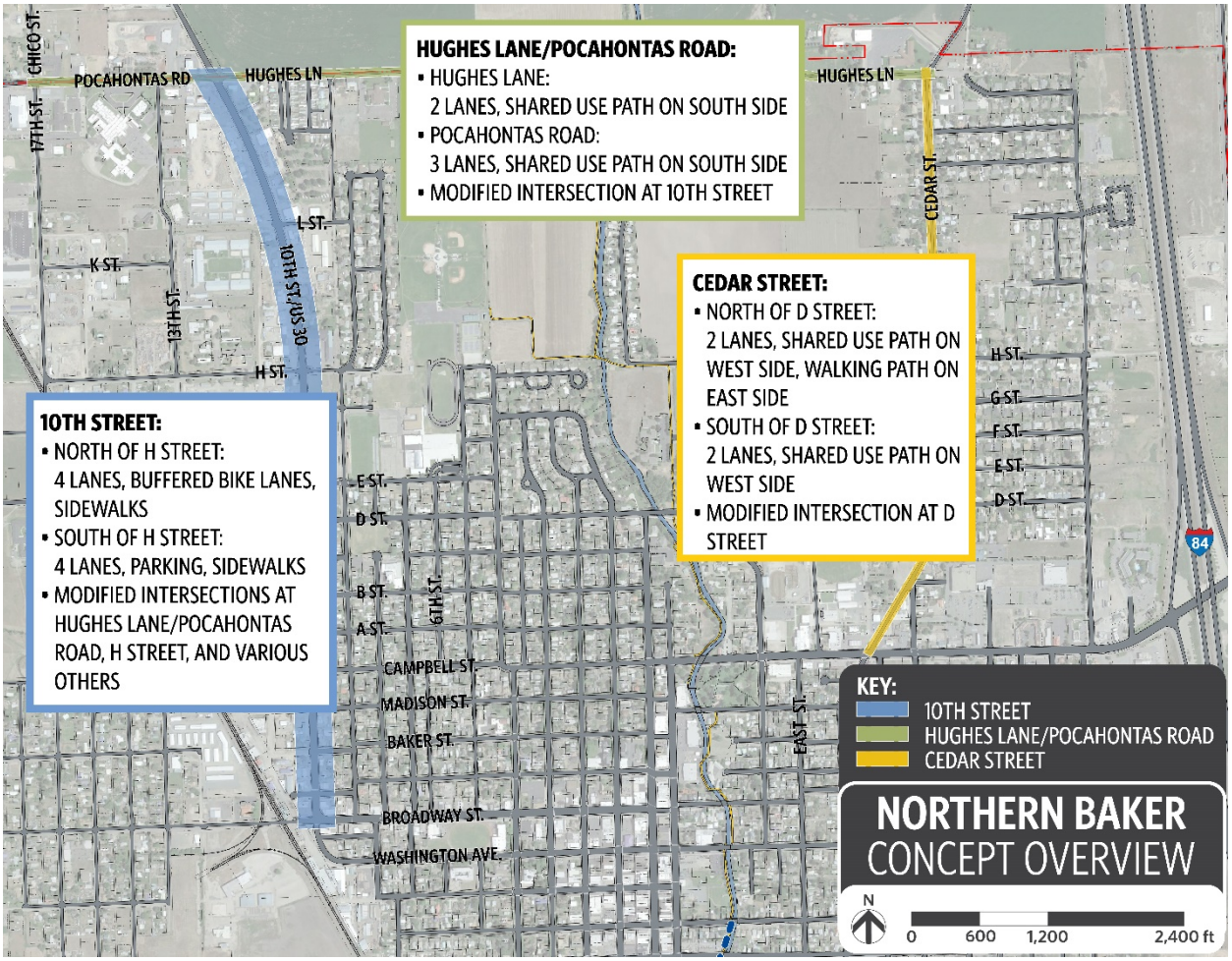
Figure 1-1. Project Area

2 Preferred Design Concepts

This section describes and depicts the preferred design concepts for all three corridors, including typical cross sections of the existing conditions for reference and evaluations of the concepts based on the evaluation criteria established in Technical Memo 3. The preferred design concepts propose improvements intended to ensure equitable access to transportation options for all ages and abilities while maintaining corridor functions Baker City residents rely on. These concepts include improvements to key intersections, enhanced street crossings, facilities for people walking and bicycling along the project corridors, and suggested connections to and enhancements of the larger network of streets and pathways to allow for safe and comfortable travel by all modes.

Figure 2-1 provides an overview of the preferred design concept proposed for each corridor.

Figure 2-1. Concept Overview



2.1 Preferred Design Concept for 10th Street

Technical Memo 4 presented two distinct concepts for 10th Street; the network concept and the complete street concept. While both concepts appeared technically feasible, stakeholder and community opinion strongly favored the network concept in order to maintain the existing four lane roadway on 10th Street. The preferred design concept presented here represents a modified version of the network concept.

2.1.1 Existing Conditions

Currently, 10th Street provides two travel lanes in each direction, with curbside parking provided approximately between Broadway Street and H Street. While the right-of-way (ROW) is consistent at approximately 80 feet, the curb-to-curb distance changes at H Street. The curb-to-curb distance is approximately 60 feet north of H Street Figure 2-2 and approximately 66 feet south of H Street (Figure 2-3).

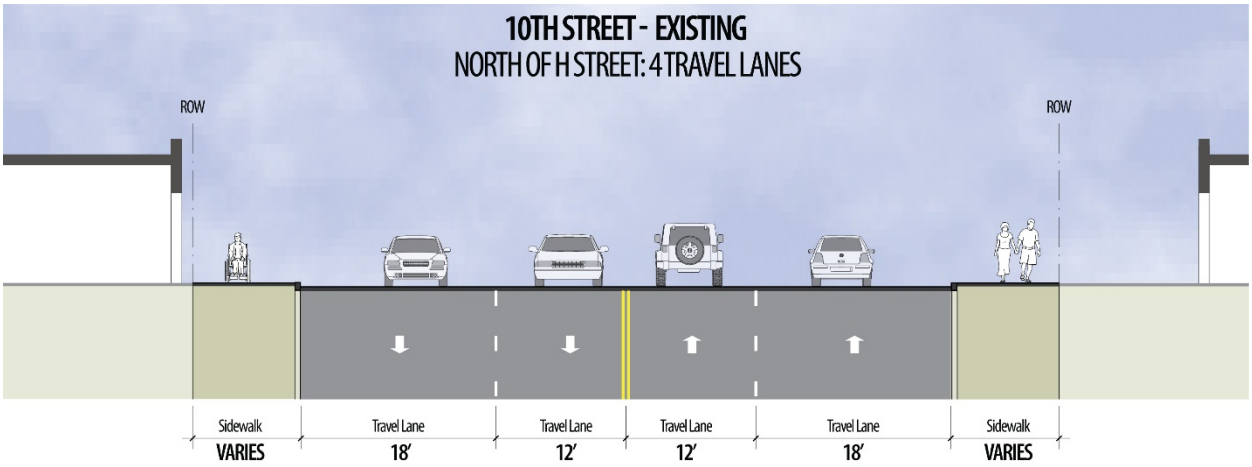


Figure 2-2. Existing Typical Condition North of H Street

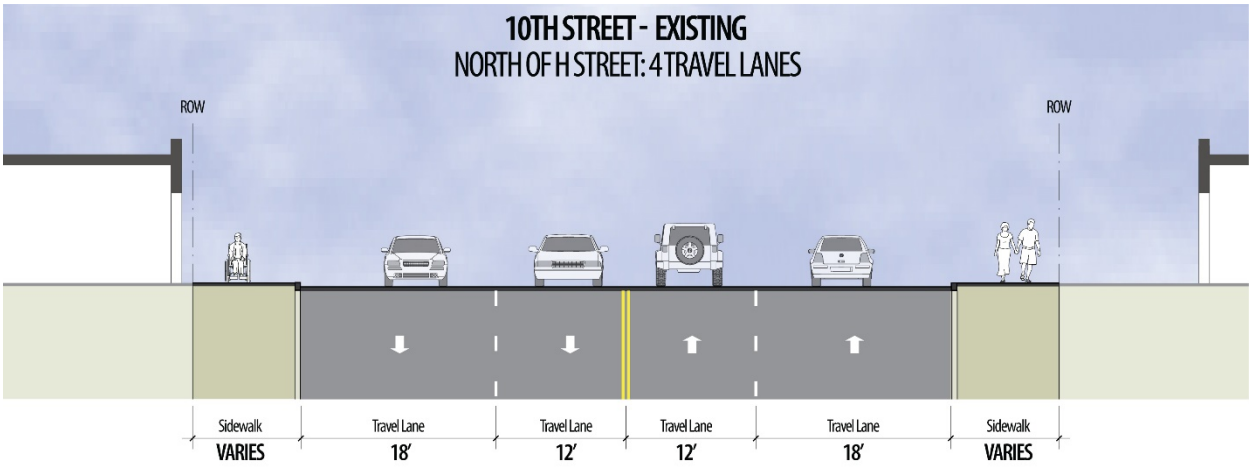
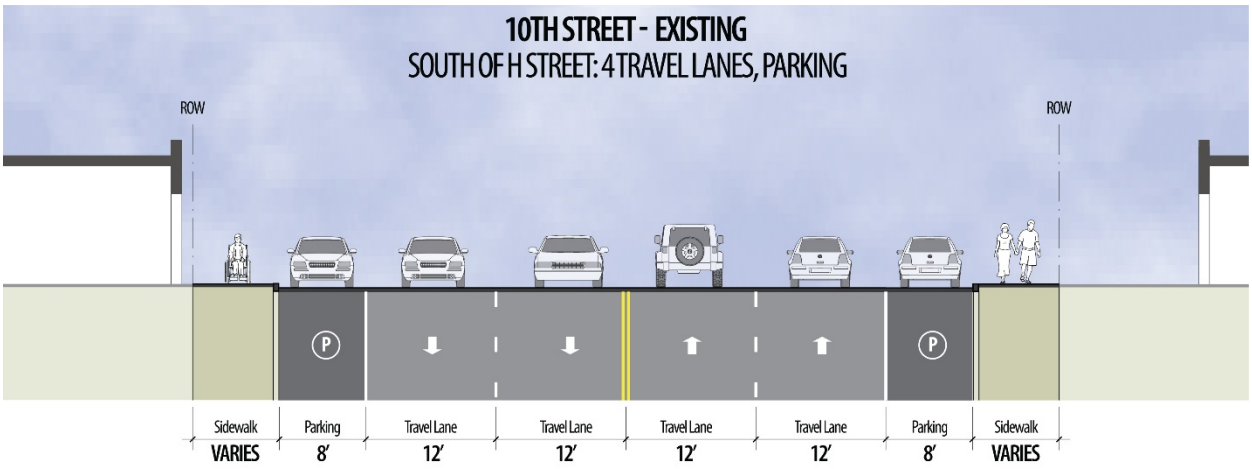


Figure 2-3. Existing Typical Condition South of H Street



2.1.2 Preferred Concept Description

The preferred 10th Street concept proposes different approaches for the segments north and south of H Street due to the different curb-to-curb width and the level of interconnectedness of the surrounding street grid. The concept maintains the existing four travel lanes for the entirety of the corridor. Bicycles are accommodated on 10th Street north of H Street while south of H Street, the concept proposes that 9th Street serve as low-stress bicycle route in the form of a bicycle boulevard; a low volume and low speed neighborhood street with signage and pavement markings that indicate to motorists and cyclists alike that the street is to be shared by all modes.

The concept also proposes connecting to the larger existing and planned non-motorized network, such as the bike lanes on D Street as designated in the Transportation System Plan (TSP); see Figure 2-4. This could be achieved by designating Campbell Street as a bicycle boulevard (similar to Baker City's neighborhood route designation) between 17th Street and Main Street to create links to the planned shared-use path along 17th Street to the west and Leo Adler Memorial Parkway to the east. Similarly, designating H Street as a bicycle boulevard from 17th Street to 8th Drive would create a connection to the planned 17th Street shared-use path and could create a link to Leo Adler Memorial Parkway with a suggested trail connection around the north end of Baker City High School. It should be noted that the proposed improvements to the local street and path network would not be funded and implemented as part of this project.

Figure 2-5 and Figure 2-6 present the proposed improvements for the northern and southern segment of the corridor respectively.

The concept proposes to include buffered bicycle lanes on 10th Street between Pocahontas Road/Hughes Lane and H Street (see Figure 2-7). Buffered bicycle lanes can be accommodated within the existing roadway width by slightly narrowing the inside travel lanes. South of H Street, the preferred concept keeps the existing cross section of 10th Street largely unchanged (see Figure 2-8).

To provide adequate access to destinations on 10th Street, frequent and enhanced crossings would improve the street network's east/west connectivity and minimize out of direction travel for non-motorized travelers. To provide enhanced crossings, the

preferred concept proposes modifications to several intersections along 10th Street, as identified in Figure 2-6.

Figure 2-4. 10th Street Concept – Network Connectivity

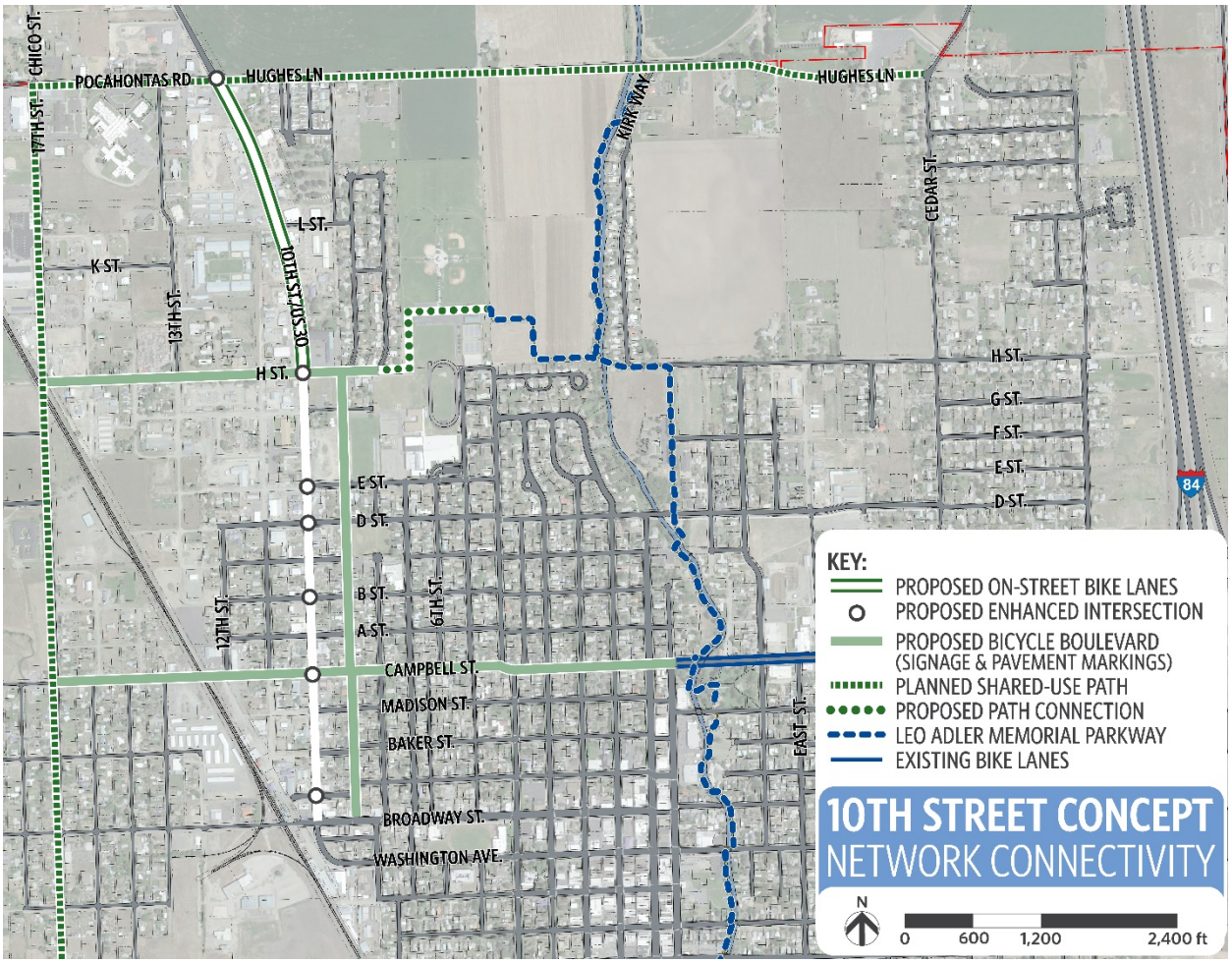


Figure 2-5. 10th Street Concept – North Segment

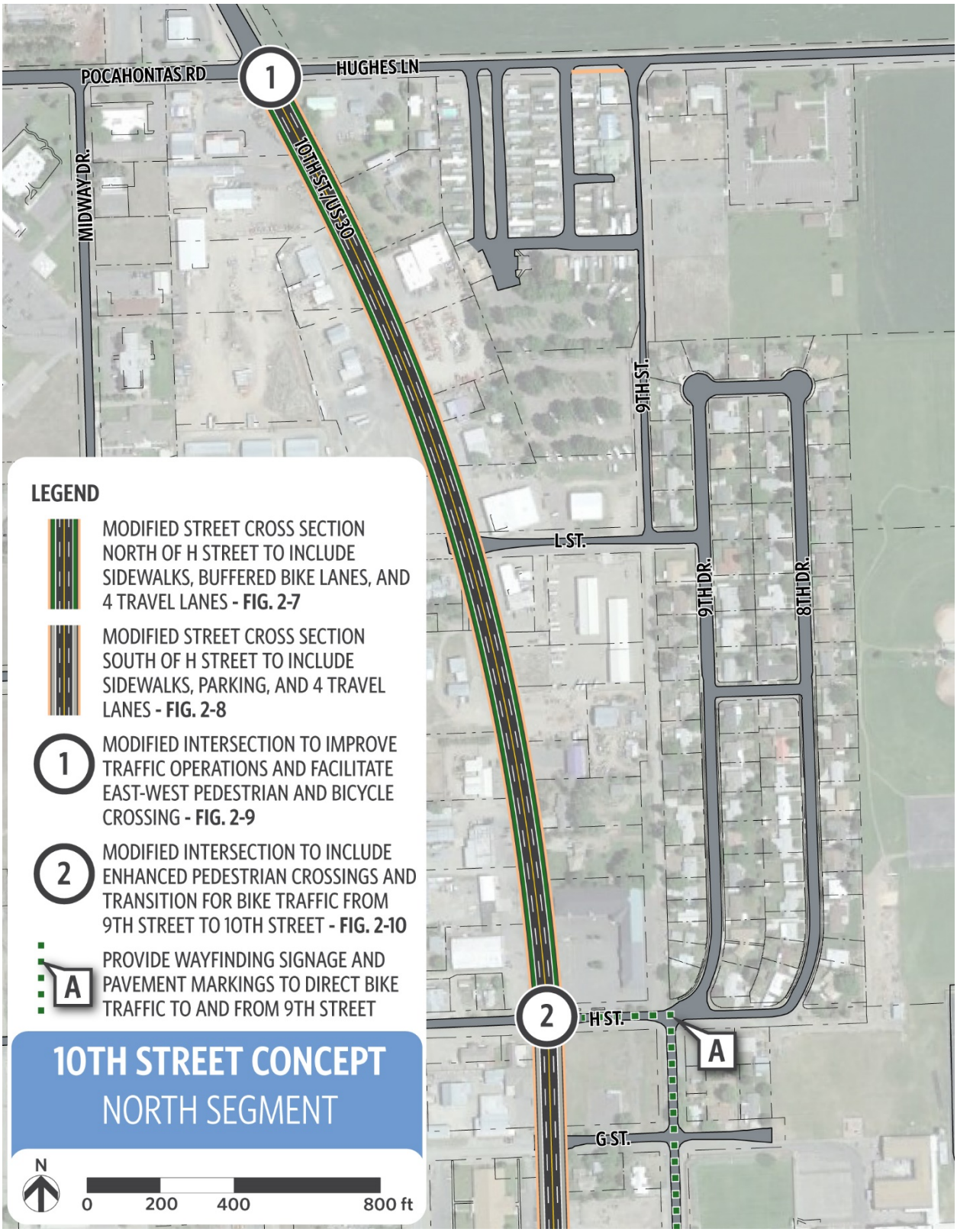


Figure 2-6. 10th Street Concept – South Segment

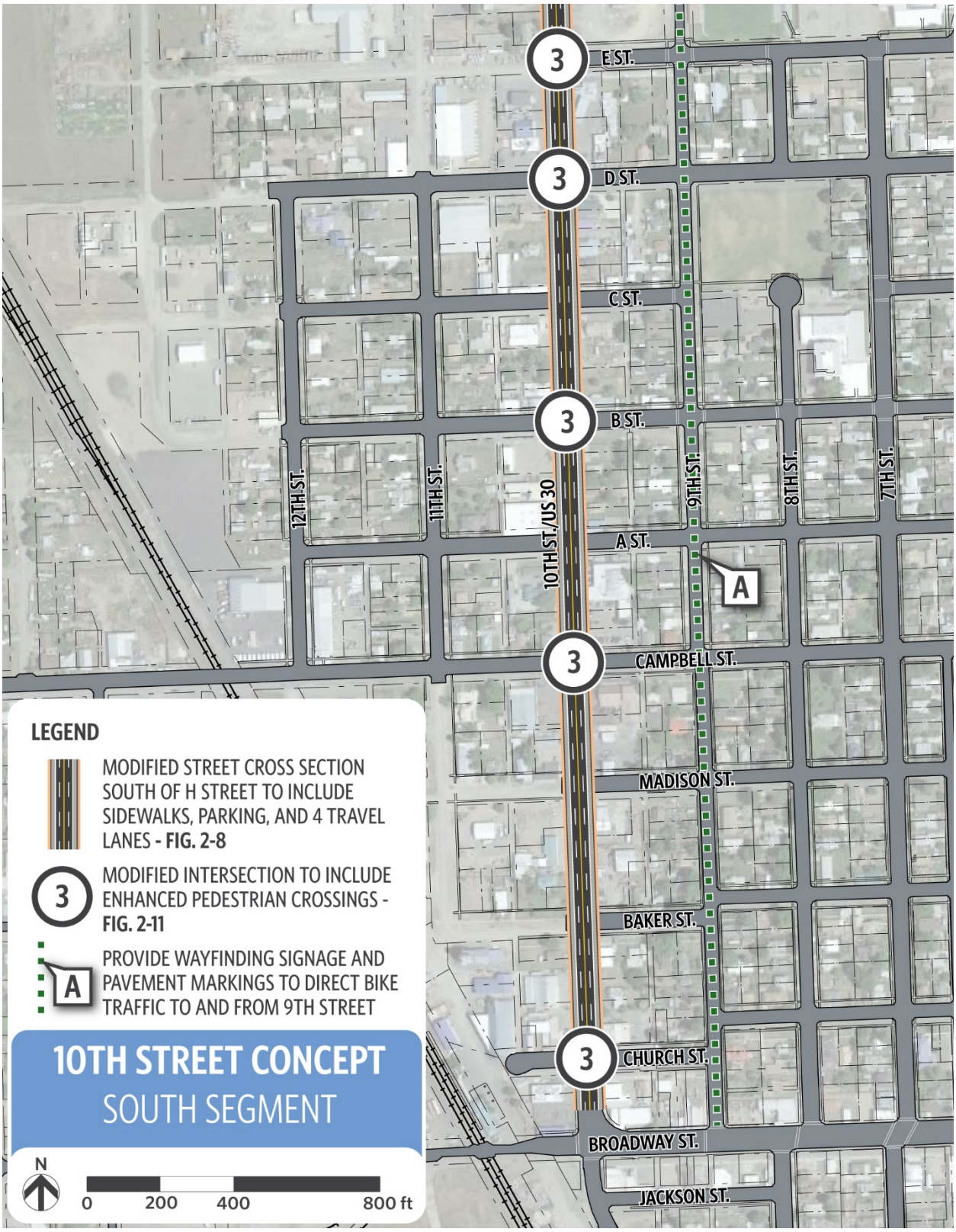


Figure 2-7. Proposed Typical Condition North of H Street

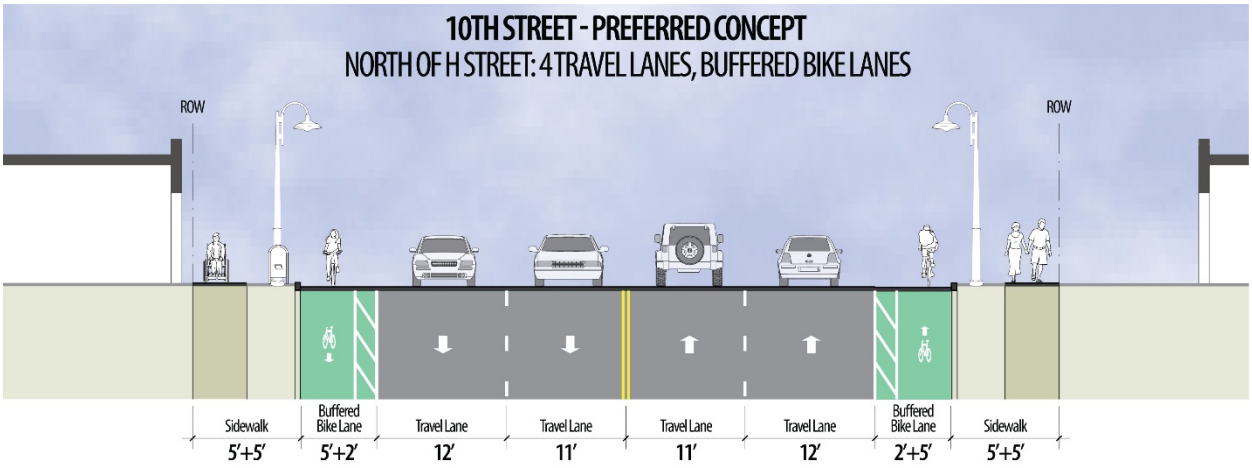
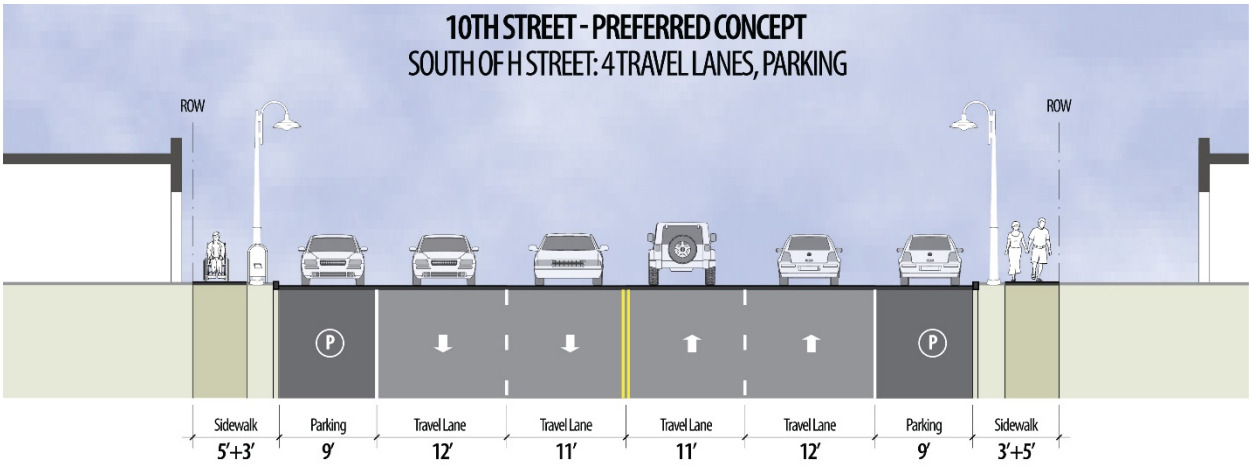


Figure 2-8. Proposed Typical Condition South of H Street



2.1.3 Proposed Intersection Modifications

Figure 2-9 shows the proposed intersection modifications at Pocahontas Road/Hughes Lane. The proposed design includes alignment shifts of all four approaches in order achieve an intersection with near-ninety-degree angles and improved sightlines. The proposed geometry would have modest ROW impacts, particularly in the northeast quadrant, but it would also provide ample opportunity for a northern gateway, welcoming travelers arriving from the north to Baker City. The proposed design would accommodate additional, dedicated turn lanes on two of the four approaches to improve traffic operations and safety. The proposed geometry would create an incentive for motorists to lower their travel speed, particularly southbound motorists approaching from the north. Moderating travel speeds will be critical in order to provide for adequate crossing of 10th Street for people traveling on foot or bike on the proposed shared-use path along Pocahontas Road and Hughes Lane. The proposed buffered bike lanes along the southern 10th Street approach would tie directly into the shared-use path, allowing for seamless travel by bike. The proposed design includes continental style marked crosswalks on three of the four approaches. To further enhance the east-west crossing of 10th Street, adding either a rectangular rapid flashing beacon (RRFB) or high-intensity activated crosswalk (HAWK) signal should be considered as a means to alert motorists to the presence of a pedestrian or bicyclist which makes it more comfortable for people travelling along the shared-used path. Further study and evaluation of the traffic control device used to enhance shared-use path crossing should occur during the design phase for the intersection.

Figure 2-10 shows the proposed intersection modifications at H Street. The proposed design includes pedestrian refuge islands and continental style crosswalks to facilitate the crossing of 10th Street for pedestrians and bicyclists as they transition from the bike lanes north of H Street to using 9th Street as a designated route south of H Street. To minimize crossing distances, the design includes curb extensions at the southern leg. Wayfinding signage would direct bicyclists approaching the intersection from the north to use the crossing at H Street and continue southbound on 9th Street. Wayfinding signage also may direct cyclists approaching from the east on H Street. The proposed design would have minimal ROW impacts in the northwest and northeast quadrants.

Figure 2-9. 10th Street Concept – Intersection Modification at Hughes/Pocahontas

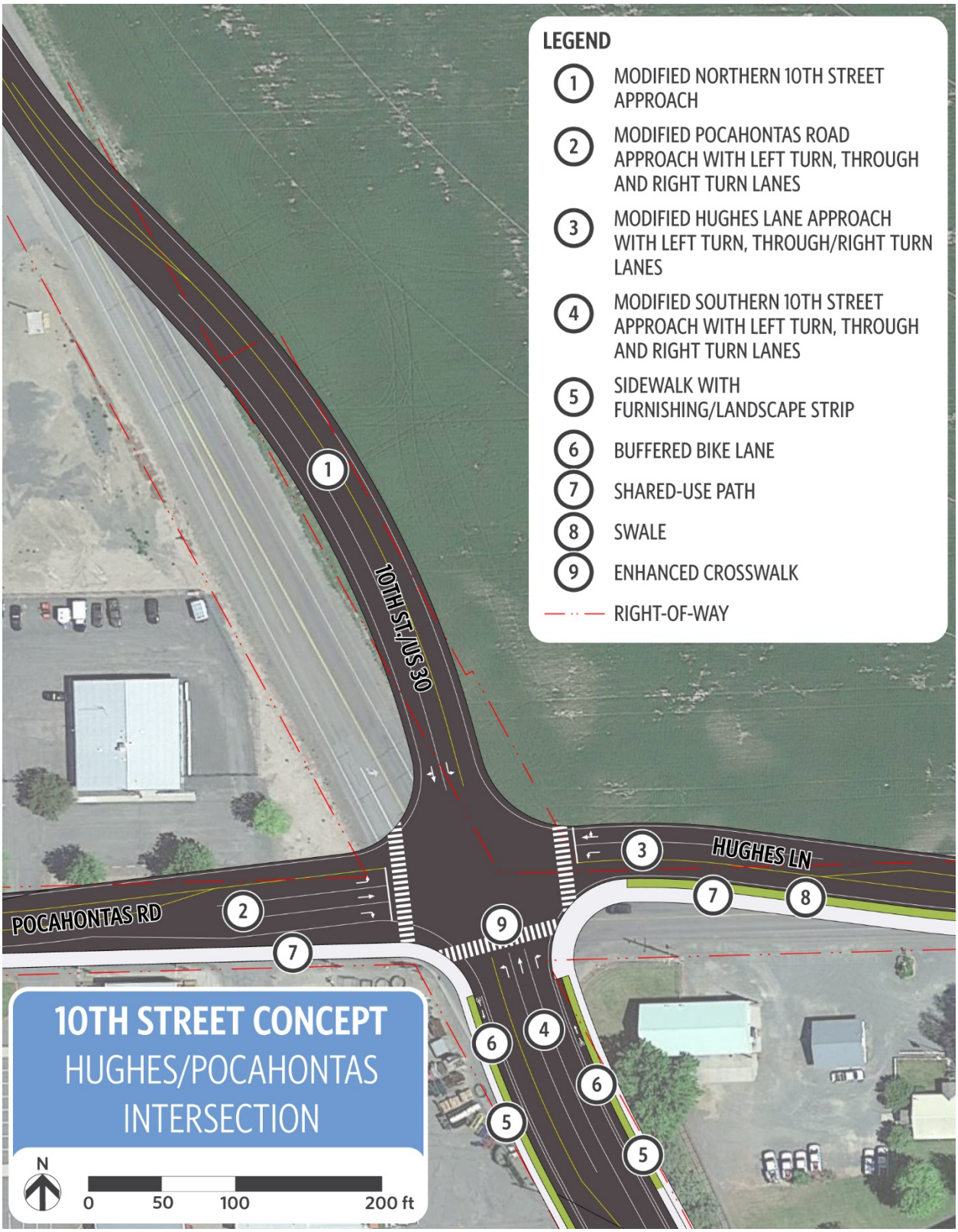


Figure 2-10. 10th Street Concept – Intersection Modification at H Street

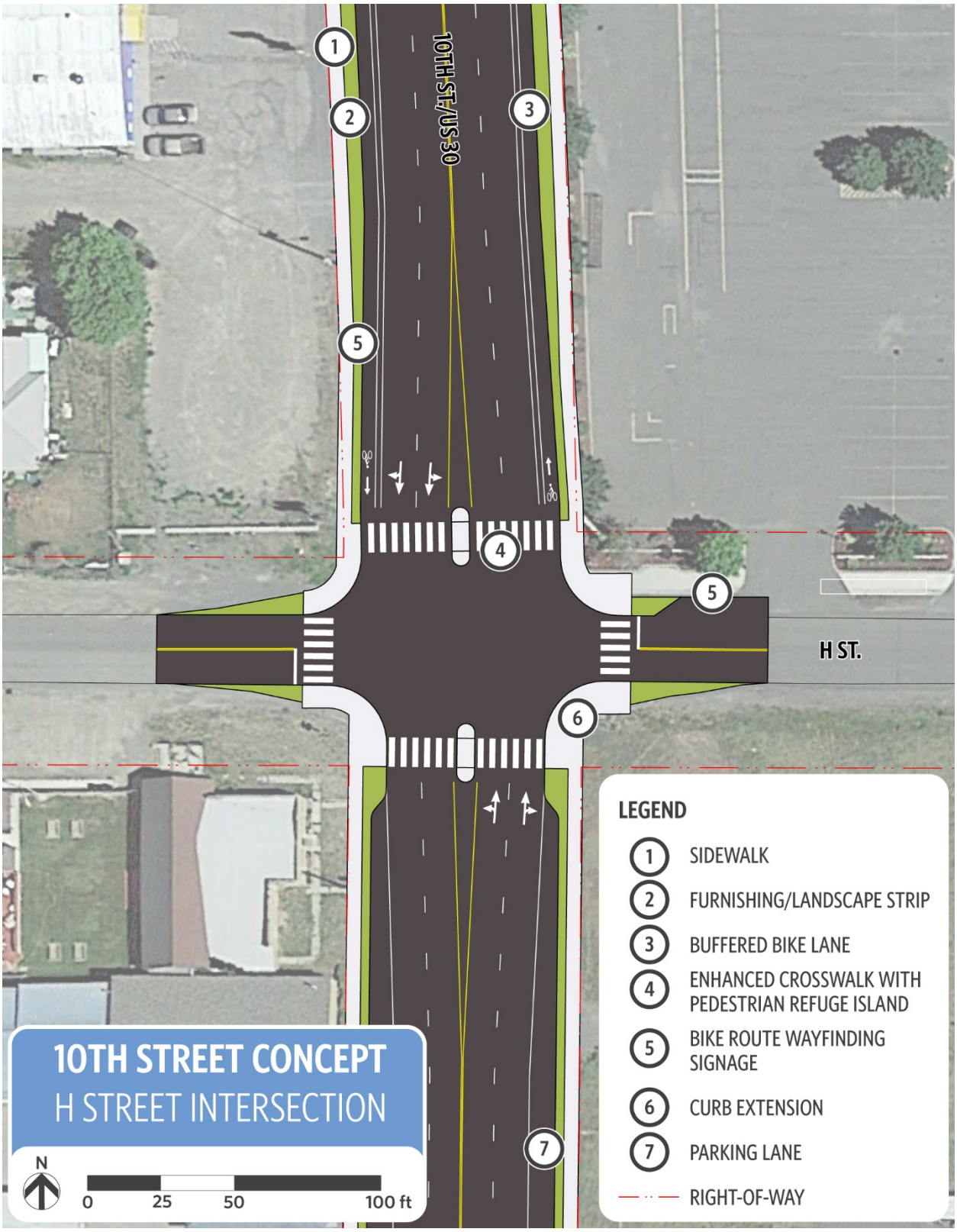
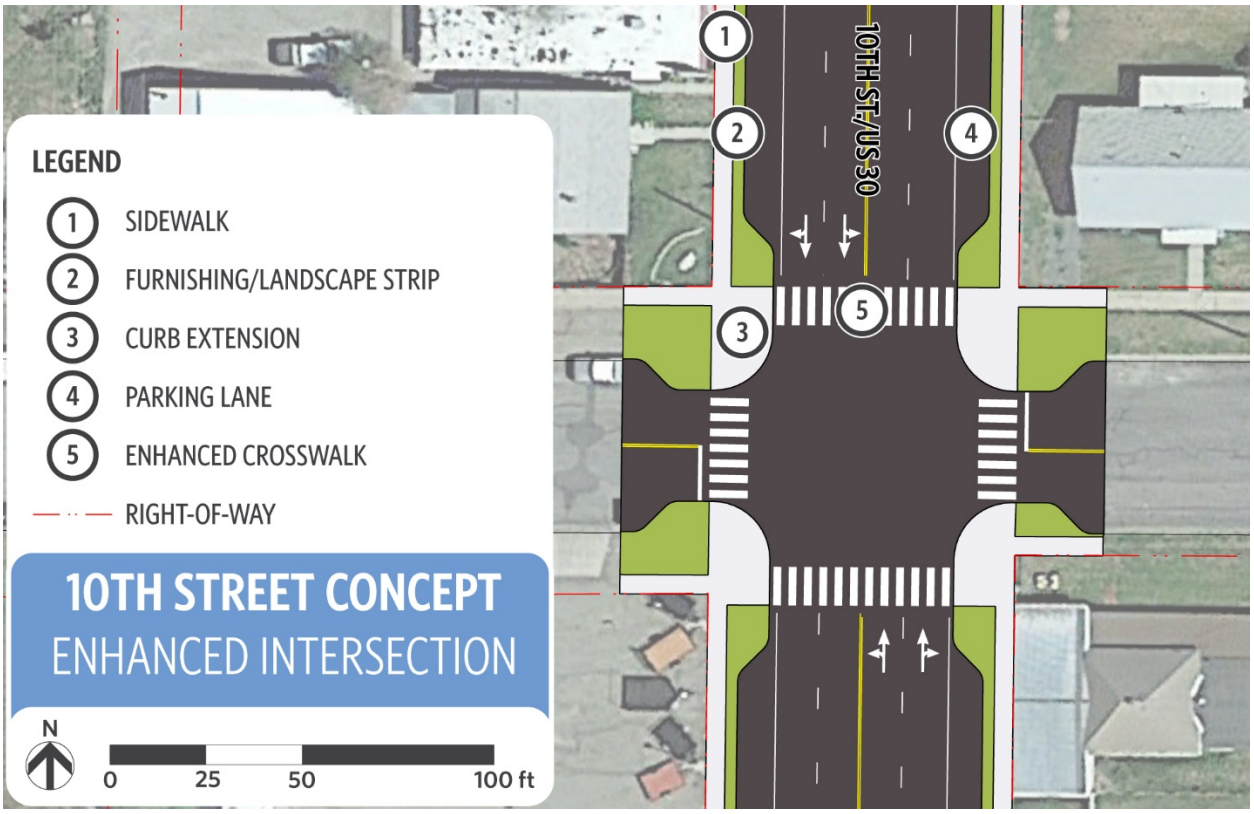


Figure 2-11 shows the proposed intersection modifications for typical enhanced intersections. These improvements are primarily intended to facilitate east-west crossings of 10th Street, and are proposed to be implemented at E Street, D Street, B Street, Campbell Street, and Church Street. The proposed design includes curb extensions on all four corners to minimize crossing distances, continental style marked crosswalks, and signage alerting motorists. Campbell Street improvements will include upgrading the signals with both a pedestrian countdown timer with a leading pedestrian interval. The countdown timer upgrade will require replacing the existing pedestrian signal head. The leading pedestrian interval will take additional investigation during the project's design phase to confirm the model of signal controller to properly gauge upgrade scope and costs. The proposed improvements would not require any additional ROW.

Figure 2-11. 10th Street Concept – Typical Enhanced Intersection Modification



2.1.4 Concept Evaluation

Table 2-1 provides an evaluation of the concept based on the evaluation criteria established in Technical Memo 3.

Table 2-1. 10th Street Concept Evaluation

Criteria		Preferred Concept	Comments
1	Feasibility of implementation	●	Minimal impacts on 10th Street – restriping and intersection improvements; does rely on signing and pavement markings on 9th Street
2	ROW constraints	●	No ROW impacts anticipated to accommodate proposed cross sections; minimal ROW impacts possible near the H Street intersection; modest impacts expected to accommodate the Hughes Lane/Pocahontas Road intersection modifications
3	Built environment constraints	●	No impacts anticipated
4	Environmental impacts and mitigation	●	No impacts anticipated
5	Conceptual cost estimate	◐	Major cost factors include intersection enhancements and signing and pavement markings on 9th Street
6	Safety and comfort for all modes of travel	◐	Improved/completed sidewalks along the entire corridor provides pedestrian access; lack of direct bike access to destinations on 10th Street south of H Street requires out of direction travel
7	Connectivity across corridor	●	Improved quality and frequency of crossings
8	Level of public and stakeholder support	◐	General community and stakeholder sentiment supports maintaining the existing 4 travel lanes, improvements of sidewalks and crossings, and improvements to the Hughes Lane/Pocahontas Road intersection; varying opinions exist with regard to accommodating bicycles on 10th Street
9	Community identity and aesthetics	◐	Largely maintains status quo with some opportunities at enhanced intersections
10	Business vitality/community livability	◐	No measurable change to existing conditions

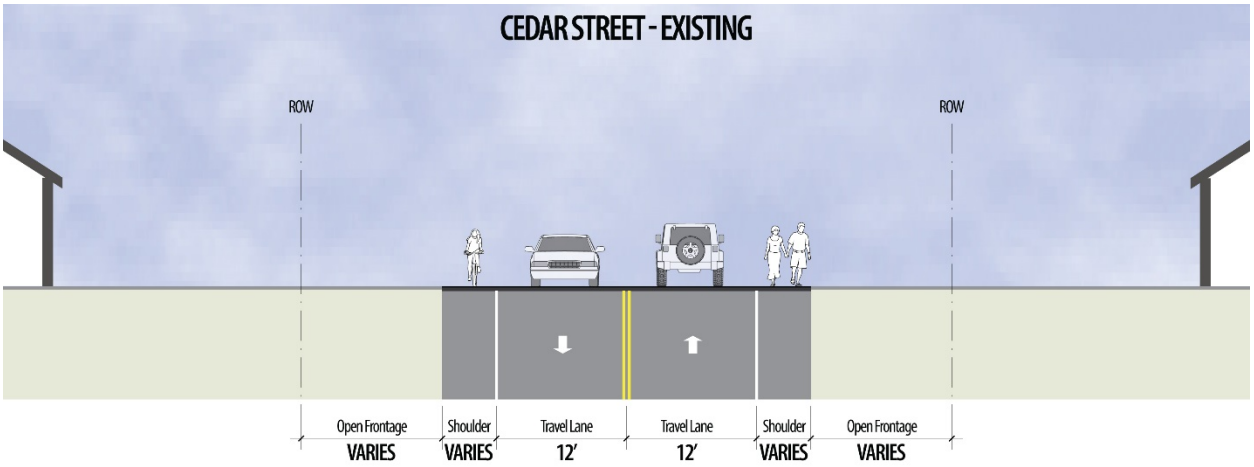
Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

2.2 Preferred Design Concept for Cedar Street

2.2.1 Existing Conditions

Cedar Street currently provides one travel lane in each direction, along with paved shoulders of varying width (see Figure 2-12). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section, there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Figure 2-12. Existing Typical Condition on Cedar Street



2.2.2 Preferred Concept Description

The preferred concept maintains the two-lane cross section. North of D Street, the preferred concept proposes a paved walking path on the east side and a paved shared-use path on the west side. Both paths are separated from the roadway by a landscaped swale. South of D Street, the concept proposes the shared-use path (SUP) on the west side and to provide enhanced pedestrian access to NEO Transit and the Community Connection Senior Center, a walking path on the east side south to the driveway of those institutions. The walking path ends at the NEO Transit and Community Connection Senior Center. Where the SUP meets with cross streets, a marked crossing should be provided.

Figure 2-13 and Figure 2-14 present the proposed improvements for the northern and southern segment of the corridor respectively. The proposed typical street cross sections are shown in Figure 2-15 and Figure 2-16.

It should be noted that the exact location of the existing street centerline within the ROW was not available for this study. During the project design, the exact roadway location needs to be confirmed to determine the remaining available width. Physical obstacles, such as mature trees in the open frontage, may require modifications of the typical cross sections to accommodate the addition of the paths.

Figure 2-13. Cedar Street Concept – North Segment

Figure 2-14. Cedar Street Concept – South Segment

Figure 2-15. Preferred Concept - Condition North of D Street

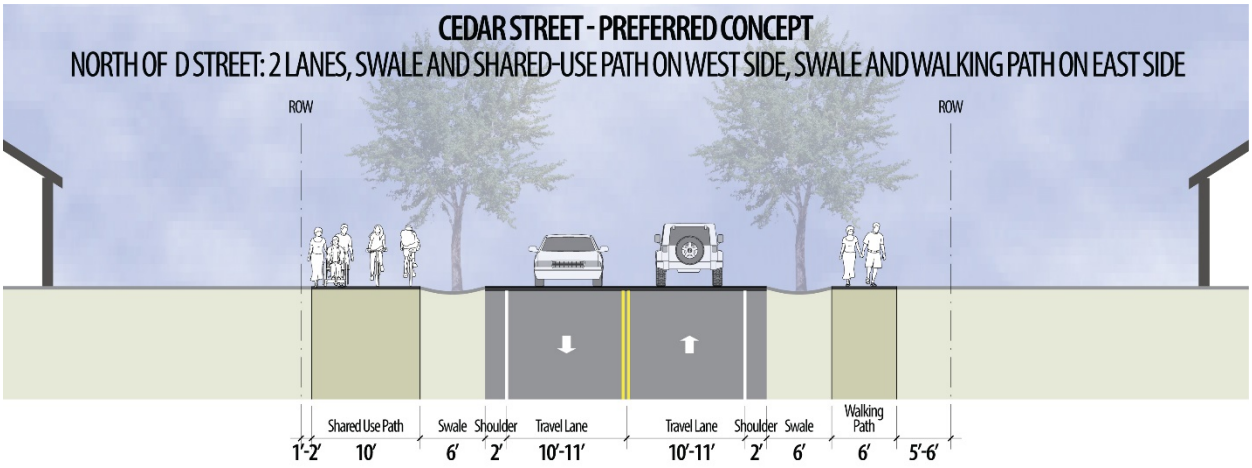
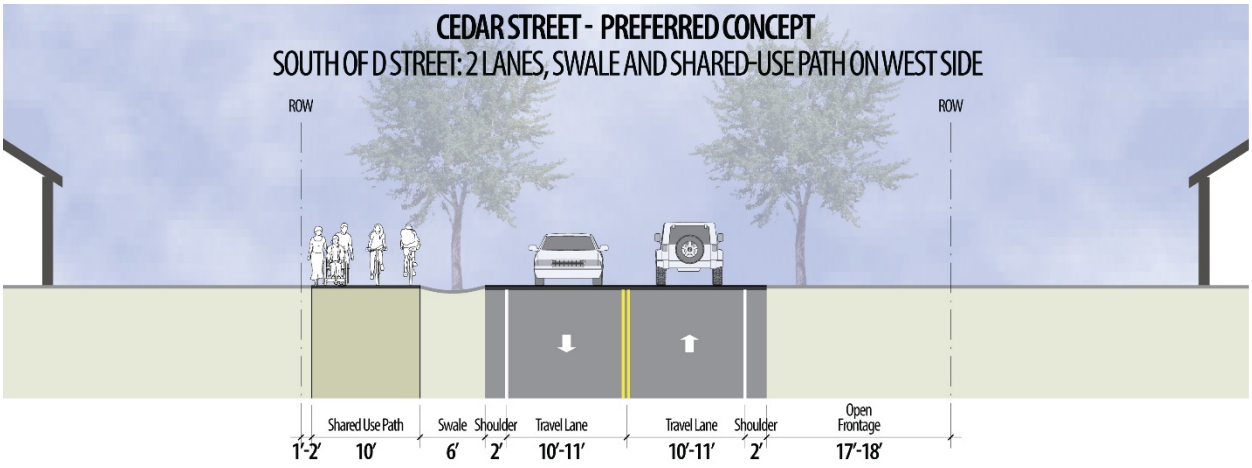


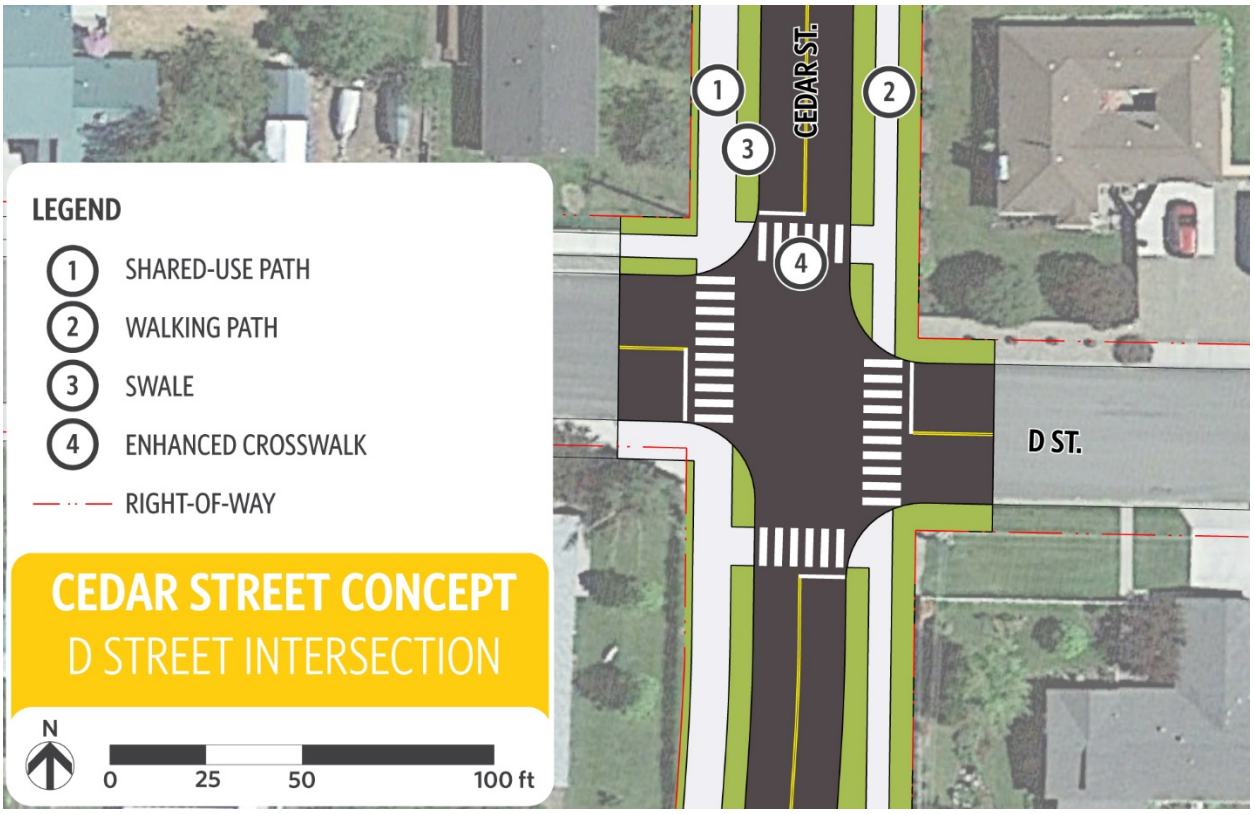
Figure 2-16. Preferred Concept - Condition South of D Street



2.2.3 Proposed Intersection Modifications

Figure 2-17 shows the proposed modifications at D Street. The proposed intersection design includes continental crosswalks to facilitate the crossing of D Street for travelers using the proposed SUP along the west side or the proposed walkway on the east side of Cedar Street. The design also includes continental crosswalks to facilitate the crossing of Cedar Street for travelers using the existing shared-use path along the south side or the existing sidewalk on the north side of D Street.

Figure 2-17. Cedar Street Concept – Intersection of Cedar Street and D Street



2.2.4 Concept Evaluation

Table 2-2 provides an evaluation of the preferred concept based on the evaluation criteria established in Technical Memo 3.

Table 2-2. Cedar Street Concept Evaluation

Criteria		Preferred Concept	Comments
1	Feasibility of implementation	●	Subject to determination of centerline location and physical obstacles
2	ROW constraints	●	No or minimal impacts anticipated
3	Built environment constraints	◐	Some impacts may occur where private improvements extend into the ROW
4	Environmental impacts and mitigation	●	Some loss of tree canopy anticipated; swales provide opportunity for additional trees/plantings
5	Conceptual cost estimate	●	Major cost factors include intersection enhancements at D Street
6	Safety and comfort for all modes of travel	●/◐	Walking routes on both sides north of D Street; South of D Street eastside access requires crossing Cedar Street
7	Connectivity across corridor	◐	Intersection enhancements at D Street are proposed to facilitate east-west crossings
8	Level of public and stakeholder support	●	General community and stakeholder sentiment supports adding the shared-use path on the west side, while some also support the east side walkway.
9	Community identity and aesthetics	●	Swales provide opportunity for street trees and public art
10	Business vitality/community livability	●	Improved livability by providing walking/biking amenities

Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply

2.3 Preferred Design Concepts for Hughes Lane/Pocahontas Road

While part of the same study corridor, Hughes Lane and Pocahontas Road differ in terms of context and existing cross section. The following describes existing conditions and concepts for both roadways.

2.3.1 Existing Conditions

Currently, Pocahontas Road provides one travel lane in each direction and a center turn lane, along with paved shoulders of varying width (see Figure 2-18). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section, there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Hughes Lane provides one travel lane in each direction, along with paved shoulders of varying width (see Figure 2-19). People on foot or bike currently utilize the shoulder to walk or ride. Outside of the paved section, there is open frontage along both sides. The ROW is consistent at approximately 60 feet.

Figure 2-18. Existing Typical Condition on Pocahontas Road

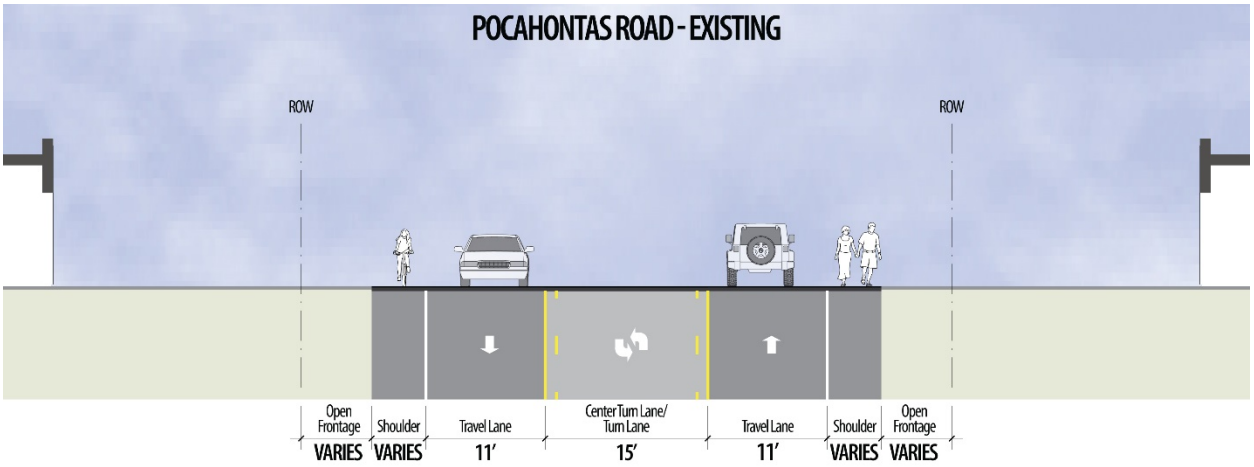
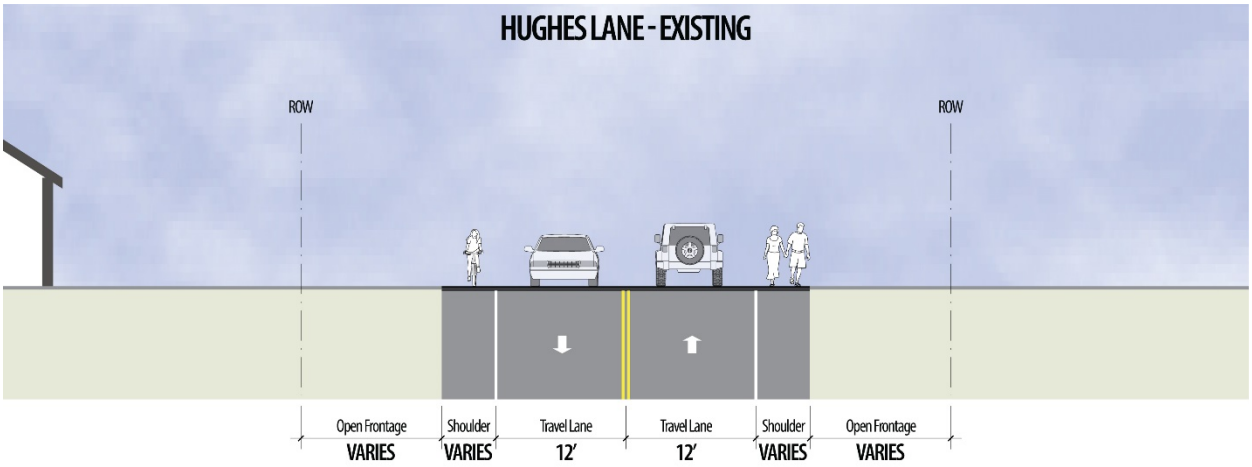


Figure 2-19. Existing Typical Condition on Hughes Lane



2.3.2 Preferred Concept Description

The proposed Pocahontas Road concept maintains the three-lane cross section, though slightly narrowed and shifted northward, and includes a paved SUP on the south side separated from the roadway by a striped buffer. The addition of physical separators to the striped buffer should be considered to enhance comfort and safety of path users. These separators may be permanent or removable barriers or delineators, such as delineator posts or concrete curbs. The desired visual or physical separation of path users from vehicular traffic should be balanced with space requirements of overly wide farming equipment traveling the corridor and path access for snowplows. Where the SUP meets with cross streets, a marked crossing should be provided.

The proposed Hughes Lane concept maintains the two-lane cross section and includes a paved SUP on the south side, separated from the roadway by a landscaped swale. Where the SUP meets with cross streets, primarily at Kirkway Street, a marked crossing should be provided.

Figure 2-20, Figure 2-21, and Figure 2-22 present the proposed improvements for the western, central and eastern segment of the corridor respectively. The proposed typical street cross section for Pocahontas Road is shown in Figure 2-23, while the proposed typical street cross section for Hughes Lane is shown in Figure 2-24.

It should be noted that the exact location of the existing street centerline within the ROW was not available for this study. During the project design the exact roadway location needs to be confirmed to determine the remaining available width. Physical obstacles, such as transmission poles in the open frontage, may require modifications of the typical cross sections to accommodate the addition of the SUP.

Figure 2-20. Pocahontas Road/Hughes Lane Concept – West Segment

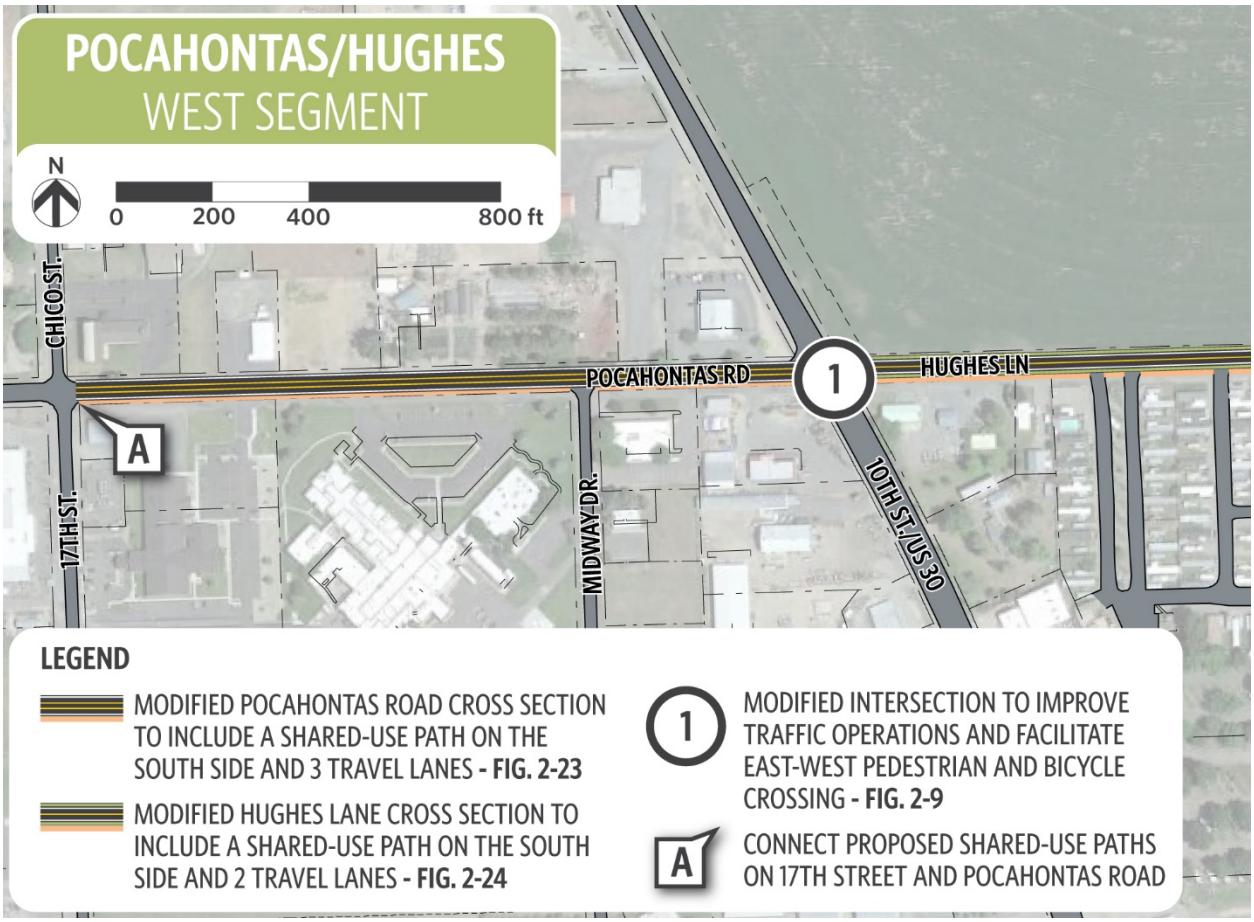


Figure 2-21. Pocahontas Road/Hughes Lane Concept – Center Segment

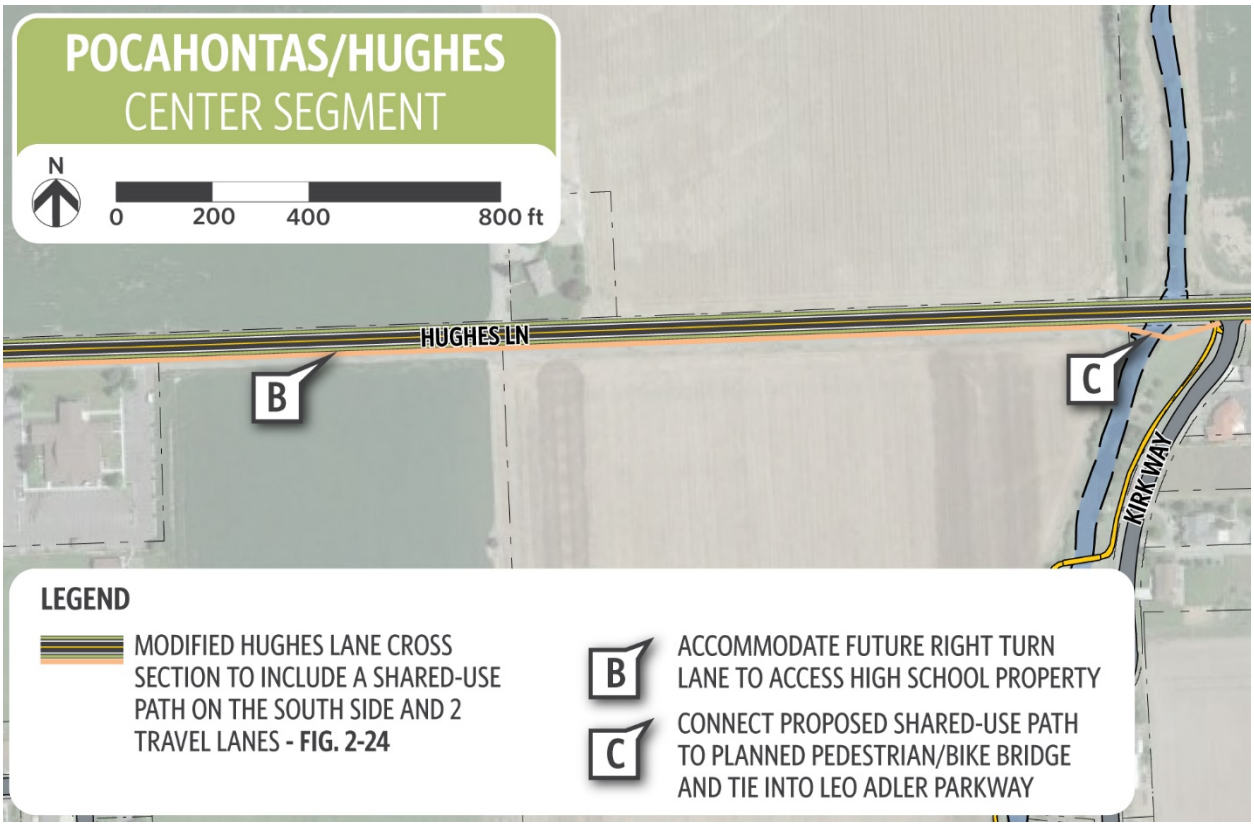


Figure 2-22. Pocahontas Road/Hughes Lane Concept – East Segment

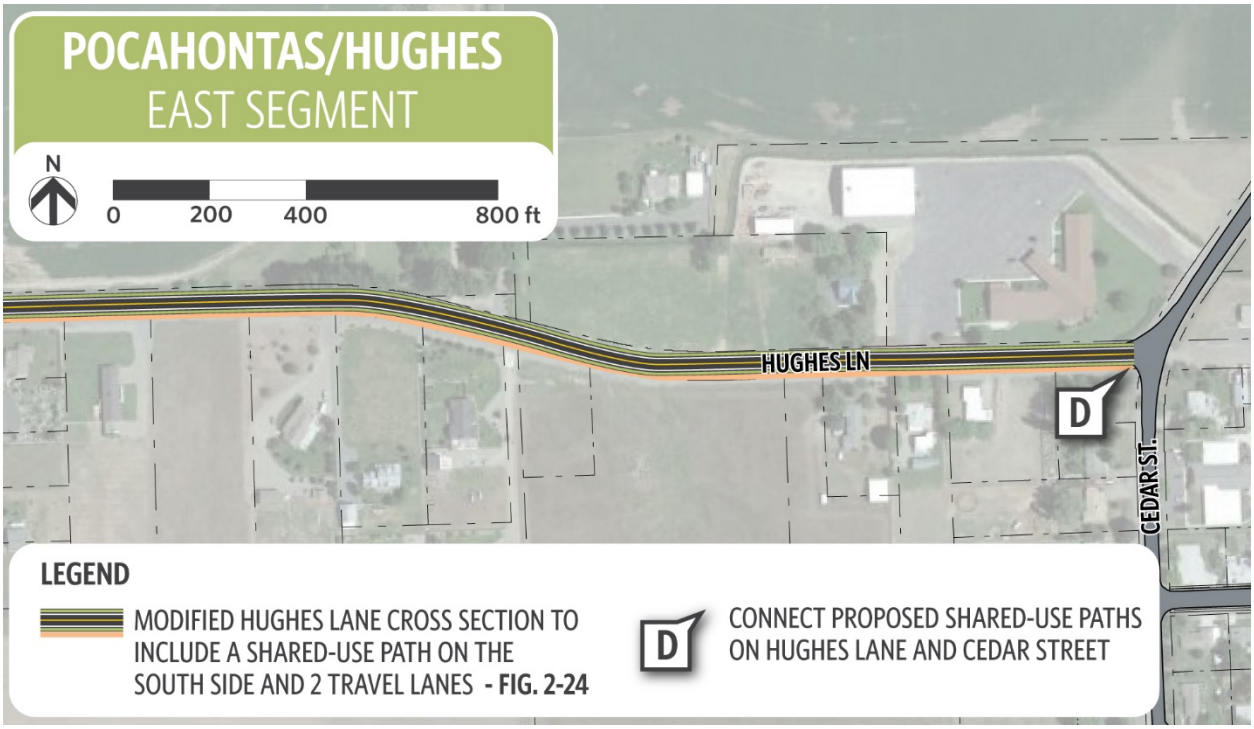


Figure 2-23. Preferred Concept – Condition on Pocahontas Road

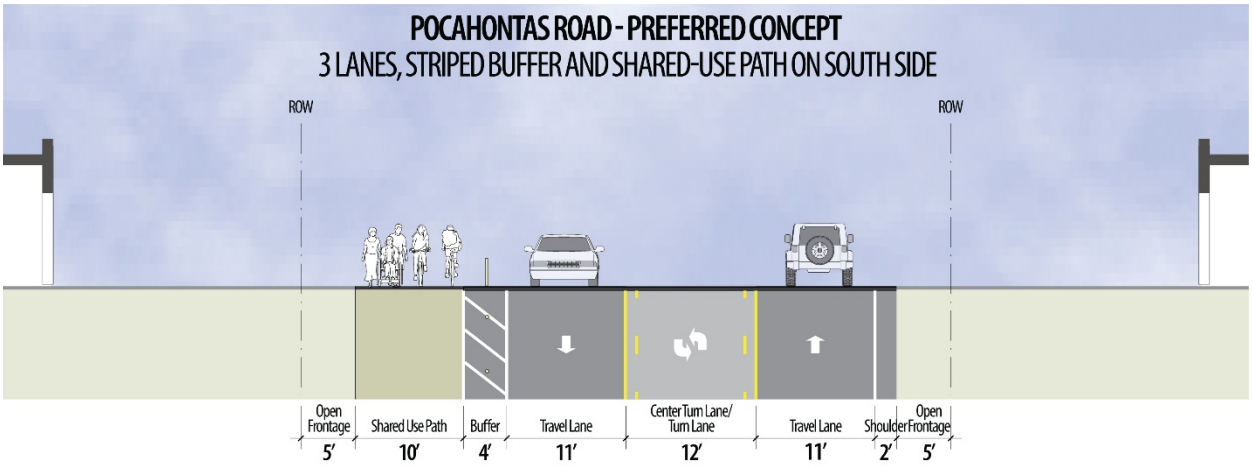
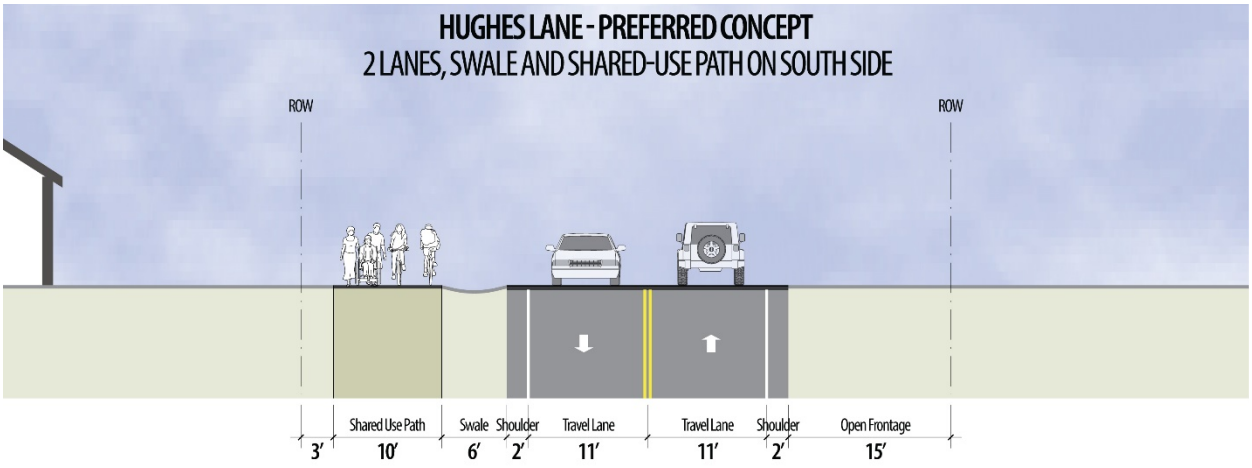


Figure 2-24. Preferred Concept – Condition on Hughes Lane



2.3.3 Concept Evaluation

Table 2-3 provides an evaluation of the concept based on the evaluation criteria established in Technical Memo 3.

Table 2-3. Pocahontas Road/Hughes Lane Concept Evaluation

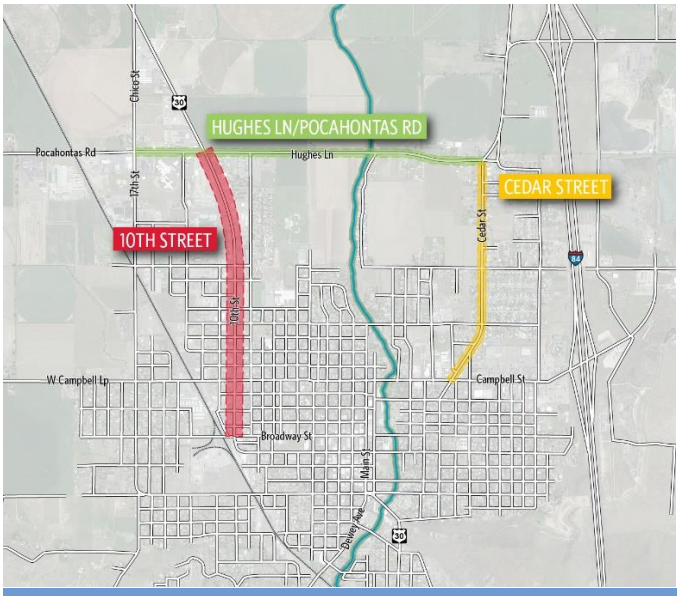
Criteria		Preferred Concept	Comments
1	Feasibility of implementation	●	Subject to determination of centerline location and transmission line pole locations
2	ROW constraints	●	No ROW impacts anticipated to accommodate proposed cross sections; modest impacts expected to accommodate the 10th Street intersection modifications
3	Built environment constraints	◐	Some impacts may occur where private improvements extend into the ROW
4	Environmental impacts and mitigation	●	Minimal impacts anticipated; the proposed swale along Hughes Lane would likely be an improvement over existing conditions
5	Conceptual cost estimate	●	Subject to determination of transmission line pole locations; requires shifting roadway and restriping along Pocahontas Road to fit the shared-use path between the roadway and transmission poles
6	Safety and comfort for all modes of travel	●/◐	Provides off-street facility for non-motorized travelers; comfort and safety subject to additional protective barriers along Pocahontas Road, balanced with space needs of farming equipment
7	Connectivity across corridor	◐	Minimal change
8	Level of public and stakeholder support	●	General community and stakeholder sentiment supports adding the shared-use path on the south side and improvements to the 10th Street intersection
9	Community identity and aesthetics	●	Swales provide opportunity for street trees and public art
10	Business vitality/community livability	●	Improved livability by providing walking/biking amenities
Key: ● = good ◐ = average ○ = poor n/a = criterion is not relevant/does not apply			

3 Next Steps

The preferred concept designs included in this memo will be presented at the upcoming Virtual Community Workshop on October 13, 2021, and the upcoming TAC meeting on October 14, 2021. Subsequently, the project will move into developing the final plan materials and updating Baker City and Baker County TSP documents as needed.

Appendix VII. Technical Memorandum #6: Transportation Solutions Analysis

Northern Baker
TRANSPORTATION IMPROVEMENT PLAN



Tech Memo #6: Transportation Solutions Analysis

Northern Baker Transportation Improvement Plan

Baker City, Oregon

October 25, 2021

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Acronyms and Abbreviations

ADA	Americans with Disabilities Act
APM	Analysis Procedures Manual
ARTS	All Road Transportation Safety
BLTS	Bicycle Level of Traffic Stress
CMF	Crash Modification Factor
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
HDM	Highway Design Manual
IAMP	Interchange Area Management Plan
LOS	Level-of-Service
LTS	Level of Traffic Stress
NBTIP	Northern Baker Transportation Improvement Plan
MUTCD	Manual on Uniform Traffic Control Devices
NEO Transit	Northeast Oregon Public Transit
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ORS	Oregon Revised Statue
OTC	Oregon Transportation Commission
PLTS	Pedestrian Level of Traffic Stress
ROW	right-of-way
TSP	Transportation System Plan
US30	U.S. Highway 30
v/c	volume-to-capacity

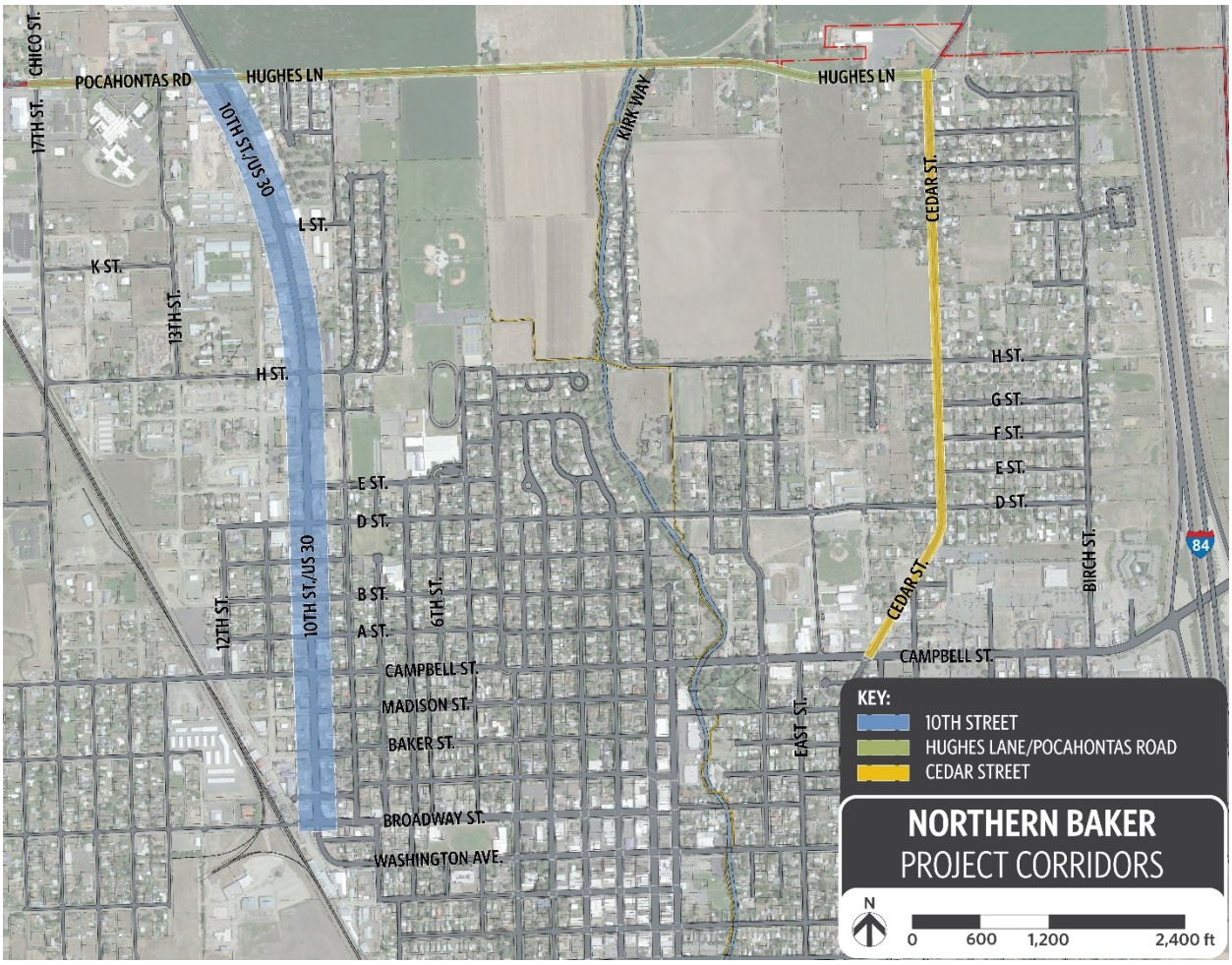
1 Introduction

The Northern Baker Transportation Improvement Plan (NBTIP) is being undertaken by Baker City in partnership with the Oregon Department of Transportation (ODOT) to develop a vision to revitalize a section of U.S. Highway 30 (10th Street or US30) within the city limits. The project also focuses on Cedar Street and Hughes Lane/Pocahontas Road. The project considered several new street design cross sections for all three corridors. A set of preferred design concepts are discussed in detail in Technical Memo 5. The preferred design concepts are meant to better accommodate multimodal travel demand and provide equitable access to destinations along these corridors for people of all ages and abilities. The study corridors are shown in Figure 1-1.

This technical memo provides an overview of the preferred design concepts for the three corridors and how the designs will impact operations and connectivity in Baker City and includes:

- Projected traffic operations and performance along the corridors and at key intersections including impacts on freight movement
- Improvements to active transportation and transit including an analysis of access and comfort level for pedestrians and bicyclists
- Initial cost estimates and design impacts on ROW and utilities
- Anticipated impacts to safety at key locations

Figure 1-1. Project Study Area



2 Summary of Improvements and Findings

A brief summary of findings is provided:

- 10th Street – The preferred design concepts for 10th Street includes new bicycle and pedestrian facilities north of H Street while the pedestrian environment is improved by a combination of sidewalk infill and increased sidewalk widths south of H Street. Crossing improvements at H, E, D, B, Campbell, and Church Streets will improve crossing conditions for both bicyclists and pedestrians including increasing comfort and reducing potential crashes. The crossing improvements may include marked crosswalks, signage, and in some cases, curb extensions, median pedestrian refuge, pedestrian signal upgrades, and pedestrian activated beacons. The crossing improvements will also increase access to employment areas west of 10th Street for active transportation users. The improvements are designed with freight movement in mind and ensure that freight access and turning movements are not impacted. Figure 2-11 offers an example of the crossing improvements.

- Pocahontas Road/Hughes Lane – The addition of a separated shared-use path on the southside of the street from 17th Street to Cedar Street will provide people walking and bicycling a separated facility for recreational trips while connecting to important employment areas and community services. The path will be separated by a landscaped swale that may include street trees or other plantings. The separated path will reduce crash risks for people walking and bicycling while also increasing comfort. Intersection crossing improvements at 10th Street/H Street will also improve comfort and reduce crash risk while providing improved access to the Saint Alphonsus Medical Center.
- Cedar Street – Cedar Street will receive a new shared-use path between Hughes Lane and D Street on the west side of the street and a new walking path on the east side of the street. Both of these facilities will be horizontally separated from the roadway and vehicle traffic to provide people walking and biking a comfortable experience when using the new facilities. The paths will be separated by landscaped swales that may include street trees or other plantings. Intersection crossing improvements at H and D Streets will improve access and reduce the potential for crashes for people walking and biking. The shared-use path South of D Street will continue to Campbell Street while the walking path will connect to the Community Center and Northeast Oregon Public (Neo) Transit's local and regional service.

2.1 Summary of Preferred Design Concepts

The preferred design concepts propose improvements intended to ensure equitable access to transportation options for all ages and abilities. These improvements include facilities for people walking and bicycling along the project corridors, and suggested connections to and enhancements of the larger network of streets and pathways to allow for safe and comfortable travel by all modes.

Figure 2-1 provides an overview of the preferred design concept proposed for each corridor while Figure 2-2 provide details on the specific location of improvements.

Figure 2-1. Preferred Concept Overview

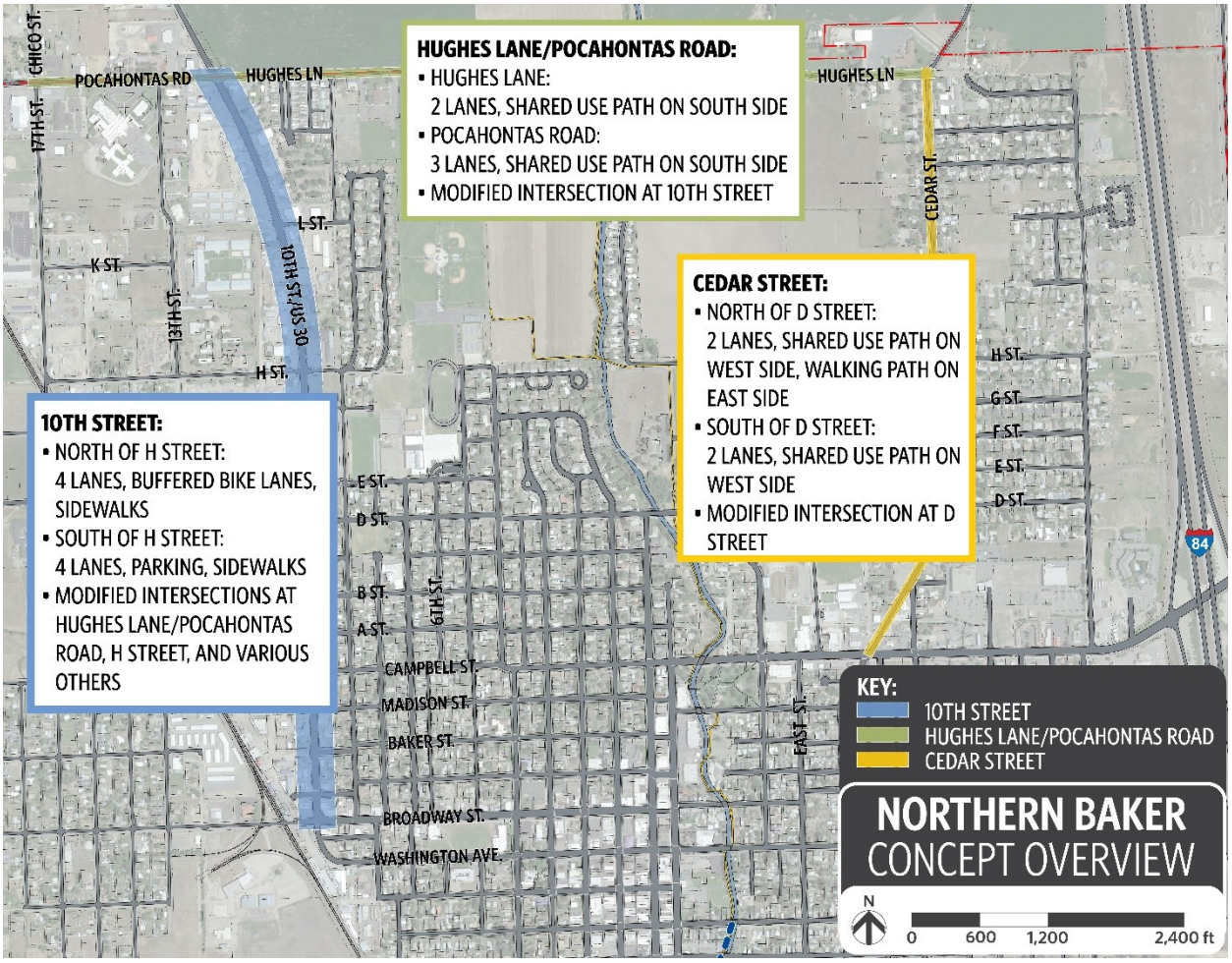
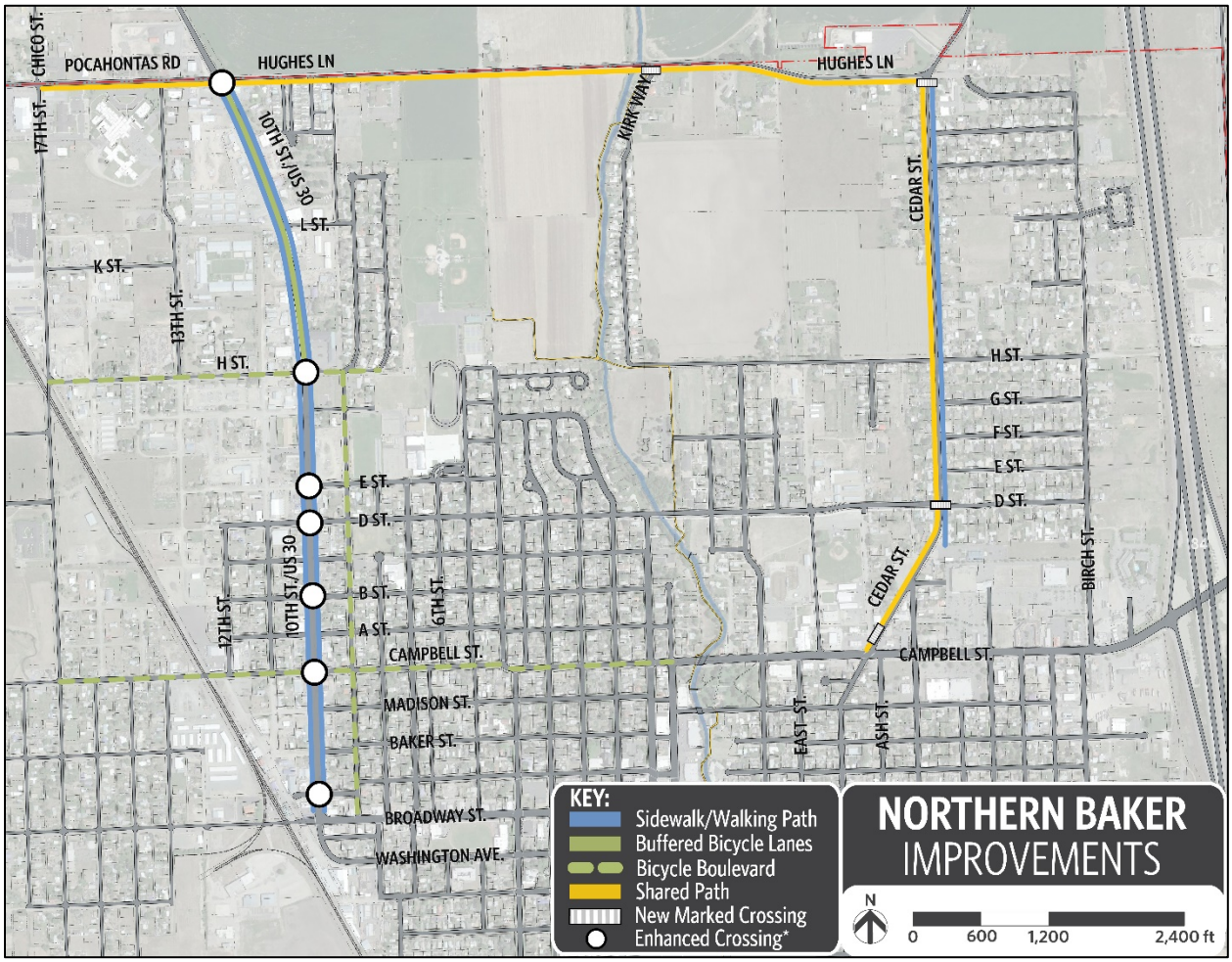


Figure 2-2. Detailed Concept Design Improvements



*Enhanced crossings may include marked crosswalks, median pedestrian refuges, curb extensions and Rectangular Rapid Flashing Beacons (RRFB) if unsignalized. At Campbell Street, the enhanced crossings will include pedestrian countdown timers featuring a leading pedestrian interval, marked crosswalks, and curb extensions.

2.2 Preferred Design Concept Cross-Sections

Below are the preferred cross section designs outlined in more detail in Technical Memo 5.

2.2.1 10th Street Cross-Sections

Figure 2-3. Proposed Typical Condition North of H Street

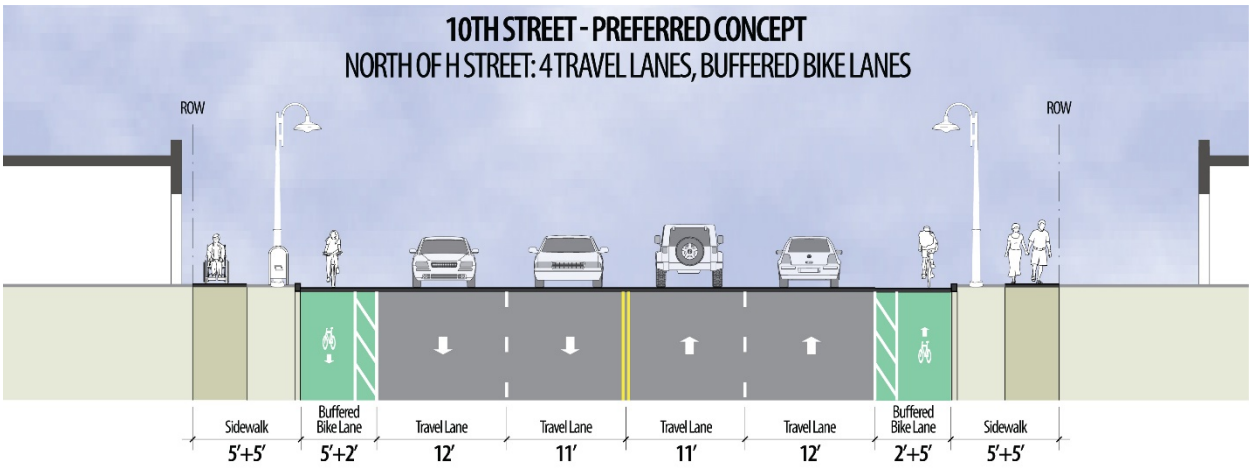
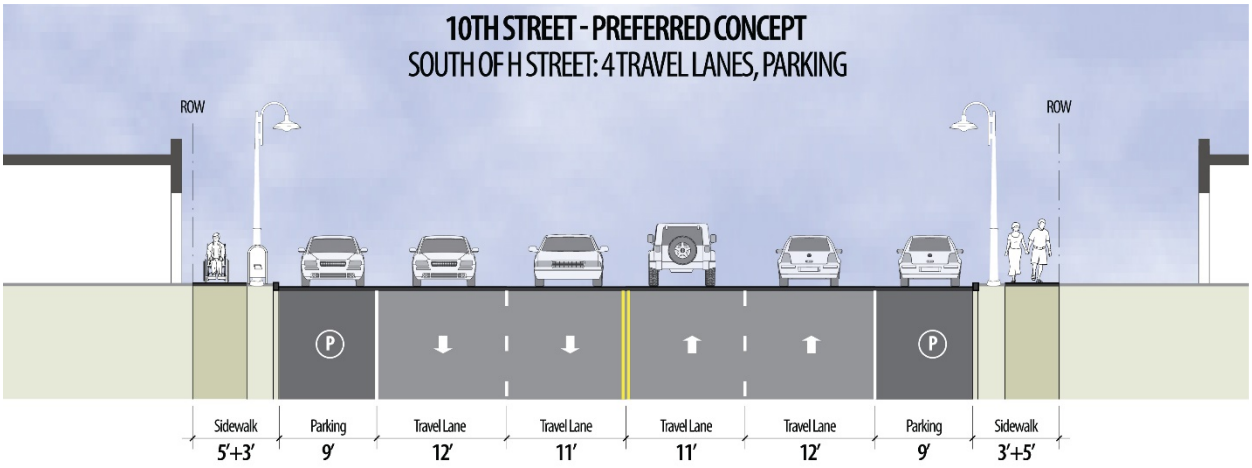


Figure 2-4. Proposed Typical Condition South of H Street



2.2.2 Pocahontas Road and Hughes Lane Cross-Sections

Figure 2-5. Preferred Concept - Pocahontas Road

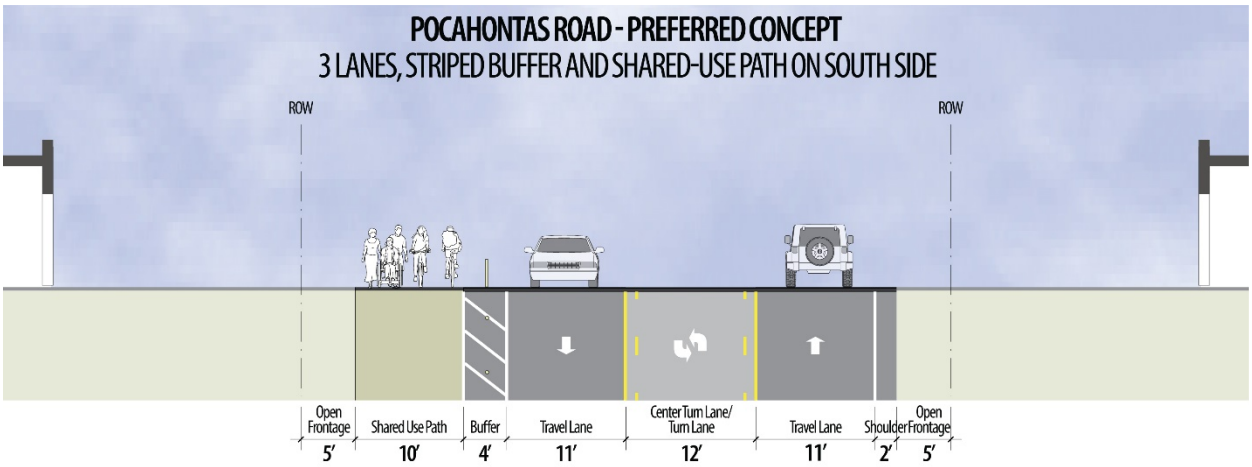
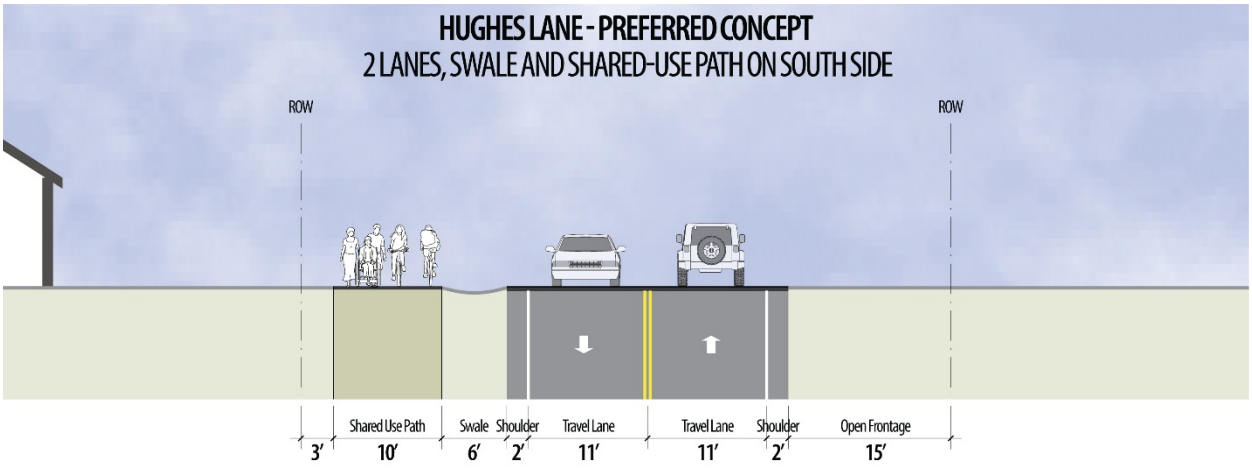


Figure 2-6. Preferred Concept - Hughes Lane



2.2.3 Cedar Street Cross-Sections

Figure 2-7. Preferred Concept - 10th Street North of D Street

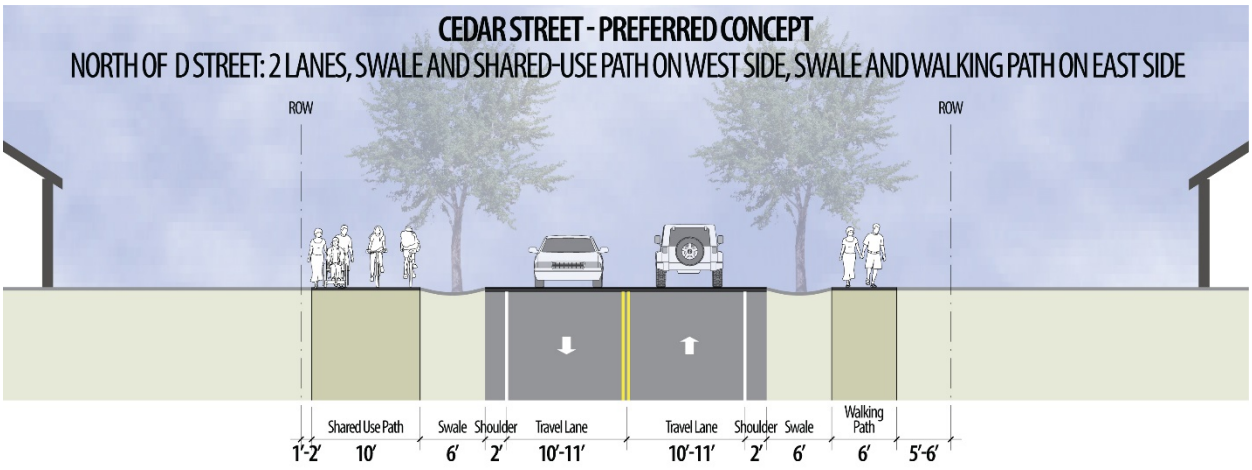
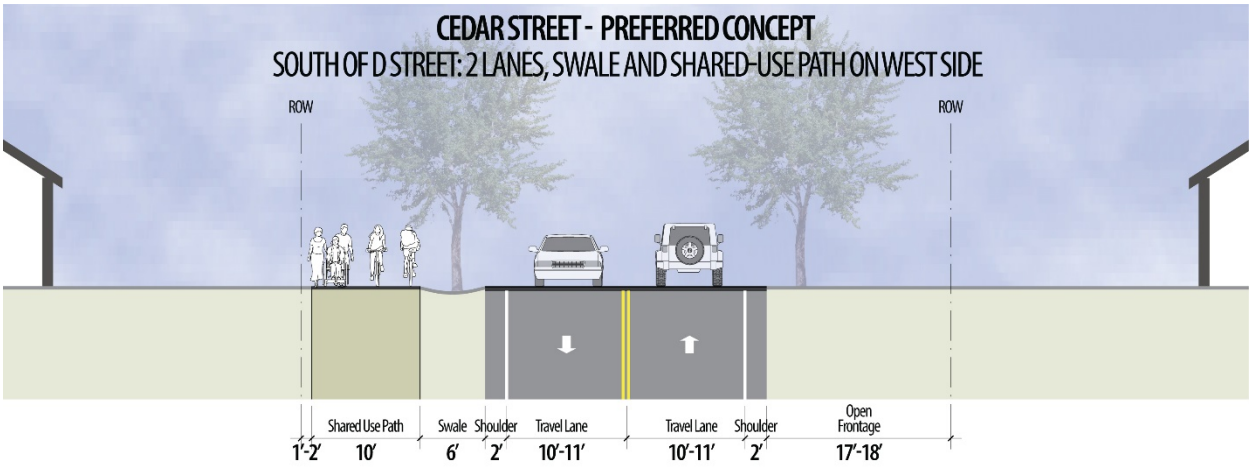


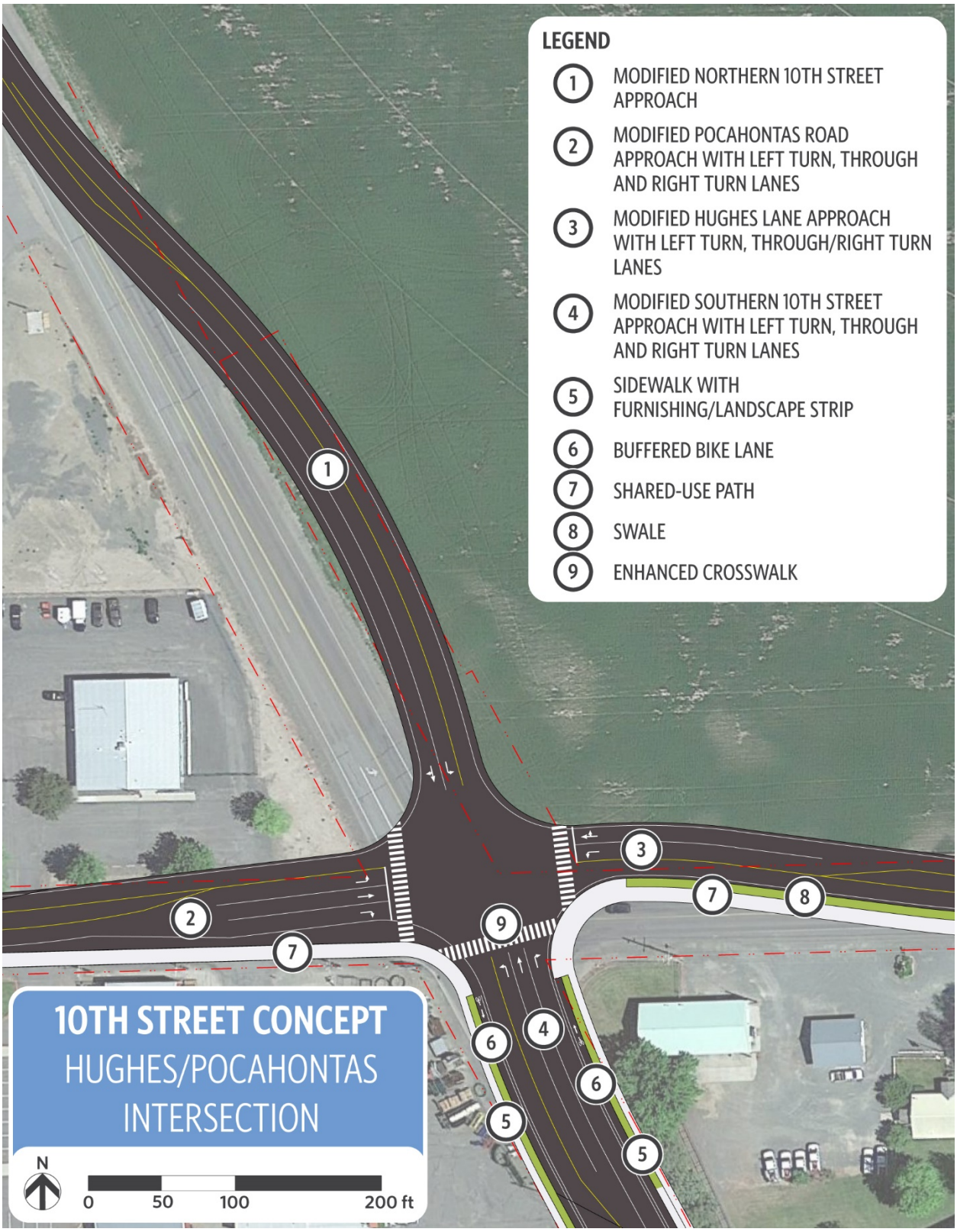
Figure 2-8. Preferred Concept - 10th Street South of D Street



2.3 Preferred Intersection Design Concepts

Below are the preferred design concepts for a selection of intersection outlined in more detail in Technical Memo 5.

Figure 2-9. Preferred Concept - Intersection of 10th Street and Hughes Lane/Pocahontas Road



*The exact alignment will be refined during the design phase and after additional outreach.

Figure 2-10. Preferred Concept - Intersection of 10th Street and H Street

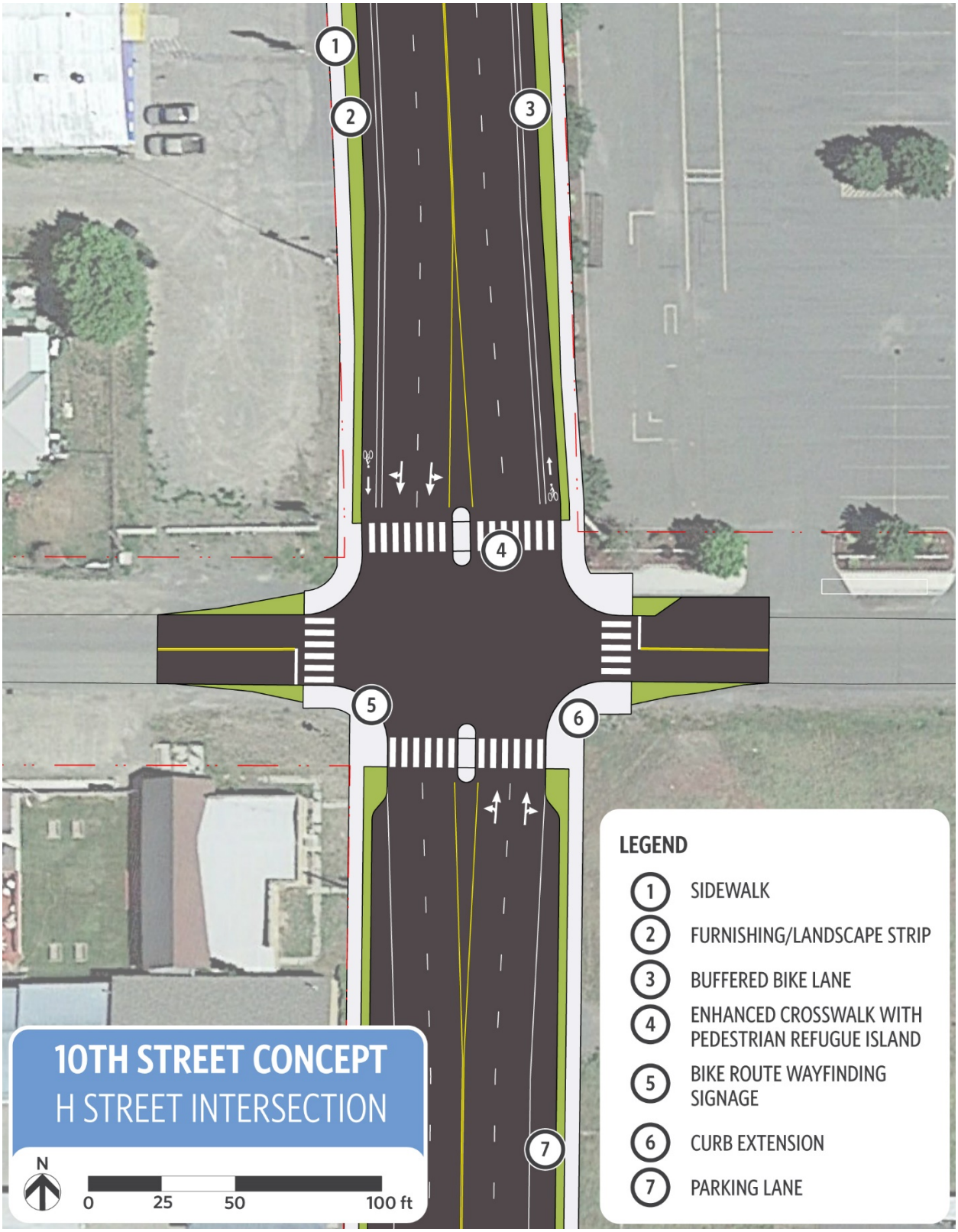


Figure 2-11. Preferred Concept - Intersection of 10th Street and B Street

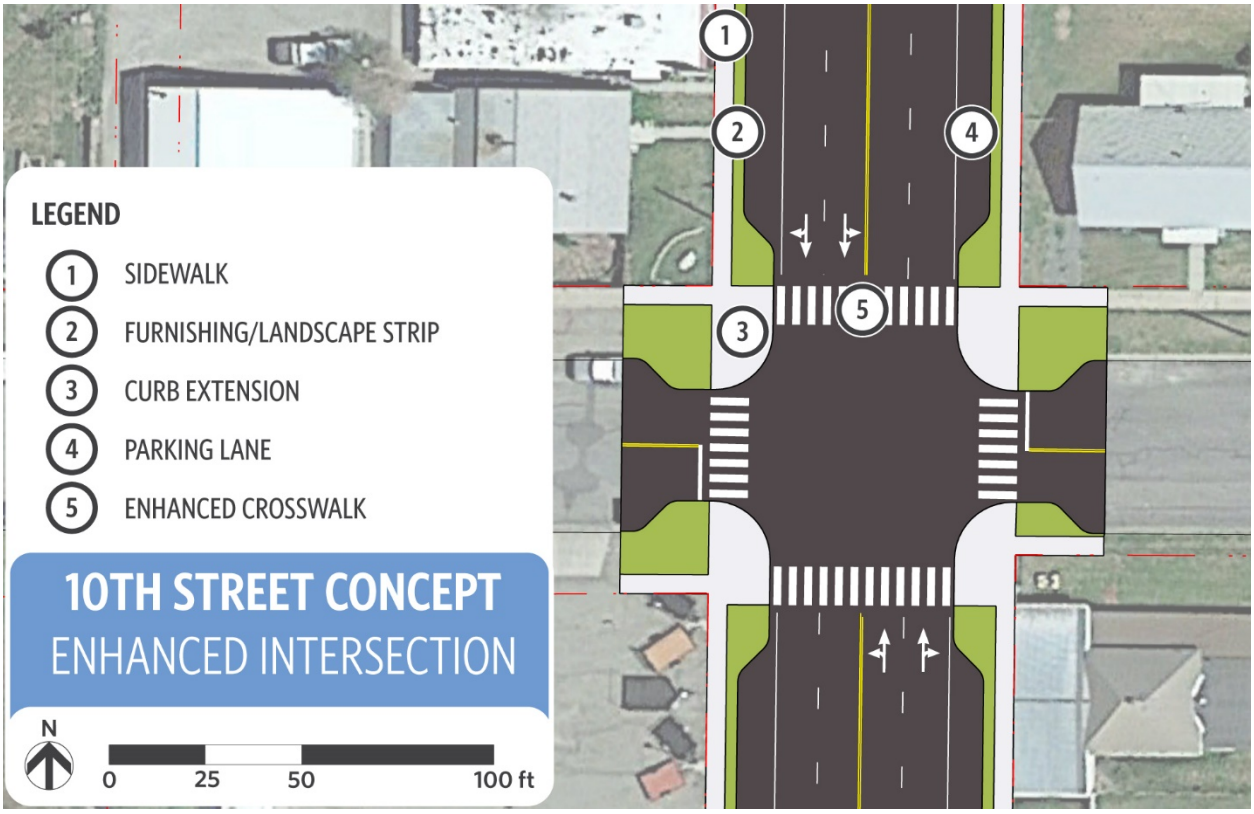
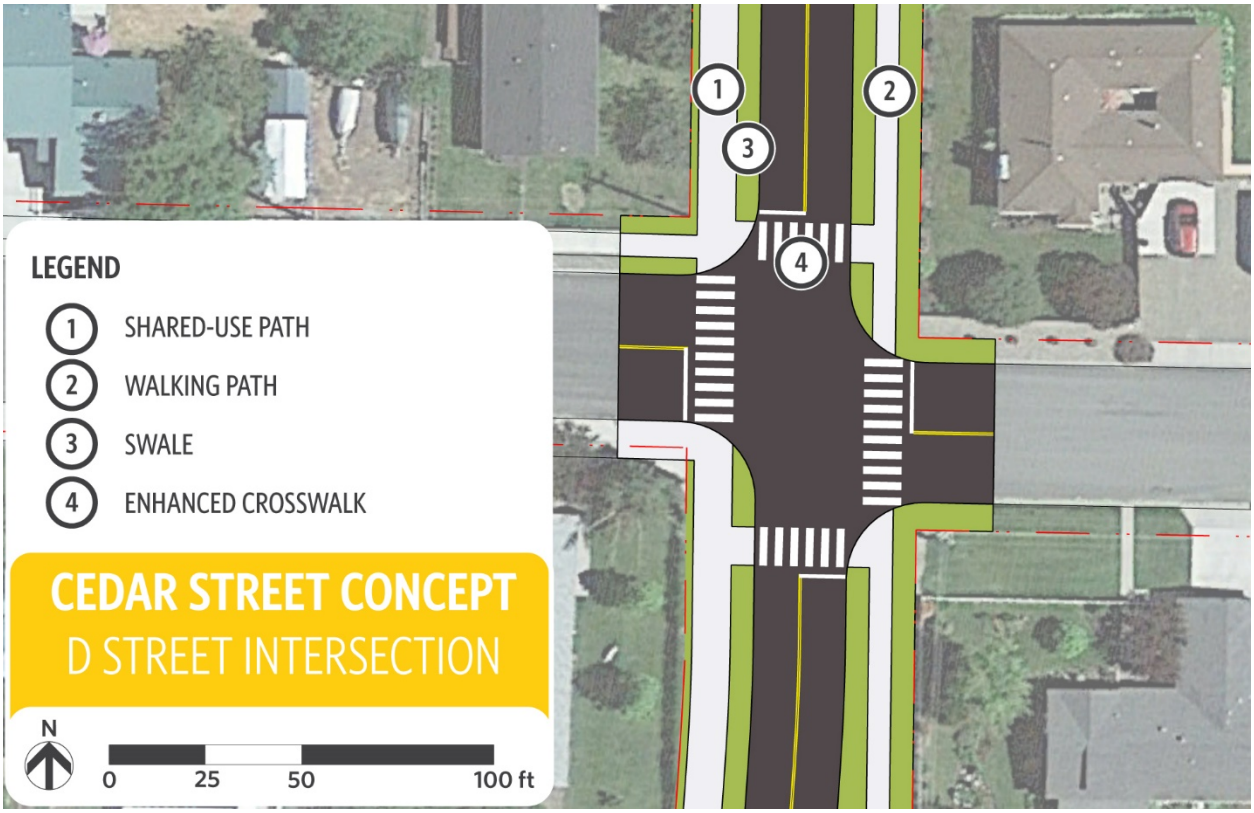


Figure 2-12. Preferred Concept - Intersection of Cedar Street and D Street



3 Transportation Solutions Assessment

This section provides an overview of the future transportation conditions on 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road based on the concept design presented in Technical Memo 5. This section includes:

- Motor Vehicle Operations Assessment
- Freight/Heavy Vehicle Assessment
- Active Transportation Assessment
- Transit Assessment
- Transportation Safety Improvements and Analysis
- ROW and Utility Impacts
- Concept Design Comparison to Previously Identified Projects
- Planning Level Cost Estimates
- Improvement Phasing

3.1 Motor Vehicle Operations Assessment

This section provides a summary of motor vehicle operations at the four study intersections along 10th Street:

- 10th Street/Hughes Lane - unsignalized
- 10th Street/E Street - unsignalized
- 10th Street/Broadway Street - signalized
- 10th Street/Campbell Street - signalized

A traffic analysis was performed for future year (2040) conditions following the recommendations and procedures included in Chapters 5, 12, and 13 of the ODOT Analysis Procedures Manual (APM). Detailed analysis output is provided in Appendix A.

Traffic volume forecasts were developed using an assumed annual growth rate of 1.0 percent per year. The population of Baker City has changed very little in the past 20 years and the current ODOT Future Highway Volume Table shows annual growth rates on 10th Street ranging from 0.1 to 0.6 percent. While not directly comparable to traffic growth, the 2013 Baker City Comprehensive Plan assumed a projected population growth for the City of 0.8 percent per year. An annual growth rate of 1 percent per year represents a conservative estimate for the future conditions analysis.

Traffic analysis was performed to determine volume-to-capacity (v/c) ratios for comparison to ODOT mobility thresholds consistent with Action 1F.1 of the Oregon Highway Plan (OHP) and the 20-year design mobility standards in the ODOT Highway Design Manual (HDM). ODOT mobility standards provide acceptable v/c ratios for project

development and design. Based on the concept design presented in Technical Memo 5, the 10th Street/Hughes Lane intersection includes recommended improvements to the existing lane configuration (see Figure 2-9) and is the only intersection that was compared to both OHP (No-Build) and HDM (Build) mobility standards.

The 10th Street corridor is located within the limits of Baker City and designated as a District Highway by the OHP. The OHP mobility targets for No-Build conditions are an overall intersection v/c ratio of 0.95 for the signalized intersection at 10th Street/Campbell Street, and a 0.95 v/c ratio for the unsignalized state highway and local street approaches at the Broadway Street, E Street, and Hughes Lane intersections. The HDM mobility target for the proposed intersection design concept at 10th Street/Hughes Lane is a 0.80 v/c ratio for the unsignalized state highway and local street approaches. Highway Capacity Manual (HCM) compliant Level-of-Service (LOS) results have also been provided.

Table 3-1 summarizes the existing year peak hour operational results. Based on the future year (2040) conditions analysis, all study area intersections meet OHP and HDM mobility targets. The signalized intersection at Campbell Street is operating at LOS A and the unsignalized intersections at E Street and Broadway Street are operating at LOS C. The Hughes Lane intersection is operating at LOS E in both the No-Build and Build scenarios and the results are based on the stop-controlled westbound left-turn movement. While the overall LOS does not change with the recommended improvements, the v/c ratio is significantly improved from 0.74 to 0.38 and the delay is reduced by over 20 percent.

Table 3-1. Future Year (2040) Peak Hour Operations

Unsignalized Intersection[1]	Major Street v/c	Minor Street		LOS
		v/c	Delay (s)	
10th Street & Hughes Lane (No-Build)	0.12	0.74	44.5	E
10th Street & Hughes Lane (Build)	0.12	0.38	35.3	E
10th Street & E Street	0.26	0.13	19.0	C
10th Street & Broadway Street	0.17	0.20	12.7	C
Signalized Intersection[2]	**v/c**		**Delay (s)**	**LOS**
10th Street & Campbell Street	0.32		7.0	A

[1] Unsignalized intersection LOS based on worst stop-controlled movement.
[2] Signalized intersection LOS based on overall intersection operations.

In addition to the operational analysis, a signal warrant analysis was performed at the 10th Street/Hughes Lane intersection using both the existing (2020) and future year (2040) traffic volumes. The signal warrant analysis focused on the peak hour, 4-hour, and 8-hour volume warrants and was performed using Highway Capacity Software (HCS), which replicates the procedures provided in the Manual on Uniform Traffic Control Devices (MUTCD). Only the peak hour signal warrant (Warrant 3) was met in the future year (2040), and only if the population was assumed to remain at or below 10,000. Based on the signal warrant analysis, a traffic signal is not warranted at this location at this time.

3.2 Freight/Heavy Vehicles Assessment

This section summarizes future movement of freight. Considerations related to freight and heavy vehicles in the study area.

3.2.1 Freight Improvements and Considerations

10th Street (U.S. Highway 30 [US30]) is designated a District Highway. According to ODOT's TransGIS tool, US30 does not show up as an OHP Freight Route, Reduction Review Route, or High Clearance Route. The design phase for 10th Street considered and evaluated many possible designs and cross sections. The resulting preferred design concepts do not include freight specific improvements but the designs do accommodate freight turning movements.

The proposed improvements for 10th Street are different for the sections north and south of H Street. South of H Street, space is allocated to accommodate street parking where existing businesses are more concentrated. North of H Street, a bicycle lane is integrated into the roadway where demand for on-street parking is less pronounced. For the section north of H Street, the number of lanes remains the same though lane widths are reduced due to the addition of a seven-foot buffered bike lane on either side of the road. The two outside lanes, which provided space for parking and travel, will be reduced from 18 feet to 12 feet. Twelve feet is the Oregon HDM recommended minimum width for a travel lane on any identified freight route, thus the preferred design concept for 10th Street should accommodate freight movement. For the section south of H Street, the two outside lanes remain 12 feet wide while the inner two lanes are reduced from 12 to 11 feet.

The project team evaluated the curb extensions, pedestrian refuge islands, and enhanced pedestrian crosswalks and determined that truck turning movements will not be impacted by these improvements. The curb extensions will, at their maximum, be as wide as the parking lane and will be designed with a turning radius that accommodates heavy vehicle turning movements.

3.2.2 Hole-in-the-air Considerations

A highway's "vehicle-carrying capacity" refers to the horizontal and vertical clearance through which a vehicle can move. This clearance is informally known as the "hole-in-the-air". The size or capacity of this clear space determines the maximum size load a truck can move along the road. This capacity can be constrained through the addition of infrastructure such as bridges, light signals, or curb extensions, thus the Oregon Transportation Commission (OTC) identified certain roads that were important to freight movement as Reduction Review Routes. Oregon Revised Statute (ORS) 366.215 states that the OTC shall not permanently reduce the "vehicle-carrying capacity" of a Reduction Review Route unless safety or access considerations require the reduction, or a local government requests an exemption and Commission determines it is in the best interest of the state and freight movement is not unreasonably impeded.

It is important to note that none of the roads in this project are identified as Reduction Review Routes. There are some minor reductions to the "hole-in-the-air" through the addition of curb extensions that protrude to the extent of the parking lane at certain

intersections. Otherwise, the overall right-of-way (ROW) from curb to curb will not be reduced and, in fact, will increase in some areas.

Figure 2-2 shows the intersections where curb extensions will be installed. The planned curb extensions will not exceed more than nine feet wide along 10th Street, equivalent to the width of the parking lane. If curb extensions are installed on both sides of the roadway, the total width would equal up to 18 ft. This would produce a minimum horizontal clearance of 46 feet. The final width of the curb extensions will be determined during the design phase and after additional outreach is considered.

3.3 Active Transportation Assessment

This section summarizes bicycle and pedestrian improvements and future conditions found in Baker City along 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road. For the three project roadways, Bicycle and Pedestrian Level of Traffic Stress (LTS) were calculated and findings presented.

3.3.1 Active Transportation Improvements

This section summarizes the active transportation improvements outlined in Technical Memo 5 and shown in Figure 2-2. The preferred design concepts propose a combination of sidewalk, walking paths and shared-use paths along the three corridors and various intersection crossing enhancements at key locations. The improvements will increase access to transit and key destinations while reducing potential bicycle and pedestrian involved crashes.

10th Street Improvements

The 10th Street corridor will feature two typical cross-sections with H street acting as the dividing line between the two as shown in Figure 2-3 and Figure 2-4. South of H Street, the cross-section for 10th will remain unchanged except for completing five-foot wide sidewalks on both sides of the corridor. Active transportation improvements north of H Street will include a buffered bike lane in both directions measuring five feet in width with a two-foot buffer to the adjacent travel lane. Sidewalks will be installed on both sides of the corridor measuring five feet in width and featuring a curb side, five-foot hardscape buffer with pedestrian scale lighting.

A parallel bicycle boulevard will run one block to the east along 9th Street between H Street and Broadway. This will create an alternate route for people walking and biking and provides a calmer and more comfortable route that is likely to reduce interactions between vehicles and people using 9th Street compared to 10th Street. The parallel route will provide similar access benefits to people walking and biking as a bicycle lane on 10th Street without the need to reallocate roadway space on 10th Street.

A series of intersection improvements will improve bicycle and pedestrian safety, connectivity, and ease of crossing. Table 3-2 below summarizes the improvements at each intersection. Figure 2-9, Figure 2-10, and Figure 2-11 show detailed plan concepts for intersection improvements along 10th Street at the intersections of Hughes Lane/Pocahontas Road, H Street, and B Street.

Table 3-2. Intersection Improvements

Intersection	Marked Crosswalk	Curb Extensions	Other
10th Street (US 30)			
Hughes Lane / Pocahontas Road	Yes		Crossing Signage, RRFB* or HAWK** beacon, additional horizontal separation of vehicles and active modes, geometric dimension changes as shown in Figure XX
H Street	Yes	Yes	Crossing Signage, Median Refuge and bicycle way-finding signage
E Street	Yes	Yes	Crossing Signage
D Street	Yes	Yes	Crossing Signage
B Street	Yes	Yes	Crossing Signage
Campbell Street	Yes	Yes	Pedestrian Countdown Timer with a leading pedestrian interval
Church Street	Yes	Yes	Crossing Signage

*Rectangular Rapid-Flashing Beacon
**High-Intensity Activated Crosswalk

10th / Hughes Lane Intersection Improvements

Figure 2-9 shows the proposed intersection modifications at Pocahontas Road/Hughes Lane. The proposed buffered bike lanes along the southern 10th Street approach would tie directly into the shared-use path, allowing for seamless travel by bike. To connect the SUP east and west of the intersection and make the crossing of 10th Street more comfortable, a marked crosswalk, warning signage and either a rectangular rapid flashing beacon (RRFB) or high-intensity activated crosswalk (HAWK) signal should be installed. The intersection design also realigns the intersection approaches to create better sight lines for drivers and to create a curve as southbound traffic approaches the intersection that will slow drivers.

Hughes Lane/Pocahontas Road Improvements

The Hughes Lane and Pocahontas corridor will feature two typical cross-sections with 10th Street acting as the dividing line between the two as shown in Figure 2-5 and Figure 2-6. Hughes Lane will feature a separated shared-use path between 10th Street and Cedar Street on the south side of the street. The path will be 10 feet wide and separated from vehicle traffic by a 6-foot swale and a 2-foot paved shoulder. The shared-use path will continue across 10th Street and along Pocahontas Road with the same 10-foot width. The shared-use path west of 10th Street will be separated from traffic with a 4-foot paved buffer featuring paint and vertical delineators. The intersection improvements are summarized below in Table 3-3.

Table 3-3. Intersection Improvements

Intersection	Marked Crosswalk	Curb Extensions	Other
Hughes Lane / Pocahontas			
Kirkway Street*	Yes		Crossing Signage

*The crossing at Kirkway Street is oriented east/west to allow the SUP to cross Kirkway Street.

Cedar Lane Improvements

The Cedar Street corridor will feature two typical cross-sections with D Street acting as the dividing line between the two as shown in Figure 2-7 and Figure 2-8. Cedar Street north of D Street will feature a shared-use path on the west side of the street. The shared-use path will be 10 feet wide and be separated from traffic by a 6-foot, landscaped swale and a 2-foot paved shoulder. On the eastside of the street will be a 6-foot walking path, again separated from traffic by a 6-foot, landscaped swale and a 2-foot paved shoulder. The shared-use path west of 10th Street will continue on the west side of the street but the sidewalk on the east side will not.

A series of intersection improvements will be installed to improve bicycle and pedestrian safety, connectivity and ease of crossing. Table 3-4 below. Figure 2-12 shows detailed a plan concept for intersection improvements at Cedar Street and D Street.

Table 3-4. Intersection Improvements

Intersection	Marked Crosswalk	Curb Extensions	Other
Cedar Street			
Hughes Lane*	Yes		Crossing Signage
D Street	Yes		Crossing Signage
Clark Street**	Yes		

*The crossing at Hughes Lane is oriented east/west to allow the SUP to connect to the eastside walking path on Cedar Street.
**The crossing is oriented north/south to allow the SUP to cross Clark Street.

3.3.2 Bicycle and Pedestrian Level of Traffic Stress

LTS is a key indicator in measuring how comfortable a roadway segment or intersection is for person walking or biking to navigate. LTS objectively measures several roadway factors including traffic volumes, speeds, and the presence and quality of bicycle and pedestrian facilities to produce an LTS rating. Ratings are measured 1 through 4 with 1 representing the most comfortable environment for active transportation users.

Table 3-5 reports the Bicycle Level of Traffic Stress (BLTS) and Pedestrian Level of Traffic Stress (PLTS) ratings for roadway segments and intersections. The LTS ratings for segments are scored based on the worst performing roadway characteristic. The table shows the LTS rating for the future roadway conditions and shows the change in LTS rating compared to the existing conditions. The majority of LTS ratings improved and none of the future conditions are expected to be worse than today. For example, a

roadway may score LTS 2 based on volumes but LTS 4 based on bicycle facility type and thus the segment will receive an overall score of LTS 4.

The concept design roadway segments generally rank LTS 1 and 2 for both bicycles and pedestrians primarily due to the increased separation of active modes from vehicle traffic. Intersection crossing and approach LTS scores also improved thanks to the combination of marked crossings, signage, curb extensions and physical separation from travel lanes. 10th Street south of E Street remains a BLTS 3 for both the segments and intersections as no bicycle facilities are being proposed in those locations.

Table 3-5. Future Build BLTS and PLTS Ratings

Location	BLTS Rating	PLTS Rating
10th Street (US 30)		
Hughes Lane to H Street	2 **(+1)***	2 **(+2)**
H Street to Campbell Street	3	2 **(+1)**
Campbell Street to Broadway	3	2 **(+1)**
Hughes Lane / Pocahontas Road		
17th Street to 10th Street	1 **(+2)**	2 **(+2)**
10th Street to Kirkway Street	1 **(+2)**	2 **(+2)**
Kirkway Street to Cedar Street	1 **(+2)**	2 **(+2)**
Cedar Street		
Hughes Lane to H Street	1 **(+2)**	2 **(+2)**
H Street to D Street	1 **(+2)**	2 **(+2)**
D Street to Campbell Street	1 **(+2)**	2 **(+2)**
Intersections (Approach and Crossing LTS Scores)		
10th Street/Hughes Lane	3 **(+1)**	2 **(+2)**
10th Street/E Street	3	3 **(+1)**
10th Street/Campbell Street	3	2 **(+1)**
10th Street/Broadway Street	3	2
Pocahontas Road/17th Street	3 **(+1)**	2 **(+1)**
Hughes Lane/Kirkway Street	2 **(+1)**	2 **(+1)**
Hughes Lane/Cedar Street	2 **(+1)**	2 **(+1)**
Cedar Street/H Street	1	2
Cedar Street/D Street	1	1
Cedar Street/Campbell Street	1	1

*(+1) indicated an improvement in the LTS rating

The ODOT APM provides guidance on target LTS ratings that roadways undergoing improvements should aim for in maximizing active transportation mode share. For bicyclists, BLTS 2 is often the target that generally appeals to most potential riders. Near schools, a BLTS 1 is desirable for elementary schools while BLTS 2 is allowable for middle and high schools. For pedestrians, a PLTS 2 is generally the minimum target for pedestrian routes. Roadways within a quarter mile of schools should use a target PLTS 1

for elementary schools and PLTS 2 for middle and high schools. Roadways near medical facilities should also have a target of PLTS 1.

The following locations will not meet the above guidance targets including:

- Pocahontas Road between 17th Street and 10th Street scores a PLTS 2. According to the ODOT APM, the target should be a PLTS 1 because of the Saint Alphonsus Medical Center. Additional horizontal separation between pedestrians and motor vehicle traffic or a reduced speed limit would result in a PLTS 1.
- 10th Street between E Street and Campbell Street scores a PLTS of 2 and a BLTS of 3. Because this section of 10th Street is within a quarter mile of the Baker Early Learning Center, both the PLTS and BLTS should score a 1 according to the ODOT APM. Additional horizontal separation between pedestrians and motor vehicle traffic or a reduced speed limit would result in a PLTS 1. The addition of bicycle lanes would improve the BLTS score along this segment.

3.4 Transit Assessment

Specific transit improvements such bus stop facilities are not included in the preferred design concepts. However, the active transportation improvements outlined in Technical Memo 5 and shown in Figure 2-2 will improve access to local and regional transit service. The access to transit due to the active transportation improvements are described below.

10th Street Improvements

Bus stops currently exist on both sides of 10th Street at the intersection with E Street. Improvements to 10th Street will include completing the sidewalk network along the corridor and providing intersection crossing improvements at the E Street and H Street intersections. These improvements will increase access to transit, make crossing the street more comfortable and reduce the crash risks that pedestrians face when crossing 10th Street to access transit.

Pocahontas Road Improvements

A bus stop currently exists on the south side of Pocahontas Road in front of Saint Alphonsus Medical Center. The installation of a shared-use path along the southside of Pocahontas Road will improve access to the transit stop. Additionally, the intersection improvements proposed to the intersection of 10th Street and Hughes Lane/Pocahontas Road will also improve access, making crossing 10th Street easier and reduce crash risks to pedestrians.

Cedar Street Improvements

A bus stop currently exists just south of D Street at the headquarters for NEO Transit. This location also serves as a stop for NEO Transit's regional shuttle service that connects Baker City to other communities in Eastern Oregon. The shared-use path along Cedar Street and intersection improvement proposed for the crossing at D Street will

increase access to both the local and regional transit service as well as reduce crash risk for pedestrians.

3.4.1 Future Transit Assessment

The preferred design concepts do not affect the operations of Neo Transit's local and regional transit services. However, the active transportation improvements described above will increase access to transit services, improve pedestrian comfort, and reduce pedestrian crash risk at three key locations as detailed above.

3.5 Transportation Safety Improvements and Analysis

This section provides a summary of the safety impacts that can be expected based on the countermeasures being proposed within the preferred concept designs. Table 3-6 provides a summary of the Crash Modification Factors (CMF) for each countermeasure that is being proposed within the preferred concept designs with complete details on each CMF available in Appendix C. The most applicable CMF for each treatment was selected. In the case of multiple treatments at a single location, the most conservative estimate of benefits is provided. For reference, a CMF of 0.80 should be expected to reduce crashes by a factor of 0.80. Stated another way, a CMF of 0.80 would reduce crashes by 20 percent. Each CMF is applicable to a particular crash type and/or crash severity.

Table 3-6. Safety Crash Modification Factors

Facility Type	CMF	Source	Countermeasure ID No.	Crash Type	Injury Type
Crosswalk with Sign at Unsignalized Intersection	0.85	ODOT ARTS*	BP15	Pedestrian	All
Curb Ramps and Extensions with Marked Crosswalk and Pedestrian Signs	0.63	ODOT ARTS	BP16	Pedestrian	All
Curb Extension	0.70	ODOT ARTS	I33	All	All
Pedestrian Median Refuge	0.69	ODOT ARTS	BP8	Pedestrian	All
Sidewalk	0.80	ODOT ARTS	BP29	Pedestrian	All
Buffered Bike Lane	0.53	ODOT ARTS	BP24	Bicycle	All Injury
Shared-use Path	0.75	FHWA CMF Clearinghouse	9250	Bicycle	All
Pedestrian Countdown Timer	0.69	ODOT ARTS	BP1	Pedestrian	All
Leading Pedestrian Interval	0.63	ODOT ARTS	BP3	Pedestrian	All
RRFB at Intersection	0.90	ODOT ARTS	BP10	Pedestrian	All

*ODOT All Roads Transportation Safety (ARTS)

3.5.1 10th Street Improvements

- Completing the sidewalks north of H Street on both sides of the roadway should provide a potential pedestrian crash reduction of 0.80. The buffered bike lanes will similarly provide a potential bicycle crash reduction of 0.53.
- The intersection improvements at H Street include a pedestrian median refuge, marked crosswalks, curb ramps, pedestrian signage and curb extensions. These countermeasures should provide a potential pedestrian crash reduction of 0.63 while the curb extensions should provide a potential crash reduction of 0.70 for all crash types.
- The intersection with Campbell will receive curb extensions and the signals upgraded to include a pedestrian countdown timer and a leading pedestrian interval. The curb extension should provide a potential crash reduction of 0.70 for all crash types while the combined pedestrian countdown timer and leading interval should provide a potential pedestrian crash reduction of 0.69.
- Intersection crossing improvements at E, D, B, and Church Street will include a marked crosswalk with signage, curb extensions, and Americans with Disability Act (ADA) curb ramp that should provide a potential pedestrian crash reduction of 0.63. The curb extensions should also provide a potential crash reduction of 0.70 for all crash types.
- While there is no specific CMF for the realignment proposed at the intersection of 10th/Hughes Lane/Pocahontas Road, there are anticipated safety benefits from a qualitative perspective. The revised alignment reduces the skew angle and provides separate turn lanes at the westbound and eastbound approach clarifying travel through the intersection. The curve at the southbound approach to the intersection may slow motorists as they are traveling into Baker City. The enhance crosswalks will provide connections to the sidewalk on 10th Street and shared use path on Hughes and Pocahontas.

3.5.2 Pocahontas Road/Hughes Lane Improvements

- Installing the shared use path along Pocahontas Road/Hughes Lane should provide a potential crash reduction of 0.75 for bicyclists for the length of the corridor.

3.5.3 Cedar Street Improvements

- The walking path and shared use path north of D Street should provide a potential crash reduction of 0.75 for bicyclists.
- The shared use path south of D Street should provide a potential crash reduction of 0.80 for pedestrians and bicyclists.
- The intersection improvements at D Street include curb extensions, marked crossing, and crossing warning signage. The improvements should provide potential crash reduction for pedestrians of 0.63 at the intersection. The curb extensions should also provide potential crash reduction benefits for all crash types by a factor of 0.70.

3.6 Utilities and ROW Impacts

This section briefly summarizes ROW and underground utility line impacts based on the preferred concept designs outlined Technical Memo 5.

3.6.1 10th Street

- Utility poles on both the west and east side of the corridor currently infringe on the sidewalk. The preferred alternative includes 8-foot sidewalks on both sides of the corridor and the utility poles will pose a challenge to accommodate the full design width along the entire corridor.
- Additional ROW will need to be acquired in the NE and SE corners of the Hughes Street/Pocahontas Road intersection to accommodate the preferred intersection realignment. Additionally, several utility poles and underground utilities may need to be relocated to align the preferred intersection design.
- A minor amount of additional ROW will need to be acquired in the NE and NW corners of the H Street intersection in order to accommodate the proposed curb extensions and median island refuge. The exact amount of ROW will be revisited during the final design phase of the project after survey is conducted.

3.6.2 Hughes Lane/Pocahontas Road

- Utility poles on the southside of Pocahontas Road will make integrating the shared-use path within the existing ROW challenging. In order to make the preferred design feasible, the centerline of the road will need to be shifted several feet to the north in order to avoid the potential impacts to the utility poles.
- The bridge on Hughes Lane over the Powder River is not wide enough to accommodate the proposed shared-use path on the southside of the roadway. A future bike/ped bridge crossing the Powder River near where the Leo Adler Memorial Parkway Trail meets Hughes Lane may need additional ROW depending on where the bridge would be located. Further study of the ROW impacts should be undertaken.

3.6.3 Cedar Street

- The centerline of the roadway may need to be adjusted eastward to the south of the D Street intersection to accommodate the shared-use path through the curve in Cedar Street. The roadway should stay within the existing ROW.
- Utility poles on the eastside of the roadway will make accommodating the proposed 6-foot walking path north of D Street challenging. A more complete inventory and mapping of the ROW and utility poles should be undertaken during the design phase for the improvements.

3.7 Concept Design Comparison to Previously Identified Projects

This section summarizes previously identified projects and compared them to the preferred concept designs. The information in this section was taken from the 2013 Baker City Transportation System Plan (TSP), the 2005 Baker County TSP, and the 2016 Interchange Area Management Plan (IAMP). The information is summarized in Table 3-7.

Previous TSP documents identified traffic signal improvements at the intersections of Hughes Lane/Cedar Street, 10th Street/D Street, and Hughes Lane/10th Street. However, based on the assessment of traffic operations in this technical memo, traffic signals are not warranted at these locations based on both existing and future traffic projections. While traffic signals had previously been proposed at these locations, the traffic volumes do not meet the necessary warrants to upgrade these intersections.

Table 3-7. Preferred Concept Design Compared to TSP Projects

Location	TSP Project Description	Preferred Concept Design	Source	TSP Update
10th Street				
Hughes Lane/10th Street	Intersection Signalization	• Improvements include intersection realignment, the addition of turn lanes, and improved bicycle and pedestrian crossing facilities. • Preferred intersection design will improve operations, sightlines, and reduce crash risks. • Traffic signal warrants are not met.	Baker County TSP, Project 8	Yes
Intersection of L, H, E, and Broadway Streets	Intersection Pedestrian Crossing Improvements	• Intersection crossing improvements are proposed for H, E, D, B, Campbell and Church. • The intersections of L and Broadway are not slated for crossing improvements.	Baker City TSP - Identified in Figure 2-1	Yes
10th Street/D Street	Intersection Signalization	• Preferred intersection design will improve pedestrian crossing with a marked crosswalk, signage, and curb extensions. • Traffic signal warrants are not met.	Baker City TSP, Project R19	Yes
10th Street from Broadway to Hughes Lane	Pedestrian network improvement - Sidewalk infill	• Improvements will include completing the sidewalks along 10th between Broadway and Hughes Lane. • No pedestrian crossing improvements are slated for the intersection at Broadway and are instead identified one block north at Church Street.	Baker City TSP, Project P45	Yes
10th Street from H Street to Broadway Street	Parallel Bicycle Boulevard along 9th Street	• No such project in TSP. • Preferred concept would create a low-stress bicycle boulevard paralleling 10th Street that would	N/A	Yes

Location	TSP Project Description	Preferred Concept Design	Source	TSP Update
10th Street				
		function as an alternative route for bicyclists.		
Pocahontas/Hughes Lane				
17th Street from Indiana Avenue to Pocahontas Road	Multi-use path	• Shared-use path along Pocahontas will be able to tie into the future path along 17th Street.	Baker City TSP, Project M4	
Hughes Lane/Pocahontas Road from Settlers Loop to Cedar Street	17th Street Multi-use path including tie-in to Pocahontas multi-use path at the intersection with 17th Street	• Shared-use path along Pocahontas will be able to tie into the future path along 17th Street	Baker City TSP, Project M2	
Cedar Street				
Hughes Lane/Cedar Street	Intersection Improvements: • Phase 1 - Eastbound right turn lane • Phase 2 - Southbound right turn lane • Phase 3 – All-way stop improvement • Phase 4 - Signalization	• The Preferred concept design does not propose changes to the intersection.	I-84 IAMP, Project B	
Hughes Lane/Cedar Street	Endorsement of the IAMP intersection improvements above	• The Preferred concept design does not address signalization or turn-pocket improvements at Hughes Lane and Cedar Street.	Baker City TSP, Project R23	
Cedar Street from Campbell Street to Hughes Lane	Sidewalk infill and crossing improvements at H and D Streets	• Pedestrian improvements, including a sidewalk and shared-use path are included north of D Street. • Crossing improvements are included for the intersection with D Street.	Baker City TSP, Project R23	
Cedar Street from Campbell Street to Hughes Lane	Bike lane - signing and striping	• A shared-use path is included in the design for the length of Cedar Street between Hughes Lane and Campbell Street.	Baker City TSP, Project R25	Yes
Cedar Street/ B Street	Intersection Safety improvement	• The shared-use path on the west side of Cedar Street will separate bicycle and pedestrian traffic from vehicle traffic and reduce crash risk. • No modifications to the intersection itself are being proposed.	Baker City TSP, Project R23	
Other Roadways				
9th Street from H Street to Broadway	Bicycle Boulevard / Neighborhood Route	• Install signage and lane markings to create low stress street.	Baker City TSP, Project P35	Yes

Location	TSP Project Description	Preferred Concept Design	Source	TSP Update
10th Street				
		• TSP project P35 addresses sidewalk infill		
Campbell Street from 17th Street to Resort Street	Bicycle Boulevard / Neighborhood Route	• Install signage and lane markings to create low stress street. • Campbell is identified in the TSP as a future bicycle route west of 10th Street.	Baker City TSP, Project M35	Yes
H Street from 17th Street to 8th Drive	Bicycle Boulevard / Neighborhood Route	• Install signage and lane markings to create low stress street.	N/A	Yes

4 Planning Level Cost Estimates

This section provides a planning level cost estimates for the proposed design concepts. Table 4-1 includes a breakdown of costs including for active transportation and general roadway improvements for each corridor. No transit or freight specific improvements were identified. More information on the costs is included in Appendix D.

Table 4-1. Planning Level Cost Estimates*

10th Street Corridor	
Total	**$ 10,678,800**
Roadway	$ 5,045,000
Active Transportation	$ 1,038,550
Contingency, Mobilization, Maintenance of Traffic, Erosion Control	$ 4,595,250
Cedar Street Corridor	
Total	**$ 1,713,500**
Roadway	$ 122,000
Active Transportation	$ 856,300
Contingency, Mobilization, Maintenance of Traffic, Erosion Control	$ 735,200
Pocahontas Road and Hughes Lane Corridor	
Total	**$ 1,851,200**
Roadway	$ 129,000
Active Transportation	$ 925,700
Contingency, Mobilization, Maintenance of Traffic, Erosion Control	$ 796,500

* Cost estimates are rounded
1. Construction estimate represents 2021 dollars
2. ODOT bid history tabs were used to determine unit prices
3. Full depth pavement replacement is assumed. 9"AC/18"AB
4. A 50% contingency was placed on all bid items listed

5. Mobilization, Maintenance of Traffic, and Erosion Control includes the 30% contingency for these percentage-based items
6. Estimates do not include Right-of-way, engineering, construction management, administrative costs, or utility relocations

Total costs for the three corridors total $14,200,000. Construction costs make up $8,100,000, including $2,800,000 for active transportation and $5,300,000 for general roadway improvements. The remaining costs of $6,100,000 consist of contingency, mobilization, maintenance of traffic and erosion control. The estimates do not account for ROW purchases, engineering, construction management, administration, or utility relocation.

5 Improvement Phasing

This section proposes phasing options for completing the preferred design concept improvements across the three corridors. 10th Street improvements should be prioritized to be completed first due to ODOT funding for the corridor currently being available. Table 5-1 below details the proposed phasing. Facilities in the table below are prioritized as either near-term (0-5 years) or mid-term (5-10 years) and are subject to the availability of funding.

Table 5-1. Preferred Design Concept Phasing

Improvements	Location	Priority Timeline
10th Street		
Intersection Realignment	10th Street and Pocahontas Road/Hughes Lane	Near-term*
Buffered Bike Lanes	Between H Street and Pocahontas Road/Hughes Lane	Near -term
Sidewalks	Between H Street and Pocahontas Road/Hughes Lane	Near -term
10th Street Crossing Improvements	Intersections with streets H, E, D, B, Campbell, and Church	Near -term
Pocahontas/Hughes Lane		
Shared-use Path	Between 17th Street and Cedar Street	Mid-term**
Cedar Street		
Shared-use Path	Between Hughes Lane and Campbell Street	Mid-term
Walking Path	Between Hughes Lane and D Street	Mid-term
Crossing Improvements	Intersections with H and D Streets	Mid-term

*Near-term projects should occur within a 0-5 year time horizon depending on the availability of funding

**Mid-term projects should occur within a 5-10 year depending on the availability of funding

Appendix A. Future Traffic Operations

Intersection	
Int Delay, s/veh	15.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	79	144	54	88	41	156	84	36	23	100	5
Future Vol, veh/h	5	79	144	54	88	41	156	84	36	23	100	5
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	100	-	-	-	100	-	0	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	81	81	81	99	99	99	65	65	65
Heavy Vehicles, %	11	11	11	12	12	12	10	10	10	15	15	15
Mvmt Flow	5	85	155	67	109	51	158	85	36	35	154	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	727	665	159	750	633	85	162	0	0	121	0	0
Stage 1	228	228	-	401	401	-	-	-	-	-	-	-
Stage 2	499	437	-	349	232	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.22	6.62	6.32	4.2	-	-	4.25	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.608	4.108	3.408	2.29	-	-	2.335	-	-
Pot Cap-1 Maneuver	328	369	863	315	384	947	1370	-	-	1390	-	-
Stage 1	755	699	-	606	584	-	-	-	-	-	-	-
Stage 2	537	564	-	647	694	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	209	318	862	184	331	947	1370	-	-	1390	-	-
Mov Cap-2 Maneuver	209	318	-	184	331	-	-	-	-	-	-	-
Stage 1	668	682	-	536	517	-	-	-	-	-	-	-
Stage 2	355	499	-	453	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	44.5	4.5	1.4
HCM LOS	B	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	308	862	304	1390	-	-
HCM Lane V/C Ratio	0.115	-	-	0.293	0.18	0.743	0.025	-	-
HCM Control Delay (s)	8	-	-	21.5	10.1	44.5	7.7	-	-
HCM Lane LOS	A	-	-	C	B	E	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	1.2	0.7	5.5	0.1	-	-

Intersection	
Int Delay, s/veh	10.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	79	144	54	88	41	156	84	36	23	100	5
Future Vol, veh/h	5	79	144	54	88	41	156	84	36	23	100	5
Conflicting Peds, #/hr	0	0	1	1	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	100	100	-	-	100	-	0	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	81	81	81	99	99	99	65	65	65
Heavy Vehicles, %	11	11	11	12	12	12	10	10	10	15	15	15
Mvmt Flow	5	85	155	67	109	51	158	85	36	35	154	8

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	727	665	159	750	633	85	162	0	0	121	0	0
Stage 1	228	228	-	401	401	-	-	-	-	-	-	-
Stage 2	499	437	-	349	232	-	-	-	-	-	-	-
Critical Hdwy	7.21	6.61	6.31	7.22	6.62	6.32	4.2	-	-	4.25	-	-
Critical Hdwy Stg 1	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.21	5.61	-	6.22	5.62	-	-	-	-	-	-	-
Follow-up Hdwy	3.599	4.099	3.399	3.608	4.108	3.408	2.29	-	-	2.335	-	-
Pot Cap-1 Maneuver	328	369	863	315	384	947	1370	-	-	1390	-	-
Stage 1	755	699	-	606	584	-	-	-	-	-	-	-
Stage 2	537	564	-	647	694	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	209	318	862	184	331	947	1370	-	-	1390	-	-
Mov Cap-2 Maneuver	209	318	-	184	331	-	-	-	-	-	-	-
Stage 1	668	682	-	536	517	-	-	-	-	-	-	-
Stage 2	355	499	-	453	677	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.9	23.7	4.5	1.4
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1370	-	-	209	318	862	184	417	1390	-	-
HCM Lane V/C Ratio	0.115	-	-	0.026	0.267	0.18	0.362	0.382	0.025	-	-
HCM Control Delay (s)	8	-	-	22.7	20.4	10.1	35.3	18.9	7.7	-	-
HCM Lane LOS	A	-	-	C	C	B	E	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.1	1.1	0.7	1.5	1.8	0.1	-	-

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	5	7	6	5	17	13	380	6	17	396	5
Future Vol, veh/h	5	5	7	6	5	17	13	380	6	17	396	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	55	55	55	85	85	85	69	69	69
Heavy Vehicles, %	9	9	9	0	0	0	6	6	6	5	5	5
Mvmt Flow	5	5	8	11	9	31	15	447	7	25	574	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	886	1112	291	821	1112	227	581	0	0	454	0	0
Stage 1	628	628	-	481	481	-	-	-	-	-	-	-
Stage 2	258	484	-	340	631	-	-	-	-	-	-	-
Critical Hdwy	7.68	6.68	7.08	7.5	6.5	6.9	4.22	-	-	4.2	-	-
Critical Hdwy Stg 1	6.68	5.68	-	6.5	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.68	5.68	-	6.5	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.59	4.09	3.39	3.5	4	3.3	2.26	-	-	2.25	-	-
Pot Cap-1 Maneuver	228	197	685	270	211	782	962	-	-	1082	-	-
Stage 1	421	457	-	540	557	-	-	-	-	-	-	-
Stage 2	705	533	-	654	477	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	186	685	250	200	782	962	-	-	1082	-	-
Mov Cap-2 Maneuver	203	186	-	250	200	-	-	-	-	-	-	-
Stage 1	412	441	-	529	545	-	-	-	-	-	-	-
Stage 2	652	522	-	617	461	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	15.4	0.4	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	962	-	-	275	396	1082	-	-
HCM Lane V/C Ratio	0.016	-	-	0.067	0.129	0.023	-	-
HCM Control Delay (s)	8.8	0.1	-	19	15.4	8.4	0.1	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.4	0.1	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	73	22	14	60	106	23	286	37	120	262	16
Future Volume (veh/h)	16	73	22	14	60	106	23	286	37	120	262	16
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1750	1699	1750	1750	1606	1750	1750	1636	1750	1750	1620	1750
Adj Flow Rate, veh/h	20	92	28	16	69	122	26	329	43	164	359	22
Adj No. of Lanes	0	1	0	0	1	0	0	2	0	0	2	0
Peak Hour Factor	0.79	0.79	0.79	0.87	0.87	0.87	0.87	0.87	0.87	0.73	0.73	0.73
Percent Heavy Veh, %	3	3	3	9	9	9	7	7	7	8	8	8
Cap, veh/h	145	258	71	124	118	187	163	1423	180	499	1005	63
Arrive On Green	0.21	0.22	0.21	0.21	0.22	0.21	0.53	0.55	0.53	0.53	0.55	0.53
Sat Flow, veh/h	123	1169	323	56	534	846	86	2591	327	604	1830	115
Grp Volume(v), veh/h	140	0	0	207	0	0	210	0	188	268	0	277
Grp Sat Flow(s),veh/h/ln	1615	0	0	1436	0	0	1574	0	1430	1096	0	1454
Q Serve(g_s), s	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	2.4	3.3	0.0	3.7
Cycle Q Clear(g_c), s	2.6	0.0	0.0	4.6	0.0	0.0	2.3	0.0	2.4	5.7	0.0	3.7
Prop In Lane	0.14		0.20	0.08		0.59	0.12		0.23	0.61		0.08
Lane Grp Cap(c), veh/h	452	0	0	408	0	0	958	0	786	753	0	799
V/C Ratio(X)	0.31	0.00	0.00	0.51	0.00	0.00	0.22	0.00	0.24	0.36	0.00	0.35
Avail Cap(c_a), veh/h	1287	0	0	1175	0	0	1880	0	1664	1448	0	1692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	0.0	12.5	0.0	0.0	4.1	0.0	4.1	4.9	0.0	4.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.7	0.0	0.0	0.2	0.0	0.3	0.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	0.0	1.9	0.0	0.0	1.1	0.0	1.0	1.7	0.0	1.6
LnGrp Delay(d),s/veh	11.9	0.0	0.0	13.2	0.0	0.0	4.3	0.0	4.4	5.5	0.0	4.9
LnGrp LOS	B			B			A		A	A		A
Approach Vol, veh/h		140			207			398			545	
Approach Delay, s/veh		11.9			13.2			4.4			5.2	
Approach LOS		B			B			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		23.1		11.7		23.1		11.7
Change Period (Y+Rc), s		4.5		4.5		4.5		4.5
Max Green Setting (Gmax), s		40.0		26.0		40.0		26.0
Max Q Clear Time (g_c+I1), s		4.4		4.6		7.7		6.6
Green Ext Time (p_c), s		7.6		0.5		10.9		0.8

Intersection Summary	
HCM 2010 Ctrl Delay	7.0
HCM 2010 LOS	A

10th and Campbell V/C Calculation

2040 No-Build

Future Year 2040 - 12:00-1:00 PM

Cycle Length (C) = 75 seconds
Total Lost Time (L) = 8 seconds

Critical Movement	HCM 2010 Adjusted Flow	HCM 2010 Sat Flow	Flow Ratio
WBLTR	180	1436	0.13
SBLTR	398	2549	0.16
		Sum of Flow Ratios	***0.28***

Xc = Sum of Critical Flow Ratios * (C/C-L)

Xc = ***0.32***

	Vol	Sat Flow	Ratio
EBT	111	1615	0.07
WBT	180	1436	0.13
NBLTR	346	3004	0.12
SBLTR	398	2549	0.16

MOVEMENT SUMMARY

Site: 101 [10th_Broadway_NoBuild]

2040 No-Build
12:00 - 1:00 PM
Site Category: (None)
Stop (Two-Way)

Movement Performance - Vehicles

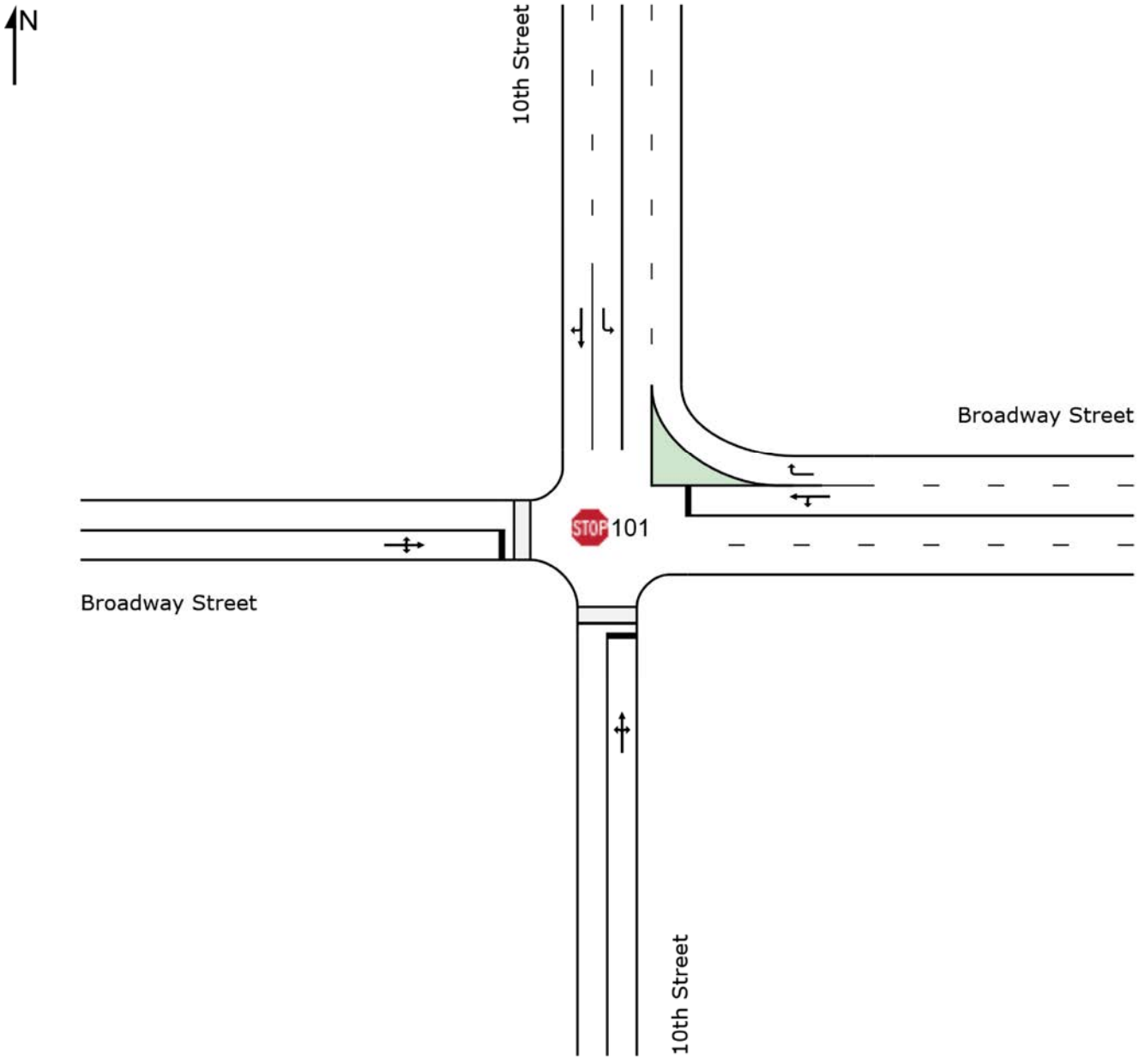
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: 10th Street												
3	L2	6	3.0	0.081	10.1	LOS B	0.3	7.4	0.37	0.31	0.37	20.7
8	T1	32	3.0	0.081	12.9	LOS B	0.3	7.4	0.37	0.31	0.37	20.9
18	R2	7	3.0	0.081	9.3	LOS A	0.3	7.4	0.37	0.31	0.37	20.8
Approach		46	3.0	0.081	12.0	LOS B	0.3	7.4	0.37	0.31	0.37	20.9
East: Broadway Street												
1	L2	11	6.0	0.118	11.9	LOS B	0.4	11.3	0.46	0.38	0.46	23.9
6	T1	62	6.0	0.118	11.5	LOS B	0.4	11.3	0.46	0.38	0.46	24.0
16	R2	237	6.0	0.169	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	28.8
Approach		310	6.0	0.169	2.8	LOS A	0.4	11.3	0.11	0.09	0.11	27.5
North: 10th Street												
7	L2	251	6.0	0.160	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	28.1
4	T1	50	6.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	29.3
14	R2	31	6.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	29.1
Approach		332	6.0	0.160	0.0	NA	0.0	0.0	0.00	0.00	0.00	28.4
West: Broadway Street												
5	L2	30	1.0	0.198	14.8	LOS B	0.8	20.0	0.44	0.38	0.44	20.7
2	T1	78	1.0	0.198	12.2	LOS B	0.8	20.0	0.44	0.38	0.44	20.8
12	R2	8	1.0	0.198	10.1	LOS B	0.8	20.0	0.44	0.38	0.44	20.7
Approach		116	1.0	0.198	12.7	LOS B	0.8	20.0	0.44	0.38	0.44	20.7
All Vehicles		804	5.1	0.198	3.6	NA	0.8	20.0	0.13	0.11	0.13	26.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Minor Road Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [10th_Broadway_NoBuild]

2040 No-Build
12:00 - 1:00 PM
Site Category: (None)
Stop (Two-Way)



HCS7 Warrants Report

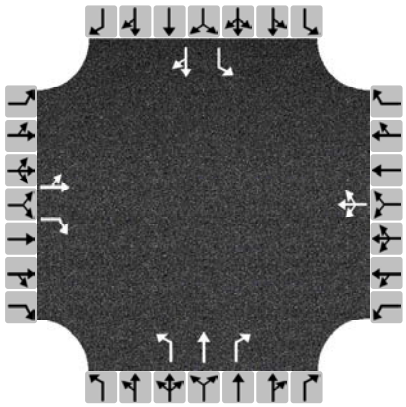
Project Information

Analyst	JLJ	Date	9/21/2021
Agency		Analysis Year	2020
Jurisdiction		Time Period Analyzed	8-Hour
Project Description	Hughes Lane Signal Warrant		

General

Major Street Direction	North-South	Population < 10,000	Yes
Starting Time Interval	9	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	35	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	0	1	1	0	1	0	1	1	1	1	1	0
Lane Usage		LT	R		LTR		L	T	R	L	TR	
Vehicle Volumes Averages (veh/h)	4	45	78	21	42	19	66	39	24	14	45	4
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
09 - 10	258	174	563	0	0	No	No	No	No	No	No	No	No	No
10 - 11	255	202	558	0	0	No	No	No	No	No	No	No	No	No
11 - 12	274	213	597	0	0	No	No	No	No	No	No	No	No	No
12 - 13	322	196	656	0	0	No	No	No	No	No	No	No	No	No
13 - 14	317	173	632	0	0	No	No	No	No	No	No	No	No	No
14 - 15	312	184	602	0	0	No	No	No	No	No	No	No	No	No
15 - 16	303	204	640	0	0	No	No	No	No	No	No	No	No	No
16 - 17	284	195	624	0	0	No	No	No	No	No	No	No	No	No
17 - 18	0	0	0	0	0	No	No	No	No	No	No	No	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
19 - 20	0	0	0	0	0	No	No	No	No	No	No	No	No	No
20 - 21	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	2325	1541	4872	0	0	0	0	0	0	0	0	0	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

HCS7 Warrants Report

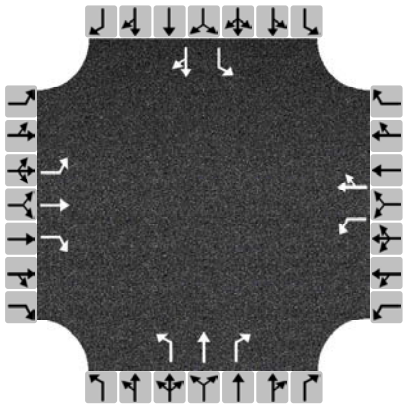
Project Information

Analyst	JLJ	Date	9/21/2021
Agency		Analysis Year	2040
Jurisdiction		Time Period Analyzed	8-Hour
Project Description	Hughes Lane Signal Warrant		

General

Major Street Direction	North-South	Population < 10,000	Yes
Starting Time Interval	9	Coordinated Signal System	No
Median Type	Undivided	Crashes (crashes/year)	0
Major Street Speed (mi/h)	35	Adequate Trials of Crash Exp. Alt.	No
Nearest Signal (ft)	0		

Geometry and Traffic



Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Number of Lanes, N	1	1	1	1	1	0	1	1	1	1	1	0
Lane Usage	L	T	R	L	TR		L	T	R	L	TR	
Vehicle Volumes Averages (veh/h)	5	54	94	26	51	23	164	47	28	17	54	5
Pedestrian Averages (peds/h)	0			0			0			0		
Gap Averages (gaps/h)	0			0			0			0		
Delay (s/veh)	0.0			0.0			0.0			0.0		
Delay (veh-hrs)	0.0			0.0			0.0			0.0		

School Crossing and Roadway Network

Number of Students in Highest Hour	0	Two or More Major Routes	No
Number of Adequate Gaps in Period	0	Weekend Counts	No
Number of Minutes in Period	0	5-year Growth Factor (%)	0

Railroad Crossing

Grade Crossing Approach	None	Rail Traffic (trains/day)	4
Highest Volume Hour with Trains	Unknown	High Occupancy Buses (%)	0
Distance to Stop Line (ft)		Tractor-Trailer Trucks (%)	10

HCS7 Warrants Report

Volume Summary

Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (70%)	1A (56%)	1B (70%)	1B (56%)	2 (70%)	3A (70%)	3B (70%)	4A (70%)	4B (70%)
09 - 10	311	209	677	0	0	No	No	No	No	No	No	No	No	No
10 - 11	306	243	670	0	0	No	No	No	No	No	No	No	No	No
11 - 12	328	255	714	0	0	No	No	No	No	No	No	No	No	No
12 - 13	386	236	788	0	0	No	Yes	No	No	No	No	No	No	No
13 - 14	1389	207	1766	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
14 - 15	374	220	722	0	0	No	Yes	No	No	No	No	No	No	No
15 - 16	363	245	768	0	0	No	Yes	No	No	No	No	No	No	No
16 - 17	339	234	748	0	0	No	Yes	No	No	No	No	No	No	No
17 - 18	0	0	0	0	0	No	No	No	No	No	No	No	No	No
18 - 19	0	0	0	0	0	No	No	No	No	No	No	No	No	No
19 - 20	0	0	0	0	0	No	No	No	No	No	No	No	No	No
20 - 21	0	0	0	0	0	No	No	No	No	No	No	No	No	No
Total	3796	1849	6853	0	0	1	5	1	1	1	0	1	0	0

Warrants

Warrant 1: Eight-Hour Vehicular Volume	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--	
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--	
56% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)	
Warrant 2: Four-Hour Vehicular Volume	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)	
Warrant 3: Peak Hour	✔
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--	
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)	✓
Warrant 4: Pedestrian Volume	
A. Four Hour Volumes --or--	
B. One-Hour Volumes	
Warrant 5: School Crossing	
Gaps Same Period --and--	
Student Volumes	
Nearest Traffic Control Signal (optional)	
Warrant 6: Coordinated Signal System	
Degree of Platooning (Predominant direction or both directions)	
Warrant 7: Crash Experience	
A. Adequate trials of alternatives, observance and enforcement failed --and--	
B. Reported crashes susceptible to correction by signal (12-month period) --and--	
C. 56% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied	
Warrant 8: Roadway Network	
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--	
B. Weekend Volume (Five hours total)	
Warrant 9: Grade Crossing	
A. Grade Crossing within 140 ft --and--	
B. Peak-Hour Vehicular Volumes	

Appendix B. BLTS and PLTS Rating Information

Pedestrian Level of Traffic Stress

- **PLTS 1**- Represents little to no traffic stress and requires little attention to the traffic situation. This is suitable for all users including children 10 years or younger, groups of people and people using a wheeled mobility device (WhMD8). The facility is a sidewalk or shared-use path with a buffer between the pedestrian and motor vehicle facility. Pedestrians feel safe and comfortable on the pedestrian facility. Motor vehicles are either far from the pedestrian facility and/or traveling at a low speed and volume. All users are willing to use this facility.
- **PLTS 2**- Represents little traffic stress but requires more attention to the traffic situation than of which young children may be capable. This would be suitable for children over 10, teens and adults. All users should be able to use the facility but, some factors may limit people using WhMDs. Sidewalk condition should be good with limited areas of fair condition. Roadways may have higher speeds and/or higher volumes. Most users are willing to use this facility.
- **PLTS 3**- Represents moderate stress and is suitable for adults. An able-bodied adult would feel uncomfortable but safe using this facility. This includes higher speed roadways with smaller buffers. Small areas in the facility may be impassable for a person using a WhMD and/or requires the user to travel on the shoulder/bike lane/street. Some users are willing to use this facility.
- **PLTS 4**- Represents high traffic stress. Only able-bodied adults with limited route choices would use this facility. Traffic speeds are moderate to high with narrow or no pedestrian facilities provided. Typical locations include high speed, multilane roadways with narrow sidewalks and buffers. This also includes facilities with no sidewalk. This could include evident trails next to roads or ‘cut through’ trails. Only the most confident or trip-purpose driven users will use this facility.

Pedestrian Level of Traffic Stress

- **BLTS 1**- Represents little traffic stress and requires less attention, so is suitable for all cyclists. This includes children that are trained to safely cross intersections (around 10 yrs. old/5th grade) alone and supervising riding parents of younger children. Generally, the age of 10 is the earliest age that children can adequately understand traffic and make safe decisions which is also the reason that many youth bike safety programs target this age level. Traffic speeds are low and there is no more than one lane in each direction. Intersections are easily crossed by children and adults. Typical locations include residential local streets and separated bike paths/cycle tracks.
- **BLTS 2**- Represents little traffic stress but requires more attention than young children would be expected to deal with, so is suitable for teen and adult cyclists with adequate bike handling skills. Traffic speeds are slightly higher but speed differentials are still low and roadways can be up to three lanes wide for both directions. Intersections are not difficult to cross for most teenagers and adults.

Typical locations include collector-level streets with bike lanes or a central business district.

- **BLTS 3**- Represents moderate stress and is suitable for most observant adult cyclists. Traffic speeds are moderate but can be on roadways up to five lanes wide in both directions. Intersections are still perceived to be safe by most adults. Typical locations include low-speed arterials with bike lanes or moderate speed non-multilane roadways.
- **BLTS 4**- Represents high stress and suitable for experienced and skilled cyclists. Traffic speeds are moderate to high and can be on roadways from two to over five lanes wide for both directions. Intersections can be complex, wide, and or high volume/speed that can be perceived as unsafe by adults and are difficult to cross. Typical locations include high-speed or multilane roadways with narrow or no bike lanes.

Appendix C. Crash Modification Factors

Hotspot or Systemic Application Type	Counter measure Number	Counter measure	Crash Type	Injury, PDO or All	Service Life (Years)	Existing Intersection Traffic Control	Urban or Rural	CRF %	Range of CRF	Reference	Proven Safety Countermeasure	ADA Trigger
Intersection Systemic	**I33**	Curb Extensions	All	All	20	Signalized or Unsignalized	Urban	**30**	30%	Michigan intersection crash reduction factors - https://www.michigan.gov/documents/mdot/mdot_Crash_Reduction_Factors_303744_7.pdf		Likely
Bike/Ped Systemic	**BP1**	Install Pedestrian Countdown Timer(s)	Pedestrian	All	20	Signalized	Urban or Rural	**70**	0 - 70%	CMF Clearinghouse (CMF ID: 5272)		
Bike/Ped Systemic	**BP3**	Install Urban Leading Pedestrian or Bicycle Interval at Signalized Intersection	Bike/Ped Systemic	All	10	Signalized	Urban or Rural	**35**	35%	Signalized Intersections: An informational guide FHWA-SA-13-027 (2013)		
Bike/Ped Systemic	**BP8**	Install Pedestrian Refuge Island	Pedestrian	All	20	None - Roadway	Urban or Rural	**31**	26 - 31%	CMF Clearinghouse (CMF ID: 8799), NCHRP 841	Y- Medians and Pedestrian Crossing Islands in Urban and Suburban Areas	Likely
Bike/Ped Systemic	**BP10**	Install Pedestrian Activated Beacon at Intersection	P & B	All	20	None - Roadway	Urban	**10**	10%	ODOT Engineering Judgement / NCHRP 841		-

Bike/Ped Systemic	**BP15**	Install Continental Crosswalk Markings and Advance Pedestrian Warning Signs at Uncontrolled Locations	Pedestrian	All	10	None - Roadway	Urban or Rural	**15**	15%	FHWA Low-Cost Safety Enhancements for Stop-Controlled and Signalized Intersections		
Bike/Ped Systemic	**BP16**	Install Curb Ramps and Extensions with a Marked Crosswalk and Pedestrian Warning Signs	Pedestrian	All	20	None - Roadway	Urban or Rural	**37**	37%	FHWA Desktop Reference for Crash Reductions Factors		
Bike/Ped Systemic	**BP24**	Install Buffered Bike Lanes	Bicycle	All Injury (Excludes PDO's)	20	None - Roadway	Urban	**47**	N/A	ODOT Engineering Judgement		
Bike/Ped Systemic	**BP29**	Sidewalk	Pedestrian - walking along	All	20	None - Roadway	Urban or Rural	**20**	20%	Engineering Judgement	Y- Walkways	Likely

Appendix D. Detailed Cost Planning Levels Estimates

Total of all Corridors*					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost**
Roadway	Asphalt Concrete Pavement	TON	$ 90	24,600	$ 2,214,000
Roadway	Aggregate Base	TON	$ 40	44,700	$ 1,788,000
Roadway	Concrete Curb	Linear Foot	$ 45	3,200	$ 144,000
Roadway	General Excavation	Each	$ 50,000	6	$ 300,000
Bike/ped	Sidewalk	Square Foot	$ 20	16,000	$ 320,000
Bike/ped	Shared Use Path	Square Foot	$ 14	104,000	$ 1,456,000
Bike/ped	Pedestrian Walkway	Square Foot	$ 14	22,800	$ 319,200
Bike/ped	Curb Extension	Each	$ 10,000	23	$ 230,000
Bike/ped	Curb Ramps	Each	$ 7,500	51	$ 382,500
Bike/ped	Median Refuge	Square Foot	$ 15	160	$ 2,400
Bike/ped	Continental Crosswalk Striping	Each	$ 850	35	$ 29,750
Bike/ped	RRFB	LS	$ 75,000	1	$ 75,000
Bike/ped	Pedestrian Countdown Timer	Each	$ 800	4	$ 3,200
Bike/ped	Leading Pedestrian Interval	Each	$ 2,500	1	$ 2,500
Roadway	Drainage	5%	$ 363,000	1	$ 363,000
Roadway	Illumination	5%	$ 269,000	1	$ 269,000
Roadway	Signing & Striping	3%	$ 218,000	1	$ 218,000
	Contingency	50%	$ 4,058,000	1	$ 4,058,000
	Mobilization	10%	$ 1,217,000	1	$ 1,217,000
	Maintenance of Traffic	5%	$ 609,000	1	$ 609,000
	Erosion Control	2%	$ 243,000	1	$ 243,000
				Total	**$ 14,243,550**

Assumptions and Exclusions*

1. Construction estimate represents 2021 dollars
2. ODOT bid history tabs were used to determine unit prices
3. Full depth pavement replacement is assumed. 9"AC/18"AB
4. A 50% contingency was placed on all bid items listed
5. Mobilization, Maintenance of Traffic, and Erosion Control includes the 30% contingency for these percentage based items
6. Estimates do not include Right-of-way, engineering, construction management, administrative costs, or utility relocations
7. Estimates for each corridor do not include contingency, mobilization, maintenance of traffic, or erosion control

10th Street Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost**
Roadway	Asphalt Concrete Pavement	TON	$ 90	24,600	$ 2,214,000
Roadway	Aggregate Base	TON	$ 40	44,700	$ 1,788,000
Roadway	Concrete Curb	Linear Foot	$ 45	3,200	$ 144,000
Roadway	General Excavation	Each	$ 50,000	4	$ 200,000
Bike/ped	Sidewalk	Square Foot	$ 20	16,000	$ 320,000
Bike/ped	Curb Extension	Each	$ 10,000	23	$ 230,000
Bike/ped	Curb Ramps	Each	$ 7,500	51	$ 382,500
Bike/ped	Median Refuge	Square Foot	$ 15	160	$ 2,400
Bike/ped	Continental Crosswalk Striping	Each	$ 850	27	$ 22,950
Bike/ped	RRFB	LS	$ 75,000	1	$ 75,000
Bike/ped	Pedestrian Countdown Timer	Each	$ 800	4	$ 3,200
Bike/ped	Leading Pedestrian Interval	Each	$ 2,500	1	$ 2,500
Roadway	Drainage	5%	$ 269,000	1	$ 269,000
Roadway	Illumination	5%	$ 269,000	1	$ 269,000
Roadway	Signing & Striping	3%	$ 161,000	1	$ 161,000
				Subtotal	**$ 6,083,550**
	Contingency	50%	$ 3,043,500	1	$ 3,043,500
	Mobilization	10%	$ 912,750	1	$ 912,750
	Maintenance of Traffic	5%	$ 456,750	1	$ 456,750
	Erosion Control	2%	$ 182,250	1	$ 182,250
				Total	**$ 10,678,800**

Cedar Street Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost**
Roadway	General Excavation	Each	$ 50,000	1	$ 50,000
Bike/ped	Shared Use Path	Square Foot	$ 14	38,000	$ 532,000
Bike/ped	Pedestrian Walkway	Square Foot	$ 14	22,800	$ 319,200
Bike/ped	Continental Crosswalk Striping	Each	$ 850	6	$ 5,100
Roadway	Drainage	5%	$ 45,000	1	$ 45,000
Roadway	Signing & Striping	3%	$ 27,000	1	$ 27,000
				Subtotal	**$ 978,300**
	Contingency	50%	$ 486,960	1	$ 486,960
	Mobilization	10%	$ 146,040	1	$ 146,040
	Maintenance of Traffic	5%	$ 73,080	1	$ 73,080
	Erosion Control	2%	$ 29,160	1	$ 29,160
				Total	**$ 1,713,540**

Pocahontas Road and Hughes Lane Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost**
Roadway	General Excavation	Each	$ 50,000	1	$ 50,000
Bike/ped	Shared Use Path	Square Foot	$ 14	66,000	$ 924,000
Bike/ped	Continental Crosswalk Striping	Each	$ 850	2	$ 1,700
Roadway	Drainage	5%	$ 49,000	1	$ 49,000
Roadway	Signing & Striping	3%	$ 30,000	1	$ 30,000
				Subtotal	**$ 1,054,700**
	Contingency	50%	$ 527,540	1	$ 527,540
	Mobilization	10%	$ 158,210	1	$ 158,210
	Maintenance of Traffic	5%	$ 79,170	1	$ 79,170
	Erosion Control	2%	$ 31,590	1	$ 31,590
				Total	**$ 1,851,210**

Appendix VIII. Corridor Specific Cost Estimates

Total of all Corridors*					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost (2024 Dollars)**
Roadway	Asphalt Concrete Pavement	TON	$ 90	24,600	$ 2,384,000
Roadway	Aggregate Base	TON	$ 40	44,700	$ 1,926,000
Roadway	Concrete Curb	Linear Foot	$ 45	3,200	$ 155,000
Roadway	General Excavation	Each	$ 50,000	6	$ 323,000
Bike/ped	Sidewalk	Square Foot	$ 20	16,000	$ 345,000
Bike/ped	Shared Use Path	Square Foot	$ 14	104,000	$ 1,568,000
Bike/ped	Pedestrian Walkway	Square Foot	$ 14	22,800	$ 344,000
Bike/ped	Curb Extension	Each	$ 10,000	23	$ 248,000
Bike/ped	Curb Ramps	Each	$ 7,500	51	$ 412,000
Bike/ped	Median Refuge	Square Foot	$ 15	160	$ 2,500
Bike/ped	Continental Crosswalk Striping	Each	$ 850	35	$ 32,000
Bike/ped	RRFB	LS	$ 75,000	1	$ 80,000
Bike/ped	Pedestrian Countdown Timer	Each	$ 800	4	$ 3,500
Bike/ped	Leading Pedestrian Interval	Each	$ 2,500	1	$ 2,700
Roadway	Drainage	5%	$ 363,000	1	$ 390,000
Roadway	Illumination	5%	$ 269,000	1	$ 290,000
Roadway	Signing & Striping	3%	$ 218,000	1	$ 235,000
	Contingency	50%	$ 4,058,000	1	$ 4,370,000
	Mobilization	10%	$ 1,217,000	1	$ 1,310,000
	Maintenance of Traffic	5%	$ 609,000	1	$ 656,000
	Erosion Control	2%	$ 243,000	1	$ 262,000
				Total	**$ 15,338,700**

Assumptions and Exclusions*

1. Initial construction estimate represents 2021 dollars inflated to 2024 using a 2.5% rate of inflation
2. ODOT bid history tabs were used to determine unit prices
3. Full depth pavement replacement is assumed. 9"AC/18"AB
4. A 50% contingency was placed on all bid items listed
5. Mobilization, Maintenance of Traffic, and Erosion Control includes the 30% contingency for these percentage based items
6. Estimates do not include Right-of-way, engineering, construction management, administrative costs, or utility relocations

10th Street Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost (2024 Dollars)**
Roadway	Asphalt Concrete Pavement	TON	$ 90	24,600	$ 2,384,000
Roadway	Aggregate Base	TON	$ 40	44,700	$ 1,925,000
Roadway	Concrete Curb	Linear Foot	$ 45	3,200	$ 155,000
Roadway	General Excavation	Each	$ 50,000	4	$ 215,000
Bike/ped	Sidewalk	Square Foot	$ 20	16,000	$ 345,000
Bike/ped	Curb Extension	Each	$ 10,000	23	$ 248,000
Bike/ped	Curb Ramps	Each	$ 7,500	51	$ 412,000
Bike/ped	Median Refuge	Square Foot	$ 15	160	$ 2,500
Bike/ped	Continental Crosswalk Striping	Each	$ 850	27	$ 25,000
Bike/ped	RRFB	LS	$ 75,000	1	$ 81,000
Bike/ped	Pedestrian Countdown Timer	Each	$ 800	4	$ 3,400
Bike/ped	Leading Pedestrian Interval	Each	$ 2,500	1	$ 2,600
Roadway	Drainage	5%	$ 269,000	1	$ 290,000
Roadway	Illumination	5%	$ 269,000	1	$ 290,000
Roadway	Signing & Striping	3%	$ 161,000	1	$ 175,000
				Subtotal	$ 6,551,000
	Contingency	50%	$ 3,043,500	1	$ 3,277,000
	Mobilization	10%	$ 912,750	1	$ 983,000
	Maintenance of Traffic	5%	$ 456,750	1	$ 491,000
	Erosion Control	2%	$ 182,250	1	$ 196,000
				Total	**$ 11,498,000**

Cedar Street Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost (2024 Dollars)**
Roadway	General Excavation	Each	$ 50,000	1	$ 54,000
Bike/ped	Shared Use Path	Square Foot	$ 14	38,000	$ 573,000
Bike/ped	Pedestrian Walkway	Square Foot	$ 14	22,800	$ 344,000
Bike/ped	Continental Crosswalk Striping	Each	$ 850	6	$ 5,500
Roadway	Drainage	5%	$ 45,000	1	$ 48,000
Roadway	Signing & Striping	3%	$ 27,000	1	$ 29,000
				Subtotal	**$ 1,054,000**
	Contingency	50%	$ 486,960	1	$ 524,000
	Mobilization	10%	$ 146,040	1	$ 157,000
	Maintenance of Traffic	5%	$ 73,080	1	$ 79,000
	Erosion Control	2%	$ 29,160	1	$ 31,500
				Total	**$ 1,845,500**

Pocahontas Road and Hughes Lane Corridor					
Improvement Type	**Item**	**Unit**	**Unit Price**	**Quantity**	**Cost (2024 Dollars)**
Roadway	General Excavation	Each	$ 50,000	1	$ 54,000
Bike/ped	Shared Use Path	Square Foot	$ 14	66,000	$ 995,000
Bike/ped	Continental Crosswalk Striping	Each	$ 850	2	$ 1,800
Roadway	Drainage	5%	$ 49,000	1	$ 53,000
Roadway	Signing & Striping	3%	$ 30,000	1	$ 33,000
				Subtotal	**$ 1,136,000**
	Contingency	50%	$ 527,540	1	$ 568,000
	Mobilization	10%	$ 158,210	1	$ 170,000
	Maintenance of Traffic	5%	$ 79,170	1	$ 85,000
	Erosion Control	2%	$ 31,590	1	$ 34,000
				Total	**$ 1,993,000**

Appendix IX. Comprehensive Plan Policy and Code Amendments

MEMORANDUM

Comprehensive Plan Policy and Code Amendments
Northern Baker Transportation Improvement Plan

DATE	December 27, 2021, Revised February 25, 2022
TO	Project Management Team
FROM	Darci Rudzinski and Clinton "CJ" Doxsee, APG
CC	FILE

OVERVIEW

This memorandum recommends an approach for amending Baker County's and Baker City's regulations to reflect the vision, goals, and proposed corridor design concepts identified in the Northern Baker Transportation Improvement Plan (NBTIP). This memorandum identifies recommended amendments to the following documents to ensure consistency with and implement the NBTIP:

- Baker County Comprehensive Plan
- City of Baker City Comprehensive Plan
- Baker City Development Code

The NBTIP provides a vision and guidance for the future development of three key City corridors: 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road. The intent of the plan is to facilitate safe and comfortable travel along and across the corridors by all modes. It identifies transportation concepts tailored to the unique characteristics of each corridor.

POLICY AND CODE AMENDMENT SUMMARY

Baker City and Baker County must amend land use regulations to implement the NBTIP and to achieve the NBTIP's vision. This vision is achieved through a variety of measures, including adoption of the plan itself, as well targeted amendments to development code requirements.

This section summarizes recommendations for Baker County and Baker City to assist with adopting and implementing the NBTIP. To implement the NBTIP, the following adoption actions are recommended.

- **Baker County Comprehensive Plan** – The County should have findings and policies in its adopted plan consistent with NBTIP recommendations. Findings and policy statements related to the County's transportation system are in Goal XII - Transportation. It is recommended that the County update these to recognize the NBTIP and incorporate the plan by reference.
- **Baker City Comprehensive Plan** – The subject corridors are within the City of Baker; the City should have findings and policies in its adopted plan to reflect the NBTIP planning process and its recommendations. It is recommended that the City update the Transportation chapter of the Comprehensive Plan to recognize the NBTIP and incorporate it by reference.
- **Baker City Development Code** – Aspects of the plan are implemented through the City's land use regulations. The City should amend its landscape, parking, and transportation standards in the Development Code to support economic development and enhance the pedestrian environment.

Baker County Comprehensive Plan

Baker County's Comprehensive Plan serves as the long-range policy guide for land use and transportation planning in unincorporated areas of the County. The Comprehensive Plan includes findings and policies that address each of the 14 applicable Statewide Planning Goals. Policies in Chapter XII provide direction for improving and maintaining the County's transportation systemin unincorporated County areas.

The County can adopt the NBTIP by reference through an amendment to its Comprehensive Plan. As proposed, the amendment would recognize the NBTIP as a refinement to the County's Transportation System Plan – the transportation element of the Comprehensive Plan.[1] This will allow the County to coordinate efforts with the City in implementing future improvements that will affect both jurisdictions.

Attachment A includes recommended Comprehensive Plan policy language to adopt the NBTIP by reference.

Baker City Comprehensive Plan

In order to make adopted City policy consistent with the NBTIP, the Baker City Comprehensive Plan should be updated to incorporate the NBTIP's vision, goals, and proposed corridor design concepts by reference. Through legislatively adopting the NBTIP by reference, the NBTIP will provide the policy framework on which to base compliance-related development requirements and seek public financing for recommended improvements.

Baker City's Comprehensive Plan provides long-range policy guidance for areas within the City's urban growth boundary (UGB). The City's Comprehensive Plan includes findings and policies that

[1] Note, there are no proposed changes to the County's physical Transportation System Plan document. Where the Transportation System Plan and NBTIP conflict, the NBTIP will govern.

address each of the applicable Statewide Planning Goals; the Transportation chapter includes policy guidance for the City's transportation system.

The Comprehensive Plan Transportation chapter should be modified to incorporate the NBTIP by reference. As proposed, the amendment would recognize the NBTIP as a refinement to the City's Transportation System Plan – the transportation element of the Comprehensive Plan.[2] Recommended changes include updated findings based on the plan as well as policy language recognizing the plan and communicating the City's commitment to implement it.

Attachment B includes recommended Comprehensive Plan policy language.

Baker City Development Code Recommendations

Baker City's development standards are provided in the Baker City Development Code (Code). The development standards implement the Comprehensive Plan and guide land use and development within the City's UGB.

It is recommended that targeted modifications to the Code be completed to ensure consistency with and to implement the NBTIP. Table 1 is a summary of recommended amendments to the City's development requirements; following the table are the findings in support of the change. The landscaping and parking recommendations were described in *Technical Memorandum #2: Context & Site Analysis.* The transportation standards recommendations were identified as the preferred alternatives in *Technical Memorandum #6: Transportation Solutions Analysis.*

Implementing transportation facility designs through development approval can improve safety for all people who use the roadway and make the overall transportation network operate better. On-site design elements like landscaping can support economic development by creating attractive environments that encourage visitors and enhance pedestrian activity.

Table 1: Development Code Recommended Amendments

Topic	Summary	Code Section
1. Parking	Update the minimum parking requirements for Restaurant uses, a subcategory of the Retail and Service use, to reduce barriers to site development.	Chapter 3.3
2. Parking Exceptions	Clarify existing provisions that allow an applicant to request lower parking requirements.	Chapter 3.3

[2] Note, there are no proposed changes to the City's physical Transportation System Plan document. Where the Transportation System Plan and NBTIP conflict, the NBTIP will govern.

Topic	Summary	Code Section
3. Transportation Standards	Update the transportation standards for minimum rights-of-way and street cross sections to incorporate the recommended design concepts in the NBTIP.	Chapter 3.4

The following describes the rationale behind the recommended Code amendments. Attachment C includes recommended code language to implement the NBTIP.

1. Parking

The amount of space needed for parking limits the area on a site for structures and other improvements and has a significant effect on the cost of development. Reducing the minimum parking requirements and providing a process to waive parking requirements allows commercial developers to use less space for parking and have more area for buildings or other site amenities.

The project team completed two hypothetical land use development scenarios to evaluate the development or redevelopment potential for an average site adjacent to 10th Street (see *Technical Memorandum #4: Preliminary Concept Design*). The scenarios focused on a commercial use with two variations and a mixed-use residential use. Each scenario presented a relatively intense level of development consistent with the maximum of what is allowed under the current Code.

Among the commercial use variations, the evaluation found that more than half of a site would be dedicated to meeting parking requirements for a restaurant approximately 9,000 square feet in size. By comparison, a retail use such as an Ace Hardware store or Dollar General, would potentially be able to construct a building more than twice the size with almost half as much required parking.

Table 2: Commercial Use Scenario Summaries

Characteristic	Retail Use	Restaurant Use
Lot	0.75 acres	0.75 acres
Structure	19,000 square feet (58%)	8,900 square feet (27%)
Parking Spaces	38 stalls	71 stalls
Parking Area	9,500 square feet (29%)	17,800 square feet (54%)
Landscaping	2,287 square feet (7%)	2,287 square feet (7%)
Walkways/Amenities	1,900 square feet (6%)	3,560 square feet (11%)

This memorandum recommends reducing the existing minimum parking requirement for restaurant uses from eight (8) spaces per 1,000 square feet down to four (4) spaces per 1,000 square feet. This would effectively increase the development potential for restaurant uses while still requiring an adequate amount of parking for patrons in most situations. The recommended modification would still require more parking compared to a retail use, reflecting a restaurant's higher general occupancy and turnover. Implementing the proposed change would not prohibit a developer from providing more parking than the minimum required.

2. Parking Exceptions

To further support the recommended parking requirement modifications, the City should also clarify existing regulations that allow for reductions to the minimum parking requirements. Allowing for reductions to minimum parking requirements would enable compact, pedestrian-oriented development for uses that do not have a need or generate a demand for excessive parking. A secondary benefit would be potentially lowering the overall cost of development.

Currently, the City allows reductions to the minimum parking requirements, however the enabling language is embedded in the minimum standards. It is recommended that the existing provisions be established as its own provision under a new exceptions section in Section 3.3.300. This exception section would also include another existing provision that provides an exception to parking requirement in the Central Commercial Zone.

3. Transportation Standards

The NBTIP planning process developed design concepts for three key corridors to support equitable access to transportation for users of all ages and abilities. The improvements were developed in partnership with Oregon Department of Transportation and guided by an advisory committee of impacted stakeholders. The designs include facilities to accommodate walking and bicycling along the corridors and the plan provides suggested connections to and enhancements of the larger network of streets and pathways connecting to the corridors.

The City's Code implements street design standards for all corridors within the City through a system of street classification and corresponding street design standards. Each street classification balances accessibility and mobility through defining the type, quantity, and size of street designs elements.

The NBTIP has tailored these design standards to the unique circumstances of each corridor; 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road. The street design standards in the Code should be amended to include the refined standards associated with each of the three corridors to ensure the future development and redevelopment are consistent with the NBTIP's vision and goals.

ATTACHMENT A: BAKER COUNTY COMPREHENSIVE PLAN AMENDMENT RECOMMENDATIONS

The following modifications implement the recommendations of the *Northern Baker Transportation Improvement Plan*. Recommended changes are in an adoption-ready format; text that is recommended to be added is shown as underlined, and text recommended to be removed is shown in strikeout.

GOAL XII ELEMENT, TRANSPORTATION

TRANSPORTATION GOAL: To provide and encourage a safe, convenient and economic transportation system.

…

II. GOAL XII TRANSPORTATION FINDINGS

The county governing body finds that:

1. Roads and Highways: The principal primary and secondary roads and highways are indicated on the "Road Index Map, Baker County Oregon 1979" as prepared by the Oregon State Highway Division in cooperation with the U.S. Department of Transportation, Federal Highway Administration.

2. The Oregon Department of Transportation has prepared and published a "County Road Inventory Description Record For Baker County, 6/05/80". Such inventory is used in conjunction with the Road Index Map.

3. The City and County of Baker have adopted an "Airport Master Plan, Baker Municipal Airport, December 1978". Such airport is considered to be an economic alternative mode of transportation in the county. Improvements and expansion of the airport are underway as a cooperative function of local, state and federal government.

   The County has adopted an Airport Development Zone that limits construction and uses within the area. Furthermore, an Airport Overlay Zone has been adopted to limit uses in approach areas of the airport. Height limitations and restrictions on uses producing interference to aircraft were included in the original Airport Zoning Ordinance of 1975 and whose restrictions are still in effect. These planning documents for the Baker Airport have been reviewed and approved by the Aeronautics Division of the State Department of Transportation. See following page.

4. Mass transit, interstate rail, and bus passenger and freight services in and through the county are considered to be economic alternative modes of transportation.

5. Transportation pipelines existing in the county (natural gas and petroleum distillates) are considered to be economic alternative modes of transportation.

6. The private automobile will continue to be the most practical mode of intra-county transportation in the forseeable future.

7. Bicycle and pedestrian modes are not practical year around methods of transportation outside the boundaries of the cities.

8. The Northern Baker Transportation Improvement Plan identifies improvements along 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road to enhance multi-modal mobility

and safety. Identified improvements in unincorporated County areas will require coordination between Baker City and the County before final design and construction.

III. GOAL XII TRANSPORTATION POLICIES

The County Governing Body declares that:

1. Seldom are transportation improvements under the exclusive direction of county government. Therefore, some of the following policies are adopted by the County as recommendations to other public agencies.

   a. The Secretary of Agriculture, pursuant to Section 8(c) of Public Law 94-199, December 31, 1975, should provide improved roads from Baker County to scenic views of and from the Western rim of Hells Canyon. It should be noted that the Hells Canyon National Recreation Area Comprehensive Management Plan is under appeal to the Secretary of Agriculture. The USFS preferred alternative to "C" includes access to P.O. Saddle and beyond to Lookout Mountain. Beyond that to Saddle Creek is non-vehicular access until access begins at Sour Apple Flat and on to Lord Flat. In short, the rim of the canyon does have improved access to and along part of the rim but not its entire length.

   b. Burnt River Canyon Road should be included in the Oregon State Highway System. Such road should provide improved access from Highway 245 on the southern slope of Dooley Mountain to the Interstate Highway at Durkee. It is noted that no plans exist within the State Department of Transportation to include this road in the state system as it does not meet their standards.

   c. Lands surrounding the airport shall be protected from development that is incompatible with the airport.

   d. Serious consideration shall be given to the formation of a broad based Airport Authority or Port District to own and operate the Baker Municipal Airport.

   e. U.S. Forest Service should be encouraged to complete the North Pine Road to an improvement standard similar to the connecting forest service road in Wallowa County.

   f. Local terminals for industrial and commercial consumption of pipeline products should be made available when needed to support economic development of the county.

   g. Interstate rail and bus passenger and freight service should continue to be available in the county.

   h. Local mass transit (private) passenger services shall be expanded as the need and economic practicality becomes apparent.

   i. Public subsidized bus transportation shall be continued for the transportation disadvantaged as the need is demonstrated and budgetary priorities will allow.

   j. The rural nature of Baker County exerts very limited demand for either foot or bicycle paths. To the degree that such demand exists, Baker County will cooperate with the State Department of Transportation in supporting these features.

   k. Baker County supports the attempt to reinstate a regularly scheduled commuter airline serving Baker County residents and businesses.

2. It shall be County policy to plan, construct and maintain county roads to acceptable standards having first considered safety, use, and economics.

3. The Northern Baker Transportation Improvement Plan has been adopted in 2022 as a refinement plan to the County's Transportation System Plan. The Northern Baker Transportation Improvement Plan provides policies and identifies improvements for portions of 10th Street, Cedar Street, Hughes Lane, and Pocahontas Road.

ATTACHMENT B: BAKER CITY COMPREHENSIVE PLAN AMENDMENT RECOMMENDATIONS

The following modifications implement the recommendations of the *Northern Baker Transportation Improvement Plan*. Recommended changes are in an adoption-ready format; text that is recommended to be added is shown as underlined, and text recommended to be removed is shown in strikeout.

TRANSPORTATION

GOAL: To provide a safe, efficient and convenient transportation system realizing maximum mobility for the community's citizens.

FINDINGS:

1. The City has developed a Public Facility Plan in conformance with rule requirements for Statewide Planning Goal 11, which includes planning requirements for transportation.
2. The City has more than 86 miles of street right-of-way within its corporate limits.
3. Streets, roads, and highways lend themselves to classification by their level of use. For purposes of this plan, designated state highways carrying through-city traffic and serving also as principal cross-town routes for local transportation are classified as Arterials. Traffic collectors, bridging residential areas with Arterials, are termed Collectors. This designation is also applied to a number of streets which serve the primary purpose of providing access to business and industry. The remaining streets are principally for access to the abutting properties and are termed Local streets.
4. The following public and freight transportation is presently available:
    a) AIR: Charter, air ambulance and limited freight service can be available at the Baker Municipal Airport (located approximately three miles north of the city).
    b) BUS: Interstate bus service is provided by Greyhound Lines on a regular schedule.
    c) RAIL: Union Pacific handles freight (in carload lots).
    d) TAXI: Baker Cab, franchised by the City, is available for local point-to-point transportation.
    e) LOCAL BUS TRANSIT: Northeast Oregon Public Transit operates Baker City Trolley, providing a single, two-way route from the east side of Baker to the west six days per week, and linking NEOtransit services in La Grande, Halfway, and Wallowa County. There is also demand-responsive and ADA para-transit service available to residents and others in Baker City.
5. Many older streets in town are in need of patching and resurfacing. In addition, a few will require base or curb construction.
6. There are some 9.64 miles of unpaved, but open, streets.

7. The City presently has 60.61 miles of paved streets, 9.64 miles of gravel streets, and 11.47 of platted but unopened streets. Of the 60.61 paved miles, 38.96 miles were determined in 2013 to be in very good or good condition.

8. Key transportation needs include:

   a) Sidewalk infill along key east-west and north-south roadways.

   b) Formal designation of Neighborhood Routes along key east-west and north-south roadways.

   c) Expansion of the multi-use pathway network.

   d) Refinements to the overall roadway functional classification system including Special Transportation Area (STA) and Urban Business Area (UBA) overlay designations to key segments of the state highway network.

   e) Expansion of the existing roadway grid to serve potential future development.

   f) Enhancements to major intersections and roadway segments to accommodate future growth or address safety concerns.

9. At the airport, the main runway, 13-31, was totally reconstructed during 1983-84 and received an overlay in 2002. Runway 17-35 received and overlay in 1991 and was sealed in 2004. The Airport Master Plan, updated in 2010, provides that Runway 17-35 will be maintained to a lesser level of readiness than the main runway, 13-31.

10. Sidewalks are now found in nearly all areas of town with streets developed to primary standard. In other areas, existence of sidewalks is spotty. Although some areas are less critical due to the nature of existing and planned development or the volume of foot traffic, other areas would benefit from sidewalk infill projects. Sidewalk infill is proposed on designated neighborhood routes as well as on higher volume streets and school walking routes; such projects provide important access to destinations such as local parks, schools, and shopping areas. Where sidewalk infill is not proposed, there is either a sidewalk already existing or low motor vehicle volumes and speeds support walking on the street.

11. Baker City has a well-connected network of neighborhood streets that are comfortable for walking and bicycling. The TSP identifies a network of "Neighborhood Routes" to improve access to destinations throughout the city. Implementation of this network includes:

   a) Sidewalk installation along pedestrian network gaps

   b) Crossing enhancements where neighborhood routes cross major streets

   c) Wayfinding such as signs and/or pavement markings to identify neighborhood routes and direct pedestrians and bicyclists to key destinations; and

   d) Low traffic volumes and speeds, which support bicycling without separate bicycle lanes.

12. The City has developed a prioritized list of planned roadway extensions, roadway modifications, and intersection improvements as part of its Transportation System Plan.

13. The I-84 Exits 302 and 306 Interchange Area Management Plan (IAMP) shall serve as the long range comprehensive management plan for providing the transportation facilities that are specifically related the two interchanges and the planned local street network for the area.

14. The City will coordinate development review with and assist ODOT in monitoring interchange development to protect interchange functions, as follows:

    a) The primary function of the I-84 Exit 302 interchange is to provide truck and vehicular access to northern Baker City and OR 86, including the industrial lands along Best Frontage Road and at the Baker City Airport. A secondary function is to provide an alternative access to central Baker City and to US 30.

    b) The primary function of Exit 306 is to provide access to downtown and southern Baker City, particularly for individuals coming from the east. A secondary function is to provide access to various regional visitor attractions, such as Phillips Reservoir and the historic mining town, the City of Sumpter.

15. The Northern Baker Transportation Improvement Plan provides a vision for improving the multi-modal mobility and safety for portions of three key corridors in the City: 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road.

16. The Northern Baker Transportation Improvement Plan identifies a network of Bicycle Boulevards to support improvements in the vicinity of 10th Street and along Hughes Lane and Cedar Street.

POLICIES:

1. The City will take steps to assure that the Transportation System Plan and Public Facility Plan are coordinated, particularly with regard to recommended capital improvements.
2. The City shall determine street status designation on a continuing basis.
3. Street construction standards, signaling, signing, and all services (for example, sweeping and snow removal) shall correspond with these designations and be appropriate to the particular street's design and use.
4. The City shall designate truck routes and enforce their use where necessary and desirable.
5. The City will strive to facilitate variety and adequacy of the transportation services available to the community.
6. The City shall repair, construct new, and generally upgrade its streets to the greatest extent possible recognizing monetary constraints.
7. Airport facilities shall be maintained at a level which is adequate for the safety of its use and protects the capital investment in existing improvements. In addition, the City shall prohibit structures either within city limits or the Urban Growth Boundary that impact on the airport conical surface.
8. Sidewalks shall be provided in new subdivisions and pursuant to Development Code requirements for reasons of safety, ease of pedestrian movement, and as a buffer between street and privately-owned land uses. The City may accept interim improvements, and may pursue grants for infill sidewalk projects that cannot otherwise be provided through development exactions.
9. Bike lanes shall be provided as designated by the Bicycle Network Plan to make bicycling safe, enjoyable and an efficient alternative to local motorized transport. Potential recreational use shall be considered as well, particularly in designating routes inappropriate for motor vehicle traffic.

10. Multi-use paths are appropriate in the general locations shown on the Pedestrian and Bicycle Network Plans. Where there is property owner support for creating multi-use paths, the City will work cooperatively with property owners and pursue grants to develop multi-use paths. The City may also adopt incentives for pathway development, for example, through transportation system development charge credits and/or adjustments to open space and/or standard subdivision improvement requirements. (These options would require amending the Development Code.)

11. Any proposed public right-of-way extension, opening, addition, widening, or improvement, closure or vacation must be formally approved and accepted by the City, pursuant to Development Code provisions and the 2013 Baker City Transportation System Plan, and any amendments thereto. Also, any private use of any public right-of-way must receive prior approval. The City may, at its discretion, require certain improvements be made or make other stipulations as a condition to the City's acceptance of any street or alley use. This is done specifically for reasons of the City's liability in public right-of-way, maintenance obligation, police patrol, fire access and responsibility generally for the public peace, safety and welfare.

12. The City of Baker City will address access concerns in the development of new streets and the management of the existing ones. In addressing these concerns, the City shall coordinate with ODOT and avoid conflicts with State Highway Access Management Rules, and:

    a) Support the ODOT Special Transportation Area (STA) designation of the state highway segments outlined in Table 1. The STA designation would acknowledge Baker's historic development pattern, including the presence of on-street parking.

    b) Support the ODOT Urban Business Area (UBA) designation of the state highway segments outlined in Table 1. The UBA designation would acknowledge the unique access characteristics and potentially streamline the permit process for uses in these areas.

Table 1: Recommended Special Transportation Area (STA) and Urban Business Area (UBA) Designations

[Table omitted from Attachment. No changes recommended to Table 1]

13. The City shall continue to encourage the provision of bus service for senior citizens and otherwise transportation disadvantaged persons, in coordination with transit and social service providers.

14. <u>The 2022 Northern Baker Transportation Improvement Plan has been adopted as a refinement plan to the Transportation System Plan, the transportation element of the Comprehensive Plan. The Northern Baker Transportation Improvement Plan provides policies and identifies improvements for portions of 10th Street, Cedar Street, and Hughes Lane/Pocahontas Road. The Plan also identifies a network of Bike Boulevards to support improvements in the vicinity of 10th Street.</u>

IMPLEMENTATION:

1. Figure 3-1 identifies significant transportation routes within the city, and classifies them as Arterials and Collectors (as defined in the Findings section, Item 3). Planned and possible future extensions of Arterials and Collectors needing additional right-of-way are also noted.

(None of these classifications considers the present condition of any street other than the fact of its being open or not.) These designations will be reviewed at a minimum of once yearly by the City staff who will recommend needed changes or adjustments.

2. The City's Public Works Department shall review annually and recommend needed changes or adjustments in the previously adopted street standards that pertain to construction, signaling, signing, and all street related services.

3. The City shall make effective use of all available resources in order to retain all transportation service presently available and to re-acquire, if possible, commuter airline service. The City shall also be receptive to new alternatives that appear in the best interests of the community's residents.

4. The City shall implement its highest priority transportation projects. The Public Works Department shall, pursuant to available funding, schedule projects in advance in order to provide sufficient lead time in planning and coordinating all necessary elements. Criteria for project selection shall include the following:

    a) Implementation of plan goals and policies with specific reference to map of planned transportation network.

    b) Present and anticipated public need, use (traffic counts, if available), density of development in area to be served.

    c) Condition of existing streets.

    d) Public demand, petition by owners, number of owners, and length of time request on file.

    e) Relationship to other planned or anticipated improvements or development either public of private.

    f) Use classification, traffic flow and safety.

    g) Relationship to existing paved streets (logical extension or isolated improvements?).

    h) Engineering considerations:

        i) General feasibility.

        ii) Right-of-way (possible acquisition required?);

        iii) Cost of construction with respect to area conditions such as soils, slope, groundwater, or ditches.

        iv) Size of project as relates to time and cost;

        v) Capability of other utilities to keep pace with construction;

        vi) Special problems or conditions;

    i) Annual 'balance' of type and size of projects.

5. The City shall integrate the above extension and bridge proposals and the street construction program as part of the general capital improvement plan.

6. The City shall integrate pedestrian and bicycle improvements with its Capital Improvement Program.

7. The City has adopted an Airport Master Plan. The City shall continue to coordinate efforts to obtain federal financing which will make the capital improvements program set forth in said Master Plan possible.

8. The City shall take any and all lawful actions as it sees fit to continually insure that any use of or action affecting a public right-of-way will follow established City ordinances and policies and is in the public interest.

9. The City through its Development Code shall ensure the provision of adequate multi-modal transportation facilities needed to serve development.

10. The City supports efforts to work with the County and ODOT in pursuit of funding for Interchange Area Management Plan (IAMP) interchange projects.

11. The City supports efforts to work with the County and ODOT in pursuit of funding for the improvements identified in the Northern Baker Transportation Improvement Plan.

ATTACHMENT C: BAKER CITY DEVELOPMENT CODE AMENDMENT RECOMMENDATIONS

The following modifications implement the recommendations of the *Northern Baker Transportation Improvement Plan*. Recommended changes are in an adoption-ready format; text that is recommended to be added is shown as underlined, and text recommended to be removed is shown in strikeout.

Chapter 3.2 – Landscaping, Street Trees, Fences, and Walls

…

3.2.300 Landscaping

A. Applicability. This Section shall apply to all new developments requiring Site Design Review.

B. Landscape Plan Required. A landscape plan is required. All landscape plans shall conform to the requirements in Chapter 4.2.500, Section B.5 (Landscape Plans).

C. Landscape Area Standards. The minimum percentage of required landscaping equals:

1. Residential Zones (multifamily): R-LD: 10% of site; R-MD and R-HD 7% of site.

2. Central Commercial Zone: 0-5% percent of the site dependent on parcel and site plan.

3. General Commercial Zone: Campbell Street and Freeway Area – 10% of site; all other general commercial areas – 7%.

4. General Industrial Zone and Light Industrial Zone: Zero percent of the site except that the approval body may require landscaping, fences, walls or other buffering that exceed the 0% landscaping standards when it finds through Site Design Review (Chapter 4.2), Conditional Use Permit review (Chapter 4.4), and/or Master Planned Development review (Chapter 4.5), as applicable, that more or different buffering is necessary to mitigate adverse noise, light, glare, and/or aesthetic impacts to adjacent properties or public roads.

D. Landscape Materials. Permitted landscape materials include trees, shrubs, grass, ground cover plants, non-plant ground covers, and outdoor hardscape features, as described below. "Coverage" is based on the projected size of the plants at maturity, i.e., typically three (3) or more years after planting.

[This sub-section omitted from Attachment. No changes are recommended these standards.]

E. Landscape Design Standards. All yards, parking lots, and required street tree planter strips shall be landscaped to provide, as applicable, erosion control, visual interest, buffering, privacy, open space and pathway identification, shading, and wind buffering, based on the following criteria:

1. Yard Setback Landscaping. Landscaping in yards shall:

   a. Provide visual screening and privacy within side and rear yards; while leaving front yards and building entrances mostly visible for security purposes;

   b. Use shrubs and trees as wind breaks;

   c. Retain natural vegetation;

   d. Define pedestrian pathways and open space areas with landscape materials;

   e. Provide focal points within a development, for example, by preserving large or unique trees or groves, hedges, and flowering plants;

   f. Use trees to provide summer shading within common open space areas and within front yards when street trees cannot be provided;

   g. Use a combination of plants for year-long color and interest;

   h. Use landscaping to screen outdoor storage and mechanical equipment areas, and to enhance graded areas such as berms, swales, and detention/retention ponds.

2. Parking areas. <u>All of the following standards shall be met for parking lots. If a development contains multiple parking lots, then the standards shall be evaluated separately for each parking lot.</u>

   <u>a.</u> <u>A minimum of 5 percent of the total surface area of all parking areas, as measured around the perimeter of all parking spaces and maneuvering areas, shall be landscaped. Such landscaping shall consist of "evenly distributed" shade trees with shrubs and/or ground cover plants that conform to the criteria in Section 3.2.300.E.1.a-h, above. "Evenly distributed" means that the trees and other plants are distributed around the parking lot perimeter and between parking bays to provide a partial canopy. At a minimum, one tree per six (6) parking spaces on average shall be planted to create a partial tree canopy over and around the parking area.</u>

   <u>b.</u> <u>All parking areas with more than 20 spaces shall include landscape islands with trees to break up the parking area into rows of not more than 12 contiguous parking spaces. All parking area landscapes shall have dimensions of not less than 24 ft2 of area, or not less than 4 feet in width by 6 feet in length, to ensure adequate soil, water, and space for healthy plant growth.</u>

   <u>c.</u> <u>Wheel stops, curbs, bollards, or other physical barriers are required along the edges of all vehicle-maneuvering areas to protect landscaping from being damaged by vehicles. Trees shall be planted not less than two feet from any such barrier.</u>

d. Trees planted in tree wells within sidewalks or other paved areas shall be installed with root barriers, consistent with applicable nursery standards.

3. Protecting Landscaping/Buildings. Buffering and screening are required under the following conditions:

a. Parking/Maneuvering Area Adjacent to Streets and Drives. Where a parking or maneuvering area is adjacent and parallel to a street or driveway, an evergreen hedge; decorative wall (masonry or similar quality material) with openings; arcade, trellis, or similar partially opaque structure 3-4 feet in height shall be established between street and driveway. The required screening shall have breaks, where necessary, to allow pedestrian access to the site. The design of the wall or screening shall also provide breaks or openings for visual surveillance of the site and security. Evergreen hedges used to comply with this standard shall be a minimum of 36 inches in height at maturity, and shall be of such species, number, and spacing to provide the required screening within one (1) year after planting. Any areas between the wall/hedge and the street/driveway line shall be landscaped with plants or other vegetative ground cover. Alternatively, an 8-foot-wide planting strip with street trees subject to review by the Tree Board may fulfill the screening requirement.

b. Parking/Maneuvering Area Adjacent to Building. Where a parking or maneuvering area, or driveway, is adjacent to a building, the area shall be separated from the building by a curb and a raised walkway, a plaza, or a landscaped buffer not less than 5 feet in width. Raised curbs, bollards, wheel stops, or other design features shall be used to protect pedestrians, landscaping, and buildings from being damaged by vehicles. Where parking areas are located adjacent to residential ground-floor living space, a 4-foot wide landscape buffer with a curbed edge may fulfill this requirement.

c. Screening of Mechanical Equipment, Trash Receptacles, Outdoor Storage and Manufacturing, Service and Delivery Areas, and Other Screening When Required. All mechanical equipment, trash receptacles, outdoor storage and manufacturing, and service and delivery areas, shall be screened from view from all public streets and adjacent Residential zones. When these or other areas are required to be screened, such screening shall be provided by:

i. a decorative wall (i.e., masonry or similar quality material),

ii. evergreen hedge,

iii. opaque fence complying with Section 3.2.500, or

iv. a similar feature that provides an opaque barrier.

Walls, fences, and hedges shall comply with the vision clearance requirements and provide for pedestrian circulation, in accordance with Chapter 3.1 - Access and Circulation. (See Section 3.2.500 for standards specific to fences and walls.)

d. Flag Lot Screen. In approving a flag lot, the City may require a landscape screen and/or fence be installed along property line(s) of the flag lot, for privacy of adjoining residents, in accordance with the provisions of Section 4.3.115. A flag lot screen shall not be required if the abutting property owner(s) indicate in writing that they do not want a screen or fence, however, the owner may install one at his or her discretion.

Figure 3.2.300.E General Landscape Areas (Typical)

[This figure omitted from Attachment. No changes are recommended this figure.]

F. Maintenance and Irrigation. The use of drought-tolerant plant species is encouraged, and may be required when irrigation is not available. Irrigation shall be provided for plants that are not drought-tolerant. If the plantings fail to survive, the property owner shall replace them with an equivalent specimen (i.e., evergreen shrub replaces evergreen shrub, deciduous tree replaces deciduous tree, etc.). All man-made features required by this Code shall be maintained in good condition, or otherwise replaced by the owner.

…

Chapter 3.3 – Parking and Loading

…

3.3.300 Automobile Parking Standards

A. Vehicle Parking - Minimum Standards by Use. The number of required off-street vehicle parking spaces shall be determined in accordance with the standards in Table 3.3.300.A, or alternatively, through a separate parking demand analysis pursuant to Section 3.3.300.B.2 ~~prepared by the applicant and subject to a Type I Review, Type II Review, or Type III review dependent upon the classification of the application~~. Where a use is not specifically listed in this table, parking requirements are determined by finding that a use is similar to one of those listed in terms of parking needs, or by estimating parking needs individually using the demand analysis option described above. Parking that counts toward the minimum requirement is parking in garages, carports, parking lots, bays along driveways, shared parking, and qualifying on-street parking.

B. Exceptions and Reductions to Off-street Parking

1. Central Commercial Zone – Minimum Standards. There is no minimum number of off-street parking spaces required in the Central Commercial Zone (CC) for commercial uses; however, the "maximum parking" standards of this Chapter apply. Residential uses within the Central Commercial Zone (CC) are subject to the minimum parking standards of this chapter, but residential parking requirements may be met with a variety of long-term lease, shared parking by easement or contract, or off-site parking options.

2. Parking Analysis. An applicant may propose a parking standard that is different than the standards under Section 3.3.300.A subject to a Type I Review, Type II Review, or Type III Review dependent upon the

classification of the application. The applicant's proposal shall consist of a written request and a parking analysis prepared by a qualified transportation professional. The parking analysis, at a minimum, shall assess the average parking demand per hour and available supply for existing and proposed uses on the site; opportunities for shared parking with other uses in the vicinity; existing public parking in the vicinity; and other relevant factors.

C. Leased Parking. Parking requirements may be satisfied by applicants who lease spaces from Baker City or from private parking lot operators if approved by the City. A copy of the active lease agreement shall be kept on file by the Planning Office, and planning approvals may be revoked if an active lease agreement in some acceptable capacity is not maintained.

Table 3.3.300.A – Minimum and Maximum Required Parking by Use	
Use Categories (Examples of uses are in Chapter 1.4; Definitions are in Chapter 1.3.)	Minimum Parking per Land Use (fractions rounded down to the closest whole number)
Maximum Allowed Parking	*For parking areas exceeding 25 spaces, no use shall exceed 125% of the minimum requirement*
RESIDENTIAL CATEGORIES	
[No changes recommended to residential minimum parking requirements]	
COMMERCIAL CATEGORIES	
Bed and Breakfast Inn	1 space per bedroom
Commercial Educational Services, not a school (e.g., tutoring or similar services)	2 space per 1,000ft^2 floor area
Commercial Outdoor Recreation	per CUP review
Commercial Parking Facility (when not an accessory use)	per CUP review
Drive-Up/Drive-In/Drive-Through *(drive- up windows, kiosks, ATM's, similar uses/facilities), per Section 2.3.190*	No requirement. See Section 2.3.190 for queuing area requirements
Major Event Entertainment	per CUP review
Offices	2 spaces per 1,000ft^2 floor area
Quick Vehicle Servicing or Vehicle Repair. *(See also Drive-Up/Drive-In/Drive-Through Uses, per Section 2.3.190)*	2 spaces, or per CUP review

Table 3.3.300.A – Minimum and Maximum Required Parking by Use	
Use Categories (Examples of uses are in Chapter 1.4; Definitions are in Chapter 1.3.)	Minimum Parking per Land Use (fractions rounded down to the closest whole number)
Retail Sales and Service *(See also Drive-Up Uses)* Retail Bulk retail (e.g., auto, boat, trailers, nurseries, lumber and construction materials, furniture, appliances, and similar sales) Restaurants and Bars Health Clubs, Gyms, Continuous Entertainment (e.g., bowling alleys) Lodging (e.g., hotels, motels, inns) Theaters and Cinemas	 2 spaces per 1,000ft^2 1 per 1,000ft^2 ~~8~~ 4 spaces per 1,000ft^2 floor area 3 space per 1,000ft^2 0.75 per rentable room (for associated uses, such as restaurants, entertainment uses, and bars, see above) 1 per 6 seats
Self-Service Storage	No standard
INDUSTRIAL CATEGORIES	
[No changes recommended to industrial minimum parking requirements]	
INSTITUTIONAL CATEGORIES	
[No changes recommended to institutional minimum parking requirements]	
OTHER CATEGORIES	
[No changes recommended to other minimum parking requirements]	

D. Vehicle Parking – Minimum Accessible Parking

E. On-street Parking

F. Shared Parking

G. Off-site Parking

H. General Parking Standards

I. Parking Stall Design and Minimum Dimensions

[Sub-section D through I omitted from Attachment. No changes are recommended these standards.]

…

3.4 – Public Facilities

…

3.4.300 Transportation Standards

A. Development Standards. The following standards shall be met for all new uses and developments:

1. All new lots created, consolidated, or modified through a land division, partition, lot line adjustment, lot consolidation, or street vacation must have frontage or approved access to a public street;

2. Streets and sidewalks within or adjacent to a development that will increase vehicle or pedestrian traffic shall be improved in accordance with the Transportation System Plan, an applicable refinement plan, and the provisions of this Chapter, except where specifically exempt by subsection (B) below, or other provisions of this Code;

3. Development of new streets, street extensions, and modifications to existing streets, shall be improved in accordance with this Section, and public streets shall be dedicated to the applicable road authority;

4. Bike lanes shall be provided pursuant to the Bike Projects Plan and the standards of this Chapter;

5. Where the TSP designates a multi-use path, construction of a multi-use path in lieu of a standard sidewalk improvement is required.

6. When a developer cannot provide the required sidewalk improvements at the time of development or construction, as applicable, the application shall be processed as a Type III procedure. The City decision body may require the installation of said improvements, the dedication of rights-of-way or easements for future improvements, construction of interim improvements, and/or a property owner agreement to not remonstrate against the formation of a local improvement district created to complete such improvements in the future, in accordance with subsection (B) below.

7. New streets, drives, and shared use paths shall be paved with asphalt, concrete, or other all-weather surface approved by the Public Works Director, pursuant to this Chapter.

B. Guarantee

C. Waiver or Deferral of Required Street or Sidewalk Improvements

D. Creation of Rights-of-Way and Easements

E. Variances

[Sub-section B through E omitted from Attachment. No changes are recommended these standards.]

F. Street Location, Width, and Grade. Except as noted below, the location, width and grade of all streets shall conform to the adopted Transportation System Plan or applicable refinement plan, and an approved street plan or subdivision plat. Street location, width, and grade shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets:

1. Street grades shall be approved by the City Engineer in accordance with the design standards in subsection 'O', below; and

2. Where the location of a street is not shown in an existing street plan, the location of streets in a development shall either:

   a. Provide for the continuation and connection of existing streets in the surrounding areas, conforming to the street standards of this Chapter, or

   b. Conform to a street plan adopted by the City if it is impractical to connect with existing street patterns because of particular topographical or other existing conditions of the land. Such a plan shall be based on the type of land use to be served, the volume of traffic, the capacity of adjoining streets, and the need for public convenience and safety.

G. Minimum Rights-of-Way and Street Sections. Except as provided by subsections (1) and (2) below, street rights-of-way and improvements shall be the widths in Table 3.4.100.F~~, as~~ . Example street cross-sections generally meeting the minimum street standards are depicted in Figures 3.4.100.F(1) through ~~(12)~~(18). These Figures are intended to demonstrate potential street configurations that meet the requirements. The basic public local residential street section shall be 28' with parking on both sides as shown in Table 3.4.100.F for streets with an anticipated traffic demand of 500 ADT or less, and 32' with parking on both sides as shown in Table 3.4.100.F when the anticipated traffic demand will be greater than 500 ADT.

1. The Baker City Public Works Director shall have the discretion to approve alternative sections to those shown in Table 3.4.100.F and Figures 3.4.100.F(1) through ~~(12)~~(18), based on the factors listed in subsection a-g, below. In addition, with the Public Works Director's concurrence, the Planning Commission shall have the discretion to approve alternative sections to those shown in Table 3.4.100.F and Figures 3.4.100.F(1) through ~~(12)~~(18), as may be proposed under a Master Planned Development.

   a. Anticipated traffic generation and/or factors of limited access;

   b. On-street parking needs;

   c. Requirements for the placement of utilities. Preliminary engineering for utilities on narrow streets or those with significant variance in curve radii may be required;

   d. Protection of significant environmental resources or reduction of potential impacts;

   e. Advancement of urban or neighborhood design objectives, including but not limited to traffic calming, and general pedestrian safety and comfort;

   f. Access needs for emergency vehicles; and

   g. Other engineering or urban design factors as may be relevant.

2. Half-Street Improvements. With the Public Works Director's concurrence, the Planning Commission shall have the discretion to approve a half-street dedication and street frontage improvement where the developer does not

own or control both sides of the subject right-of-way and where the new development will generate less than less than 300 Average Daily Trips (ADT).

Table 3.4.300.F Street Standards from the Adopted Transportation System Plan											
Street Type	Ave. Daily Trips (ADT)	Right-of-Way Width	Curb-to-Curb Paved Width	Within Curb-to-Curb Area				Curb	Planting Strips, Furnishing Zone, or Swales	Side-Walks, Walking Path	Shared-Use Paths
				Motor Vehicle Travel Lanes	Median/ Center Turn Lane	Bike Lanes	On-Street Parking				
URBAN ARTERIALS: 8,000 - 30,000 ADT											
Urban Arterial Street *(~~50ft Paving with~~ With No Parking)*		~~80ft~~	~~50ft w/ 14ft raised median~~	~~2 at 12ft~~	~~14ft~~	~~2 at 6ft~~	~~none~~	~~6in~~	~~6ft~~	~~8ft~~	
10th Street (North of H Street)		80ft	60ft	3-4 at 11-12ft	None	2 at 7ft	None	6in	4.5ft. (furnishing zone)	5ft	
Pocahontas Road		60ft	40ft	2 at 11ft	12ft	None	None	None	4ft striped buffer		10ft south side
Hughes Lane		60ft	25ft	2 at 11ft	None	None	None	None	6ft swale south side		10ft south side
All other Streets		80ft	50ft w/ 14 raised median	2 at 12ft	14ft	2 at 6ft	none	6in	6ft	8ft	
Urban Arterial Street *(with Parking on Both Sides)*		~~80ft~~	~~64ft w/14ft raised median~~	~~2 at 12ft~~	~~12ft - 14ft~~	~~2 at 5ft - 6ft~~	~~8ft parallel (both sides)~~	~~6in~~	~~None~~	~~7ft~~	
10th Street (South of H Street)		80ft	64	3-4 at 11-12ft	None	None	9ft parallel (both sides)	6in	2.5ft. (furnishing zone)	5ft	
All other Streets		80ft	64ft w/14ft raised median	2 at 12ft	12ft - 14ft	2 at 5ft – 6ft	8ft parallel (both sides)	6in	None	7ft	
Commercial Street *(36ft*		80ft	36ft	2 at 12ft	None	2 at 6ft	None	6in	11ft-15ft	6ft	10ft optional

Table 3.4.300.F Street Standards from the Adopted Transportation System Plan											
Street Type	Ave. Daily Trips (ADT)	Right-of-Way Width	Curb-to-Curb Paved Width	Within Curb-to-Curb Area				Curb	Planting Strips, Furnishing Zone, or Swales	Side-Walks, Walking Path	Shared-Use Paths
				Motor Vehicle Travel Lanes	Median/ Center Turn Lane	Bike Lanes	On-Street Parking				
Paving with No Parking)											
Commercial Street *(50ft Paving with Parking on Both Sides)* [1]		80ft	50ft	2 at 12ft	None	2 at 5ft	8ft parallel (both sides)	6in	8ft w/ 6ft side-walk or none with 14ft sidewalk	6ft or 14ft	
COLLECTORS											
Major Collector Street	Greater than 1,500 ADT	80ft	52ft	24ft	None	2 at 5ft	9ft parallel (both sides)	6in	7ft	6ft	
Minor Collector Street	1,000 to 1,500 ADT	~~60ft~~	~~36ft~~	~~22ft~~	~~None~~	~~None~~	~~7ft parallel (both sides)~~	~~6in~~	~~5ft~~	~~6ft~~	
Cedar Street (North of D Street)		58-62ft	24-26ft	2 at 11-12ft	None	None	None	None	6ft swale – both sides	6ft east side	10ft west side
Cedar Street (South of D Street)		58-62ft	24-26ft	2 at 11-12ft	None	None	None	None	6ft swale west side	None	10ft west side
Other Minor Collector Streets		60ft	36ft	22ft	None	None	7ft parallel (both sides)	6in	5ft	6ft	
Local Industrial [2]		60ft	24ft	24ft	None	None	None	-	None	None	
LOCAL RESIDENTIAL STREETS: Less than 1,000 ADT											
No changes recommended to local residential street standards.											

Figure 3.4.3100.F(1) Urban Arterial Street (50' Paving with No Parking)

Figure 3.4.3100.F(2) Urban Arterial Street (with Parking on Both Sides)

Figure 3.4.3100.F(3) Commercial Street (36' Paving with No Parking)

Figure 3.4.3100.F(4) Commercial Street (50' Paving with Parking on Both Sides)

Figure 3.4.3100.F(5) Major Collector Street

Figure 3.4.3100.F(6) Minor Collector Street

Figure 3.4.3100.F(7) Local Industrial Street

Figure 3.4.3100.F(8) Local Residential Street (32' Parking on Both Sides)

Figure 3.4.3100.F(9) Local Residential Street (28' Parking on Both Sides)

Figure 3.4.1300.F(10) Improvement Option for Existing Unpaved Local Residential Street

Figure 3.4.3100.F(11) Multi-Use Path Street Option

Figure 3.4.1300.F(12) Alley and Pathway Sections

No changes recommended to existing street cross-section illustrations.

Figure 3.4.1300.F(13) 10th Street – North of H Street

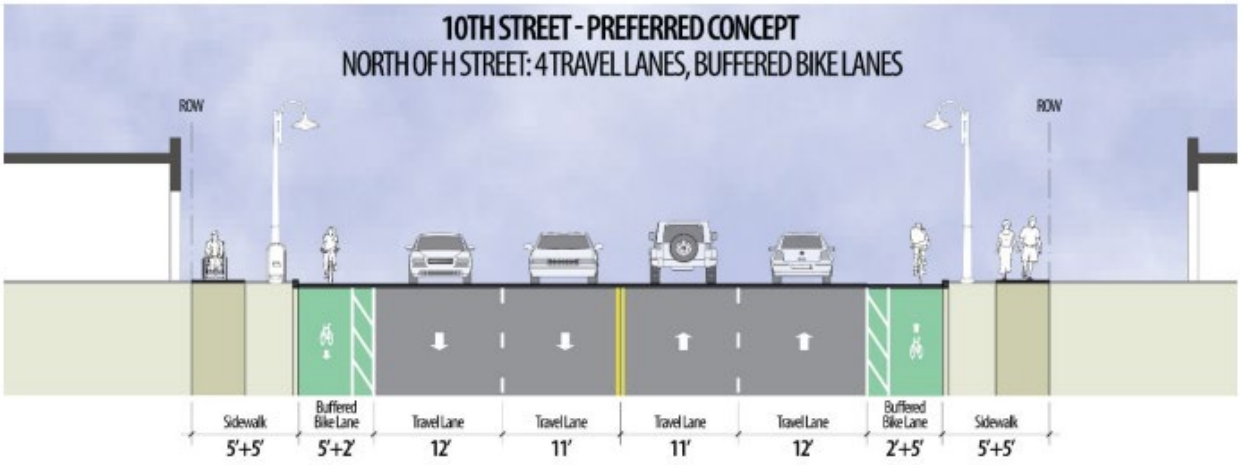


Figure 3.4.1300.F(14) 10th Street – South of H Street

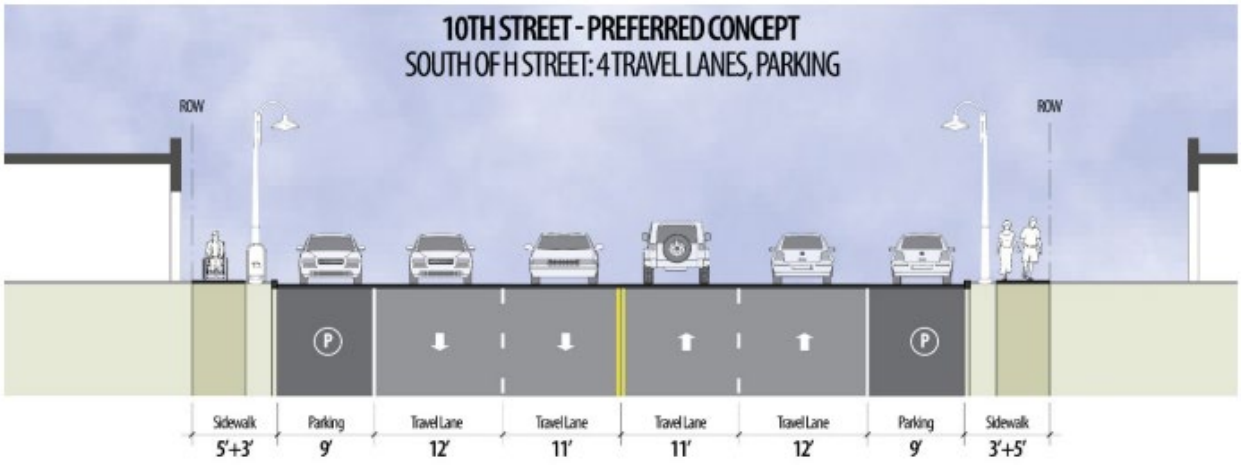


Figure 3.4.1300.F(15) Pocahontas Road

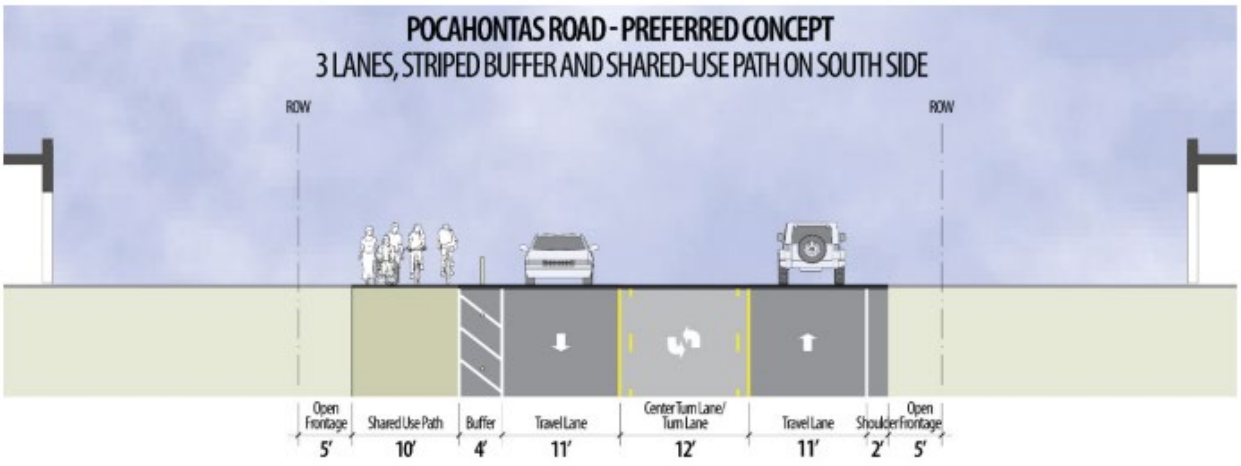


Figure 3.4.1300.F(16) Hughes Lane

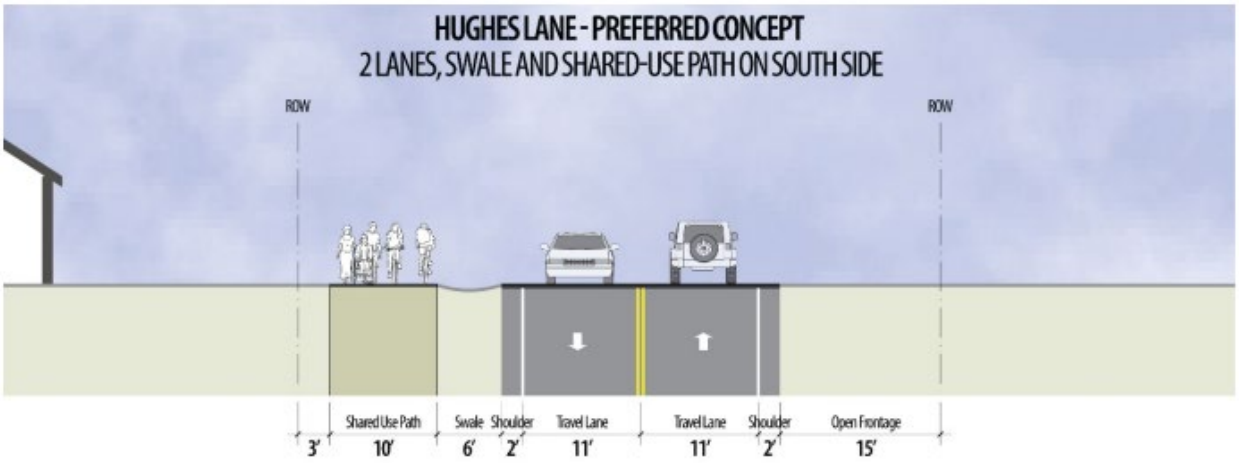


Figure 3.4.1300.F(17) Cedar Street – North of D Street

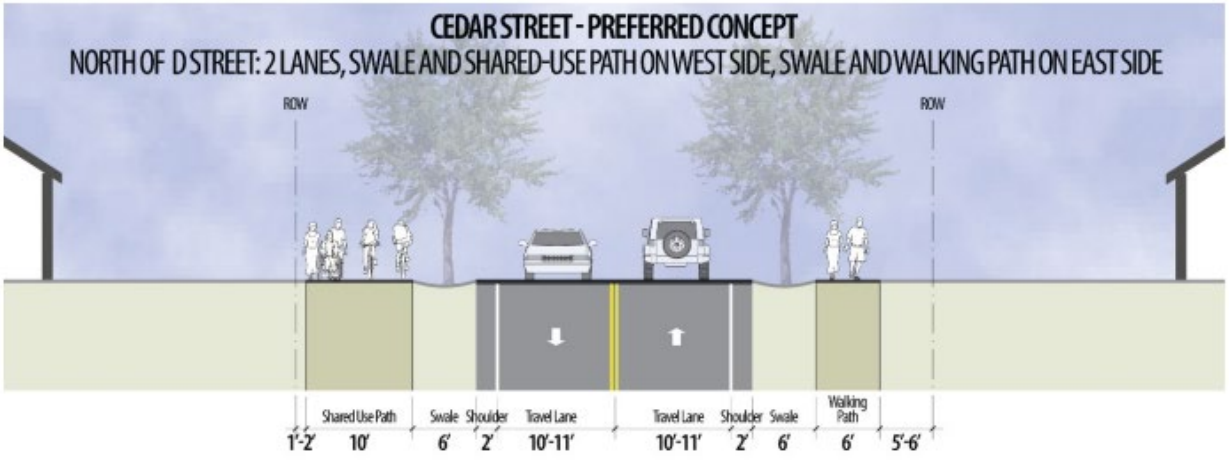
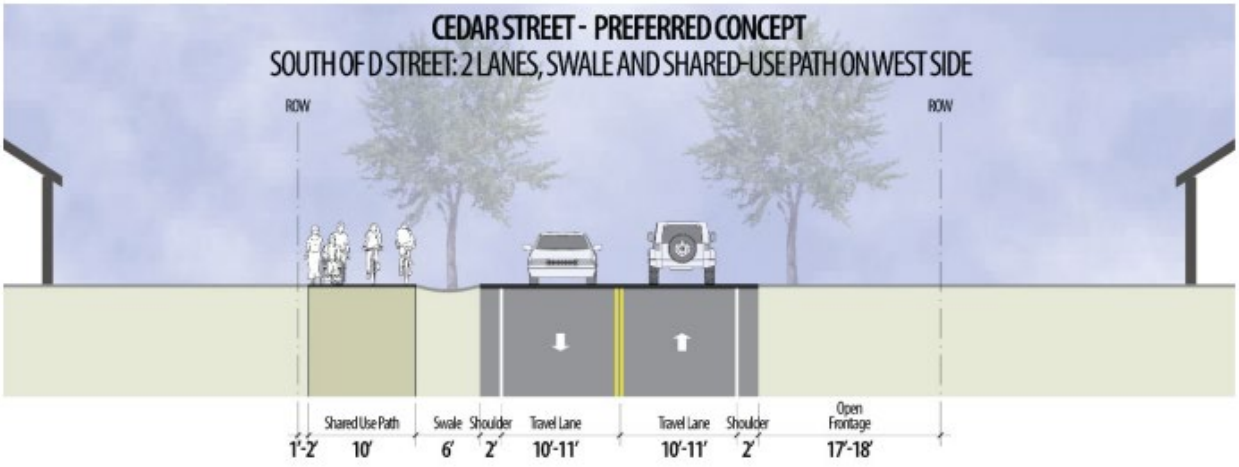


Figure 3.4.1300.F(18) Cedar Street – South of D Street



H. Subdivision Street Connectivity.

I. Traffic Signals and Traffic Calming Features.

J. Future Street Plan and Extension of Streets.

K. Street Alignment, Radii, and Connections.

No changes recommended to sub-sections H through K.

L. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with the standards in Table 3.4.100.F, applicable provisions of Transportation System Plan, the Comprehensive Plan, refinement plans, and adopted street plans. Maintenance of sidewalks and planter strips in the right-of-way is the continuing obligation of the adjacent property owner.

M. Intersection Angles.

N. Existing Right-of-Way.

O. Cul-de-sacs.

P. Grades and Curves.

Q. Curbs, Curb Cuts, Ramps, and Driveway Approaches.

R. Streets Adjacent to Railroad Right-of-Way.

S. Development Adjoining Arterial Streets.

T. Alleys, Public or Private.

U. Private Streets.

V. Gated Communities.

W. Street Names.

X. Survey Monuments.

Y. Street Signs.

Z. Mail-boxes.

AA. Street Light Standards

No changes recommended to sub-sections M through AA.