APPENDIX A:

Background Document Review Memorandum

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TECHNICAL MEMORANDUM #1

TO: Junction City TSP Project Management Team

FROM: Kelly Sandow P.E. Sandow Engineering

DATE: February 15, 2016

RE: Junction City TSP Update
Background Document Review -2016 Update

This memorandum provides an update to the Technical Memorandum #1 prepared by DKS as part of the previous work on the TSP update prior to the year 2015. For the most part the information contained in DKS Technical Memorandum is still valid, with a few exceptions. The updates to DKS's Technical Memorandum #1 are marked within redlines within the memorandum, with the updated information provided below.

RESIDENTIAL LAND NEED ANALYSIS (2010)

Portland State University's Population Research Center provided a 2015-2065 update to the "Coordinated Population Forecast". As per the updated document, the year 2015 population within the UGB is 6,463. Junction City population is expected to grow by 34 % to 8,653. Following the methodology within the "Residential Needs Analysis (2010)" the number of needed housing both currently and in the future was determined. It is estimated that the City will need to add 982 housing units by the year 2036. The housing should be provided at a mix of 55% single family, 25% multi-family (2-4 units per structure) and 20% multi-family (5+ units/structure) There is enough land currently within the UGB (year 2016) and the correct mix of zoning to facilitate the housing need through the year 2036.

MAJOR DEVELOPMENT PLANS

As of November 2015, several of the major development plans previously identified have been developed out or significantly modified and other developments are planned that will impact the City's transportation system. The changes made to the major development plan as part of the 2016 update are:

- The Oregon State Correctional Facility is no longer assumed to be built out by the year 2036. As such, the vehicle trips previously added to the system by this project were removed.

- The Oregon State Hospital has been built out to it capacity, which is significantly smaller than what was originally planned. The current capacity of employees (340) and patients

(174) has been updated within this analysis. The hospital is functioning near capacity in current conditions (year 2015) with the expected capacity expected to be met by the year 2036. The vehicle trips from the Hospital have been updated to reflect the current and future capacity data.

- Grain Millers is proposed at the south end of the UGB (Meadow View Drive). The facility is expected to have 30 employees. The access to the facility will be via Prairie Road and no traffic will access Highway 99 from Meadowview Drive. Vehicle trips from Grain Millers were considered in the analysis.

- Several residential developments have been approved but not build out yet/currently being built: these include Rose Apartments (south of 18th near Rose St), Alona Apartments (North of W 1st Avenue Near Oak Street), Rolling Meadows (west of Oaklea Dr), and The Reserve (west of Oaklea Dr.). These developments were assumed to be built out as serve a substantial portion of the housing need by the year 2036.

These changes have been reflected in the base year (2015 analysis) and the future 2036 analysis.

APPENDIX B:

Mission, Goals, and Policies Update Memorandum

DKS *Associates*
TRANSPORTATION SOLUTIONS

Memorandum

TO: Junction City TSP Citizen Advisory Committee

FROM: John Bosket, PE – DKS Associates

DATE: July 8, 2011

SUBJECT: **Junction City TSP Update**
Mission, Goals, and Policies Update P09042-010

Attached to this memorandum is a copy of Chapter 2 of the current Junction City Transportation System Plan (TSP), containing the mission, goals, and policies related to transportation. As stated in the introduction, the mission is the overall goal regarding transportation in Junction City. The goals are broad statements of philosophy that describe the hopes of the people of the community for the future of the community. The policies are statements that provide a specific course of action moving the community toward the attainment of its goals.

As part of this TSP update process, we will be reevaluating the mission, goals, and policies. While they can be continuously updated throughout the process, it will be important to give careful consideration to this task early in the project so the new mission, goals, and policies can be used to guide the development of the TSP as much as possible. In the end, we should be able to use them to evaluate TSP recommendations to ensure the plan aligns with community interests.

As shown, there are currently several areas of interest included within the seven goal statements:

- Base the TSP on a combination of factual findings, public input, and the comprehensive plan.
- Plan for a financially feasible transportation system.
- Maximize the efficiency of facilities and the life of investments made.
- Emphasize safety and quality of life.
- Consider aesthetic impacts on the community and protection of the downtown.
- Remain flexible to change and updates as needed.
- Provide a balanced multimodal transportation system that offers a range of travel choices.

Consider whether there are additional goal statements that should be included (e.g., goals related to sustainable practices). Maybe some goal statements just need refinement?

Following the goal statements, there are a number of policies that represent specific actions to be taken to help achieve the communities goals. We will discuss potential changes to these as well, but will likely see more revisions in this section later.

We would like to discuss this material in further detail as part of the first CAC meeting on August 4. Please review the current TSP Chapter 2 and be prepared to discuss where you believe these goals and policies continue to align with local interests and where changes may be needed. Following that meeting, you'll be asked to engage with your fellow community members whom you represent to provide more insight into how the mission, goals, and policies could better reflect the interests of Junction City. Then, at our next CAC meeting, we'll spend some more time considering these new ideas and how to best update this chapter, which will guide much of our work moving forward.

Chapter Two
MISSIONS, GOALS, AND POLICIES

A. INTRODUCTION

To explain the items that follow in this chapter, the mission is the overall goal regarding transportation in Junction City. The goals are broad statements of philosophy that describe the hopes of the people of the community for the future of the community. Each goal is developed around a topic area. A goal may never be completely attainable, but is used as a point toward which to strive. The goals guided the development of the transportation system plan and should be used to monitor future transportation strategies and improvements. Policies are statements that provide a specific course of action moving the community toward the attainment of its goals. Each new capital improvement project, land use application, or implementation measure must be consistent with the policies. Once adopted, the mission, goals, and policies, as well as the project lists, will become part of Junction City's Comprehensive Plan.

B. MISSION

M1 Enhance the quality of life in Junction City by providing a balanced transportation system that meets the travel needs of the community.

C. GOALS

G1 The TSP will be based on research/data/knowledge and widespread public input and will be coordinated with and include material from the existing transportation element of the city's comprehensive plan.

G2 The TSP will include a convenient, efficient and financially feasible network of arterial, collector and local streets.

G3 The TSP will protect and enhance the existing transportation facilities within the city as new facilities are built to augment the system. The old and new parts of the system should be effectively and efficiently connected and coordinated with county and state transportation facilities.

G4 The TSP will stress safety for the users and will protect and enhance the community's quality of life.

G5 The TSP will be sensitive to the community's aesthetics and will strive to retain a sense of community, particularly in the downtown area of Junction City, which is seen as critical to the town as a focal center.

G6 The plan will remain flexible to change and will be supportive of reviewing and updating the TSP through the periodic review process or the comprehensive plan amendment process.

G7 The plan will be balanced among the modes of transportation, offering members of the community choices/alternatives to single occupant autos.

D. POLICIES

Plan Context and Implementation

TSP-1 The Mission, Goals and Policies and the Project Lists of the Transportation System Plan and adopted Refinement Plans are elements of the Junction City Comprehensive Plan. Other portions of the TSP are supporting documents of the comprehensive plan.

TSP-2 The Junction City TSP identifies the general location of transportation improvements. Changes in the specific alignment of proposed public road and highway projects shall be permitted if the new alignment falls within a transportation corridor or right-of-way identified in the Transportation System Plan.

TSP-3 All development proposals, plan amendments, or zone changes shall conform with the adopted Transportation System Plan.

TSP-4 For improvements designated in the Transportation System Plan, the following activities shall be allowed without land use review:

- Dedication of right-of-way,
- Authorization of construction and the construction of facilities and improvements, and
- Classification of the roadway and approved road standards.

TSP-5 Changes in the frequency of transit and rail services that are consistent with the Transportation System Plan shall be allowed without land use review.

TSP-6 For State projects that require an Environmental Impact Study (EIS) or Environmental Assessment (EA), the draft EIS or EA shall serve as the documentation for local land use review, if local review is required.

(1) Where the project is consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent or subsequent compliance with applicable development standards or conditions;

Where the project is not consistent with the Transportation System Plan, formal review of the draft EIS or EA and concurrent completion of necessary goal exceptions or plan amendments.

Protection of Transportation Facilities

TSP-7 The city shall protect the function of existing and planned transportation systems as identified in TSP through application of appropriate land use and access management regulations. The State of Oregon has adopted administrative rules that specify certain standards and procedures that apply to all new access permits on state facilities. The Lane County TSP will include similar requirements for access onto the county road system. Junction City will apply these standards and procedures during the development review process and will notify the County and/or ODOT when access to their facilities is proposed.

TSP -8 When making a land use decision, the city shall consider the impact of the new development on the existing and planned transportation facilities. Notice of all land use changes located on state or county roads shall be sent to the respective jurisdiction, and comments from same shall be included in the official record.

TSP-9 The city shall consider the potential to establish or maintain bikeways or walkways prior to the vacation of any public easement or right-of-way.

TSP-10 At the time of land development or land division, the city shall require the dedication of additional right-of-way when necessary to obtain adequate street widths and bikeways and walkways in accordance with the City's adopted street plans, bicycle plans and pedestrian plans.

TSP-11 Private development shall not encroach within the setbacks required for future street expansion.

TSP-12 ~~Truck~~ Freight routes and other motorized vehicle alternatives may be used as tools to minimize the impact of large and heavy vehicles in the downtown and other areas.

Functional Classifications of Streets

TSP-13 Oregon State Highway 99, 1st Avenue (including High Pass and River Rd. segments), Oaklea Drive, and 18th Avenue shall be classified as arterials and shall be safe, high volume traffic movers serving as regional connectors. Access to an arterial shall, wherever feasible, be from the collector road system. Arterials shall be protected against strip development and access driveways that will restrict their effectiveness.

TSP-14 6th and 10th Avenues east of Oaklea Drive and Prairie Road are major collectors and shall provide access from local streets or minor collectors to the arterial system. Individual accesses shall be managed to minimize degradation of capacity and traffic safety.

TSP-15 A minor collector shall provide access to abutting properties and serve local access needs of neighborhoods, including limited through traffic. Minor Collectors include the north/south street and the extensions of 6th, 10th and 15th Avenues west of Oaklea in the Professional/Technical Zone area, 13th Avenue and 15th Ave. west of Rose St. (including the portions to be built and shown on the Street Projects Map), the access road south of 1st and east of Hwy 99 (shown on the Street Projects Map), Hwy. 36, the proposed grid system from W. 1st south to Bailey Lane and from Prairie Rd. west, Prairie Rd. East of Hwy. 99, Rose, Maple, Kalmia, Juniper, Holly, Front, Deal/18th to Hwy. 99, and Birch. New development that generates a significant amount of traffic shall be discouraged from locating on minor collectors that serve residential areas.

TSP-16 Local streets are all streets not identified in previous categories. A local street shall provide direct property access and access to collectors and minor arterials.

Layout and Design of Streets, Bikeways, and Sidewalks/Walkways

TSP-17 The city shall adopt standards for streets, bike paths and lanes, sidewalks/walkways, bus stops, and other transportation facilities and shall require such facilities at the time of land division or development.

TSP-18 Streets shall be designed to efficiently and safely accommodate emergency service vehicles.

TSP-19 Streets, bikeways, and walkways shall be designed to meet the needs of pedestrians and cyclists to promote safe and convenient bicycle and pedestrian circulation within the community. Unless there is a convenient alternative, all new major and minor collector and arterial streets shall have bicycle lanes and all new streets shall have sidewalks.

TSP-20 Direct and convenient access for motor vehicles, public transit, bicycles, and pedestrians, shall be provided to major activity centers, including schools, shopping areas, parks, community centers and employment centers.

TSP-21 Pedestrian access to transit facilities from new commercial, residential, and high employment uses and community activity centers shall be provided. Existing commercial, residential, and high employment uses and community activity centers shall provide safe and accessible pedestrian access to transit facilities when a site changes use or is retrofitted.

TSP-22 The city will encourage/require the extension of the city's street system wherever possible, thereby increasing connectivity. In all cases

where it is reasonable, land divisions shall continue existing streets, set aside rights-of-way for future streets and intersections that will promote connectivity, and continue the city's grid system. Cul-de-sacs and other low-connectivity street types shall be discouraged except where topography, land features (wetlands, drainage systems, etc.) or land development patterns preclude high connectivity street patterns. Where cul-de-sacs and other low-connectivity street types are used multi-use paths may be required for bike and pedestrian users.

TSP-23 North/South connectivity needs to be promoted, particularly in the western section of the city that is already largely developed and will not be affected by new subdivision requirements promoting the extension of the city's grid system. Many problem areas exist but one of the areas identified is the area between 1st and 18th streets and between Nyssa and Vine. Increasing the connectivity of this area would reduce the amount of traffic using Ivy St. (Hwy. 99).

TSP-24 Streets identified as future transit routes shall be designed to safely and efficiently accommodate transit vehicles and pedestrians, thus encouraging the use of public transportation. Street designs shall be responsive to topography and shall minimize impacts to natural resources such as streams, wetlands, and wildlife corridors.

TSP-25 Where new walkways are built or where crossings are rebuilt they shall be built to city standards and incorporate handicapped accessibility features as required by state and federal law.

Maintenance

TSP-26 Maintenance and repair of existing bike and pedestrian facilities shall be given equal priority to the maintenance and repair of motor vehicle facilities.

TSP-27 Operation, maintenance, repair, and preservation of existing transportation facilities shall be allowed without land use review, except where specifically regulated.

Parking

TSP-28 On-site motor vehicle parking, as required by Junction City ordinances, shall be provided for all new development unless on-street parking or other nearby sites provide adequate parking for the proposed use. Where development that does not meet the parking requirement is proposed the applicant shall use the variance procedures contained in the city's zoning ordinance.

TSP-29 An overnight truck parking area within the city may be needed so large trucks, which are not allowed to park on City streets overnight, don't have to park on the street illegally.

TSP-30 Bicycle parking facilities shall be required as part of new multi-family residential developments of three units or more, new retail, office and industrial developments, and all transit transfer stations and park and ride lots.

TSP-31 Parking requirements/needs will be addressed in the central business district with creative solutions/guidance. Recognizing the limitations of land in the downtown commercial areas, the Planning Commission can adjust or waive parking requirements for infill and renovation projects in developed areas along Hwy. 99 between 18th and 1st Ave. and along 6 th Ave. and in other areas where land availability is limited and infill or more efficient use of land is desired. Such adjustments shall use the variance procedures set forth in the city's zoning ordinance.

TSP-32 As a follow-up to the TSP the city will review its signage ordinance for Ivy St. to see if changes are necessary.

TSP-33 As a follow-up to the TSP the city will look at RV impacts on traffic within the city.

Coordinated Review

TSP-34 The city shall coordinate with the Department of Transportation to implement the highway improvements listed in the Statewide Transportation Improvement Program (STIP) that are consistent with the city's Transportation System Plan and comprehensive plan.

TSP-35 The city shall consider the findings of ODOT's draft Environmental Impact Statements (EIS) and Environmental Assessments (EA) as integral parts of the land use decision-making procedures. Other actions required, such as a goal exception or plan amendment, will be combined with review of the draft ~~EA~~ EIS or ~~EIS~~ EA and land use approval process.

TSP-36 Procedures for the coordination between the city and Lane County on developments that impact county transportation facilities are identified in the City/County Urban Growth Management Agreement (UGMA). The city shall adhere to the UGMA procedures in order to protect Lane County's interests in said facilities.

Hwy. 99

TSP-37 Highway 99 is a critical facility to residents of Junction City, the surrounding communities, and the state. ~~The model shows that if nothing is done to better manage traffic on the highway portions of Hwy. 99 within the city will reach capacity within the planning period.~~ The city ~~will work closely with ODOT to secure funding for and develop a refinement plan that will maximize Hwy. 99's usefulness in moving traffic while maintaining a healthy and functional downtown community.~~

The Highway 99 Refinement Plan proposes a (Ivy) Hwy 99/Holly St couplet solution. The HWY 99 Refinement Plan shall be used for future project development.

APPENDIX C:

Existing Conditions Memorandum

Chapter 3: Existing Conditions

This chapter documents the existing condition of the transportation system in the City of Junction City for all travel modes including pedestrian, bicycle, transit, motor vehicle, air, rail, pipeline, and water. The findings from this chapter will provide a baseline for determining the existing and future transportation needs and will guide development of transportation projects within Junction City. This chapter concludes with a summary of key findings that will be carried forward for consideration through the Transportation System Plan (TSP) update process.

STUDY AREA

The City of Junction City is located near the southern end of the Willamette Valley, approximately five miles northwest of Eugene and 26 miles south of Corvallis. OR 99 runs from north to south through the center of the city, splitting into OR 99W and OR 99E near the north city limits. OR 99 to the south (also known as Ivy Street through the city) creates a direct connection to the Eugene/Springfield area, Interstate 5, and the McKenzie Highway, which provides access to the Willamette National Forest and destinations in central Oregon. To the north, OR 99W parallels Interstate 5 for over 100 miles and connects Junction City to Corvallis and several other cities before terminating in Portland. OR 99E connects Junction City to Harrisburg and Albany and provides a route to Interstate 5 for travelers destined to the north. In addition, OR 36 intersects OR 99 near the south end of town and provides a connection to the coast and other destinations to the west.

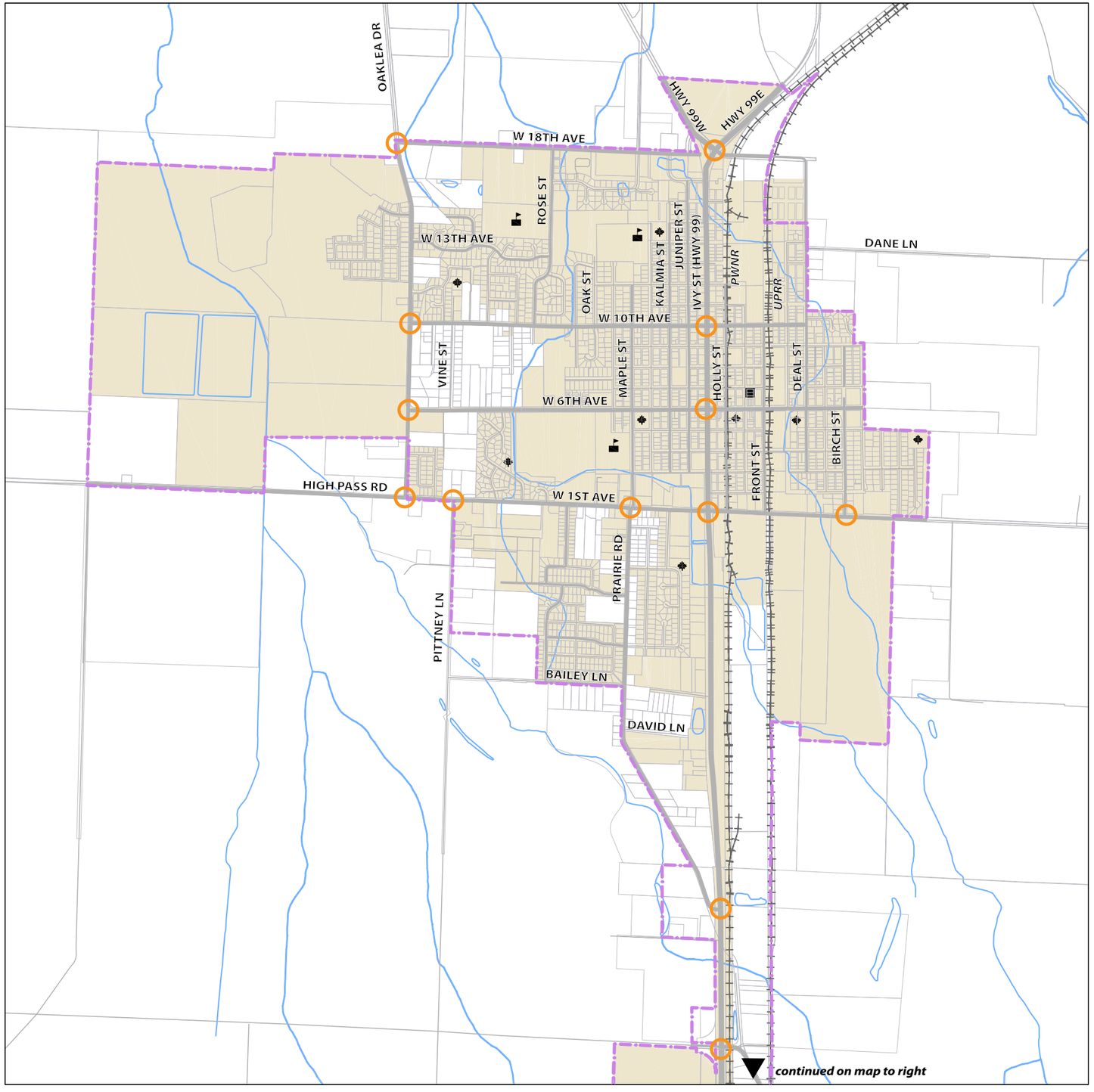
Along with the state highway system, two railroad lines, owned by Union Pacific Railroad (UPRR) and Portland and Western Railroad(PNWR), play a major role in Junction City's regional transportation network. These railroad lines parallel OR 99 to the east through Junction City, with the PNWR line running down the middle of Holly Street and the UPRR line running approximately 600 feet further east.

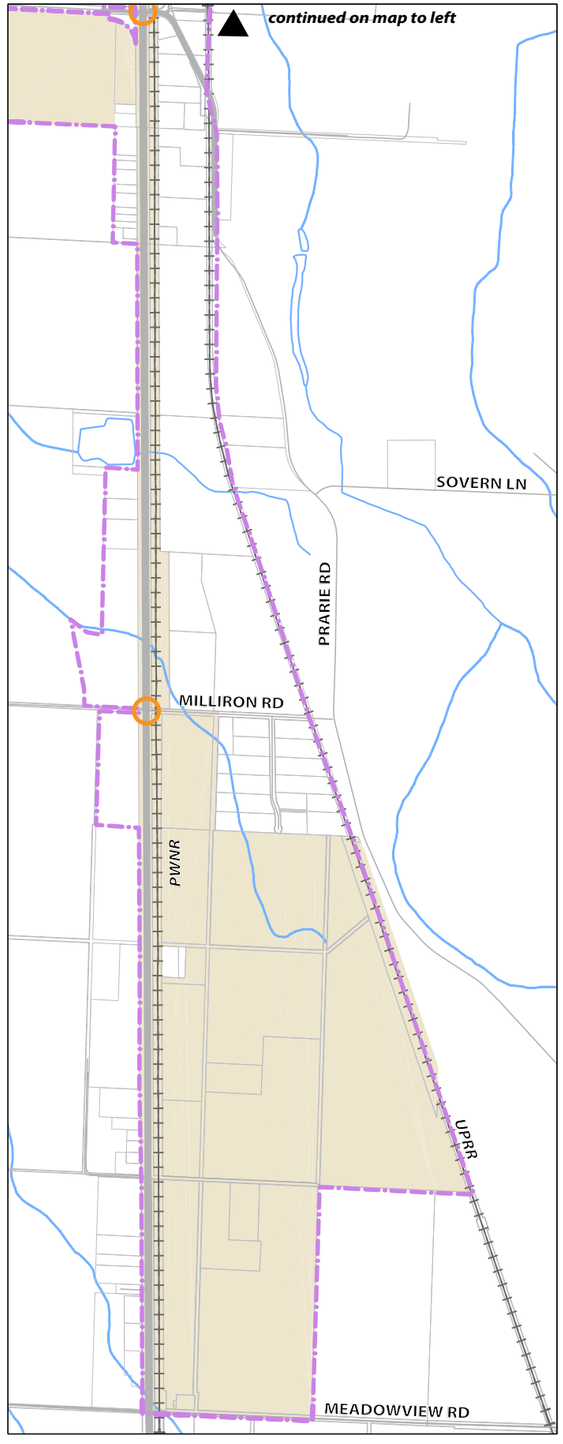
The study area for the TSP is shown in Figure 1 and includes the entire transportation network within the Junction City Urban Growth Boundary (UGB).

Junction City
Transportation System Plan

FIGURE 1

Study Area





Legend

- STUDY INTERSECTION

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

Places of Interest

- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

To understand existing travel characteristics and conditions in Junction City, an inventory of the existing transportation infrastructure was conducted in March of 2011 and was further refined in November 2015. In addition to the citywide inventory, 14 study intersections were selected for focused operational analysis. These intersections are listed below and illustrated in Figure 1.

- Birch Street/1st Avenue-River Road
- Pitney Lane/1st Avenue-High Pass Road
- Prairie Road-Maple Street/1st Avenue
- Oaklea Drive/1st Avenue-High Pass Road
- Oaklea Drive/6th Avenue
- Oaklea Drive/10th Avenue
- Oaklea Drive/18th Avenue
- OR 99W/OR 99E
- OR 99/1st Avenue
- OR 99/6th Avenue
- OR 99/10th Avenue
- OR 99/Prairie Road
- OR 99/OR 36-Prairie Road
- OR 99/Milliron Road

Land Use and Zoning

The relationship between existing land uses, zoning, Comprehensive Plan designations, and the transportation infrastructure in Junction City is an important element in understanding traffic patterns and potential for growth. Existing land uses, such as commercial, industrial, or residential development, create the traffic volumes experienced on the local transportation network today. The adopted zoning districts identify what type of development is allowed to happen in the future. Similarly, Comprehensive Plan designations identify types of development planned to be in place over the 20-year planning horizon. In many cases, the Comprehensive Plan designations align with current zoning districts. However, where they differ, future zoning changes must align with the Comprehensive Plan designations.

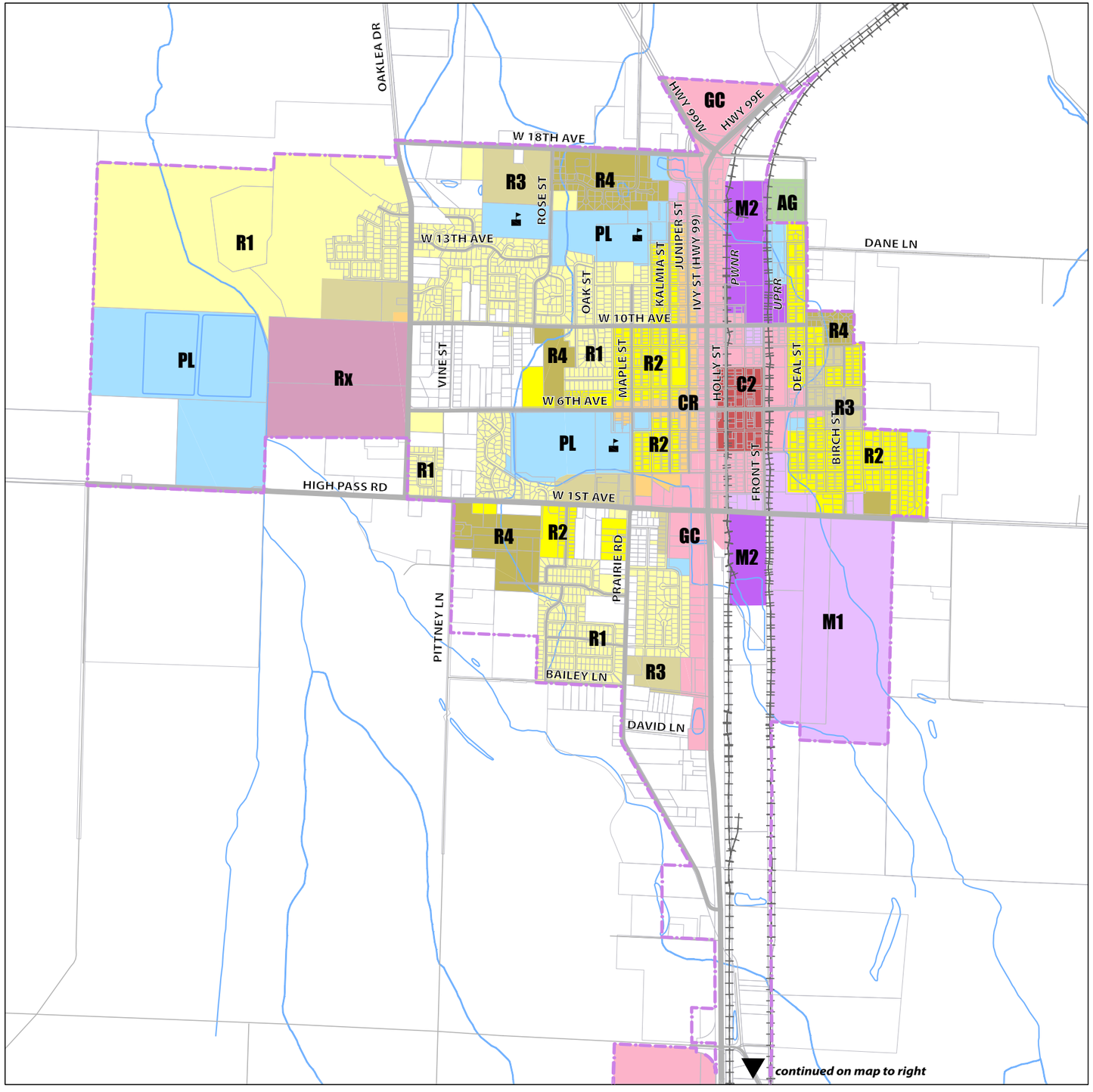
The adopted zoning districts and Comprehensive Plan designations within the Junction City UGB can be seen in Figures 2 and 3, respectively. Existing land uses align well with the current zoning districts, with commercial development and zoning centered on the OR 99 corridor and within the downtown area. Residential uses abut the commercial lands to the east and west, with most residentially-zoned land to the west due to the locations of the city limits and UGB. Industrial lands are located east of OR 99, with one area between 10th and 17th Avenues and the other from 4th Avenue to the southern UGB. As shown in the zoning districts map in Figure 2, there are several pockets of land west of OR 99 that are surrounded by the city limits but have not yet been annexed into the city.

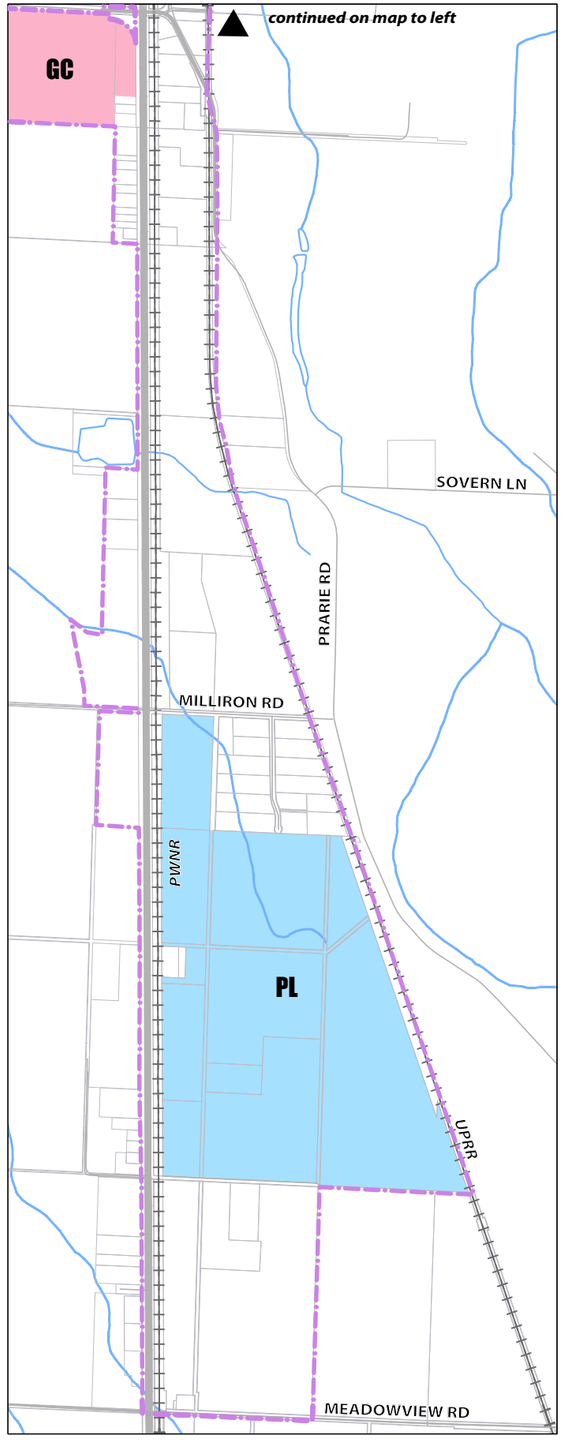
As mentioned, the adopted Comprehensive Plan designations shown in Figure 3 align well with the zoning districts in Figure 2. When comparing the two, the most noticeable difference is the growth potential within the UGB to the south, where a significant amount of industrial land has been designated east of OR 99 extending south to Meadowview Road. To the west of OR 99, the commercial corridor and abutting residential land has also been extended, with the residential lands extending only as far as Prairie Road and the commercial lands extending to just south of Milliron Road. Also, the pockets of land that have not yet been annexed into the city (west of OR 99) are designated for residential development, matching surrounding uses.

Junction City
Transportation System Plan

FIGURE 2

Zoning Districts





Legend

Zoning

- Agricultural-AG
- Central Commercial C2
- Commercial/Residential-CR
- General Commercial-GC
- Light Industrial-M1
- Heavy Industrial-M2
- Public Land-PL
- Residential Mix TBD-Rx
- Single-Family Residential-R1
- Duplex Family Residential-R2
- Multi-Family Residential-R3
- Multi-Structural Residential-R4

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *PUBLIC SCHOOL*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

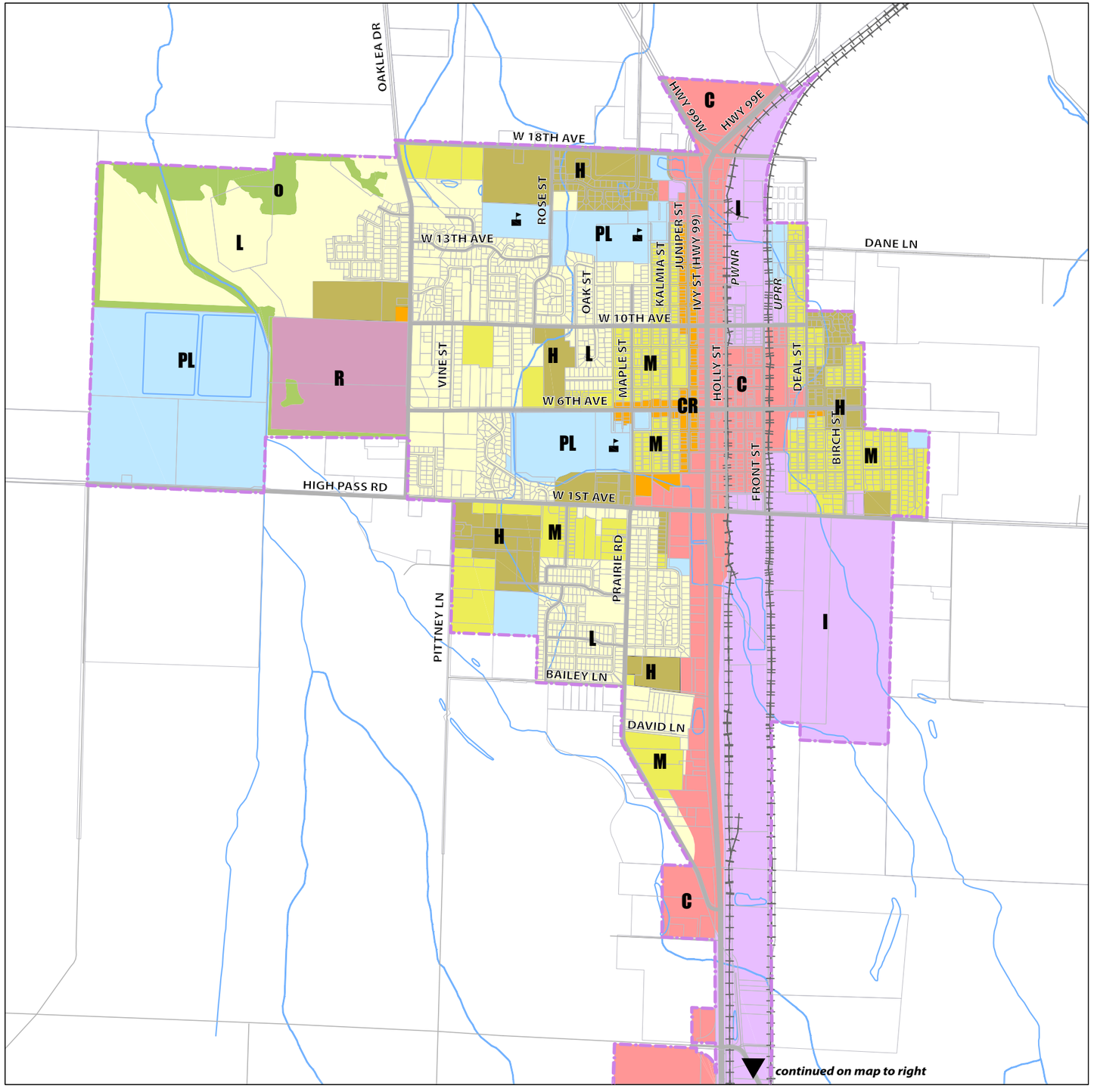
N W E S

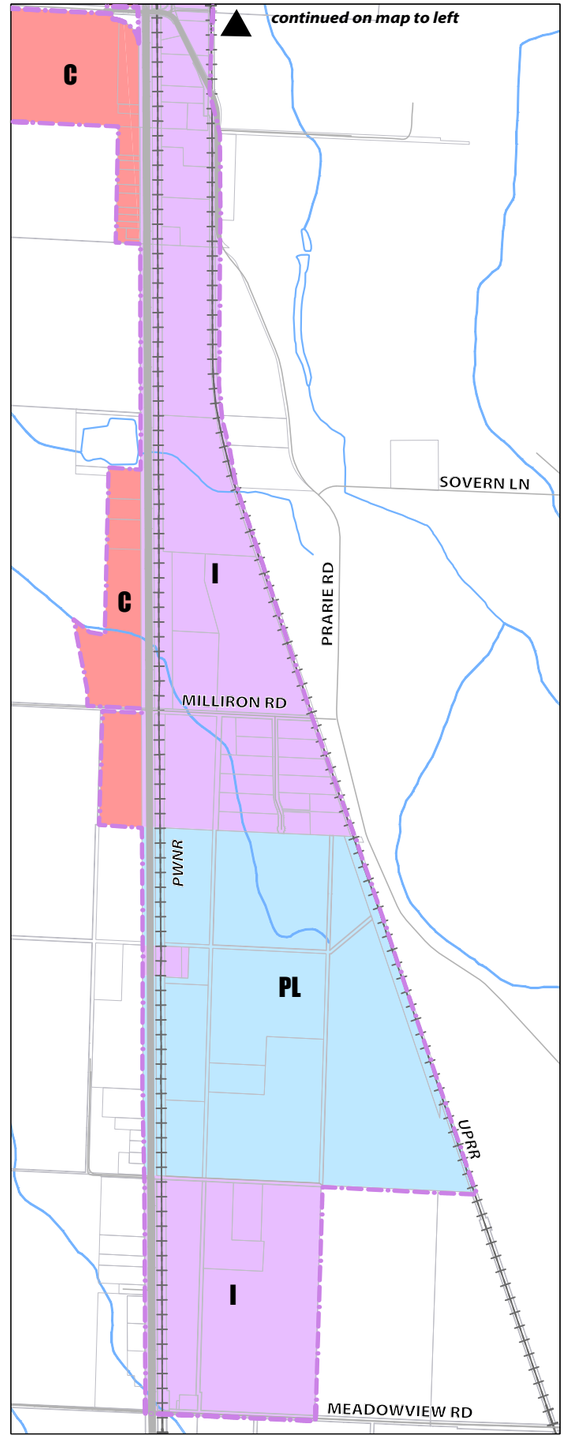
0 1000 2000 Feet

Junction City
Transportation System Plan

FIGURE 3

Comprehensive Plan Designations





Legend

Designations

- Commercial-C
- Commercial/Residential-CR
- Industrial-I
- Low Density Residential-L
- Medium Density Residential-M
- High Density Residential-H
- Residential Mix TBD-R
- Open Space/Westlands-O
- Public-PL

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*

- *PUBLIC SCHOOL*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

N W E S

0 1000 2000 Feet

Goal 5 Resources

Goal 5 is a broad statewide planning goal that covers more than a dozen resources, such as waterways, wildlife habitats, historic places, energy sources, aggregate, and scenic areas. Avoiding or minimizing impacts to such resources supports the development of a sustainable transportation system that reduces project costs and preserves those resources for future generations.

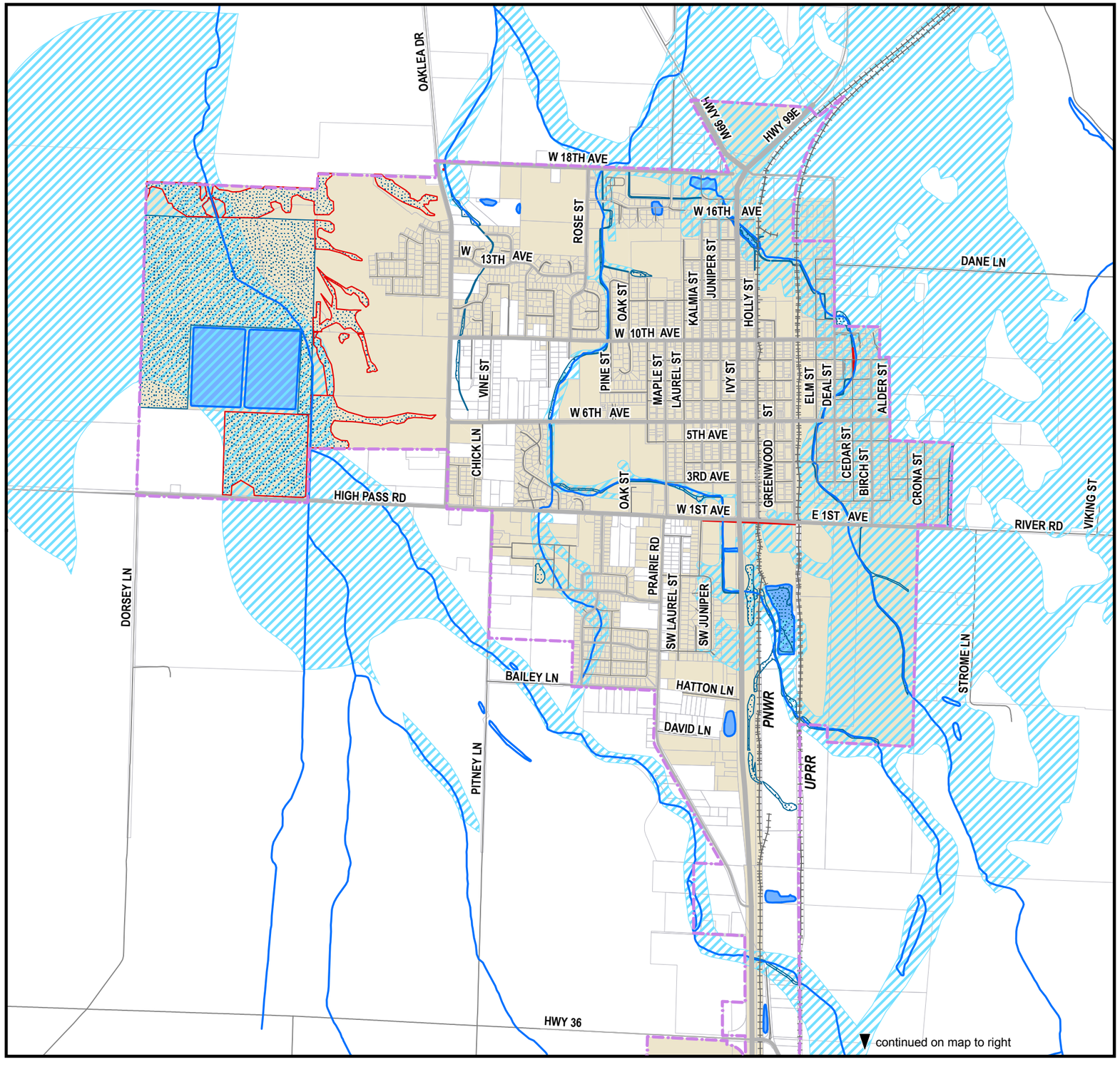
Streams and wetlands resources have been mapped in Figure 4, where information describing them was readily available. Historic and archeological sites were also identified, but the sites and specific locations are protected under state law, and have not been mapped to protect their potential sensitivity. However the archeological resources recorded in the study area vicinity will be referenced and considered as future potential projects are discussed. As improvement projects are developed for the TSP, potential conflicts with these resources will be included as part of alternatives evaluation.

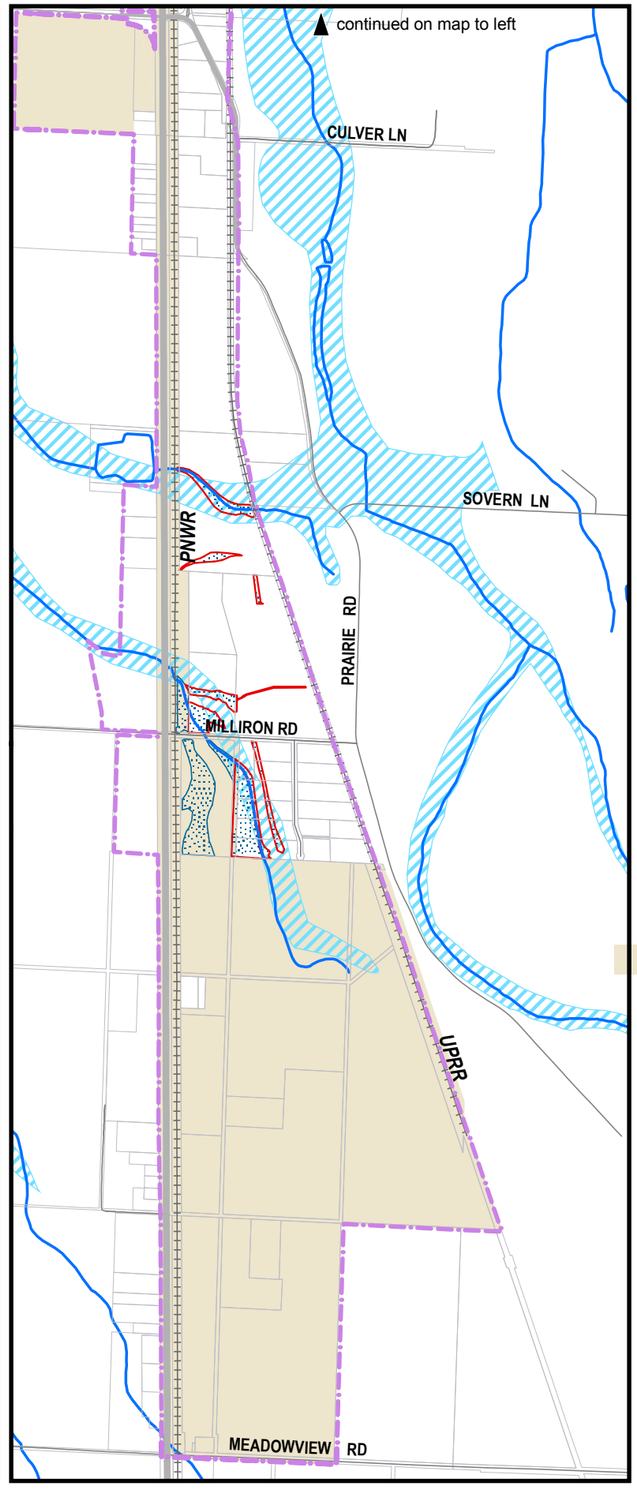
Junction City

Transportation System Plan

FIGURE 4

Streams & Wetlands





Legend

- STREAMS
- FLOODPLAIN

Wetlands
(2011 Oregon Dept. of State Lands)

- WETLANDS
- WETLANDS WITH DSL DELINEATION

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD

N W E S

0 1,000 2,000 *Feet*

PEDESTRIANS

The livability of a city is in part determined by citizens' perceptions of their ability to safely and comfortably walk to key destinations such as schools, parks, local shopping, and other services. The pedestrian system serves all types of pedestrians making different types of trips. It is especially important to provide safe pedestrian accessibility for children, seniors, low-income households and other transportation-disadvantaged populations. Walkable cities promote independence for a wide range of people that may not be able to drive and lessen reliance on travel by motor vehicle.

Junction City has the potential to have a well-utilized pedestrian network due to the generally compact layout of most of the activity generators (downtown shops, schools, parks, and community centers). Most activity generators, as well as most of the transportation-disadvantaged populations, are located in or near the city-core, within a ½-mile walk between key locations. This proximity helps to create a very walkable environment because most pedestrian trips are less than one mile in length, with trips less than ½-mile generally considered to be within a comfortable walking distance.

To improve the pedestrian environment in Junction City, the activity generators need to be better connected; with fewer barriers to direct travel. Gaps in pedestrian facilities should be filled to provide a grid of travel ways that promotes both short and long-distance trips. Pedestrian facilities also need to be maintained to keep the environment comfortable and attractive to all potential users.

This section describes the current pedestrian facilities within Junction City, including sidewalks, shared-use paths, and crossings.

Sidewalks

The primary form of pedestrian infrastructure is sidewalks; generally located along roadways. It is important that sidewalks be located along arterial and collector streets so that pedestrians have convenient access to the same high-demand locations as motor vehicles, while having physical separation from motor vehicle travel. Sidewalks should be continuous and should provide increased connectivity as pedestrians get closer to major facilities and activity generators.

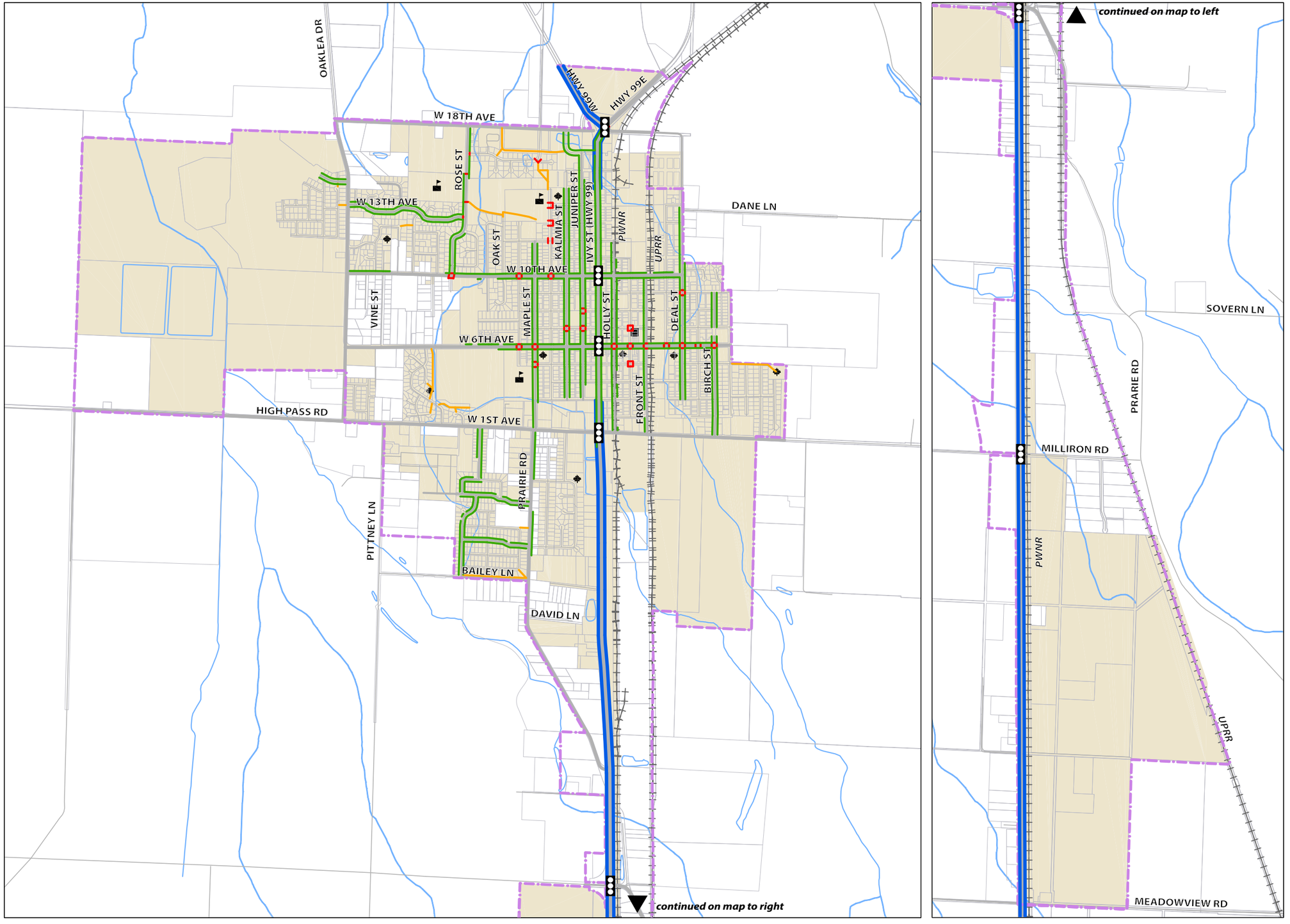
Figure 5 presents an inventory of pedestrian facilities on the arterial and collector street network in Junction City. The arterial and collector streets located near the downtown core have sidewalks on either one side or both sides of the street. The presence of sidewalks on arterials and collector streets generally becomes less common with increased distance from downtown. Sidewalks on neighborhood streets are more common in newer residential developments.

Significant gaps in the sidewalk network occur along Oaklea Drive, 18th Avenue, 1st Avenue, and the western ends of 10th and 6th Avenues. Sidewalk infill is also needed on Prairie Road from 1st Avenue to at least Bailey Lane. In addition, the layout of many neighborhoods and streets between Maple Street, 1st Avenue, Oaklea Drive, and 18th Avenue has limited connectivity, making walking distances to many destinations much longer. This limited connectivity also has an impact on the accessibility of area schools, which has resulted in some students cutting through private property to shorten their trips, such as reported at Scandia Village near the high school.

Junction City
Transportation System Plan

FIGURE 5

Existing Pedestrian and Bicycle Facilities



Legend

TRAFFIC SIGNAL

Arterial and Colletor Inventory

- MARKED CROSSWALK
- EXISTING SIDEWALK
- SHOULDER BIKEWAY
- SHARED USE PATH

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

Places of Interest

- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

Sidewalks along roadways may be located either directly adjacent to the curb or separated from the road by landscaping or planter strips. Along higher-speed roadways (especially 45 mph and above), buffers between pedestrians and motor vehicles are recommended to provide a comfortable walking environment. In high pedestrian use areas such as downtown, as much as 13 feet of width is preferred to allow for storefront displays, outdoor seating, parking meters, utility poles and other features in addition to providing a comfortable walkway. Most sidewalks in Junction City are five to six feet wide, including many of the sidewalks in the downtown, which is not wide enough to accommodate a furnishing zone or storefront displays.

Existing sidewalk facilities in the city should be enhanced to provide an improved pedestrian environment. The sidewalks along OR 99 (Ivy Street, the primary north-south arterial through downtown Junction City) are five to six-feet wide, curb-tight sidewalks, which in many places are abutting building frontages. Due to OR 99 being a designated truck and freight route, wind gusts and spray from heavy vehicles can be uninviting for pedestrians using the facility. In contrast, some older neighborhoods along Maple Street, Kalmia Street, and Juniper Street, have more attractive walking environments, with fairly continuous sidewalks buffered by planter strips.

Sidewalks and other pedestrian facilities need to be compliant with Americans with Disability Act (ADA) standards and regulations. It is important for all users that sidewalks be well maintained and free of significant obstacles to travel. Some sidewalks in the city are cracked or crumbling due wear, weathering, and underground roots. In addition, flooding can occur during heavy rains.

Shared-Use Paths

Shared-use paths are separated transportation facilities that enhance access and circulation for non-motorized modes of travel. Shared-use paths may be paved or gravel and particularly support recreational uses such as walking, jogging, and bicycling. Shared-use paths are generally wider than sidewalks, enough for safe passing to occur between different types of users. The preferred width for shared-use paths is 12 feet wide in urbanized and high-use areas, with a minimum width of eight feet allowable in short, constrained locations where necessary.

Shared-Use Path along west side of Junction City High School

The pedestrian and bicycle network in Junction City includes several shared-use paths, primarily around the Junction City High School and Laurel Elementary School. They are typically eight feet wide and paved with asphalt or concrete.

Street Crossings

Because street crossings expose pedestrians to conflicts with motor vehicle traffic, they can be safety concerns and may act as barriers to a well-connected pedestrian network. Factors such as

the crossing width, speed of traffic, volume of traffic, and visibility play a significant role in the level of comfort and safety of a crossing.

While there are many different types of treatments available to improve pedestrian crossings, the two most commonly seen in Junction City are traffic signals and striped crosswalks. Marked crosswalks on arterial and collector streets and intersections with traffic signals are illustrated in Figure 5.

Traffic signals are commonly installed to facilitate the movement of motor vehicles, but they also provide controlled crossing opportunities for pedestrians. All of the traffic signals in the city are located along OR 99. While these intersections do provide controlled crossings and most have ADA accessible curb ramps, they are also very far apart. The closest pair of signals (10th and 6th Avenues) are approximately ¼-mile apart. For a corridor surrounded by a grid of streets providing pedestrian access every 300 feet, these signals are too far apart to be usable for many pedestrians.

Off of OR 99, marked crosswalks are most frequently located along 10th Avenue and 6th Avenue. Many marked crosswalks connect to curb ramps, but most ramps are of older construction and not ADA accessible. In some cases, the curbs have no ramps at all.

Unique crosswalk designs using green paint were identified in school zones and in the downtown. However, because the use of green paint for such markings does not comply with the Manual on Uniform Traffic Control Devices (MUTCD), it may create a liability for the City should an incident occur. Therefore, unless this treatment is being tested as part of a state or federal sanctioned pilot project, it is recommended that they be removed and replaced with compliant designs.

Pedestrian Activity

Pedestrian counts were taken at study intersections during weekday afternoon peak periods to help gauge the level of activity. These counts were taken at the same time as the motor vehicle counts; primarily during September 2010 with updated counts taken during October/November 2015, when school was in session.

The most active location was the intersection on OR 99 with 6th Avenue, which experienced more than 150 pedestrian crossings from 3:00 to 6:00 p.m., with as many at 70 crossings occurring in one hour. The intersection on OR 99 with 10th Avenue had the second-most pedestrian crossings, but totaled only 75 during the three-hour period. Other intersections along OR 99 experienced far fewer crossings, with only the intersection at 1st Avenue serving a notable demand of about 20 crossings in the afternoon peak.

Off of the OR 99 corridor, the intersection on 1st Avenue with Maple Street/Prairie Road experienced 42 crossings during the afternoon peak. However, the demand at all other non-highway study intersections was very low.

With the flat terrain, compact form, and good overall connectivity, the design of Junction City makes walking a viable travel option. The pedestrian crossing counts and field observations confirm that many people do choose to walk and that demand can be concentrated in areas where

connectivity is limited (such as 1st Avenue/Maple Avenue/Prairie Road) or where opportunities to traverse barriers are provided (such as the signals on OR 99).

Pedestrian Collision History

A review of the Oregon Department of Transportation's (ODOT's) collision data from January 1, 2010, to December 31, 2014, was conducted to help better understand pedestrian safety issues in Junction City. The collision data identified three accidents involving pedestrians. The first accident occurred at a driveway/alley near the intersection of the 6th Ave and Holly Street. The motor vehicle did not yield right of way to the pedestrian on the sidewalk. . The weather was clear and dry, the pedestrian was in a motorized wheelchair ,and sustained minor injuries. The accident occurred at 10 a.m.

The second accident involving a pedestrian occurred at the intersection of Oaklea Drive and 15th Avenue. The motor vehicle was headed south on Oaklea Drive and the pedestrian was crossing Oaklea Drive heading east. The weather was clear and dry and the accident occurred at 4:00 p.m. The report states that the pedestrian was illegally in the roadway and was not wearing visible clothing. The pedestrian sustained minor injuries.

The third accident involving a pedestrian occurred at the intersection of Cedar and 6th Avenue. The motor vehicle was driving South on Cedar and did not yield right of way to the pedestrian who was crossing Cedar. The weather was clear and dry and the pedestrian sustained minor injuries. The accident occurred at 3:00 p.m.

BICYCLES

Traveling by bicycle can result in environmental and health benefits, while also saving money and reducing traffic congestion for others. After walking, bicycling is the second most common non-motorized mode of transportation. Bicycle travel can facilitate longer non-motorized trips, well beyond the ½ mile to 1 mile limit for most pedestrian trips.

Bikeways are required on all arterials and collectors by OAR 660-012-0065. Bikeways can be provided in a number of ways, but most commonly include bike lanes, shoulder bikeways, shared roadways, or shared-use paths. This section describes the findings from an inventory completed of Junction City's existing bicycle facilities. Existing bicycle facilities can be seen in Figure 5.

Bike Lanes

Bike lanes are 5 to 6-foot wide shoulders that have been designated for bicycle use, most commonly by pavement markings. There are no designated bike lanes in Junction City.

Shoulder Bikeways

Shoulder bikeways can be any roadway shoulder where bicyclists are allowed to ride, although the route is not specifically designated for bicycle use. To comfortably accommodate bikes, these shoulders should preferably be 6 feet wide, or at least 5 feet wide where there are adjacent barriers such as curbs or guardrail. Shoulders as narrow as 4 feet can be used in constrained areas when needed.

At the north end of the city on OR 99W and OR 99E, most of the shoulder is wide enough to be used by bicyclists. South of the intersection of OR 99W with OR 99E, adequate shoulders are available for bicyclist through the Flat Creek bridge. However, from the south end of the bridge to 3rd Avenue, there are no shoulders or separate bicycle facilities available on OR 99 (Ivy Street). Bicyclists typically ride down the sidewalks along OR 99. South of 3rd Avenue, the shoulders widen again and are adequate for bicycle use through the remainder of the study area.

Off of OR 99, the only roadway with consistently wide enough shoulders to accommodate bike travel is 1st Street east of OR 99.

Shared Roadways

Shared roadways are virtually any road where bikes ride in travel lanes with cars because separate facilities (e.g., bike lanes or shoulders) are not available. While this may not be suitable for safe and comfortable travel in some situations, generally, this can be a cost-effective and acceptable solution on roads where average daily traffic volumes are at 3,000 vehicles per day or fewer and speeds are 25 mph or lower. Routes can be further enhanced with warning signing and pavement markings to let drivers know to expect bikes on the road.

Most roadways in Junction City could be considered shared roadways. Even on many of the arterial and collector streets, traffic volumes are low enough to accommodate a shared roadway, but speeds may be too high. As decisions are made regarding where bike lanes and other types of bike facilities should be constructed in the future, areas where shared roadways could be safely created at lower costs should be considered.

Shared-Use Paths

The shared-use paths in Junction City are discussed in the Pedestrian section. The paths are paved and in good condition for bicycles. At 8 feet wide, they are somewhat narrow for frequent bicycle use. Limited bike route signage is located along the shared-use paths and the existing signage is in poor condition.

Bike Parking

Bike parking is an essential element of bike facility infrastructure because it allows users to feel secure in knowing their bike is safe while they access destinations such as schools, work places, and local businesses.

Bicycle parking was identified at a few key locations such as the Junction City Library, the Community Services Center, and at the local schools. The existing bike racks are of the older wave and modified-grid design, which are generally less space efficient for sidewalk application and less secure than newer inverted-U bike racks, also known as staple racks. In addition, most bike parking locations are not in highly visible areas, which tend to deter theft.

Modified-Grid Style Bike Parking at Oaklea Middle School

Bicycle Activity

Bicycle counts were taken at study intersections at the same time as the motor vehicle and pedestrian counts, which occurred primarily in September 2010 along with updated counts in October/November 2015. Intersection activity was measured during the afternoon peak period from 3:00 to 6:00 p.m.

In general, bicycle activity was fairly low with only a few bicyclists observed at most intersections during the three-hour afternoon period. The greatest amount of activity was at the intersections of OR 99 at 6th Avenue and 1st Avenue at Maple Street/Prairie Road where 13 and 12 bicyclists were observed, respectively. At the OR 99/6th Avenue intersection, most bicyclists were crossing the highway.

While the data used is very limited, it does suggest that there may be a moderate amount of bicycle travel in the city and that it is being channeled into key locations where connectivity is limited or where crossings of busy roads are facilitated. A better picture of the existing bicycle activity levels may be obtained by counting bicyclist at key locations during periods known for having higher activity, especially near schools during hours immediately prior to and immediately following the school day.

Bicycle Collision History

A review of ODOT's collision data from January 1, 2010 to December 31, 20014 was conducted to help better understand bicycle safety issues in Junction City. Within this time period, eight bicycle collisions were reported. Four accidents occurred along Ivy Street at 3rd Avenue, 7th Avenue, 10th Avenue and 12th Avenue. The accidents at 7th Avenue and 12th Avenue occurred when a motor vehicle was making a right turn from 7th/12th Avenue heading south onto OR 99

(Ivy Street). Both bicyclists were in the crosswalk and were traveling on the sidewalk, facing traffic and headed northbound. The report from the accident on 7th Avenue states that an obstruction blocked the driver of the motor vehicle's view. The accident at 3rd Avenue and Ivy Street involved a motor vehicle making a left turn from 3rd Avenue north onto Ivy Street. The bicyclist was traveling west on 3rd Avenue. The report states that the motor vehicle did not have right of way over the bicyclist. The accident at 10th Avenue and Ivy Street involved a motor vehicle traveling southbound on Ivy Street colliding with a bicyclist traveling eastbound crossing Ivy Street in the crosswalk. The report states that the bicyclist disregarded the traffic signal.

Two accidents occurred along 10th Avenue at the intersections of 10th Avenue and Rose Street and 10th Avenue and the Juniper Street Alley. The accident at 10th Avenue and Rose Street involved a motor vehicle on 10th Avenue making a left hand turn onto Rose Street. The bicyclist was headed southbound in the crosswalk. The report states that the bicyclist did not have right of way. The accident at 10th Avenue and the Juniper Street Alley involved a motor vehicle traveling eastbound on 10th Avenue colliding with a bicycle traveling northbound. The report states that the bicyclist did not have right of way and struck the motor vehicle.

The final two accidents occurred on 6th Avenue at the intersections of 6th Avenue and Nyssa Street and the Greenwood Street Alley. The accident at 6th Avenue and Nyssa involved a motor vehicle headed eastbound on 6th Avenue colliding with a bicycle in the roadway (direction of travel unknown). The report states that the bicyclist disregarded a stop sign. The accident at 6th Avenue and Greenwood Street Alley involved a stopped vehicle that was headed northbound and a bicyclist headed eastbound. The report states that the bicyclist struck the vehicle.

In all but one accident, the bicyclists involved were all under 20 years of age and all of the bicyclist sustained injuries.

TRANSIT

Public travel options are provided to Junction City by different forms of transit, which operate on fixed schedules and routes or are demand-responsive. Public transit is a way to provide citizens with mobility without using or owning a personal vehicle. It is particularly important for transit-dependent populations: the young, the elderly, persons with disabilities, and/or lower incomes. A transit system can enhance the livability of a city and provide economic benefits by reducing roadway volumes, and providing safe and efficient means to access shopping and employment centers. The existing fixed route, paratransit, and inter-city passenger bus services in Junction City are described in this section.

Fixed Route Transit Service

Lane Transit District (LTD)

Lane Transit District (LTD) is a fixed-route public transit provider operating within Lane County, Oregon. Since 1970, LTD has been providing transport services to the Eugene-Springfield metropolitan area and its surrounding communities. Route frequencies and locations continue to evolve based on rider volumes and available resources.

Junction City is served by one designated Rural Route, which is mapped in Figure 6. Route 95 picks up Monday through Friday three times during the morning (6:40 a.m., 8:09 a.m., and 10:09 a.m.), two times during the midday (12:09 p.m. and 3:12 p.m.), and three times during the evening (5:12 p.m., 6:10 p.m., and 7:14 p.m.) hours and runs twice in the morning, once midday, and once in the evening on Saturday. Sunday service is provided once in the morning and once in the evening.

Bus stop on Maple Street

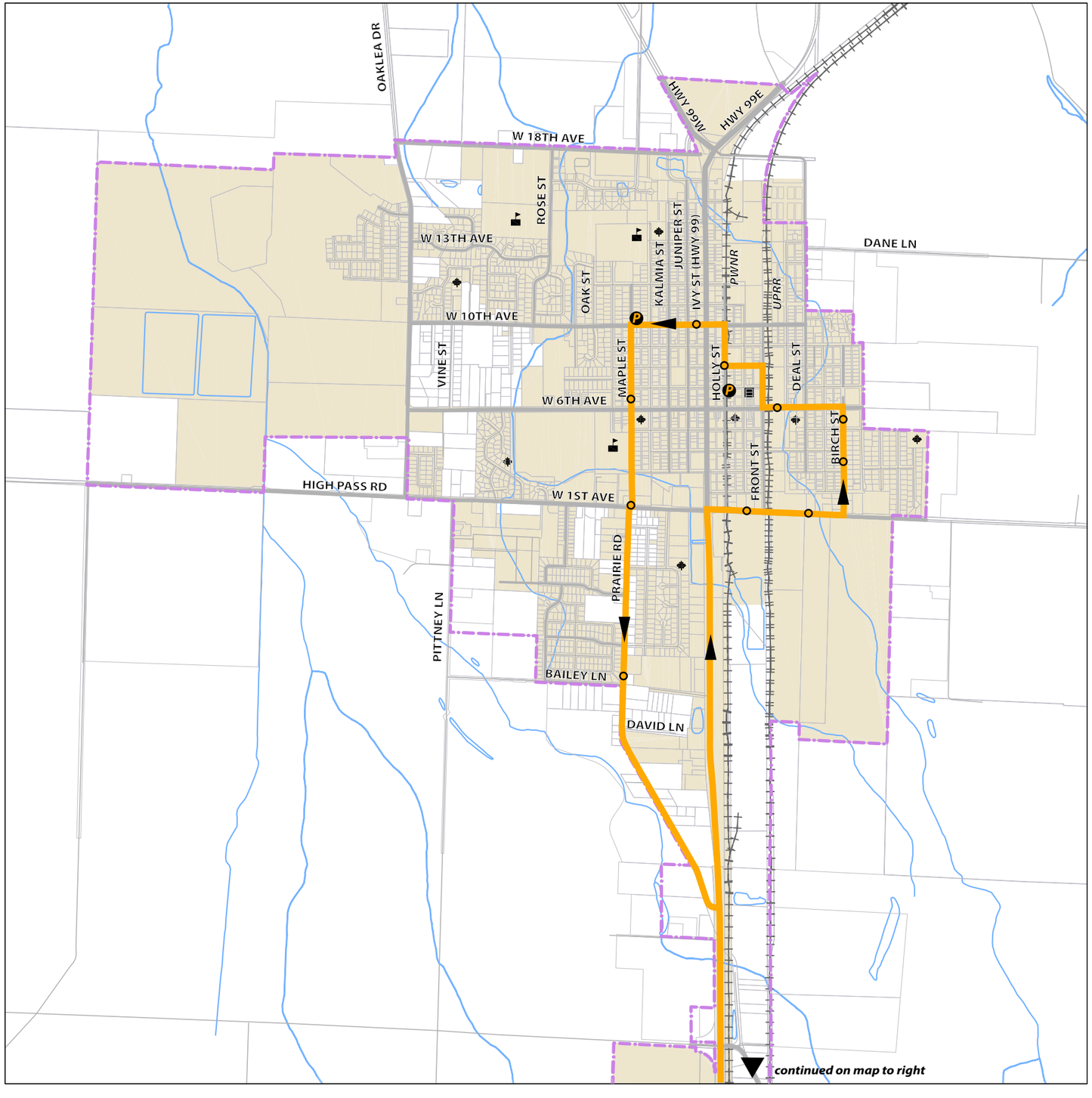
2010 data illustrates that boardings along the route vary throughout the day with an average weekday ridership of up to 200 passengers. Weekend ridership is around 40 passengers.

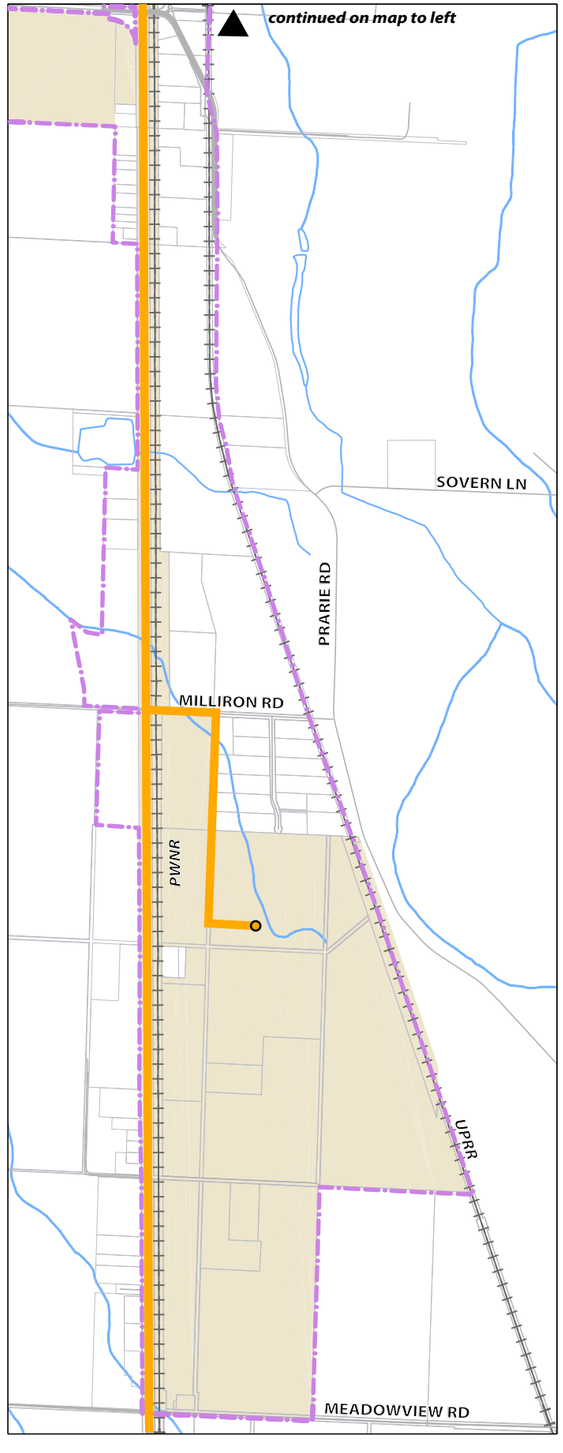
Route 95 has approximately 12 stop locations within the Junction City UGB. Two Park & Rides are located along Route 95 in Junction City at the Junction City United Methodist Church (750 West 10th Avenue) and in Downtown Junction City (West 7th Avenue and Holly Street). The Park & Rides are free and provide direct bus service to destinations within the service area. All buses are equipped to be Americans with Disabilities Act (ADA) accessible and have bike racks.

Junction City
Transportation System Plan

FIGURE 6

Transit





Legend

- BUS STOP
- BUS ROUTE
- PARK AND RIDE

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*

Places of Interest

- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

N W E S

0 1000 2000 Feet

At the time of the last TSP update, Junction City did have another service route. Route 95X was an express route with limited stops, however, the route was discontinued in August 2008 due to poor ridership. LTD has seen an overall decrease in ridership from residents in Junction City from approximately 61,000 passengers in 2005 with Route 95 and 95X in service, to roughly 46,000 passengers in 2010 with only Route 95 serving the community. Some of the ridership decrease is a result of jobs lost in Junction City.

To assist older adults and persons with disabilities, LTD has developed an EZ Access Program, which offers special transportation services.[1] The EZ Access Program provides half fare for persons with disabilities and Medicare cardholders. Their Honored Rider Program offers free bus passes to anyone older than 65 years of age. LTD also conducts individualized training for older adults and persons with disabilities to learn how to use the accessible features of the system. The accessible features of the system include: on-board announcements at stops, kneeling buses to make the first boarding step easier to reach for those with trouble climbing steps, and lifts and ramps to making boarding easier for those using a mobility device or who are unable to use stairs. In addition, LTD has extended paratransit service (RideSource) that provides a range of transportation services to people who are unable to use the bus. However, as discussed below, paratransit service is not available to Junction City.

Benton County Special Transportation Fund (STF)

Benton County's Special Transportation Fund (STF) is a program that promotes Benton County public transportation options for seniors and persons of any age group with disabilities. As part of the STF, Benton County has a rural transportation service that provides transportation opportunities for people residing, working or doing business north and south of Benton County. The rural transportation service has one route from Adair Village to Corvallis. This service runs five days a week and operates four round trips per day. Benton County did have an 99 Express Routes from Monroe to Junction City, however, due to low ridership and budget cuts the route was removed.

Paratransit Transit Service

A demand-response service for persons unable to use the bus is provided by LTD as part of their requirement to meet the Americans with Disabilities Act. This act requires that a complementary paratransit service be provided when a fixed-route system is operational.[2] LTD provides their required paratransit service through a program called RideSource. The service boundary for RideSource is the Eugene-Springfield Metropolitan Planning Organization (MPO). Junction City would need to join the MPO to receive complementary paratransit service from RideSource. However, paratransit service is available for residents in Junction City receiving Medicaid.

[1] *RIDER'S DIGEST Routes and Schedules*. Lane Transit District. January 9, 2011.

[2] *Part 37-Transportation Services for Individuals with Disabilities (ADA)*. ADA Regulations, Guidance, and Procedures. Federal Transit Administration. Revised October 1, 2007. Web address: http://www.fta.dot.gov/civilrights/ada/civil_rights_3906.html.

Inter-City Passenger Bus and Rail Services

Inter-city passenger bus and rail services are available through Greyhound[3] and Amtrak[4] in both Eugene and Corvallis. Per the last TSP update, Greyhound did stop in Junction City, however the stop is no longer a Greyhound station location. To access Greyhound or Amtrak, Junction City residents must travel to Eugene or Corvallis.

Greyhound services Eugene eight times a day with four trips from Portland to Eugene and four trips from Eugene to Portland. Several of these trips stop in Corvallis on their way to either Portland or Eugene. Corvallis is serviced seven times a day with four trips from Corvallis to Portland and three trips from Corvallis to Eugene.

Amtrak services Eugene-Springfield on the Amtrak Cascades route and provides services to Corvallis through the Pacific Coast Thruway Bus Connections with the service provider Valley Retriever. Valley Retriever operates out of the Corvallis Greyhound Station.[5]

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) describes any action that removes single occupancy vehicle (SOV) trips from the roadway network during peak travel periods. TDM often focuses on promoting alternative modes of travel to reduce overall vehicle miles traveled. The Lane Transit District, which provides transit service for Junction City, promotes both carpooling and vanpooling as alternative transportation options.

Carpooling is made up of two or more people sharing a ride in a private or company vehicle. Carpooling can be realized through a program called *Drive less. Connect.*[6], which helps to match those people interested in carpooling.

Vanpooling is typically a group of seven to 15 people who share their commute. The vanpool travels from a prearranged meeting place to a common destination. Valley VanPool is a service provided by the combined efforts of Cascades West Rideshare, Cherriots Rideshare, and the Lane Transit District's point2point Solutions Program. Currently Valley VanPool has 48 routes traversing all across the Willamette Valley.[7]

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[3] *Locations: States: Oregon*. Greyhound. Website accessed April 11, 2016. Web Address: http://www.greyhound.com/en/locations/locations.aspx?state=or.

[4] *Browse by Region – Northwest*. Amtrak. Website accessed April 11, 2016. Web Address: http://www.amtrak.com/servlet/ContentServer?c=Page&pagename=am%2FLayout&p=1237405732508&cid=1237608346792.

[5] *Amtrak Cascades*. Amtrak. Website accessed April 11, 2016. Web address: http://www.amtrak.com/servlet/ContentServer/Page/1237405732505/1237405732505.

[6] Drive less. Connect. Website accessed April 11, 2016. Web address: http://drivelessconnect.com/.

[7] Valley VanPool. Website accessed April 11, 2016. Web address: http://www.valleyvanpool.info/vanpool.htm.

MOTOR VEHICLES

The use of private motor vehicles is the predominant transport mode for Junction City residents and visitors. Motor vehicles give drivers flexibility in route and destination, are a critical mode of travel for freight movement, and are important for travelers living on the outskirts of Junction City. Existing motor vehicle facilities, volumes, intersection operations, safety, and issues within the City of Junction City are described in this section.

Motor Vehicle Facilities

The motor vehicle system within Junction City includes state highways, county roads, and city streets. Roadway jurisdictions, classifications, standards, and physical conditions are discussed below.

Roadway Jurisdiction and Functional Classification

The responsibility for facility operation and maintenance within the Junction City UGB depends on which agency has jurisdiction. While the City of Junction City maintains jurisdiction over most roadways in the city, the state highways, which include OR 99E, OR 99W, OR 99, and OR 36, are under the jurisdiction of ODOT. Lane County also maintains jurisdiction over many roadways surrounding and within the city. The jurisdiction of area roadways, along with their designated functional classifications, are described below.

Junction City Roadways and Functional Classification

Functional classification describes how a facility is intended to be designed and operated. This is often described by the level of access or mobility that the facility is intended to provide. Generally, when a facility provides a higher degree of direct access, the level of mobility it is able to provide decreases. The City of Junction City has four designated functional classifications including arterials, major collectors, minor collectors, and local streets. Designated City street functional classifications are illustrated in Figure 7, with descriptions of each classification from the existing TSP provided below. Updates to the City's roadway functional classifications will occur during the TSP update process. As part of that process, the City should consider using functional classification designations that are consistent with those used by the State of Oregon to facilitate funding allocation.

Arterials

Access to arterials should typically be from the collector road system. These roadways should be protected against strip development and access driveways that will reduce their capacity and decrease their effectiveness. Highway 99, 1st Avenue (including High Pass and River Road segments), W 18th Avenue, and Oaklea Drive are classified as arterials in Junction City. These facilities need to be safe, high volume traffic movers and serve as regional connectors.

Major Collectors

Major collectors move traffic from local streets and minor collectors to the arterial system and back. Individual accesses appear more frequently than on arterials, but are

managed to minimize degradation of capacity and traffic safety. Prairie Road, 6th Avenue, and 10th Avenue are considered major collectors in Junction City.

Minor Collectors

Minor collectors provide access to abutting properties and serve local access to neighborhoods including limited through traffic. New development that generates a significant amount of traffic shall be discouraged from locating on minor collectors that serve residential areas and traffic studies will be used to analyze impacts of the proposed uses. Minor collectors include Rose, Maple, Kalmia, Juniper, Holly, Front, Deal, and Birch Streets.

Local Streets

Local streets provide direct property access as well as access to collectors and minor arterials. All streets not listed above are categorized as local streets.

State and County Roadways and Classifications

The Oregon Highway Plan (OHP) classifies all state highways according to their intended function. State highways within the vicinity of Junction City are described in Table 1. Both OR 99E and OR 99W are classified as Regional Highways north of the city before they merge into OR 99, which serves as the main north-south corridor through town. OR 36 is classified as a District Highway. The intended functions of Regional and District Highways are described below.

Regional Highways

Regional Highways provide connections to regional centers, Statewide or Interstate Highways, or economic or activity centers of regional significance. The management objective of regional highways is to provide safe and efficient, high-speed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas. A secondary priority is to serve land uses in the vicinity of these highways.

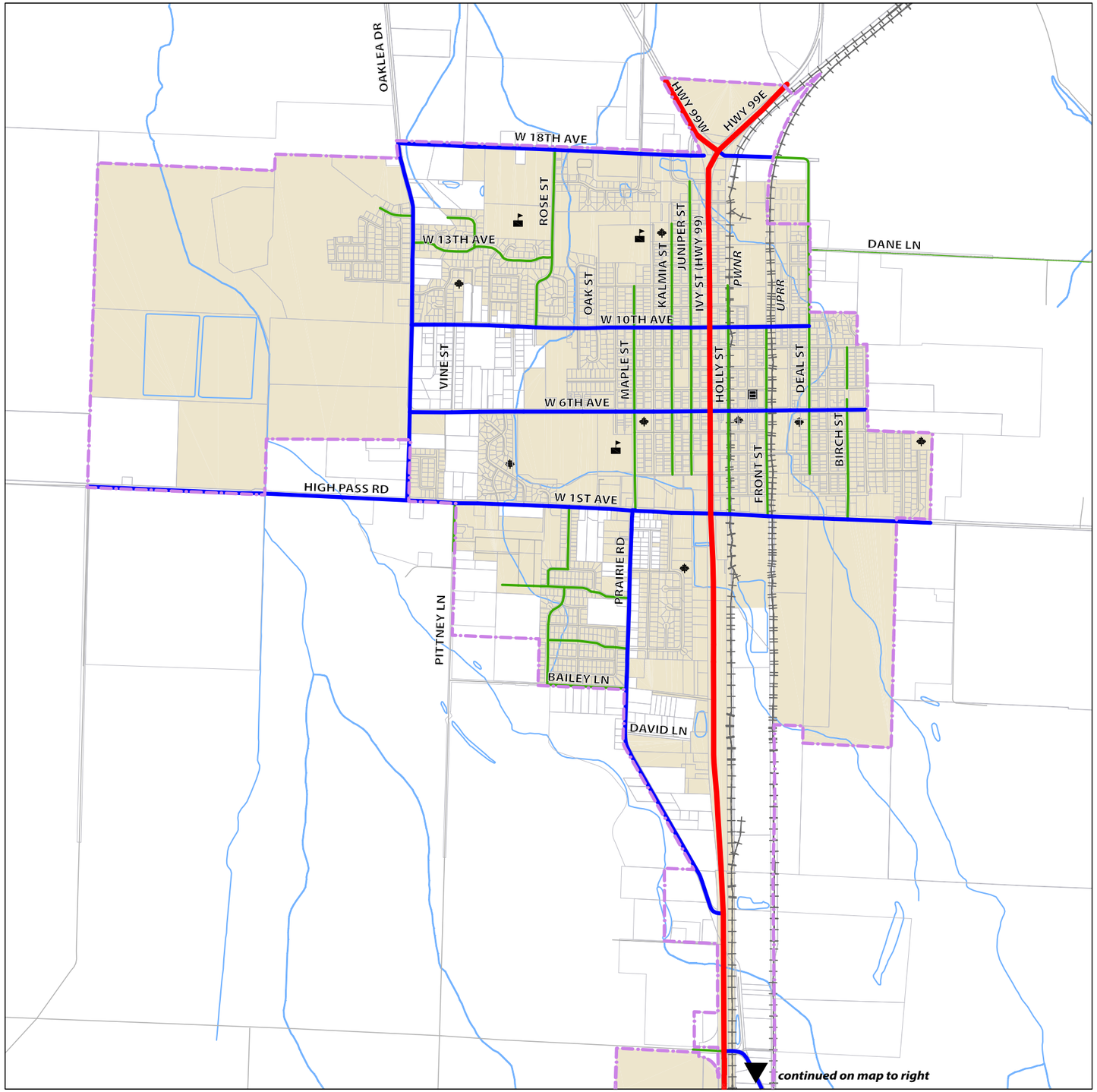
District Highways

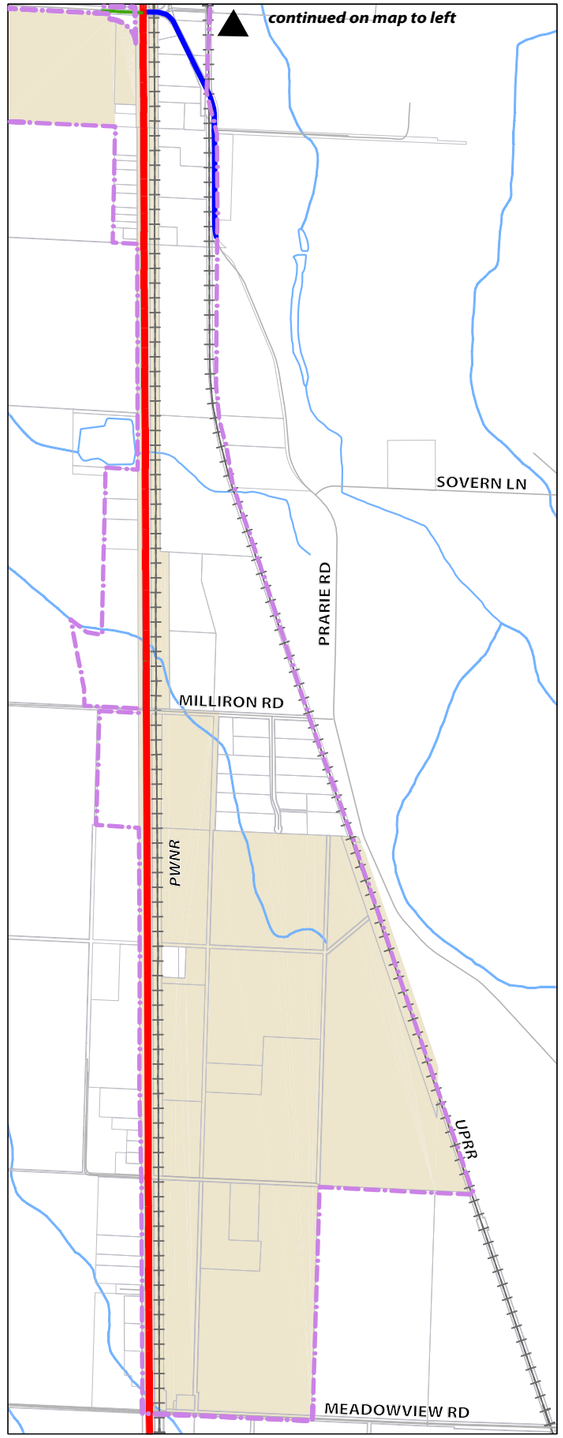
District Highways serve a county-wide significance and function largely as county and city arterials or collectors. They provide connections and links between urbanized areas, rural centers, and urban hubs, and also serve local access and traffic. The management objective for district highways is to provide safe and efficient, moderate to high-speed continuous-flow operation in rural areas and moderate to low-speed operation in urban and urbanizing areas.

Junction City
Transportation System Plan

FIGURE 7

Roadway Functional Classification





Legend

Roadways
- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL

Places of Interest
- CITY HALL
- PARK
- PUBLIC SCHOOL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

0 1000 2000 Feet

OR 99E, OR 99W, and OR 99 are also designated as federal truck routes. OR 99W and OR99 are further designated by ODOT as State Freight Routes. The Freight Route designation is intended to facilitate efficient and reliable interstate, intrastate, and regional truck movement through a designated freight system. On these routes, the needs of freight movement must be balanced with the needs of other highway users. Where freight routes coincide with a local community's main street, there may be competing objectives for the design and function of the highway. In such cases, a management plan may be needed.

Lane County uses similar functional classification system designations as Junction City, including arterials, collectors, and local roadways. Because Lane County maintains jurisdiction over a number of roadways through and surrounding Junction City (see Table 1), close coordination between agencies regarding design, permitting, and maintenance is required.

Both ODOT and Lane County monitor pavement conditions on their roadways. The most recent pavement condition ratings along state highways and county roads are provided in Table 1. Roadways are scored in a variety of categories that can sum to 100 points on an established scale. The rating system used by ODOT is as follows: Very Good (100-96), Good (95-76), Fair (75-46), Poor (45-21), and Very Poor (20-0). For Lane County, the rating system varies slightly, and is as follows: Very Good (100-75), Good (74-55), Poor (54-40), and Very Poor (39-0).

TABLE 1: State and County Roadway Functional Classifications and Pavement Conditions

Roadway Name	Segment	Functional Classification	Other Designations	Pavement Condition Index Rating* (0-100 scale)
ODOT Roadways				
OR 99E	North Junction City UGB to OR 99W/OR 99E Intersection	Regional Highway	Federal Truck Route	Good (80)
OR 99W	North Junction City UGB to OR 99W/OR 99E Intersection	Regional Highway	State Freight Route, Federal Truck Route	Good (84)
OR 99	OR 99E/OR 99W Intersection to South End of Flat Creek Bridge	Regional Highway	State Freight Route, Federal Truck Route	Fair (72-74)
OR 99	South End of Flat Creek Bridge to W. 3rd Avenue	Regional Highway	State Freight Route, Federal Truck Route	Fair (62)
OR 99	W. 3rd Avenue to Meadowview Road	Regional Highway	State Freight Route, Federal Truck Route	Fair (67)
OR 36	OR 99 to West Junction City UGB	District Highway	-	Good (80)
Lane County Roadways				
W 6th Avenue	Oaklea Drive to Spruce Street	Major Collector	-	Good (69)
W 10th Avenue	Oaklea Drive to Rose Street	Major Collector	-	-
11th Street	Tamarack Street to Spruce Street	Local	-	Very Good (80)
E 18th Avenue & Deal Street	OR 99 to 0.30 miles east (UGB)	Minor Collector	-	Very Good (83)
W 18th Avenue	Oaklea Drive to Safeway	Major Collector	-	Very Good (100)
Bailey Lane	Pitney Lane to UGB	Local	-	Very Good (81)
Dane Lane	All	Local	-	Very Good (82)
High Pass Road	OR 99 to West UGB	Major Collector	-	Very Good (100)
Meadowview Road	OR 99 to East	Minor Collector	-	Very Good (90)
Meadowview Road	OR 99 to West	Minor Collector	-	Very Good (90)
Milliron Road	OR 99 to East	Local	-	Very Good (80**)
Milliron Road	OR 99 to West	Local	-	Very Good (78)
Oaklea Drive	OR 99W to High Pass Road	Major Collector	-	Very Good (100)
Pitney Lane	High Pass Road to OR 36	Local	-	Good (73)
Prairie Road	Bailey Lane to OR 99	Major Collector	-	Very Good (90)
Prairie Road	OR 99 to Meadowview Road	Major Collector	-	Very Good (81 – 83)
River Road	OR 99 to East UGB	Minor Arterial	-	Very Good (80)
Rose Street	South of 10th Avenue	Local	-	Very Good (78)
Spruce Street	North of 10th Avenue	Local	-	Very Good (85)
Spruce Street	South of 10th Avenue	Local	-	Very Good (83)
Tamarack Street	North of 10th Avenue	Local	-	Very Good (78)
Vine Street	6th Avenue to 10th Avenue	Local	-	Very Good (82)
Walnut Street	South of 10th Avenue	Local	-	Very Good (83)

* Pavement condition ratings last reported in 2014 for state roadways and in 2011/2012 for county roadways.
**Pavement condition rating reported in 2009/2010 for county roadway.

Access Management Standards

Access management includes the planning, design, and regulation of how people enter and leave a roadway. The design and operation of access points along a roadway can have a significant impact on the efficiency and safety of travel. Therefore, access is typically managed in a manner that is consistent with the functional classification that has been assigned to a roadway. Key elements often include: spacing between access points, provision of circulation between adjacent properties, visibility, design, and formal permitting process.

Junction City Access Management Standards

Junction City has established access management regulations through the Municipal Code (Chapter 17.85). These regulations include permitting and site plan review processes, design and spacing standards, and requirements for the provision of inter-parcel circulation and joint access. The City's requirements for access spacing are shown below in Table 2, with spacing measured from centerline to centerline of the intersection. New accesses shall meet or exceed these minimum spacing requirements. However, where no alternatives exist or where strict application of the standards are impractical, the City may allow variances.

TABLE 2: City of Junction City Access Spacing Standards

Functional Classification	Minimum Access Spacing
Arterial	150 feet
Major Collector	75 feet
Minor Collector	50 feet
Local Street	25 feet

Source: City of Junction City Ordinance 17.85.060

In addition to the access management standards described above, both Junction City and Lane County adopted an Access Management Plan as part of the OR 99 Junction City Refinement Plan.[8] The Access Management Plan applies to OR 99W, OR 99E, and OR 99 from approximately the northern UGB to OR 36 and supersedes the access management standards for adopting agencies. It includes an access management action plan that outlines short-, medium-, and long-range actions for each access point (public street intersections and private driveways) to these highways. Short-range actions could be implemented immediately, medium-range actions are dependent on property redevelopment, and long-range actions would occur as part of or following a construction project by ODOT or the City. The ultimate objective of this plan is to identify incremental improvements to make safety and operations enhancements to the corridor.

The Access Management Plan also includes guidance for modifying plan recommendations in the future, as well as recommendations for modifications to the public alleys in the downtown area to better support side street access. The ability to use the modified alleys for primary access points to highway adjacent properties has recently been questioned as being impractical and too

[8] *OR 99 Junction City Refinement Plan*, 2008.

costly to support local development. This element of the plan is being reconsidered as part of the TSP update.

State Access Management Standards

Access management standards for state highways are provided through the *1999 Oregon Highway Plan* and OAR 734-051. Much like the City's access management regulations, ODOT's regulations include a formal process for the review and approval of access permits, as well as spacing and design requirements. Highway access spacing standards vary with highway classification, surrounding area type, volume of traffic served, and posted speed.

The Access Management Plan included as part of the OR 99 Junction City Refinement Plan supersedes ODOT's access spacing standards where applicable. State highways not affected by that plan include OR 99 south of OR 36 and OR 36. The access spacing standards for those highway segments are shown in Table 3.

TABLE 3: State Access Spacing Standards for Select Highway Segments

Highway Segment	Classification	Average Annual Daily Traffic Volume	Posted Speed (mph)	Area Type [a]	Spacing Standard [b]
OR 99: OR 36 to Meadowview Road	Regional Highway	13,000	55	Urban	990 feet
OR 36: OR 99 to Pitney Lane	District Highway	3,300	55	Rural	650 feet

[a] The Urban standard applies in UBGs unless a management plan agreed to by ODOT and the local government(s) establishes a different standard.

[b] Measurement of the approach road spacing is from center to center on the same side of the roadway.

Source: 1999 Oregon Highway Plan, as amended December 2011.

Lane County Access Management Standards

The Lane Code includes regulations pertaining to access to County roads in Chapter 15.138. Lane County access spacing standards for arterial and collector roadways are shown in Table 4. Spacing standards for local roadways range from 20 to 100 feet, depending on the use being served.

TABLE 4: Lane County Access Spacing Standards for Arterials and Collectors (Feet)

Posted Speed or Traveled Speed (mph)	Principal Arterial	Minor Arterial	Major Collector	Minor Collector
> 55	700	475	475	325
50	550	475	475	325
40 & 45	500	400	400	325
30 & 35	400	275	275	220
< 25	400	200	200	150

Posted Speeds and Traffic Control

An inventory of posted speeds and intersection traffic controls within the Junction City UGB is shown in Figure 8. The majority of streets within the UGB have speed limits of 25 miles per hour (mph) or are not posted. OR 99 through town is posted at 30 mph, but outside of the downtown speeds are between 45 and 55 mph. There are currently six traffic signals in Junction City, with all of them being on OR 99.

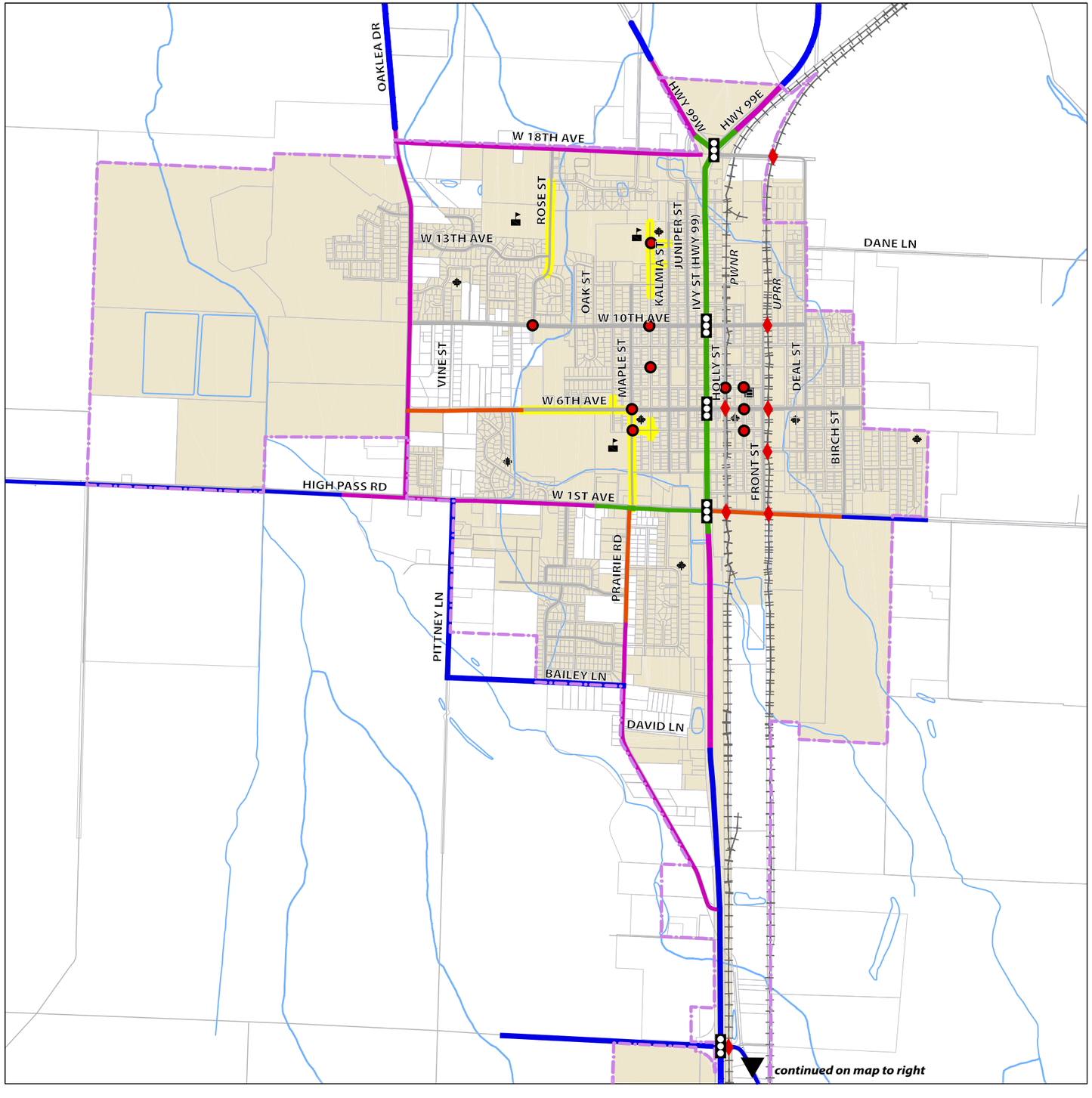
On-Street Parking

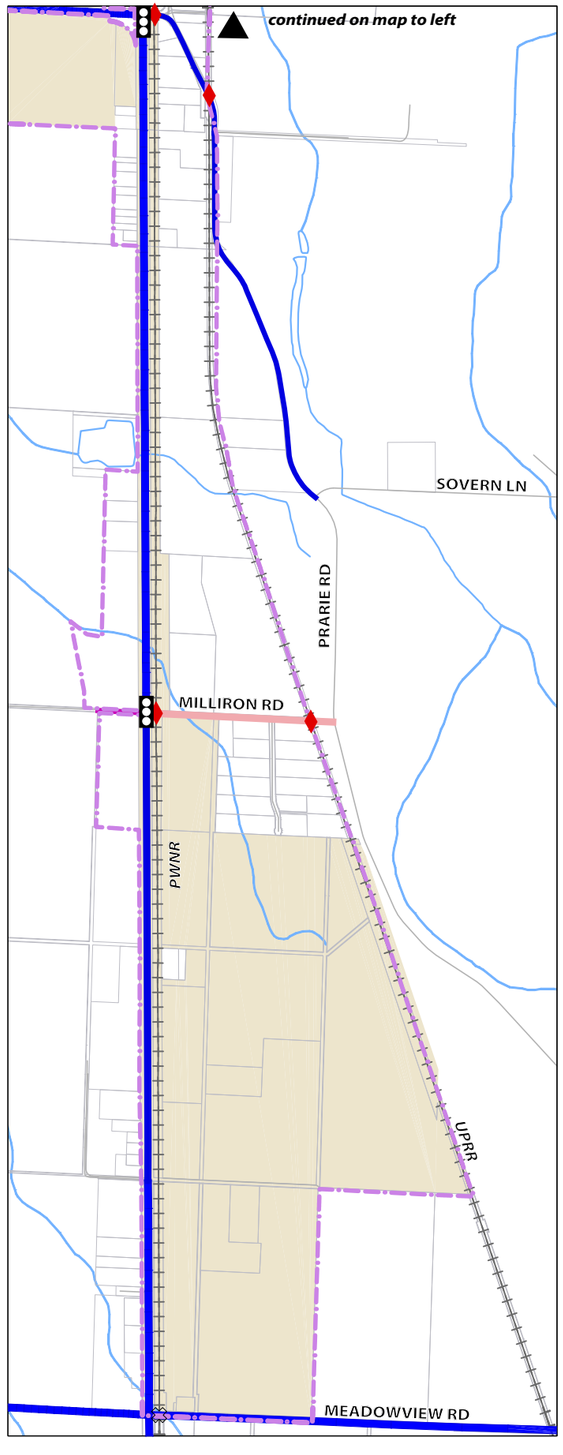
On-street parking in Junction City is permitted on residential streets and in the downtown core. Most parking spaces in the downtown core are marked; however, outside of the downtown core spaces are typically not marked. One recent change to parking has occurred on 6th Avenue east of OR 99. Some formerly parallel parking spaces have been adjusted to angled parking on the south side of the roadway. This change was made in the summer of 2010 to provide more parking spaces in the downtown. Parking in the downtown is free of charge but is restricted to two-hour limits in some locations.

Junction City
Transportation System Plan

FIGURE 8

Vehicle Speed Limits and Traffic Control





Legend

Intersection Control
- TRAFFIC SIGNAL
- ALL WAY STOP
- SCHOOL ZONE

Railroad Control
- GATES

Posted Speed Limit
(25MPH or less if not shown)
- 30 MPH
- 35 MPH
- 40 MPH
- 45 MPH
- 45 MPH

CITY LIMITS
URBAN GROWTH BOUNDARY
TAX LOTS
RAILROAD
STREAM

Places of Interest
- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

Motor Vehicle Volumes

Motor vehicle traffic counts were collected at study intersections and on several key area roadways. On most roads, traffic volumes are generally moderate to low, indicating that they are well under capacity and should not be experiencing congestion. The highest traffic volumes occur along the OR 99 corridor.

Weekday traffic along OR 99 often experiences a brief peak in the morning between 7:00 and 8:00 a.m. before dropping to moderate levels during the midday. Traffic volumes then steadily rise after 2:00 p.m., reaching the highest levels of the day between 4:00 and 5:00 p.m. (typical peak hour estimated to be 4:30 to 5:30 p.m.). By 7:00 p.m., traffic volumes on OR 99 have decreased substantially and can be fairly low.

Design Hour Traffic Volumes

Prior to measuring system performance and the need for improvements, a design hour must be selected. The 30th highest annual hour traffic volume (30 HV) was selected because it is a commonly used design period for transportation improvements and is also the basis for ODOT's mobility targets. Therefore, prior to using the traffic counts collected for analysis, they were factored to better represent this time period. The methodology used for seasonally adjusting traffic volume counts obtained in Junction City was consistent with that used recently for the *OR 99 Junction City Refinement Plan*[9] as well as with the ODOT Transportation Planning Analysis Unit's *Analysis Procedures Manual* (Chapter 4 Developing Design Hour Volumes).

The ODOT 2010 Seasonal Trend Table[10] was used to generate seasonal factors for the traffic counts. Due to the characteristics of traffic in Junction City and to be consistent with previous analysis, an average of the "Commuter" and "Summer" trends was used to produce a seasonal factor. The seasonal factor calculation methodology can be found in the appendix. The resulting traffic volumes for use in analysis for this project are similar to those that would be experienced during a weekday afternoon peak hour in the summer. These volumes are illustrated in Figure 9.

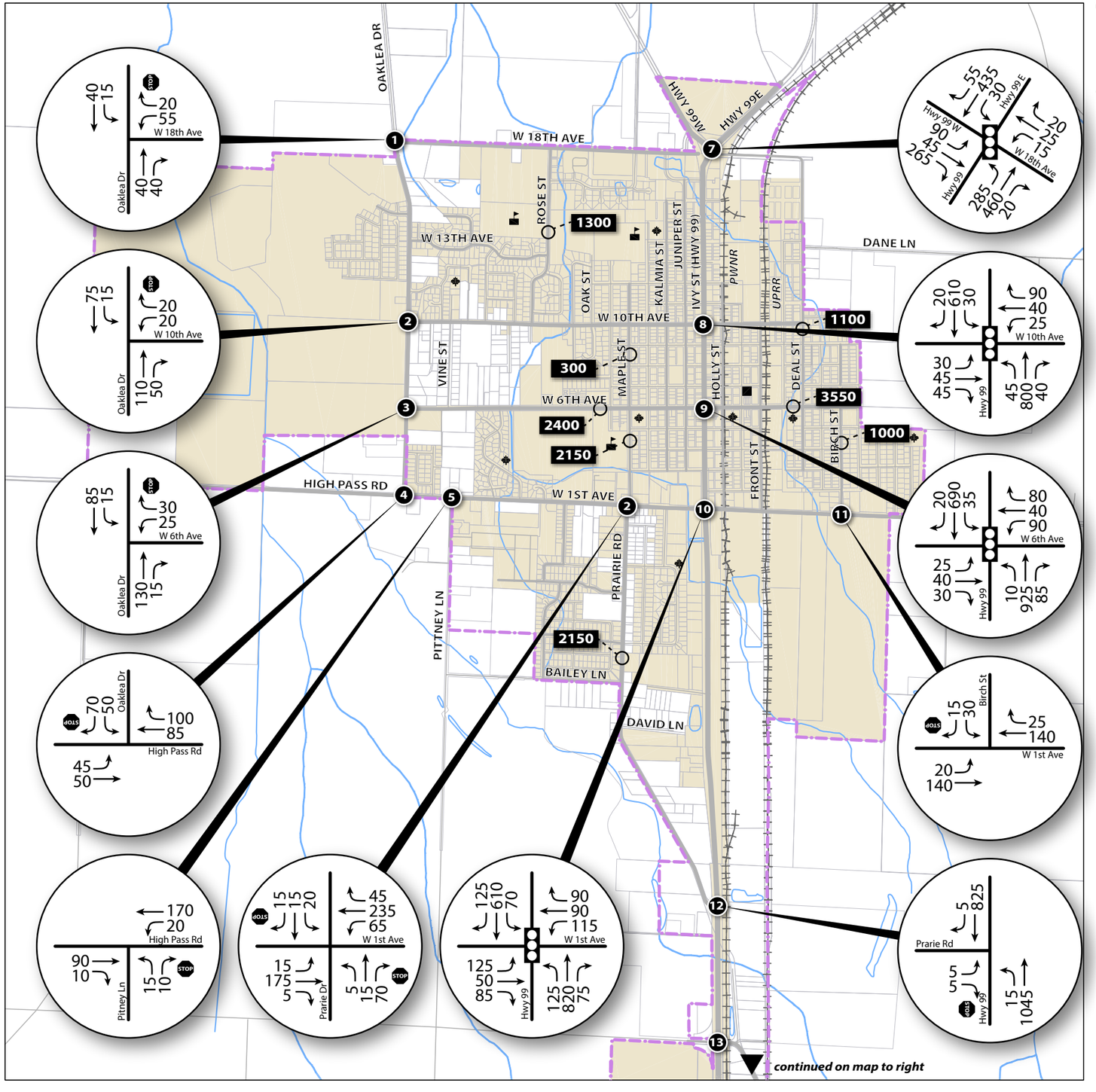
[9] *OR 99 Junction City Refinement Plan*, DKS Associates, LCOG, 2008.

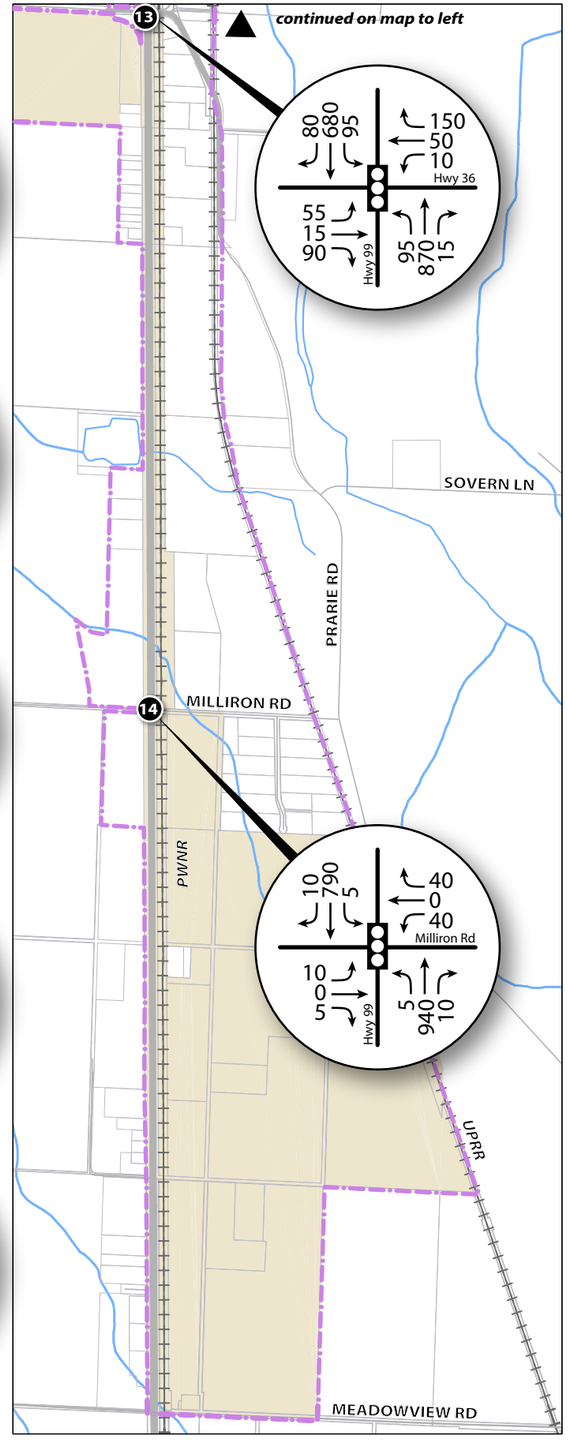
[10] *2010 Seasonal Trend Table*. Retrieved February 16, 2011, from Oregon Department of Transportation Web site: http://www.oregon.gov/ODOT/TD/TPAU/A_Data.shtml

Junction City
Transportation System Plan

FIGURE 9

2015 Existing
PM Peak Hour
Traffic Volumes





Legend

0 STUDY INTERSECTION

Roadways

- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL

CITY LIMITS

URBAN GROWTH BOUNDARY

TAX LOTS

RAILROAD

STREAM

Traffic Volume Data

STOP STOP SIGN

TRAFFIC SIGNAL

← 000 PM PEAK HOUR TRAFFIC VOLUME

○ 000 WEEKDAY AVERAGE DAILY TRAFFIC

Places of Interest

CITY HALL

PARK

PUBLIC SCHOOL

N W E S

0 1000 2000 Feet

Traffic Operations

Existing traffic operations were analyzed at the 14 study intersections using Synchro 8 software to measure the levels of congestion currently being experienced. These intersections were selected because they are controlling traffic flow on the major corridors in Junction City and affect how efficiently the roadway system operates.

Intersection Performance Standards

The use of mobility standards or targets for roadways identifies the maximum amount of congestion that an agency has deemed to be acceptable. Such standards are commonly used to assess the impacts of proposed land use actions and to help determine transportation improvement needs for project planning.

Junction City does not currently maintain adopted mobility standards for roadways in the city. However, both ODOT and Lane County do have adopted mobility standards for facilities under their jurisdiction. ODOT's mobility "targets" are based on volume to capacity (v/c) ratios, and vary by functional classification, area type, and posted speed. Lane County's mobility standards are based on both v/c ratios and levels of service. The measures of v/c ratios and levels of service are both described below, with applicable ODOT and County mobility targets/standards provided in Tables 5 and 6.

Volume to capacity (v/c) ratio

The v/c ratio represents a facility's level of saturation (i.e., what proportion of capacity is being used), with values ranging from 0.00 to 1.00. A lower ratio indicates smooth operations and minimal delays. As the ratio approaches 1.00, congestion increases and performance is degraded. At a ratio of 1.00, the intersection, lane, or movement is saturated and usually experiences excessive queues and long delays.

Level of service (LOS)

The level of service (LOS) is a performance measure that is similar to a "report card" rating and is based on average vehicle delay. Level of service A, B, and C indicate conditions where traffic moves without significant delays. Level of service D and E are progressively worse operating conditions. Level of service F represents conditions where average vehicle delay has become excessive and demand is near capacity. This condition is typically evident by long queues and delays, with intersection delays often being difficult to measure because congestion may extend into and be affected by adjacent intersections. The average delay value (in seconds) corresponding to each level of service designation, along with additional level of service descriptions, are provided in the appendix.

It should be noted that mobility targets shown in Table 5 for ODOT facilities are taken from the *1999 Oregon Highway Plan* (OHP) and are used to measure when improvements will be needed. A different set of mobility targets for state facilities will be used later in the TSP project to assess the adequacy of proposed improvements.

TABLE 5: ODOT Highway Peak Hour Mobility Targets (v/c ratios)[11]

Highway Category	Inside Urban Growth Boundary		
	Non-MPO outside of STAs where non-freeway posted speed ≤ 35 mph	**Non-MPO outside of STAs where non-freeway speed > 35 mph, but < 45 mph**	**Non-MPO where non-freeway speed limit ≥ 45 mph**
Freight Route on a Regional or District Highway	0.90	0.85	0.85
Regional Highway	0.90	0.85	0.85
District/ Local Interest Roads	0.95	0.90	0.90

Note: For unsignalized intersections, achieving the volume to capacity ratios for the state highway approaches indicates that state mobility targets are being met. In order to maintain safe operation of the intersection, non-state highway approaches are expected to meet or not to exceed the volume to capacity ratios for District/Local Interest Roads.

TABLE 6: Lane County Peak Hour Mobility Standards[12]

Inside Urban Growth Boundaries		**Outside Urban Growth Boundaries**
Speed Limit <45 mph	**Speed Limit ≥45 mph**	**Outside Unincorporated Communities**
v/c ≤ 0.85	v/c ≤ 0.75	v/c ≤ 0.70

Note: Arterial and Collector streets must also perform at a level of service D or better.

Existing Operating Conditions

The traffic volumes representing the design hour (shown in Figure 9) under existing conditions where analyzed at the study intersections, with the results compared to applicable mobility targets/standards. As shown in Table 7, all study intersections are meeting mobility targets/standards with no significant congestion noted. The analysis worksheets can be found in the appendix.

[11] *Ibid.*

[12] *Lane County Transportation System Plan*, Goal 4, June 2004 and *Lane Code 15.696*.

TABLE 7: Existing (2010) Weekday PM Peak Hour Intersection Operations

Intersection (North-South / East-West)	Jurisdiction	Mobility Target	Intersection Performance		
			Delay (sec)	*LOS*	*V/C*
Oaklea Dr. / 18th Ave.	Lane County	0.95 V/C or LOS D	9.7	A/A	0.11
Oaklea Dr. / 10th Ave.	Lane County	0.95 V/C or LOS D	9.8	A/A	0.06
Oaklea Dr. / 6th Ave.	Lane County	0.95 V/C or LOS D	10.1	A/B	0.09
Oaklea Dr. / 1st Ave. – High Pass Rd.	Lane County	0.95 V/C or LOS D	10.9	A/B	0.20
Pitney Ln. / 1st Ave. – High Pass Rd.	Lane County	0.95 V/C or LOS D	10.0	A/B	0.04
Prairie Rd.-Maple St. / 1st Ave.-High Pass Rd.	Junction City/ Lane County	0.95 V/C or LOS D	15.6	A/C	0.15
OR 99E / OR 99W	ODOT	0.85 V/C	13.2	B	0.50
OR 99 / 10th Ave.	ODOT	0.90 V/C	7.0	A	0.46
OR 99 / 6th Ave.	ODOT	0.90 V/C	11.8	B	0.53
OR 99 / 1st Ave.	ODOT	0.90 V/C	15.5	B	0.61
Birch St. / 1st Ave. – River Rd.	Junction City/ Lane County	0.95 V/C or LOS D	11.9	A/B	0.07
OR 99 / Prairie Rd.	ODOT	0.85 V/C*	16.7	A/C	0.03
OR 99 / OR 36	ODOT	0.85 V/C	14.7	B	0.57
OR 99 / Milliron Rd	ODOT	0.85 V/C*	6.1	A	0.46

Signalized Intersection:
Delay = Average Intersection Delay (sec.)
LOS = Level of Service
V/C = Volume to Capacity Ratio
Shaded values do not meet standards

Unsignalized Intersection:
Delay = Critical Movement Approach Delay (sec.)
LOS = Major Street LOS / Minor Street LOS
V/C = Critical Movement Volume to Capacity Ratio
Note: LOS for all-way stop intersections reported for entire intersection
* Mobility target shown is for stopped minor street approaches

Traffic Safety

The relative level of safety experienced on the streets within Junction City was assessed by obtaining five-years (2010 through 2014) of collision data from ODOT and analyzing it for trends and comparisons with similar facilities.

Intersection Collisions

Most motor vehicle collisions in Junction City (nearly half) occur along OR 99, which is also where most of the traffic is. It is also common for most collisions to occur at or near intersections, since these are the places where most conflicts between vehicles occur. The first level of analysis conducted was conducted using the Critical Crash Rate method following ODOT's *Analysis Procedures Manual (APM)* to identify the intersections experiencing the higher than average rates of collisions compared to other intersections of the same type within the study area.

Table 8 reports the five-year collision history of the intersections in the city with the most notable frequency of collisions. At each intersection an overall rate of collisions is calculated. The use of collision rates (collision per million entering vehicles, or "MEV") with respect to the volume of traffic served provides for a better comparison between locations than when just looking at the total number of collisions. Additonally, comparing individual intersection crash rates to average crash rates for intersections of the same type within the study area helps to better identify intersections with higher than average crash rates.

The most collisions occurred at the intersections on OR 99 with 10th, 6th, and 1st Avenues. However, only the intersections of OR 99 with 10th Avenue and 1st Avenue with Birch Street experienced a rate of collisions greater than the critical rate calculated for the study area.

It should also be noted that the severity of collisions was generally low throughout the city with just over half of crashes resulting in property damage only. Of the 245 crashes reported within the city during the investigated 5 year period there were four fatalities and 6 accidents resulting in major injuries. Two of the fatal crashes occurred at/near the intersection of OR36 and OR99. One involved a motor vehicle that disregarded the traffic signal resulting in an angle crash. The other involved a motor vehicle which crossed the centerline into opposing traffic resulting in a head on collision. One of the fatal crashes occurred on OR 99 at Hatton Drive when a recreational vehicle headed southbound on OR 99 swerved into the shoulder hitting a stopped vehicle on Hatton Drive. The final fatal crash occurred at the intersection of Kalmia Street and 3rd Avenue when a motor vehicle ran off the road hitting a tree. The report states that speed was too fast for conditions.

TABLE 8: Intersection Collision Summary (2010-2014)

Intersection	Entering AADT	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical
OR 99 / 10th Ave	16,352	25	Urban 4SG	0.84	0.39	0.59	Yes
Birch St / 1st Ave	3,318	3	Urban 3ST	0.50	0.11	0.42	Yes
OR 99 / 6th Ave	17,656	13	Urban 4SG	0.40	0.39	0.59	No
OR 99 / 1st Ave	19,346	14	Urban 4SG	0.40	0.39	0.58	No
OR 99 / OR 36	17,650	9	Urban 4SG	0.28	0.39	0.59	No
Oaklea St / 18th Ave	1,964	1	Urban 3ST	0.28	0.11	0.55	No

* Average annual collisions per million entering vehicles (MEV); MEV estimates based on 2009 ODOT Volume Tables or 30HV

Source: ODOT Collision Data for 2010, 2011, 2012, 2013, 2014.

The most common collision type at the intersection of OR 99 with 10th Avenue are turning collisions. While rear-end collisions are typically the most common at signalized intersections, turning collisions were found to be the most common at the intersection with 10th Avenue (more than double the amount of rear-end collisions). The intersection of 1st Avenue with Birch Street had two rear end crashes and one angle crash with no apparent pattern for the rear end crashes.

These findings are relatively consistent with recent Safety Priority Index System ratings developed by ODOT. The Safety Priority Index System (SPIS) identifies hazardous locations on state highways, with the score based on three years of collision data considering collision frequency, rate, and severity. This rating provides a general comparison of the overall safety of the highway based on collision information for all highway segments throughout the state. In general, ratings within the top 10% are considered for improvements. The 2014 SPIS data set found that the intersection of OR 99 with OR 36 was a top 10% SPIS site. The 2010 though 2012 data sets found that the intersection of OR 99 at 10th Avenue was a top 10% SPIS site. Finally, in 2013 the intersection of OR 99 at Hatton Ln was identified as a top 10% SPIS site. The appearance of Hatton Lane in the top 10% SPIS sites was likely due to the fatal accident which occurred in 2011.

Through field observations, another potentially hazardous location was found at the intersection on Oaklea Drive with 18th Avenue. From the stopped 18th Avenue approach, the driver's line of sight is partially obstructed to the south by hedges and trees on private property because of the curvature of the roadway. This can make safely pulling out into the roadway difficult to do with oncoming traffic traveling at 45 mph. It also obscures the view of the 18th Avenue intersection from northbound drivers on Oaklea Drive, which can result in sudden braking.

No collisions were reported at this intersection within the three-year period examined (2007-2009). However, a resident of a nearby home did offer that she frequently hears sudden braking and skidding tires.

View from 18th Avenue looking south on Oaklea Drive

Corridor Collisions

Approximately one-third of the collisions that occurred in Junction City happened on segments of roadways in between intersections. More than half of those occurred along OR 99. The 12 collisions that occurred on city and county streets were spread about the area with no one location having more than one collision. Collisions on county and city streets tended to be low severity and nearly all of them involved a collision with a parked car.

Along the OR 99 corridor, there were 15 collisions in between intersections, with most of those being rear-end collisions. Most collisions occurred in the segment between 1st and 11th Avenues.

ODOT compiles collision data on state highways and calculates the rate of collisions per million vehicle miles that occurred on each roadway for comparison purposes. Table 9 shows the collision rates for the years 2010 through 2014 that occurred on the OR 99 corridor in comparison to the rates experienced on similar facilities around the state.

As shown, the section of OR 99 within the city limits is experiencing collision rates under the statewide average for similar facilities.

TABLE 9: Comparison of OR 99 Collision Rate to Statewide Average (2010-2014)

Highway Milepoints	Section Description	Collisions per Million Vehicle Miles				
		2010	2011	2012	2013	2014
Statewide Average Rate (Minor Arterials in Rural Cities)		1.41	1.80	1.54	1.53	1.72

MP 108.51 – MP 114.28	Junction City North City Limit to Junction City South City Limit (Minor Arterial in Rural City)	1.29	1.36	1.21	1.25	1.39
Statewide Average Rate (Minor Arterials in Rural Areas)		1.00	1.08	1.11	1.12	1.18
MP 114.2846 – MP 115.04	Junction City South City Limit to Eugene Urban Area (Minor Arterial in Rural Area)	0.71	-	0.49	0.49	0.49

Source: ODOT 2014 State Highway Crash Rate Tables

Safety concerns related to roadway speeds have also been expressed by the Junction City Police Department and community members. Areas of concern include:

- Prairie Road between 1st Avenue and OR 99
- Bailey Lane
- Pitney Lane
- 1st Avenue between Prairie Road and Oaklea Drive
- 18th Avenue between OR 99 and Oaklea Drive
- OR 99E and OR 99W headed southbound approaching Junction City
- OR 99 between W 1st Ave/River Road and OR 36

While changing roadway speed limits will not be accomplished through this TSP update, it is recommended that a process for handling speed zone reduction requests be outlined.

RAIL FACILITIES

Junction City has two freight rail service tracks running north-south, east of OR 99. Both the Union Pacific Rail Road (UP) and the Pacific Northwest Rail Road (PNWR) operate within the city with a total of 23 crossings (UP has 7 crossings and PNWR has 16 crossings). The UP line is the main freight line and trains typically travel at speeds up to 79 mph through town roughly 15 times per day. The PNWR is a smaller line and train speeds vary from 10 mph to 40 mph through town with one to two trains per day.

Railroad crossing controls vary between the UP and PNWR lines. The UP line, which runs parallel to the east side of Front Street and operates at much higher speeds and frequency, uses both gates and some type of flashing lights at all of its seven crossing in town. Plans are currently being formed to put fencing along the tracks through Junction City to channelize pedestrians to safe crossing locations.

The PNWR runs just east of OR 99 and down the middle of Holly Street. Traffic controls used include cross bucks, stop signs, or other signs or signals. The highly used intersection of 6th Avenue at Holly Street has crossing gates. Ultimately, the City would like to see the tracks along Holly Street removed, with service relocated to another corridor. This could include consolidation of services along the existing UP railroad.

While the PNWR line operates at much lower speeds and frequencies, it still introduces many challenges for other modes of travel. This is especially true where the tracks run down Holly Street. When trains pass through town, motor vehicle traffic must move out of the way or wait prior to entering the street. Furthermore, the pavement adjacent to the railroad tracks is often in disrepair, creating hazardous crossings for pedestrians and bicyclists. PNWR is currently in the process of incrementally improving pavement along Holly Street, however no timeline has been established for project completion.

PNWR Train traveling North on Holly Street

From 2000 to 2010, four collisions involving trains have been reported in Junction City. In 2005, a train associated with PNWR stuck a truck/trailer near 12th Street. The train was traveling at approximately 10 mph and the incident only resulted in injury to the driver of the motor vehicle. In 2006, a train associated with UP traveling at approximately 23 mph struck a truck/trailer at 4th Avenue. No injuries were reported as a result of this collision.

In addition to these, two pedestrian deaths occurred at the intersection of the UP line and 6th Avenue. In both cases, pedestrians where hit and killed by Amtrak trains traveling at speeds over 70 mph. In 2004, an elderly women who reportedly had a hard time hearing was hit and killed while crossing the tracks during the afternoon on a clear day. In 2010, a pedestrian was hit at night time while attempting to beat the train. In both cases, pedestrians disregarded the warning system and gates to cross the tracks.

AIR FACILITIES

The City of Junction City does not have its own airport or other air service facilities within the UGB. The closest major airport to Junction City is the Eugene Airport, which is located approximately five miles south of the city and provides service for both passengers and freight. The Eugene airport is the second largest airport in the State of Oregon and is the largest non-hub airport in the nation. The airport provides regular direct service to Portland, Seattle, San Francisco, San Jose, Oakland, Los Angeles, Denver, Salt Lake City, Las Vegas, and Phoenix-Mesa.[13]

[13] flyEUG. *About Us*. flyEUG Website: http://www.flyeug.com/about.cfm. Accessed March 2, 2011.

PIPELINE

Northwest Pipeline Company operates a major regional natural gas transmission line between Portland and Eugene, which passes through Junction City along railroad right-of-way. The gas is distributed in the Junction City area by Northwest Natural Gas. This six-inch high-pressure main interconnects storage facilities in the state, as well as interstate sources.

Kinder Morgan operates an eight-inch major petroleum transmission pipeline, which runs along the railroad right-of-way. It extends from Portland to Eugene and has been in operation since 1962. This pipeline is a common carrier, designed to handle alternately gasoline, biodiesel, or diesel fuel. It currently transmits approximately 45,000 barrels of fuel per day to Eugene (roughly equivalent to 210 tanker trucks of fuel).[14] From Eugene, it is distributed by truck to end destinations or for storage in tank facilities nine miles south of Junction City.

WATER FACILITIES

No navigable waterways exist within the Junction City urban growth boundary. The Willamette River runs north-south approximately three miles east of the study area.

SUMMARY OF KEY FINDINGS

Based on the inventory and analysis of existing transportation conditions, the following key findings were identified for consideration during the development of transportation solutions for the city.

Pedestrian

- The compact layout of most activity generators in the city creates opportunities to establish walking as an attractive mode of travel.
- The layout of older neighborhoods in the central city and newest neighborhoods around the perimeter provide good connectivity for convenient walking.
- Sidewalks upgrades for ADA compliance are being made around the city.
- Gaps in the sidewalk network need to be filled on key routes, including: Oaklea Drive, 18th Avenue. 1st Avenue, the western ends of 10th and 6th Avenues, and Prairie Road from 1st Avenue to Bailey Lane.
- The layout of many neighborhoods between 1st Avenue, Maple Street, 18th Street, and Oaklea Drive has limited connectivity, making walking less convenient. As an example, there have been reports of high school students walking through the private streets of Scandia Village to reach homes to the north.
- Sidewalks on OR 99 are narrower than typically preferred in high-use commercial areas with storefronts.

[14] *Motor Fuel & Distillate in Oregon: Quality, Sources, and Distribution*, Oregon Department of Energy, 2009.

- Sidewalks on OR 99 are too close to traffic, which can make walking uncomfortable and uninviting.
- Sidewalk maintenance, especially in older neighborhoods, is needed to repair severely damaged and flooded areas.
- Shared-use paths are present, but a comprehensive network does not exist.
- Many people in Junction City are choosing to walk, but barriers may be making walking more difficult or less convenient. Key barriers noted include poor connectivity in some areas and lack of good crossing opportunities on high-volume, high-speed streets such as OR 99.
- Crosswalk treatments should be consistent with recognized federal and state standards to facilitate recognition by motorists.

Bicycle

- The compact layout of most activity generators in the city creates opportunities to establish biking as an attractive mode of travel.
- Relatively low levels of observed bicycle travel indicate that there may be unrealized demand that can served by enhancing bicycle facilities.
- There are no facilities for bicycles on OR 99 between the Flat Creek Bridge and 3rd Avenue. Bicyclists were observed riding on the sidewalks in this area.
- Off of OR 99, no roadways include designated bicycle facilities. On some roadways, widening to include bicycle facilities could be challenging due to adjacent constraints. As an example, widening along High Pass Road may be difficult without impacting the historic cemetery that is very close to the road right of way..
- Many roadways in Junction City serve low traffic volumes at relatively low speeds. These road may be candidates for designation as shared roadways for bicycle travel, which can be a cost-effective way to create bike routes through the city.
- Shared-use paths (8 feet wide) are somewhat narrow for comfortable bicycle travel.
- Provision for secure and convenient bike parking is generally infrequent.
- Poor connectivity in some areas creates longer trips for bicycle travel.
- Convenient and comfortable crossings of OR 99 are needed.

Transit

- A centrally located fixed bus route provides service to Eugene, with three stops and two Park & Ride lots in the city.
- Accessibility of bus stops for bicycles and pedestrians should be enhanced to encourage transit use.

- Transit access to Monroe (formerly the Benton County 99 Express Route) was discontinued due to low ridership and budget cuts.
- LTD offers an EZ Access Program to educate and encourage transit use by older adults and persons with disabilities.
- Paratransit service in Junction City is not available. It would become available if Junction City joined the MPO.

Motor Vehicle

- OR 99 is a state and federally designated Truck/Freight route, which emphasizes a need for mobility and efficient movement of large vehicles. However, it also creates a barrier for pedestrians and bicyclists desiring to cross town or travel to the downtown area.
- A recently adopted access management plan for OR 99 includes recommendations for use of alleyways to support side street access instead of accessing directly from OR 99. This has been questioned as potentially being impractical and costly.
- Key intersections examined throughout the city are operating well with little congestion. They are all in compliance with state and county standards for mobility. The city does not currently have an adopted standard for mobility.
- More than two-thirds of all motor vehicle collisions in Junction City occur on OR 99.
- Approximately two-thirds of all motor vehicle collisions in Junction City occur at intersections.
- Most collisions occur on OR 99 between OR 99E and 1st Avenue. The intersections with the most collisions in that area are at 10th, 6th, and 1st Avenues. The 10th Avenue intersection experiences the most collisions.
- The severity of crashes in the city is generally low. However, crash severities worsen on OR 99 to the south where posted speeds are higher.
- There is an existing sight obstruction to the south at the intersection on Oaklea Drive with 18th Avenue.
- The intersection of OR99 and 6th Avenue is the only traffic signal without roadway illumination in Junction City.

Rail

- Railroad crossings along the high-speed, high-frequency UP line are typically controlled with gates and flashing lights.
- For the low-speed, low-frequency PNWR line, crossing controls vary widely. In some cases, such as where the train runs down Holly Street, there are no controls.
- Trains traveling down the PNWR line along Holly Street create conflicts with other modes of travel. However, these trains do travel at low speeds and are infrequent.

- Railroad crossings often create hazardous barriers for pedestrians and bicyclists due to pavement disrepair and gaps between rails and pavement where bicycle, wheelchair, and walker wheels can become stuck.

Seasonal Adjustment Calculation

2015 SEASONAL TREND TABLE (Updated: 11/09/15)															Peak
TREND	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Period
INTERSTATE URBANIZED	0.9381	0.9195	0.9220	0.9266	0.9215	0.9164	0.9352	0.9539	0.9565	0.9589	0.9775	0.9960	1.0119	1.0277	0.9164
INTERSTATE NONURBANIZED	0.9501	0.9016	0.8748	0.8438	0.8431	0.8425	0.8920	0.9416	0.9820	1.0224	1.0449	1.0675	1.1177	1.1679	0.8425
COMMUTER	0.9495	0.9586	0.9409	0.9239	0.9194	0.9149	0.9276	0.9402	0.9425	0.9446	0.9731	1.0016	1.0239	1.0463	0.9149
COASTAL DESTINATION	0.9840	0.9465	0.8933	0.8286	0.8273	0.8260	0.8771	0.9283	0.9852	1.0421	1.0991	1.1560	1.1766	1.1972	0.8260
COASTAL DESTINATION ROUTE	1.0110	0.9509	0.8643	0.7555	0.7552	0.7549	0.8330	0.9111	1.0208	1.1305	1.2110	1.2915	1.3498	1.4080	0.7549
AGRICULTURE	0.9092	0.8807	0.8642	0.8445	0.8412	0.8380	0.8419	0.8459	0.8791	0.9123	0.9800	1.0477	1.1405	1.2332	0.8380
RECREATIONAL SUMMER	0.9368	0.8563	0.7953	0.7218	0.7327	0.7436	0.8027	0.8618	0.9653	1.0688	1.2301	1.3915	1.5047	1.6180	0.7218
RECREATIONAL SUMMER WINTER	1.2854	1.0826	0.9657	0.8120	0.8456	0.8793	1.0312	1.1831	1.4133	1.6219	1.7084	1.7733	1.4489	1.1245	0.8120
RECREATIONAL WINTER	1.9669	1.6650	1.4562	1.1365	1.1639	1.1912	1.3347	1.4782	1.7869	2.0956	2.4558	2.8160	1.9444	1.0729	0.9363
SUMMER	0.9257	0.8907	0.8658	0.8350	0.8379	0.8407	0.8779	0.9152	0.9494	0.9836	1.0382	1.0929	1.1341	1.1753	0.8350
SUMMER < 2500	0.8897	0.8588	0.8385	0.8142	0.8233	0.8324	0.8482	0.8639	0.9022	0.9405	1.0159	1.0913	1.1759	1.2606	0.8142

***Seasonal Trend Table factors are based on previous year ATR data. The table is updated yearly.**
***Grey shading indicates months were seasonal factor is greater than 30%**

	Sept		
commuter	0.9402	0.9149	1.027743
summer	0.9152	0.8350	1.095961
			1.061852
	nov		
commuter	0.9731	0.9149	1.063655
summer	1.0382	0.8350	1.243328
			1.153491
	Oct		
commuter	0.9446	0.9149	1.032545
summer	0.9836	0.8350	1.177882
			1.105213

Level of Service Definition

TRAFFIC LEVELS OF SERVICE

Analysis of traffic volumes is useful in understanding the general nature of traffic in an area, but by itself indicates neither the ability of the street network to carry additional traffic nor the quality of service afforded by the street facilities. For this, the concept of *level of service* has been developed to subjectively describe traffic performance. Level of service can be measured at intersections and along key roadway segments.

Level of service categories are similar to report card ratings for traffic performance. Intersections are typically the controlling bottlenecks of traffic flow and the ability of a roadway system to carry traffic efficiently is generally diminished in their vicinities. Levels of Service A, B and C indicate conditions where traffic moves without significant delays over periods of peak travel demand. Level of service D and E are progressively worse peak hour operating conditions and F conditions represent where demand exceeds the capacity of an intersection. Most urban communities set level of service D as the minimum acceptable level of service for peak hour operation and plan for level of service C or better for all other times of the day. The *Highway Capacity Manual* provides level of service calculation methodology for both intersections and arterials.[1] The following three sections provide interpretations of the analysis approaches.

[1] *2000 Highway Capacity Manual*, Transportation Research Board, Washington D.C., 2000, Chapters 16 and 17.

ALL-WAY STOP CONTROLLED INTERSECTIONS

Unsignalized intersections and all-way stop controlled intersections are each subject to a separate capacity analysis methodology. All-way stop controlled intersection operations are reported by leg of the intersection.

This method calculates a delay value for each approach to the intersection. The *2000 Highway Capacity Manual* describes the detailed methodology. The following table describes the amount of delay associated with each level of service.

Delay (Seconds)	Level of Service
0 - 10	A
10 - 15	B
15 - 25	C
25 - 35	D
35 - 50	E
> 50	F

Source: 2000 *Highway Capacity Manual*, Transportation Research Board, Washington, D.C.

UNSIGNALIZED INTERSECTIONS (Two-Way Stop Controlled)

Unsignalized intersection level of service is reported for the major street and minor street (generally, left turn movements). The method assesses available and critical gaps in the traffic stream which make it possible for side street traffic to enter the main street flow. The *2000 Highway Capacity Manual* describes the detailed methodology. It is not unusual for an intersection to experience level of service E or F conditions for the minor street left turn movement. It should be understood that, often, a poor level of service is experienced by only a few vehicles and the intersection as a whole operates acceptably.

Unsignalized intersection levels of service are described in the following table.

Level of Service	Expected Delay	(Sec/Veh)
A	Little or no delay	0-10.0
B	Short traffic delay	>10.1-15.0
C	Average traffic delays	>15.1-25.0
D	Long traffic delays	>25.1-35.0
E	Very long traffic delays	>35.1-50.0
F	Extreme delays potentially affecting other traffic movements in the intersection	> 50

Source: 2000 *Highway Capacity Manual*, Transportation Research Board Washington, D.C.

Intersection Evaluation Worksheets

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	55	20	40	40	15	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	81	81	81	81	81	81
Heavy Vehicles, %	2	5	0	0	0	3
Mvmt Flow	68	25	49	49	19	49

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	160	74	0	0	99	0
Stage 1	74	-	-	-	-	-
Stage 2	86	-	-	-	-	-
Critical Hdwy	6.42	6.25	-	-	4.1	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.345	-	-	2.2	-
Pot Cap-1 Maneuver	831	979	-	-	1507	-
Stage 1	949	-	-	-	-	-
Stage 2	937	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	820	979	-	-	1507	-
Mov Cap-2 Maneuver	820	-	-	-	-	-
Stage 1	949	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	857	1507	-
HCM Lane V/C Ratio	-	-	0.108	0.012	-
HCM Control Delay (s)	-	-	9.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	1.8

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	20	20	110	50	15	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	23	23	128	58	17	87

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	279	157	0	0	186	0
Stage 1	157	-	-	-	-	-
Stage 2	122	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	715	894	-	-	1401	-
Stage 1	876	-	-	-	-	-
Stage 2	908	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	706	894	-	-	1401	-
Mov Cap-2 Maneuver	706	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	896	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	789	1401	-
HCM Lane V/C Ratio	-	-	0.059	0.012	-
HCM Control Delay (s)	-	-	9.8	7.6	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0	-

Intersection	
Int Delay, s/veh	2.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	25	30	130	15	15	85
Conflicting Peds, #/hr	0	0	0	1	1	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	83	83	83	83	83	83
Heavy Vehicles, %	0	0	0	0	0	1
Mvmt Flow	30	36	157	18	18	102

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	305	167	0	0	175	0
Stage 1	166	-	-	-	-	-
Stage 2	139	-	-	-	-	-
Critical Hdwy	6.4	6.2	-	-	4.1	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	-	-	2.2	-
Pot Cap-1 Maneuver	691	882	-	-	1414	-
Stage 1	868	-	-	-	-	-
Stage 2	893	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	681	881	-	-	1413	-
Mov Cap-2 Maneuver	681	-	-	-	-	-
Stage 1	868	-	-	-	-	-
Stage 2	880	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.1	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	777	1413	-
HCM Lane V/C Ratio	-	-	0.085	0.013	-
HCM Control Delay (s)	-	-	10.1	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	4.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	45	50	85	100	50	70
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	80	80	80	80	80	80
Heavy Vehicles, %	0	1	1	2	0	0
Mvmt Flow	56	62	106	125	62	88

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	231	0	-	0	344	169
Stage 1	-	-	-	-	169	-
Stage 2	-	-	-	-	175	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1349	-	-	-	657	880
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	860	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1349	-	-	-	629	880
Mov Cap-2 Maneuver	-	-	-	-	629	-
Stage 1	-	-	-	-	866	-
Stage 2	-	-	-	-	823	-

Approach	EB	WB	SB
HCM Control Delay, s	3.7	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1349	-	-	-	755
HCM Lane V/C Ratio	0.042	-	-	-	0.199
HCM Control Delay (s)	7.8	0	-	-	10.9
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.1	-	-	-	0.7

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	90	10	20	170	15	10
Conflicting Peds, #/hr	0	1	1	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	98	11	22	185	16	11

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	111	0	333	106
Stage 1	-	-	-	-	105	-
Stage 2	-	-	-	-	228	-
Critical Hdwy	-	-	4.1	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.2	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	1492	-	666	954
Stage 1	-	-	-	-	924	-
Stage 2	-	-	-	-	815	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1491	-	654	952
Mov Cap-2 Maneuver	-	-	-	-	654	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	801	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.8	10
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	748	-	-	1491	-
HCM Lane V/C Ratio	0.036	-	-	0.015	-
HCM Control Delay (s)	10	-	-	7.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	175	5	65	235	45	5	15	70	20	15	15
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	7	7	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	1	0	0	0	0	0	0	0
Mvmt Flow	16	184	5	68	247	47	5	16	74	21	16	16

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	302	0	0	196	0	0	656	664	196	685	643	280
Stage 1	-	-	-	-	-	-	225	225	-	415	415	-
Stage 2	-	-	-	-	-	-	431	439	-	270	228	-
Critical Hdwy	4.1	-	-	4.12	-	-	7.1	6.5	6.2	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.1	5.5	-	6.1	5.5	-
Follow-up Hdwy	2.2	-	-	2.218	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1270	-	-	1377	-	-	382	384	850	365	394	764
Stage 1	-	-	-	-	-	-	782	721	-	619	596	-
Stage 2	-	-	-	-	-	-	607	582	-	740	719	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1268	-	-	1375	-	-	339	352	844	302	361	758
Mov Cap-2 Maneuver	-	-	-	-	-	-	339	352	-	302	361	-
Stage 1	-	-	-	-	-	-	767	707	-	607	557	-
Stage 2	-	-	-	-	-	-	542	544	-	650	705	-

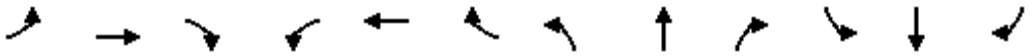
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	1.5	11.6	15.6
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	641	1268	-	-	1375	-	-	392
HCM Lane V/C Ratio	0.148	0.012	-	-	0.05	-	-	0.134
HCM Control Delay (s)	11.6	7.9	0	-	7.8	0	-	15.6
HCM Lane LOS	B	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	0.5	0	-	-	0.2	-	-	0.5

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	90	45	265	15	25	20	285	460	20	30	435	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0		3.5	4.0		3.5	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.95		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1614	1750	1417		1614		1614	3182		1599	3228	1365
Flt Permitted	0.88	1.00	1.00		0.93		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1495	1750	1417		1522		1614	3182		1599	3228	1365
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	97	48	285	16	27	22	306	495	22	32	468	59
RTOR Reduction (vph)	0	0	61	0	18	0	0	3	0	0	0	41
Lane Group Flow (vph)	97	48	224	0	47	0	306	514	0	32	468	18
Heavy Vehicles (%)	3%	0%	5%	9%	0%	0%	3%	4%	0%	4%	3%	9%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	8 1		4		1	6		5	2	
Permitted Phases	8	8		4								2
Actuated Green, G (s)	10.4	10.4	31.6		10.4		17.2	32.3		2.2	17.3	17.3
Effective Green, g (s)	10.4	10.4	31.6		10.4		17.2	32.3		2.2	17.3	17.3
Actuated g/C Ratio	0.18	0.18	0.56		0.18		0.30	0.57		0.04	0.31	0.31
Clearance Time (s)	4.0	4.0			4.0		3.5	4.0		3.5	4.0	4.0
Vehicle Extension (s)	2.5	2.5			2.5		2.5	4.6		2.5	4.6	4.6
Lane Grp Cap (vph)	275	322	793		280		492	1822		62	990	418
v/s Ratio Prot		0.03	0.16				c0.19	0.16		0.02	c0.14	
v/s Ratio Perm	c0.06				0.03							0.01
v/c Ratio	0.35	0.15	0.28		0.17		0.62	0.28		0.52	0.47	0.04
Uniform Delay, d1	20.1	19.3	6.5		19.4		16.8	6.1		26.6	15.9	13.7
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.1		0.2		2.1	0.2		5.3	0.6	0.1
Delay (s)	20.6	19.4	6.6		19.6		18.9	6.3		31.9	16.5	13.8
Level of Service	C	B	A		B		B	A		C	B	B
Approach Delay (s)		11.2			19.6			11.0			17.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	56.4	Sum of lost time (s)	11.5
Intersection Capacity Utilization	52.3%	ICU Level of Service	A
Analysis Period (min)	15		

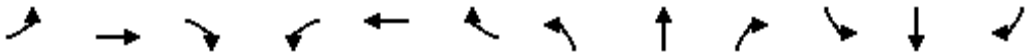
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	45	45	25	40	90	45	800	40	30	610	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.92			0.99			1.00	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1625			1569			3202			3210	
Flt Permitted		0.80			0.93			0.89			0.89	
Satd. Flow (perm)		1323			1474			2849			2853	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	33	49	49	27	44	99	49	879	44	33	670	22
RTOR Reduction (vph)	0	38	0	0	85	0	0	2	0	0	1	0
Lane Group Flow (vph)	0	93	0	0	85	0	0	970	0	0	724	0
Confl. Peds. (#/hr)	7		9	9		7	3		7	7		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		10.4			10.4			56.6			56.6	
Effective Green, g (s)		10.4			10.4			56.6			56.6	
Actuated g/C Ratio		0.14			0.14			0.75			0.75	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		2.5			2.5			6.1			6.1	
Lane Grp Cap (vph)		183			204			2150			2153	
v/s Ratio Prot												
v/s Ratio Perm		c0.07			0.06			c0.34			0.25	
v/c Ratio		0.51			0.42			0.45			0.34	
Uniform Delay, d1		29.9			29.5			3.4			3.0	
Progression Factor		1.02			1.00			0.42			1.00	
Incremental Delay, d2		1.6			1.0			0.6			0.4	
Delay (s)		32.3			30.5			2.0			3.4	
Level of Service		C			C			A			A	
Approach Delay (s)		32.3			30.5			2.0			3.4	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.8%	ICU Level of Service	C
Analysis Period (min)	15		

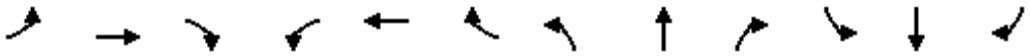
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	40	30	90	40	80	10	925	85	35	690	20
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.96			0.95			0.99			1.00	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1619			1601			3216			3182	
Flt Permitted		0.89			0.83			0.95			0.87	
Satd. Flow (perm)		1461			1354			3051			2789	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	41	31	93	41	82	10	954	88	36	711	21
RTOR Reduction (vph)	0	25	0	0	36	0	0	6	0	0	2	0
Lane Group Flow (vph)	0	73	0	0	180	0	0	1046	0	0	766	0
Confl. Peds. (#/hr)	16		11	11		16	11		2	2		11
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		14.6			14.6			52.4			52.4	
Effective Green, g (s)		14.6			14.6			52.4			52.4	
Actuated g/C Ratio		0.19			0.19			0.70			0.70	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		2.5			2.5			6.1			6.1	
Lane Grp Cap (vph)		284			263			2131			1948	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.13			c0.34			0.27	
v/c Ratio		0.26			0.68			0.49			0.39	
Uniform Delay, d1		25.6			28.1			5.2			4.7	
Progression Factor		0.99			1.00			1.47			1.68	
Incremental Delay, d2		0.4			6.6			0.7			0.6	
Delay (s)		25.6			34.6			8.3			8.5	
Level of Service		C			C			A			A	
Approach Delay (s)		25.6			34.6			8.3			8.5	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	50	85	115	90	90	125	820	75	70	610	125
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.91		1.00	0.93		1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1593	1500		1619	1605		1630	3207		1614	3109	
Flt Permitted	0.49	1.00		0.60	1.00		0.29	1.00		0.23	1.00	
Satd. Flow (perm)	820	1500		1022	1605		492	3207		396	3109	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	139	56	94	128	100	100	139	911	83	78	678	139
RTOR Reduction (vph)	0	75	0	0	64	0	0	6	0	0	17	0
Lane Group Flow (vph)	139	75	0	128	136	0	139	988	0	78	800	0
Confl. Peds. (#/hr)	6		11	11		6	1		2	2		1
Heavy Vehicles (%)	4%	0%	7%	2%	0%	0%	2%	2%	4%	3%	4%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	15.3	15.3		15.3	15.3		47.7	41.4		45.7	40.4	
Effective Green, g (s)	15.3	15.3		15.3	15.3		47.7	41.4		45.7	40.4	
Actuated g/C Ratio	0.20	0.20		0.20	0.20		0.64	0.55		0.61	0.54	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	6.1		2.5	6.1	
Lane Grp Cap (vph)	167	306		208	327		408	1770		327	1674	
v/s Ratio Prot		0.05			0.08		c0.03	c0.31		0.02	0.26	
v/s Ratio Perm	c0.17			0.13			0.19			0.13		
v/c Ratio	0.83	0.25		0.62	0.42		0.34	0.56		0.24	0.48	
Uniform Delay, d1	28.6	25.0		27.2	26.0		5.8	10.9		6.5	10.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.90	0.67	
Incremental Delay, d2	27.9	0.3		4.6	0.6		0.4	1.3		0.3	0.9	
Delay (s)	56.5	25.3		31.7	26.6		6.2	12.2		6.1	8.1	
Level of Service	E	C		C	C		A	B		A	A	
Approach Delay (s)		40.3			28.6			11.4			7.9	
Approach LOS		D			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	25	140	140	25	30	15
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	185	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	77	77	77	77	77	77
Heavy Vehicles, %	2	0	2	5	0	0
Mvmt Flow	32	182	182	32	39	19

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	214	0	-	0	445	200
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	247	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1356	-	-	-	574	846
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	799	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1354	-	-	-	559	845
Mov Cap-2 Maneuver	-	-	-	-	559	-
Stage 1	-	-	-	-	840	-
Stage 2	-	-	-	-	778	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	11.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1354	-	-	-	559	845
HCM Lane V/C Ratio	0.024	-	-	-	0.07	0.023
HCM Control Delay (s)	7.7	0	-	-	11.9	9.4
HCM Lane LOS	A	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.2	0.1

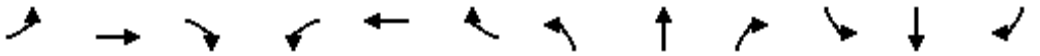
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	5	5	15	1045	825	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	4	0
Mvmt Flow	5	5	16	1112	878	5

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1468	441	883	0	-	0
Stage 1	880	-	-	-	-	-
Stage 2	588	-	-	-	-	-
Critical Hdwy	7.14	6.9	4.1	-	-	-
Critical Hdwy Stg 1	6.14	-	-	-	-	-
Critical Hdwy Stg 2	6.14	-	-	-	-	-
Follow-up Hdwy	3.67	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	103	570	775	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	478	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	101	570	775	-	-	-
Mov Cap-2 Maneuver	221	-	-	-	-	-
Stage 1	331	-	-	-	-	-
Stage 2	468	-	-	-	-	-

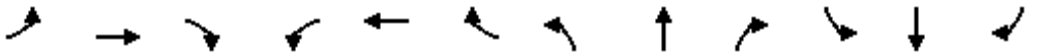
Approach	EB	NB	SB
HCM Control Delay, s	16.7	0.1	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	775	-	319	-	-
HCM Lane V/C Ratio	0.021	-	0.033	-	-
HCM Control Delay (s)	9.7	-	16.7	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	15	90	10	50	150	95	870	15	95	680	80
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1539	1444		1680	1488	1599	3220		1646	3197	1377
Flt Permitted		0.73	1.00		0.93	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1165	1444		1571	1488	1599	3220		1646	3197	1377
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	16	97	11	54	161	102	935	16	102	731	86
RTOR Reduction (vph)	0	0	85	0	0	142	0	1	0	0	0	43
Lane Group Flow (vph)	0	75	12	0	65	19	102	950	0	102	731	43
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	12%	0%	3%	0%	4%	0%	4%	3%	0%	1%	4%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		7.3	7.3		7.3	7.3	7.2	30.7		6.8	30.3	30.3
Effective Green, g (s)		7.3	7.3		7.3	7.3	7.2	30.7		6.8	30.3	30.3
Actuated g/C Ratio		0.12	0.12		0.12	0.12	0.12	0.50		0.11	0.50	0.50
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.5	5.2		2.5	5.2	5.2
Lane Grp Cap (vph)		139	173		188	178	189	1625		184	1593	686
v/s Ratio Prot							c0.06	c0.29		0.06	0.23	
v/s Ratio Perm		c0.06	0.01		0.04	0.01						0.03
v/c Ratio		0.54	0.07		0.35	0.11	0.54	0.58		0.55	0.46	0.06
Uniform Delay, d1		25.2	23.7		24.6	23.8	25.2	10.6		25.6	9.9	7.9
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		3.1	0.1		0.8	0.2	2.3	0.9		2.9	0.5	0.1
Delay (s)		28.3	23.9		25.4	24.0	27.5	11.4		28.4	10.4	8.0
Level of Service		C	C		C	C	C	B		C	B	A
Approach Delay (s)		25.8			24.4			13.0			12.2	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	60.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	0	5	40	0	40	5	940	10	5	790	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.85		1.00	0.85		1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1511	1488		1662	1488		1662	3260	1488	1662	3193	
Flt Permitted	0.93	1.00		0.93	1.00		0.29	1.00	1.00	0.23	1.00	
Satd. Flow (perm)	1480	1488		1628	1488		507	3260	1488	409	3193	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	11	0	6	45	0	45	6	1056	11	6	888	11
RTOR Reduction (vph)	0	6	0	0	41	0	0	0	4	0	1	0
Lane Group Flow (vph)	11	0	0	45	4	0	6	1056	7	6	898	0
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	4.3	4.3		4.3	4.3		31.4	30.7	30.7	31.4	30.7	
Effective Green, g (s)	4.3	4.3		4.3	4.3		35.4	32.7	32.7	35.4	32.7	
Actuated g/C Ratio	0.08	0.08		0.08	0.08		0.68	0.63	0.63	0.68	0.63	
Clearance Time (s)	4.0	4.0		4.0	4.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	123	123		135	123		407	2061	941	345	2019	
v/s Ratio Prot		0.00			0.00		0.00	c0.32		c0.00	0.28	
v/s Ratio Perm	0.01			c0.03			0.01		0.00	0.01		
v/c Ratio	0.09	0.00		0.33	0.03		0.01	0.51	0.01	0.02	0.44	
Uniform Delay, d1	21.9	21.7		22.3	21.8		2.7	5.2	3.5	2.8	4.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	0.0		1.1	0.1		0.0	0.3	0.0	0.0	0.2	
Delay (s)	22.1	21.7		23.4	21.9		2.7	5.5	3.5	2.8	5.1	
Level of Service	C	C		C	C		A	A	A	A	A	
Approach Delay (s)		22.0			22.6			5.4			5.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	51.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	44.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX D:

Travel Forecasting Tool Development Memorandum

SANDOWENGINEERING
160 Madison Street Suite A • Eugene, Oregon 97402 • 541.513.3376

TECHNICAL MEMORANDUM #3-UPDATE

TO: Junction City TSP Project Management Team

FROM: Kelly Sandow P.E. Sandow Engineering

DATE: January 10, 2016

RE: Junction City TSP Update
Travel Forecast Development -2016 Update

This memorandum provides a revised Technical Memorandum #3 as it describes the future forecasting analysis tools and methods to determine the year 2036 traffic volumes with the updated population forecasts, changes to the Oregon State Hospital and Correctional Facility, and current UGB boundaries, and available buildable lands within the UGB.

Sandow Engineering used the data and VISUM model that DKS has created as a base and made modifications/updates as they correlate to the changes in existing and future predictions of population and housing within the City as of year 2015.

ROADWAY NETWORK

The roadway network included in the Junction City TSP VISUM model consists of all local, collector, and arterial streets within the existing Junction City UGB. In addition, because there are routing alternatives outside of the Junction City UGB, the model includes roadways surrounding Junction City that serve local traffic.

The purpose of the existing conditions network is to configure the model and act as a base in the development of the future model. The existing model network included all capacity-related improvement as of 2015.

The 2036 future year baseline roadway network has been developed to include identified capacity-related improvements that are already planned for construction in the near future. Capacity improvements related to the Hospital and Prison have been completed as of year 2015, therefore the existing conditions model has been updated to include those improvements.

Other future projects identified for Junction City are bicycle, pedestrian, or roadway modernization projects. These projects are not incorporated into the model because they are not expected to increase motor vehicle capacity or travel speeds relative to existing conditions.

TRANSPORTATION ANALYSIS ZONES

For transportation modeling purposes, the Junction City UGB was divided into transportation analysis zones (TAZs), representing the sources of vehicle trip generation within the city. The TAZ structure is based on a combination of the existing roadway network, land use data, UGB, zoning, and comprehensive plan designations. The TAZ system was developed by using the previous Junction City travel demand model as a starting point. However, significant modifications were made to create a more detailed TAZ structure. The TAZ system defined for the network includes 74 zones within the current UGB and 7 zones identified for future expansion. The Junction City TSP VISUM network also includes eight external TAZs at the key gateways into and out of the city (as well as outlying residential areas) to account for vehicle trips that enter and exit the Junction City UGB. The 81 zone system and external zones are illustrated in Figure 1. (This work was prepared by others, and was determined to be usable with no modifications by Sandow Engineering)

LAND USE

Land use is a key factor affecting the traffic demands placed on Junction City's transportation system. The location, density, type, and mixture of land uses have a direct impact on traffic levels and patterns. An inventory of existing land uses and future (2036) land use projections identifies existing and future land uses for each TAZ in the Junction City UGB.

Existing and future land use totals for Junction City were obtained from several sources. The household estimates are based on the Lane County coordinated population forecasts for the Junction City UGB1 (2015-2065 projections) the estimated growth in households, the number of residents in households and group quarters, and average household size[2]. The employment totals for 2015 and 2036 are scaled based on employment estimates for 2009, 2029, 2039, and 2059.[3] The scaling is performed by calculating rates of annual growth between base and future years[4]. Land use totals for the Junction City UGB are identified in Table 1.

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[1] Population Forecasts for Lane County, its Cities, and Unincorporated Area 2015-2064, Portland State University Population Research Center, June 2015.
[2] Draft Housing Element, Junction City Comprehensive Plan, City of Junction City, June 2012
[3] Draft Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis, ECONorthwest & Winterbrook Planning, June 2009.
[4] Employment in 2010 is estimated based on compound growth rates calculated between 2009 and 2029 for various employment types (Industrial, Office, Retail, Other Service, and Government). Employment in 2036 is estimated by modifying identified growth rates by employment type calculated between 2029 and 2059 to match the employment total identified for 2039 with the updates for the Prison, Hospital, and Grain Millers.

Table 1: Land Use Totals (UGB)

Year	Households	Employment
2015	2,704	3,545
2036*	3,545	5,682
Growth (2036-2015)	1,218	2,137

*2036 UGB includes Comprehensive Plan expansion areas.

Previously, Winterbrook Planning allocated the land use totals for the 2010 base model to the identified TAZ system. Sandow Engineering used these allocations to update employment data to reflect the current year (2015) data. The employment total is composed of government employment, retail employment, office employment, industrial employment, and other services employment. The household data was updated based on the housing that has been completed as of the year 2015. The households total is classified into single family housing units, multi-family housing units, and apartments.

The future 2036 land use allocation estimates the amount of each land use that each TAZ will accommodate based on expected build-out of vacant or underdeveloped lands and assuming Comprehensive Plan zoning. The future year land use allocations for employment were developed by Winterbrook Planning with revisions provided by the PMT to reflect local knowledge. Sandow Engineering used previously calculated employment data totals and allocations by TAZ. However, the TAZ allocations for the hospital, prison, and Grain Millers has been updated to existing and projected information as of 2015.

The future year housing units were allocated to TAZ's and prioritized by existing applications/plans, infill in currently built subdivisions, easy to develop areas, then lastly infill in awkward lots. The household and employment totals for TAZs are consistent with the citywide forecasts identified in Table 1. Detailed land use data by TAZ is attached in the Appendix.

TRAVEL DEMAND

Travel demand on roadways and at intersections in Junction City has been estimated using methodology similar to that specified by the ODOT Procedures Manual for cumulative analysis models (often referred to as Level 2 models). Adjustments made to the methodology included modeling all vehicle trips (not just growth increment), adjusting the trip distribution to reduce household-to-household trips, and using VISUM modeling software to perform the base trip

assignment. Adjustments were made by hand to correct the vehicle paths towards the most reasonable travel path given the origin and destinations. Travel demand has been estimated at the 30th highest hour conditions for the years 2015 and 2036. The purpose of the 2015 model is to calibrate the network in preparation for developing the 2036 model network, which will be used for the future analysis.

The travel demand analysis includes the translation of City land use information into motor vehicle trips. This was done for each of the Junction City TAZs based on the existing and projected land uses described previously in the Land Use section of this memorandum. Trips traveling to and from the external TAZs were estimated for both the 2015 and 2036 analysis years.

TRIP TYPES

Travel demand projections involve the determination of three distinct types of trips:

- External-External (E-E) Trips do not have an origin or destination in Junction City and either do not stop or only make a very minor stop while passing through the Junction City UGB. These trips are typically referred to as through traffic.

- Internal-External (I-E) Trips originate in Junction City and are traveling to a location outside of the Junction City UGB and External-Internal (E-I) Trips originate outside of the Junction City UGB and are traveling to a location within Junction City.

- Internal-Internal (I-I) Trips travel from one location within the Junction City UGB to another location within the UGB.

EXTERNAL TRIP ENDS

External trip ends consist of through trips (i.e., E-E trips) as well as trips that enter or leave Junction City (i.e., I-E and E-I trips). The number of 2015 external trip ends was based on existing traffic volumes (30th highest hour conditions) at key gateways to the City, which include OR 99W and OR 99E to the north, OR 99 to the south, OR 36 and High Pass Road to the west, and River Road to the east (as well as additional roads connecting to outlying residential areas).

The proportion of each external trip type, specifically determining the portion of E-E through trips, was estimated based on the collection of origin-destination blue-tooth device data, the traffic counts, and the previous Junction City travel demand model. The blue-tooth device data was collected at the major gateways (OR 99W north of Oaklea Drive, OR 99E north of Link Lane, OR 99 south of Meadowview Road, and OR 36 west of Dorsey Lane) in April, 2011. The process for converting blue-tooth data into external trip distributions is illustrated in the Appendix. The previous Junction City travel demand model was used to verify the blue tooth results and supplement data for external locations where blue-tooth data was not collected.

Future external trip end quantities were estimated based on the existing traffic volumes and forecasted growth at the external gateways. Forecasted external growth was primarily based on the ODOT (2034) Highway Future Volume Table with an extrapolation to the year 2036 data. The volumes and annual growth rates applied to entering and exiting trips at external locations are included in the Appendix.

INTERNAL TRIP ENDS

The number of internal trip ends in Junction City was determined using land use trip generation methodology, which translates land use quantities (number of dwelling units or number of employees) into vehicle trip ends (number of vehicles entering or leaving a TAZ) using land use-specific trip generation rates. These rates were initially based on national rates obtained from the Institute of Transportation Engineers (ITE) Trip Generation, 8th Edition 9, with adjustments made to trip rates to reflect local travel patterns based on existing vehicle count data.

By applying the trip generation rates to the TAZ land uses, the number of trips entering and exiting each TAZ was estimated for both the existing year 2015 land uses and the projected year 2036 land uses. Trip generation for each TAZ in 2016 and 2036 is summarized in the Appendix.

TRIP DISTRIBUTION

Trip distribution determines how many trips travel between each of the internal and external TAZs. The external trips passing through Junction City were distributed based on the O-D survey and the Junction City travel demand model, as discussed previously in the External Trip Ends section of this memorandum. Distribution for trips traveling to and from internal zones (i.e., trips having at least one internal trip end) was based on weighting the attractiveness of each zone, as measured by the number of trip ends generated by the zone. Separate weighting percentages were used for household and non-household trip ends to avoid yielding a disproportionate number of household-to-household trips during the PM peak hour.

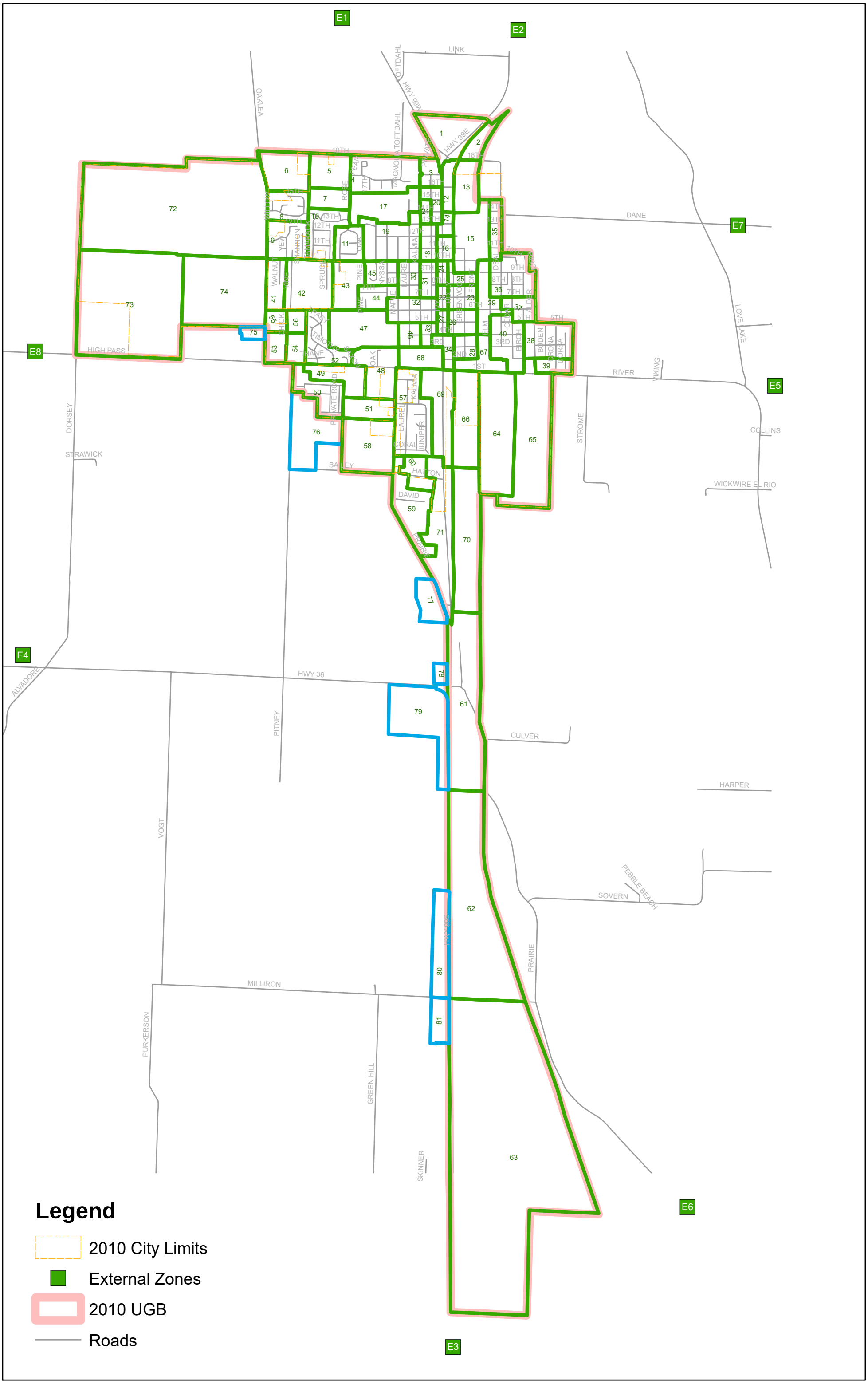
TRIP ASSIGNMENT

Trip assignment involves the determination of the specific travel routes taken by all of the trips within the transportation network. This step was performed using VISUM modeling software as a base with modifications made manually to reasonable routes between origins and destinations. The forecast tool inputs include the transportation network (i.e., road and intersection locations and characteristics, as determined from maps and field inventories) and a trip distribution table (determined using methodology described previously in this memorandum). Iterated assignment was then performed using estimated travel times along roadways and delays at intersection movements. The path choice for each trip was based on minimal travel times between locations.

MODEL VOLUMES

Model output volume plots are provided in the Appendix for the 2015 base year, for the 2036 future year, and the increment of traffic growth between 2015 and 2036 during the PM peak hour. Future year design hour volumes consider the model for both the base year 2015 and forecast year 2036 scenarios. A “post processing” technique following NCHRP 255 methodology was utilized to refine model travel forecasts to the volume forecasts utilized for 2036 intersection analysis. Revised future 2036 turn movement projections are provided in the attached Appendix.

Figure 1 · Transportation Analysis Zones

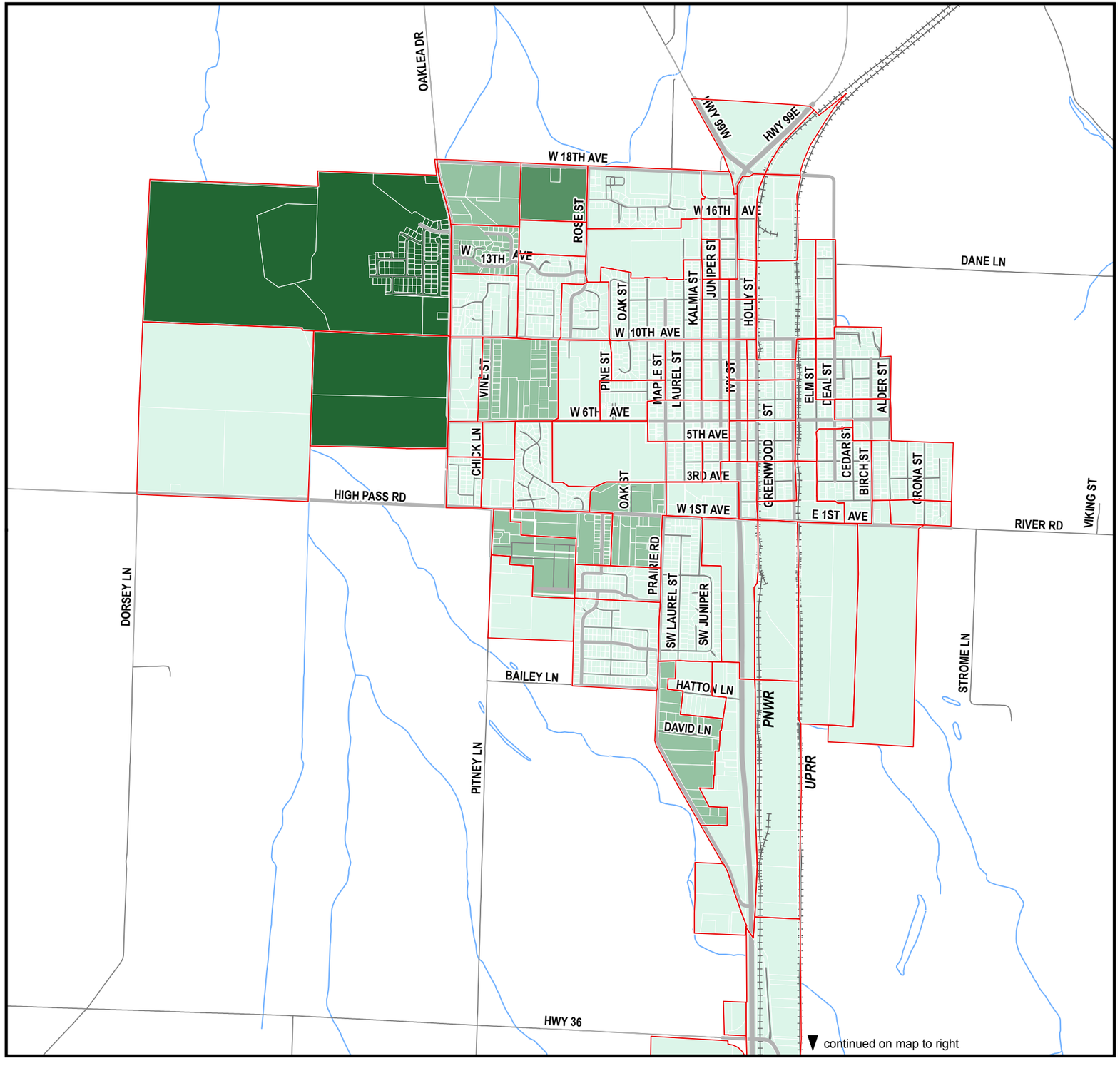


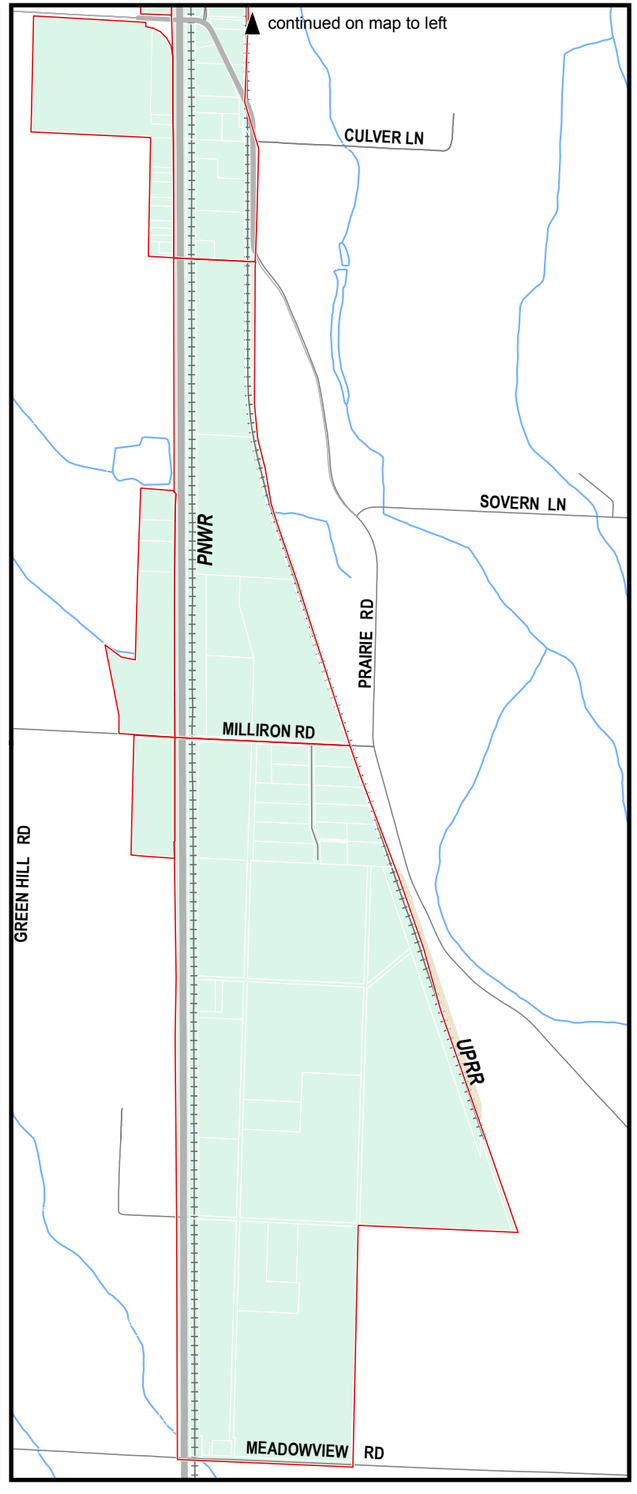
Junction City

Transportation System Plan

FIGURE 1

Household Growth (2015-2035)





Legend

Household Growth, 2015-2035 (Number of Households)

- LESS THAN 10
- 10 - 49
- 50 - 199
- MORE THAN 200

- TRANSPORTATION ANALYSIS ZONE (TAZ) BOUNDARY

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*

- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

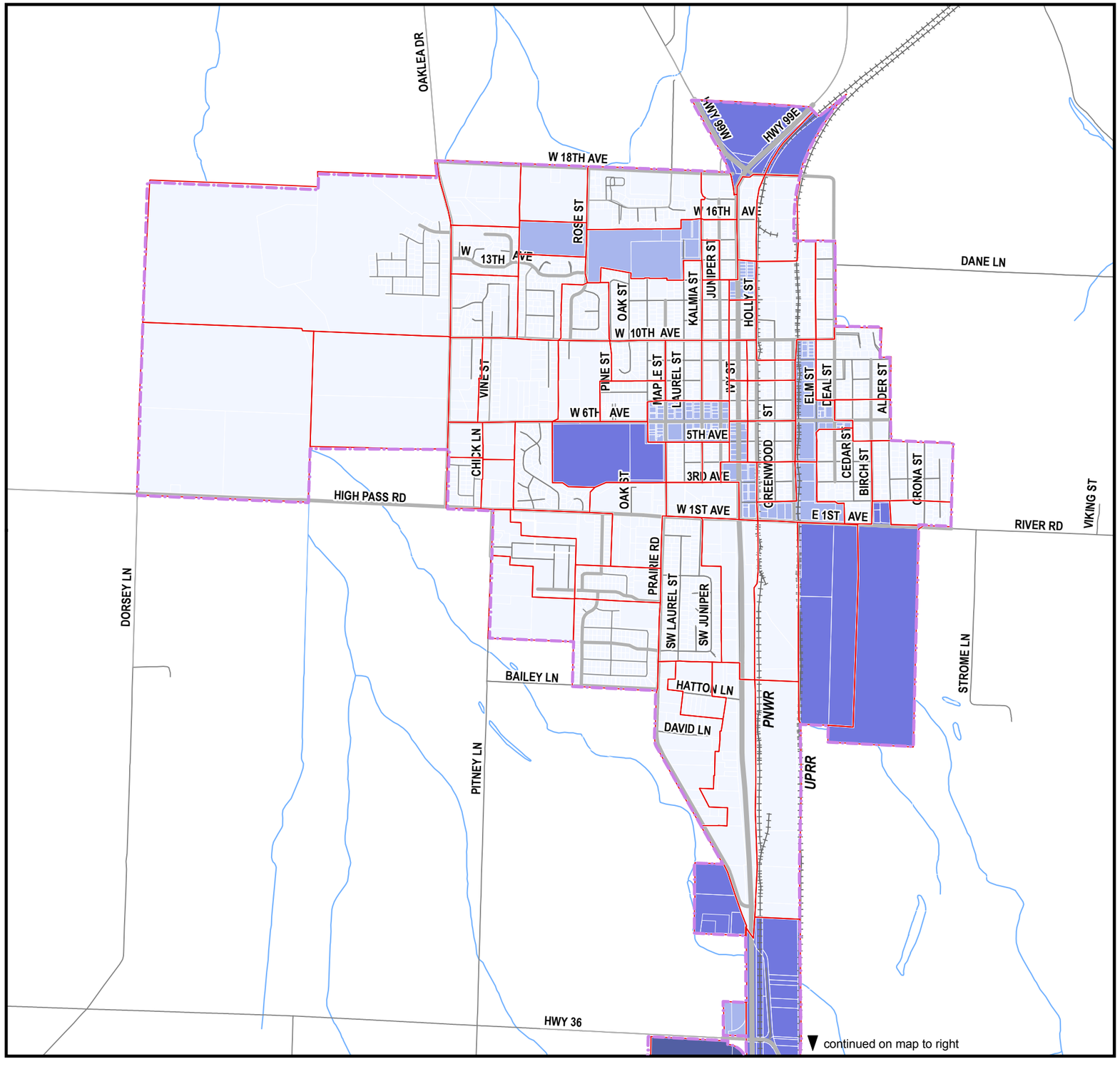
0 1,000 2,000 *Feet*

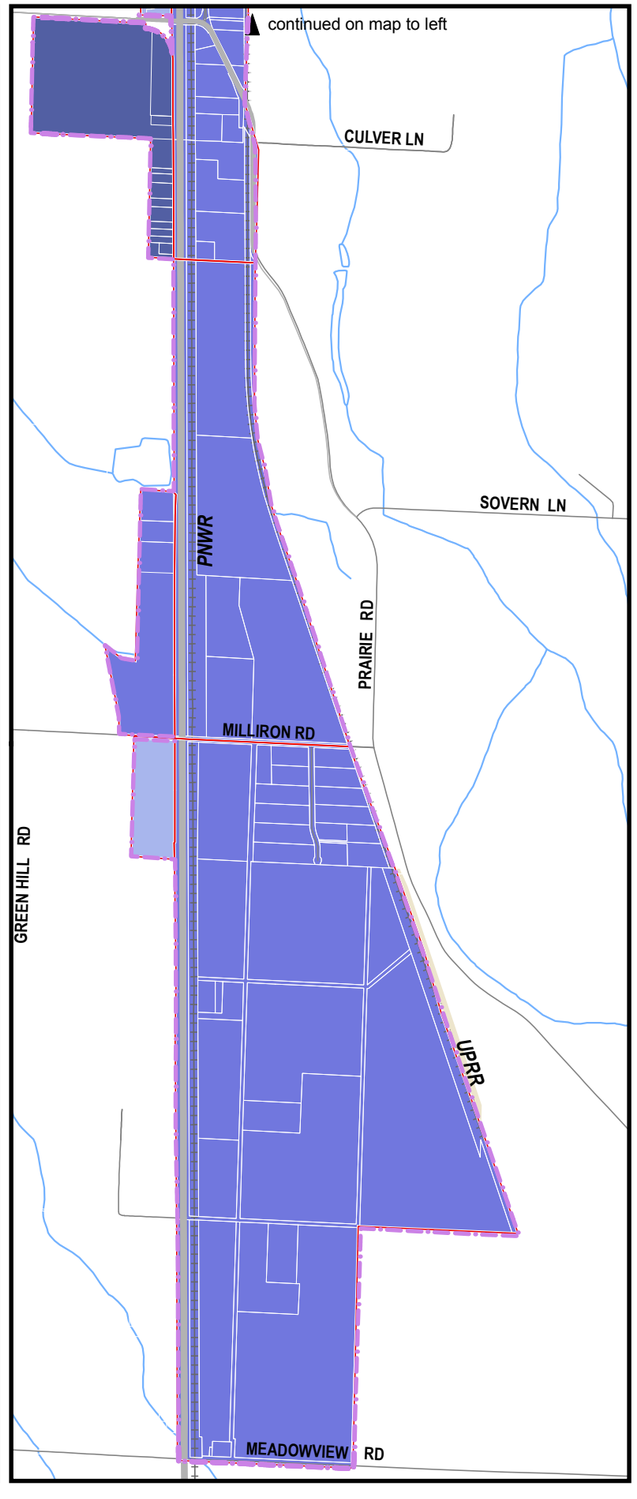
Junction City

Transportation System Plan

FIGURE 2

Employment Growth (2015-2035)





Legend

Employment Growth, 2015-2035 (Number of Employees)

- LESS THAN 10
- 10 - 49
- 50 - 199
- MORE THAN 200

- TRANSPORTATION ANALYSIS ZONE (TAZ) BOUNDARY

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*

- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

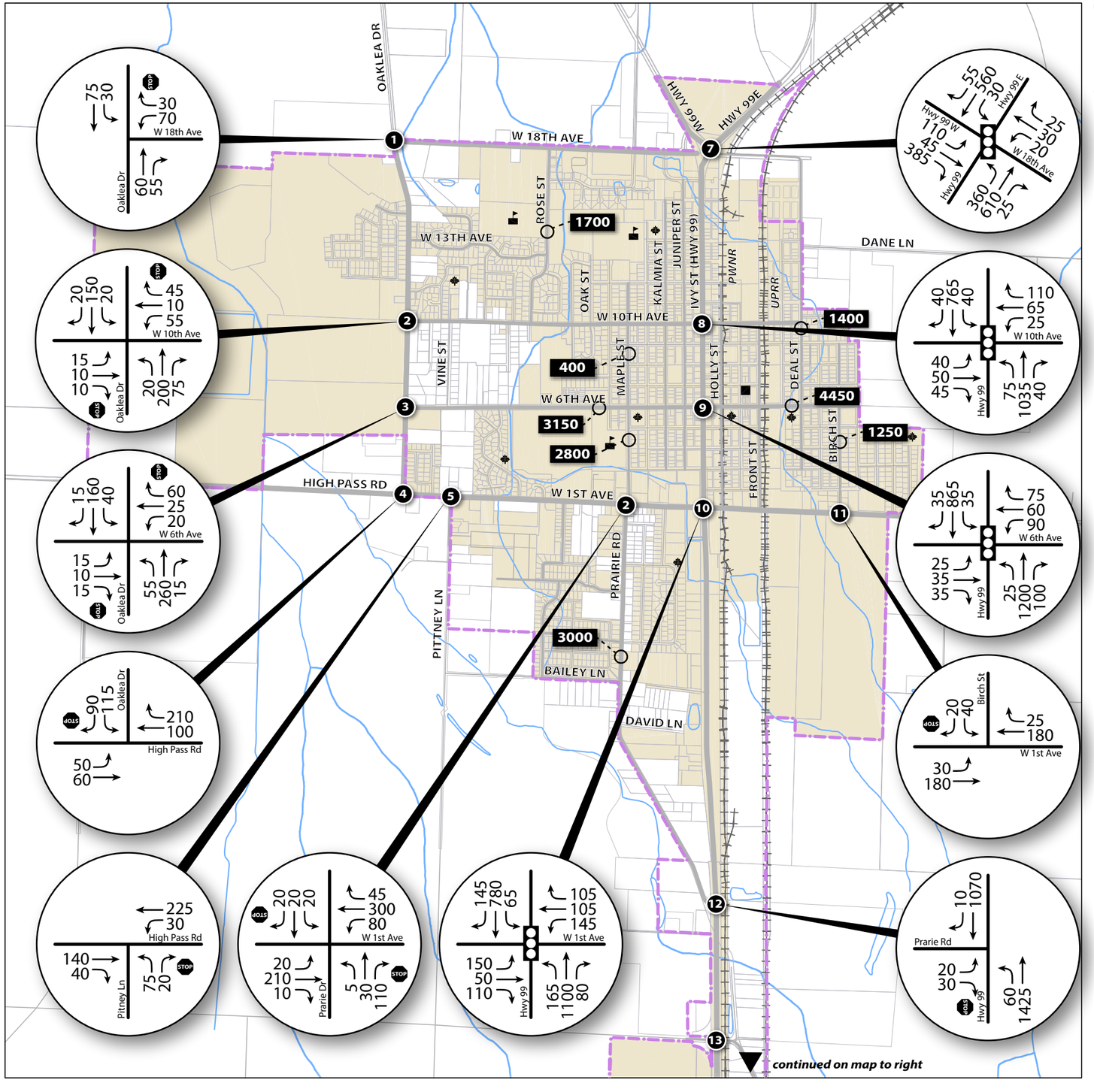
N W E S

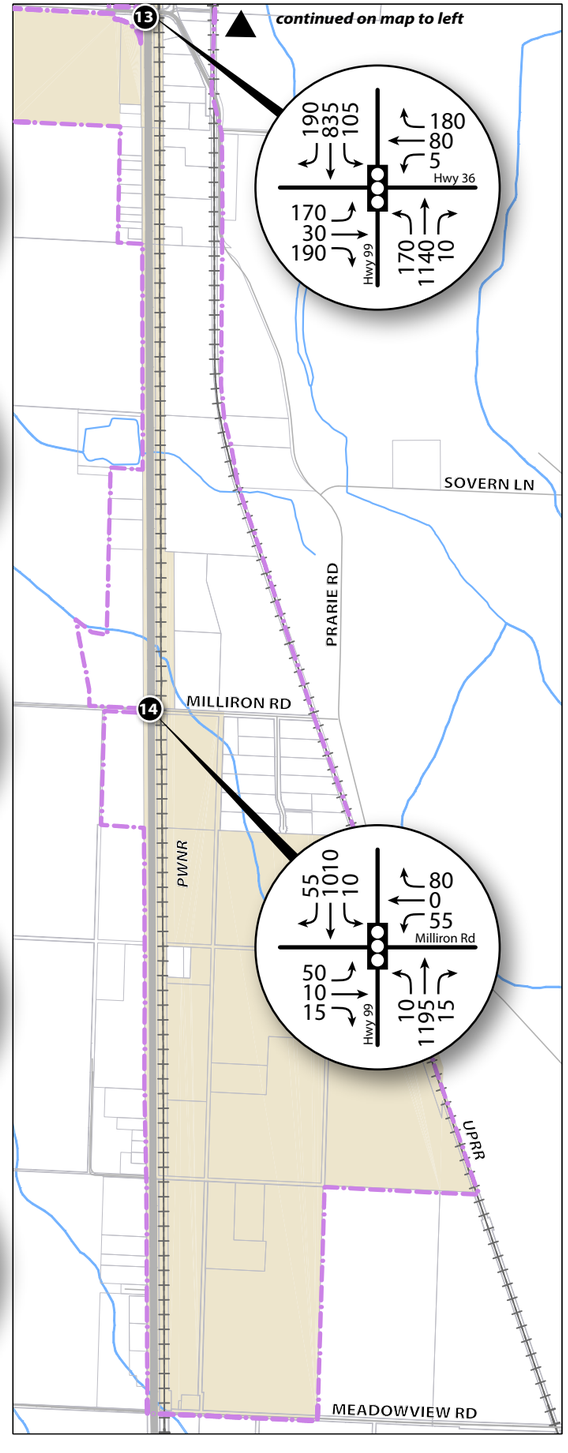
0 1,000 2,000 *Feet*

Junction City
Transportation System Plan

FIGURE 3

2035 Future
PM Peak Hour
Traffic Volumes





Legend

- STUDY INTERSECTION

Roadways

- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

Traffic Volume Data

- STOP SIGN
- TRAFFIC SIGNAL
- 000 — PM PEAK HOUR TRAFFIC VOLUME
- 000 — WEEKDAY AVERAGE DAILY TRAFFIC

Places of Interest

- CITY HALL
- PARK
- PUBLIC SCHOOL

N W E S

0 1000 2000 Feet

Tech Memo #3-Update

Appendix

2015 Land Use by TAZ

TAZ				Household Type								Employment Type				
Number	Total Households	2015 Vacant Parcels	Total Employment	Accessory Dwelling Units	Manufactured Homes	Single Family Housing	Duplexes (2 units)	Triplexes (3 units)	Quadplexes (4 units)	Apartments	Manufactured Homes (Park)	Government	Retail	Office	Other Services	Industrial
1	1		14	0	0	1	0	0	0	0	0	0	14	0	0	0
2	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	1		128	0	0	1	0	0	0	0	0	0	109	0	0	19
4	111		121	0	0	41	17	0	9	0	0	22	54	28	17	0
5	1		0	0	0	1	0	0	0	0	0	0	0	0	0	0
6	26		0	2	0	2	0	0	0	0	22	0	0	0	0	0
7	0		56	0	0	0	0	0	0	0	0	56	0	0	0	0
8	54		0	0	0	54	0	0	0	0	0	0	0	0	0	0
9	54		0	0	0	54	0	0	0	0	0	0	0	0	0	0
10	94		0	4	1	83	3	0	0	0	0	0	0	0	0	0
11	45		0	1	0	44	0	0	0	0	0	0	0	0	0	0
12	0		94	0	0	0	0	0	0	0	0	0	0	0	0	94
13	0		94	0	0	0	0	0	0	0	0	0	0	0	0	94
14	1		80	0	0	1	0	0	0	0	0	0	18	28	34	0
15	1		160	0	0	1	0	0	0	0	0	66	0	0	0	94
16	1		127	0	0	1	0	0	0	0	0	0	72	0	17	38
17	0		60	0	0	0	0	0	0	0	0	60	0	0	0	0
18	40		81	1	1	27	2	0	0	7	0	0	36	28	17	0
19	110		0	0	1	105	2	0	0	0	0	0	0	0	0	0
20	14		106	0	0	14	0	0	0	0	0	0	72	0	34	0
21	12		44	0	0	12	0	0	0	0	0	0	0	28	16	0
22	0		107	0	0	0	0	0	0	0	0	0	91	0	16	0
23	11		296	0	0	7	2	0	0	0	0	66	127	40	25	38
24	0		107	0	0	0	0	0	0	0	0	0	91	0	16	0
25	6		55	0	0	6	0	0	0	0	0	0	18	0	18	19
26	4		138	0	0	1	0	1	0	0	0	0	54	28	18	38
27	0		100	0	0	0	0	0	0	0	0	0	54	28	18	0
28	38		43	0	0	17	5	0	0	0	11	0	0	27	16	0
29	0		108	0	0	0	0	0	0	0	0	0	92	0	16	0
30	50		0	0	0	50	0	0	0	0	0	0	0	0	0	0
31	30		107	0	0	15	0	0	0	15	0	0	0	56	51	0
32	64		141	1	0	41	3	2	1	6	0	44	18	28	51	0
33	16		14	0	0	16	0	0	0	0	0	0	0	14	0	0
34	0		126	0	0	0	0	0	0	0	0	0	92	0	34	0
35	32		0	0	0	22	5	0	0	0	0	0	0	0	0	0
36	158		0	3	17	69	11	3	3	26	0	0	0	0	0	0
37	78		87	0	0	2	0	1	3	61	0	0	0	53	34	0
38	95		0	0	0	91	2	0	0	0	0	0	0	0	0	0
39	41		0	0	0	18	0	0	0	0	23	0	0	0	0	0
40	85		0	4	0	69	6	0	0	0	0	0	0	0	0	0
41	16		8	3	1	12	0	0	0	0	0	0	0	0	8	0
42	55		0	0	5	48	1	0	0	0	0	0	0	0	0	0
43	73		0	1	0	9	0	0	0	0	63	0	0	0	0	0
44	43		0	0	0	29	3	0	2	0	0	0	0	0	0	0
45	51		0	1	0	42	4	0	0	0	0	0	0	0	0	0
46	33		0	0	0	31	1	0	0	0	0	0	0	0	0	0
47	0		60	0	0	0	0	0	0	0	0	60	0	0	0	0
48	158		80	0	1	9	0	0	0	104	44	0	18	28	34	0
49	29	22	0	0	1	28	0	0	0	0	0	0	0	0	0	0
50	75	32	0	0	0	1	0	0	0	0	74	0	0	0	0	0
51	50	4	0	0	1	49	0	0	0	0	0	0	0	0	0	0
52	91		0	0	0	91	0	0	0	0	0	0	0	0	0	0
53	30	6	0	0	0	30	0	0	0	0	0	0	0	0	0	0
54	4	26	0	1	1	2	0	0	0	0	0	0	0	0	0	0
55	2		0	0	0	2	0	0	0	0	0	0	0	0	0	0
56	3		0	0	0	3	0	0	0	0	0	0	0	0	0	0
57	179		0	0	0	139	0	0	10	0	0	0	0	0	0	0
58	142	5	0	0	0	142	0	0	0	0	0	0	0	0	0	0
59	15		0	0	1	14	0	0	0	0	0	0	0	0	0	0
60	145		36	1	0	4	0	0	0	140	0	0	36	0	0	0
61	9		94	0	0	9	0	0	0	0	0	0	0	0	0	94
62	0		75	0	0	0	0	0	0	0	0	0	0	0	0	75
63	1		318	0	0	1	0	0	0	0	0	300	0	0	12	6
64	0		168	0	0	0	0	0	0	0	0	0	0	0	0	168
65	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
66	0		19	0	0	0	0	0	0	0	0	0	0	0	0	19
67	0		92	0	0	0	0	0	0	0	0	0	36	0	0	56
68	0		66	0	0	0	0	0	0	0	0	0	36	14	16	0
69	0		69	0	0	0	0	0	0	0	0	0	69	0	0	0
70	0		112	0	0	0	0	0	0	0	0	0	0	0	0	112
71	60		54	0	0	6	2	0	0	0	50	0	54	0	0	0
72	98		0	0	0	98	0	0	0	0	0	0	0	0	0	0
73	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	1		0	0	0	1	0	0	0	0	0	0	0	0	0	0
2010 UGB																
Totals	**2637**		**3845**	**23**	**31**	**1666**	69	7	28	**359**	**287**	**674**	**1261**	**428**	**518**	**964**
Control	**2637**		**3545**				**138**	**21**	**112**			**374**	**1261**	**428**	**518**	**964**
77	3		4			3									4	
78	0		10			0							10			
79	11		15			9					2				15	
80	5		8			5									8	
81	10		40			3				7					40	
2035 UGB																
Totals	**2666**		**3922**	**23**	**31**	**1686**	69	7	28	**366**	**289**	**674**	**1271**	**428**	**585**	**964**
Control	**NA**		**NA**				**138**	**21**	**112**			**NA**	**NA**	**NA**	**NA**	**NA**

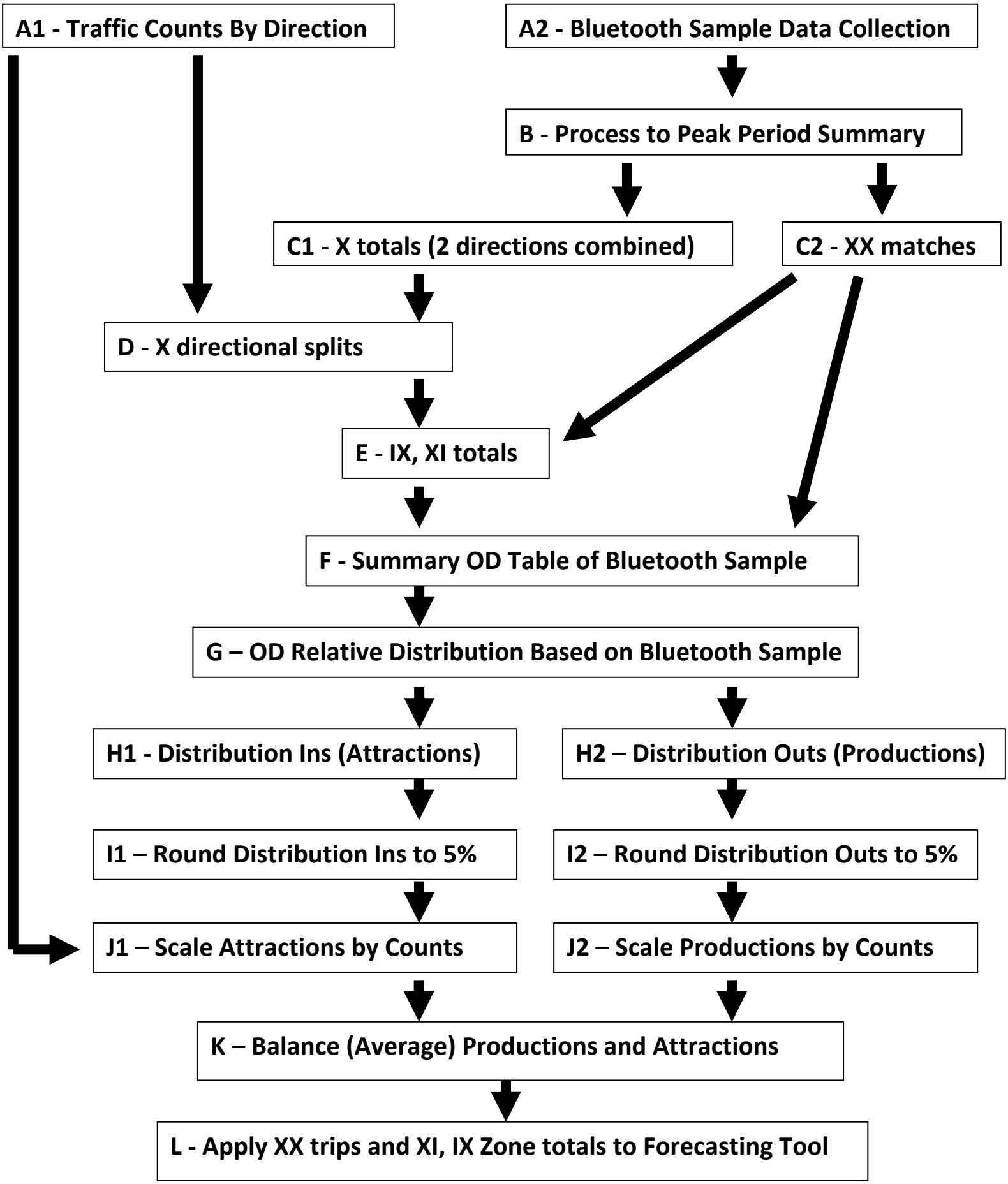
2035 Land Use by TAZ

TAZ			Household Type								Employment Type				
Number	Total Households	Total Employment	Accessory Dwelling Units	Manufactured Homes	Single Family Housing	Duplex or Small Lot SF (2 units)	Triplexes (3 units)	Quadplexes (4 units)	Apartments	Manufactured Homes (Park)	Government	Retail	Office	Other Services	Industrial
1	**1**	**94**	0	0	1	0	0	0	0	0	0	34	30	30	0
2	**0**	**60**	0	0	0	0	0	0	0	0	0	0	0	0	60
3	**1**	**128**	0	0	1	0	0	0	0	0	0	109	0	0	19
4	**111**	**121**	0	0	41	17	0	9	0	0	22	54	28	17	0
5	**147**	**0**	0	0	1	0	0	0	146	0	0	0	0	0	0
6	**58**	**0**	2	0	2	16	0	0	0	22	0	0	0	0	0
7	**0**	**66**	0	0	0	0	0	0	0	0	66	0	0	0	0
8	**66**	**0**	0	0	66	0	0	0	0	0	0	0	0	0	0
9	**54**	**0**	0	0	54	0	0	0	0	0	0	0	0	0	0
10	**94**	**0**	4	1	83	3	0	0	0	0	0	0	0	0	0
11	**45**	**0**	1	0	44	0	0	0	0	0	0	0	0	0	0
12	**0**	**94**	0	0	0	0	0	0	0	0	0	0	0	0	94
13	**0**	**94**	0	0	0	0	0	0	0	0	0	0	0	0	94
14	**1**	**98**	0	0	1	0	0	0	0	0	0	18	40	40	0
15	**1**	**160**	0	0	1	0	0	0	0	0	66	0	0	0	94
16	**1**	**127**	0	0	1	0	0	0	0	0	0	72	0	17	38
17	**0**	**90**	0	0	0	0	0	0	0	0	90	0	0	0	0
18	**40**	**87**	1	1	27	2	0	0	7	0	0	36	28	23	0
19	**110**	**0**	0	1	105	2	0	0	0	0	0	0	0	0	0
20	**14**	**106**	0	0	14	0	0	0	0	0	0	72	0	34	0
21	**12**	**44**	0	0	12	0	0	0	0	0	0	0	28	16	0
22	**0**	**107**	0	0	0	0	0	0	0	0	0	91	0	16	0
23	**11**	**296**	0	0	7	2	0	0	0	0	66	127	40	25	38
24	**0**	**107**	0	0	0	0	0	0	0	0	0	91	0	16	0
25	**6**	**55**	0	0	6	0	0	0	0	0	0	18	0	18	19
26	**4**	**144**	0	0	1	0	1	0	0	0	0	60	28	18	38
27	**0**	**135**	0	0	0	0	0	0	0	0	0	62	43	30	0
28	**38**	**43**	0	0	17	5	0	0	0	11	0	0	27	16	0
29	**0**	**148**	0	0	0	0	0	0	0	0	0	108	12	28	0
30	**50**	**0**	0	0	50	0	0	0	0	0	0	0	0	0	0
31	**30**	**111**	0	0	15	0	0	0	15	0	0	4	56	51	0
32	**64**	**161**	1	0	41	3	2	1	6	0	44	26	28	63	0
33	**16**	**20**	0	0	16	0	0	0	0	0	0	0	14	6	0
34	**0**	**157**	0	0	0	0	0	0	0	0	0	108	15	34	0
35	**32**	**0**	0	0	22	5	0	0	0	0	0	0	0	0	0
36	**158**	**0**	3	17	69	11	3	3	26	0	0	0	0	0	0
37	**78**	**90**	0	0	2	0	1	3	61	0	0	0	56	34	0
38	**95**	**0**	0	0	91	2	0	0	0	0	0	0	0	0	0
39	**41**	**0**	0	0	18	0	0	0	0	23	0	0	0	0	0
40	**85**	**0**	4	0	69	6	0	0	0	0	0	0	0	0	0
41	**16**	**8**	3	1	12	0	0	0	0	0	0	0	0	8	0
42	**95**	**0**	0	5	48	21	0	0	0	0	0	0	0	0	0
43	**73**	**0**	1	0	9	0	0	0	0	63	0	0	0	0	0
44	**51**	**0**	0	0	29	3	0	4	0	0	0	0	0	0	0
45	**51**	**0**	1	0	42	4	0	0	0	0	0	0	0	0	0
46	**33**	**0**	0	0	31	1	0	0	0	0	0	0	0	0	0
47	**0**	**110**	0	0	0	0	0	0	0	0	110	0	0	0	0
48	**198**	**80**	0	1	9	0	0	0	144	44	0	18	28	34	0
49	**50**	**0**	0	1	49	0	0	0	0	0	0	0	0	0	0
50	**105**	**0**	0	0	1	0	0	0	0	104	0	0	0	0	0
51	**54**	**0**	0	1	53	0	0	0	0	0	0	0	0	0	0
52	**91**	**0**	0	0	91	0	0	0	0	0	0	0	0	0	0
53	**36**	**0**	0	0	36	0	0	0	0	0	0	0	0	0	0
54	**4**	**0**	1	1	2	0	0	0	0	0	0	0	0	0	0
55	**2**	**0**	0	0	2	0	0	0	0	0	0	0	0	0	0
56	**3**	**0**	0	0	3	0	0	0	0	0	0	0	0	0	0
57	**179**	**0**	0	0	139	0	0	10	0	0	0	0	0	0	0
58	**147**	**0**	0	0	147	0	0	0	0	0	0	0	0	0	0
59	**43**	**0**	0	1	14	14	0	0	0	0	0	0	0	0	0
60	**145**	**36**	1	0	4	0	0	0	140	0	0	36	0	0	0
61	**9**	**174**	0	0	9	0	0	0	0	0	0	0	0	0	174
62	**0**	**235**	0	0	0	0	0	0	0	0	0	0	0	0	235
63	**1**	**392**	0	0	1	0	0	0	0	0	340	0	0	16	36
64	**0**	**218**	0	0	0	0	0	0	0	0	0	0	0	0	218
65	**0**	**50**	0	0	0	0	0	0	0	0	0	0	0	0	50
66	**0**	**19**	0	0	0	0	0	0	0	0	0	0	0	0	19
67	**0**	**122**	0	0	0	0	0	0	0	0	0	36	0	0	86
68	**0**	**66**	0	0	0	0	0	0	0	0	0	36	14	16	0
69	**0**	**72**	0	0	0	0	0	0	0	0	0	72	0	0	0
70	**0**	**112**	0	0	0	0	0	0	0	0	0	0	0	0	112
71	**60**	**54**	0	0	6	2	0	0	0	50	0	54	0	0	0
72	**393**	**0**	0	0	313	40	0	0	0	0	0	0	0	0	0
73	**0**	**0**	0	0	0	0	0	0	0	0	0	0	0	0	0
74	**365**	**0**	0	0	276	0	23	0	20	0	0	0	0	0	0
2010 UGB Totals	**3668**	**4691**	**23**	**31**	**2204**	159 **318**	30 **90**	30 **120**	**565**	**317**	**804**	**1342**	**515**	**606**	**1424**
77	**3**	**149**	0	0	3	0	0	0	0	0	0	100	45	4	0
78	**0**	**52**	0	0	0	0	0	0	0	0	0	40	6	6	0
79	**11**	**614**	0	0	9	0	0	0	0	2	0	261	186	167	0
80	**5**	**116**	0	0	5	0	0	0	0	0	0	60	30	26	0
81	**10**	**60**	0	0	3	0	0	0	7	0	0	20	5	35	0
2035 UGB Totals	**3697**	**5682**	**23**	**31**	**2224**	159 **318**	30 **90**	30 **120**	**572**	**319**	**804**	**1823**	**787**	**844**	**1424**

Land Use Growth (2010 to 2035) by TAZ

TAZ				Household Type								Employment Type				
Number	2015-2035 Total Household Growth	% of total	Total Employment	Accessory Dwelling Units	Manufactured Homes	Single Family Housing	Duplex or Small Lot SF (2 units)	Triplexes (3 units)	Quadplexes (4 units)	Apartments	Manufactured Homes (Park)	Government	Retail	Office	Other Services	Industrial
1	0	0%	80	0	0	0	0	0	0	0	0	0	20	30	30	0
2	0	0%	60	0	0	0	0	0	0	0	0	0	0	0	0	60
3	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	146	14%	0	0	0	0	0	0	0	146	0	0	0	0	0	0
6	32	3%	0	0	0	0	16	0	0	0	0	0	0	0	0	0
7	0	0%	10	0	0	0	0	0	0	0	0	10	0	0	0	0
8	12	1%	0	0	0	12	0	0	0	0	0	0	0	0	0	0
9	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0%	18	0	0	0	0	0	0	0	0	0	0	12	6	0
15	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0%	30	0	0	0	0	0	0	0	0	30	0	0	0	0
18	0	0%	6	0	0	0	0	0	0	0	0	0	0	0	6	0
19	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	0	0%	6	0	0	0	0	0	0	0	0	0	6	0	0	0
27	0	0%	35	0	0	0	0	0	0	0	0	0	8	15	12	0
28	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0%	40	0	0	0	0	0	0	0	0	0	16	12	12	0
30	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0%	4	0	0	0	0	0	0	0	0	0	4	0	0	0
32	0	0%	20	0	0	0	0	0	0	0	0	0	8	0	12	0
33	0	0%	6	0	0	0	0	0	0	0	0	0	0	0	6	0
34	0	0%	31	0	0	0	0	0	0	0	0	0	16	15	0	0
35	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0%	3	0	0	0	0	0	0	0	0	0	0	3	0	0
38	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
42	40	4%	0	0	0	0	20	0	0	0	0	0	0	0	0	0
43	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	8	1%	0	0	0	0	0	0	2	0	0	0	0	0	0	0
45	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0%	50	0	0	0	0	0	0	0	0	50	0	0	0	0
48	40	4%	0	0	0	0	0	0	0	40	0	0	0	0	0	0
49	21	2%	0	0	0	21	0	0	0	0	0	0	0	0	0	0
50	30	3%	0	0	0	0	0	0	0	0	30	0	0	0	0	0
51	4	0%	0	0	0	4	0	0	0	0	0	0	0	0	0	0
52	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
53	6	1%	0	0	0	6	0	0	0	0	0	0	0	0	0	0
54	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
58	5	0%	0	0	0	5	0	0	0	0	0	0	0	0	0	0
59	28	3%	0	0	0	0	14	0	0	0	0	0	0	0	0	0
60	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0%	80	0	0	0	0	0	0	0	0	0	0	0	0	80
62	0	0%	160	0	0	0	0	0	0	0	0	0	0	0	0	160
63	0	0%	74	0	0	0	0	0	0	0	0	40	0	0	4	30
64	0	0%	50	0	0	0	0	0	0	0	0	0	0	0	0	50
65	0	0%	50	0	0	0	0	0	0	0	0	0	0	0	0	50
66	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0%	30	0	0	0	0	0	0	0	0	0	0	0	0	30
68	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0%	3	0	0	0	0	0	0	0	0	0	3	0	0	0
70	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
72	295	29%	0	0	0	215	40	0	0	0	0	0	0	0	0	0
73	0	0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0
74	364	35%	0	0	0	275	0	23	0	20	0	0	0	0	0	0
2010 UGB Totals	**1031**		**846**	**0**	**0**	**538**	90	23	2	**206**	**30**	**130**	**81**	**87**	**88**	**460**
							180	**69**	**8**							
77	0		145	0	0	0	0	0	0	0	0	0	100	45	0	0
78	0		42	0	0	0	0	0	0	0	0	0	30	6	6	0
79	0		599	0	0	0	0	0	0	0	0	0	261	186	152	0
80	0		108	0	0	0	0	0	0	0	0	0	60	30	18	0
81	0		20	0	0	0	0	0	0	0	0	0	20	5	-5	0
2035 UGB Totals	**1031**		**1760**	**0**	**0**	**538**	90	23	2	**206**	**30**	**130**	**552**	**359**	**259**	**460**
							180	**69**	**8**							

Bluetooth OD Data Application



STEP B - Process to Peak Period Summary

Hourly Summary -XX Matches

Station 1 — 99W (northwest)

Site 1 to 1

Hr Start	Tue	Wen	Thu	Fri	SUM
1500					0
1600					0
1700					0
1800					0

Site 1 to 2

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	1				1
4PM					**0**
5PM	1				**1**
6PM					0
	0	6	1	2	1	**10** daily

Site 1 to 3

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM		1	3	2	6
4PM			2	3	**5**
5PM					**0**
6PM	1	1		1	3
	0	15	12	21	19	**67** daily

Site 1 to 4

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM			0		0
4PM			1		**1**
5PM					**0**
6PM					0
	1	0	0	4	0	**5** daily

Station 2 — 99E (northeast)

Site 2 to 1

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	0				0
4PM				1	**1**
5PM				2	**2**
6PM	1				1
	2	9	1	3	7	**22** daily

Site 2 to 2

Hr Start	Tue	Wen	Thu	Fri	SUM
1500					0
1600					0
1700					0
1800					0

Site 2 to 3

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	2		2		4
4PM	1	2	1	2	**6**
5PM			1	1	**2**
6PM	1		1		2
	3	30	14	17	17	**81** daily

Site 2 to 4

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	1	4	1	4	10
4PM		4		2	**6**
5PM	2			1	**3**
6PM	1	1			2
	2	8	18	6	12	**46** daily

Station 3 — 99 (south)

Site 3 to 1

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	7	3	3	7	20
4PM	2	4	4	5	**15**
5PM	4	1	2	8	**15**
6PM	3	5	1	1	10
	6	42	51	46	51	**196** daily

Site 3 to 2

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	4	6	7	6	23
4PM	8	7	4	6	**25**
5PM	1	1	3	3	**8**
6PM	2	5	1	1	9
	7	70	48	48	46	**219** daily

Site 3 to 3

Hr Start	Tue	Wen	Thu	Fri	SUM
1500					0
1600					0
1700					0
1800					0

Site 3 to 4

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM			3	1	4
4PM		3		4	**7**
5PM	3	1	1	1	**6**
6PM	1	1		2	4
	4	15	13	15	17	**64** daily

Station 4 — OR 36 (west)

Site 4 to 1

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM					0
4PM					**0**
5PM				1	**1**
6PM				1	1
	0	0	0	1	3	**4** daily

Site 4 to 2

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM	1				1
4PM		2			**2**
5PM	2			3	**5**
6PM	1	1			2
	1	8	10	3	10	**32** daily

Site 4 to 3

Hr Start	Tue	Wen	Thu	Fri	SUM
3PM		1		2	3
4PM	1	1	1		**3**
5PM			1		**1**
6PM			1		1
	0	8	10	9	5	**32** daily

Site 4 to 4

Hr Start	Tue	Wen	Thu	Fri	SUM
1500					0
1600					0
1700					0
1800					0

C2 - XX Matches

Summary of Matches from Step B

Station	1	2	3	4	ALL
1		1	5	1	7
2	3		8	9	20
3	30	33		13	76
4	1	7	4		12
	34	41	17	23	**115**

from C2

XX Ins	XX Outs
7	34
20	41
76	17
12	23
115	115

C1 - X Totals

PM Peak 2 HR - Trip Ends

Station	Tue	Wen	Thu	Fri	X Total
1	*40*	*44*	*43*	*51*	178
2	*73*	*67*	*64*	*83*	287
3	*72*	*61*	*55*	*70*	258
4	*29*	*31*	*32*	*39*	131
ALL	214	203	194	243	**854**

A1 - Count By Direction

PM Peak 1 HR Count

Count In	Count Ot	Total
380	400	780
430	490	920
790	680	1470
130	180	310
		3480

D - X Directional Split

In %	Out %	X In	X Out
0.49	0.51	87	91
0.47	0.53	134	153
0.54	0.46	139	119
0.42	0.58	55	76

E - IX, XI Totals

PM Peak 2 HR / 4 days *(X - XX)*

XI (In)	IX (Out)	XX In Pct	XX Out Pct
80	57	8%	37%
114	112	15%	27%
63	102	55%	14%
43	53	22%	30%

F - Summary OD Table

Bluetooth OD Table -

4 Days x 2 Hour PM Peak (4-6PM)

	1	2	3	4	OTHER	SUM
1		1	5	1	80	87
2	3		8	9	114	134
3	30	33		13	63	139
4	1	7	4		43	55
OTHER	57	112	102	53		324
SUM	91	153	119	76	300	739
					check trip total	*739*

G - Relative Distributions

External %

	1	2	3	4	ALL
1		1%	4%	1%	6%
2	3%		7%	8%	17%
3	26%	29%		11%	66%
4	1%	6%	3%		10%
	30%	36%	15%	20%	100%

In %

	1	2	3	4	OTHER
1		1%	6%	1%	92%
2	2%		6%	7%	85%
3	22%	24%		9%	45%
4	2%	13%	7%		78%

Out %

	1	2	3	4	
1		1%	4%	1%	
2	3%		7%	12%	
3	33%	22%		17%	
4	1%	5%	3%		
OTHER	63%	73%	86%	70%	

H1 - Relative Distribution Outs

Initial Distibution - Outs

	1	2	3	4	XI
1		1%	4%	1%	27%
2	3%		7%	12%	38%
3	33%	22%		17%	21%
4	1%	5%	3%		14%
IX	63%	73%	86%	70%	
SUM	1.00	1.00	1.00	1.00	1.00

H2 - Relative Distribution Ins

Initial Distribution - Ins

	1	2	3	4	XI	
1		1%	6%	1%	92%	1.00
2	2%		6%	7%	85%	1.00
3	22%	24%		9%	45%	1.00
4	2%	13%	7%		78%	1.00
IX	18%	35%	31%	16%		1.00

I1 -Rounded Distribution Outs

Adjusted (based on count data, judgement and other available information)

	1	2	3	4	XI
1	0%	10%	5%	1%	27%
2	10%	0%	5%	10%	38%
3	30%	20%	0%	20%	21%
4	1%	5%	5%	0%	14%
IX	59%	65%	85%	69%	0%
SUM	1.00	1.00	1.00	1.00	1.00
	400	490	680	180	

I2 -Rounded Distribution Ins

Adjusted (based on count data, judgement and other available information)

	1	2	3	4	XI		
1	0%	10%	5%	1%	84%	1.00	380
2	10%	0%	5%	5%	80%	1.00	430
3	20%	20%	0%	10%	50%	1.00	790
4	2%	10%	10%	0%	78%	1.00	130
IX	18%	35%	31%	16%	0%	1.00	

J1 - Scale Attractions by Counts

Attractions

	1	**2**	**3**	**4**
1	-	49	34	2
2	40	-	34	18
3	120	98	-	36
4	4	25	34	-
SUM	**164**	**172**	**102**	**56**

J2- Scale Productions by Counts

Productions

	1	**2**	**3**	**4**	**SUM**
1	-	38	19	4	61
2	43	-	22	22	86
3	158	158	-	79	395
4	2	13	13	-	28

K2- Balance Productions and Attractions

	1	**2**	**3**	**4**	XI	SUM
1		44	27	3	307	380
2	42		28	20	341	430
3	139	128		58	466	790
4	3	19	24		84	130
IX	216	300	602	99		
SUM	400	490	680	180		

	XX % In	XX % Out	XX % Combined
99W	19%	46%	
99E	21%	39%	
99(south)	41%	11%	
36	35%	45%	

2004 LCOG Model PM Peak Hour Trip Distribution

Use '04 Model Data to Estimate Externals Not Captured with Bluetooth

2004 Model PM peak Hour External Trip Table

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass F	*Internal*	*External*	*Total*	
99W	0	0	101	5	4	6	1	2	*121*	*119*	*240*	50%
99E	0	0	108	21	16	24	3	9	*187*	*181*	*368*	49%
99 (S)	101	157	0	30	23	0	5	12	*331*	*328*	*659*	50%
OR 36	3	5	61	0	3	4	1	0	*80*	*77*	*157*	49%
1st/River	5	7	28	5	0	6	0	2	*112*	*53*	*165*	32%
Prairie (S)	6	10	0	15	6	0	1	6	*93*	*44*	*137*	32%
Dane Ln	1	1	9	1	0	1	0	0	*21*	*13*	*34*	38%
High Pass Rd	1	2	25	0	1	2	0	0	*68*	*31*	*99*	31%
Internal	*120*	*179*	*348*	*69*	*110*	*92*	*18*	*61*				
External	*117*	*182*	*332*	*77*	*53*	*43*	*11*	*31*				
Total	*237*	*361*	*680*	*146*	*163*	*135*	*29*	*92*				
	49%	50%	49%	53%	33%	32%	38%	34%				

Relative Distribution Ins

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass F	*Internal*	*External*	*Total*	
99W	0%	0%	42%	2%	2%	3%	0%	1%	50%	*50%*	*240*	100%
99E	0%	0%	29%	6%	4%	7%	1%	2%	51%	*49%*	*368*	100%
99 (S)	15%	24%	0%	5%	3%	0%	1%	2%	50%	*50%*	*659*	100%
OR 36	2%	3%	39%	0%	2%	3%	1%	0%	51%	*49%*	*157*	100%
1st/River	3%	4%	17%	3%	0%	4%	0%	1%	68%	*32%*	*165*	100%
Prairie (S)	4%	7%	0%	11%	4%	0%	1%	4%	68%	*32%*	*137*	100%
Dane Ln	3%	3%	26%	3%	0%	3%	0%	0%	62%	*38%*	*34*	100%
High Pass Rd	1%	2%	25%	0%	1%	2%	0%	0%	69%	*31%*	*99*	100%

Relative Distribution Outs

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd
99W	0%	0%	15%	3%	2%	4%	3%	2%
99E	0%	0%	16%	14%	10%	18%	10%	10%
99 (S)	43%	43%	0%	21%	14%	0%	17%	13%
OR 36	1%	1%	9%	0%	2%	3%	3%	0%
1st/River	2%	2%	4%	3%	0%	4%	0%	2%
Prairie (S)	3%	3%	0%	10%	4%	0%	3%	7%
Dane Ln	0%	0%	1%	1%	0%	1%	0%	0%
High Pass Rd	0%	1%	4%	0%	1%	1%	0%	0%
Internal	51%	50%	51%	47%	67%	68%	62%	66%
External	*49%*	*50%*	*49%*	*53%*	*33%*	*32%*	*38%*	*34%*
Total	*237*	*361*	*680*	*146*	*163*	*135*	*29*	*92*
	100%	100%	100%	100%	100%	100%	100%	100%

2011 PM Peak Hour Trip Table Estimate

2011 Counts (30 HV)

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd		*Total (Production/In)*
99W										*380*
99E										*430*
99 (S)										*790*
OR 36										*130*
1st/River										160
Prairie (S)										215
Dane Ln										35
High Pass Rd										130
Total (Attraction/Out)	*400*	*490*	*680*	*180*	160	150	35	155		

Scale Productions by Counts

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd		*Total*
99W					6	10	2	3		*380*
99E					19	28	4	11		*430*
99 (S)					28	0	6	14		*790*
OR 36					2	3	1	0		*130*
1st/River	5	7	27	5	0	6	0	2		*160*
Prairie (S)	9	16	0	24	9	0	2	9		*215*
Dane Ln	1	1	9	1	0	1	0	0		*35*
High Pass F	1	3	33	0	1	3	0	0		*130*

Scale Attractions by Counts

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd	
99W					4	7	1	3	
99E					16	27	4	15	
99 (S)					23	0	6	20	
OR 36					3	4	1	0	
1st/River	8	10	28	6	0	7	0	3	
Prairie (S)	10	14	0	18	6	0	1	10	
Dane Ln	2	1	9	1	0	1	0	0	
High Pass F	2	3	25	0	1	2	0	0	
Total	*400*	*490*	*680*	*180*	*160*	*150*	*35*	*155*	

Balance Productions and Attractions

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd	
99W					5	8	1	3	
99E					17	27	4	13	
99 (S)					25	0	6	17	
OR 36					3	4	1	0	
1st/River	7	8	28	6	0	6	0	3	
Prairie (S)	10	15	0	21	8	0	1	10	
Dane Ln	1	1	9	1	0	1	0	0	
High Pass F	2	3	29	0	1	2	0	0	

2011 PM Peak Hour Trip Table Estimate

L - Final External Trip Table

from	99W	99E	99 (S)	OR 36	1st/River	Prairie (S)	Dane Ln	High Pass Rd	*XI*		*Total X*	*XX Total*	XX %
99W	-	**44**	**27**	**3**	5	8	1	3	**289**	380	*380*	91	23.9%
99E	**42**	-	**28**	**20**	17	27	4	13	**279**	430	*430*	151	35.1%
99 (S)	**139**	**128**	-	**58**	25	0	6	17	**417**	790	*790*	373	47.2%
OR 36	**3**	**19**	**24**	-	3	4	1	0	**76**	130	*130*	54	41.5%
1st/River	7	8	28	6	-	6	0	3	**102**	160	*160*	58	36.3%
Prairie (S)	10	15	0	21	8	-	1	10	**150**	215	*215*	65	30.2%
Dane Ln	1	1	9	1	0	1	-	0	**22**	35	*35*	13	37.1%
High Pass Rd	2	3	29	0	1	2	0	-	**93**	130	*130*	37	28.5%
IX	**196**	**272**	**535**	**71**	**101**	**102**	**22**	**109**					
	400	490	680	180	160	150	35	155					
Total X	*400*	*490*	*680*	*180*	*160*	*150*	*35*	*155*					
XX Total	204	218	145	109	59	48	13	46					
XX %	51.0%	44.5%	21.3%	60.6%	36.9%	32.0%	37.1%	29.7%					

External Traffic Volume Growth Summary

External Location	ODOT Hwy #	Milepoint	2012	2013	2015	2034	2035	Average Yearly Growth	20 year growth factor (2030-2010)	20 Year Growth	5 Year Growth (20 year / 4)	20Year Growth	20 Year Growth Factor
99E	58	33.32	7,600		8064	11,000	11155	155	1.38	38%			**1.38**
99W	91	108.71		7,077	7336	9,800	9930	130	1.35	35%			**1.35**
99 (S)	91	115.28		14,869	15310	19,500	19721	221	1.29	29%			**1.27**
OR 36	229	51.49	3,800		3882	4,400	4427	27	1.14	14%			**1.14**
Average (applied to other external areas)													**1.29**

DATA FROM ODOT FUTURE VOLUME TABLE (2034)

Estimated based on straighline growth

2035 TRIP GENERATION

	IN	IN	IN	IN	IN	IN	IN	IN		OUT	OUT	OUT	OUT	OUT	OUT	OUT	OUT
TAZ	HH_SFDU trips	HH_MFDU trips	EMP_Government trips	EMP_Retail trips	EMP_Office trips	EMP_Other trips	EMP_Manufacturing trips	Total Trips		HH_SFDU trips	HH_MFDU trips	EMP_Government trips	EMP_Retail trips	EMP_Office trips	EMP_Other trips	EMP_Manufacturing trips	Total Trips
	0.47	0.40	0.79	0.70	0.05	0.70	0.09			0.28	0.22	0.85	0.90	0.26	0.90	0.33	
1	0	0	0	24	1	21	0	**47**		0	0	0	30	8	27	0	**65**
2	0	0	0	0	0	0	5	**5**		0	0	0	0	0	0	20	**20**
3	0	0	0	77	0	0	2	**79**		0	0	0	98	0	0	6	**104**
4	19	10	17	38	1	12	0	**98**		11	6	19	48	7	15	0	**107**
5	0	59	0	0	0	0	0	**59**		0	32	0	0	0	0	0	**32**
6	2	15	0	0	0	0	0	**17**		1	8	0	0	0	0	0	**9**
7	0	0	52	0	0	0	0	**52**		0	0	56	0	0	0	0	**56**
8	31	0	0	0	0	0	0	**31**		18	0	0	0	0	0	0	**18**
9	26	0	0	0	0	0	0	**26**		15	0	0	0	0	0	0	**15**
10	42	1	0	0	0	0	0	**43**		24	1	0	0	0	0	0	**25**
11	21	0	0	0	0	0	0	**21**		12	0	0	0	0	0	0	**12**
12	0	0	0	0	0	0	8	**8**		0	0	0	0	0	0	31	**31**
13	0	0	0	0	0	0	8	**8**		0	0	0	0	0	0	31	**31**
14	0	0	0	13	2	28	0	**43**		0	0	0	16	10	36	0	**62**
15	0	0	52	0	0	0	8	**61**		0	0	56	0	0	0	31	**88**
16	0	0	0	51	0	12	3	**66**		0	0	0	65	0	15	13	**93**
17	0	0	71	0	0	0	0	**71**		0	0	77	0	0	0	0	**77**
18	14	4	0	25	1	16	0	**60**		8	2	0	32	7	21	0	**70**
19	50	1	0	0	0	0	0	**51**		29	0	0	0	0	0	0	**30**
20	7	0	0	51	0	24	0	**81**		4	0	0	65	0	30	0	**99**
21	6	0	0	0	1	11	0	**18**		3	0	0	0	7	14	0	**25**
22	0	0	0	64	0	11	0	**75**		0	0	0	82	0	14	0	**96**
23	3	1	52	89	2	18	3	**168**		2	0	56	114	10	22	13	**218**
24	0	0	0	64	0	11	0	**75**		0	0	0	82	0	14	0	**96**
25	3	0	0	13	0	13	2	**30**		2	0	0	16	0	16	6	**40**
26	0	0	0	42	1	13	3	**60**		0	0	0	54	7	16	13	**90**
27	0	0	0	44	2	21	0	**67**		0	0	0	56	11	27	0	**93**
28	8	6	0	0	1	11	0	**27**		5	3	0	0	7	14	0	**29**
29	0	0	0	76	1	20	0	**96**		0	0	0	97	3	25	0	**125**
30	24	0	0	0	0	0	0	**24**		14	0	0	0	0	0	0	**14**
31	7	6	0	3	3	36	0	**54**		4	3	0	4	14	46	0	**71**
32	20	5	35	18	1	44	0	**123**		12	3	38	23	7	56	0	**139**
33	8	0	0	0	1	4	0	**12**		4	0	0	0	4	5	0	**13**
34	0	0	0	76	1	24	0	**101**		0	0	0	97	4	30	0	**131**
35	10	2	0	0	0	0	0	**12**		6	1	0	0	0	0	0	**7**
36	42	17	0	0	0	0	0	**59**		25	9	0	0	0	0	0	**34**
37	1	26	0	0	3	24	0	**54**		1	14	0	0	14	30	0	**59**
38	43	1	0	0	0	0	0	**44**		25	0	0	0	0	0	0	**26**
39	9	9	0	0	0	0	0	**18**		5	5	0	0	0	0	0	**10**
40	34	2	0	0	0	0	0	**37**		20	1	0	0	0	0	0	**22**
41	8	0	0	0	0	6	0	**13**		4	0	0	0	0	7	0	**12**
42	25	8	0	0	0	0	0	**34**		15	5	0	0	0	0	0	**19**
43	5	25	0	0	0	0	0	**30**		3	14	0	0	0	0	0	**16**
44	14	3	0	0	0	0	0	**17**		8	2	0	0	0	0	0	**10**
45	20	2	0	0	0	0	0	**22**		12	1	0	0	0	0	0	**13**
46	15	0	0	0	0	0	0	**15**		9	0	0	0	0	0	0	**9**
47	0	0	87	0	0	0	0	**87**		0	0	94	0	0	0	0	**94**
48	5	76	0	13	1	24	0	**118**		3	41	0	16	7	30	0	**97**
49	24	0	0	0	0	0	0	**24**		14	0	0	0	0	0	0	**14**
50	0	42	0	0	0	0	0	**42**		0	23	0	0	0	0	0	**23**
51	26	0	0	0	0	0	0	**26**		15	0	0	0	0	0	0	**15**
52	43	0	0	0	0	0	0	**43**		25	0	0	0	0	0	0	**25**
53	17	0	0	0	0	0	0	**17**		10	0	0	0	0	0	0	**10**
54	2	0	0	0	0	0	0	**2**		1	0	0	0	0	0	0	**1**
55	1	0	0	0	0	0	0	**1**		1	0	0	0	0	0	0	**1**
56	1	0	0	0	0	0	0	**1**		1	0	0	0	0	0	0	**1**
57	66	4	0	0	0	0	0	**70**		39	2	0	0	0	0	0	**41**
58	69	0	0	0	0	0	0	**69**		41	0	0	0	0	0	0	**41**
59	7	6	0	0	0	0	0	**13**		4	3	0	0	0	0	0	**7**
60	2	56	0	25	0	0	0	**84**		1	30	0	32	0	0	0	**64**
61	4	0	0	0	0	0	15	**20**		2	0	0	0	0	0	58	**60**
62	0	0	0	0	0	0	21	**21**		0	0	0	0	0	0	78	**78**
63	0	0	20	0	0	11	3	**35**		0	0	67	0	0	14	12	**94**
64	0	0	0	0	0	0	19	**19**		0	0	0	0	0	0	72	**72**
65	0	0	0	0	0	0	4	**4**		0	0	0	0	0	0	17	**17**
66	0	0	0	0	0	0	2	**2**		0	0	0	0	0	0	6	**6**
67	0	0	0	25	0	0	8	**33**		0	0	0	32	0	0	29	**61**
68	0	0	0	25	1	11	0	**37**		0	0	0	32	4	14	0	**50**
69	0	0	0	51	0	0	0	**51**		0	0	0	65	0	0	0	**65**
70	0	0	0	0	0	0	10	**10**		0	0	0	0	0	0	37	**37**
71	3	21	0	38	0	0	0	**62**		2	11	0	48	0	0	0	**61**
72	148	16	0	0	0	0	0	**164**		87	9	0	0	0	0	0	**96**
73	0	0	0	0	0	0	0	**0**		0	0	0	0	0	0	0	**0**
74	130	17	0	0	0	0	0	**148**		77	9	0	0	0	0	0	**86**
75	0	0	0	0	0	0	0	**0**		0	0	0	0	0	0	0	**0**
76	0	0	0	0	0	0	0	**0**		0	0	0	0	0	0	0	**0**
77	1	0	0	70	2	3	0	**77**		1	0	0	90	11	4	0	**105**
78	0	0	0	28	0	4	0	**33**		0	0	0	36	2	5	0	**43**
79	4	1	0	184	8	118	0	**315**		2	0	0	234	47	150	0	**434**
80	2	0	0	42	1	18	0	**64**		1	0	0	54	8	23	0	**86**
81	1	4	0	14	0	25	0	**44**		1	2	0	18	1	31	0	**53**
Total	1076	448	385	1283	35	594	126	**3948**		632	241	463	1633	201	756	472	**4399**
								3948									4399

Existing Year	2015
Future Analysis Year	2036
Model Base Year	2010
Model Future Year	2036

Link Identification			Existing	Raw Model		Raw Model	Annual	Base Model	Future Model Adj to	Diffrence	Growth	Percent	Select
Intersection	Approach		30 HV	Base		Future	Growth	Adj to 2015	2036	Method	Method	Differenct	Method
99 at Mill Iron	SB	Inflow	805	682	303	985	0.017	740	985	1050	1071	2%	1071
		Outflow	990	818	381	1199	0.018	891	1199	1298	1332	3%	1332
99 at Mill Iron	WB	Inflow	15	15	77	92	0.197	30	92	77	46	40%	77
		Outflow	15	15	63	78	0.162	27	78	66	43	35%	66
99 at Mill Iron	NB	Inflow	955	817	291	1108	0.014	873	1108	1190	1212	2%	1212
		Outflow	835	701	285	986	0.016	756	986	1065	1089	2%	1089
99 at Mill Iron	EB	Inflow	80	80	87	167	0.042	97	167	150	138	8%	138
		Outflow	15	15	29	44	0.074	21	44	38	32	17%	38
99 at 36	SB	Inflow	855	889	393	1282	0.017	965	1282	1172	1136	3%	1136
		Outflow	1075	1050	563	1613	0.021	1158	1613	1530	1497	2%	1497
99 at 36	WB	Inflow	160	116	325	441	0.108	179	441	423	395	6%	395
		Outflow	225	174	273	447	0.060	227	447	446	444	0%	444
99 at 36	NB	Inflow	980	819	381	1200	0.018	892	1200	1288	1318	2%	1318
		Outflow	780	693	303	996	0.017	751	996	1025	1034	1%	1034
99 at 36	EB	Inflow	210	216	80	296	0.014	231	296	275	269	2%	269
		Outflow	125	145	40	185	0.011	153	185	157	151	4%	151
99 at prairie	SB	Inflow	830	865	341	1206	0.015	931	1206	1105	1076	3%	1076
		Outflow	1050	1015	521	1536	0.020	1115	1536	1471	1446	2%	1446
99 at prairie	WB	Inflow	10	10	55	65	0.212	21	65	54	32	42%	54
		Outflow	20	20	58	78	0.112	31	78	67	50	25%	67
99 at prairie	NB	Inflow	1060	1008	562	1570	0.021	1116	1570	1514	1491	2%	1491
		Outflow	830	863	379	1242	0.017	936	1242	1136	1101	3%	1101
99 at prairie	EB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
99 at 1st	SB	Inflow	805	982	316	1298	0.012	1043	1298	1060	1002	5%	1002
		Outflow	1035	1074	425	1499	0.015	1156	1499	1378	1342	3%	1342
99 at 1st	WB	Inflow	260	250	71	321	0.011	264	321	317	317	0%	317
		Outflow	340	351	105	456	0.012	371	456	425	418	2%	418
99 at 1st	NB	Inflow	1020	1091	506	1597	0.018	1188	1597	1429	1371	4%	1371
		Outflow	810	953	342	1295	0.014	1019	1295	1086	1030	5%	1030
99 at 1st	EB	Inflow	295	295	88	383	0.011	312	383	366	362	1%	362
		Outflow	195	215		215	0.000	215	215	195	195	0%	195
1st at Prairie	SB	Inflow	50	57	14	71	0.009	60	71	61	59	3%	59
		Outflow	75	53	18	71	0.013	56	71	90	94	5%	94
1st at Prairie	WB	Inflow	195	191	63	254	0.013	203	254	246	244	1%	244
		Outflow	255	275	101	376	0.014	294	376	337	326	3%	326
1st at Prairie	NB	Inflow	90	57	56	113	0.038	68	113	135	150	10%	150
		Outflow	85	99	37	136	0.014	106	136	115	109	5%	109
1st at Prairie	EB	Inflow	345	327	102	429	0.012	347	429	427	427	0%	427
		Outflow	265	206	78	284	0.015	221	284	328	341	4%	341
High Pass at Oaklea	SB	Inflow	120	108	104	212	0.037	128	212	204	199	3%	199
		Outflow	145	120	166	286	0.053	152	286	279	273	2%	273
High Pass at Oaklea	WB	Inflow	95	130	26	156	0.008	135	156	116	110	5%	110
		Outflow	155	155	55	210	0.014	166	210	199	197	1%	197
High Pass at Oaklea	NB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
High Pass at Oaklea	EB	Inflow	185	200	192	392	0.037	237	392	340	306	10%	306
		Outflow	100	164	101	265	0.024	183	265	182	144	20%	182
1st at Birch	SB	Inflow	45	35	17	52	0.019	38	52	59	61	4%	61
		Outflow	45	50	16	66	0.012	53	66	58	56	3%	56
1st at Birch	WB	Inflow	160	193	78	271	0.016	208	271	223	208	7%	208
		Outflow	155	161	65	226	0.016	174	226	208	202	3%	202
1st at Birch	NB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							

99 at Mill Iron		
	inflow	outflow
SB	1071	1332
WB	77	66
NB	1212	1089
EB	138	38
Total	2499	2525
Balanced	13	-13
SB	1077	1325
WB	78	66
NB	1219	1084
EB	139	38
Total	2512	2512

99 at 36		
	inflow	outflow
SB	1136	1497
WB	395	444
NB	1318	1034
EB	269	151
Total	3118	3127
Balanced	4	-4
SB	1138	1495
WB	396	443
NB	1320	1033
EB	269	151
Total	3122	3122

99 at prairie		
	inflow	outflow
SB	1076	1446
WB	54	67
EB	1491	1101
Total	2621	2615
Balanced	-3	3
SB	1074	1448
WB	54	67
EB	1489	1103
Total	2618	2618

99 at 1st		
	inflow	outflow
SB	1002	1342
WB	317	418
NB	1371	1030
EB	362	195
Total	3052	2985
Balanced	-33	33
SB	991	1357
WB	313	422
NB	1356	1041
EB	358	197
Total	3018	3018

1st at Prairie		
	inflow	outflow
SB	59	94
WB	244	326
NB	150	109
EB	427	341
Total	880	869
Balanced	-5	5
SB	59	95
WB	242	328
NB	149	110
EB	424	343
Total	875	875

High Pass at Oaklea		
	inflow	outflow
SB	199	273
WB	110	197
NB	0	0
EB	306	182
Total	615	651
Balanced	18	-18
SB	205	265
WB	113	191
NB	0	0
EB	315	176
Total	633	633

1st at Birch		
	inflow	outflow
SB	61	56
WB	208	202
NB	0	0
EB	205	221
Total	474	478
Balanced	2	-2
SB	61	56
WB	209	201
NB	0	0
EB	205	220
Total	476	476

1st at Birch	EB	Inflow	165	41	49	90	0.046	50	90	205	295	31%	205
		Outflow	170	159	63	222	0.015	171	222	221	221	0%	221
Oaklea at 6th	SB	Inflow	100	119	126	245	0.041	143	245	202	171	15%	202
		Outflow	160	118	186	304	0.061	154	304	310	316	2%	316
Oaklea at 6th	WB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
Oaklea at 6th	NB	Inflow	145	121	166	287	0.053	153	287	279	272	2%	272
		Outflow	110	112	104	216	0.036	132	216	194	180	7%	180
Oaklea at 6th	EB	Inflow	55	13	32	45	0.095	19	45	81	129	37%	81
		Outflow	30	23	35	58	0.059	30	58	58	59	0%	59
Oaklea at 10th	SB	Inflow	90	111	101	212	0.035	130	212	172	146	15%	172
		Outflow	130	95	155	250	0.063	125	250	255	260	2%	260
Oaklea at 10th	WB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
Oaklea at 10th	EB	Inflow	160	117	150	267	0.049	146	267	281	293	4%	293
		Outflow	95	119	136	255	0.044	145	255	205	167	19%	205
Oaklea at 10th	EB	Inflow	40	26	74	100	0.109	40	100	100	99	0%	99
		Outflow	65	40	34	74	0.033	47	74	92	103	11%	92
Oaklea at 18th	SB	Inflow	55	75	62	137	0.032	87	137	105	87	18%	105
		Outflow	60	42	27	69	0.025	47	69	82	88	7%	88
Oaklea at 18th	WB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
Oaklea at 18th	NB	Inflow	80	72	51	123	0.027	82	123	121	120	1%	120
		Outflow	95	106	75	181	0.027	120	181	156	143	8%	143
Oaklea at 18th	EB	Inflow	75	47	24	71	0.020	52	71	94	103	9%	103
		Outflow	55	46	35	81	0.029	53	81	83	84	1%	84
99 at 6th	SB	Inflow	745	934	306	1240	0.013	993	1240	992	930	6%	930
		Outflow	1030	1039	367	1406	0.014	1110	1406	1326	1305	2%	1305
99 at 6th	WB	Inflow	95	127	11	138	0.003	129	138	104	102	2%	102
		Outflow	70	133	68	201	0.020	146	201	125	96	23%	125
99 at 6th	NB	Inflow	1020	1056	416	1472	0.015	1136	1472	1356	1322	3%	1322
		Outflow	810	972	301	1273	0.012	1030	1273	1053	1001	5%	1001
99 at 6th	EB	Inflow	210	253	26	279	0.004	258	279	231	227	2%	227
		Outflow	160	227	23	250	0.004	231	250	179	173	3%	173
99 at 10th	SB	Inflow	660	891	324	1215	0.014	953	1215	922	841	9%	841
		Outflow	920	826	330	1156	0.015	889	1156	1187	1196	1%	1196
99 at 10th	WB	Inflow	120	105	22	127	0.008	109	127	138	140	1%	140
		Outflow	105	179	94	273	0.020	197	273	181	145	20%	181
99 at 10th	NB	Inflow	885	920	355	1275	0.015	988	1275	1172	1142	3%	1142
		Outflow	680	936	299	1235	0.012	994	1235	922	845	8%	845
99 at 10th	EB	Inflow	155	117	42	159	0.014	125	159	189	197	4%	197
		Outflow	115	91	20	111	0.008	95	111	131	135	3%	135
99 at 99	SB	Inflow	520	435	138	573	0.012	462	573	631	646	2%	646
		Outflow	570	494	202	696	0.016	533	696	733	745	2%	745
99 at 99	WB	Inflow	400	328	162	490	0.019	359	490	531	546	3%	546
		Outflow	365	395	113	508	0.011	417	508	456	445	2%	445
99 at 99	EB	Inflow	765	692	288	980	0.016	747	980	998	1003	1%	1003
		Outflow	715	594	279	873	0.018	648	873	940	964	2%	964
99 at 99	EB	Inflow	60	49	12	61	0.009	51	61	70	71	2%	71
		Outflow	95	21	6	27	0.011	22	27	100	116	14%	100
Highpass at Pitney	SB	Inflow	0	0	0	0							
		Outflow	0	0	0	0							
Highpass at Pitney	WB	Inflow	100	167	108	275	0.025	188	275	187	146	22%	187
		Outflow	185	206	177	383	0.033	240	383	328	295	10%	295
Highpass at Pitney	NB	Inflow	25	32	86	118	0.103	49	118	94	61	36%	94
		Outflow	30	43	50	93	0.045	53	93	70	53	25%	70
Highpass at Pitney	EB	Inflow	190	210	107	317	0.020	231	317	276	261	6%	261
		Outflow	100	159	70	229	0.017	172	229	157	133	15%	157

Oaklea at 6th		
	inflow	outflow
SB	202	316
WB	0	0
NB	272	180
EB	81	59
Total	555	555
Balanced	0	0
SB	202	316
WB	0	0
NB	272	180
EB	81	59
Total	555	555

Oaklea at 10th		
	inflow	outflow
SB	172	260
WB	0	0
NB	293	205
EB	99	92
Total	564	558
Balanced	-3	3
SB	171	262
WB	0	0
NB	291	206
EB	99	93
Total	561	561

Oaklea at 18th		
	inflow	outflow
SB	105	88
WB	0	0
NB	120	143
EB	103	84
Total	329	315
Balanced	-7	7
SB	103	90
WB	0	0
NB	118	146
EB	101	86
Total	322	322

99 at 6th		
	inflow	outflow
SB	930	1305
WB	102	125
NB	1322	1001
EB	227	173
Total	2581	2604
Balanced	12	-12
SB	935	1299
WB	102	124
NB	1328	997
EB	228	172
Total	2592	2592

99 at 6th		
	inflow	outflow
SB	930	1305
WB	102	125
NB	1322	1001
EB	227	173
Total	2581	2604
Balanced	12	-12
SB	935	1299
WB	102	124
NB	1328	997
EB	228	172
Total	2592	2592

99 at 10th		
	inflow	outflow
SB	841	1196
WB	140	181
NB	1142	845
EB	197	135
Total	2320	2356
Balanced	18	-18
SB	848	1186
WB	141	180
NB	1151	839
EB	199	134
Total	2338	2338

99 at 99		
	inflow	outflow
SB	646	745
WB	546	445
NB	1003	964
EB	71	100
Total	2266	2253
Balanced	-6	6
SB	644	747
WB	544	446
NB	1000	966
EB	71	100
Total	2259	2259

Highpass at Pitney		
	inflow	outflow
SB	0	0
WB	187	295
NB	94	70
EB	261	157
Total	543	522
Balanced	-10	10
SB	0	0
WB	184	301
NB	93	72
EB	256	160
Total	533	533

APPENDIX E:

Future Transportation Needs Memorandum

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FUTURE TRANSPORTATION NEEDS-UPDATE

TO: Junction City TSP Project Management Team

FROM: Kelly Sandow P.E. Sandow Engineering

DATE: March 1, 2016

RE: Junction City TSP Update
Future Transportation Needs Review -2016 Update

The following describes how Junction City's transportation system needs will change through the planning horizon year of 2036. The discussion begins with an analysis of how projected growth in housing and employment will affect transportation patterns and concludes with an evaluation of the transportation system's ability to serve these new demands. The findings from this chapter will inform the development of transportation system solutions to be included in the TSP.

FUTURE LAND USE

Land use is a key factor affecting the demands placed on Junction City's transportation system. The location, density, type, and mixture of land uses have a direct impact on traffic levels and travel patterns. Housing and employment estimates for Junction City were obtained from several sources including the Lane County coordinated population forecasts for the Junction City urban growth boundary (UGB) 2015-2065, the Comprehensive Plan Housing Element, and Economic Opportunities Analysis. Land use totals for the Junction City UGB are identified in Table 1.

TABLE 1: Land Use Totals (UGB)

Year	Households	Employment
2015	2,704	3,545
2036*	3,545	5,682
Growth (2036-2015)	1,218	2,137

*2036 UGB includes Comprehensive Plan expansion areas.

The land use totals identified in Table 1 were allocated within the UGB based on an inventory of existing uses, expected build-out of vacant or underdeveloped lands, and Comprehensive Plan

zoning. To facilitate the process of distributing land use growth, groups of tax lots were combined into Transportation Analysis Zones (TAZs). Growth by TAZ in terms of households and employment are depicted in Figure 1 and Figure 2, respectively. Detailed land use data by TAZ was previously documented in Technical Memorandum #3 (See Appendix D).

Household growth by TAZ, projected through the year 2036, is shown in Figure 1. The majority of household growth is expected to occur on the west side of OR 99. Areas with the most expected household growth (where growth exceeds one hundred households per TAZ) are west of Oaklea Drive, and southeast of Oaklea Drive/W 18th Avenue. The areas of growth reflect proposed Comprehensive Plan changes, which increased the amount of medium density residential land designations, and re-designated low density residential and professional/technical districts to higher density residential land.

Figure 2 shows expected employment growth by TAZ. Most employment growth is expected to occur in the southern portion of Junction City, along OR 99 south of OR 36.

FUTURE TRAFFIC VOLUMES

Design hour (weekday p.m. peak hour) traffic volumes for the year 2036 were developed using a combination of the local housing and employment growth along with growth in regional through trips. The volumes were estimated using a travel forecasting tool developed specifically for Junction City that converts land uses into motor vehicle trips. These trips are routed through the roadway network; taking into consideration speeds, intersection controls, and delay caused by congestion. This traffic forecasting methodology was reviewed and approved by representatives from Junction City, Lane County, and ODOT. The detailed methodology, assumptions, and development process of the travel forecasting tool is described in Technical Memorandum #3, with is included in Appendix D.

The 2036 design hour intersection traffic volumes are shown in Figure 3. Most of the growth in traffic volumes occurs along OR 99 and other key arterial routes such as High Pass Road, Oaklea Drive, and 18th Avenue. Pitney Lane, OR 36, and Prairie Road will also experience moderate levels of traffic growth due the relationship between residential growth on the west side of the city and employment opportunities at the south end of the city and in Eugene. Planning for street extensions to serve areas of future development will be an important element of the TSP.

FUTURE TRAFFIC OPERATIONS

The 2036 design hour traffic volumes were analyzed at the study intersections, with the results compared to applicable mobility targets/standards, as identified in Chapter 3. The results of the traffic analysis are shown in Table 2 and detailed analysis worksheets can be found in the Appendix.

As shown below, while traffic volumes and congestion will increase citywide, nearly all study intersections will continue to meet mobility standards.

TABLE 2: Future (2036) Weekday PM Peak Hour Intersection Operations

Intersection (North-South / East-West)	**Jurisdiction**	**Mobility Target**	**Intersection Performance**	
			LOS	*V/C*
Oaklea Dr. / 18th Ave.	Lane County	0.95 V/C or LOS D	B	0.15
Oaklea Dr. / 10th Ave.	Lane County/ Junction City	0.95 V/C or LOS D	B	0.25
Oaklea Dr. / 6th Ave.	Lane County	0.95 V/C or LOS D	B	0.27
Oaklea Dr. / 1st Ave. – High Pass Rd.	Lane County	0.95 V/C or LOS D	B	0.37
Pitney Ln. / 1st Ave. – High Pass Rd.	Lane County	0.95 V/C or LOS D	B	0.18
Prairie Rd.-Maple St. / 1st Ave.-High Pass Rd.	Junction City/ Lane County	0.95 V/C or LOS D	C	0.28
OR 99E / OR 99W	ODOT	0.85 V/C	**B**	0.64
OR 99 / 10th Ave.	ODOT	0.90 V/C	B	0.65
OR 99 / 6th Ave.	ODOT	0.90 V/C	B	0.67
OR 99 / 1st Ave.	ODOT	0.90 V/C	C	0.79
Birch St. / 1st Ave. – River Rd.	Junction City/ Lane County	0.95 V/C or LOS D	B	0.09
OR 99 / Prairie Rd.	ODOT	0.90 V/C*	C	0.22
OR 99 / OR 36	ODOT	0.80 V/C	B	0.79
OR 99 / Milliron Rd	ODOT	0.80 V/C	B	0.56

Signalized Intersection:
Delay = Average Intersection Delay (sec.)
LOS = Level of Service
V/C = Volume to Capacity Ratio
Shaded values do not meet standards

Unsignalized Intersection:
Delay = Critical Movement Approach Delay (sec.)
LOS = Major Street LOS / Minor Street LOS
V/C = Critical Movement Volume to Capacity Ratio
Note: LOS for all-way stop intersections reported for entire intersection
* Mobility target shown is for stopped minor street approaches

Another issue that may affect traffic operations and safety in the future is the manner in which property access is taken from OR 99 south of 1st Avenue where posted speeds are 45 mph or higher. Between 1st Avenue and Prairie Road, there are a number of existing commercial

businesses with closely spaced driveways that create the potential for confusion and conflicting turns. In addition, the recent UGB expansion has created a number of individual commercial lots between OR 36 and Milliron Road that have no means of access other than directly to OR 99. As transportation solutions are considered for the TSP, a plan for establishing access to these properties that lessens the potential for conflicts should be explored. This could include strategies such as providing access from new roads in front of or behind the properties (which may be difficult due to shallow properties and challenges with phased construction) or establishing shared access points to reduce the overall number of conflict areas. Roads or driveways that access OR 99 should be designed to be visible from a distance and spaced far enough apart to avoid potentially unsafe conflicts.

FUTURE BICYCLE, PEDESTRIAN, AND TRANSIT NEEDS

For the assessment of future transportation needs, it is assumed that no improvements are made to existing conditions. Therefore, the needs identified under existing conditions would generally continue to be needed in the future. However, with new areas of development within the urban growth boundary and increased traffic volumes on the street network, some new issues would emerge.

For bicycles and pedestrians, the need to infill existing gaps and improve street crossing opportunities will continue to exist. The Junction City Parks, Open Space, and Trails Master Plan includes proposed future off-street trails and on-street bike routes that should be considered for inclusion in the TSP. Future street extensions into areas of new development would include sidewalks and appropriate bicycle facilities, but improvements along key existing routes will be critical for completing connections to activity generators.

Projected motor vehicle traffic increases on OR 99, Prairie Road, High Pass Road, Oaklea Drive, and 18th Avenue will elevate the importance of separate walking and cycling facilities (i.e., separate from the auto travel lanes, which could include sidewalk and bike lanes). The need for safe crossing opportunities will also be heightened. Crossing treatments that improve pedestrian visibility and driver awareness will be considered to improve safety for all modes of travel. In addition, safety education programs should be used to encourage safe crossings on routes to schools.

New areas of development within the city may also change demands for transit services. In addition to the increased potential demand for paratransit and ridesharing services, new demand for the fixed Route 95 line could drive a need for increased frequency of service or changes in the route alignment to enhance accessibility.

FUTURE FUNDING AVAILABILITY

Projecting the revenue anticipated to be available for future capital projects helps to provide an understanding of the city's capacity for constructing the transportation improvement projects to support growth. Future estimates for Junction City's transportation funding through the year 2036 are summarized in Table 3. These projections include estimated resources available based on the amount of revenue collected in the past from current funding sources and assumptions for growth in land development through the planning horizon. Estimated expenditures are based on historical data of costs associated with maintaining the existing transportation system. These expenditures are subtracted from the total estimated revenues to calculate the net balance available for capital improvement projects. As shown, the city may have approximately $2.4 million available for capital improvements through 2036. It should be noted that this does not include any one-time or project-specific funding grants or other non-routine sources of revenue from other jurisdictions.

TABLE 3: Estimate of Funding Availability Through 2036

RESOURCES	Annual Average	20 Year Total
OR Gas Tax - Bike Component	$2,300	$46,000
OR Gas Tax - Streets Component	$220,700	$4,414,000
Sidewalk Permits	$2,560	$51,200
System Development Fees	$120,800	$2,416,000
Fund Balance (Current Existing)	NA	$1,178,000
		$8,105,200

EXPENDITURES	Annual Average	20 Year Total
Personnel (Wages, Benefits, Etc.)	$164,700	$3,294,000
Equipment, Materials, & Services	$125,200	$2,504,000
Street Maintenance & Repairs	$8,200	$164,000
		$5,962,000

Available Balance for Capital Improvement Projects	**$2,143,200**

SUMMARY OF KEY FINDINGS

Based on the evaluation of future conditions through the year 2036, the following key findings were identified for consideration during the development of transportation solutions for the city. This list is intended to supplement, not replace, the summary of findings for existing conditions (see Chapter 3).

PEDESTRIAN

- Improving existing pedestrian facility gaps and crossings on key routes will be critical for connecting future growth areas in the west and south to activity generators within the city.

- Separate walking facilities will be needed on higher volume streets such as OR 99, Prairie Road, High Pass Road, Oaklea Drive, and 18th Avenue.

- Future street extensions into new growth areas must include continuous sidewalks.

BICYCLE

- Improving existing bicycle facility gaps and crossings on key routes will be critical for connecting future growth areas in the west and south to activity generators within the city.

- Separate cycling facilities (which could include bike lanes) will be needed on higher volume streets such as OR 99, Prairie Road, High Pass Road, Oaklea Drive, and 18th Avenue.

- Future street extensions into new growth areas must include appropriate accommodations for cycling. For new arterial and collector streets, construction of bike lanes is required by both the state and county.

TRANSIT

- As future development occurs, the need to increase transit services or modify routes must be monitored. Funding for enhanced services should be considered during the development of solutions for the TSP.

MOTOR VEHICLE

- Street extensions will be needed to serve new areas of development, providing a framework of arterial and collector roadways.

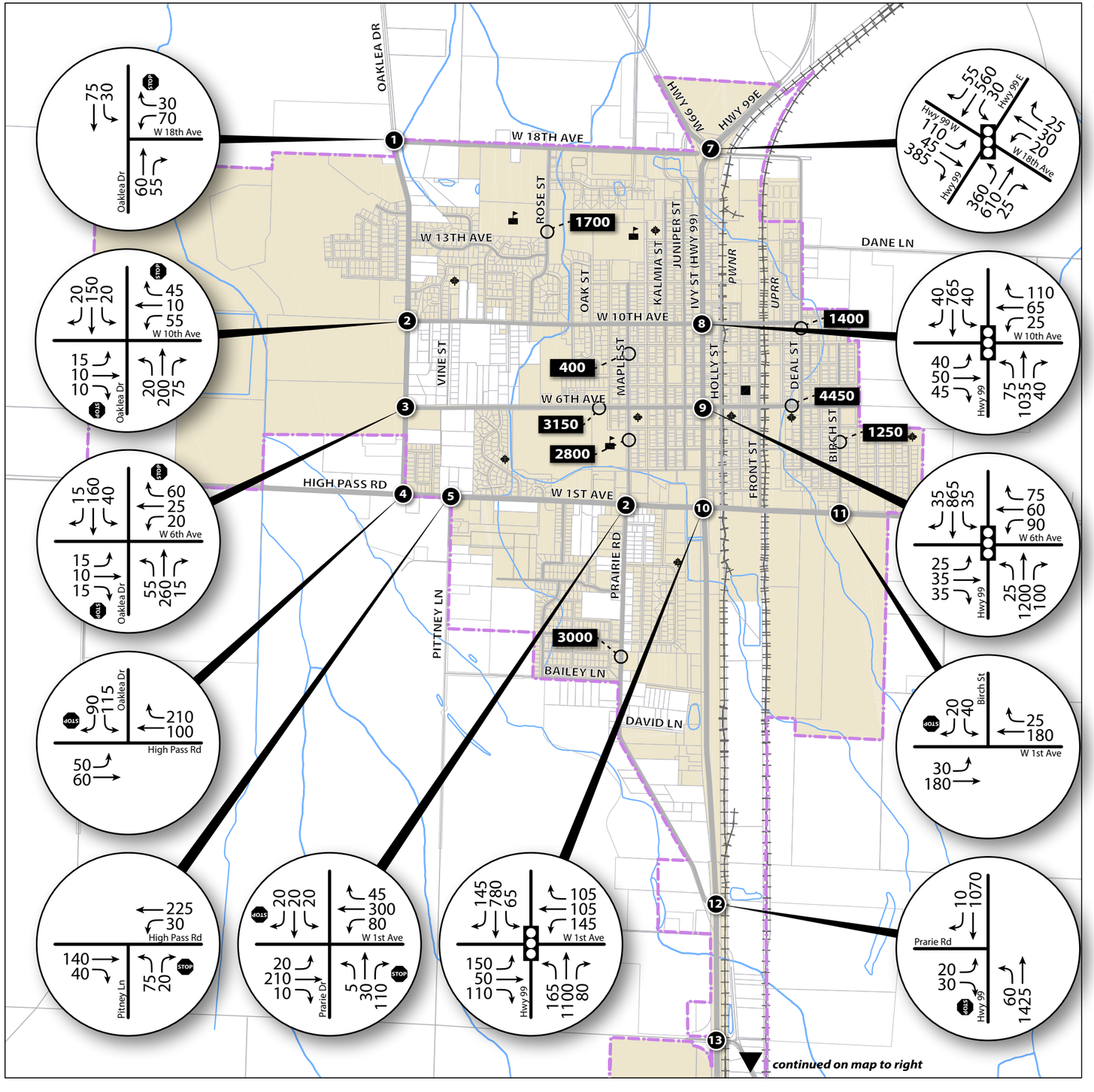
- Maintaining safe access to highway adjacent properties on OR 99 south of 1st Avenue may become more challenging in the future as traffic volumes increase.

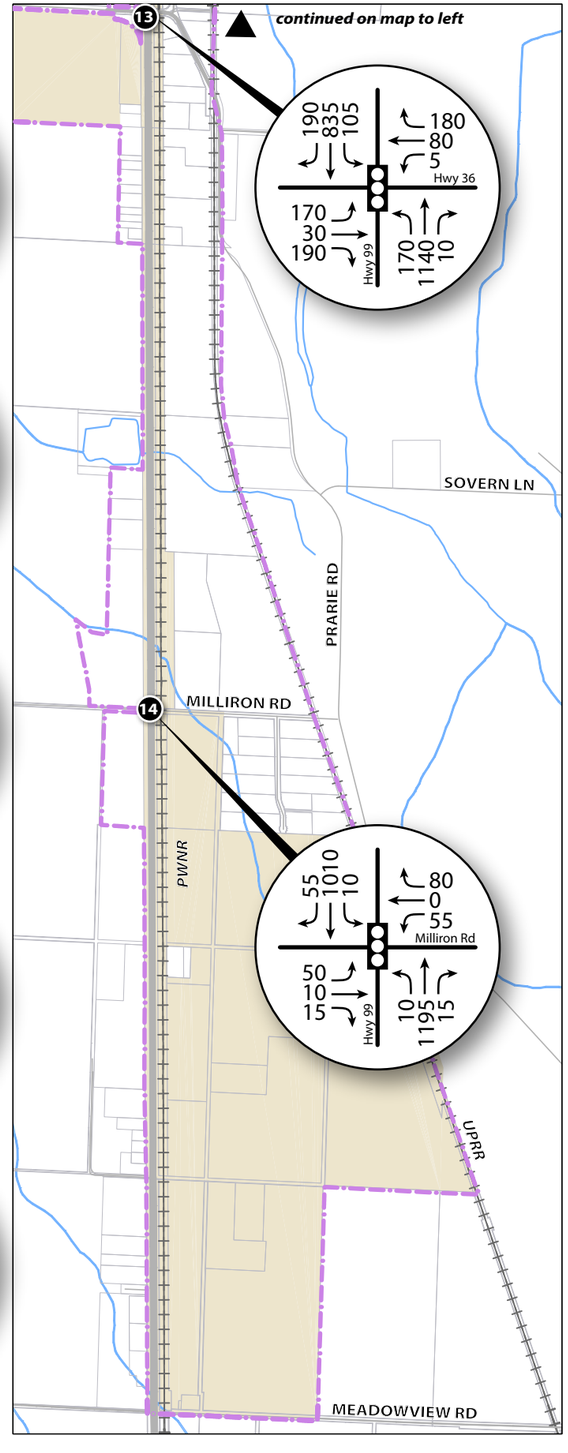
Intersection Evaluation Worksheets

Junction City
Transportation System Plan

FIGURE 3

2035 Future
PM Peak Hour
Traffic Volumes





Legend

- STUDY INTERSECTION

Roadways

- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

Traffic Volume Data

- STOP SIGN
- TRAFFIC SIGNAL
- 000 — PM PEAK HOUR TRAFFIC VOLUME
- 000 — WEEKDAY AVERAGE DAILY TRAFFIC

Places of Interest

- CITY HALL
- PARK
- PUBLIC SCHOOL

N W E S

0 1000 2000 Feet

Intersection	
Intersection Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	70	30	60	55	30	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	5	0	0	0	3
Mvmt Flow	82	35	71	65	35	88

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	262	103	0	0	135	0
Stage 1	103	-	-	-	-	-
Stage 2	159	-	-	-	-	-
Follow-up Headway	4	3	-	-	2	-
Pot Capacity-1 Maneuver	727	944	-	-	1462	-
Stage 1	921	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Time blocked-Platoon, %			-	-		-
Mov Capacity-1 Maneuver	709	944	-	-	1462	-
Mov Capacity-2 Maneuver	709	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	848	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	2

Minor Lane / Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	766	1462	-
HCM Lane V/C Ratio	-	-	0.154	0.024	-
HCM Control Delay (s)	-	-	10.6	7.523	0
HCM Lane LOS			B	A	A
HCM 95th %tile Q(veh)	-	-	0.541	0.074	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	10	10	55	10	45	20	200	75	20	150	20
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	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	2	2	2	0	2	0	2	0	0	0	1	2
Mvmt Flow	17	12	12	64	12	52	23	233	87	23	174	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	588	599	186	567	567	276	198	0	0	320	0	0
Stage 1	233	233	-	323	323	-	-	-	-	-	-	-
Stage 2	355	366	-	244	244	-	-	-	-	-	-	-
Follow-up Headway	4	4	3	4	4	3	2	-	-	2	-	-
Pot Capacity-1 Maneuver	421	415	856	437	433	768	1375	-	-	1251	-	-
Stage 1	770	712	-	693	650	-	-	-	-	-	-	-
Stage 2	662	623	-	764	704	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-		-	-
Mov Capacity-1 Maneuver	372	398	856	408	415	768	1375	-	-	1251	-	-
Mov Capacity-2 Maneuver	372	398	-	408	415	-	-	-	-	-	-	-
Stage 1	754	697	-	678	636	-	-	-	-	-	-	-
Stage 2	593	610	-	725	689	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14	14	0	1

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1375	-	-	454	506	1251	-	-
HCM Lane V/C Ratio	0.017	-	-	0.09	0.253	0.019	-	-
HCM Control Delay (s)	7.663	0	-	13.7	14.5	7.932	0	-
HCM Lane LOS	A	A		B	B	A	A	
HCM 95th %tile Q(veh)	0.052	-	-	0.294	0.994	0.057	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	10	15	20	25	60	55	260	15	40	160	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	1	1	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	85	85	85	85	85	85	85	85	85	85	85	92
Heavy Vehicles, %	2	2	2	0	2	0	2	0	0	0	1	2
Mvmt Flow	18	12	18	24	29	71	65	306	18	47	188	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	785	744	197	749	743	316	205	0	0	324	0	0
Stage 1	291	291	-	444	444	-	-	-	-	-	-	-
Stage 2	494	453	-	305	299	-	-	-	-	-	-	-
Follow-up Headway	4	4	3	4	4	3	2	-	-	2	-	-
Pot Capacity-1 Maneuver	310	343	844	331	343	729	1366	-	-	1247	-	-
Stage 1	717	672	-	597	575	-	-	-	-	-	-	-
Stage 2	557	570	-	709	666	-	-	-	-	-	-	-
Time blocked-Platoon, %								-	-		-	-
Mov Capacity-1 Maneuver	240	309	843	291	309	728	1365	-	-	1246	-	-
Mov Capacity-2 Maneuver	240	309	-	291	309	-	-	-	-	-	-	-
Stage 1	675	643	-	562	542	-	-	-	-	-	-	-
Stage 2	448	537	-	652	637	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17	16	1	2

Minor Lane / Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1365	-	-	355	452	1246	-	-
HCM Lane V/C Ratio	0.047	-	-	0.133	0.273	0.038	-	-
HCM Control Delay (s)	7.769	0	-	16.7	15.9	8.003	0	-
HCM Lane LOS	A	A		C	C	A	A	
HCM 95th %tile Q(veh)	0.149	-	-	0.453	1.099	0.118	-	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	5.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	50	60	100	210	115	90
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	0	1	1	2	0	0
Mvmt Flow	59	71	118	247	135	106

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	365	0	-	0	429	241
Stage 1	-	-	-	-	241	-
Stage 2	-	-	-	-	188	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1205	-	-	-	587	803
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	849	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1205	-	-	-	557	803
Mov Capacity-2 Maneuver	-	-	-	-	557	-
Stage 1	-	-	-	-	804	-
Stage 2	-	-	-	-	806	-

Approach	EB	WB	SB
HCM Control Delay, s	4	0	14

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1205	-	-	-	644
HCM Lane V/C Ratio	0.049	-	-	-	0.374
HCM Control Delay (s)	8.141	0	-	-	13.9
HCM Lane LOS	A	A			B
HCM 95th %tile Q(veh)	0.154	-	-	-	1.736

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	140	40	30	225	75	20
Conflicting Peds, #/hr	0	1	1	0	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	1	0	0	1	0	0
Mvmt Flow	152	43	33	245	82	22

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	198	0	486	177
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	310	-
Follow-up Headway	-	-	2	-	4	3
Pot Capacity-1 Maneuver	-	-	1387	-	544	871
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	748	-
Time blocked-Platoon, %	-	-		-		
Mov Capacity-1 Maneuver	-	-	1386	-	527	869
Mov Capacity-2 Maneuver	-	-	-	-	527	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	726	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1	13

Minor Lane / Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	575	-	-	1386	-
HCM Lane V/C Ratio	0.18	-	-	0.024	-
HCM Control Delay (s)	12.6	-	-	7.66	0
HCM Lane LOS	B			A	A
HCM 95th %tile Q(veh)	0.65	-	-	0.072	-

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	20	210	10	80	300	45	5	30	110	20	20	20
Conflicting Peds, #/hr	2	0	1	1	0	2	0	0	7	7	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	2	1	0	0	0	0	0	0	0
Mvmt Flow	21	221	11	84	316	47	5	32	116	21	21	21

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	370	0	0	239	0	0	811	814	235	864	796	348
Stage 1	-	-	-	-	-	-	275	275	-	515	515	-
Stage 2	-	-	-	-	-	-	536	539	-	349	281	-
Follow-up Headway	2	-	-	2	-	-	4	4	3	4	4	3
Pot Capacity-1 Maneuver	1200	-	-	1328	-	-	300	315	809	277	322	700
Stage 1	-	-	-	-	-	-	736	686	-	546	538	-
Stage 2	-	-	-	-	-	-	532	525	-	671	682	-
Time blocked-Platoon, %		-	-		-	-						
Mov Capacity-1 Maneuver	1198	-	-	1326	-	-	252	281	803	199	287	695
Mov Capacity-2 Maneuver	-	-	-	-	-	-	252	281	-	199	287	-
Stage 1	-	-	-	-	-	-	717	668	-	532	492	-
Stage 2	-	-	-	-	-	-	454	480	-	535	664	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	2	14	20

Minor Lane / Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	550	1198	-	-	1326	-	-	302
HCM Lane V/C Ratio	0.278	0.018	-	-	0.064	-	-	0.209
HCM Control Delay (s)	14	8.059	0	-	7.899	0	-	20
HCM Lane LOS	B	A	A		A	A		C
HCM 95th %tile Q(veh)	1.127	0.054	-	-	0.203	-	-	0.773

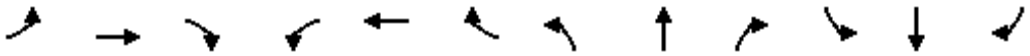
Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (vph)	110	45	385	20	30	25	360	610	25	30	560	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0		3.5	4.0		3.5	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00		1.00		1.00	0.95		1.00	0.95	1.00
Frt	1.00	1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1614	1750	1417		1612		1614	3183		1599	3228	1365
Flt Permitted	0.77	1.00	1.00		0.93		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1305	1750	1417		1525		1614	3183		1599	3228	1365
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	116	47	405	21	32	26	379	642	26	32	589	58
RTOR Reduction (vph)	0	0	33	0	20	0	0	3	0	0	0	40
Lane Group Flow (vph)	116	47	372	0	59	0	379	665	0	32	589	18
Heavy Vehicles (%)	3%	0%	5%	9%	0%	0%	3%	4%	0%	4%	3%	9%
Turn Type	Perm	NA	pt+ov	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		8	8 1		4		1	6		5	2	
Permitted Phases	8	8		4								2
Actuated Green, G (s)	17.1	17.1	41.5		17.1		20.4	39.8		2.2	21.6	21.6
Effective Green, g (s)	17.1	17.1	41.5		17.1		20.4	39.8		2.2	21.6	21.6
Actuated g/C Ratio	0.24	0.24	0.59		0.24		0.29	0.56		0.03	0.31	0.31
Clearance Time (s)	4.0	4.0			4.0		3.5	4.0		3.5	4.0	4.0
Vehicle Extension (s)	2.5	2.5			2.5		2.5	4.6		2.5	4.6	4.6
Lane Grp Cap (vph)	316	423	832		369		466	1794		49	987	417
v/s Ratio Prot		0.03	c0.26				c0.23	0.21		0.02	c0.18	
v/s Ratio Perm	0.09				0.04							0.01
v/c Ratio	0.37	0.11	0.45		0.16		0.81	0.37		0.65	0.60	0.04
Uniform Delay, d1	22.2	20.8	8.1		21.1		23.3	8.5		33.8	20.8	17.2
Progression Factor	1.00	1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.3		0.1		10.2	0.2		24.5	1.3	0.1
Delay (s)	22.8	20.9	8.4		21.2		33.5	8.7		58.3	22.1	17.3
Level of Service	C	C	A		C		C	A		E	C	B
Approach Delay (s)		12.4			21.2			17.7			23.4	
Approach LOS		B			C			B			C	

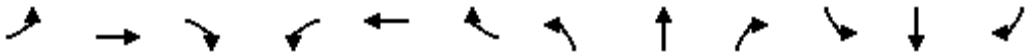
Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.6	Sum of lost time (s)	11.5
Intersection Capacity Utilization	61.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	50	45	25	65	110	75	1035	40	40	765	40
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.93			0.99			0.99	
Flt Protected		0.99			0.99			1.00			1.00	
Satd. Flow (prot)		1632			1583			3206			3203	
Flt Permitted		0.75			0.96			0.82			0.85	
Satd. Flow (perm)		1240			1525			2635			2719	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	54	49	27	71	120	82	1125	43	43	832	43
RTOR Reduction (vph)	0	31	0	0	55	0	0	2	0	0	3	0
Lane Group Flow (vph)	0	115	0	0	163	0	0	1248	0	0	915	0
Confl. Peds. (#/hr)	7		9	9		7	3		7	7		3
Heavy Vehicles (%)	0%	0%	0%	4%	0%	0%	0%	3%	0%	0%	3%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		13.1			13.1			53.9			53.9	
Effective Green, g (s)		13.1			13.1			53.9			53.9	
Actuated g/C Ratio		0.17			0.17			0.72			0.72	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		2.5			2.5			6.1			6.1	
Lane Grp Cap (vph)		216			266			1893			1954	
v/s Ratio Prot												
v/s Ratio Perm		0.09			c0.11			c0.47			0.34	
v/c Ratio		0.53			0.61			0.66			0.47	
Uniform Delay, d1		28.2			28.6			5.6			4.5	
Progression Factor		1.02			1.00			0.71			1.00	
Incremental Delay, d2		2.0			3.5			1.4			0.8	
Delay (s)		30.8			32.1			5.4			5.3	
Level of Service		C			C			A			A	
Approach Delay (s)		30.8			32.1			5.4			5.3	
Approach LOS		C			C			A			A	

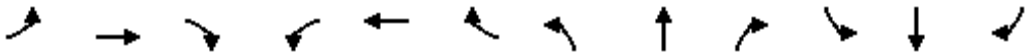
Intersection Summary			
HCM 2000 Control Delay	9.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	35	35	90	60	75	25	1200	100	35	865	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frpb, ped/bikes		0.99			0.99			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.95			0.96			0.99			0.99	
Flt Protected		0.99			0.98			1.00			1.00	
Satd. Flow (prot)		1606			1617			3220			3178	
Flt Permitted		0.89			0.85			0.93			0.86	
Satd. Flow (perm)		1449			1395			2984			2742	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	26	36	36	93	62	77	26	1237	103	36	892	36
RTOR Reduction (vph)	0	28	0	0	28	0	0	6	0	0	3	0
Lane Group Flow (vph)	0	70	0	0	204	0	0	1360	0	0	961	0
Confl. Peds. (#/hr)	16		11	11		16	11		2	2		11
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	4%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		8			4			6			2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)		15.7			15.7			51.3			51.3	
Effective Green, g (s)		15.7			15.7			51.3			51.3	
Actuated g/C Ratio		0.21			0.21			0.68			0.68	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		2.5			2.5			6.1			6.1	
Lane Grp Cap (vph)		303			292			2041			1875	
v/s Ratio Prot												
v/s Ratio Perm		0.05			c0.15			c0.46			0.35	
v/c Ratio		0.23			0.70			0.67			0.51	
Uniform Delay, d1		24.6			27.4			6.9			5.8	
Progression Factor		0.99			1.00			1.89			1.17	
Incremental Delay, d2		0.3			6.5			1.2			0.9	
Delay (s)		24.7			34.0			14.3			7.7	
Level of Service		C			C			B			A	
Approach Delay (s)		24.7			34.0			14.3			7.7	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	86.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	150	50	110	145	105	105	165	1100	80	65	780	145
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	5.0		4.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		0.99	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.93		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1594	1476		1620	1605		1630	3217		1614	3116	
Flt Permitted	0.47	1.00		0.57	1.00		0.17	1.00		0.14	1.00	
Satd. Flow (perm)	784	1476		972	1605		290	3217		238	3116	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	163	54	120	158	114	114	179	1196	87	71	848	158
RTOR Reduction (vph)	0	92	0	0	61	0	0	5	0	0	17	0
Lane Group Flow (vph)	163	82	0	158	167	0	179	1278	0	71	989	0
Confl. Peds. (#/hr)	6		11	11		6	1		2	2		1
Heavy Vehicles (%)	4%	0%	7%	2%	0%	0%	2%	2%	4%	3%	4%	3%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6			2		
Actuated Green, G (s)	17.8	17.8		17.8	17.8		48.2	39.1		39.9	34.8	
Effective Green, g (s)	17.8	17.8		17.8	17.8		48.2	39.1		39.9	34.8	
Actuated g/C Ratio	0.24	0.24		0.24	0.24		0.64	0.52		0.53	0.46	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	5.0		4.0	5.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	6.1		2.5	6.1	
Lane Grp Cap (vph)	186	350		230	380		354	1677		220	1445	
v/s Ratio Prot		0.06			0.10		c0.06	c0.40		0.02	0.32	
v/s Ratio Perm	c0.21			0.16			0.26			0.15		
v/c Ratio	0.88	0.24		0.69	0.44		0.51	0.76		0.32	0.68	
Uniform Delay, d1	27.5	23.1		26.1	24.4		8.0	14.3		9.8	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.43	0.91	
Incremental Delay, d2	33.6	0.3		7.6	0.6		0.8	3.3		0.6	2.4	
Delay (s)	61.1	23.4		33.6	24.9		8.8	17.6		14.6	16.8	
Level of Service	E	C		C	C		A	B		B	B	
Approach Delay (s)		41.6			28.5			16.5			16.6	
Approach LOS		D			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	78.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection	
Intersection Delay, s/veh	2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	30	180	180	25	40	20
Conflicting Peds, #/hr	2	0	0	2	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	185	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	0	2	5	0	0
Mvmt Flow	35	212	212	29	47	24

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	241	0	-	0	508	228
Stage 1	-	-	-	-	226	-
Stage 2	-	-	-	-	282	-
Follow-up Headway	2	-	-	-	4	3
Pot Capacity-1 Maneuver	1326	-	-	-	528	816
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	770	-
Time blocked-Platoon, %		-	-	-		
Mov Capacity-1 Maneuver	1324	-	-	-	512	815
Mov Capacity-2 Maneuver	-	-	-	-	512	-
Stage 1	-	-	-	-	816	-
Stage 2	-	-	-	-	747	-

Approach	EB	WB	SB
HCM Control Delay, s	1	0	12

Minor Lane / Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1324	-	-	-	512	815
HCM Lane V/C Ratio	0.027	-	-	-	0.092	0.029
HCM Control Delay (s)	7.793	0	-	-	12.7	9.5
HCM Lane LOS	A	A			B	A
HCM 95th %tile Q(veh)	0.082	-	-	-	0.302	0.089

Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined

Intersection	
Intersection Delay, s/veh	0.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	20	30	60	1425	1070	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	150	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	17	0	0	3	4	0
Mvmt Flow	21	32	64	1516	1138	11

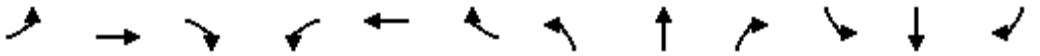
Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2030	574	1149	0	-	0
Stage 1	1144	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Follow-up Headway	4	3	2	-	-	-
Pot Capacity-1 Maneuver	41	467	615	-	-	-
Stage 1	236	-	-	-	-	-
Stage 2	329	-	-	-	-	-
Time blocked-Platoon, %				-	-	-
Mov Capacity-1 Maneuver	37	467	615	-	-	-
Mov Capacity-2 Maneuver	136	-	-	-	-	-
Stage 1	236	-	-	-	-	-
Stage 2	295	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	24	0	0

Minor Lane / Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	615	-	237	-	-
HCM Lane V/C Ratio	0.104	-	0.224	-	-
HCM Control Delay (s)	11.53	-	24.5	-	-
HCM Lane LOS	B		C		
HCM 95th %tile Q(veh)	0.346	-	0.838	-	-

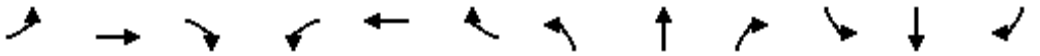
Notes

~ : Volume Exceeds Capacity; $: Delay Exceeds 300 Seconds; Error : Computation Not Defined



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	170	30	190	5	80	180	170	1140	10	105	835	190
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	6.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1524	1444		1682	1488	1599	3224		1646	3197	1377
Flt Permitted		0.70	1.00		0.98	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1107	1444		1658	1488	1599	3224		1646	3197	1377
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	179	32	200	5	84	189	179	1200	11	111	879	200
RTOR Reduction (vph)	0	0	90	0	0	143	0	1	0	0	0	63
Lane Group Flow (vph)	0	211	110	0	89	46	179	1210	0	111	879	137
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	12%	0%	3%	0%	4%	0%	4%	3%	0%	1%	4%	8%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		23.7	23.7		23.7	23.7	16.2	46.6		11.1	41.5	41.5
Effective Green, g (s)		23.7	23.7		23.7	23.7	16.2	46.6		11.1	41.5	41.5
Actuated g/C Ratio		0.24	0.24		0.24	0.24	0.17	0.48		0.11	0.43	0.43
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	6.0		5.0	6.0	6.0
Vehicle Extension (s)		2.5	2.5		2.5	2.5	2.5	5.2		2.5	5.2	5.2
Lane Grp Cap (vph)		269	351		403	362	265	1542		187	1362	586
v/s Ratio Prot							c0.11	c0.38		0.07	0.27	
v/s Ratio Perm		c0.19	0.08		0.05	0.03						0.10
v/c Ratio		0.78	0.31		0.22	0.13	0.68	0.79		0.59	0.65	0.23
Uniform Delay, d1		34.5	30.2		29.5	28.8	38.1	21.2		41.0	22.1	17.8
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		13.4	0.4		0.2	0.1	6.1	3.2		4.2	1.5	0.5
Delay (s)		47.9	30.6		29.7	28.9	44.2	24.4		45.2	23.6	18.3
Level of Service		D	C		C	C	D	C		D	C	B
Approach Delay (s)		39.5			29.1			26.9			24.7	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	97.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	10	15	55	0	80	10	1195	15	10	1010	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.91		1.00	0.85		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1511	1594		1662	1488		1662	3260	1488	1662	3179	
Flt Permitted	0.70	1.00		0.74	1.00		0.20	1.00	1.00	0.16	1.00	
Satd. Flow (perm)	1114	1594		1294	1488		352	3260	1488	282	3179	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	11	16	60	0	87	11	1299	16	11	1098	60
RTOR Reduction (vph)	0	14	0	0	77	0	0	0	6	0	4	0
Lane Group Flow (vph)	54	13	0	60	10	0	11	1299	10	11	1154	0
Heavy Vehicles (%)	10%	0%	0%	0%	0%	0%	0%	2%	0%	0%	4%	0%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA	Perm	pm+pt	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4			6		6	2		
Actuated Green, G (s)	6.7	6.7		6.7	6.7		36.6	36.0	36.0	36.8	36.1	
Effective Green, g (s)	6.7	6.7		6.7	6.7		40.6	38.0	38.0	40.8	38.1	
Actuated g/C Ratio	0.11	0.11		0.11	0.11		0.68	0.64	0.64	0.69	0.64	
Clearance Time (s)	4.0	4.0		4.0	4.0		6.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.0	4.0	2.5	4.0	
Lane Grp Cap (vph)	125	179		145	167		297	2085	951	256	2039	
v/s Ratio Prot		0.01			0.01		0.00	c0.40		c0.00	0.36	
v/s Ratio Perm	c0.05			0.05			0.02		0.01	0.03		
v/c Ratio	0.43	0.07		0.41	0.06		0.04	0.62	0.01	0.04	0.57	
Uniform Delay, d1	24.6	23.6		24.5	23.5		3.4	6.4	3.9	3.7	6.0	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.7	0.1		1.4	0.1		0.0	0.7	0.0	0.1	0.4	
Delay (s)	26.3	23.7		25.9	23.6		3.4	7.1	3.9	3.7	6.4	
Level of Service	C	C		C	C		A	A	A	A	A	
Approach Delay (s)		25.4			24.6			7.0			6.4	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	59.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	52.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX F:

Transportation System Solutions Memorandum

SANDOWENGINEERING
160 Madison Street Suite A • Eugene, Oregon 97402 • 541.513.3376

TECH MEMO #4-UPDATE

TO: Junction City TSP Project Management Team

FROM: Kelly Sandow P.E. Sandow Engineering

DATE: March 1, 2016

RE: Junction City TSP Update
Transportation System Solutions -2016 Update

The following provides an update to the previous versions of Technical Memo #4 where the proposed updates the roadway network are discussed. The following describes Sandow Engineering's updates to the information recommended within DKS's technical Memo #4 as necessary (see Appendix)

STREET FUNCTIONAL CLASSIFICATION

Street functional classification is an important tool for managing the roadway network. It is based on a hierarchal system of roads with designated management and design requirements to achieve the type of service desired.

A number of changes were made to the City's functional classification system as part of this TSP update. This included aligning the classification with the existing and future uses in the City and to update the design for the classification to meet the City needs.

The new functional classification system for roadways in Junction City is described below, including the management objectives for each class. A functional classification map is provided in Figure 4, showing the classification for all roadways in the city, including new street extensions proposed as part of the motor vehicle system improvements.

PRINCIPAL ARTERIAL

Principal arterials are primary routes serving regional traffic passing through the city and connecting the city to other urban areas. They are intended to serve high volumes of traffic over long distances, typically maintain higher posted speeds, and minimize direct access to adjacent land to support the safe and efficient movement of people and goods. Inside of the urban growth boundary, speeds may be reduced to reflect the roadside environment and surrounding land uses.

MAJOR COLLECTOR STREET

A collector street provides access and circulation within and between residential, commercial, industrial, and mixed use lands. Collector streets provide more citywide circulation while still

accessing neighborhoods. They collect traffic from local streets and channel them onto the arterial system.

NEIGHBORHOOD COLLECTOR STREET

A neighborhood collector street provides access and circulation to residential neighborhoods. These types of streets are found only in residential neighborhoods. In general, the ROW and roadway widths are narrower than Major Collector Streets but allow for uses that are necessary in residential neighborhoods, such as on-street parking, lower speeds, and shared bicycle facilities.

LOCAL STREET

Local streets provide immediate access to adjacent land. These streets are designed to enhance the livability of neighborhoods and should generally accommodate less than 2,000 vehicles per day. When traffic volumes reach 1,000 to 1,200 vehicles per day through residential areas, safety and livability can be degraded. A well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles and encourage more use by pedestrians and cyclists. Speeds are not normally posted, with a statutory 25 mph speed limit in effect.

PROPOSED CHANGES TO FUNCTIONAL CLASSIFICATION:

The following changes to the street functional classifications are proposed to better align the existing and future uses with the needed mobility and design of the roadway. The following changes are recommended.

Changes to Existing Functional Classification:

- Milliron Road from west UGB to east UGB changes from a Local Street to a Major Collector Street
- Meadowview Road from west UGB to east UGB changes from unclassified to a Major Collector Street
- West 18th Avenue changes from Arterial to Major Collector Street
- Oaklea Drive from West First/High Pass Road to 18th Street changes from Arterial to Major Collector Street
- High Pass Road/West 1st Street changes from Arterial to Major Collector Street
- Rose Street from 18th Avenue to W 13th Avenue changes from Minor Collector Street to Major Collector Street
- Holly Street changes from Minor Collector Street to Major Collector Street
- Front Street changes from Minor Collector Street to Major Collector Street
- Deal Street from 6th Avenue to 18th Avenue changes from Minor Collector Street to Major Collector Street
- Juniper Street changes from Minor Collector Street to Major Collector Street
- Bailey Lane from UGB to Prairie Road changes from Minor Collector Street to Major Collector Street
- Pitney Lane from W 1st Avenue to Bailey Lane changes from Minor Collector Street to Major Collector Street
- The minor collector streets: W 13th Avenue, Rose Street, Kalmia Street, Maple Street, Deal Street from 6th Avenue to 2nd Street, Birch Street, SW Quince Street, Prairie Meadows, SW

Rose Street, Green Meadows from SW Quince St to SW Rose Street, and SW Coral Street all change to Neighborhood Collector Streets

Classifications applied to future roadway extensions:

- W 6th Avenue west of Oaklea Drive (Neighborhood Collector)
- W 10th Avenue from Oaklea Drive to west UGB (Neighborhood Collector)
- New north---south street west of Oaklea Drive from north UGB to High Pass Road (Major Collector)
- New north---south street west of Oaklea Drive from north UGB to W 10th Avenue extension (Neighborhood Collector)
- Prairie Meadows Avenue to Pitney Lane (Neighborhood Collector)
- SW Coral Street to Pitney Lane (Neighborhood Collector)

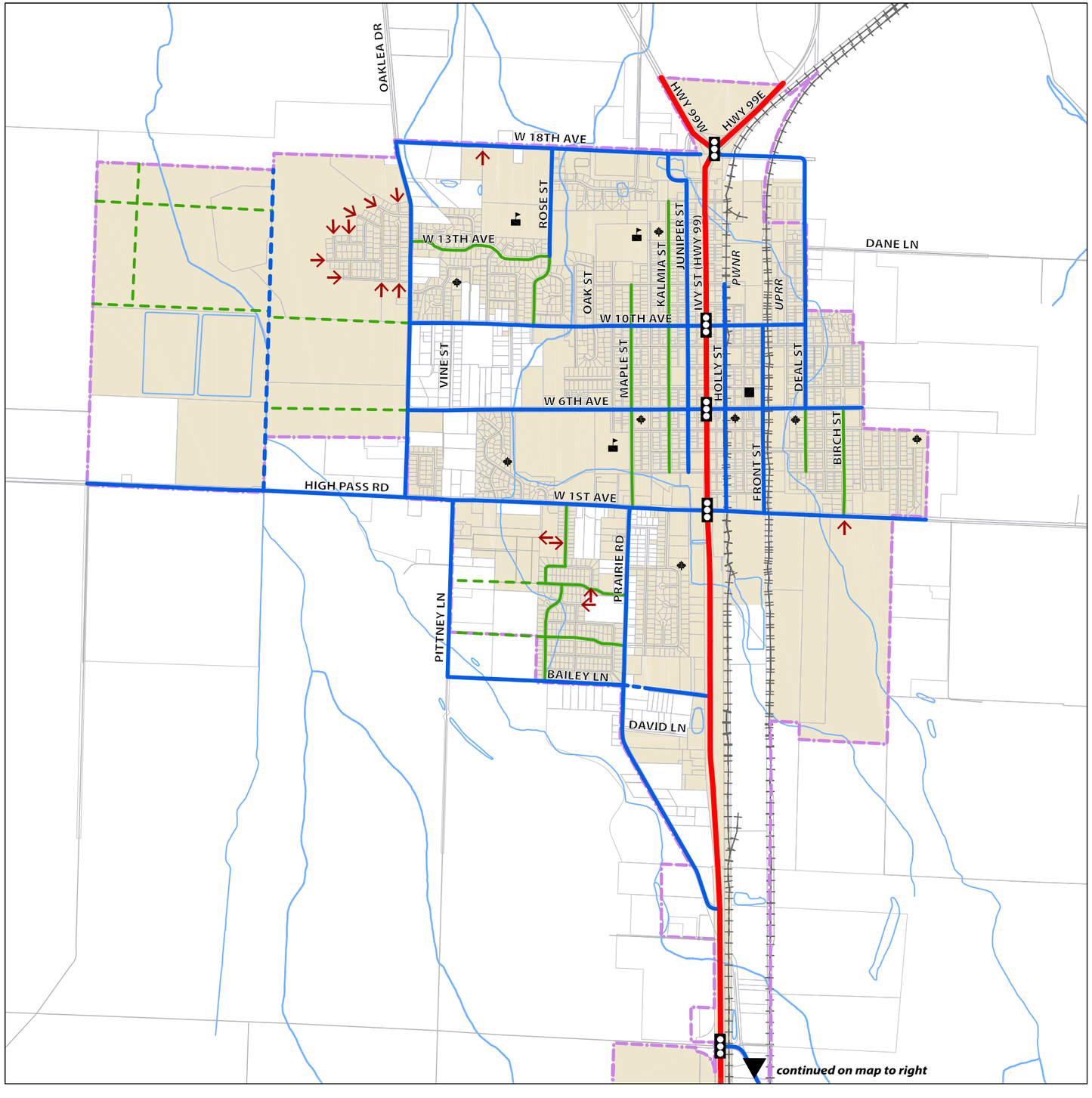
TYPICAL ROADWAY CROSS---SECTION STANDARDS

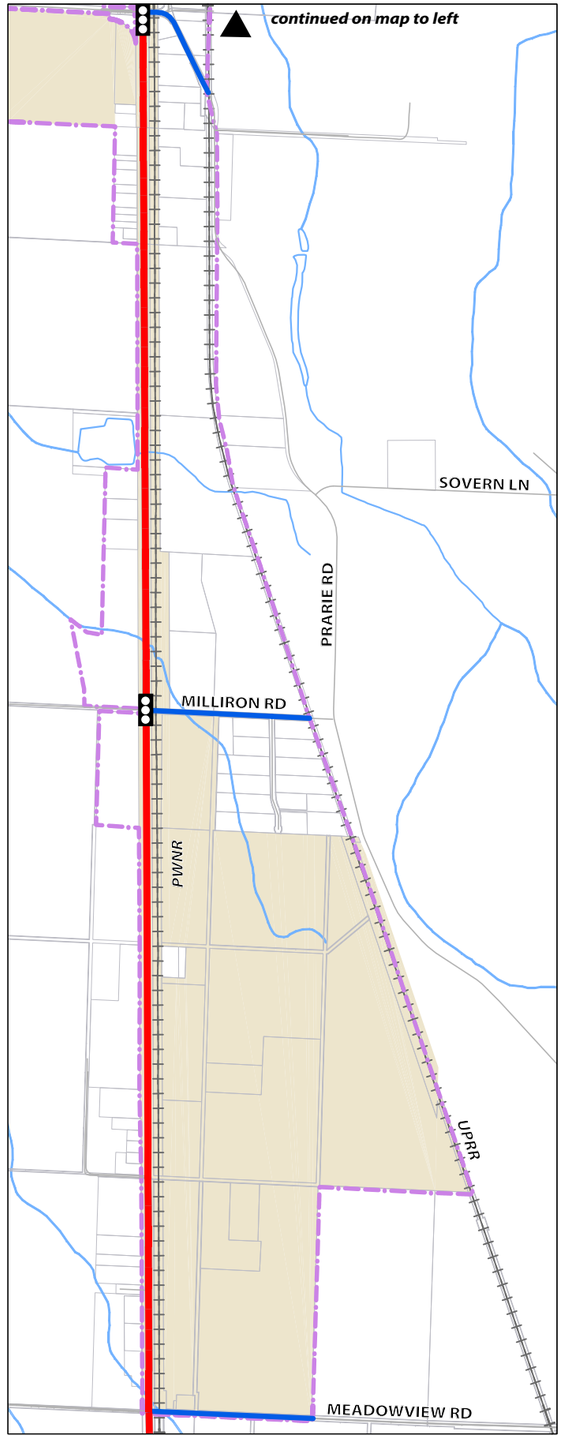
The design characteristics of city streets in Junction City were developed to meet the function and demand for each facility type. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting the design standards.
Figures 5, 6, 7, and 8 illustrate the recommended cross-section standards for city arterials, major collectors, neighborhood collectors, and local streets in Junction City.

Junction City
Transportation System Plan

FIGURE 4

Proposed Future Roadways, Functional Classification, and Local Street Connectivity





Legend

TRAFFIC SIGNAL

Roadways

- PRINCIPAL ARTERIAL
- MAJOR COLLECTOR
- NEIGHBORHOOD COLLECTOR
- FUTURE MAJOR COLLECTOR
- FUTURE NEIGHBORHOOD COLLECTOR
- LOCAL
- POTENTIAL LOCAL STREET CONNECTION

- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

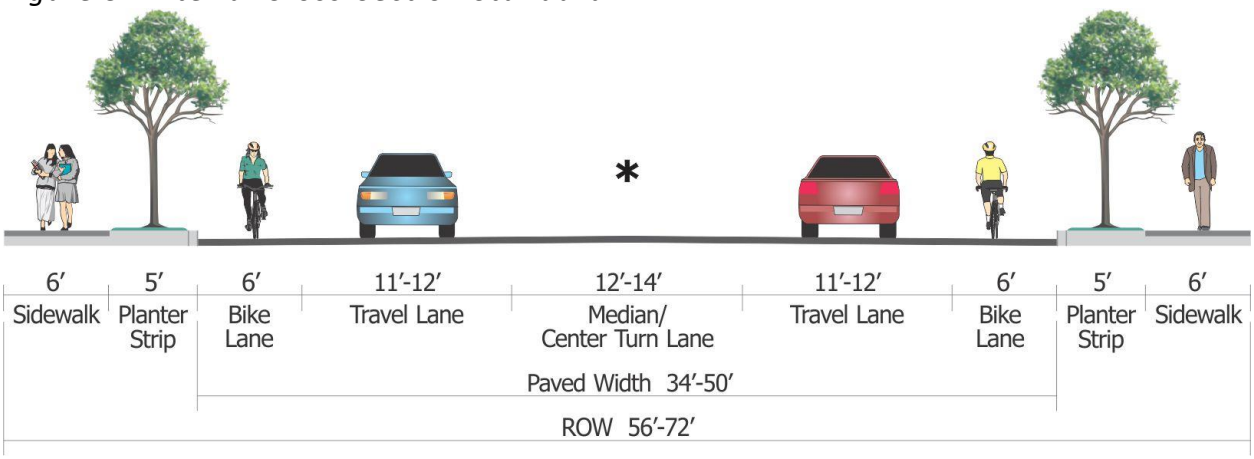
Places of Interest

- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

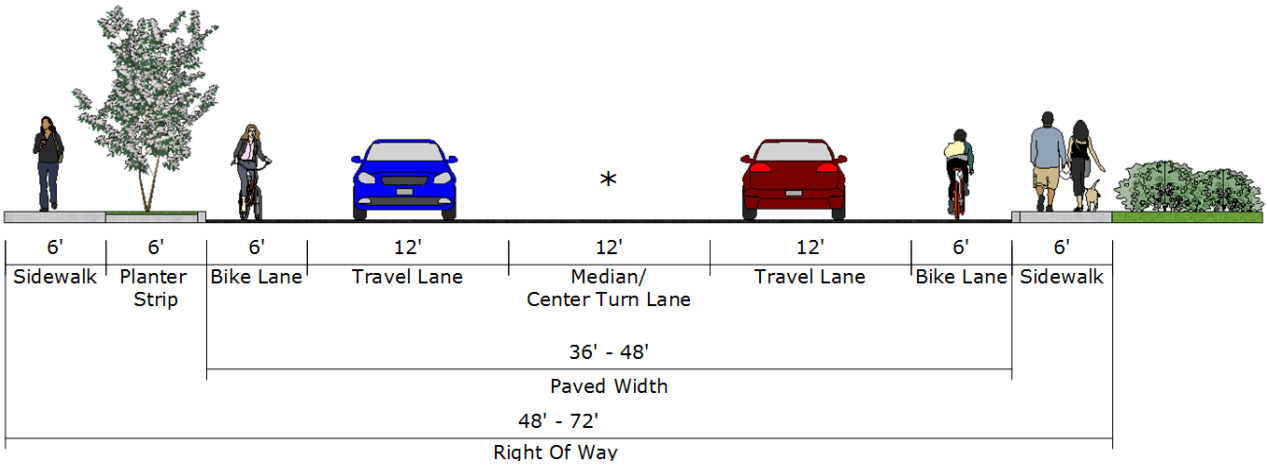
0 1000 2000 Feet

Figure 5: Arterial Cross-Section Standard



- The preferred width of travel lanes on arterials is 11 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, travel lane widths should be increased to 12 feet.
- Center left turn lane is optional depending on surrounding land use and available right-of-way.
- The minimum width of center turn lanes on arterials is 12 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, center turn lane widths should be increased to a minimum of 14 feet.
- Recommended sidewalk widths are 6 feet.
- Recommended planter strip widths are 5 feet.
- Minimum bike lane widths of 5 feet may be allowed in constrained areas.
- On-street parking is permitted on arterial streets when the roadway speeds are less than 35 mph.

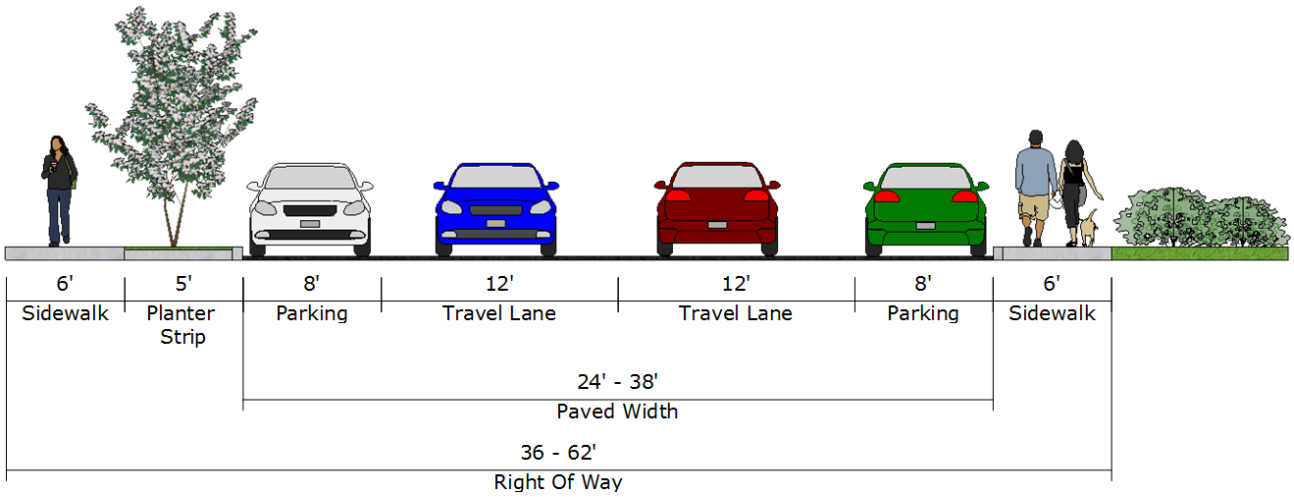
Figure 6: Major Collector Cross-Section Standard



*Optional

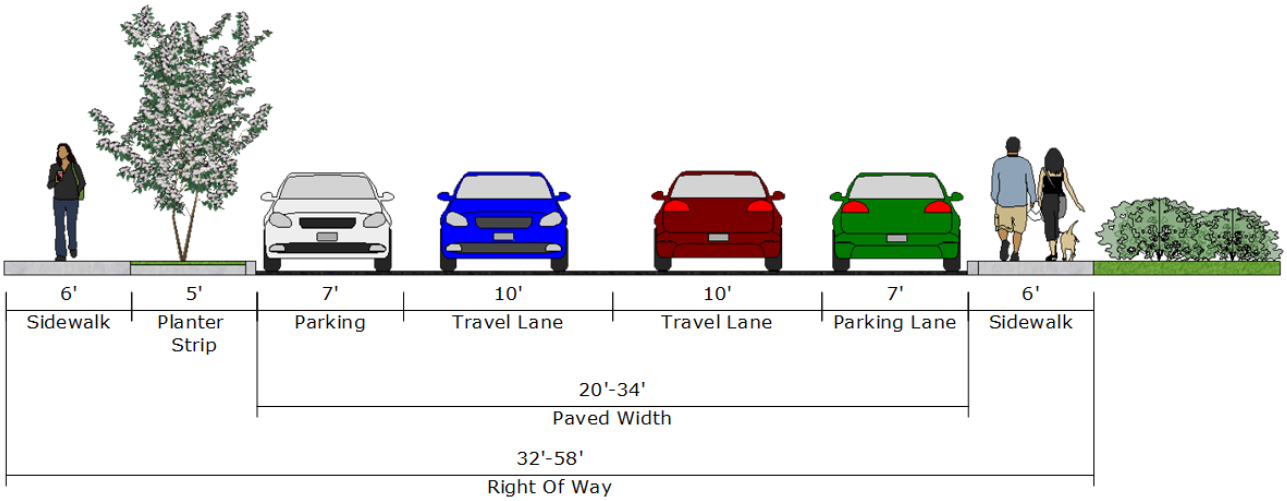
- The preferred width of travel lanes on major collectors is 11-12 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, travel lane widths should be increased to 12 feet.
- Recommended center left turn lane or left turn pockets at intersections depending on surrounding land use and available right-of-way.
- The preferred width of center turn lanes on major collectors is 12 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, center turn lane widths should be increased to 14 feet.
- Recommended sidewalk widths are 6 feet.
- Preferred setback sidewalk option, curbside sidewalks may be allowed in constrained areas.
- Recommended planter strip widths are 5 feet.
- Minimum bike lane widths of 5 feet may be allowed in constrained areas.
- Striping is necessary on all roads.
- Parking is optional if ROW is available and warranted by surrounding land uses.

Figure 7 Neighborhood Collector Cross-Section Standard



- The preferred width of travel lanes on neighborhood collectors is 11-12 feet.
- Recommended sidewalk widths are 6 feet.
- Preferred setback sidewalk option, curbside sidewalks may be allowed in constrained areas.
- Recommended planter strip widths are 5 feet.
- On street parking (8-foot width) included on both sides of the street.
- Parking may be allowed on one side only in constrained areas.
- Striping not necessary unless or needed to direct traffic.

Figure 8: Local Street Cross-Section Standard



- Recommended sidewalk widths are 6 feet.
- Preferred setback sidewalk option, curbside sidewalks may be allowed in constrained areas.
- Recommended planter strip widths are 5 feet.
- On-street parking (8-foot width) included on one or both sides of the street
- Parking may be allowed on one side only in constrained areas
- Striping is not necessary unless needed to direct traffic

Planning level right-of-way needs can be determined utilizing these figures. Specific dimensions for roadways with various lane and parking characteristics are detailed in Table 1 for each street classification. These roadway standards are compliant with the Oregon Transportation Planning Rule, which specifies that local governments limit excessive roadway widths.

TABLE 1: Typical Roadway Cross-Sections

Street Type	Right-of-Way Width	Curb-to-Curb Paved Width	Within Curb-to-Curb Area				Planter Strips[B]	Sidewalks[CD]
			Motor Vehicle Travel Lanes	Median/ Center Turn Lanes	Bike Lanes[A]	On-Street Parking		
Minor Arterials	56'-72'	34'-50'	11'-12'	12'-14'	6'	-	5'	6'
Major Collectors	48'-74'	34'-52'	11'-12'	12'-14'	6'	8' (optional)	5'	6'
Neighborhood Collector	36'-62'	24'-38'	11'-12'	-	-	8'	5'	6'
Neighborhood Local Streets	32'-58'	20'-34'	10'-12'	-	-	8'	5'	6'

A – Minimum bike lane widths of 5' may be allowed in constrained areas.
B – Width includes 6" curb if planter strip is between curb and sidewalk.
C – Width includes 6" curb unless planter strip is between curb and sidewalk.
D – Variances may be allowed for gap infill to match existing sidewalk widths.

ACCESS MANAGEMENT

Access management is the control of access points allowed to enter arterial and collector facilities to preserve their functionality and maximize their capacity. Controlling access can reduce congestion and crash rates, providing efficient, safe, and timely travel.
On arterial and collector facilities, excessive driveways erode the capacity of roadways as additional conflict points are introduced at each driveway location. Reducing or consolidating driveways on these main facilities can decrease collisions and preserve capacity on high volume roads thereby maintaining traffic flow and mobility within the city. Balancing access and good mobility can be achieved through various access management strategies, the first of which is establishing access management spacing standards for driveways and intersections.

Junction City has established access management regulations through the Municipal Code (Chapter 17.85). These regulations include permitting and site plan review processes, design and spacing standards, and requirements for the provision of inter-parcel circulation and joint access.
The City's current requirements for access spacing applied to the recommended functional classification system are shown below in Table 2, with spacing measured from centerline to centerline of the intersection. As part of this TSP update, the minimum access spacing for minor arterials and collectors has been increased to better support the objectives of providing for longer and higher speed trips and to enhanced safety where posted speeds are higher. These changes will require amendments to the Municipal Code. New accesses shall meet or exceed these minimum spacing requirements. However, where no alternatives exist or where strict application of the standards is impractical, the City may allow variances.

TABLE 2: City of Junction City Access Spacing Standards

Functional Classification	Minimum Access Spacing (ft.)
Minor Arterial	200
Major Collector	100
Neighborhood Collector	25
Local	25

MOTOR VEHICLE SYSTEM IMPROVEMENTS

The following section presents transportation improvement projects to address motor vehicle travel needs. Four categories of motor vehicle projects were identified for Junction City:

- **New Roadways or Roadway Extensions**: Key new roadway connections are identified that provide improved connectivity and access, especially for developing areas.
- **Roadway Modernizations**: This includes upgrading roadways to current standards that may include wider lanes, shoulders, curbs, sidewalks, bicycle facilities, or turn lanes. The functional right-of-way is typically widened to accommodate enhancements, but actual right-of-way changes and potential property acquisitions vary by location.
- **Safety Improvements**: Improvements are suggested for locations where safety concerns have been identified.
- **Traffic Operations Improvements**: Improvement projects have been identified for locations where motor vehicle delays are expected to be most significant by the year 2036.

Recommended projects are described in Table 3, which includes Project ID numbers to help locate improvements on Figure 9. The project descriptions include key benefits for use in future grant applications and strategic planning.

TABLE 3: Motor Vehicle Improvements

Project ID	Project Description	Probable Construction Costs[##]
New Roadways/Roadway Extensions		
MV1	**W 6th Avenue**: Oaklea Drive to west: Extend W 6th Avenue as a new Collector Street from Oaklea Drive to new north-south Collector Street (see MV4) ***Key Benefits: Connectivity***	$4,190,000
MV2	**W 10th Avenue**: Oaklea Drive to west: Extend W 10th Avenue as a new Collector Street from Oaklea Drive to west UGB ***Key Benefits: Connectivity***	$10,100,000
MV3	**New Collector Street**: North UGB to W 10th Avenue: Construct new Collector Street extending from the North UGB to the W 10th Avenue extension (see MV2) ***Key Benefits: Connectivity***	$5,560,000
MV4	**New Collector Street**: North UGB to High Pass Road: Construct new Collector Street west of Oaklea Drive extending from the North UGB to High Pass Road ***Key Benefits: Connectivity***	$11,730,000
MV5	**New Collector Street**: West UGB to MV4: Construct new Collector Street from west UGB to other New Collector Street (see MV4) ***Key Benefits: Connectivity***	$6,380,000
MV6	**New Frontage Road east of PNWR railroad**: E 1st Avenue to Prairie Road: Construct new Collector Street between Portland & Western and Union Pacific railroads. Project should include railroad crossing closures where feasible ***Key Benefits: Connectivity, Mobility, Safety***	$16,535,000
MV7	**Prairie Meadows Avenue**: Extend west to Pitney Lane: Construct to match existing segment of Prairie Meadows Avenue (would not meet new Neighborhood Collector Street standard, but provides consistency with established construction) ***Key Benefits: Connectivity***	$1,200,000
MV8	**Coral Street**: Extend west to Pitney Lane: Construct to match existing segment of Coral Street (at a minimum build to Neighborhood Collector Street standard) ***Key Benefits: Connectivity***	$1,950,000
MV9	**Hatton Lane**: Extend west to Prairie Road: Phase 1: Acquire right-of-way for Hatton Lane extension to Prairie Road, and construct a pedestrian and bicycle connection (see SLM6). Phase 2: Extend Hatton Lane as a new Collector Street connecting Prairie Road to OR 99 ***Key Benefits: Connectivity***	Phase 1: $210,000 Phase 2: $655,000
Roadway Modernizations		

Project ID	Project Description	Probable Construction Costs[##]
MV10	**Meadowview Road**: OR 99 to East UGB: Construct to Major Collector standards including bike lanes on both sides and sidewalk only on the north side ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,480,000
MV11	**Oaklea Drive[#]**: W 18th Avenue to W 1st Avenue/High Pass Road: Construct to Major Collector standards including left turn pockets, bike lanes, and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$7,190,000
MV12	**W 1st Avenue/High Pass Road*[#]**: Oaklea Drive to OR 99: Construct to Major Collector standards including left turn lane, bike lanes, and sidewalks. ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Safety, Livability, Auto Mobility***	$6,070,000
MV13	**E 1st Avenue/River Road[#]**: OR 99 to East UGB: Construct to Major Collector standards including center turn lane, bike lanes, and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$4,270,000
MV14	**W 6th Avenue[#]**: Oaklea Drive to Timothy Street: Construct to Major Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$1,735,000
MV15	**W 18th Avenue[#]**: Oaklea Drive to Juniper Street: Construct to Major Collector standards including bike lanes on both sides and sidewalk only on the south side (no center turn lane) ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$2,585,000
MV16	**E 18th Avenue[#]**: OR 99 to East UGB: Construct to Major Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$1,625,000
MV17	**Prairie Road[#]**: W 1st Avenue to Bailey Lane: Construct to Major Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$3,730,000
MV18	**Prairie Road[#]**: Bailey Lane to OR 99: Construct to Major Collector standards including bike lanes and sidewalks. Do not construct sidewalks where adjacent to UGB ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$4,415,000
MV19	**Prairie Road[#]**: OR 99 to East UGB: Construct to Major Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$1,730,000
MV20	**Pitney Lane[#]**: W 1st Avenue/High Pass Road to Bailey Lane: Construct to Major Collector standards including bike lanes on both sides and sidewalk only on the east side (no center turn lane) ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,665,000

Project ID	Project Description	Probable Construction Costs[##]
MV21	**Milliron Road[#]**: West UGB to East UGB: Construct to Major Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,105,000
MV22	**Bailey Lane**: West UGB to Prairie Road: Construct Major Collector standards including left turn lanes, bike lanes on both sides, and sidewalk. ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$1,250,000
MV23	**W 1st Avenue/High Pass Road[#]**: West UGB to Oaklea Drive: Construct Major Collector standards including left turn lanes, bike lanes on both sides, and sidewalk only on the north side. This includes a segment that is entirely outside of the UGB, but is needed for connectivity ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$3,830,000
Safety Improvements		
MV24	**Restripe E 6th Avenue**: OR 99 to Front Street: Convert from front-facing angle parking to parallel parking to provide consistent center-line ***Key Benefits: Safety, Safe Routes to School***	$10,500
MV25	**OR 99 Traffic Signal Upgrades: OR 99E/OR 99W, OR 99/OR 36, and OR 99/Milliron Road**: Upgrade signal head back plates with retroreflective borders. The remaining signal head upgrades are captured under the crossing improvement projects for the signals at OR 99/10th, OR 99/6th, and OR 99/1st ***Key Benefits: Safety***	$10,000
MV26	**Oaklea Drive/ W 18th Avenue**: Improve sight distance for northbound approach to the intersection ***Key Benefits: Safety***	$55,000
Traffic Operations Improvements		
MV27	**Maple Road/Prairie Road intersection with W 1st Avenue/High Pass Road:** Realign north and south approaches of intersection and add left turn lanes on all approaches ***Key Benefits: Safety, Safe Routes to School, Auto Mobility***	$1,175,000
MV28	**OR 99 Traffic Signal Optimization**: OR 99E/OR 99W junction to Milliron Road: Periodically review traffic signal timings along OR 99 to optimize operations as needed to respond to changes in traffic volumes ***Key Benefits: Auto Mobility***	$30,000
	Total Cost	**$105,470,500**

*****Impacts to historical cemetery must be considered in any widening plans along High Pass Road.

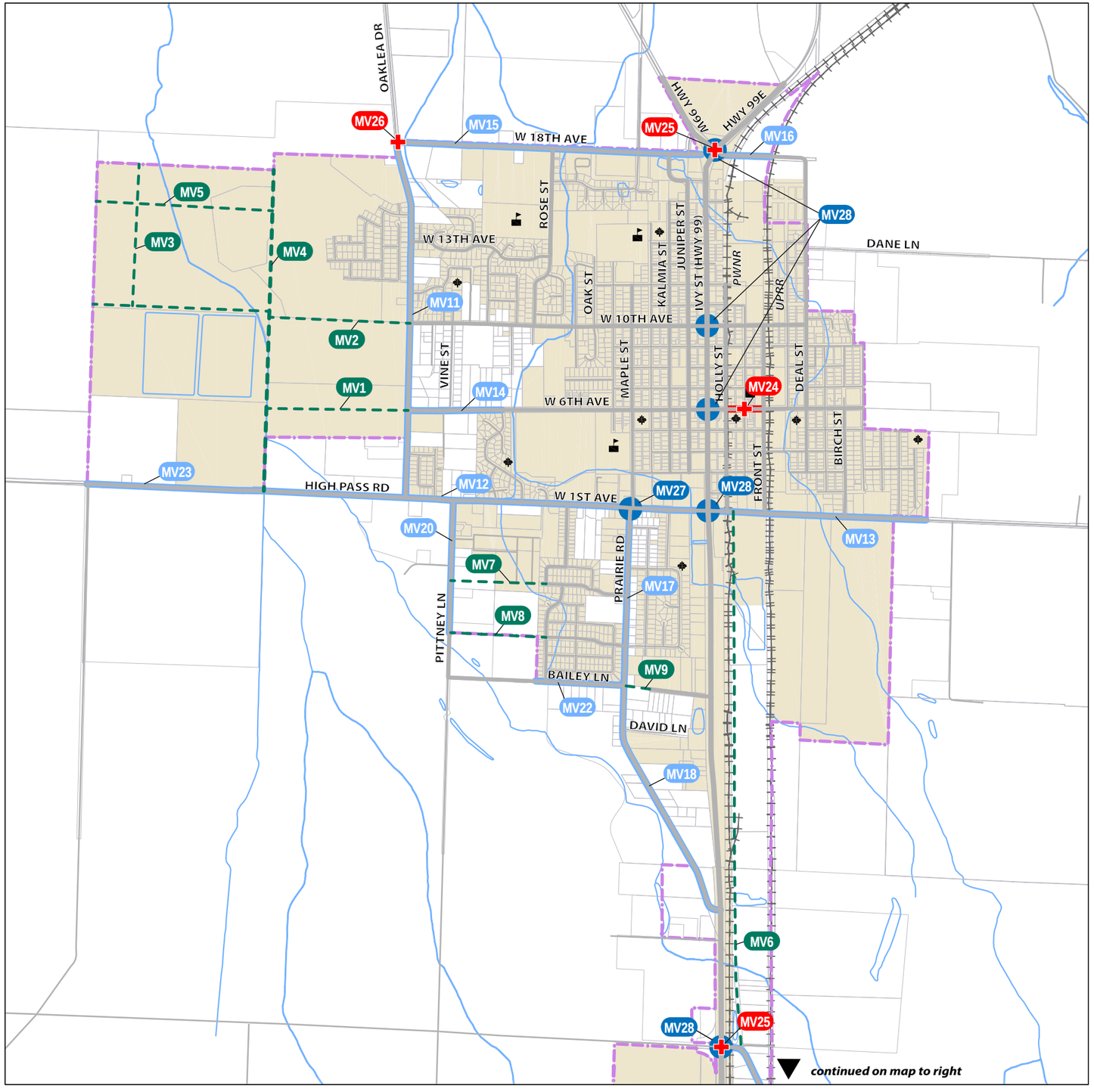
[#]Identified in Lane County TSP.

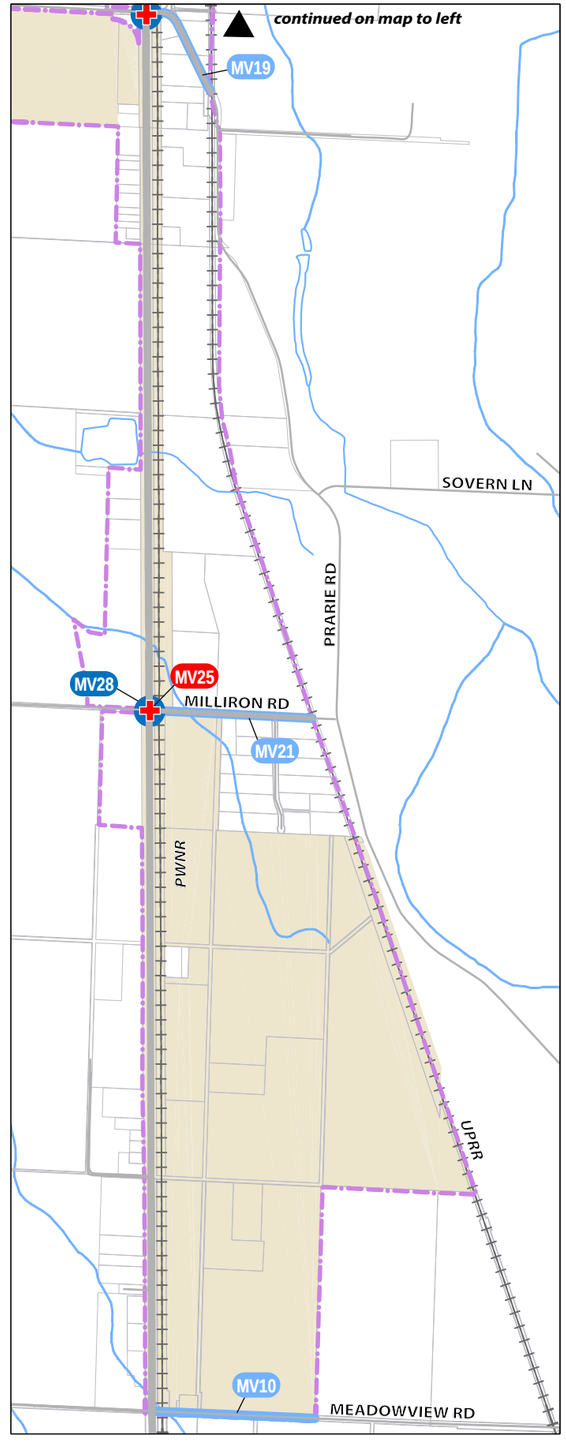
[##]Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

Junction City
Transportation System Plan

FIGURE 9

Proposed Motor Vehicle Network Improvements





Legend

Network Improvments

- XX — MOTOR VEHICLE PROJECT NUMBER
- ROADWAY MODERNIZATION
- NEW ROADWAYS/ ROADWAY ENTENSIONS
- SAFETY IMPROVMENTS
- TRAFFIC OPERATIONS IMPROVMENTS

Roadways

- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

Places of Interest

- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

PEDESTRIAN FACILITY IMPROVEMENTS

Improvements to the pedestrian network include sidewalk infill and new sidewalk construction projects, shared-use path connections, and street crossing improvements. Shared-use path connections and street crossing improvements also benefit bicycle transportation, but are only listed under the Pedestrian Plan.

Design for pedestrian improvements on non-city streets need to be coordinated with the jurisdictional authority. The plan is intended to provide flexibility to meet the standards and needs at the time of project design.

Sidewalk infill and new sidewalk construction projects are listed in Table 4, which includes Project ID numbers to help locate improvements. The project descriptions include key benefits for use in future grant applications and strategic planning. New roadway and roadway modernization projects that would include the construction of sidewalk or pedestrian facilities appropriate to the street classification of the roadway are listed under the Motor Vehicle Plan and are not shown here.

TABLE 4: Sidewalk Infill/Construction Projects

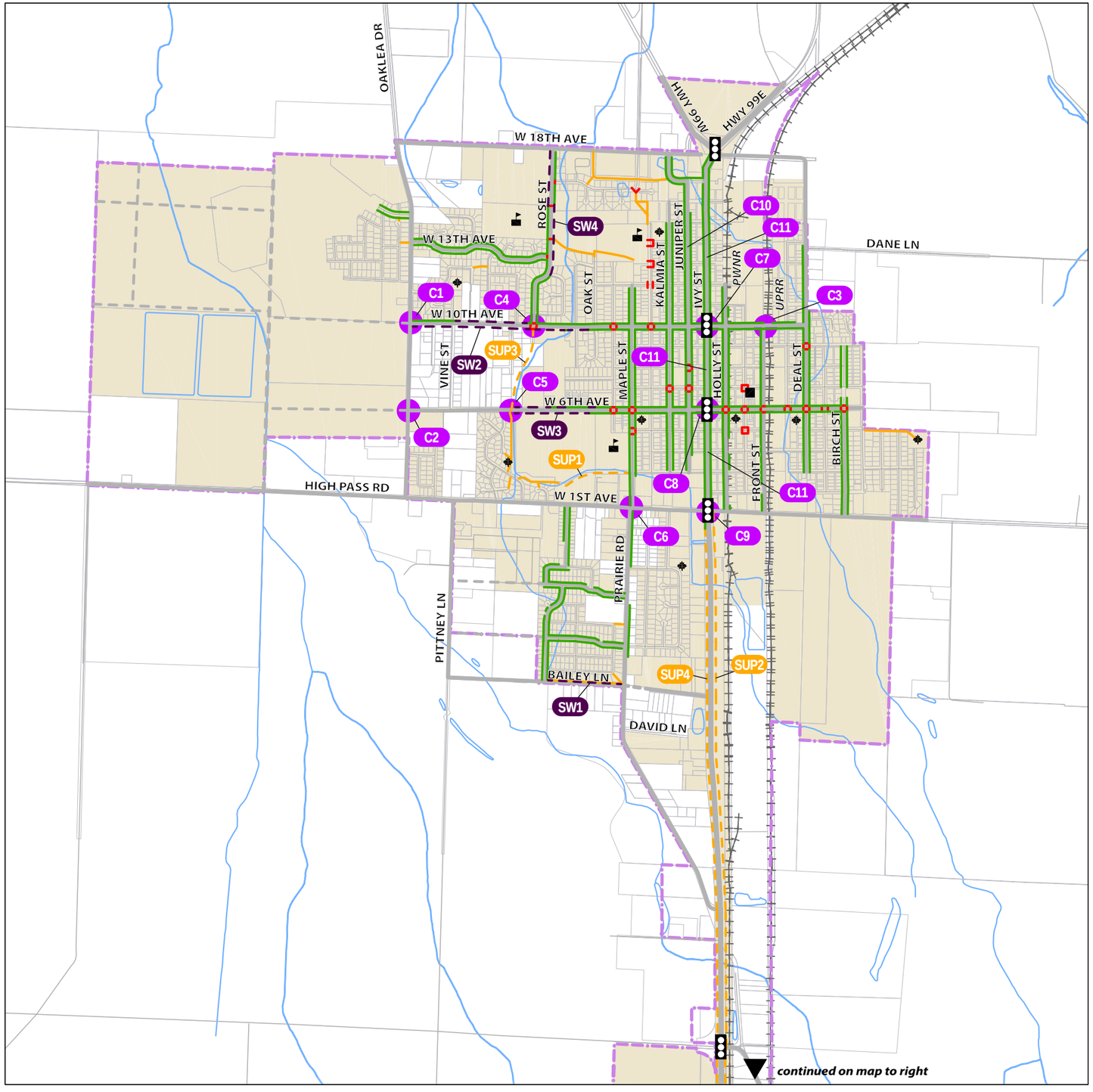
Project ID	Project Description	Probable Construction Costs*
SW1	**Bailey Ln**: Pitney Ln to Quince St – Sidewalk construction on north side in UGB ***Key Benefits: Pedestrian Connectivity***	$235,000
SW2	**W 10th Ave**: Oaklea Dr to Maple St - Sidewalk construction/infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$610,000
SW3	**W 6th Ave**: Timothy St to Pine Ct - Sidewalk construction/infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$320,000
SW4	**Rose St**: W 18th Ave to W 13th Ave – Sidewalk infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$315,000
SWG	**General Infill:** Infill of missing sidewalk throughout the City and the replacement of sidewalk that no longer meets current design or ADA standards	N/A
	Total Cost	

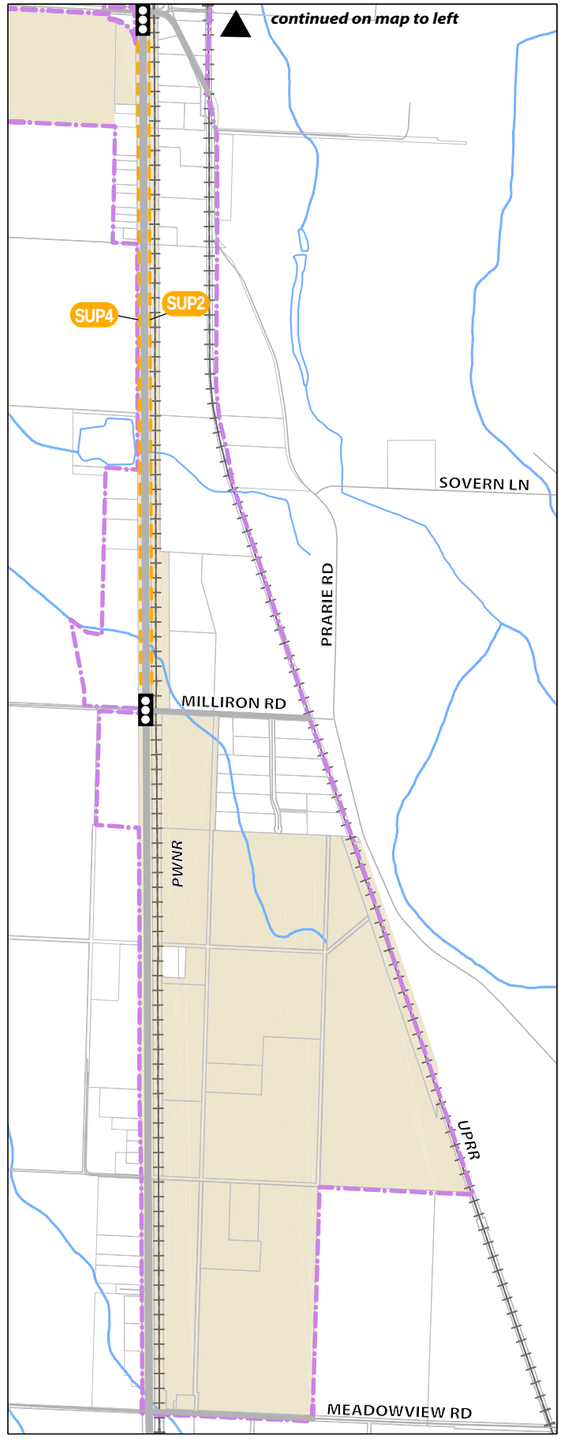
***** *Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.*

Junction City
Transportation System Plan

FIGURE 1

Proposed Pedestrian Network Improvements





Legend

Network Improvments
- SIDEWALK INFILL/ CONSTRUCTION (SW)
- SHARED USE PATH (SUP)
- POINT/CROSSING (C)
- XX PEDESTRIAN PROJECT NUMBER

Existing Pedestrian Facilities
- MARKED CROSSWALK
- SIDEWALK
- SHARED USE PATH
- TRAFFIC SIGNAL

Roadways
- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

Places of Interest
- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

SHARED PEDESTRIAN FACILITY IMPROVEMENTS

The projects proposed in Tables 5 and 6, including street crossing improvements and shared-use paths, will provide benefits to both cyclists and pedestrians traveling in Junction City. The improvement locations and project descriptions can be seen in Figure 1. Note that Project C11 in Table 2 includes safety education programs to provide a cost-effective supplement to the construction projects in the plan.

TABLE 5: Street Crossing Improvements

Project ID	Project Description	Probable Construction Costs[#]
C1	**Oaklea Dr/W 10th Ave**: As part of the Oaklea Dr. road modernization project (MV11), install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$45,000
C2	**Oaklea Dr/W 6th Ave**: As part of the Oaklea Dr. road modernization project (MV11), install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$45,000
C3	**E 10th Ave/Front St**: Connect existing sidewalk on north side of E 10th Ave to provide an accessible railroad crossing. Replace curb ramps on all corners to meet ADA standards. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$30,000
C4	**W 10th Ave/Rose St**: Project should be constructed before or as part of project SUP3. Evaluate user needs at this location; consider improved intersection lighting, striping the crosswalk on the south leg of the intersection, and converting existing crosswalks to continental style. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$15,000
C5	**W 6th Ave/Shared-Use Path Connection**: Project should be constructed concurrently with project SUP3. Evaluate user needs at this location; consider enhanced pavement markings and signage. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$5,000
C6	**W 1st Ave/Prairie Rd/Maple St**: As an interim improvement, construct curb extensions on the opposing west corner of Maple Street and east corner of Prairie Road to enhance pedestrian visibility and shorten the crossing distance. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$30,000
C7	**W 10th Ave/OR 99**: Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School***	$20,000

Project ID	Project Description	Probable Construction Costs[#]
C8	**W 6th Ave/ OR 99**: Install intersection lighting (currently no lighting on mast arms). Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School***	$35,000
C9	**W 1st Ave /OR 99**: Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School***	$20,000
C10	**Juniper Street:** Provide raised pedestrian crossings at key locations along Juniper Street. Possible locations include 14th Street and 13th Street ***Key Benefits: Safety, Pedestrian/Bicycle Connectivity***	$40,000
C11	**OR 99 from 18th Ave to 1st Ave**: Install pedestrian activated crossing treatments on OR 99. Consider including Rectangular Rapid Flashing Beacons (RRFBs), advanced stop bars, curb ramps, and striped crosswalks at mid-block locations between: • 15th Ave and 12th Ave, • 9th Ave and 7th Ave, and • 5th Ave and 3rd Ave. ***Key Benefits: Safety, Pedestrian/Bicycle Connectivity***	$140,000
C12	**Education**: Many free educational materials are available. Coordinate with the Oregon Department of Transportation, Junction City School District, and Junction City Police Department to implement safety education programs including pedestrian crossing education for school children. ***Key Benefits: Safety, Safe Routes to School***	Variable

*The installation of RRFBs requires an investigation and approval from the State Traffic-Roadway Engineer. Any mid-block improvements on a State Freight Route will require review concerning freight mobility. The National Cooperative Highway Research Program (NCHRP) Report 572 outlines a process to identify the appropriate type of crossing treatment at unsignalized locations. It was envisioned that RRFBs would be installed, but a pedestrian activated beacon or signal could also be the appropriate treatment.

[#] Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

TABLE 6: Shared-Use Paths

Project ID	Project Description	Probable Construction Costs*
SUP1	**Southern Edge of Junction City High School, Connecting Existing Shared-Use Path to Maple Street**: Alignment may require right-of-way or easement. ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$195,000

SUP2	**OR 99 from 1st Avenue to Milliron Road**: Alignment within existing public right-of-way along east side of OR 99 between highway and railroad. May require coordination with PNWR. Will requires some wetland mitigation. Consider constructing with wider 12-foot paved width to better accommodate high bicycle speeds. Could be constructed in lieu of constructing sidewalks along east side of OR 99. ***Key Benefits: Pedestrian/Bicycle Connectivity, Alternative to Travel on OR 99, Livability***	$2,935,000
SUP3	**Rose Street Alignment from W 10th Avenue to W 6th Ave**: Provides needed access between middle school and high school and provides a continuation of the existing path around the high school. Alignment will require right-of-way acquisition or easements and must cross the ditch. ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$550,000
SUP4	**OR 99**: W 1st Ave to Milliron Rd – Multi-Use Path along west side of OR 99. Path to be placed within existing right-of-way ***Key Benefits: Pedestrian/Bicycle Connectivity, Alternative to Travel on OR 99, Livability***	$1,400,000
	Total Cost	**$5,080,000**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

BICYCLE FACILITY IMPROVEMENTS

Existing and future bicycle facilities and needs in Junction City were evaluated and described in reports that have been included in the appendix. This chapter includes the bicycle component of the "Preferred Plan," which consists of all transportation improvements identified to meet future needs through the year 2036. Priority projects that could be constructed with anticipated available funding have been identified as part of a "Financially Constrained Plan" for motor vehicles.

While Junction City currently has few dedicated bicycle facilities, many of the existing roadways have space available to provide for bike facilities, but would need to be restriped and signed to accommodate them. The bicycle facility design guide below was developed to characterize the types of bicycle facilities being recommended as part of the Junction City TSP. The types of bicycle facilities increase from the lowest comfort level to the highest comfort level. The highest comfort level is a shared-use path, which provides complete separation from motor vehicle traffic and gives cyclist a dedicated space in the transportation network. Design elements for Shared Lane Markings/Sharrows, Shoulder Bikeways, Standard Bike Lanes, Bike Boulevard, Buffered bike Lane, and Shared-Use Path are shown in the following design guide images.

Design for pedestrian improvements on non-city streets need to be coordinated with the jurisdictional authority. The plan is intended to provide flexibility to meet the standards and needs at the time of project design.

Bicycle Facility Design Guide[1]

Shared Lane Markings/Sharrows

Comfort Level ●○○○

▶ Shared lane markings (SLMs), also known as "sharrows", are high-visibility pavement marking symbols that indicate the appropriate position for a bicycle when sharing a lane with motor vehicles. Sharrows can be used on low-volume, low-speed roadways, where bike lanes are desirable but not possible or cost effective due to physical constraints. The marking encourages bicyclists to ride away from the door zone if adjacent on-street parking is available, and indicates to drivers where to expect cyclists. Signing can also accompany the SLMs to alert motorist that cyclists may be encountered.

Design Guidance

- Streets with motor vehicle volumes of less than 3,000 vehicles per day.
- Streets with motor vehicle posted speeds of 30 mph or lower.
- Spacing can vary from 50'-100' along busier streets, or up to 250' along low traffic routes.

[1] Reference Documents: MUTCD 2009, NACTO Urban Bikeway Design Guide, AASHTO Guide for Development of Bicycle Facilities, ODOT Bicycle and Pedestrian Design Guide 2011

Shoulder Bikeways

Comfort Level ●●○○

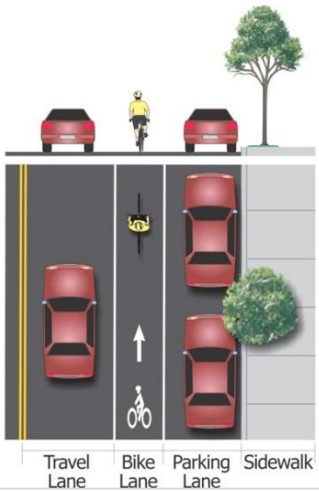
▶ A shoulder bikeway is a paved shoulder that provides space for bicycling. This designated area is denoted by an edge line, provides separation for bicyclists, reduces conflicts with faster moving motor vehicles, and is commonly found on rural roads.

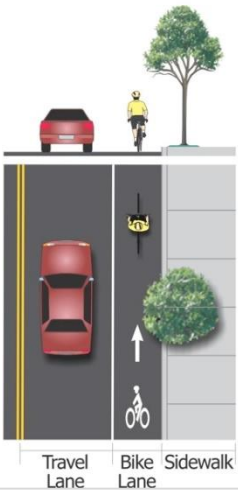
Design Guidance

- A minimum shoulder width of 6′ is recommended.
- A minimum shoulder width of 4′ may be used when a curb, guardrail, or roadside barrier is not present. Otherwise, a minimum width of 5′ is recommended.
- Edge line is designated by a 4″ stripe.

Standard Bike Lane

Comfort Level ●●○○





▶ Bike lanes are used to designate space for exclusive use by bicyclists. Bike lanes are denoted by a solid white line, bike lane symbols, and can be accompanied by signing. Most often bike lanes are intended for one-way travel in the same direction as adjacent traffic lanes, although contraflow and left side bike lanes have been used. Application of bike lanes is appropriate on arterial and collector streets with higher motor vehicle volumes and speeds.

Design Guidance

- Streets with motor vehicle volume of 3,000 vehicles per day or more.
- Streets with posted motor vehicle speed of 25 mph or higher.
- Use 8″ stripe to designate a bike lane.
- Recommended width is 6′, with a minimum of 4′ on open shoulders or 5′ from face to curb, guardrail, or parked car.
- Bike lanes should not be wider than 7′ so drivers do not mistake the lane for parking.

Bike Boulevard

Comfort Level ●●○○

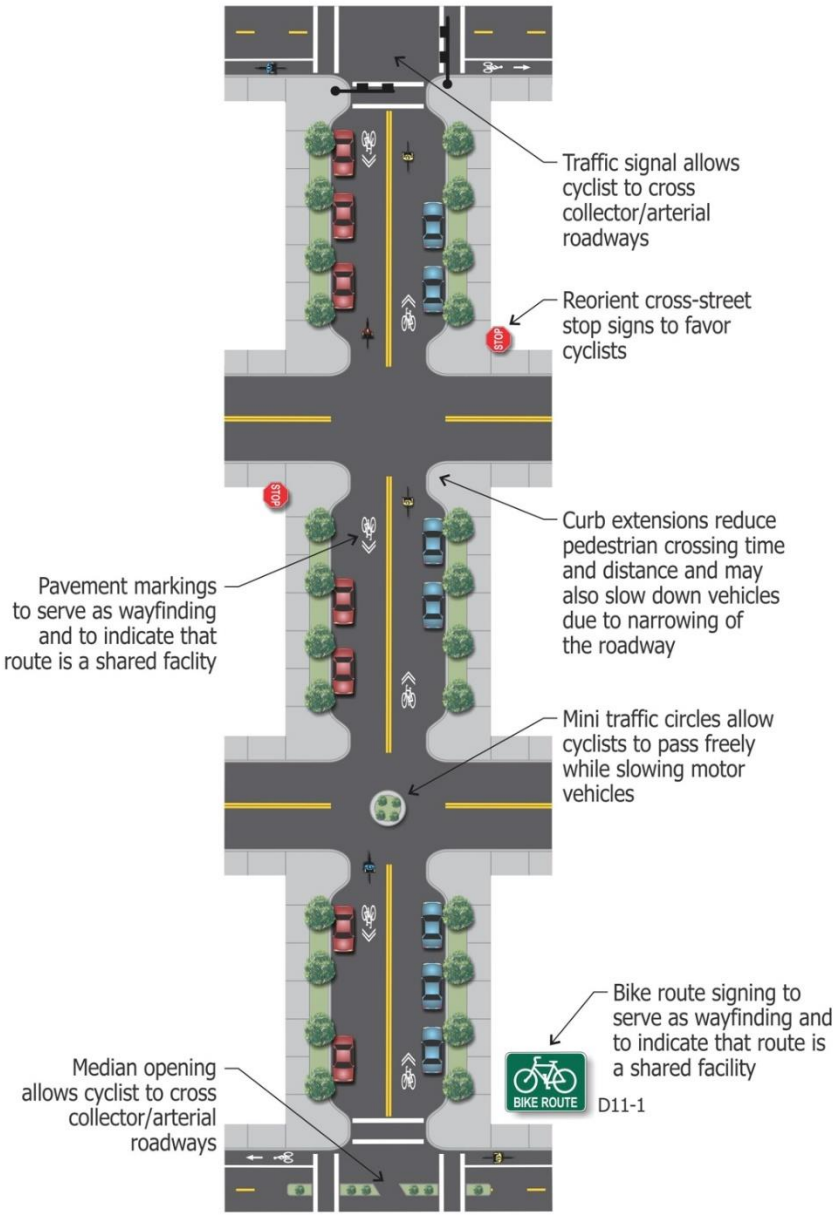


Illustration is one example of a bike boulevard. Treatments applied may vary.

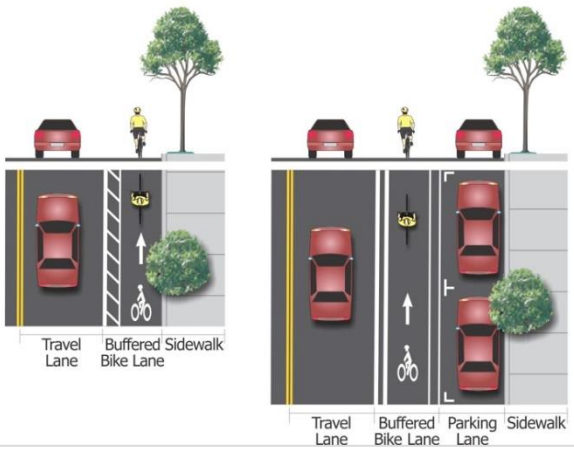
▶ A bike boulevard is a roadway with low motor vehicle speeds and volumes that has been modified to prioritize the movement of bicycles. These facilities use a variety of design treatments to discourage through trips by motor vehicles and to create a safe and comfortable environment for cyclists. Treatments include signing and pavement markings, along with traffic calming measures.

Design Guidance

- Streets with less than 3,000 motor vehicles per day.
- Streets with posted speeds of 25 mph or lower.

Buffered Bike Lane

Comfort Level ●●●○



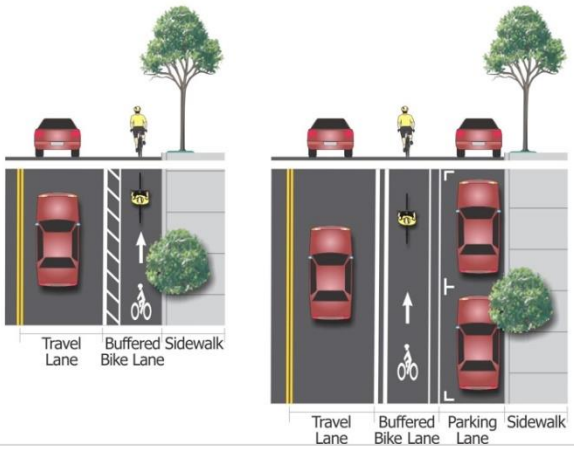
▶ A buffered bike lane is a standard bike lane paired with a delineated buffer space, which further separates the bike lane from the adjacent motor vehicle travel lane and/or parking lane, to increase bicyclist comfort. This treatment can be used on streets with excess width to provide more separation for bicyclist, or when there are high motor vehicle volumes, speed, and/or high amounts of truck traffic.

Design Guidance

- Standard bicycle bike lane (5′ to 6′) with an additional 2′ to 4′ striped buffer.
- Streets with posted speeds of 25 mph or higher.
- Locations where standard bike lanes are being considered and additional space for buffering is desired to increase cyclist comfort.

Buffered Bike Lane

Comfort Level ●●●○



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Design Guidance

- Standard bicycle bike lane (5′ to 6′) with an additional 2′ to 4′ striped buffer.
- Streets with posted speeds of 25 mph or higher.
- Locations where standard bike lanes are being considered and additional space for buffering is desired to increase cyclist comfort.

Proposed bicycle improvements are described in Table 7, which includes Project ID numbers to help locate improvements on Figure 3. The project descriptions include key benefits for use on future grant applications and strategic planning. Construction of new roadways or roadway modernizations identified in the Motor Vehicle Plan are not included in Table 5, but will include the construction of bicycle facilities appropriate to the functional classification of the street. Also, shared-use path connections and street crossing improvements that benefit bicycle transportation are listed under the Pedestrian Plan.

TABLE 7: Bicycle Facility Improvements

Project ID	Project Description	Probable Construction Costs*
BL1	**Rose St**: W 18th Ave to W 13th Ave: Bike Lanes - Roadway would need to be restriped to remove on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$65,000
BL2	**W 6th Ave**: Timothy Pl to OR 99: Bike Lanes - Need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$125,000
BL3	**W 10th Ave**: Oaklea Dr to Nyssa St: Bike Lanes - Roadway would need to be restriped to remove on-street parking. Need community feedback about utilization of existing on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$125,000
BL4	**E 6th Ave**: Front St to Birch St: Bike Lanes - Would need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$50,000
BL5	**W 10th Ave**: Nyssa St to OR 99: Bike Lanes – Would require parking removal on one side of the street to include one 8' parking aisle, 6' bike lanes, 11' travel lanes. Need community feedback about utilization of existing on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$60,000
BL6	**Birch St**: E 1st Ave to E 6th Ave: Bike Lanes - Need to restripe roadway to include 7' parking aisles, 5' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity***	$65,000
BL7	**Bailey Ln**: Pitney Ln to Prairie Rd: Bike lane on north side and south side. ***Key Benefits: Bicycle Connectivity***	$105,000
BL8	**10th Street:** Highway 99 to Deal Street-Restripe roadway to provide bike lanes. Would require the removal of on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$20,000
BL9	**18th Street:** Widen Rodway to provide bike lanes on both sides of the roadway. Alternatively, a shared use path could be constructed on the north side. ***Key Benefits: Bicycle Connectivity***	$1,500,000
BL10	**Hatton Lane:** Prairies Road to Highway 999. Provide striped bike lanes as part of the roadway reconstruction and connection. ***Key Benefits: Bicycle Connectivity***	$5,000
BVD1	**Kalmia Street:** Shared Lane Markings and traffic calming techniques on Kalmia Street from 14th Street to 3rd Street as appropriate to create a bicycle boulevard with low volume and low speed motor vehicle use ***Key Benefits: Bicycle Connectivity***	$45,000

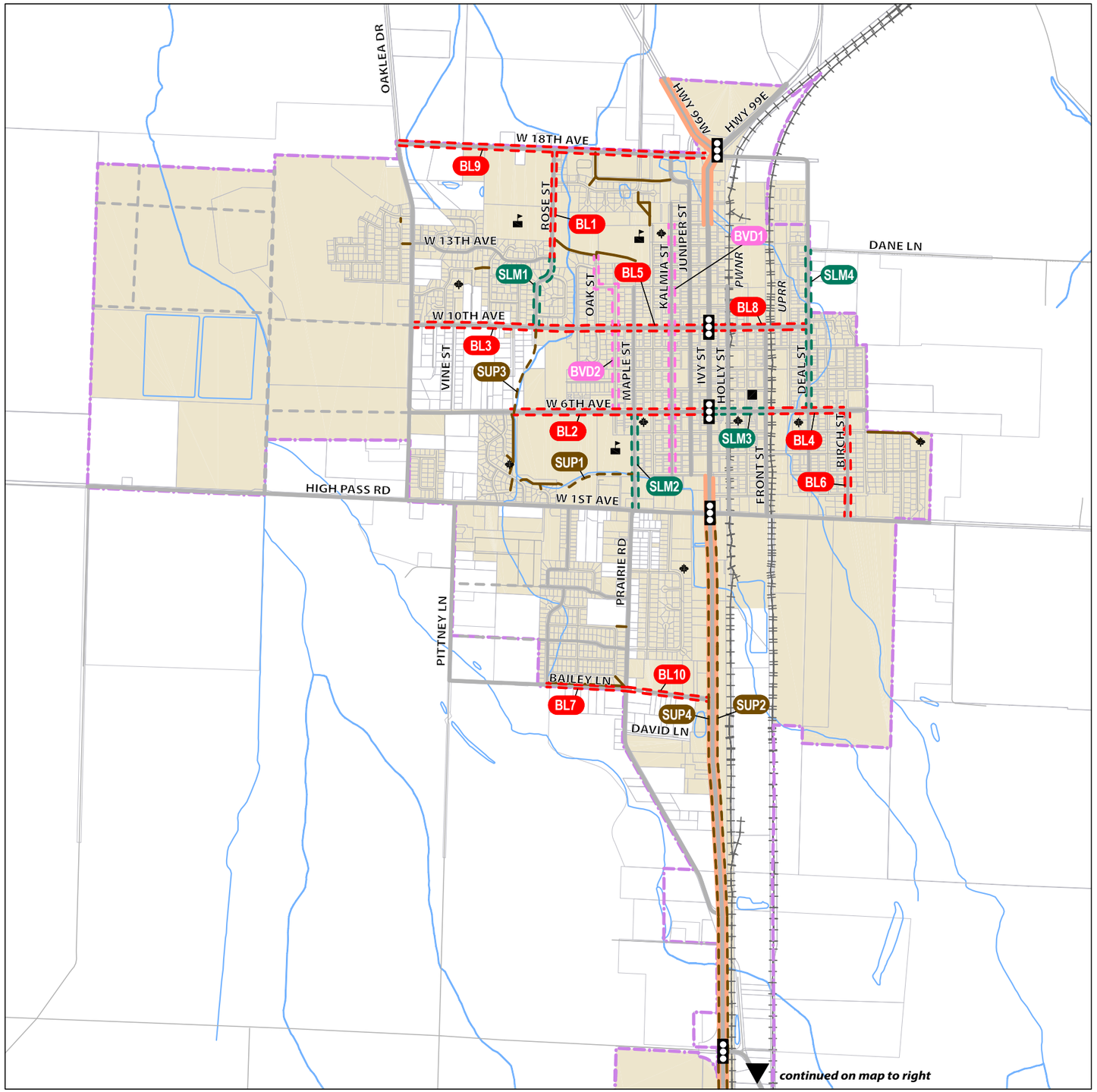
BVD2	**Nyssa St/Oak St**: Laurel Elementary School to W 6th Ave: Install Shared Lane Markings and traffic calming techniques as appropriate to create a bicycle boulevard with low volume and low speed motor vehicle use. Alignment would run north on Nyssa St from W 6th Ave, cross W 10th Ave, turn west on W 12th Ave, and turn north on Oak St to connect to the shared-use path at Laurel Elementary School. Consider installing an All-Way stop at the intersection on W 10th Ave with Nyssa St and crossing enhancements at the intersection on W 6th Ave with Nyssa St. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$45,000
SLM1	**Rose St**: W 13th Ave to W 10th Ave: Shared-Lane Markings - Existing on-street parking is actively used. Supplemental warning signs should be installed leading into the curve. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$5,000
SLM2	**Maple St**: W 6th Ave to W 1st Ave: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$10,000
SLM3	**E 6th Ave**: OR 99 to Front St: Shared-Lane Markings – Traffic volumes are higher than preferred, but speeds are low. Recommend converting angled on-street parking to parallel parking to enhance cyclist visibility. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$5,000
SLM4	**Deal St**: E 6th Ave to Dane Ln: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity***	$15,000
	Total Cost	**$2,298,000**

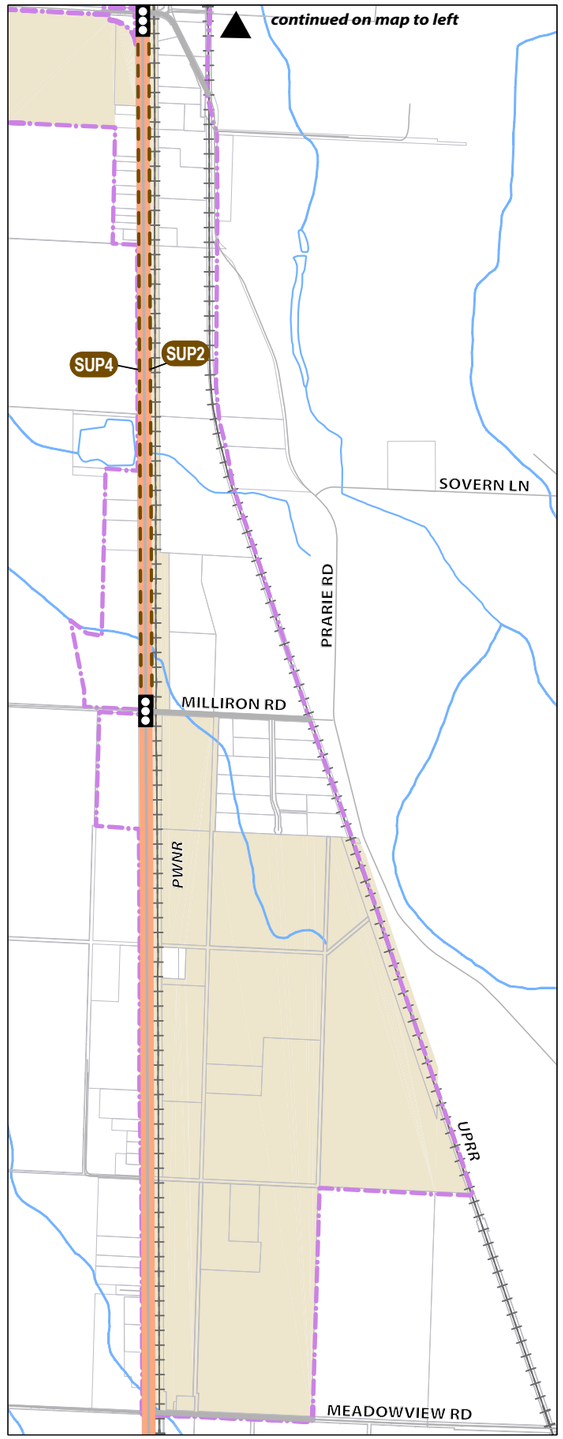
* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

Junction City
Transportation System Plan

FIGURE 3

Proposed Bicycle Network Improvements





Legend

Network Improvments
- SHARED LANE MARKINGS (SLM)
- BIKE LANE (BL)
- SHARED USE PATH (SUP)
- BIKE BOULEVARD (BVD)
- XX BICYCLE PROJECT NUMBER

Existing Bicycle Facilities
- SHOULDERED BIKE LANE
- SHARED USE PATH
- TRAFFIC SIGNAL

Roadways
- *ARTERIAL*
- *MAJOR COLLECTOR*
- *MINOR COLLECTOR*
- *LOCAL*
- *CITY LIMITS*
- *URBAN GROWTH BOUNDARY*
- *TAX LOTS*
- *RAILROAD*
- *STREAM*

Places of Interest
- *CITY HALL*
- *PARK*
- *PUBLIC SCHOOL*

N W E S

0 1000 2000 Feet

Tech Memo #4-Update

Appendix

DKS

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Portland, OR 97205
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Technical Memorandum #4

DATE: October 25, 2013

TO: Project Management Team

FROM: John Bosket, PE
Mat Dolata, PE, PTP
Kristin Svicarovich, EIT

SUBJECT: **Technical Memorandum #4**
Junction City Transportation System Solutions P09042-010

The following memorandum identifies recommended transportation system solutions to address future transportation needs that were identified in the previous evaluation of existing and future conditions (Chapters 3 and 4, respectively). The projects and strategies described were developed through feedback received from the Project Management Team, Technical Advisory Committee, Citizen Advisory Committee, and the general public.

The range of solutions provided is intended to help the city take a balanced approach to enhancing and managing the transportation system in the future. This includes transportation system management practices to extend the life of investments made in transportation infrastructure, projects to improve the motor vehicle, bicycle, and pedestrian systems, policies to support a growing transit system, and transportation demand management options to reduce single occupancy motor vehicle travel.

This TSP, including the project lists, does not have any legal or regulatory effect on land or transportation facilities that the City does not own. Although evaluation and proposed improvements of non-City facilities are included, the TSP does not obligate its governmental partners to take any action or construct any projects. Without additional action by the governmental entity that owns the subject facility or land (e.g., Lane County, ODOT) any project that involves a non-City facility is merely a recommendation. As in most facility planning efforts, moving towards a well- connected network depends on the cooperation of multiple jurisdictions. The TSP is intended to facilitate discussions between the City and its governmental partners to work together to achieve transportation system goals and objectives.

MOTOR VEHICLE SYSTEM IMPROVEMENTS

Transportation System Management

Transportation System Management (TSM) strategies extend the functional life of existing and future facilities by optimizing their ability to move people and goods in a safe and efficient manner. They are also often easier to implement because they generally have lower capital investment costs than traditional projects that build new facilities or add roadway capacity.

Street Functional Classification

Street functional classification is an important tool for managing the roadway network. It is based on a hierarchal system of roads with designated management and design requirements to achieve the type of service desired.

To be more consistent with federal and state functional classification naming conventions, it is recommended that the City update their classification designations.. Aligning the functional classification naming conventions may facilitate future efforts to obtain federal funding for local improvement projects. Therefore, the current hierarchy of Arterial, Major Collector, Minor Collector, and Local Street is recommended to be replaced by Principal Arterial, Minor Arterial, Collector Street, and Local Street.

The recommended functional classification system for roadways in Junction City is described below, including the management objectives for each class. A functional classification map is provided in Figure 1, showing the recommended classification for all roadways in the city, including new street extensions proposed as part of the motor vehicle system improvements.

Principal Arterial

Principal arterials are primary routes serving regional traffic passing through the city and connecting the city to other urban areas. They are intended to serve high volumes of traffic over long distances, typically maintain higher posted speeds, and minimize direct access to adjacent land to support the safe and efficient movement of people and goods. Inside of the urban growth boundary, speeds may be reduced to reflect the roadside environment and surrounding land uses.

Minor Arterial

Minor arterials provide service between principal arterials and collectors. They should generally be spaced approximately one mile apart to maintain citywide accessibility and reduce through traffic on collectors and local streets, which can negatively impact safety and livability. Because they primarily serve longer trips within the city, they should be provided in continuous lengths of multiple miles where feasible, not in short segments. Minor arterials typically serve higher volumes of traffic at moderate to high speeds, with posted speeds generally no lower than 30 mph. Access control is a key feature.

Collector Street

A collector street provides access and circulation within and between residential, commercial, industrial, and mixed use lands. Collector streets provide more citywide circulation while still accessing neighborhoods. They collect traffic from local streets and channel them onto the arterial system. They are intended to carry between 1,200 and 10,000 vehicles per day, including limited through traffic, at a minimum posted speed of 25 mph. The maximum interval for collector roadways should be approximately 1,500 feet. While access and mobility are more balanced than on arterials, new driveways serving single or multi-family homes should not be permitted where traffic volume forecasts exceed 5,000 vehicles per day. Variances may be granted by the Planning Commission based on existing land use and parcelization.

Local Streets

Local streets provide immediate access to adjacent land. These streets should be designed to enhance the livability of neighborhoods and should generally accommodate less than 2,000 vehicles per day. When traffic volumes reach 1,000 to 1,200 vehicles per day through residential areas, safety and livability can be degraded. A well-connected grid system of relatively short blocks can minimize excessive volumes of motor vehicles and encourage more use by pedestrians and bicyclists. Speeds are not normally posted, with a statutory 25 mph speed limit in effect.

DKS Associates TRANSPORTATION SOLUTIONS | REAL URBAN GEOGRAPHICS

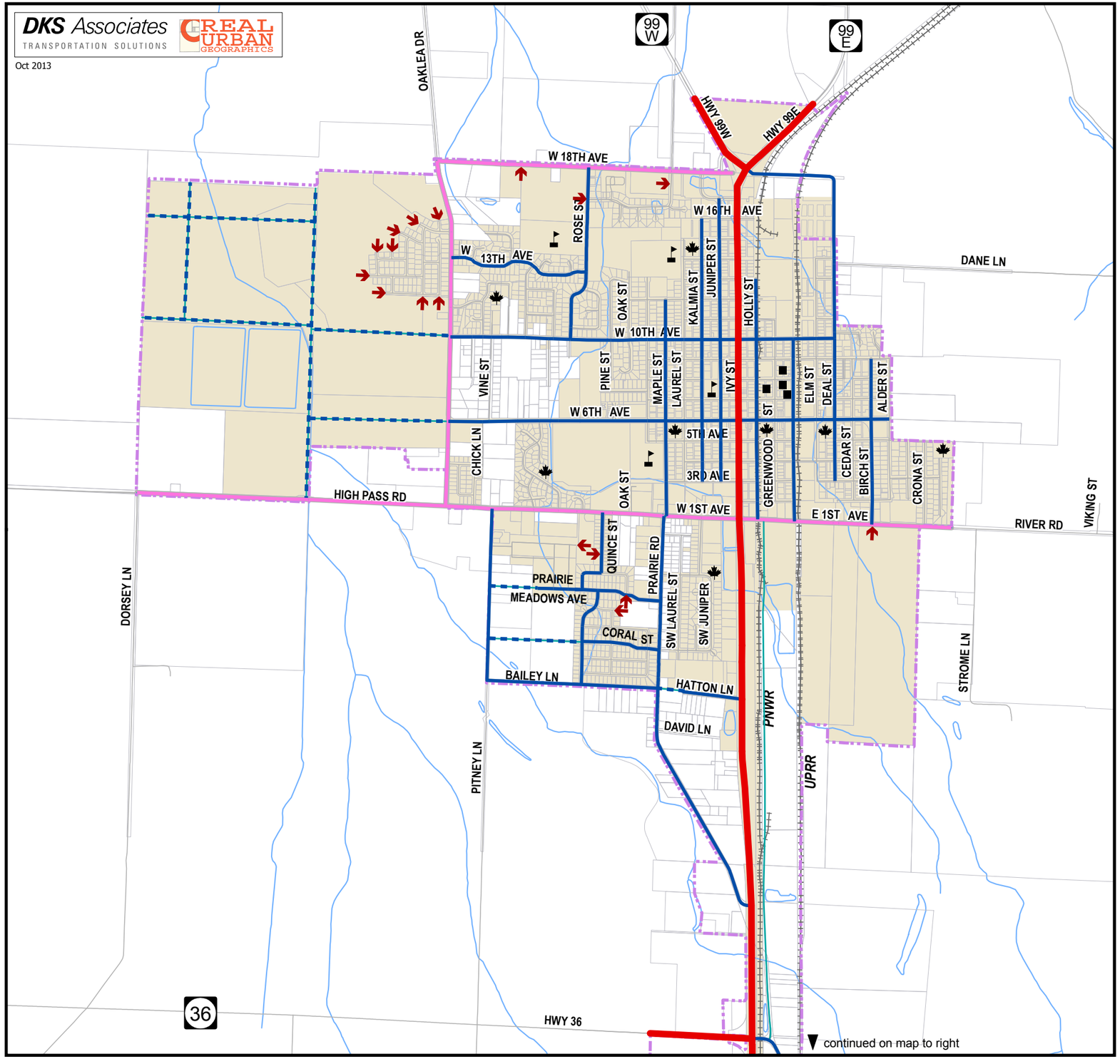
Oct 2013

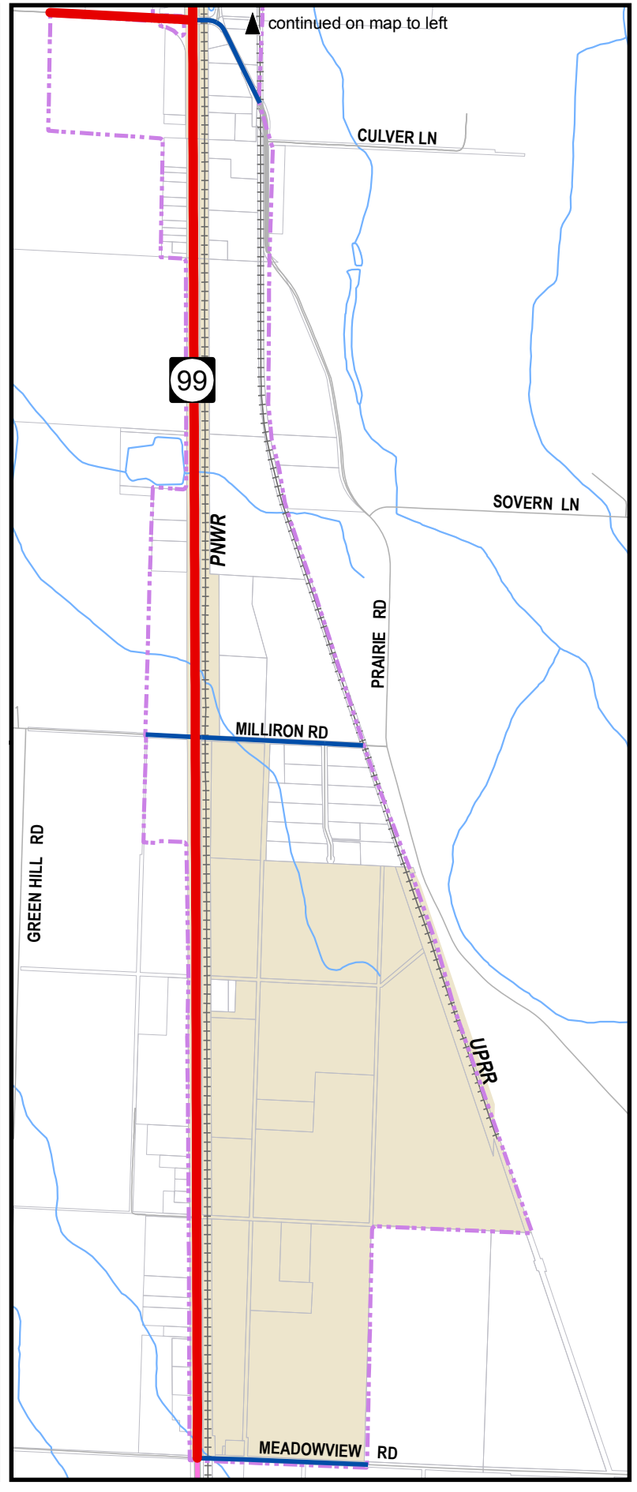
Junction City

Transportation System Plan

FIGURE 1

Proposed Future Roadways, Functional Classification, and Local Street Connectivity





Legend

Roadways

- PRINCIPAL ARTERIAL
- MINOR ARTERIAL
- COLLECTOR
- FUTURE COLLECTOR
- LOCAL
- POTENTIAL LOCAL STREET CONNECTION

Places of Interest

- CIVIC/GOV'T
- PARK
- SCHOOL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

0 1,000 2,000 Feet

Proposed Functional Classification Changes in Junction City

The following changes to street functional classifications are proposed as part of this TSP update to improve the network design and mobility within Junction City. Changes to the existing functional classifications will require coordination with ODOT to follow the formal process to update the federal classification map.

Changes to existing functional classifications:

- Milliron Road from west UGB to east UGB changes from a Local Street to a Collector Street
- Meadowview Road from west UGB to east UGB changes from unclassified to a Collector Street

Classifications applied to future roadway extensions:

- W 6th Avenue west of Oaklea Drive (Collector)
- W 10th Avenue from Oaklea Drive to west UGB (Collector)
- New north-south street west of Oaklea Drive from north UGB to High Pass Road (Collector)
- New north-south street west of Oaklea Drive from north UGB to W 10th Avenue extension (Collector)
- Prairie Meadows Avenue to Pitney Lane (Collector)
- New north-south street east of the PNWR railroad from E 1st Avenue to Prairie Road (Collector)

Typical Roadway Cross-Section Standards

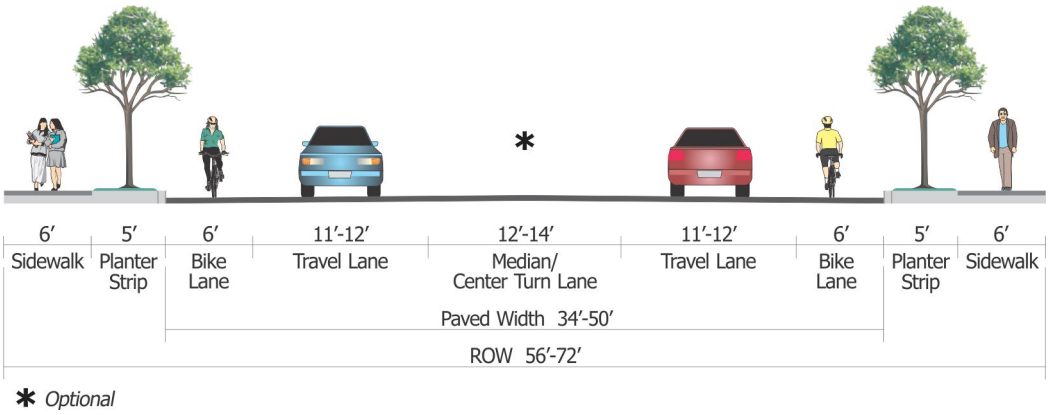
The design characteristics of city streets in Junction City were developed to meet the function and demand for each facility type. Because the actual design of a roadway can vary from segment to segment due to adjacent land uses and demands, the objective was to define a system that allows standardization of key characteristics to provide consistency, but also to provide criteria for application that provides some flexibility, while meeting the design standards.

Current street design standards identified in the Junction City Municipal Code and the Junction City Public Works minimum section engineering illustrations include inconsistencies in classification types. City street standards and classifications are also not consistent with Lane County standards. Figures 2, 3, 4, and 5 illustrate the recommended cross-sections for city minor arterials, collectors, and local streets in Junction City. The cross-section standards for minor arterials and collectors are consistent with Lane County Road Design Standards[1] except where noted. Low impact development (LID) may be accommodated in the cross-sections shown with approval from the Public Works Director.

No cross-section is provided for Principal Arterials because OR 99W, OR 99E, OR 99, and OR 36 are the only facilities with that proposed functional classification and they are under Oregon Department of Transportation (ODOT) jurisdiction. Roadways under state jurisdiction will be subject to design standards in ODOT's Highway Design Manual.

[1] Lane Code, Chapter 15, Road Design Standards, Lane County. Accessed March 15, 2013.

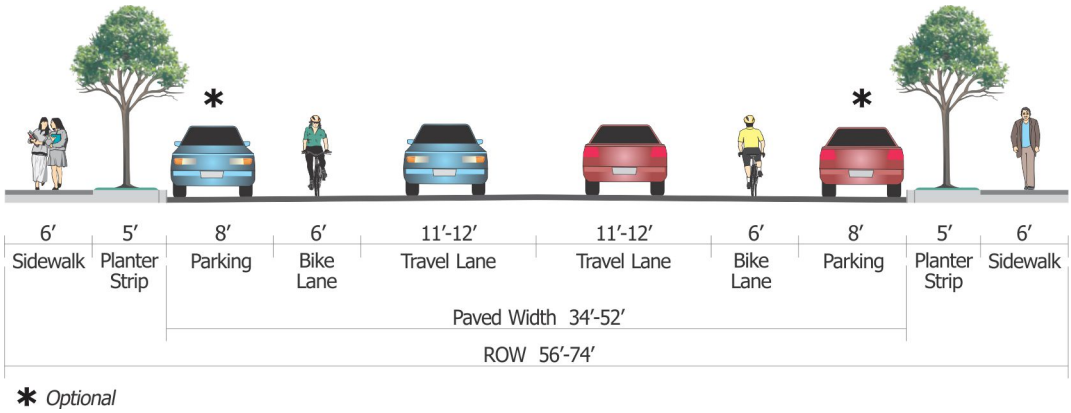
Figure 2: Minor Arterial



- The preferred width of travel lanes on minor arterials is 11 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, travel lane widths should be increased to 12 feet.
- Center left turn lane is optional depending on surrounding land use and available right-of-way.
- The preferred width of center turn lanes on minor arterials is 12 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, center turn lane widths should be increased to 14 feet.
- Minimum bike lane widths of 5 feet may be allowed in constrained areas.[2]
- On-street parking is not permitted on minor arterial streets.

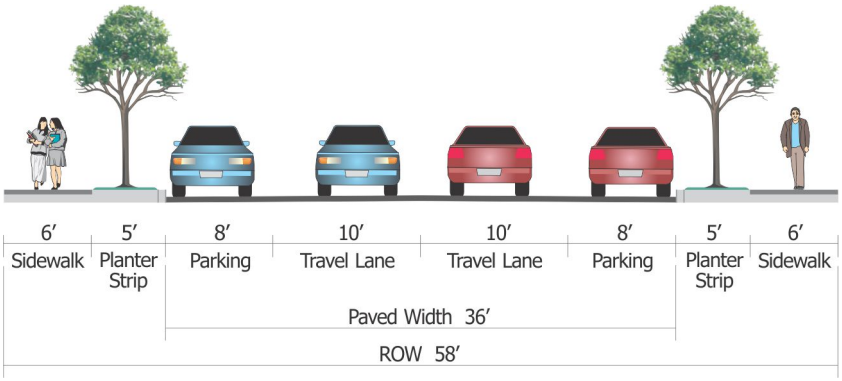
[2] For Lane County facilities, a minimum 5.5-foot bike lane width is required (Lane County 15.702(9)(a)). A 5-foot bike lane would require approval of a Deviation (Lane County 15.709) or a Variance (Lane County 15.900). For Lane County facilities, a minimum 5.5-foot bike lane width is required (Lane County 15.702(9)(a)).

Figure 3: Collector



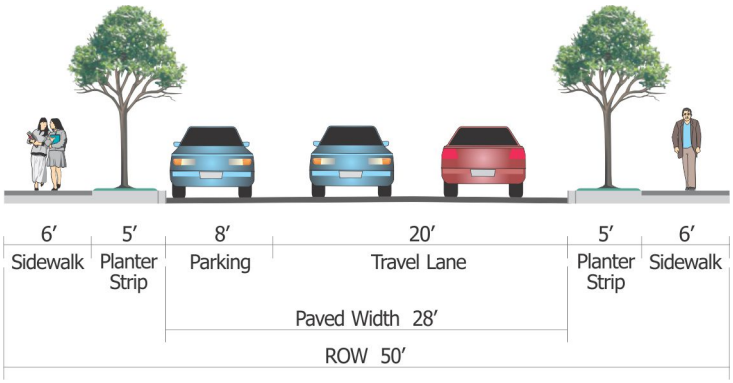
- The preferred width of travel lanes on collectors is 11 feet. In industrial areas or areas where the truck percentage of average daily traffic is 10% or more within a 12-hour period, travel lane widths should be increased to 12 feet.
- On-street parking (8-foot width) may be included where justified by a parking study.
- Minimum bike lane widths of 5 feet may be allowed in constrained areas.

Figure 4: Local Street



- Parking may be allowed on one side only in constrained areas.

Figure 5: Neighborhood Local Street



- Parking is allowed on one side of the street only.

Planning level right-of-way needs can be determined utilizing these figures. Specific dimensions for roadways with various lane and parking characteristics are detailed in Table 1 for each street classification. These street standards are compliant with the Oregon Transportation Planning Rule, which specifies that local governments limit excessive roadway widths.[3]

Under some conditions a variance to the adopted street cross-sections may be requested from the Planning Commission. Typical conditions that may warrant consideration of a variation include (but are not limited to) the following:

- Infill sites
- Innovative designs (roundabouts)
- Severe constraints presented by topography, environmental, or other resources present
- Existing developments and/or buildings that make it extremely difficult or impossible to meet the design standard

[3] OAR 660-012-0045 (7)

TABLE 1: Typical Roadway Cross-Sections

Street Type	Right-of-Way Width	Curb-to-Curb Paved Width	Within Curb-to-Curb Area				Planting Strips[B]	Sidewalks[C] [D]
			Motor Vehicle Travel Lanes	Median/ Center Turn Lanes	Bike Lanes[A]	On-Street Parking		
Minor Arterials	56'-72'	34'-50'	11'-12'	12'-14' (optional)	6'	-	5'	6'
Collectors	56'-74'	34'-52'	11'-12'	-	6'	8' (optional)	5'	6'
Local Streets	58'	36'	10'	-	-	8'	5'	6'
Neighborhood Local Streets	50'	28'	10'	-	-	8'[E]	5'	6'

Notes:
A – Minimum bike lane widths of 5' may be allowed in constrained areas.
B – Width includes 6" curb if planter strip is between curb and sidewalk.
C – Width includes 6" curb unless planter strip is between curb and sidewalk.
D – Variances may be allowed for gap infill to match existing sidewalk widths.
E – Parking allowed on one side of the street only.

Access Management

Access management is the control of access points allowed to enter arterial and collector facilities to preserve their functionality and maximize their capacity. Controlling access can reduce congestion and crash rates, providing efficient, safe, and timely travel.

On arterial and collector facilities, excessive driveways erode the capacity of the roadways as additional conflict points are introduced at each driveway location. Reducing or consolidating driveways on these main facilities can decrease collisions and preserve capacity on high volume roads thereby maintaining traffic flow and mobility within the city. Balancing access and good mobility can be achieved through various access management strategies, the first of which is establishing access management spacing standards for driveways and intersections.

Junction City Access Management Standards

Junction City has established access management regulations through the Municipal Code (Chapter 17.85). These regulations include permitting and site plan review processes, design and spacing standards, and requirements for the provision of inter-parcel circulation and joint access.

The City's current requirements for access spacing applied to the recommended functional classification system are shown below in Table 2, with spacing measured from centerline to centerline of the intersection. It is recommended that the minimum access spacing for minor arterials be increased from 150 feet to 300 feet to better support the primary objectives of providing for longer and higher speed trips. It is also recommended that the minimum access spacing requirement be increased for enhanced safety on collector streets where posted speeds are 30 mph or greater.

TABLE 2: City of Junction City Access Spacing Standards

Functional Classification	Current Minimum [a] Access Spacing (ft.)	Recommended Minimum Access Spacing (ft.)
Minor Arterial	150	300
Collector (≥30 mph)	75	150
Collector (<30 mph)	75	75
Local	25	25

[a] Source: City of Junction City Ordinance 17.85.060

New accesses shall meet or exceed these minimum spacing requirements. However, where no alternatives exist or where strict application of the standards is impractical, the City may allow variances. As part of the TSP update process, consideration should be given to whether the current variance standards (Chapter 17.85.120) should be modified. Furthermore, consideration should be given to modifying the access spacing standards in Chapter 17.85.060 to require a minimum separation of 50 feet from any access to a street corner.

Lane County and State of Oregon Access Management Standards

Both Lane County and ODOT maintain access regulations for roadways under their jurisdiction. Lane County's access regulations are documented in Lane Code Chapter 15.130 through 15.140. Access management regulations for state highways are provided through the *1999 Oregon Highway Plan* and OAR 734-051. No changes to Lane County or ODOT access regulations are proposed as part of the TSP update.

Recommended Changes for Managing Access to OR 99W, OR 99E, and OR 99

The City of Junction City and Lane County have adopted an Access Management Plan as part of the OR 99 Junction City Refinement Plan.[4] The Access Management Plan applies to OR 99W, OR 99E, and OR 99 from approximately the northern UGB to OR 36 and supersedes other access management standards.

Following the adoption of the Access Management Plan, ODOT's access management regulations have changed and some elements of the plan have been impractical to implement. In response, it is recommended that the adoption of the Access Management Plan be repealed and the following policy adopted in its place.

Access Management Policy for OR 99W, OR 99E, and OR 99

Access points to state and local roadways, in the form of private driveways and public street intersections, provide network connectivity and access to adjacent properties. However, they also introduce conflict

[4] *OR 99 Junction City Refinement Plan,* 2008.

points that can have negative impacts on safe and efficient travel. Therefore, the planning, design, and operation of access points to state and local roadways in a manner that appropriately balances the need for access and connectivity to support local development with safe and efficient operations is of interest to the City of Junction City (City), Lane County (County), and the Oregon Department of Transportation (ODOT).

The City, County, and ODOT have adopted individual policies and regulations related to access management that apply to the roadways under their respective jurisdictions within Junction City. It is expected that future decisions regarding the planning, design, and operation of access to the roadways in Junction City will be governed by the applicable regulations of each agency at the time of the decision. The City and County access-related regulations are included in each jurisdiction's zoning codes and their policies are provided in their respective comprehensive plans and TSPs. ODOT's access-related regulations are provided in OAR 734-051 and its policies are provided in the Oregon Highway Plan (OHP). Should the City have access management policies that are equal to or more restrictive than that of ODOT, those standards would be applied to developments along an ODOT facility.

Oregon Highway 99

Oregon Highway 99 is the principle roadway and carries by far the most traffic in Junction City. It also has the greatest number of access points and safety issues within the City. Because of its key role within the transportation system, the City, County, and ODOT have agreed that the following policy statements shall be considered as part of all future decisions related to access points within the Oregon Highway 99 corridor.

- Each agency shall focus on safety when making decisions regarding access to Oregon Highway 99, keeping in mind economic development needs and objectives of property is served by the access points.
- Recognize that the safety and mobility of the highway are generally improved by minimizing conflict points through actions such as reducing the number of access points and increasing the separation between them.
- The unique challenges of providing appropriate access to adjacent lands shall be considered. Specific examples include:

    Oregon Highway 99 from 18th Avenue to 1st Avenue

    This segment of the corridor is characterized by lower posted speeds (30 mph), a comprehensive grid system of local streets creating intersections on the highway every 300 feet, the presence of parallel alleys, and fully developed general commercial land uses on small lots. It also serves as a principal commercial corridor through the city. There are many constraints that may make the reduction of access points impractical in some areas. Nonetheless, as land uses change and properties reconfigure, and within the framework of the local code and OAR 734-051, ODOT and the City shall collaborate to identify opportunities for consolidating or sharing access points and developing cross easements that reduce the need for travel on Oregon Highway 99.

Oregon Highway 99 from 1st Avenue to Meadowview Road

This segment of the corridor is characterized by higher posted speeds (45 to 55 mph), a mix of adjacent commercial and industrial land, and as a transition area between the urban and rural areas. The larger lots and higher potential for redevelopment may provide new opportunities to minimize conflicts on the highway through actions such as consolidating access, establishing shared access points, developing cross easements, and constructing parallel streets connecting to lower classified roadways. In consideration of the higher travel speeds that could result in higher severity collisions, opportunities to minimize access points shall be explored by the City, County, and ODOT when considering access changes.

Traffic Signal Coordination and Optimization

The coordination and optimization of traffic signals along key corridors can substantially reduce congestion and travel time, while increasing travel speeds for those traveling along the mainline corridor. Signals along OR 99 are currently coordinated, and any new or improved signal along OR 99 within Junction City shall be added to the coordinated system.

Traffic signal spacing plays a significant role in the ability to successfully coordinate signal timing to achieve efficient progression of traffic. While no new traffic signals are currently planned within the city, should a new signal be proposed, the signal spacing guidance provided in Table 3 should be used to determine appropriate placement.

For proposed signals on ODOT facilities, approval will need to be acquired from ODOT prior to installation. ODOT signal spacing policy identifies a desirable distance of at least ½ mile between signals unless an engineering investigation demonstrates that another distance would be appropriate. For proposed signals on Lane County facilities, approval will also need to be acquired from Lane County prior to installation.

TABLE 3: Optimum Signalized Intersection Spacing for Efficient Traffic Progression

Cycle Length (seconds)	Speed (miles per hour)						
	25	**30**	**35**	**40**	**45**	**50**	**55**
60	1,100 ft	1,320 ft	1,540 ft	1,760 ft	1,980 ft	2,200 ft	2,430 ft
70	1,280 ft	1,540 ft	1,800 ft	2,050 ft	2,310 ft	2,500 ft	2,820 ft
80	1,470 ft	1,760 ft	2,050 ft	2,350 ft	2,640 ft	2,930 ft	3,220 ft
90	1,630 ft	1,980 ft	2,310 ft	2,640 ft	2,970 ft	3,300 ft	3,630 ft
120	2,200 ft	2,640 ft	3,080 ft	3,520 ft	3,960 ft	4,400 ft	4,840 ft

Source: Technical Guidelines for the Control of Direct Access to Arterial Highways – Volumes I and II, Federal Highway Administration (FHWA-RD-76-86).

Neighborhood Traffic Management

Neighborhood Traffic Management (NTM) is used to describe strategies that neighborhoods can deploy to slow down traffic and potentially reduce volumes, creating a more inviting environment for pedestrians and bicyclists. NTM strategies typically include traffic calming techniques to improve neighborhood livability on local streets.

Mitigation measures for neighborhood traffic impacts must balance the need to manage vehicle speeds and volumes with the need to maintain mobility, circulation, and function for service providers (e.g., emergency response). Table 4 lists common NTM applications with a corresponding photo log included in the appendix. Any NTM project should include coordination with emergency response staff to ensure public safety is not compromised. NTM strategies implemented on a state freight route will require consideration and input from ODOT concerning freight mobility.

Lane County does not have a policy to allow NTM strategies. If Junction City is willing and able to undertake the research, outreach, design, construction, and maintenance required for these facilities, the County may allow the identified improvements on their roadways. Any improvements to or alternations of County facilities requires review and approval by the County.

TABLE 4: Summary of Neighborhood Traffic Management Strategies

NTM Application	Use by Function Classification			Impact	
	Arterial	Collector	Local	Speed Reduction	Traffic Diversion
Chicanes			✓	✓	✓
Chokers			✓	✓	✓
Curb Extensions	✓	✓	✓	✓	
Diverters (with emergency vehicle pass-through)		✓	✓		✓
Median Islands	✓	✓	✓	✓	
Raised Crosswalks			✓	✓	✓
Speed Cushions (with emergency vehicle pass-through)			✓	✓	✓
Speed Hump			✓	✓	✓
Traffic Circles			✓	✓	✓

Junction City currently does not have a formal neighborhood traffic management program. If such a program were desired to help respond to future issues, suggested elements include:

- Provide a formalized process for citizens who are concerned about the traffic on their neighborhood street. The process could include filing a citizen request with petition signatures and a preliminary evaluation. If the evaluation finds cause for concern, a neighborhood meeting would be held and formal data would be collected and evaluated. If a problem is found to exist, solutions would be identified and the process continued with neighborhood meetings, feedback from service and maintenance providers, cost evaluation, and traffic calming device implementation. Six months after implementation the device would be evaluated for effectiveness.
- For land use proposals, in addition to assessing impacts to the entire transportation network, traffic studies for new developments must also assess impacts to residential streets. A recommended threshold to determine if this additional analysis is needed is if the proposed project increases through traffic on residential streets by 20 or more vehicles during the evening peak hour or 200 vehicles per day. Once the analysis is performed, the threshold used to determine if residential streets are impacted would be if their daily traffic volume exceeds 1,200 vehicles.

Potential Speed Reductions

Safety concerns related to roadway speeds throughout Junction City have been expressed by the Junction City Police Department and community members. Corridors of concern include:

- Prairie Road between 1st Avenue and OR 99
- Bailey Lane
- Pitney Lane
- 1st Avenue between Prairie Road and Oaklea Drive
- 18th Avenue between OR 99 and Oaklea Drive
- OR 99E and OR 99W headed southbound approaching Junction City
- OR 99 between W 1st Avenue/River Road and OR 36

While changing roadway speed limits cannot be accomplished through this TSP update, it is recommended that speed studies be undertaken as necessary to address the concerns of the community.

Local Street Connectivity

Local street connectivity is required by the state Transportation Planning Rule (OAR 660-012) and is important for the continued development of Junction City. Providing adequate connectivity can reduce the need for wider roads, traffic signals, and turn lanes. Increased connectivity can reduce a city's overall vehicle miles traveled (VMT), balance the traffic load on major facilities, encourage citizens to seek out other travel modes, and reduce emergency vehicle response times. Improvement to local street connectivity is easier to implement in newly developing areas, however, retrofitting existing areas to provide greater connectivity should also be attempted.

The existing street connectivity in Junction City varies as the network gets further away from the downtown core. The downtown area is well developed with a connected grid system, which is only limited in some locations near the Portland & Western and Union Pacific Railroads on the east side of OR 99. Many of the newer

neighborhoods outside of the downtown core have been designed to provide good street connectivity, but some neighborhoods in the area between Maple Street, 1st Avenue, Oaklea Drive, and 18th Avenue have been designed with many dead-end streets.

Figure 1 shows a Local Street Connectivity Plan and specifies the general locations where new local street connections should be installed as areas continue to develop. The connection locations are approximate and were located to reduce neighborhood impacts by balancing traffic on neighborhood routes. Locations were also selected considering the Goal 5 resources and efforts were made to avoid impacting environmental features, topography, and the existing built environment.

As future develop occurs, such as in the undeveloped residential land in the northwest corner of Junction City, and in the undeveloped industrial land to the south along the east side of OR 99, the local street network should be designed to maintain good connectivity where feasible. In planning for future development, the following objectives should be applied.

- In residential zones, a block pattern that supports good pedestrian connectivity should be maintained; the maximum block length and perimeter should not exceed 600 feet and 1,600 feet.
- In industrial zones, large blocks may be necessary to support industrial development; no maximum block length or perimeter should be established, except where new collector or arterial roadways are planned.
- In all other zones, the maximum block length and perimeter should not exceed 800 feet length and 2,600 feet perimeter, respectively.
- Pathways (for pedestrians and bicycles) should be provided at or near mid-block where the block length exceeds 600 feet in length. Pathways should also be provided where cul-de-sacs or dead-end streets are planned, to connect the ends of the streets together, to other streets, and/or to other developments, as applicable.
- Dead-end streets or cul-de-sacs should be no more than 200 feet long and should only be used when environmental or topographical constraints, existing development patterns, or compliance with other standards in the city's code preclude street extension and through circulation.

To protect existing neighborhoods from the potential traffic impacts caused by extending stub end streets, the design and construction of connector roadways should evaluate if neighborhood traffic management strategies are necessary. In addition, when a development constructs stub streets, the city should require the installation of signs indicating the potential for future connectivity to increase awareness of residents.

Motor Vehicle Projects

The following section presents transportation improvement projects to address motor vehicle travel needs. Four categories of motor vehicle projects have been identified for Junction City:

- **New Roadway or Roadway Extension**: Key new roadway connections are identified that provide improved connectivity and access, especially for developing areas.
- **Roadway Modernization**: This includes upgrading roadways to current standards that may include wider lanes, shoulders, curbs, sidewalks, bicycle facilities, or turn lanes. The functional right-of-way is typically

widened to accommodate enhancements to the travel facilities, but actual right-of-way changes and potential property acquisitions vary by location.

- **Safety Improvements**: Improvements are suggested for locations where safety concerns have been identified.
- **Traffic Operations Improvement**: Improvement projects have been identified for locations where motor vehicle delays are expected to be most significant in 2035.

Recommended projects are described in Table 5, and located in Figure 6. It should be noted, that for local roads or neighborhood local streets, the applicable design standard of Junction City shall apply to County Roads functionally classified as Local Roads. In the absence of city standards, the County's road standards shall apply.[5] For all discrepancies between the Junction City road standards and the Lane County road standards on collector and arterial facilities, the City may submit a Deviation Application for those discrepancies. The Lane County Engineer will then review the Deviation Application and determine if an alternate design standard can be approved. This process will be required on a project by project basis.

TABLE 5: Proposed Motor Vehicle Improvements

Project ID	Roadway	Project Limits	Probable Construction Costs##	Project Description
New Roadways/Roadway Extensions				
MV1	6th Avenue	Oaklea Drive to west	$4,187,500	Extend 6th Avenue as a new Collector Street from Oaklea Drive to new north-south Collector Street (see MV5)
MV2	10th Avenue	Oaklea Drive to west	$10,098,000	Extend 10th Avenue as a new Collector Street from Oaklea Drive to west UGB
MV3	New Collector Street	North UGB to 10th Avenue	$5,558,000	Construct new Collector Street extending from the North UGB to 10th Avenue
MV4	New Collector Street	North UGB to High Pass Road	$11,731,500	Construct new Collector Street west of Oaklea Drive extending from the North UGB to High Pass Road

[5] See Lane County Code 15.704 (Urban Local Street Standards).

Project ID	Roadway	Project Limits	Probable Construction Costs[##]	Project Description
MV5	New Collector Street	West UGB to MV4	$6,379,500	Construct new Collector Street from west UGB to MV4
MV6	New Frontage Road east of PNWR railroad	1st Avenue to Prairie Road	$16,534,000	Construct to Collector standards between PNWR and UP railroads
MV7	Prairie Meadows Avenue	Extend west to Pitney Lane	$1,437,000	Construct to Collector standards including bike lanes and sidewalks
MV8	Coral Street	Extend west to Pitney Lane	$2,335,000	Construct to Collector standards including bike lanes and sidewalks
MV9	Hatton Lane	Extend west to Prairie Road	Phase 1: $207,500 Phase 2: $655,000	Phase 1: Acquire right-of-way for Hatton Lane extension to Prairie Road, and construct a pedestrian and bicycle connection. Phase 2: Extend Hatton Lane as a new Collector Street connecting Prairie Road to OR 99
Roadway Modernizations				
MV10	Meadowview Road	OR 99 to East UGB	$2,476,500	Construct to Collector standards including bike lanes on both sides and sidewalk only on the north side
MV11	Oaklea Drive[#]	18th Avenue to 1st Avenue/High Pass Road	$7,191,000	Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks
MV12	1st Avenue/High Pass Road*[#]	Oaklea Drive to OR 99	$8,143,500	Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks. Includes western most section located inside of the UGB

Project ID	Roadway	Project Limits	Probable Construction Costs[##]	Project Description
MV13	1st Avenue/River Road[#]	OR 99 to East UGB	$4,269,500	Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks
MV14	6th Avenue[#]	Oaklea Drive to Timothy Street	$1,732,000	Construct to Collector standards including bike lanes and sidewalks
MV15	18th Avenue[#]	Oaklea Drive to Juniper Street	$2,585,500	Construct to Minor Arterial standards including bike lanes on both sides and sidewalk only on the south side (no center turn lane)
MV16	18th Avenue[#]	OR 99 to East UGB	$1,622,000	Construct to Collector standards including bike lanes and sidewalks
MV17	Prairie Road[#]	1st Avenue to Bailey Lane	$3,729,000	Construct to Collector standards including bike lanes and sidewalks
MV18	Prairie Road[#]	Bailey Lane to OR 99	$4,415,000	Construct to Collector standards including bike lanes and sidewalks. Do not construct sidewalks where adjacent to UGB
MV19	Prairie Road[#]	OR 99 to East UGB	$1,726,500	Construct to Collector standards including bike lanes and sidewalks
MV20	Pitney Lane[#]	1st Avenue/High Pass Road to Bailey Lane	$2,663,000	Construct to Collector standards including bike lanes on both sides and sidewalk only on the east side (no center turn lane)
MV21	Milliron Road[#]	West UGB to East UGB	$2,102,000	Construct to Collector standards including bike lanes and sidewalks
Safety Improvements				
MV22	Oaklea Drive	Oaklea Drive/ 18th Avenue intersection	$55,000	Improve sight distance for northbound approach

Project ID	Roadway	Project Limits	Probable Construction Costs[##]	Project Description
MV23	6th Avenue Access Improvements	OR 99 to Holly Street	$4,000	Access improvements along 6th Avenue to reduce potential conflicts
MV24	Restripe 6th Avenue	OR 99 to Front Street	$10,500	Convert from front-facing angle parking to parallel parking to provide consistent center-line
MV 25	OR99 Traffic Signal Upgrades	OR99E/OR99W, OR99/OR36, and OR99/Milliron Road	$8,000	Upgrade signal head backplates with retroreflective borders. The remaining signal head upgrades are captured under the crossing improvement projects for the signals at OR99/10th, OR99/6th, and OR99/1st
Traffic Operations Improvements				
MV26	Intersection Improvement**	Maple Road/Prairie Road and 1st Avenue intersection	$796,000	Realign north and south approaches of intersection and add left turn lanes on all approaches
MV27	OR 99 Traffic Signal Optimization	OR 99E/OR 99W junction to Milliron Road	$28,000	Periodically review traffic signal timings along OR 99 to optimize operations as needed to respond to changes in traffic volumes
Proposed Motor Vehicle Improvements Project Total			**$100,606,000**	

*Impacts to historical cemetery must be considered in any widening plans along High Pass Road.

**Southbound approach (Maple Street) traffic operations perform at LOS E as a 2-way stop, exceeding the Junction City mobility standard of LOS D. Several mitigations were considered to address the forecasted mobility deficiency. An all-way stop, a southbound right-turn lane, and adding left-turn pockets on 1st Avenue would not improve performance enough to reach LOS D. To reach LOS D for the southbound turn (from Maple Street), 1st Avenue would need to be reconstructed to include a two-way center left-turn lane.

[#]Identified in Lane County TSP

[##]Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

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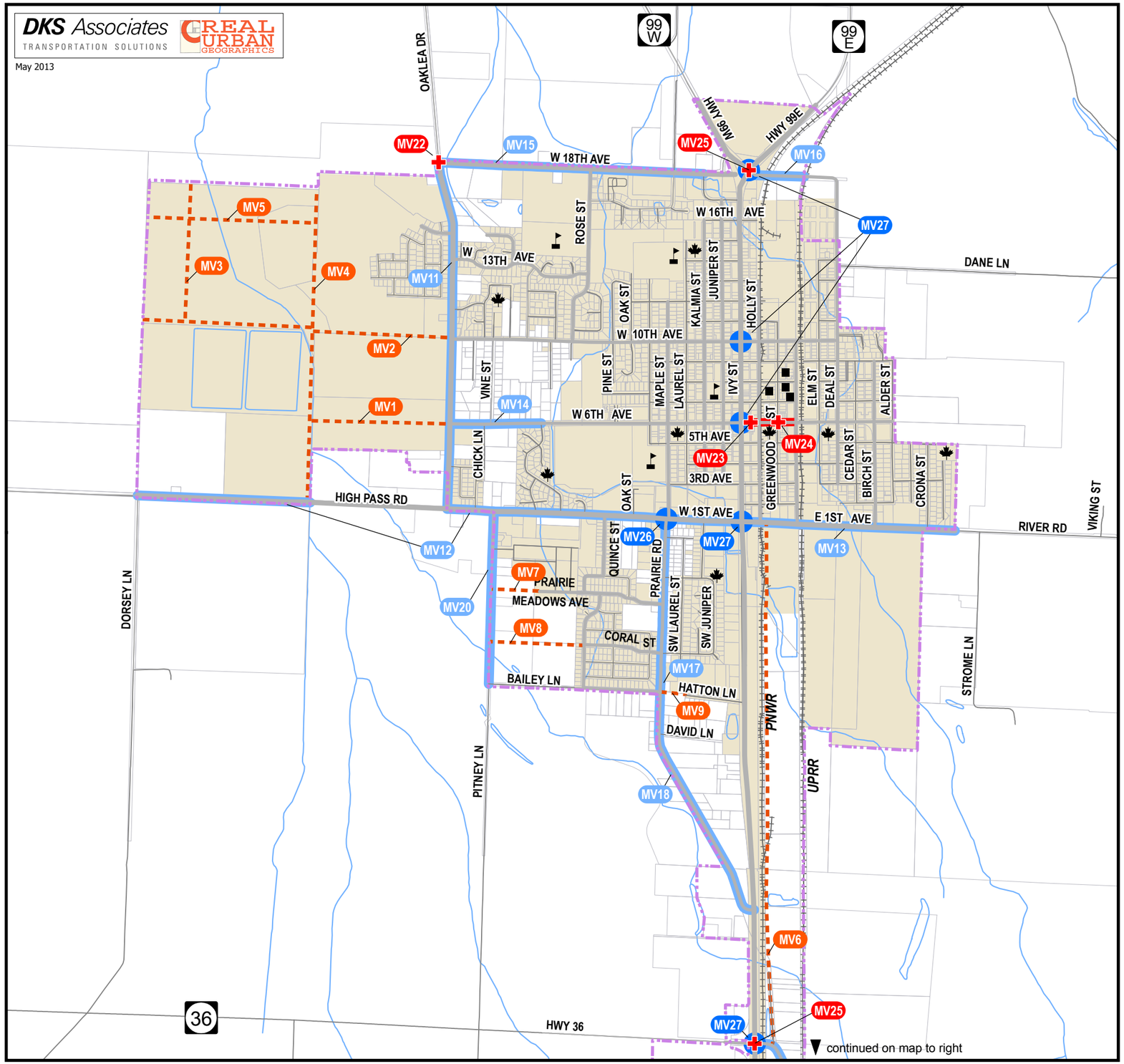
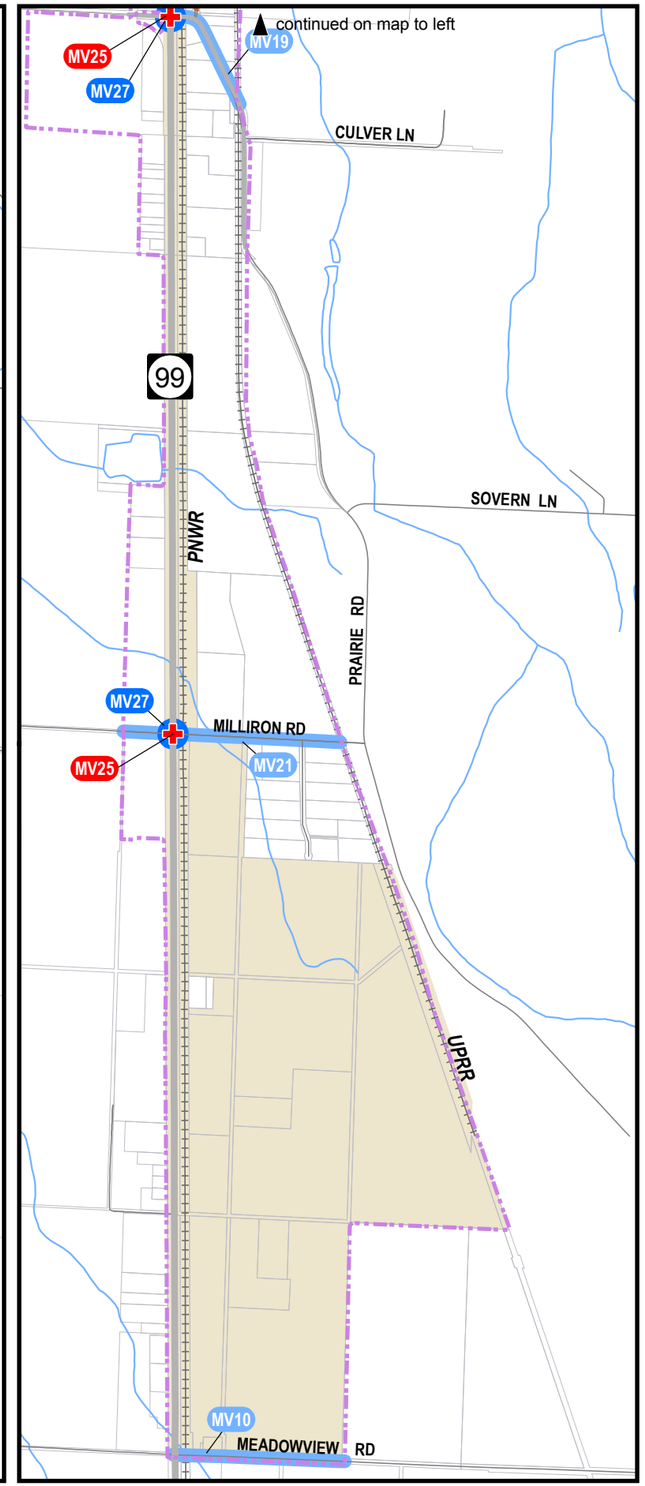
May 2013





Junction City

Transportation System Plan

FIGURE 6

Proposed Motor Vehicle Network Improvements

Legend

- XX — MOTOR VEHICLE PROJECT NUMBER

Network Improvements

- ROADWAY MODERNIZATION
- NEW ROADWAYS/ ROADWAY EXTENSIONS
- SAFETY IMPROVEMENTS
- TRAFFIC OPERATIONS IMPROVEMENTS

Places of Interest

- CIVIC/GOV'T
- PARK
- SCHOOL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

0 1,000 2,000 Feet

Transportation Demand Management

Transportation Demand Management (TDM) describes actions intended to remove single occupancy vehicle trips from the roadway network during peak travel demand periods. The goal of TDM is to reduce vehicle miles traveled (VMT) and promoting alternative modes of travel. Shifting peak travel demands on roadways means that the existing roadway capacity can be used more efficiently, which could mean that Junction City may avoid or delay building new or wider roads. A wide variety of TDM strategies exist, and it's important to tailor those strategies to meet the needs of a smaller urban community.

It is recommended that Junction City require the implementation of TDM strategies for all new employers of 100 workers or more. TDM strategies should also be considered as an alternative to constructing capacity improvements to mitigate impacts from proposed development where the improvements would be cost prohibitive or result in undesirable impacts to adjacent land.

Table 6 is a list of potential TDM strategies the city should consider implementing as needed, including descriptions of their potential for trip reduction during peak travel periods.

TABLE 6: Potential Transportation Demand Management Strategies

Strategy	Description	Potential Trip Reduction
Telecommuting	Employees perform regular work duties at home rather than commuting from home to work. This may be full time or on selected work days. This can require computer equipment to be most effective.	82-91% (Full Time) 14-36% (1-2 Days/Week)
Compressed Work Week	Schedule where employees work their regular scheduled number of hours in fewer days per week.	7-9% (9 day/80 hr) 16-18% (4 day/40 hr) 32-36% (3 day/36 hr)
Transit Pass Subsidy	For employees who take transit to work on a regular basis, the employer pays for all or part of the cost on a monthly transit pass.	19-32% (Full subsidy of cost, high transit service) 4-6% (Full subsidy of cost, medium transit service) 0.5-1% (Full subsidy of cost, low transit service) 10-16% (Half subsidy of cost, high transit service) 2-3% (Half subsidy of cost, medium transit service) 0-0.5% (Half subsidy of cost, low transit service)
Reduced Cost or Preferential Parking for HOVs	Parking costs charged to employees are reduced for carpools and or vanpools. Employer provides reserved prime location parking spots for HOV commuters.	1-3%

Strategy	Description	Potential Trip Reduction
Alternate Mode Subsidy	For those employees that commute to work by a mode other than driving alone, the employer provides a monetary bonus to the employee.	21-34% (Full subsidy, high transit service) 5-7% (Full subsidy, medium transit service) 1-2% (Full subsidy, low transit service) 10-17% (Half subsidy, high transit service) 2-4% (Half subsidy, medium transit service) 0.5-1% (Half subsidy, low transit service)
On-Site Services	Provide services at the work site that are frequently used by the employees of that work site. Examples include cafes/restaurants, dry cleaners, day care centers, and bank machines.	1-2%
Bicycling Program	Provides support services to those employees that bicycle to work. Examples include: safe/secure bicycle storage, shower facilities, and subsidy of commute bicycle purchase.	0-10%
On-Site or Public Rideshare Matching for Carpools and Vanpools	On-Site: Employees who are interested in carpooling or vanpooling provide information to a transportation coordinator on staff regarding their work hours, availability of a vehicle and place of residence. The coordinator then matches employees who can reasonably rideshare together. Public: Public entity (city, transit agency, region, state) provides an interactive website for carpool matching.	1-2% (Without support strategies) 6-8% (With support strategies)
Provide Vanpools	Employees that live near each other are organized by their employer into a vanpool for their trip to work. The employer may subsidize the cost of operation and maintain the van.	15-25% (Company-provided vans with a fee) 30-40% (Company-subsidized vans)
Gifts/Awards for Alternative Mode Use	Employees are offered the opportunity to receive a gift or an award for using modes other than driving alone.	0-3%
Employer Bus	Employer provides a bus service specifically to transport employees to work.	3-11%
Walking Program	Provide support services for those who walk to work. This could include buying walking shoes or providing lockers and showers.	0-3%
Time Off with Pay for Alternative Mode Use	Employees are offered time off with pay as an incentive to use alternative modes.	1-2%
Company Cars for Business Travel	Employees are allowed to use company cars for business-related travel during the day.	0-1%
Guaranteed Ride Home Program	A company owned or lease vehicle or taxi fare is provided in the case of an emergency for employees that use alternative modes.	1-3%

Source: Employee Commute Options (ECO) Sample Trip Reduction Plan, Oregon Department of Environmental Quality, 2006.

In addition to providing transit service to Junction City, Lane Transit District provides both carpooling and vanpooling as alternative transportation options as part of their Point2Point initiative.[6] Carpooling can also be realized through a program called Drive less. Connect.[7], which helps to match those people interested in carpooling. Valley VanPool is a service provided by the combined efforts of Cascades West Rideshare, Cherriots Rideshare, and Lane Transit District's Commuter Solutions Program. Currently Valley VanPool has 41 routes traversing all across the Willamette Valley.[8]

For larger employers, scheduling shift changes to minimizing traffic impacts during peak travel periods can also be a very effective TDM strategy. An example would be maintaining regular working hours from 7 a.m. to 4 p.m. when the peak travel period of the city is closer to 5 p.m.

PEDESTRIAN FACILITY IMPROVEMENTS

Future pedestrian needs in Junction City were identified by evaluation of the existing pedestrian network. Visits to the field by the project team, feedback from both the Technical Advisory Committee (TAC) and the Project Management Team (PMT), comments provided by community members at the open house, and identification of deficiencies through the existing conditions effort, have all contributed to the list of pedestrian facility improvements. Some of the general deficiencies identified in the pedestrian system include:

- Lack of sidewalks and/or sidewalk gaps on arterial and collector streets in areas outside of the downtown grid network;
- Lack of sidewalks along key school routes;
- Lack of ADA accessible curb ramp and/or sidewalk construction outside of the downtown grid network that makes access difficult for persons with disabilities;
- Need for enhanced crossing treatments at busy non-signalized intersections;
- Need for enhanced crossing treatments at signalized intersections;
- Lack of key shared use path connections near school routes.

Improvements to the pedestrian network include sidewalk infill and new sidewalk construction projects, shared use path connections, and intersection crossing improvements. Sidewalk infill and new sidewalk construction projects are listed in Table 7 and can be seen on Figure 7. New roadways and roadway modernization projects identified in the motor vehicle section of this document are not included in Table 7, but will include construction of sidewalk or pedestrian facilities appropriate to the street classification of the roadway.

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[6] Point2Point June 19, 2013. Web address: http://www.point2pointsolutions.org/
[7] Drive less. Connect. October 18, 2012. Web address: http://drivelessconnect.com/.
[8] Valley VanPool. October 18, 2012. Web address: http://www.valleyvanpool.info/vanpool.htm.

Many pedestrian projects also benefit bicycle transportation, such as shared-use path connections and point crossing intersection improvements. These shared pedestrian and bicycle improvements are included in the Pedestrian Facility Improvements section, but will affect both modes.

As part of the existing conditions evaluation, ramp locations not meeting ADA requirements were identified along roadways with functional classifications above collector status. All new projects must install ADA compliant facilities and any updates to existing infrastructure should bring existing facilities up to current standards.

It should be noted, that for local roads or neighborhood local streets, the applicable design standard of Junction City shall apply to County Roads functionally classified as Local Roads. In the absence of city standards, the County's road standards shall apply.[9] For all discrepancies between the Junction City road standards and the Lane County road standards on collector and arterial facilities, the City may submit a Deviation Application for those discrepancies. The Lane County Engineer will then review the Deviation Application and determine if an alternate design standard can be approved. This process will be required on a project by project basis.

TABLE 7: Proposed Sidewalk Infill/Construction Projects

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
SW1	Bailey Ln	Pitney Ln to Prairie Rd	$235,000	Sidewalk construction on north side in UGB
SW2	W 10th Ave	Oaklea Dr to Maple St	$610,000	Sidewalk construction/infill
SW3	W 6th Ave	Timothy St to Pine Ct	$320,000	Sidewalk construction/infill
SW4	Prairie Meadows	West end to Prairie Rd	$435,000	Sidewalk infill
SW5	SW Quince St	Prairie Meadows to Bailey Ln	$65,000	Sidewalk infill
SW6	SW Coral St	SW Quince St to Prairie Rd	$110,000	Sidewalk infill
SW7	Rose St	W 18th Ave to W 13th Ave	$315,000	Sidewalk infill
SW8	Green Meadows	SW Quince St to Prairie Meadows	$45,000	Sidewalk infill
SW9	Birch St	E 2nd Ave to E 1st Ave	$35,000	Sidewalk infill
SW10	OR 99	W 1st Ave to approximately 1,300 feet south of Milliron Rd	$2,805,000	Sidewalk construction along west side of OR 99.
Proposed Sidewalk Infill/Construction Project Total			**$4,975,000**	

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

[9] See Lane County Code 15.704 (Urban Local Street Standards).

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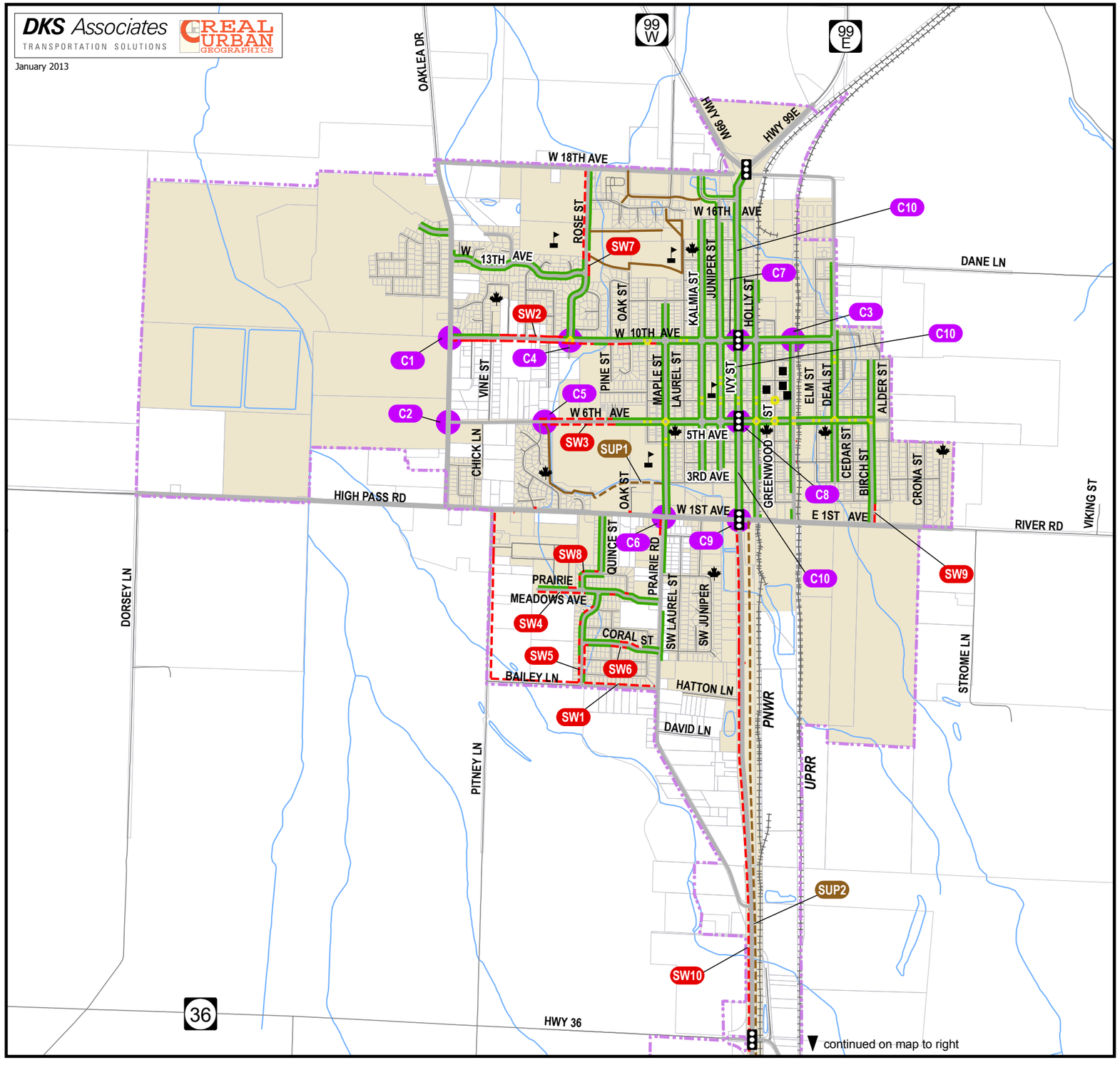
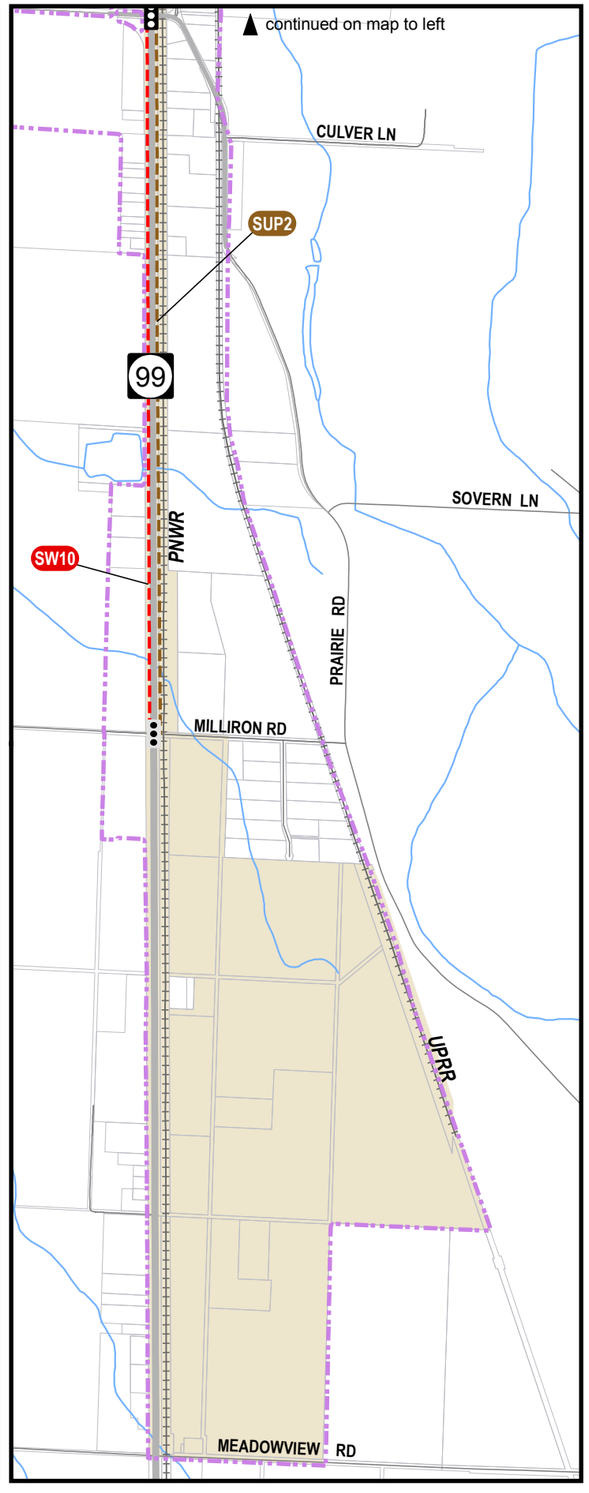




Junction City

Transportation System Plan

FIGURE 7

Proposed Pedestrian Network Improvements

Legend

Proposed Improvements

- SIDEWALK INFILL/ CONSTRUCTION (SW)
- SHARED USE PATH (SUP)
- POINT/CROSSING (C)
- TRAFFIC SIGNAL
- ## PEDESTRIAN PROJECT NUMBER

Existing Pedestrian Facilities

- MARKED CROSSWALK
- EXISTING SIDEWALK
- SHARED-USE PATH
- TRAFFIC SIGNAL

Roadways

- ARTERIAL
- COLLECTOR
- LOCAL STREET

Places of Interest

- CIVIC/GOV'T
- PARK
- SCHOOL

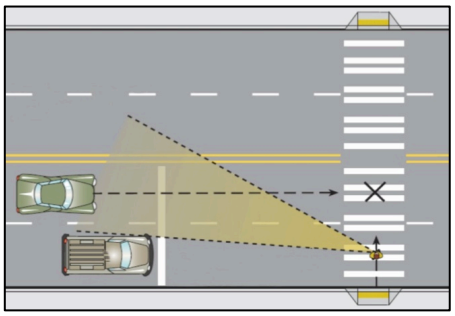
- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

0 1,000 2,000 Feet

Shared Pedestrian and Bicycle Improvements

The projects proposed in Table 8 will provide benefits to both bicyclist and pedestrians traveling in Junction City. Key intersection improvements can improve the livability of neighborhoods and encourage community members to use alternate modes of transportation. The improvement locations and project descriptions can be seen in Figure 7. Project C11 addresses safety education programs within Junction City, it is recommended that Junction City takes full advantage of these programs in addressing needs within the City.



Advance stop lines improve visibility on multi-lane roadways (Source: Oregon Bicycle and Pedestrian Plan, ODOT)

One of the most common needs expressed by the community was improving the ability of pedestrians and cyclists to cross OR 99. Crossing improvements are recommended in Table 8 (see Project C10) that include installation of warning flashers that pedestrians can activate with a push-button, as well as crosswalks and advanced stop bars so cars will stop further away from the crossing to improve visibility of the pedestrian.

TABLE 8: Proposed Intersection Crossing Improvements

Project ID	Crossing Location	Probable Construction Costs[#]	Project Description
C1	Oaklea Dr/W 10th Ave	$45,000	As part of the Oaklea Dr. road modernization project, install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings
C2	Oaklea Dr/W 6th Ave	$45,000	As part of the Oaklea Dr. road modernization project, install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings
C3	E 10th Ave/Front St	$30,000	Connect existing sidewalk on north side of E 10th Ave to provide an accessible railroad crossing. Replace curb ramps on all corners to meet ADA standards.

Project ID	Crossing Location	Probable Construction Costs[#]	Project Description
C4	W 10th Ave/Rose St	$15,000	Project would be contingent on proposed SUP1. Evaluate user needs at this location; consider improved intersection lighting, and striping the crosswalk on the south leg of the intersection.
C5	W 6th Ave/Shared Use Path Connection	$5,000	Project would be contingent on proposed SUP1. Evaluate user needs at this location; consider enhanced pavement markings and signage.
C6	W 1st Ave/Prairie Rd/Maple St	$30,000	As an interim improvement, construct curb extensions on the opposing west corner of Maple Street and east corner of Prairie Road to enhance pedestrian visibility and shorten the crossing distance. As part of the intersection improvement projects (MV25), curb extensions may no longer be feasible. Consider adding pedestrian-activated Rectangular Rapid Flashing Beacons** to assist crossings of 1st Avenue. Also evaluate the need for crosswalk pavement markings.
C7	W 10th Ave/OR 99	$20,000	Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders.

Project ID	Crossing Location	Probable Construction Costs[#]	Project Description
C8	W 6th Ave/ OR 99	$35,000	Install intersection lighting (currently no lighting on mast arms). Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders.
C9	W 1st Ave /OR 99	$20,000	Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders.
C10	OR 99 from 18th Ave to 1st Ave	$140,000	Install pedestrian activated crossing treatments on OR 99. Consider including Rectangular Rapid Flashing Beacons (RRFBs)*, advanced stop bars, curb ramps, and striped crosswalks at mid-block locations between: • 15th Ave and 12th Ave, • 9th Ave and 7th Ave, and • 5th Ave and 3rd Ave.
C11	NA	Variable.	Many free educational materials are available. Coordinate with the Oregon Department of Transportation, Junction City School District, and Junction City Police Department to implement safety education programs including pedestrian crossing education for school children.
Proposed Intersection Crossing Improvements Project Total		**$385,000**	

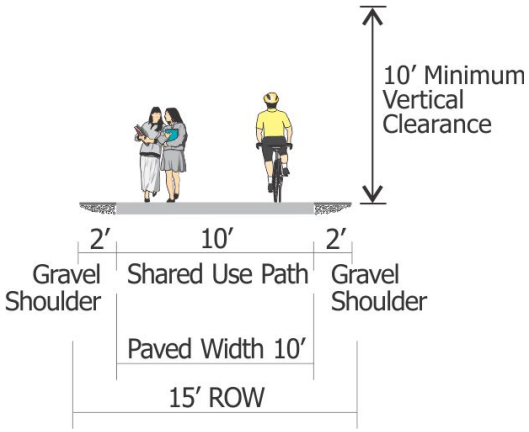
*The installation of RRFBs requires an investigation and approval from the State Traffic-Roadway Engineer. Any mid-block improvements on a State Freight Route will require review concerning freight mobility. The National Cooperative Highway Research Program (NCHRP) Report 572 outlines a process to identify the appropriate type of crossing treatment at

unsignalized locations. It was envisioned that RRFBs would be installed, but a pedestrian activated beacon or signal could also be the appropriate treatment.

[#] Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

In addition to intersection crossing improvements, shared-use paths can be facilities that benefit both pedestrians and bicyclist. Figure 8 includes a recommended design for all future shared-use paths constructed in the city. Three shared-use path alignments have been identified in this plan, which also align with The Parks and Paths of Junction City Plan.[10] The paths are described in Table 9 and can be seen in Figure 7.

Figure 8: Shared-Use Path



- In constrained areas, vertical clearance may be reduced to a minimum of 8 feet with warning signage.
- Where path abuts existing or proposed hard surface, shoulders shall be paved to tie into the hard surface.
- In constrained areas, the paved surface width may be reduced to a minimum of 8 feet. In areas where usage may be high or where bicycle speeds may be high, a minimum paved surface width of 12 feet is recommended.

[10] *The Parks and Paths of Junction City An Integrated Parks, Open Space and Trails Master Plan*. May 11, 2010. http://www.junctioncityoregon.gov/vertical/sites/%7BE865F063-52B6-4191-89A3-FB88287BBBED%7D/uploads/Attachment_14_Existing_Parks_and_Paths_Plan.pdf Accessed March 4, 2013.

TABLE 9: Proposed Shared-Use Path Alignments

Project ID	Name/Location	Probable Construction Costs*	Project Description/Notes
SUP1	Southern Edge of Junction City High School, Connecting Existing Shared-Use Path to Maple Street	$195,000	Alignment may require right-of-way or easement.
SUP2	OR 99 from 1st Avenue to Milliron Road	$2,935,000	Alignment within existing public right-of-way along east side of OR 99 between highway and railroad. May require coordination with PNWR. Will requires some wetland mitigation. Consider constructing with wider 12-foot paved width to better accommodate high bicycle speeds. Could be constructed in lieu of constructing sidewalks along east side of OR 99.
Proposed Shared-use Path Alignments Project Total		**$3,130,000**	

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

BICYCLE FACILITY IMPROVEMENTS

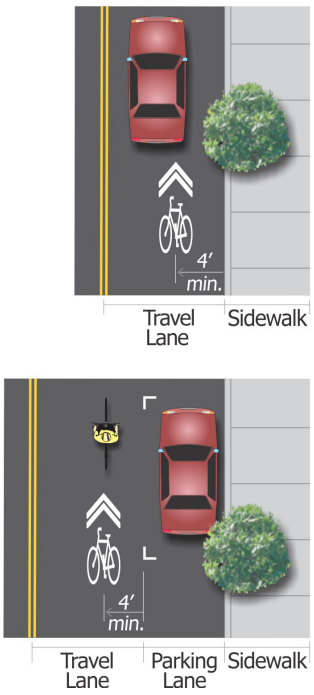
Junction City has a limited amount of dedicated bike facilities that are located along portions of OR 99 and along existing shared-use paths. Depending on the roadway width, existing volumes, on-street parking, and directness of route, many of the existing roadways in Junction City have space available for bike facilities, but would need to be restriped and signed to accommodate an additional mode. Recommended bike facilities include shared lane markings, shoulder bikeways, bike lanes, bicycle boulevards, buffered bike lanes, and shared-use paths. A bicycle facility design guide is provided below to illustrate how each facility type could be implemented and what level of comfort and protection it provides to the cyclist.

It should be noted, that for local roads or neighborhood local streets, the applicable design standard of Junction City shall apply to County Roads functionally classified as Local Roads. In the absence of city standards, the County's road standards shall apply.[11] For all discrepancies between the Junction City road standards and the Lane County road standards on collector and arterial facilities, the City may submit a Deviation Application for those discrepancies. The Lane County Engineer will then review the Deviation Application and determine if an alternate design standard can be approved. This process will be required on a project by project basis.

Bicycle Facility Design Guide[12]

Shared Lane Markings/Sharrows

Comfort Level ●○○○



▶ Shared lane markings (SLMs), also known as "sharrows", are high-visibility pavement marking symbols that indicate the appropriate position for a bicycle when sharing a lane with motor vehicles. Sharrows can be used on low-volume, low-speed roadways, where bike lanes are desirable but not possible or cost effective due to physical constraints. The marking encourages bicyclists to ride away from the door zone if adjacent on-street parking is available, and indicates to drivers where to expect cyclists. Signing can also accompany the SLMs to alert motorist that cyclists may be encountered.

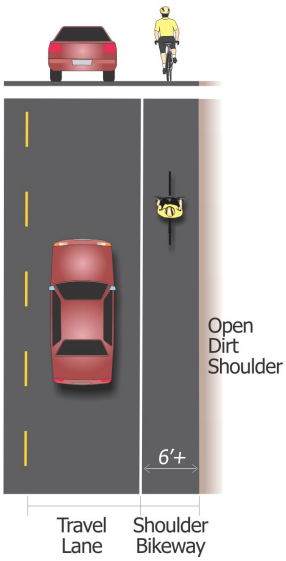
Design Guidance

- Streets with motor vehicle volumes of less than 3,000 vehicles per day.
- Streets with motor vehicle posted speeds of 30 mph or lower.
- Spacing can vary from 50′-100′ along busier streets, or up to 250′ along low traffic routes.

[11] See Lane County Code 15.704 (Urban Local Street Standards).
[12] Reference Documents: MUTCD 2009, NACTO Urban Bikeway Design Guide, AASHTO Guide for Development of Bicycle Facilities, ODOT Bicycle and Pedestrian Design Guide 2011

Shoulder Bikeways

Comfort Level ●●○○



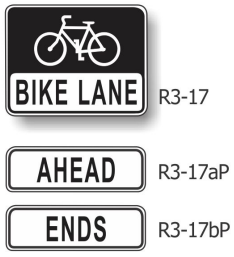
▶ A shoulder bikeway is a paved shoulder that provides space for bicycling. This designated area is denoted by an edge line, provides separation for bicyclists, reduces conflicts with faster moving motor vehicles, and is commonly found on rural roads.

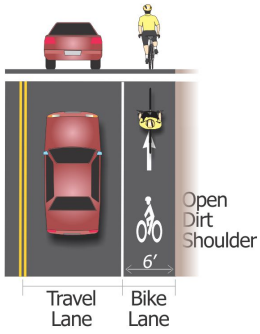
Design Guidance

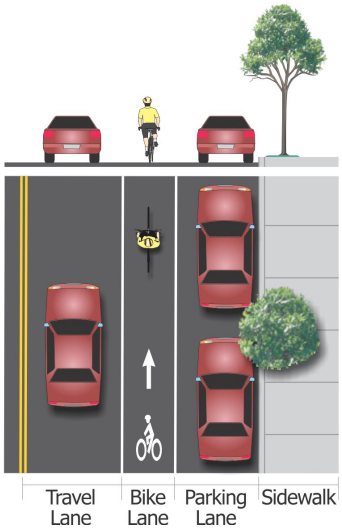
- A minimum shoulder width of 6′ is recommended.
- A minimum shoulder width of 4′ may be used when a curb, guardrail, or roadside barrier is not present. Otherwise, a minimum width of 5′ is recommended.
- Edge line is designated by a 4″ stripe.

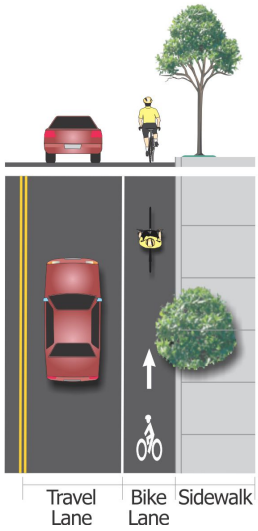
Standard Bike Lane

Comfort Level ●●○○









▶ Bike lanes are used to designate space for exclusive use by bicyclists. Bike lanes are denoted by a solid white line, bike lane symbols, and can be accompanied by signing. Most often bike lanes are intended for one-way travel in the same direction as adjacent traffic lanes, although contraflow and left side bike lanes have been used. Application of bike lanes is appropriate on arterial and collector streets with higher motor vehicle volumes and speeds.

Design Guidance

- Streets with motor vehicle volume of 3,000 vehicles per day or more.
- Streets with posted motor vehicle speed of 25 mph or higher.
- Use 8″ stripe to designate a bike lane.
- Recommended width is 6′, with a minimum of 4′ on open shoulders or 5′ from face to curb, guardrail, or parked car.
- Bike lanes should not be wider than 7′ so drivers do not mistake the lane for parking.

Bike Boulevard

Comfort Level ●●○○

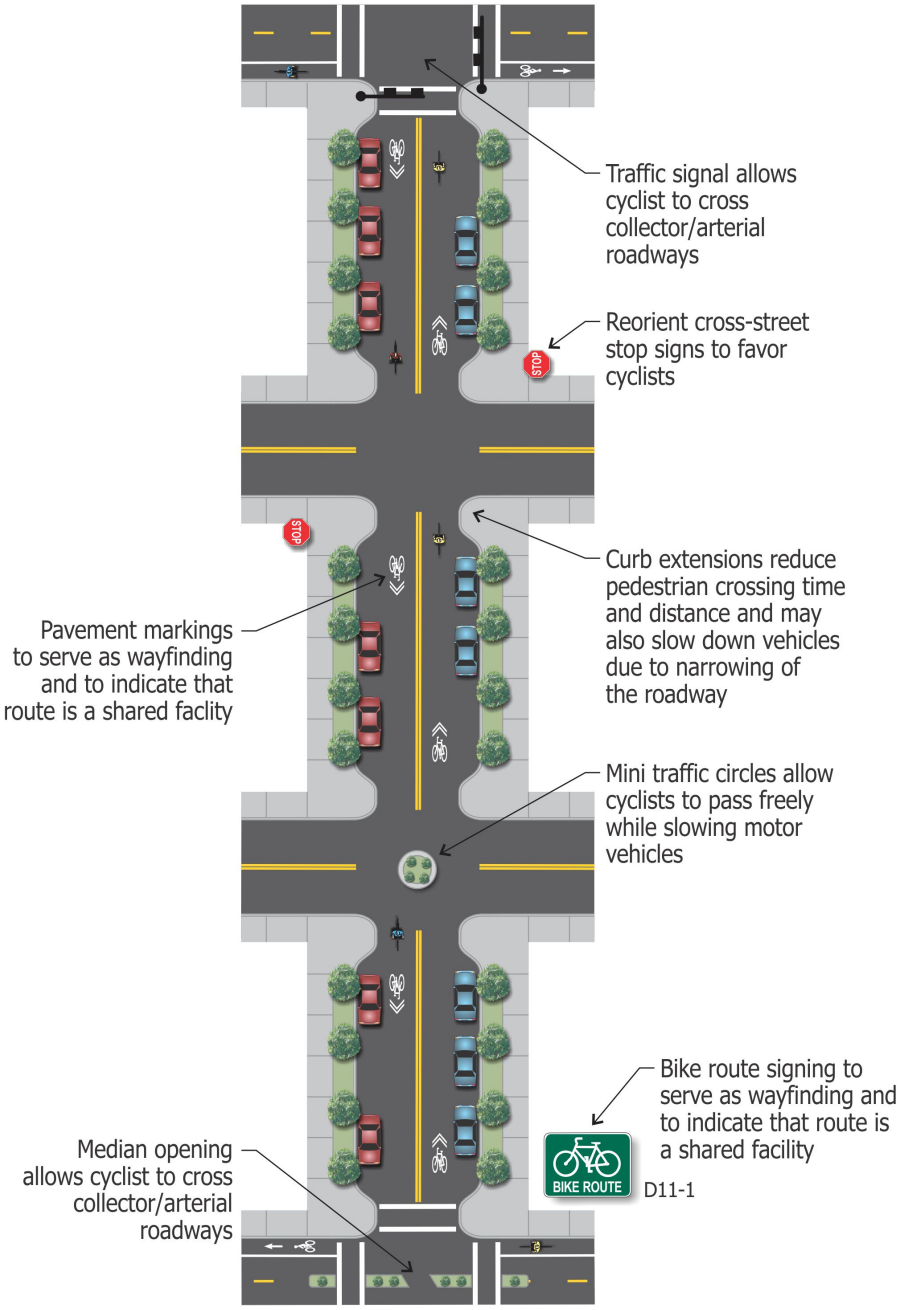


Illustration is one example of a bike boulevard. Treatments applied may vary.

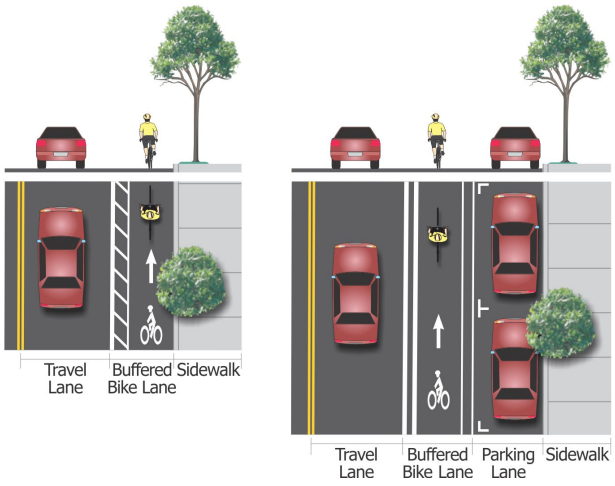
▶ A bike boulevard is a roadway with low motor vehicle speeds and volumes that has been modified to prioritize the movement of bicycles. These facilities use a variety of design treatments to discourage through trips by motor vehicles and to create a safe and comfortable environment for cyclists. Treatments include signing and pavement markings, along with traffic calming measures.

Design Guidance

- Streets with less than 3,000 motor vehicles per day.
- Streets with posted speeds of 25 mph or lower.

Buffered Bike Lane

Comfort Level ●●●○



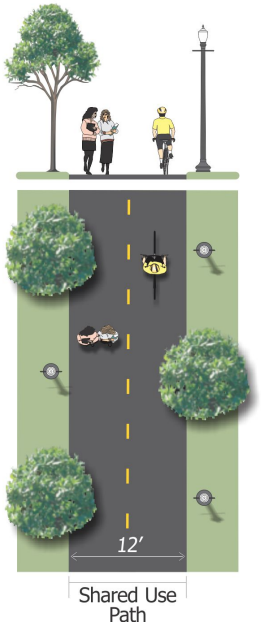
▶ A buffered bike lane is a standard bike lane paired with a delineated buffer space, which further separates the bike lane from the adjacent motor vehicle travel lane and/or parking lane, to increase bicyclist comfort. This treatment can be used on streets with excess width to provide more separation for bicyclist, or when there are high motor vehicle volumes, speed, and/or high amounts of truck traffic.

Design Guidance

- Standard bicycle bike lane (5′ to 6′) with an additional 2′ to 4′ striped buffer.
- Streets with posted speeds of 25 mph or higher.
- Locations where standard bike lanes are being considered and additional space for buffering is desired to increase cyclist comfort.

Shared Use Path

Comfort Level ●●●●



▶ Shared use paths are used by pedestrians, bicyclists, skaters, and many other community members. Paths include continuous separation from motor vehicle traffic, frequent connection to land uses including schools and shopping, provide some security to users through illumination and proximity to housing or businesses, have scenic qualities, and well-designed street crossings.

Design Guidance

- Shared use paths are commonly 10′ wide for two-way traffic in rural areas, but should be 12′ wide or wider in urban and suburban areas.
- Minimum width for a shared use path is 8′ wide to be used at pinch points or where low volumes are expected.
- Proper sight distance should be maintained.
- Path should be illuminated for night time users.

Proposed bicycle facilities can be viewed in Figure 9, and are described further in Table 10. When possible, options were provided for particular bike facilities with the hope that input from the community would help to develop a safe and comfortable bike network in Junction City. Construction of new roadways or roadway modernizations identified in the motor vehicle sections of this document are not included in Table 10, but will include the construction of both bicycle and pedestrian facilities appropriate to the functional classification of the street.

Many bicycle facility projects also benefit the pedestrian network, such as intersection and crossing improvements, connectivity improvements, and shared-use paths. These shared bicycle and pedestrian improvements were previously described in the Pedestrian Facility Improvements section.

TABLE 10: Proposed Bicycle Facility Improvements

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
BL1	Rose St	W 18th Ave to W 13th Ave	$65,000	Bike Lanes - Roadway would need to be restriped to remove on-street parking.
BL2	W 6th Ave	Timothy Pl to OR 99	Option 1: $125,000 Option 2: $15,000	**Option 1**: Bike Lanes - Would need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. **Option 2**: Shared-Lane Markings – Traffic volumes and speeds may make this option uncomfortable/unsafe.
BL3	W 10th Ave	Oaklea Dr to Nyssa St	Option 1: $125,000 Option 2: $15,000	**Option 1:** Bike Lanes - Roadway would need to be restriped to remove on-street parking. Need community feedback about utilization of existing on-street parking. **Option 2**: Shared-Lane Markings
BL4	E 6th Ave	Front St to Birch St	Option 1: $50,000 Option 2: $5,000	**Option 1**: Bike Lanes - Would need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. **Option 2**: Shared-Lane Markings - Traffic volumes may make this option uncomfortable/unsafe.

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
BL5	E 10th Ave	OR 99 to Deal St	Option 1: $60,000 Option 2: $10,000	**Option 1**: Bike Lanes - Roadway would need to be restriped to remove on-street parking. Need community feedback about utilization of existing on-street parking. **Option 2**: Shared-Lane Markings
BL6	Birch St	E 1st Ave to E 6th Ave	Option 1: $65,000 Option 2: $95,000 Option 3: $10,000	**Option 1**: Bike Lanes - Would need to restripe roadway to include 7' parking aisles, 5' bike lanes, 11' travel lanes. **Option 2**: Buffered Bike Lanes - Would need to restripe roadway and remove on-street parking on one side of the street to include one 8' parking aisle, 5' bike lanes with 3' buffers, 11' travel lanes. Need community feedback about utilization of existing on-street parking. **Option 3**: Shared-Lane Markings
BL/SB7	Bailey Ln	Pitney Ln to Prairie Rd	$105,000	Bike lane on north side inside of UGB & Shoulder Bikeway for south side.

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
BL8	Hatton Ln	Prairie Rd to OR 99 (new segment to be constructed as part of MV9)	Option 1: $50,000 Option 2: $5,000	**Option 1:** Bike Lanes – Existing roadway would need to be restriped to remove on-street parking so bike lane treatment is consistent with continuation of alignment from OR 99 to Pitney Lane. This improvement would not be needed until Hatton Ln is extended to Prairie Rd. **Option 2**: Shared-Lane Markings
BBL1	W 10th Ave	Nyssa St to OR 99	Option 1: $85,000 Option 2: $60,000 Option 3: $10,000	**Option 1**: Buffered Bike Lane - Would need to restripe roadway and remove on-street parking to include 6’ bike lanes with 3’ buffers, 12' travel lanes. Need community feedback about utilization of existing on-street parking. **Option 2:** Bike Lanes – Would require parking removal on one side of the street to include one 8' parking aisle, 6’ bike lanes, 11' travel lanes. Need community feedback about utilization of existing on-street parking. **Option 3**: Shared-Lane Markings - Future traffic volumes may make this option uncomfortable/unsafe.

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
BLVD1	Nyssa St/Oak St	Laurel Elementary School to W 6th Ave	$45,000	Install Shared Lane Markings and traffic calming techniques as appropriate to create a bicycle boulevard with low volume and low speed motor vehicle use. Alignment would run north on Nyssa St from W 6th Ave, cross W 10th Ave, turn west on W 12th Ave, and turn north on Oak St to connect to the shared-use path at Laurel Elementary School. Consider installing an All-Way stop at the intersection on W 10th Ave with Nyssa St and crossing enhancements at the intersection on W 6th Ave with Nyssa St.
SLM1	Rose St	W 13th Ave to W 10th Ave	Option 1: $5,000 Option2: $45,000	**Option 1**: Shared-Lane Markings - Existing on-street parking is actively used. Supplemental warning signs should be installed leading into the curve. **Option 2**: Bike Lanes - Roadway would need to be restriped to remove on-street parking. Need community feedback about utilization of existing on-street parking.

Project ID	Roadway	Project Limits	Probable Construction Costs*	Project Description
SLM2	Maple St	W 6th Ave to W 1st Ave	Option 1: $10,000 Option 2: $60,000	**Option 1**: Shared-Lane Markings **Option 2**: Bike Lanes - Would need to restripe roadway and remove on-street parking. Need community feedback about utilization of existing on-street parking.
SLM3	E 6th Ave	OR 99 to Front St	Option 1: $5,000 Option 2: $30,000	**Option 1:** Shared-Lane Markings – Traffic volumes are higher than preferred, but speeds are low. Recommend converting angled on-street parking to parallel parking to enhance cyclist visibility. **Option 2**: Bike Lanes - Would need to restripe roadway, replace angled on-street parking with parallel parking (8' parking, 5' bike lanes, 11' travel lanes).
SLM4	Deal St	E 6th Ave to Dane Ln	Option 1: $15,000 Option 2: $100,000	**Option 1:** Shared-Lane Markings **Option 2**: Bike Lanes - Would need to remove on-street parking and provide 6' bike lanes and 11' travel lanes. Need community feedback about utilization of existing on-street parking.
Proposed Bicycle Facility Improvement Projects Low Total			**$320,000**	
Proposed Bicycle Facility Improvement Projects High Total			**$1,040,000**	

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

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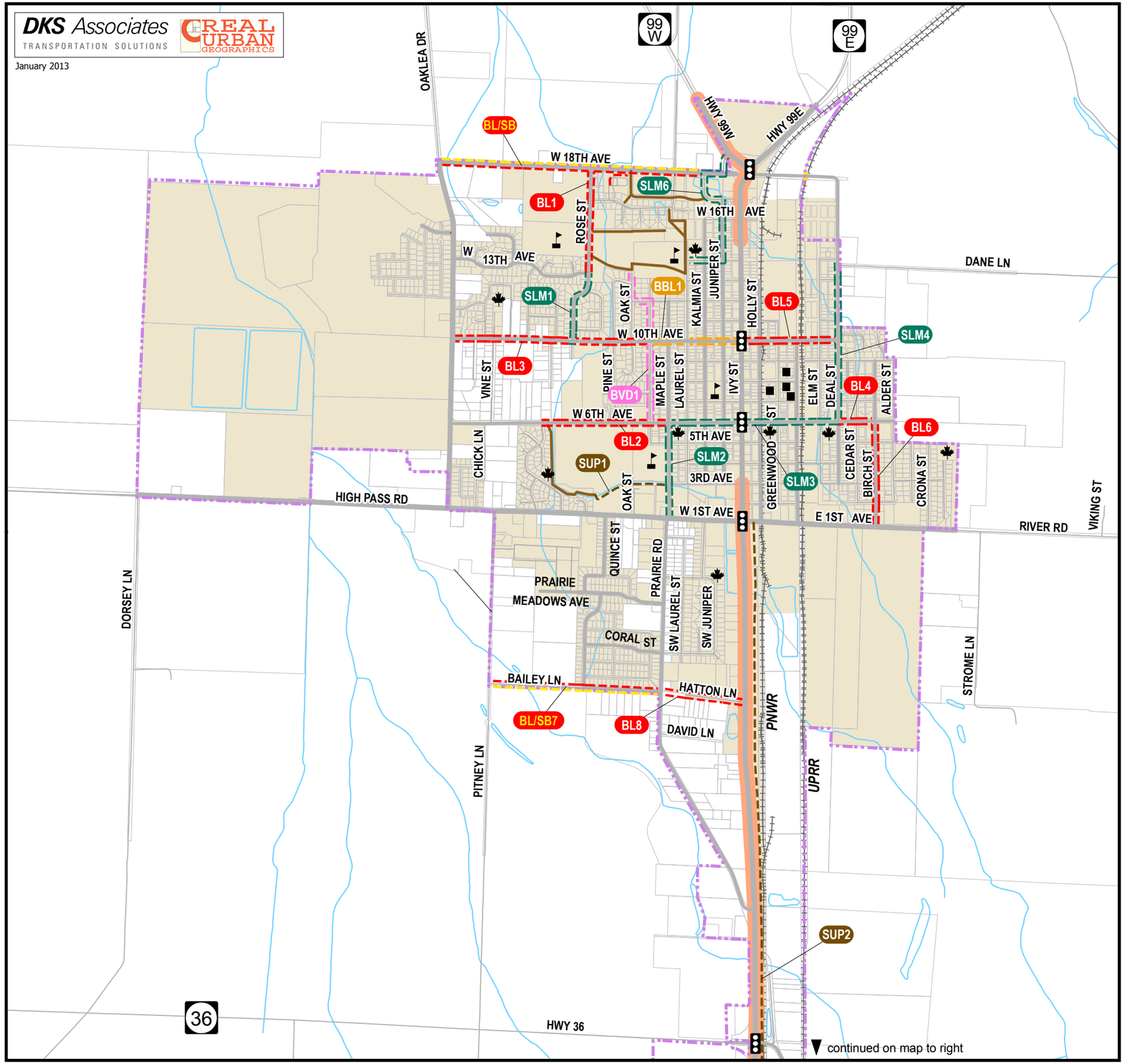
January 2013

Junction City

Transportation System Plan

FIGURE 9

Proposed Bicycle Network Improvements



Legend

Proposed Improvements

- SHARED LANE MARKINGS (SLM)
- BIKE LANE (BL)
- BUFFERED BIKE LANE (BBL)
- SHARED USE PATH (SUP)
- BIKE BOULEVARD (BLVD)
- SHOULDERED BIKE LANE (SB)
- TRAFFIC SIGNAL
- ## BICYCLE PROJECT NUMBER

Existing Bicycle Facilities

- SHOULDERED BIKE LANE
- SHARED USE PATH
- TRAFFIC SIGNAL

Roadways

- ARTERIAL
- COLLECTOR
- LOCAL STREET

Places of Interest

- CIVIC/GOV'T
- PARK
- SCHOOL

- CITY LIMITS
- URBAN GROWTH BOUNDARY
- TAX LOTS
- RAILROAD
- STREAM

N W E S

0 1,000 2,000 Feet

TRANSIT FACILITY IMPROVEMENTS

Increasing the availability and use of transit service in Junction City is one way to remove single occupancy vehicles from the roadway; it also provides mobility to those without access to private vehicles. Lane Transit District (LTD) provides a fixed-route public transit service to Junction City. Junction City is served by Route 95, which is a rural route, and has approximately ten stop locations within the Junction City UGB.

As new areas develop within the city, particularly to the west, the city should actively engage LTD to discuss the ability to meet new service demands. These needs could include increased frequency of service, changes in the route alignment to increase accessibility for users, or potentially identifying a new park & ride location. The city should also prioritize improvements to the pedestrian and bicycles systems that would enhance the accessibility of existing transit stops.

Paratransit service is also provided by LTD as part of their requirement to meet the American with Disabilities Act. LDT provides paratransit service through a program called RideSource. The service boundary for RideSource is the Eugene-Springfield Metropolitan Planning Organization (MPO). Junction City would need to join the MPO to receive complementary paratransit service from RideSource. However, paratransit service is available for residents in Junction City receiving Medicaid. The Federal Transit Authority does provide grants to support public transportation in rural areas with populations of less than 50,000. The grants are awarded annually and provide funding for both operation and capital improvements.

FINANCIAL SUMMARY

Comparing the estimated costs associated with all desired transportation improvements (i.e., the Preferred Plan) to the city's forecasted revenue for transportation project implementation over the planning period allows for an assessment of the adequacy of current revenue streams. Ultimately, a subset of projects from the Preferred Plan that aligns with revenue that may be available through a reasonable funding strategy will be identified as the Strategic Plan for transportation improvements.

Planning-level cost estimates were developed for all the identified TSP projects. The total cost of projects identified is approximately $110 million. Because partnering agencies may share the costs of some projects, particularly those that are not under City jurisdiction, the direct costs to the City may be significantly lower. Nonetheless, the projects identified under City jurisdiction and the City share of costs for other facilities reflects a significant funding need.

Based on the revenues and costs identified in TSP Chapter 4 (Future Needs), a total of $2.4 million is available to implement the identified TSP projects. While the city is not required to be able to fund all projects listed in the TSP, this difference in costs and revenue represents a substantial gap, indicating that there may be difficulty providing facilities to support new growth. Therefore, consideration should be given to reevaluating current revenue streams for transportation projects and exploring options for potential new funding sources. The City will need to develop a strategic approach to identify high priority projects and the funding sources to pay for them.

POTENTIAL NEW FUNDING SOURCES

Consideration of new funding sources to increase revenue for transportation improvements is recommended to facilitate the implementation of needed projects. Any potential funding source is constrained based on a variety of factors, including the willingness of local leadership and the electorate to burden citizens and businesses, the availability of local funds to be dedicated or diverted to transportation issues from other competing City programs, and the availability and competitiveness of state and federal funds. Nonetheless, it is important for the City to consider all options to provide and enhance funding for its transportation programs.

This section describes several potential transportation funding sources, including State and County contributions, City sources (i.e., residents, businesses, and/or developers), grants, and debt financing. Many of these sources have been used in the past by other agencies in Oregon, and in most cases, when used collectively, are sufficient to fund transportation improvements for a local community.

State and County Contributions

There are multiple roadways in Junction City that are the responsibility of either ODOT or Lane County. The City should seek funding partnerships (i.e., contributions) from ODOT and Lane County for projects located on their respective roadways. In addition, direct appropriations are another potential funding source.

ODOT Contributions

The Oregon Transportation Commission (OTC) and the Oregon Department of Transportation have changed how the State Transportation Improvement Program (STIP) is developed. Beginning in the summer of 2012, the STIP will be divided into two broad categories: *Fix-It* and *Enhance*. *Fix-It* includes activities that fix or preserve the transportation system, while *Enhance* includes activities that enhance, expand, or improve the transportation system. The new STIP development process seeks to identify the most effective projects based on community and state values, rather than those that fit best into prescribed programs. The change was made to enable ODOT to take care of the existing transportation assets while still providing a measure of funding to enhance the state and local transportation system in a truly multimodal way. As has been the case for many years, the OTC continues to put a strong emphasis on preserving the existing transportation system first. This is evidenced by the funding split between the *Fix-It* portion of the proposed new STIP (76 percent) and the *Enhance* portion (24 percent).

Programmed projects are included in the four-year Statewide Transportation Improvement Program (STIP), which is updated every two years. ODOT maintenance districts also have available funds that may be used for small-scale projects such as in-fill sidewalks or culvert repair on a state highway.

When considering proposed land use actions, such as subdivisions or site development, the City should not assume that projects planned on OR 99 or OR 36 will be in place to support the proposed development unless the project is programmed in the current STIP. Construction of projects which have been previously required through the City land use or ODOT approach permit approval process may be assumed if construction of the development is in process. For proposed comprehensive plan amendments, which must consider the long-term

adequacy of the transportation system for TPR 660-012-0060 compliance, ODOT must be consulted to determine whether a highway project is "reasonably likely to be funded" based on current funding projections.

Direct Appropriations

The City can also seek direct appropriations from the State Legislature and/or the United States Congress for transportation capital improvements. The City may want to pursue these special, one-time appropriations, particularly for projects that support economic development.

City Sources

The City can also look to local residents, business owners, and developers to raise additional funds designated for transportation-related improvements. Optional sources include developer exactions, Urban Renewal District (URD), Local Fuel Tax, SDC increases, local improvement district (LID), General Fund revenue transfers, special assessments, and employment taxes.

Developer Exactions

Exactions are roadway and/or intersection improvements that are partially or fully funded by developers as conditions of development approval. Typically, all developers are required to improve the roadways along their frontage upon site redevelopment. In addition, when a site develops or redevelops, the developer may be required by the City or ODOT (through a highway approach permit) to provide off-site improvements depending upon the expected level of traffic generation and the resulting impacts to the transportation system.

Urban Renewal District (URD)

A URD is a tax-funded district within the City. The URD would be funded with the incremental increases in property taxes that result from the construction of applicable improvements. As desired, the funds raised by a URD can be used for, but are not limited to, transportation projects located within the URD boundaries.

Local Fuel Tax

Twenty-two cities and two counties in Oregon have adopted local gas taxes by public vote ranging from one to five cents per gallon. The taxes are paid to the city monthly by distributors of fuel. The process for presenting such a tax to voters will need to be consistent with Oregon State law as well as the laws of the City. The current moratorium on new local gas taxes is scheduled to expire in 2014. Nearby locations with a City gas tax include Cottage Grove (three cents per gallon), Veneta (three cents per gallon), Springfield (three cents per gallon), Coburg (three cents per gallon) and Eugene (five cents per gallon).

Transportation System Development Charges (SDCs)

To help fund transportation improvements needed to support future growth, the City could consider increasing the SDC rate. Transportation SDCs are an existing funding source collected from new development that is designated for projects that increase the transportation system's capacity (not for projects that target maintenance or operations).

Local Improvement District (LID)

The City may set up Local Improvement Districts (LIDs) to fund specific capital improvement projects within defined geographic areas, or zones of benefit. LIDs impose assessments on properties within its boundaries and may only be spent on capital projects within the geographic area. Benefiting properties are assessed their share to pay for improvements.

Since LIDs may not fund ongoing maintenance costs, they require separate accounting. Furthermore, because citizens representing 33 percent of the assessment can terminate a LID and overturn the planned projects, LID projects and costs must obtain broad approval of property owners within the LID boundaries. LIDs can be matched against other funds where a project has system wide benefit beyond the adjacent properties. LIDs are often used for sidewalks and pedestrian amenities that provide clear benefit to residents along the subject street.

Street Utility Fee

A number of Oregon cities supplement their street funds with street utility fees. Establishing user fees to fund applicable transportation activities and/or capital construction ensures that those who create the demand for service pay for it proportionate to their use. The street utility fees are recurring monthly or bi-monthly charges that are paid by all residential, commercial, industrial, and institutional users. The fees are charged proportionate to the amount of traffic generated; a retail commercial user pays a higher rate than a residential user. Typically, there are provisions for reduced fees for those that can demonstrate they use less than the average rate, for example, a residence where no cars or trucks are registered.

From a system health perspective, forming a utility fee also helps to support the ongoing viability of the program by establishing a source of reliable, dedicated funding for that specific function. Fee revenues can be used to secure revenue bond debt used to finance capital construction. A transportation utility can be formed by Council action and does not require a public vote.

The General Fund Revenues

At the discretion of the City Council, the City can allocate General Fund revenues to pay for its transportation program. General Fund revenues primarily include property taxes, user taxes, and any other miscellaneous taxes and fees imposed by the City. Allocation is completed through the City's annual budget process, but the funding potential of this source is constrained by competing community priorities set by the City Council. General Fund resources could fund any aspect of the transportation program, from capital improvements to operations, maintenance, and administration. Additional revenues available from this source are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

Special Assessments

A variety of special assessments are available in Oregon to defray the costs of sidewalks, curbs, gutters, street lighting, parking, and central business district (CBD) or commercial zone transportation improvements. These assessments would likely fall within the Measure 50 limitations. One example is the 50/50 program. This is a

match program for sidewalk infill projects where property owners pay half the cost of a sidewalk improvement and the City matches the investment to complete the project.

Employment Taxes

Employment taxes may be levied to raise additional funds. For example, in the Portland region, payroll and self-employment taxes are used to generate approximately $145 million annually. The City of Portland has chosen to earmark these funds for transit agency operations.

Grants

Junction City should actively pursue State and Federal grants, in particular to complete desired pedestrian and bicycle projects. Grant opportunities include funding for pedestrian, bicycle, Intelligent Transportation System (ITS), and Safe Routes to School (SRTS) improvements. Current grant programs include:

Federal Funding Sources

- Highway Safety Improvement Program
- Transportation Enhancements-Bicycle and Pedestrian Projects
- Recreational Trails Program
- Safe Routes to School (SRTS)
- New Freedom Initiative
- Community Development Block Grants
- Land and Water Conservation Fund
- Transportation, Community and System Preservation Program
- TIGER Grant

State Funding Sources

- Oregon Immediate Opportunity Fund
- Oregon Transportation Infrastructure Bank
- Oregon Special Transportation Fund
- Oregon Bicycle and Pedestrian Program Grants
- Oregon Pedestrian Safety Mini-Grant Program
- Oregon Business Energy Tax Credits (BETC)
- Oregon Safe Routes to School (OSRTS)

Other Funding Sources

- American Greenways Program
- Bikes Belong Grant Program

Debt Financing

While not a direct funding source, debt financing is another funding method. Through debt financing, available funds can be leveraged and project costs can be spread over the projects' useful lives. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but it is also viewed as an equitable funding source for larger projects because it spreads the burden of repayment over existing and future customers who will benefit from the projects. One caution in relying on debt service is that a funding source will still need be identified to fulfill annual repayment obligations. Two methods of debt financing are voter-approved general obligation bonds and revenue bonds.

Voter-Approved General Obligation Bonds

Subject to voter approval, the City can issue General Obligation (GO) bonds to debt finance capital improvement projects. GO bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property throughout the City (i.e., a property tax increase). Depending on the critical nature of projects identified in the Transportation Plan and the willingness of the electorate to accept increased taxation for transportation improvements, voter-approved GO bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.

Revenue Bonds

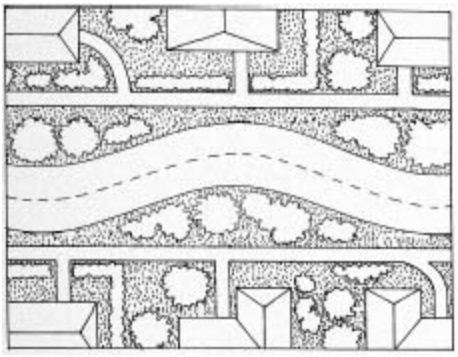
Revenue bonds are municipal bonds that are secured by the revenue received by financing income-producing projects. In contrast to GO bonds, revenue bonds fund projects that generally only serve those in the community who pay for their services. Given the nature of revenue bonds, they may not be as applicable to transportation projects as are GO bonds and are most commonly used for other municipal projects such as sewer and water system upgrades where users pay a monthly fee for service. Interest costs for revenue bonds are slightly higher than for GO bonds due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

APPENDIX G:

Neighborhood Traffic Management Photo Log

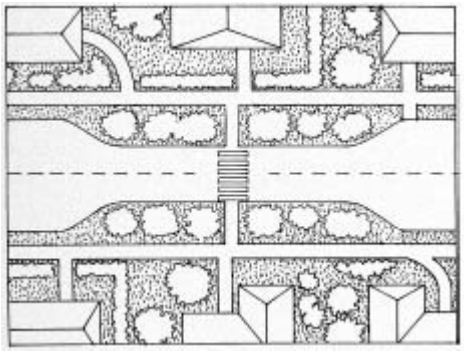
APPENDIX: NEIGHBORHOOD TRAFFIC MANAGEMENT (NTM) STRATEGIES PHOTO LOG

Chicanes



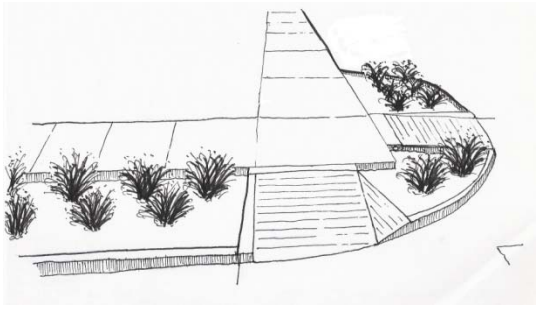
Source: Understanding the User. Chapter 9: Traffic Calming. Federal Highway Administration

Chokers

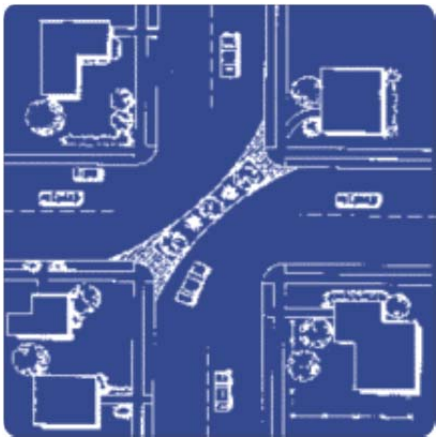


Source: Understanding the User. Chapter 9: Traffic Calming. Federal Highway Administration

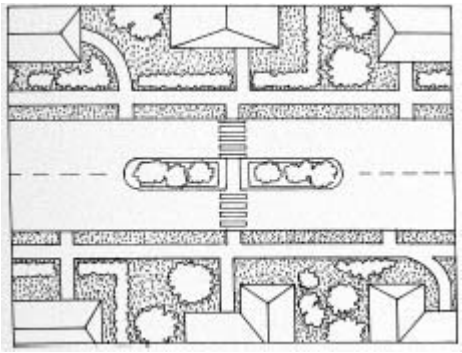
Curb Extensions



Diverters



Median Islands



Source: Understanding the User. Chapter 9: Traffic Calming. Federal Highway Administration

Raised Crosswalks

Source: google.com

Speed Cushions (with emergency vehicle pass-through)

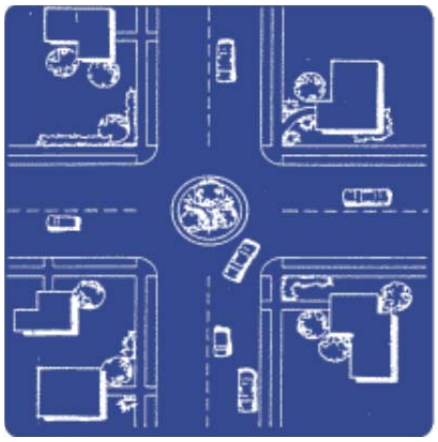
Speed Feedback Signs

Source: www.stocktongov.com

Speed Hump

Source: Understanding the User. Chapter 9: Traffic Calming. Federal Highway Administration

Traffic Circles



APPENDIX H:

Implementation-Action Strategy Memorandum

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Draft Technical Memorandum #6

DATE: December 9, 2013

TO: Project Management Team

FROM: John Bosket, PE
Kristen Svicarovich, EIT

This document has not been reviewed by the Citizen Advisory Committee and is not intended for public distribution.

SUBJECT: **Junction City TSP Update**
Implementation-Action Strategy

P09042-010

The following memorandum summarizes the financial strategies for implementing the projects identified in the City of Junction City Transportation System Plan (TSP) using projected revenue through the year 2035. The proposed transportation system improvement projects and associated costs are provided for both the "preferred plan" and the "financially constrained plan." The preferred plan includes all projects recommended in the City's TSP, while the financially constrained plan includes only high-priority projects from the preferred plan that have a reasonable likelihood of being funded given the amount of revenue projected to be available.

FUNDING FOR TRANSPORTATION (CURRENT SOURCES)

Future projections for the City of Junction City transportation funding through the year 2035 are summarized in Table 1. These projections include estimated resources available based on the amount of revenue collected in the past from current funding sources and assumptions for growth in land development through the planning horizon. Expenditures have also been estimated based on historical data describing costs associated with maintaining the existing transportation system. These estimated expenditures are subtracted from the total estimated revenues to calculate the net balance available for capital improvement projects. This estimated funding does not include any one-time or project-specific grants or other non-routine sources of revenue from other jurisdictions.

Table 1 shows that Junction City may have approximately $3 million available for capital improvements through 2035, but at the same time may be more than $600,000 short of being able to cover expenses for basic maintenance and operations during the same period (equating to about $25,000 per year). The reason for this discrepancy is because revenue generated by System Development Charges can only be spent on capacity building projects, not on maintenance and operations.[1]

---

[1] Junction City Municipal Code 13.40.060 and 13.40.070, as well as ORS 223.307

This suggests that the City's current revenue streams are inadequate to support basic costs for keeping the transportation system functioning. Deferred maintenance of the transportation system can exponentially increase the costs of repairs in the future. Therefore, rather than relying on grants or the City's general fund to make up the difference, new local revenue streams should be considered.

Furthermore, System Development Charges can only be applied toward capacity building projects. As the only remaining revenue stream to pay for capital improvements after maintenance and operations are covered, this may limit the types of projects the City can construct (e.g., System Development Charges could not fund safety projects). This may present another reason for the City to establish new transportation revenue streams.

Table 1: Estimate of Funding Availability Through 2035

Transportation Revenue	**Annual Average**	**Total through 2035**
OR Gas Tax - Bike Component [A]	$2,300	$57,500
OR Gas Tax - Streets Component [B]	$220,700	$5,517,500
Sidewalk Permits [C]	$2,560	$64,000
System Development Charges [D]	$120,800	$3,020,000
Fund Balance (Current Existing)	NA	$1,178,000
		$9,837,000

Expenditures for Basic Maintenance and Operations	**Annual Average**	**Total through 2035**
Personnel (Wages, Benefits, Etc.)	$164,700	$4,117,500
Equipment, Materials, & Services	$125,200	$3,130,000
Street Maintenance & Repairs	$8,200	$205,000
		$7,452,500

Available Balance for Basic Maintenance and Operations [D]	**-$635,500**
Available Balance for Capital Improvement Projects	**$3,020,000**

[A] Can only be applied toward construction or maintenance of pedestrian and bicycle facilities (ORS 366.514).

[B] Can be applied toward construction, maintenance, or operations of the transportation system.

[C] Likely spent entirely on administrative costs of sidewalk construction inspection.

[D] System Development Charges cannot be applied toward maintenance and operations and are for capacity building projects only.

TRANSPORTATION IMPROVEMENT PROGRAM

The Transportation Improvement Program (TIP) consist of a Preferred Plan of all transportation improvements identified to meet future needs through the year 2035, as well as a Financially Constrained Plan, which is a subset of the Preferred Plan projects that aligns with anticipated funding. The Financially Constrained Plan is commonly used to populate the City's Capital Improvement Program (CIP). However, any project from the TIP Preferred Plan is eligible for inclusion on the CIP.

Projects for the Financially Constrained Plan were selected based on priorities expressed by the Citizen Advisory Committee and input obtained through a public open house. As a result, the Financially Constrained Plan puts a strong emphasis on walking and biking facilities that support safe routes to schools and improvements in the safety and efficiency of travel along OR 99.

Figure 1: Financially Constrained Plan Funding by Mode of Travel

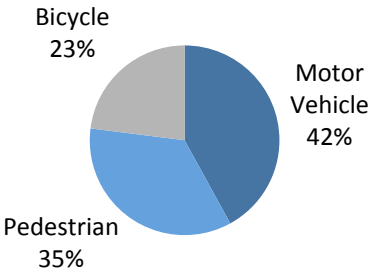

Table 2 summarizes the total costs to fund the Preferred and Financially Constrained Plans. As shown in Table 2, the Financially Constrained Plan consists of about 3% of the total Preferred Plan, with most of the difference being in Motor Vehicle mode projects, which include significant roadway extensions and upgrades. The allocation of funding for the Financially Constrained Plan has been well balanced between modes of travel, as shown in Figure 1.

Table 2: Transportation Improvement Program Costs (2013-2035) – Preferred vs. Financially Constrained Plans

Transportation Mode	**Planning-Level Costs (2013 Dollars)**	
	Preferred Plan	**Financially Constrained Plan**
Pedestrian (Table 3)	$4,975,000	$930,000
Shared Pedestrian/Bicycle (Tables 4 and 5)		
Crossings	$385,000	$60,000
Shared-Use Paths	$3,130,000	$195,000
Bicycle (Table 6)	$690,000	$565,000
Motor Vehicles (Table 7)	$103,110,500	$1,266,750
Total Cost	**$112,290,500**	**$3,016,750**
Difference between Preferred and Financially Constrained Plans		**$109,273,750**

Individual projects for all transportation modes are identified in Tables 3 through 7. The Project ID number provides a reference for locating each project on the corresponding modal plan maps (attached). The project descriptions include key benefits for use in future grant applications and strategic planning. Estimated costs for each project are provided, with a specific allocation for projects included in the Financially Constrained Plan.

The cost of the Financially Constrained Plan reflects only those costs assumed to be the responsibility of the City. Because many roadways in Junction City are under the jurisdiction of Lane County or ODOT, there may be opportunities to have those agencies contribute funds for some projects. It has also been assumed that a portion of some projects may be constructed as frontage improvements by future development where adjacent land is currently undeveloped. These assumptions are noted in Tables 3 through 7, and are strictly an aid for establishing a long-range transportation budget for Junction City. They do not create an obligation for any parties listed to contribute funds.

Table 3: Pedestrian Mode - Proposed Sidewalk Infill/Construction Projects

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
SW1	**Bailey Ln**: Pitney Ln to Prairie Rd – Sidewalk construction on north side in UGB ***Key Benefits: Pedestrian Connectivity***	$235,000	
SW2	**W 10th Ave**: Oaklea Dr to Maple St - Sidewalk construction/infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$610,000	$610,000
SW3	**W 6th Ave**: Timothy St to Pine Ct - Sidewalk construction/infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$320,000	$320,000
SW4	**Prairie Meadows**: West end to Prairie Rd - Sidewalk infill ***Key Benefits: Pedestrian Connectivity***	$435,000	
SW5	**SW Quince St**: Prairie Meadows to Bailey Ln - Sidewalk infill ***Key Benefits: Pedestrian Connectivity***	$65,000	
SW6	**SW Coral St**: SW Quince St to Prairie Rd – Sidewalk infill ***Key Benefits: Pedestrian Connectivity***	$110,000	
SW7	**Rose St**: W 18th Ave to W 13th Ave – Sidewalk infill ***Key Benefits: Pedestrian Connectivity, Safe Routes to School***	$315,000	
SW8	**Green Meadows**: SW Quince St to Prairie Meadows – Sidewalk infill ***Key Benefits: Pedestrian Connectivity***	$45,000	
SW9	**Birch St**: E 2nd Ave to E 1st Ave – Sidewalk infill ***Key Benefits: Pedestrian Connectivity***	$35,000	
SW10	**OR 99**: W 1st Ave to approximately 1,300 feet south of Milliron Rd - Sidewalk construction along west side of OR 99. ***Key Benefits: Pedestrian Connectivity***	$2,805,000	
	Preferred Plan	**$4,975,000**	
	Financially Constrained Plan		**$930,000**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.
** Identification of potential funding partners is for budgeting and planning purposes only and does not create an obligation for funding from parties listed.

Table 4: Shared Pedestrian/Bicycle Modes - Proposed Intersection Crossing Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
C1	**Oaklea Dr/W 10th Ave**: As part of the Oaklea Dr. road modernization project, install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$45,000	
C2	**Oaklea Dr/W 6th Ave**: As part of the Oaklea Dr. road modernization project, install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$45,000	
C3	**E 10th Ave/Front St**: Connect existing sidewalk on north side of E 10th Ave to provide an accessible railroad crossing. Replace curb ramps on all corners to meet ADA standards. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$30,000	$30,000
C4	**W 10th Ave/Rose St**: Project would be contingent on proposed SUP3. Evaluate user needs at this location; consider improved intersection lighting, and striping the crosswalk on the south leg of the intersection. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$15,000	
C5	**W 6th Ave/Shared Use Path Connection**: Project would be contingent on proposed SUP3. Evaluate user needs at this location; consider enhanced pavement markings and signage. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$5,000	
C6	**W 1st Ave/Prairie Rd/Maple St**: As an interim improvement, construct curb extensions on the opposing west corner of Maple Street and east corner of Prairie Road to enhance pedestrian visibility and shorten the crossing distance. ***Key Benefits: Safety, Safe Routes to School, Pedestrian/Bicycle Connectivity***	$30,000	$30,000

Table 4 (continued): Shared Pedestrian/Bicycle Modes - Proposed Intersection Crossing Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
C7	**W 10th Ave/OR 99**: Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School,***	$20,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
C8	**W 6th Ave/ OR 99**: Install intersection lighting (currently no lighting on mast arms). Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School***	$35,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
C9	**W 1st Ave /OR 99**: Enhance pedestrian crossing by upgrading pedestrian signal heads to countdown pedestrian signals. Upgrade pedestrian signals by using audible signals. Upgrade signal head backplates with retroreflective borders. ***Key Benefits: Safety, ADA Accessibility, Safe Routes to School***	$20,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
C10	**OR 99 from 18th Ave to 1st Ave**: Install pedestrian activated crossing treatments on OR 99. Consider including Rectangular Rapid Flashing Beacons (RRFBs)***, advanced stop bars, curb ramps, and striped crosswalks at mid-block locations between: • 15th Ave and 12th Ave, • 9th Ave and 7th Ave, and • 5th Ave and 3rd Ave. ***Key Benefits: Safety, Pedestrian/Bicycle Connectivity***	$140,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
C11	**Education**: Many free educational materials are available. Coordinate with the Oregon Department of Transportation, Junction City School District, and Junction City Police Department to implement safety education programs including pedestrian crossing education for school children. ***Key Benefits: Safety, Safe Routes to School***	Variable	City staff time, but negligible expenses (Potential funding partners: ODOT)
	Preferred Plan	**$385,000**	
	Financially Constrained Plan		**$60,000**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

** Identification of potential funding contributors is for budgeting purposes only and does not create an obligation for funding from parties listed.
*** The installation of RRFBs requires an investigation and approval from the State Traffic-Roadway Engineer. Any mid-block improvements on a State Freight Route will require review concerning freight mobility. The National Cooperative Highway Research Program (NCHRP) Report 572 outlines a process to identify the appropriate type of crossing treatment at unsignalized locations. It was envisioned that RRFBs would be installed, but a pedestrian activated beacon or signal could also be the appropriate treatment.

Table 5: Shared Pedestrian/Bicycle Modes - Proposed Shared-Use Path Alignments

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
SUP1	**Southern Edge of Junction City High School, Connecting Existing Shared-Use Path to Maple Street**: Alignment may require right-of-way or easement. ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$195,000	$195,000
SUP2	**OR 99 from 1st Avenue to Milliron Road**: Alignment within existing public right-of-way along east side of OR 99 between highway and railroad. May require coordination with PNWR. Will requires some wetland mitigation. Consider constructing with wider 12-foot paved width to better accommodate high bicycle speeds. Could be constructed in lieu of constructing sidewalks along east side of OR 99. ***Key Benefits: Pedestrian/Bicycle Connectivity, Alternative to Travel on OR 99, Livability***	$2,935,000	
	Preferred Plan	**$3,130,000**	
	Financially Constrained Plan		**$195,000**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.
** Identification of potential funding contributors is for budgeting purposes only and does not create an obligation for funding from parties listed.

Table 6: Bicycle Mode - Proposed Bicycle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
BL1	**Rose St**: W 18th Ave to W 13th Ave: Bike Lanes - Roadway would need to be restriped to remove on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$65,000	$65,000
BL2	**W 6th Ave**: Timothy Pl to OR 99: Bike Lanes - Need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$125,000	$125,000
BL3	**W 10th Ave**: Oaklea Dr to Nyssa St: Bike Lanes - Roadway would need to be restriped to remove on-street parking. Need community feedback about utilization of existing on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$125,000	$125,000
BL4	**E 6th Ave**: Front St to Birch St: Bike Lanes - Would need to restripe roadway to include 8' parking aisles, 6' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$50,000	$50,000
BL5	**W 10th Ave**: Nyssa St to OR 99: Bike Lanes – Would require parking removal on one side of the street to include one 8' parking aisle, 6' bike lanes, 11' travel lanes. Need community feedback about utilization of existing on-street parking. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$60,000	$60,000
BL6	**Birch St**: E 1st Ave to E 6th Ave: Bike Lanes - Need to restripe roadway to include 7' parking aisles, 5' bike lanes, 11' travel lanes. ***Key Benefits: Bicycle Connectivity***	$65,000	$65,000
BL/SB7	**Bailey Ln**: Pitney Ln to Prairie Rd: Bike lane on north side inside of UGB & Shoulder Bikeway for south side. ***Key Benefits: Bicycle Connectivity***	$105,000	
BLVD1	**Nyssa St/Oak St**: Laurel Elementary School to W 6th Ave: Install Shared Lane Markings and traffic calming techniques as appropriate to create a bicycle boulevard with low volume and low speed motor vehicle use. Alignment would run north on Nyssa St from W 6th Ave, cross W 10th Ave, turn west on W 12th Ave, and turn north on Oak St to connect to the shared-use path at Laurel Elementary School. Consider installing an All-Way stop at the intersection on W 10th Ave with Nyssa St and crossing enhancements at the intersection on W 6th Ave with Nyssa St. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$45,000	$45,000

Table 6 (continued): Bicycle Mode - Proposed Bicycle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
SLM1	**Rose St**: W 13th Ave to W 10th Ave: Shared-Lane Markings - Existing on-street parking is actively used. Supplemental warning signs should be installed leading into the curve. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$5,000	$5,000
SLM2	**Maple St**: W 6th Ave to W 1st Ave: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$10,000	$10,000
SLM3	**E 6th Ave**: OR 99 to Front St: Shared-Lane Markings – Traffic volumes are higher than preferred, but speeds are low. Recommend converting angled on-street parking to parallel parking to enhance cyclist visibility. ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$5,000	$5,000
SLM4	**Deal St**: E 6th Ave to Dane Ln: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity***	$15,000	
SLM5	**E 10th Ave**: OR 99 to Deal St: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity, Safe Routes to School***	$10,000	$10,000
SLM6	**Hatton Ln**: Prairie Rd to OR 99 (new segment to be constructed as part of MV9): ***Phase 1***: Shared-Lane Markings ***Key Benefits: Bicycle Connectivity***	Phase 1: $5,000	
	Preferred Plan	**$690,000**	
	Financially Constrained Plan		**$565,000**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.
** Identification of potential funding contributors is for budgeting purposes only and does not create an obligation for funding from parties listed.

Table 7: Motor Vehicle Mode - Proposed Motor Vehicle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
New Roadways/Roadway Extensions			
MV1	**6th Avenue**: Oaklea Drive to west: Extend 6th Avenue as a new Collector Street from Oaklea Drive to new north-south Collector Street (see MV5) ***Key Benefits: Connectivity***	$4,190,000	
MV2	**10th Avenue**: Oaklea Drive to west: Extend 10th Avenue as a new Collector Street from Oaklea Drive to west UGB ***Key Benefits: Connectivity***	$10,100,000	
MV3	**New Collector Street**: North UGB to 10th Avenue: Construct new Collector Street extending from the North UGB to 10th Avenue ***Key Benefits: Connectivity***	$5,560,000	
MV4	**New Collector Street**: North UGB to High Pass Road: Construct new Collector Street west of Oaklea Drive extending from the North UGB to High Pass Road ***Key Benefits: Connectivity***	$11,730,000	
MV5	**New Collector Street**: West UGB to MV4: Construct new Collector Street from west UGB to MV4 ***Key Benefits: Connectivity***	$6,380,000	
MV6	**New Frontage Road east of PNWR railroad**: 1st Avenue to Prairie Road: Construct to Collector standards between PNWR and UP railroads ***Key Benefits: Connectivity, Safety***	$16,535,000	
MV7	**Prairie Meadows Avenue**: Extend west to Pitney Lane: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Connectivity***	$1,435,000	
MV8	**Coral Street**: Extend west to Pitney Lane: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Connectivity***	$2,335,000	
MV9	**Hatton Lane**: Extend west to Prairie Road: Phase 1: Acquire right-of-way for Hatton Lane extension to Prairie Road, and construct a pedestrian and bicycle connection (see SLM6). Phase 2: Extend Hatton Lane as a new Collector Street connecting Prairie Road to OR 99 ***Key Benefits: Connectivity***	Phase 1: $210,000 Phase 2: $655,000	Phase 1: $210,000

Table 7 (continued): Motor Vehicle Mode - Proposed Motor Vehicle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
Roadway Modernizations			
MV10	**Meadowview Road**: OR 99 to East UGB: Construct to Collector standards including bike lanes on both sides and sidewalk only on the north side ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,480,000	
MV11	**Oaklea Drive#**: 18th Avenue to 1st Avenue/High Pass Road: Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$7,190,000	
MV12	**1st Avenue/High Pass Road***#**: Oaklea Drive to OR 99: Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks. ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Safety, Livability, Auto Mobility***	$6,070,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: Lane County)
MV13	**1st Avenue/River Road#**: OR 99 to East UGB: Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$4,270,000	
MV14	**6th Avenue#**: Oaklea Drive to Timothy Street: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$1,735,000	$433,750 of City funds designated from Financially Constrained budget. Remainder assumed funded by grants or other funding partners. (Potential funding partners: Lane County, Developers)
MV15	**18th Avenue#**: Oaklea Drive to Juniper Street: Construct to Minor Arterial standards including bike lanes on both sides and sidewalk only on the south side (no center turn lane) ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$2,585,000	
MV16	**18th Avenue#**: OR 99 to East UGB: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$1,625,000	

Table 7 (continued): Motor Vehicle Mode - Proposed Motor Vehicle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
MV17	**Prairie Road**[#]: 1st Avenue to Bailey Lane: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Safe Routes to School, Livability***	$3,730,000	
MV18	**Prairie Road**[#]: Bailey Lane to OR 99: Construct to Collector standards including bike lanes and sidewalks. Do not construct sidewalks where adjacent to UGB ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$4,415,000	
MV19	**Prairie Road**[#]: OR 99 to East UGB: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$1,730,000	
MV20	**Pitney Lane**[#]: 1st Avenue/High Pass Road to Bailey Lane: Construct to Collector standards including bike lanes on both sides and sidewalk only on the east side (no center turn lane) ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,665,000	
MV21	**Milliron Road**[#]: West UGB to East UGB: Construct to Collector standards including bike lanes and sidewalks ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability***	$2,105,000	
MV22	**1st Avenue/High Pass Road***[#]: West UGB to Oaklea Drive: Construct to Minor Arterial standards including center turn lane, bike lanes, and sidewalks. ***Key Benefits: Pedestrian/Bicycle Connectivity, Livability, Auto Mobility***	$2,075,000	
Safety Improvements			
MV23	**6th Avenue Access Improvements**: OR 99 to Holly Street: Access improvements along 6th Avenue to reduce potential conflicts ***Key Benefits: Safety, Safe Routes to School***	$5,000	$5,000
MV24	**Restripe 6th Avenue**: OR 99 to Front Street: Convert from front-facing angle parking to parallel parking to provide consistent center-line ***Key Benefits: Safety, Safe Routes to School***	$10,500	$10,500

Table 7 (continued): Motor Vehicle Mode - Proposed Motor Vehicle Facility Improvements

Project ID	Project Description	Probable Construction Costs*	Financially Constrained Plan Budget (Potential Funding Partners)**
MV 25	**OR99 Traffic Signal Upgrades: OR99E/OR99W, OR99/OR36, and OR99/Milliron Road**: Upgrade signal head backplates with retroreflective borders. The remaining signal head upgrades are captured under the crossing improvement projects for the signals at OR99/10th, OR99/6th, and OR99/1st ***Key Benefits: Safety, Safe Routes to School***	$10,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
MV26	**High Pass Rd/West 1st Street at Oaklea Drive**: Install driver feedback sign displaying speed to reduce drive speeds along High Pass Road heading eastbound toward OR 99. ***Key Benefits: Safety, Safe Routes to School***	$20,000	$20,000
MV27	**Oaklea Drive**: Oaklea Drive/ 18th Avenue intersection: Improve sight distance for northbound approach ***Key Benefits: Safety***	$55,000	
Traffic Operations Improvements			
MV28	**Intersection Improvement******: Maple Road/Prairie Road and 1st Avenue intersection: Realign north and south approaches of intersection and add left turn lanes on all approaches ***Key Benefits: Safety, Safe Routes to School, Auto Mobility***	$1,175,000	$587,500 of City funds designated from Financially Constrained budget. Remainder assumed funded by grants or other funding partners. (Potential funding partners: Lane County)
MV29	**OR 99 Traffic Signal Optimization**: OR 99E/OR 99W junction to Milliron Road: Periodically review traffic signal timings along OR 99 to optimize operations as needed to respond to changes in traffic volumes ***Key Benefits: Auto Mobility***	$30,000	No City funds designated from Financially Constrained budget. Assumed funded by grants or other funding partners. (Potential funding partners: ODOT)
	Preferred Plan	**$103,110,500**	
	Financially Constrained Plan		**$1,266,750**

* Probable construction costs should be used for planning purposes only. Each project cost estimate should be revisited when determining specific project funding needs.

** Identification of potential funding contributors is for budgeting purposes only and does not create an obligation for funding from parties listed.

**** Impacts to historical cemetery must be considered in any widening plans along High Pass Road.

**** Southbound approach (Maple Street) traffic operations perform at LOS E as a 2-way stop, exceeding the Junction City mobility standard of LOS D. Several mitigations were considered to address the forecasted mobility deficiency. An all-way stop, a southbound right-turn lane, and adding left-turn pockets on 1st Avenue would not improve performance enough to reach LOS D. To reach LOS D for the southbound turn (from Maple Street), 1st Avenue would need to be reconstructed to include a two-way center left-turn lane.

Identified in Lane County TSP.

POTENTIAL NEW FUNDING SOURCES

Consideration of new funding sources to increase revenue for transportation improvements is recommended to facilitate the implementation of needed projects and cover the cost of basic maintenance and operations. Any potential funding source is constrained based on a variety of factors, including the willingness of local leadership and the electorate to burden citizens and businesses, the availability of local funds to be dedicated or diverted to transportation issues from other competing City programs, and the availability and competitiveness of state and federal funds. Nonetheless, it is important for the City to consider all options to provide and enhance funding for its transportation programs.

This section describes several potential transportation funding sources, including State and County contributions, City sources (i.e., residents, businesses, and/or developers), grants, and debt financing. Many of these sources have been used in the past by other agencies in Oregon, and in most cases, when used collectively, are sufficient to fund transportation improvements for a local community.

Federal, State, and County Contributions

There are multiple roadways in Junction City that are the responsibility of either ODOT or Lane County. The City should seek funding partnerships (i.e., contributions) from ODOT and Lane County for projects located on their respective roadways. In addition, direct appropriations are another potential funding source.

ODOT Contributions

The Oregon Transportation Commission (OTC) and the Oregon Department of Transportation have changed how the State Transportation Improvement Program (STIP) is developed. Beginning with the 2015 to 2018 process, the STIP has been divided into two broad categories: *Fix-It* and *Enhance*. *Fix-It* includes activities that fix or preserve the transportation system, while *Enhance* includes activities that enhance, expand, or improve the transportation system. The new STIP development process seeks to identify the most effective projects based on community and state values, rather than those that fit best into prescribed programs. The change was made to enable ODOT to take care of the existing transportation assets while still providing a measure of funding to enhance the state and local transportation system in a truly multimodal way. As has been the case for many years, the OTC continues to put a strong emphasis on preserving the existing transportation system first. This is evidenced by the funding split between the *Fix-It* portion of the proposed new STIP (76 percent) and the *Enhance* portion (24 percent).

Programmed projects are included in the four-year STIP, which is updated every two years. ODOT maintenance districts also have available funds that may be used for small-scale projects such as in-fill sidewalks or culvert repair on a state highway.

When considering proposed land use actions, such as subdivisions or site development, the City should not assume that projects planned on state highways will be in place to support the proposed development unless the project is programmed in the current STIP. Construction of projects which have been previously required through the City land use or ODOT approach permit approval process may be assumed if construction of the development is in process. For proposed comprehensive plan amendments, which must consider the long-term

adequacy of the transportation system for TPR 660-012-0060 compliance, ODOT must be consulted to determine whether a highway project is "reasonably likely to be funded" based on current funding projections.

Grants

Junction City should actively pursue State and Federal grants, in particular to complete desired pedestrian and bicycle projects. Grant opportunities include funding for pedestrian, bicycle, Intelligent Transportation System (ITS), and Safe Routes to School (SRTS) improvements. Grant sources change over time, but current sources to explore include:

Federal Funding Sources

- Highway Safety Improvement Program
- Transportation Alternatives Program
- Transportation for Elderly Persons and Persons with Disabilities
- Community Development Block Grants
- Land and Water Conservation Fund
- Congestion Mitigation & Air Quality Improvement Program
- TIGER Grants

State Funding Sources

- Oregon Immediate Opportunity Fund
- ConnectOregon V
- Oregon Parks and Recreation Department Local Government Grants
- Oregon Transportation Infrastructure Bank
- Oregon Special Transportation Fund
- Oregon Pedestrian Safety Enforcement Mini-Grant Program
- Oregon Safe Routes to School (OSRTS)
- Oregon Transportation and Growth Management Program (for planning studies only)

Other Funding Sources

- PeopleForBikes Community Grant Program

Direct Appropriations

The City can also seek direct appropriations from the State Legislature and/or the United States Congress for transportation capital improvements. The City may want to pursue these special, one-time appropriations, particularly for projects that support economic development.

City Sources

The City can also look to local residents, business owners, and developers to raise additional funds designated for transportation-related improvements. Optional sources include developer exactions, Urban Renewal Districts (URD), Local Fuel Taxes, SDC increases, Local Improvement Districts (LID), General Fund revenue transfers, special assessments, and employment taxes.

Developer Exactions

Exactions are roadway and/or intersection improvements that are partially or fully funded by developers as conditions of development approval. Typically, all developers are required to improve the roadways along their frontage upon site redevelopment. In addition, when a site develops or redevelops, the developer may be required by the City, County, or ODOT (through a highway approach permit) to provide off-site improvements depending upon the expected level of traffic generation and the resulting impacts to the transportation system.

Urban Renewal District (URD)

A URD is a tax-funded district within the City. Improvement projects within the district are typically paid for through bonds and constructed up front, with the bond debt paid by the incremental increases in property taxes that result from the improvements made. While this process can be used to pay for transportation improvements, it also channels future tax revenue away from other potential uses until the debt is paid or until the term of the district expires.

Local Fuel Tax

Twenty-two cities and two counties in Oregon have adopted local fuel taxes by public vote, ranging from one to five cents per gallon. Nearby locations with a City fuel tax include Cottage Grove (three cents per gallon), Veneta (three cents per gallon), Springfield (three cents per gallon), Coburg (three cents per gallon) and Eugene (five cents per gallon).

Based on experiences in other communities, a local fuel tax in Junction City could generate approximately $10,000 annually for every cent charged. A three to five-cent tax, similar to neighboring communities, could generate $30,000 to $50,000 annually (or approximately $1,000,000 by the year 2035). This is roughly equivalent to the projected budget shortfall for basic transportation maintenance and operations.

With the tax being applied to fuel sales, visitors and people traveling through Junction City will contribute revenue as well as local residents. Assuming the average driving resident in Junction City travels 12,000 miles per year with a rate of fuel consumption of just over 20 miles per gallon of fuel, they would pay about $6 annually for every cent of local fuel tax charged.

The taxes are paid to the City monthly by distributors of fuel and can be applied to any transportation expenses (e.g., maintenance, operations, or new construction). The process for presenting such a tax to voters will need to be consistent with Oregon State law, as well as the laws of the City. The current moratorium on new local fuel taxes is scheduled to expire in 2014.

Transportation System Development Charges (SDCs)

To help fund transportation improvements needed to support future growth, the City could consider increasing the SDC rate. Transportation SDCs are an existing funding source collected from new development that is designated for projects that increase the transportation system's capacity (not for projects that target maintenance or operations).

The City of Junction City has a current SDC rate of approximately $1,110 per single-family residence (i.e., $111.60 per trip end). If additional projects are determined to be needed to support future growth beyond those currently included in the Financially Constrained Plan, the City could consider increasing the SDC rate. For every increase in SDC rates of $100 for single-family residences (or $10 per trip end for all uses), there would be an additional $270,000 available for transportation improvements through the year 2035.

Additionally, consideration should be given to rewriting the City of Junction City SDC ordinance so that funds could also be used to make improvements to the pedestrian and bicycle system, which is typically not allowed under standard SDC ordinances.

Local Improvement District (LID)

The City may set up Local Improvement Districts (LIDs) to fund specific capital improvement projects within defined geographic areas, or zones of benefit. LIDs impose assessments on properties within its boundaries and may only be spent on capital projects within the geographic area. Benefiting properties are assessed their share to pay for improvements.

Since LIDs may not fund ongoing maintenance costs, they require separate accounting. Furthermore, because citizens representing 33 percent of the assessment can terminate a LID and overturn the planned projects, LID projects and costs must obtain broad approval of property owners within the LID boundaries. LIDs can be matched against other funds where a project has system wide benefit beyond the adjacent properties. LIDs are often used for sidewalks and pedestrian amenities that provide clear benefit to residents along the subject street.

Street Utility Fee

A number of Oregon cities supplement their street funds with street utility fees. Establishing user fees to fund applicable transportation activities and/or capital construction ensures that those who create the demand for service pay for it proportionate to their use. Street utility fees are recurring monthly charges included on existing local utility bills that are paid by all residential, commercial, industrial, and institutional users. The fees are charged proportionate to the amount of traffic generated, so a retail commercial user pays a higher rate than a residential user. Typically, there are provisions for reduced fees for those that can demonstrate they use less than the average rate, for example, a residence where no cars or trucks are registered.

While the fee structure per user varies, a street utility fee that costs the average single-family homeowner in Junction City $3 to $5 per month could generate approximately $25,000 to $35,000 annually, which is roughly equivalent to the projected budget shortfall for basic transportation maintenance and operations. As the city

grows through the year 2035, the annual revenue could increase to well over $100,000 with no increase in the monthly fee.

From a system health perspective, forming a street utility fee establishes a source of reliable, dedicated funding for transportation. Fee revenue use is flexible and can be used for maintenance and operations expenses or can be used to secure revenue bond debt used to finance capital construction. A street utility fee can be formed by Council action and does not require a public vote.

General Fund Revenues

At the discretion of the City Council, the City can allocate General Fund revenues to pay for its transportation program. General Fund revenues primarily include property taxes, user taxes, and any other miscellaneous taxes and fees imposed by the City. Allocation is completed through the City's annual budget process, but the funding potential of this source is constrained by competing community priorities set by the City Council. General Fund resources could fund any aspect of the transportation program, from capital improvements to operations, maintenance, and administration. Additional revenues available from this source are only available to the extent that either General Fund revenues are increased or City Council directs and diverts funding from other City programs.

Special Assessments

A variety of special assessments are available in Oregon to defray the costs of sidewalks, curbs, gutters, street lighting, parking, and central business district (CBD) or commercial zone transportation improvements. These assessments would likely fall within the Measure 50 limitations. One example is the 50/50 program. This is a match program for sidewalk infill projects where property owners pay half the cost of a sidewalk improvement and the City matches the investment to complete the project.

Employment Taxes

Employment taxes may be levied to raise additional funds. For example, in the Portland region, payroll and self-employment taxes are used to generate approximately $145 million annually. The City of Portland has chosen to earmark these funds for transit agency operations.

Debt Financing

While not a direct funding source, debt financing is another funding method. Through debt financing, available funds can be leveraged and project costs can be spread over the projects' useful lives. Though interest costs are incurred, the use of debt financing can serve not only as a practical means of funding major improvements, but it is also viewed as an equitable funding source for larger projects because it spreads the burden of repayment over existing and future customers who will benefit from the projects. One caution in relying on debt service is that a funding source will still need to be identified to fulfill annual repayment obligations. Two methods of debt financing are voter-approved general obligation bonds and revenue bonds.

Voter-Approved General Obligation Bonds

Subject to voter approval, the City can issue General Obligation (GO) bonds to debt finance capital improvement projects. GO bonds are backed by the increased taxing authority of the City, and the annual principal and interest repayment is funded through a new, voter-approved assessment on property throughout the City (i.e., a

property tax increase). Depending on the critical nature of projects identified in the Transportation System Plan and the willingness of the electorate to accept increased taxation for transportation improvements, voter-approved GO bonds may be a feasible funding option for specific projects. Proceeds may not be used for ongoing maintenance.

Revenue Bonds

Revenue bonds are municipal bonds that are secured by the revenue received by financing income-producing projects. In contrast to GO bonds, revenue bonds fund projects that generally only serve those in the community who pay for their services. Given the nature of revenue bonds, they may not be as applicable to transportation projects as are GO bonds and are most commonly used for other municipal projects such as sewer and water system upgrades where users pay a monthly fee for service. Interest costs for revenue bonds are slightly higher than for GO bonds due to the perceived stability offered by the "full faith and credit" of a jurisdiction.

APPENDIX I:

Committee Meeting and Open House Summaries

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PLANNING
COMMUNICATIONS
CONFLICT RESOLUTION
SUSTAINABLE DEVELOPMENT
ENVIRONMENTAL PROJECT MANAGEMENT
GOVERNMENTAL/COMMUNITY RELATIONS

MEMORANDUM

DATE: March 21, 2011

TO: Project Management Team

FROM: Steve Faust, Cogan Owens Cogan, LLC

RE: Junction City TSP, Public Information and Outreach Strategy

The consultant team is designing a public information and outreach strategy for the Junction City Transportation System Plan (TSP) process. The main purpose of this strategy is to publicize two open houses and engage citizens in the planning process. The Consultant shall coordinate this plan with the technical elements of the Project to meet regulatory requirements and to address identified project issues. This memorandum describes the public outreach activities the consultant team will initiate to maximize stakeholder participation and provides roles and responsibilities for the consultant team and City staff.

Citizen Advisory Committee

The City of Junction City will establish and the consultant team will facilitate a Citizen Advisory Committee (CAC) to advise City staff and the consultant team and provide recommendations to the Planning Commission and City Council throughout the planning process. Specific roles and responsibilities of the CAC include:

- Regularly prepare for and attend four (4) CAC meetings (meeting outline below); meeting materials will be provided one week in advance of the meeting.
- Review and comment on work products and activities throughout the project, including all aspects of the Transportation System Plan.
- Encourage community members to participate in the project and act as liaisons to specific constituencies or interest groups which they may represent.
- Serve as hosts at open houses; encourage other community members to attend.
- Provide recommendations on key project issues and decisions.

Meeting Outline

Meeting #1

- **Review project objectives, scope of work and schedule**
- **Review CAC roles and responsibilities**
- **Review and comment on Draft Technical Memorandum #1: Background Document Review**
- **Review and comment on Draft TSP Chapter 2: Goals and Policies**

Meeting #2

- **Review and comment on Draft TSP Chapter 3: Existing Transportation Conditions**
- **Review and comment on Draft TSP Chapter 4: Future Transportation Needs**
- **Discuss options to meet TSP deficiencies**
- **Advise on format and content for public open house #1**

Meeting #3

- **Review and comment on Draft Technical Memorandums #4: Alley Circulation Plan**
- **Review and comment on Draft Technical Memorandum #5: Transportation System Solutions**
- **Advise on format and content for public open house #2**

Meeting #4

- **Review and comment on Draft Technical Memorandum #6: Implementation-Action Strategy**
- **Review and comment on Draft Implementation Ordinances and Code Changes**

Information Boards

The consultant will prepare up to four information boards to be displayed in public spaces. The boards will be developed as the project progresses to provide an overview and key questions for each stage of the process. For example 1) project background and objectives, 2) goals, policies and system needs, 3) proposed solutions, 4) draft transportation system plan.

Public Open Houses

The consultant team, in coordination with the City, will design and facilitate two open houses to engage the public in the TSP process. The consultant team will develop the format and agenda for each open house and a summary of citizen feedback. City staff will be responsible for open house logistics, the printing of open house materials and staffing of the registration table.

The consultant team will carry out the following activities to help the City publicize the meeting to a broad spectrum of stakeholders and interested parties:

- **Prepare a media release for inclusion in the Tri-County Tribune, The Register-Guard, The Santa Clara Tribune and any other local media outlets as indicated by City staff.**
- **Prepare an e-mail blast to interested parties to coincide with the media release. The consultant will maintain and update a comprehensive stakeholder contact list to keep affected and interested parties aware of Project developments, timetable, and opportunities for public involvement. The contact list shall include contact names, addresses/e-mail addresses of key stakeholders and interested parties. City staff will provide the initial list with available stakeholder contact information to the consultant.**
- **Design a flyer for each open house. City staff will be responsible for printing and distributing the flyers through various means which could include electronic distribution to the chamber of commerce, civic organizations and other local associations and through posting in prominent places such as City Hall, library, community center and local businesses (e.g., banks, restaurants).**
- **Develop a comment form for open house participants. The comment form will provide citizens with an alternative way in which to provide their opinions on key issues and questions at the open house. City staff will be responsible for printing the comment forms. The consultant team will compile comment card responses along with survey results (see below) following the open house.**
- **The consultant team will prepare an online survey for those unable to attend the open house. The survey will mirror the comment form provided at the open house. A link to the survey will be provided in the media releases and e-mail blasts and will be listed on open house materials. Additionally, a link could be provided on the City's website. The consultant team will compile survey results along with comment card responses.**

<u>Public Open House #1</u>

The purpose of Open House #1 is to present project objectives, scope of work and schedule and for the public to review and comment on TSP Chapters 2, 3 and 4 (Goals/Policies and System Needs).

<u>Public Open House #2</u>

The purpose of Open House #2 will be to for the public to review and comment on Draft Technical Memoranda #4 and #5 (Proposed Solutions).

Joint Planning Commission/City Council Work Session

The consultant shall prepare for and present the draft TSP, Implementation-Action Strategy and draft implementation ordinances and code changes. The consultant team will be responsible for designing the work session presentation and materials, giving the presentation and answering questions from the Planning Commission and City Council. City staff will be responsible for printing materials for the work session.

summary

Junction City Transportation System Plan Update
Citizen Advisory Committee (CAC) Meeting #1

Meeting Date: August 4, 2011
Meeting Time: 6:00 p.m. to 8:00 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
CAC Members
- Bob Biswell
- Mike Kaiser
- D.W. Northey
- Kurt Straube
- Jack Sumner
- Jason Thiesfeld

Project Management Team
- Kay Bork, City of Junction City
- John Bosket, DKS Associates
- Savannah Crawford, Oregon Department of Transportation
- Steve Faust, Cogan Owens Cogan
- Lydia McKinney, Lane County Transportation

Sign-in, Introductions, and Agenda Overview
Kay Bork welcomed everyone to the first meeting of the Junction City Transportation System Plan (TSP) Update Citizen Advisory Committee (CAC). She introduced Steve Faust who thanked the CAC for their participation and asked them to introduce themselves. After introductions, Steve reviewed the agenda and asked for any additions of which there were none.

Project Background, Purpose, and Schedule
Kay explained that the City's TSP was last updated in 2008 with the addition of the OR 99 Junction City Refinement Plan-which is set to go before the Lane Board of County Commissioners for adoption in October. The City created a work plan for a full TSP update in 2008-09 and now has funding to initiate the work. It is anticipated that the TSP update will take approximately 14 months to adoption. The City has selected the consulting firm DKS Associates to lead the TSP Update along with their subconsultants Cogan Owens Cogan and Winterbrook Planning.

John Bosket explained that the TSP is an extension of the City's Comprehensive Plan. The purpose of the TSP is to describe the City's plans for all modes of travel for the next 20 years, including projects, policies and other transportation-related actions. John reviewed the project schedule and major tasks. The first task is to review existing transportation documents for current transportation goals and policies. The CAC will review a summary of these documents later in the agenda.

The next tasks are to document existing conditions of the transportation system and project future system needs in 2035. The existing conditions work is underway and the results of these tasks will be reviewed by the CAC, the Technical Advisory Committee (TAC) and at a public open house this fall. Additionally, an Alley Access Management Subcommittee will meet to review TSP and Hwy 99 access management requirements for businesses on Ivy and in the downtown core. Recent changes to ODOT access management requirements will be considered as well. John asked for volunteers to serve on the subcommittee. Jason Thiesfield, Jack Sumner, Kurt Straube and Mike Kaiser all volunteered.

Once the existing and future conditions are finalized, the consulting team will look at how to address future needs by developing TSP alternatives. These alternatives will be evaluated by the TAC, CAC and at a second public open house. This work is scheduled for late 2011 and early 2012.

Once preferred system alternatives are selected, the consulting team will develop a draft plan and implementation strategies, including cost estimates for planned TSP improvements. The drat plan is scheduled for completion in April 2012 at which time it will be reviewed by the TAC and CAC as well as the Planning Commission and City Council. Recommended changes will be incorporated into a revised draft. The adoption process will be initiated in May 2012 with final adoption scheduled for August 2012.

Transportation System Planning "101" Presentation
John gave a general overview of Transportation System Planning. John explained the TSP's purpose, common elements, process and basic terminology. The presentation is available upon request.

Public Involvement Strategy
Steve Faust reviewed the Public Involvement Strategy which outlines expected outreach activities. Steve reviewed CAC roles and responsibilities which include encouraging community members to participate in the project and acting as liaisons to the specific constituencies or interest groups they represent. CAC members indicated they understood and accepted their role. Four meetings of the CAC are anticipated throughout the course of the project along with two public open houses. The consultant team will prepare information boards to be displayed in public spaces. These boards may be used to increase awareness leading up to the open houses.

Draft Technical Memorandum #1: Background Documents/ Plans
John reviewed the city, county and state plans, policies, regulations and ordinances in Technical Memorandum #1. Rather than reading the memorandum in its entirety, the CAC was instructed to use it as a reference document. He noted that some documents are more relevant than others and highlighted several documents and issues:

- The Junction City TSP must be consistent with the Lane County TSP. The Lane County TSP identifies several projects along the edges of Junction City providing opportunities to make consistent pedestrian and bicycle connections.
- The Junction City TSP and OR 99 Junction City Refinement Plan are the most important documents to review to become familiar with existing transportation policies. The Refinement Plan recommends a couplet system two lanes in each direction, southbound on Ivy and northbound on Holly, assuming the railroad tracks are moved. Preliminary discussions with the railroad have revealed there is a desire to move the tracks at some point. The Refinement Plan made some policy changes regarding freight mobility and other minor issues.
- The TSP will likely include updates to zoning ordinances to incorporate best practices and meet state requirements.
- Kay mentioned that the Public Works Director is interested in aligning the Roadway Design Standards and standards in the code which currently do not match.
- The TSP will take into account transportation impacts from major development proposals including the state hospital and corrections facility and land use assumptions such as the change in zoning designation for the professional/technical site to residential.
- Environmental plans will be reviewed to ensure that planned facility improvements do not conflict with sensitive environmental lands.
- TSP updates that impact state highways must take ODOT regulations into account.
- OR Bicycle and Pedestrian Plan is a good resource for best practices.
- City projects within 500 feet of a rail line will trigger the involvement of ODOT Rail. ODOT Rail's general policy is no new at-grade rail crossings. As needed, Savannah Crawford will bring in an appropriate ODOT Rail representative to discuss rail issues.
- ODOT is in the process of changing some standards in the Access Management Rule. They will be effective beginning in 2012, so the city and consultant team will work with ODOT to ensure new regulations are met. ODOT is currently determining how to implement new legislation regarding these regulations. The consultant team will send a link to the CAC with more information about Senate Bill 264 which initiated these changes.
- ORS 366.215 deals with impacts to state highways that might affect freight movement and require that policy changes don't reduce vehicle carrying capacity.

TSP Mission, Goals, and Policies
John explained that the TSP begins with the city's existing mission, goals and policies related to transportation. Changes to these items can be made throughout the process. However, because they help guide the TSP, changes early in the process are preferred even if they are general in nature. He noted that the policies are grouped by topic rather than under the goals. The CAC may want to consider reorganizing the policies and should consider eliminating policies that are obsolete or don't make sense. Several policies the CAC may want to review/consider are those related to:

- Traffic impact studies
- Functional classifications
- Future transit routes
- Upgrading the pedestrian system to be ADA compliant
- Coordination with the Lane Transit District

The CAC was asked for their initial thoughts on the mission. No changes were recommended for the mission at this time. They were then asked to review the existing goals as well as recommend any additional goals that help convey the values that Junction City wants to protect. CAC members identified several goal topics and areas of interest including:

- Provision of a fully connected sidewalk system
- Providing walkable school zones
- Mitigating barriers created by railroads for the elderly
- Improving coordination among jurisdictions (to avoid problems such as the recent need to protect the historical cemetery from transportation-related impacts
- Support business development by providing an easy and predictable path forward
- Safety – specifically improving difficult OR 99 crossings between 18th and 10th and children crossings on OR 99
- Regional bus service – there used to be bus service to Monroe and Corvallis
- Safe Routes to School – there is no way walk or bike between the High School and Middle School

CAC members were asked to discuss these items further with their neighbors and constituencies in advance of the next CAC meeting.

Public Comments/Questions
There were no public comments.

Next Steps and Adjourn
John reminded CAC members to review the existing TSP and speak with the community about the transportation mission, goals and policies. CAC members can

bring their comments to the next meeting or send them to Kay in advance of the meeting.

The first meeting and site visit of the Alley Access Management Subcommittee will be scheduled for some time in September.

summary

Junction City Transportation System Plan Update
Citizen Advisory Committee (CAC) Meeting #2

Meeting Date: September 27, 2012
Meeting Time: 5:30 p.m. to 7:30 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
CAC Members:
- Bob Biswell
- Mike Kaiser
- Kurt Straube
- Jason Thiesfeld

Project Management Team:
- Stacy Clauson , Lane Council of Governments/City of Junction City
- John Bosket, DKS Associates
- Savannah Crawford, Oregon Department of Transportation
- Steve Faust, Cogan Owens Cogan
- Kevin Watson, City of Junction City

Sign-in, Introductions, and Agenda Overview
Steve Faust welcomed everyone to the second meeting of the Junction City Transportation System Plan (TSP) Update Citizen Advisory Committee (CAC). It was recognized that this was actually the third meeting of the CAC because a special session was held in the spring of 2012 to provide an update on the project status. However, this was the second regularly scheduled meeting of the CAC for the project, with the first being in August 2011. After introductions, Steve reviewed the agenda and asked for any additions of which there were none.

Project Status
John Bosket explained that the group had not met in more than a year due to delays in the Comprehensive Plan Amendment process. Since the TSP must be in line with the Comprehensive Plan, the project team was hesitant to move forward too quickly until the Plan was approved. There are two phases to the Comprehensive Plan Amendment process. Phase 1 was launched in 2010 and included an urban growth boundary (UGB) expansion that was approved and has been annexed into the city. Phase 2 included a UGB expansion along the west side of Highway 99 for commercial and residential development as well as parks to support the new development. The Plan was approved by City Council on September 17, 2012. The next steps in the process are for Lane County to co-adopt the Plan before it goes to the state for review and approval.

In May, the City Council directed staff to move forward with elements of the TSP that are not impacted by the Comprehensive Plan Amendment. DKS Associates prepared the

existing conditions report ,which the CAC will discuss today. The next step will be to compile future transportation needs and improvements. It is the understanding of some CAC members that the future needs analysis would be split into two parts: the bicycle, pedestrian and transit components which are not as dependent upon Comprehensive Plan Amendment approval and the motor vehicle component, which is. John indicated that both short and long term needs will be on the table for discussion moving forward.

Input from Alley Access Management Subcommittee

The Alley Access Management Subcommittee also met about one year ago to discuss concerns with the use of public alleys for property/business access to OR 99 between 17th Avenue and 1st Avenue as recommended in the OR 99 Junction City Refinement Plan. Concerns include utilities, garbage cans and other obstructions in alleyways. Also of concern is ensuring a business friendly approach that avoids costly improvements that could negatively impact development. Other concerns include alleys being blocked for periods of time by garbage or utility trucks and already constrained lot depths of approximately 100 feet.

CAC members stress that it is important to keep the plan flexible so it can change as state standards change. Savannah Crawford indicated that ODOT is refining policy language to be less prescriptive than the current access management plan for OR 99. CAC members also pointed out that ODOT had categorized every driveway along the corridor and that those categorizations may have had some indication of how each driveway was to be treated in the future. Savannah was not familiar with this work, but suspected it may have been related to a paving project and would only have had relevance to actions taken at that time. She will investigate this and see what she can find.

Draft Chapter 3: Existing Conditions

John reviewed the draft Existing Conditions report by mode of transportation. The study area for the report includes the entire transportation network within the Junction City UGB. The current mapping was based on the adopted Comprehensive Plan prior to September 2012. These maps will be updated to ensure the TSP reflects the currently adopted Comprehensive Plan. Oregon Statewide Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) is mentioned briefly in the report. Streams and wetlands are mapped and historic and archaeological sites were identified, though not mapped to protect their potential sensitivity. These resources will be referenced and considered as future potential projects are discussed.

CAC members indicate that the classification of High Pass Road is inconsistent in city and county planning documents and even within this report. John agreed that street functional classifications in the current TSP are not clear and that confusion over classifications should be addressed through this process. CAC members also suggest that Phase 2 of the OR 99 couplet plan be reviewed because the recommendations to widen High Pass Road would impact the historic cemetery.

<u>Pedestrians</u>

Pedestrian safety is a big area of interest. Most destinations in Junction City (downtown shops, schools, parks) are located within what is considered a comfortable walking distance of ½-mile of population centers including transportation-disadvantaged populations. The city's flat topography also adds to a walkable environment.

Arterial and collector streets located near the downtown core have sidewalks on either one side or both sides of the street. Moving away from downtown, areas that were developed in the 1970s have fewer or no sidewalks. Sidewalks are more common in either the older or newer residential developments. Significant gaps in the sidewalk network are found along Oaklea Drive, 18th Avenue, 1st Avenue and the western ends of 10th and 6th Avenues. Other gaps are found on Prairie Road from 1st Avenue to at least Bailey Lane. Sidewalks are generally five to six feet wide, which is considered adequate. The one exception may be in the downtown as the Technical Advisory Committee questioned whether the sidewalks in this area are wide enough to accommodate street furnishings, storefront displays, and a walking zone. CAC members indicate that the sidewalks in the downtown seem to be wide enough.

Sidewalks need to be compliant with Americans with Disability Act (ADA) standards and regulations. Many sidewalks have an older design, which the city is retrofitting over time. There are some maintenance issues that will not be dealt with through the TSP but were referred to the public works department. John asked CAC members if the city should develop an ADA program or address noncompliance on an ad-hoc basis. CAC members support retrofitting sidewalks as a goal or policy, but do not want to be too prescriptive in terms of identifying a specific number of intersections that should be retrofitted or amount of money that should be spent each year. A goal or policy will help ensure that sidewalks are upgraded with new development and may help obtain state or other funding. CAC members also indicate that the railroad continues to be a barrier for pedestrians and ADA accessibility. In regards to paths, the Parks Master Plan includes a recommendation to connect 6th to 10th Avenues and 10th to the rest of the network through a shared-use path. CAC members recommend building the path adjacent to the ditch/streambed.

Most crossing improvements are needed along OR 99. Signaled crossings are too far apart to be usable for many pedestrians. CAC members indicate that speed limits may be too high on Oaklea coming into the city. They would like to see more marked crossings at intersections if funding does not allow for them to have signals. John indicated that there are a variety of ways to address dangerous crossings in addition to typical signals, including pedestrian activated signals and additional lighting. Outreach to schools regarding crossing and bike safety is encouraged. Creating a safe pedestrian crossing on 1st Avenue at Maple Street should be a priority. Sidewalks are also needed along 1st Avenue/High Pass Road because a lot of school kids either walk out there or stand along the road waiting for a bus. The signals along OR 99 should be upgraded to include better illumination to improve safety. No other pedestrian issues were identified.

<u>Bicycles</u>

Bikeways are required on all arterials and collectors by state law. Bikeways can include a variety of treatments such as bike lanes, shoulder bikeways, shared roadways or shared-use paths. There are no designated bike lanes in Junction City. Most bike facilities in the city are on the road. CAC members state that recreational biking is common and guide signs would be helpful. There appears to be a lot of bike traffic on High Pass Road. While OR 99 cannot be widened for sidewalks or bike lanes, most streets in the city can accommodate bike traffic on shared roadways. Some wide streets, such as 6th Avenue, Oaklea Drive and 18th Avenue could accommodate a bike lane. The next step is to identify the best approach for each road.

Bike parking in the city is limited, but required by code for certain types of new commercial and residential development. No further bicycle issues were identified.

Transit

Junction City is served by Rural Route 95, provided by Lane Transit District (LTD) and two Park & Ride lots. CAC members feel that transit stops should be priority areas for ADA improvements. Curb inserts for buses at stops to get buses out of the traffic flow should be considered if cost and right-of-way are not significant obstacles. LTD provides their required paratransit service through RideSource within the Eugene-Springfield Metropolitan Planning Organization (MPO). Currently, paratransit service is only available within Junction City for people covered by Medicaid. Junction City would need to join the MPO to receive complementary paratransit service from RideSource. It is believed that Junction City will have a large enough population to join the MPO when results of the 2020 census are available. CAC members were asked if the current bus stop locations and route were adequately servicing the city. There was no knowledge suggesting that this wasn't the case. No further issues related to transit were identified.

Motor Vehicles

There is some confusion about roadway jurisdiction and functional classification in Junction City. The City maintains jurisdiction over many roadways in the city, but the highways are under ODOT jurisdiction and many other roadways through and surrounding the city are operated by Lane County. The TSP process should provide clarity on these matters.

Junction City development standards for new development appear to be complete. The map of speed limits and major traffic controls in the Existing Conditions document contains one error, which will be fixed in the final document. Junction City and Lane County adopted an Access Management Plan as part of the OR 99 Junction City Refinement Plan. Speed limits and traffic relief along High Pass Road should be addressed. Recommended changes in speed limits will be documented, but not changed, as part of the TSP process. CAC members are also concerned about areas in need of additional lighting. There are several possible funding mechanisms for lighting in addition to their addition with new development.

There do not appear to be any issues related to congestion in the City, including on OR 99 (all standards for mobility are being met). Most motor vehicle collisions occur along OR 99,

with the intersection at 10th Avenue having the highest frequency of crashes. Overall, the most common collision types are rear-end and turning collisions. While rear-end collisions are common at signalized intersections, turning collisions are actually the most frequent at the intersection at 10th Avenue, which is somewhat unusual. In addition to intersections along OR 99, the intersection at 18th and Oaklea was noted as a safety concern due to limited sight distance. No further issues related to motor vehicles were identified.

Rail

Previous efforts to relocate the railroad tracks along Holly Street appear to have halted. Bike and pedestrian crossings along the railroad continue to be an issue. No further rail issues were identified.

TSP Mission, Goals, and Policies

At the previous CAC meeting, members identified several new goal topics for consideration in the new TSP. The one possible goal topic identified during the meeting was Safe Routes to School. CAC members did not have any other goal topics to add, but were reminded that goals can be added throughout the TSP process as needed.

Public Comments/Questions

There were no public comments.

Next Steps and Adjourn

DKS will revise the project schedule in coordination with Stacy and Savannah after confirming the project direction with City Council. Next steps will be to identify future needs and improvements and vet them and the existing conditions at a public meeting.

summary

Junction City Transportation System Plan Update
Citizen Advisory Committee (CAC) Meeting #3

Meeting Date: January 31, 2013
Meeting Time: 5:30 p.m. to 7:30 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
CAC Members:
- Karen Leach, City Council
- Bob Biswell
- Mike Kaiser
- Ellen Mooney, Lane County Roads Advisory Committee
- Jason Thiesfeld

Project Management Team:
- John Bosket and Mat Dolata, DKS Associates
- Kevin Watson, City of Junction City
- Stacy Clauson , Lane Council of Governments/City of Junction City
- Savannah Crawford, Oregon Department of Transportation
- Steve Faust, Cogan Owens Cogan

Sign-in, Introductions, and Agenda Overview
Karen Leach opened the meeting. Steve Faust welcomed everyone to the third meeting of the Junction City Transportation System Plan (TSP) Update Citizen Advisory Committee (CAC). Following introductions, Steve Faust reviewed the agenda and asked for any additions of which there were none.

Project Status and Upcoming Open House
John Bosket talked about the TSP being dependent upon the Comprehensive Plan, which is the planning foundation of the City. There has been some delay in this process to ensure that decisions made about the TSP align with the Comprehensive Plan. With clear direction from City Council, the TSP process can move ahead.

John stated that there is a draft set of TSP goals and policies that will remain open until the end of the process, so any suggestions for new or revised goals and policies are welcome. He reminded CAC members that they reviewed existing conditions at the last meeting in September 2012, including current pedestrian, bike, motor vehicle and safety issues. Today the CAC will review Chapter 4 of the TSP, Future Transportation Issues, focusing on future needs of the transportation system. The CAC will discuss solutions at

their next meeting. Several ideas for potential solutions have come forth from the CAC and the Technical Advisory Committee.

Steve Faust described plans for the Transportation Open House, scheduled for Thursday, February 21st from 6 to 8 pm at Viking Sal. Outreach efforts include a flyer that went out with utility bills, a media release to local newspapers, an email to various business organizations and targeted outreach to advocacy groups, such as Travel Lane County and Greater Eugene Area Riders (GEARs), a bicycle advocacy group. CAC members suggested contacting the Lions club, Airport Rotary, Long Tom Grange and Shadow Hills Country Club.

Steve stated that the Open House will include several stations where participants could provide information about current and future transportation issues. The first station will be an overview of the project. The second station will include a list of transportation issues. Participants will use stickers to vote for their priorities and/or add issues that are not on the list. The final station will include maps of existing pedestrian, bicycle and motor vehicle/public transit conditions. Participants will be encouraged to identify locations of transportation problems and needs.

CAC members indicated that it is difficult to get people to come forward to talk about issues they would like to see addressed. Steve said that in addition to discussing issues with project staff, each participant will receive a form to use as another opportunity to record their comments.

Draft Chapter 4: Future Transportation Needs
Mat Dolata reviewed Chapter 4: Future Transportation Needs. The first step in determining future needs is to estimate future population, housing, and employment for Junction City. These estimates were obtained from the Lane County coordinated population forecasts for the Junction City urban growth boundary (UGB) and the Comprehensive Plan Housing Element and Economic Opportunities Analysis. These studies project an increase in households from 2,582 in 2010 to 4,455 in 2035, and an increase in employment from 3,545 jobs in 2010 to 7,240 in 2035. The estimates are then allocated to zones within the City where growth is expected to occur.

Housing growth is expected to occur primarily in the western portion of the City, while employment uses are anticipated primarily to the south, including the hospital and prison site, UGB expansion areas along OR 99, and other Junction City industrial areas.

Using the housing and employment forecasts, traffic volumes are estimated using a travel forecasting tool developed specifically for Junction City that converts land uses into motor vehicle trips. Most of the growth in traffic volumes will occur along OR 99 and other key arterial routes, such as High Pass Road, Oaklea Drive and 18th Avenue. Pitney Lane, OR 36 and Prairie Road are also expected to experience moderate levels of traffic growth.

summary

In the earlier planning study for the OR 99 Highway Refinement Plan (2008), significant congestion was forecast along OR 99. In response, major highway projects were considered, including a bypass of Junction City. A couplet configuration through Junction City was selected as the preferred alternative.

However, the current future projections for traffic along OR 99 are much lower. The level of growth over the 20-year planning period is similar, but today's traffic volumes that new growth would be added to are much lower than they were back in 2006. This is largely due to the recession and the loss of a major employer (Country Coach) that was located in a central area.

As a result, future congestion along OR 99 is not a significant issue and the major highway projects (i.e., the couplet) do not appear to be necessary through the new planning horizon of 2035. While the couplet wouldn't be a recommended project in Junction City's TSP, they should not dismiss it entirely because the need for it may return later (and could be needed the next time the City updates their TSP). Therefore, these improvements should be documented in the appendix for future consideration.

The CAC reviewed future bicycle, pedestrian, motor vehicle and transit needs. Key bicycle issues consist of a lack of bicycle facilities, a lack of connectivity and limited and dangerous crossings at OR 99 and the railroad. Existing shared-use paths are too narrow and adequate bike parking is infrequent. Key pedestrian issues also consist of a lack of continuity and connectivity of sidewalks, limited and dangerous crossings at OR 99 and the railroad, narrow sidewalks on OR 99 and a need for sidewalk maintenance and ADA compliance.

Motor vehicle issues include safety on OR 99. Most collisions occur between OR 99 and 1st Avenue, but severities worsen to the south where posted speeds are higher. Other issues include sight obstruction, lighting and needed street extensions. Widening High Pass Road to accommodate additional traffic may be difficult without impacting the historic cemetery. Long delays are expected when making a left turn onto High Pass Road from Maple Street. Safe access for properties along OR 99 is also of concern, especially in UGB expansion areas south of 1st Avenue. Travel Demand Management policies are needed to manage peak hour traffic demand for larger future employers.

Transit system issues include a potential need to increase service or modify routes as the City grows. Bicycle and pedestrian access to bus stops is also needed. Availability of paratransit services in Junction City are limited.

Projections of the revenue anticipated to be available for future capital projects are estimated at approximately $2.4 million through 2035. This does not include any one-time or project specific grants or other non-routine sources of revenue.

In summary, there are not many new issues anticipated in the future that are not present today. Improvements are needed to bring some roads up to urban standards, widening them with sidewalks and bike lanes where possible. Needed pedestrian improvements include filling sidewalk gaps, bringing sidewalks up to ADA standards, and making crossings safer at OR 99. Enhancements to bike facilities and transit (Lane Transit District) also are needed.

CAC members expressed concern about the lack of safe crossings at OR 99. Upgrades to existing signals, including timing, illumination and audio features could improve conditions. John suggested that pedestrian actuated crossings at OR 99 and 4th Avenue or other intersections could be considered. CAC members suggested that 8th Street is another popular intersection for pedestrian crossing and participants at the Open House may identify additional intersections. The project team will send bicycle, pedestrian and motor vehicle/transit issues maps to CAC members by email.

Preliminary Discussion of Walking and Biking Improvements
John reviewed a handout describing bicycle facility alternatives to CAC members, including:

- Shared lane markings/sharrows
- Shoulder bikeways
- Standard bike lanes
- Buffered bike lanes
- Cycle tracks
- Shared use paths
- Bike boulevards

In response to a CAC question about bicycle facilities impeding the flow of motor vehicle traffic, John indicated that there are a variety of options to alleviate that problem ranging from facilities that separate bikes from cars to eliminating parking on one side of the street in some areas. Several CAC members expressed concern about limiting parking.

CAC members reviewed several preliminary biking improvements and stated that impacts on existing traffic flow and infrastructure should be considered. They first discussed Rose Street between 10th and 18th Avenues. Proposed improvements include a painted bike lane from 18th to 13th Avenue where on-street parking is not needed and is rarely used (BL1). Shared lane markings were proposed from 13th to 10th Avenue (SLM1). CAC members noted that having bikes share the road would be dangerous because of high traffic volumes and because the curve in the road is quite dangerous as it is today. Installing bike lanes is not supported either because it would require removing parking throughout the neighborhood,

which is not desirable. Another suggestion was placing bike facilities on school property from Rose Street southeast to Oak Street and then continue south on Oak. CAC members also indicated that several property owners have expressed concerns about locating paths along ditches. Stacy stated that paths along ditches would be contingent upon property owner participation.

Next, CAC members discussed how best to allow people to travel safely by walking and biking between Laurel Elementary School, Oaklea Middle School, and Junction City High School. The preliminary proposal creates a continuous route along Maple Street from High Pass Road to 7th Avenue, then shifting east to Laurel Street to reach the elementary school.

Bike lanes on Maple Street from High Pass Road to 6th Street would be preferred, but would require removal of on-street parking. Shared lane markings could be considered as an alternative. Another suggestion was to place a path on school property between 3rd and 5th Avenues. Kevin Watson noted that the City applied for a grant to realign Maple Street and Prairie Road where they intersect 1st Avenue. The project utilizes the existing right of way for the most part.

The proposed route would continue north on Maple across the four way stop at 6th Avenue. At 7th Avenue, the path shifts one block to the east and continues on Laurel Street to Laurel Elementary (BVD1). The proposed route type also changes north of 6th Avenue from shared lane markings (or bike lanes) to a bike boulevard, which would encourage low motor vehicle speeds and prioritize the movement of bicycles. It was noted that a LTD bus route comes down Maple Street. A CAC member suggested moving the bike boulevard to Nyssa Street instead, one block to the west instead of to the east. There are already four-way stops on Nyssa at both 6th and 10th Avenues.

Painted bike lanes are proposed along 6th Avenue from Oaklea Drive to Deal Street due to its identification as a collector and higher volumes of motor vehicles. On-street parking would be removed from Oaklea to Timothy Place (BL2). Further to the east, CAC members' only concern is that parking is needed for football games at the High School. Through the downtown, the angled parking would need to be converted to parallel parking to make room for bike lanes. CAC members felt that even though traffic volumes are higher, having bikes share the road in the downtown (instead of using bike lanes) seemed okay because speeds are low. The final segment from Front to Birch Street would be restriped to add bike lanes.

John asked CAC members about providing a bicycle bypass to the east of OR 99 for recreational bikers. CAC members thought there was merit to providing a continuous route for bikers and suggested contacting Travel Lane County to ask about scenic bike routes. John suggested putting it in the TSP as a project and figuring out the details later.

summary

Public Comments/Questions
One member of the public asked the CAC to keep bikers on the roads and not on paths in yards and ditches. Creating such paths outside city limits is feasible, but much harder to do on existing urban properties.

Next Steps and Adjourn
DKS will update these materials to reflect CAC comments. The TAC and CAC will reconvene at the beginning of May to discuss possible solutions and host an open house for public comment.

summary

Junction City Transportation System Plan Update
Citizen Advisory Committee (CAC) Meeting #4

Meeting Date: July 8, 2013
Meeting Time: 5:30 p.m. to 7:30 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
CAC Members:
- Karen Leach - Chair, City Council
- Bob Biswell
- Kurt Straube

Project Management Team:
- John Bosket, DKS Associates
- Stacy Clauson, Lane Council of Governments/City of Junction City
- Steve Faust, Cogan Owens Cogan

Sign-in, Introductions, and Agenda Overview
Karen Leach opened the meeting. Steve Faust welcomed everyone to the fourth meeting of the Junction City Transportation System Plan (TSP) Update Citizen Advisory Committee (CAC). Following introductions, Steve reviewed the agenda and asked for any additions of which there were none.

Project Status and Upcoming Open House
John Bosket reviewed the project status. The alley circulation plan has been eliminated from the project, instead incorporating policy language acknowledging the importance for both access to businesses and safe travel along OR 99 and that future decisions regarding access will be subject to the policies and regulations in place at that time. ODOT policies/regulations have been recently revised to incorporate more flexibility. The CAC's next meeting will be a joint meeting with the Technical Advisory Committee to review the Draft Transportation System Plan and is scheduled for early October. A joint work session of the Planning Commission and City Council will follow the CAC/TAC meeting before the adoption process begins in December. The City hopes to complete the process by January 2014.

Technical Memorandum #4 proposes transportation solutions for walking, driving and biking and is the main topic of tonight's meeting and the July 11 Open House. The consultant team is looking to CAC members to identify priorities in light of limited funding. The Open House will be held at the Viking Sal from 6 to 8pm. As with tonight's CAC meeting, Open

House participants will be asked to identify priority improvement projects. The City hopes CAC members can attend to serve as ambassadors of the project. Steve asked CAC members to think about tonight's presentation of transportation improvement projects and, at the end of the meeting, make recommendations about how the information might be presented differently.

Approval of Meeting Summary from CAC Meeting #3
CAC members approved the Meeting #3 Summary without changes.

Draft Transportation Solutions
John reviewed Technical Memo #4 with the CAC. One member asked about the status of the past recommendation to create a west side corridor using Oaklea and Pitney to reduce travel through the city and along OR 99. John stated that revised population and employment forecasts indicate that changes in the area are not needed in the short-term, but the issue will be included in the TSP as a long-range strategy so it does not get lost. Proposed improvements may be revisited during the next TSP update or considered along with other strategies, such as varying shift times, if a major employer locates in Junction City.

Regarding potential conflicts with the historic cemetery adjacent to High Pass Road, the consultant team does not recommend lowering the functional classification to allow for a smaller design since this is a high-volume regional facility. The recommended approach to resolving conflicts in this area would be use a non-standard design through the bottleneck area, which would require approval of a design exception from Lane County. The City will work directly with the County to arrive at an acceptable design for this area at the time construction is proposed.

Alley and Access Management
As mentioned earlier, the Access Management Plan is no longer needed and will be replaced in the TSP by policy language acknowledging the importance for both access to businesses and safe travel along OR 99 and that future decisions regarding access will be subject to the policies and regulations in place at that time. ODOT has updated its policies regarding closures and spacing for access points to be more flexible. Under this approach, City policies will be in alignment with ODOT policies, streamlining the process. Table 2 shows recommended changes to minimum spacing standards for minor arterials, from 150 to 300 feet, and collectors with speed limits greater than 30 miles per hour, from 75 to 150 feet. Alternative access point spacing can always be pursued through the variance process.

Funding
The Technical Memo identifies approximately $110 million in projects, while the projected revenue to implement these projects is estimated at $2.4 million. This is not uncommon. The City has a choice to make about whether to spend to the existing limit or identify new

funding streams to increase revenues. The memo outlines potential new funding sources that the City may wish to consider, such as increasing system development charge rates or fuel taxes. Small changes can result in enough additional revenue to fund system maintenance and a few key projects. The CAC will review funding options in greater detail at the October meeting.

Bicycle Facility Improvements

John stated that, in addition to seeking input on priority bicycle facility improvements, he is looking to the CAC to identify a preferred option where choices are presented. The CAC made the following recommendations with the caveat that decisions may be modified based on community feedback at the July 11 Open House:

- BL2 (W 6th Ave from Timothy Pl to OR 99) – CAC prefers Option #1, bike lanes.
- BL3 (W 10th Ave from Oaklea Dr to Nyssa St) – CAC prefers Option #1, bike lanes.
- BL4 (E 6th Ave from Front St to Birch St) – CAC prefers Option #1, bike lanes. E 6th St could extend to Front St at the edge of downtown.
- BL5 (E 10th Ave from OR 99 to Deal St) – CAC has no recommendation.
- BL6 (Birch St from E 1st Ave to E 6th Ave) – CAC prefers Option #1, bike lanes.
- BL8 (Hatton Ln from Prairie Rd to OR 99) – CAC prefers Option #2, bike lanes, today, but Option #1, shared-lane markings, to address connectivity in the future.
- BBL1 (W 10th Ave from Nyssa St to OR 99) – CAC prefers Option #2, bike lanes.
- BLVD1 (Nyssa St/Oak St from Laurel Elementary School to W 6th Ave) – CAC notes the importance of connecting schools.
- SLM1 (Rose St from W 13th Ave to W 10th Ave) – CAC prefers Option #1, shared-lane markings.
- SLM2 (Maple St from W 6th Ave to W 1st Ave) – CAC prefers Option #1, shared-lane markings.
- SLM3 (E 6th Ave from OR 99 to Front St) – CAC prefers Option #1, shared-lane markings, with conversion of parking from angle to parallel.
- SLm4 (Deal St from E 6th Ave to Dane Ln) – CAC prefers Option #1, shared-lane markings, with County cooperation.

The CAC identified connections to schools as a top priority as well as improvements on 6th and 10th Avenues. Other priorities are consistent with the TSP goals, such as completing the sidewalk network, supporting business development and improving safety along OR 99.

Pedestrian Crossings

The Technical Memo includes recommendations for pedestrian activated beacons and signs to create assisted crossings that supplement crossing opportunities provided by signals on OR 99 at W 1st, 6th, 10th and 18th Avenues. Another recommendation is a program to educate youth about safe crossing. The CAC supports proposed shared-use paths at the southern edge of Junction City High School, connecting the existing shared-use path to

Maple Street, and on OR 99 from 1st Avenue to Milliron Road to accommodate recreational bikers and future commuters. The CAC would also like to see the formerly proposed shared-use path connecting 6th Avenue to 10th Avenue (aligning with the path around the high school and Rose Street) reconsidered. The City will discuss this with the St. Helen Catholic Church.

Motor Vehicle Improvements

The CAC supports proposed motor vehicle improvements, the majority of which modernize existing roads to new standards that include bike facilities/shoulders, sidewalks, and crossings.

Public Comments/Questions

- *How does the possible urban growth boundary amendment impact these recommendations?* John responded that all land use changes assumed as part of the comprehensive plan amendment were also assumed when developing the traffic forecasts for the TSP update. So the TSP update is consistent with the comprehensive plan amendment/urban growth boundary amendment. If large employers locate in Junction City that generate more traffic than assumed (in accordance with coordinated housing and employment projections) in the TSP update, the City can amend the TSP or require transportation impact analyses to ensure the system is adequate.
- *How do the changes in access spacing standards benefit the City?* The changes increase spacing on roads with higher speeds for safety purposes and will minimize potentially dangerous conflicts. Alternative spacing can always be pursued through the variance process if these standards are not practical in certain situations.

Next Steps and Adjourn

CAC members recommend making sure that maps are clear to community members to ensure they understand proposed improvements. Funding options will be discussed in greater detail at the next meeting. CAC members are encouraged to attend the July 11 Open House.

M E M O R A N D U M

TO: TSP Citizen Advisory Committee
FROM: Stacy Clauson, Lane Council of Governments
DATE: May 22, 2012
RE: Update on the status of the TSP Update

ISSUE:

Staff would like to re-engage this Committee on transportation planning issues and is seeking direction on the process for moving forward on the Transportation System Plan Update.

I. BACKGROUND and PURPOSE

In 2009 Oregon Department of Transportation agreed to fund an update the City's Transportation System Plan which was last updated in 2000 and in 2008 with the adoption of the Highway 99 Refinement Plan. ODOT set aside the funding to assist the city it process of updating the Comprehensive Plan with the Phase II customized periodic review.

The 2000 TSP is outdated and relies on an old population forecast for the planning horizon ending in 2015. The update to the TSP provides the City of Junction City with an opportunity to look at how the transportation system is currently used and how it should change to meet the long-term (20-year) needs of Junction City's residents, businesses, and visitors. Through coordination with community members and affected public agencies, the City of Junction City will develop a plan for improvements of all modes of transportation in Junction City, including the roadway, bicycle and pedestrian, transit, and rail networks. The Plan will also include a transportation improvement and financing plan.

The TSP is being prepared in coordination with the Oregon Department of Transportation, and the Oregon Department of Land Conservation and Development. This project will also closely consider local, regional and state policies, plans, and rules, including Oregon's Transportation Planning Rule (TPR), the Oregon Highway Plan, and other local, regional, and state policies, plans, and rules.

The updated TSP is intended to be consistent with the Comprehensive Plan. The City is in the process of updating the Comprehensive Plan (Phase II) which will be using the adopted coordinated population forecast. In Phase II the City will also be identifying expansion areas for future commercial and residential growth. The TSP update will be able to identify future transportation needs based on the adopted coordinated population and evaluate transportation impacts and needs for the growth areas that are recommended from Phase II.

The adopted Transportation System Plan will include a project list that can be incorporated into city, county and state transportation plans and will help to prioritize funding sources for these identified projects. This project list helps to inform the Capital Improvement Program (CIP).

An overview of the TSP purpose and process is contained in Attachment 1, which is a copy of a presentation completed by ODOT's consultant (DKS Associates) who is helping to put together the plan. Staff encourages you to review this presentation and ask any questions you may have either before or during the meeting.

Attachment 2 provides an overview of the planning process for the TSP Update and also highlights where in the process the CAC will meet and provide input. To date, progress on the TSP has been delayed while work was being completed on the Comprehensive Plan. The following has been completed:

- A Public Outreach Strategy has been developed;
- The CAC has met once (in August, 2011) to review existing planning documents, policies, and regulations applicable to the TSP Update, as well as to consider draft goals and policies for the TSP. During this meeting, DKS made some suggestions on how the existing goals and policies might be changed, and asked CAC members to mull it over, talk to fellow citizens, and come to the next meeting ready to reshape the goals and policies as needed;
- A meeting was held with the Alley Access Management Subcommittee to discuss the use of the public alleys for property/business access to OR 99 between 17th Avenue and 1st Avenue;
- DKS Associates has also prepared several technical documents that need to be coordinated with ODOT and describe the methods that will be used for travel forecasting; and
- DKS Associates has also inventoried the existing transportation system within the City. This information will be presented as part of the existing conditions report that DKS is preparing.

II. ODOT OPTIONS FOR UPDATE TIMING

One of the key pieces of information that is needed for the project consultants to move forward at this time is information on the City's Customized Periodic Review and plans for accommodating commercial and residential growth over the next 20 years. Since the City has not completed the Phase II process, staff has met with representatives from the Oregon Department of Transportation (ODOT) to brainstorm different options for moving forward with the TSP at this time. Based upon these discussions, staff is recommending that the CAC consider and provide input to the City Council on the following two options presented by ODOT:

1) Continue with the TSP update, using current Comprehensive Plan Update assumptions. Currently, the TSP is incorporating the Comprehensive Plan assumptions and recommended UGB expansion areas. This option would allow for the City to continue working on the TSP effort and adopt it concurrently with, or shortly thereafter, the Comprehensive Plan is adopted and finalized. The risk to this option is that the City cannot adopt a TSP that is not consistent with their Comprehensive Plan. So, if the Comprehensive Plan is appealed, adoption of the elements within the TSP that are impacted by the appeal will be postponed. If the Comprehensive Plan process is appealed and sent back to the City, the TSP will likely need to be revised based upon any revised Comprehensive Plan assumptions. In the event this occurs, ODOT is willing to provide funding assistance to make the necessary TSP revisions. Option Timeline - Approx. 12 months for completion of the TSP (not including adoption).

2) Postpone TSP until Comprehensive Plan update is adopted and finalized. This option will allow the Comprehensive Plan process to finish, assuring the City has received all local and state approvals on the Comprehensive Plan assumptions. The risk to this option is that the City would delay work on the TSP until after the Comprehensive Plan is adopted. Option Timeline - While approximately 12 months remain, the City would restart this work whenever the Comprehensive Plan process is complete, extending the overall TSP process to 18-24 months - or longer if the Comprehensive Plan is appealed.

Staff Recommendation: Follow option 1. If the Council selects this Option 1, the TSP process will continue, with the following next anticipated steps (as depicted in Attachment 2):

- Formation of a Technical Advisory Committee (TAC). This Committee would have a slightly different composition from the CAC and would be formed to represent affected agencies/service providers. The TAC would review draft deliverables and attend meetings and provide comments on technical and regulatory issues within their areas of expertise to help the City create a sound and adoptable plan.
- Present the Draft Existing Conditions chapter for review.
- Future traffic forecasts for the year 2035 will be estimated and the Draft Future Conditions chapter will be delivered for review.
- Schedule meeting dates for the TAC, CAC, and a Public Open House as indicated in the work plan.
- Advertise for the Public Open House (flyers, information boards, media release, email blast, etc.)

III. ODOT Update of new legislation/rules that may impact the TSP

Savannah Crawford, ODOT Area 5 Planner, will be attending the meeting and can provide updates on any new legislation/rules that may impact the TSP.

IV. CHECK-IN ON HOMEWORK FROM THE LAST MEETING

As noted above, during the first CAC meeting, DKS Associates requested CAC members to review existing goals and policies contained in the City's existing TSP Chapter 2 (see Attachment 3) and consider:

- Do the existing goals and policies continue to align with local interests? If not, what changes/refinements are needed?
- Are additional goal statements or policies that should be included?

DKS recommended that you engage with your fellow community members whom you represent to provide more insight into how the mission, goals, and policies could better reflect the interests of Junction City. Then, at the next CAC meeting, we'll spend some more time considering these new ideas and how to best update this chapter, which will guide much of our work moving forward.

V. ATTACHMENTS

1. PowerPoint Presentation – TSP Introduction for CAC Representatives
2. Project Timeline
3. Existing TSP Chapter 2

summary

Junction City Transportation System Plan Update

Community Open House

April 10, 2013

The City of Junction City is updating its Transportation System Plan (TSP), the transportation element of the City's comprehensive plan. The purpose of the TSP is to describe the City's plans for all modes of travel for the next 20 years, including projects, policies and other transportation-related actions. The result of this project will be a plan that will include improvements to meet the long-term transportation needs of Junction City's residents, businesses, and visitors.

The City hosted a Community Open House on Thursday, February 21st from 6 to 8 p.m. at the Viking Sal Senior Center. More than 25 Junction City residents, property and business owners and other stakeholders participated in the Open House. Participants had the opportunity to indicate their transportation improvement priorities and comment on existing conditions related to walking, biking, driving and transit. They also could provide feedback by completing a comment form. An online survey was created to allow those who couldn't attend the Open House to share their comments. The following is a summary comments gathered at the open house and through comment forms and the online survey.

Transportation Improvement Priorities

1. With limited funding to make improvements to the transportation system, what types of projects do you feel the City should focus on most? The preliminary list of priority issues below was developed with input provided by the Citizen Advisory Committee. Select the three issues you think are most important or add topics that are not listed.

Priority	Responses
Help pedestrians and bikes cross Highway 99	20
Complete safe routes to schools for children	18
Upgrade old sidewalks and rail crossings for the elderly and disabled	17
Minimize delay for motor vehicles	12
No biking/walking paths on private property	12
Create a complete and connected network of pathways for walking and biking	7
Improvements on Holly Street (railroad track)	6
Make walking along Highway 99 near downtown more comfortable	4
12 foot walkway from 1st Avenue to Eugene	4
Invest in projects that improve safety	4
Clean up markings on 6th and OR 99/Ivy Street	1
Repair 5th and 6th Streets along tracks	1
Improve transit service	0

Existing Conditions

Walking

2. Where in the city do you feel the safest when walking?
    - Downtown area (3)
    - 6th Avenue (2)
    - Anywhere but Ivy Street
    - Any lighted and level sidewalk
    - Deal near Bi Mart
    - Most side streets
    - My neighborhood
    - Quince Drive
    - West of Front and north of 1st
    - West of OR 99

3. What keeps you from walking instead of driving?

Reason	Responses
Destinations are too far away	6
Bad weather	6
Too dark/unsafe	3
Age	2
Lack of sidewalks	2
No safe route to my destination	2
Flying rocks/gravel from passing vehicles	1

4. What streets and intersections need improvements to make walking and crossing the street safer (e.g. sidewalks)?
    - All OR 99 crosswalks; need more marked crosswalks between 10th and 18th (3)
    - Holly Street is rutted and washed out; the sidewalks have deteriorated a lot over the years; Holly St. between 1st and 2nd (3)
    - High Pass Road and Prairie Road (3)
        - Marked crosswalks at 1st/High Pass Road and Prairie/Maple
    - 6th west of Maple/at Juniper (2)
    - Oaklea – better lighting at Oaklea and 15th (2)
    - 8th and Ivy
    - 10th and Holly
    - 10th and Ivy
    - Re-pave Greenwood between 4th and 6th

Other Comments/Issues

- Add a policy that states proposed paths should not be located along ditches or through private property (2)
- There is a lack of ADA accessible routes from Norseman Village Apartments on 1st Avenue to public sidewalks
- Education program for schoolchildren to promote safe crossings
- Need better sidewalk maintenance
- Enforce sidewalk repair ordinances
- Educate parents and children about traffic laws; we don't need to accommodate bad habits
- The Parks and Paths Plan estimates costs for developing pathways on private land at $10 for a 1 x 9 foot area – when does this kick in?

Biking

5. Where in the city do you feel the safest when riding your bike?
    - Anywhere
    - Anywhere but Ivy Street
    - School zones

6. What keeps you from biking instead of driving?

Reason	Responses
Bad weather	3
Too dark/unsafe	2
Age	1
Destinations are too far away	0
Lack of bike lanes	0
Lack of bike parking	0
No safe route to my destination	0

7. What streets have the greatest potential to accommodate bikes?
    - 10th Street (3)
    - 6th Street (3)
    - Oak Drive (2)
    - Greenwood
    - Holly Street
    - Juniper Street
    - Laurel Street
    - Public School property between Laurel Elementary and Oaklea Middle School, south to 10th Avenue

8. In what places do you feel unsafe when riding your bike? Why?

- Ivy Street because there is no bike lane and semi trucks going too fast
- OR 99
- Rose between 10th and 13th

Other Comments/Issues

- Add a policy that states proposed paths should not be located along ditches or through private property (2)
- Bike facilities on Rose St. from 10th to 13th Avenues would be dangerous
- Mark (sign) bike trail from Junction City to Corvallis via Ferguson and Bellfountain

Public Transit

9. For what purpose(s) do you use public transit?

Reason	Responses
I don't use public transit	10
Inconvenient	1
Commute to work	0
Travel to Eugene	0

10. How could public transit service be improved?

Improvement	Responses
Increase bus frequency	3
Improve safety at bus stops/on bus	2
Change the route	1
Put it back on River Road	1
Reduce the cost	1
Add more stops	0
Reduce the number of stops	0

11. Is there anything else you would like to say about improving public transit service?
    - Keep costs at a minimum

Driving

12. What streets or intersections have the greatest need for improvements to make traveling by car safer and easier?
    - Holly Street; from River Road north; at 6th Street (5)
    - Ivy and 7th, 8th , 9th, 10th and 17th (5)
    - 10th and OR 99; OR 99 from 10th to 18th (2)
    - Oaklea Drive (2)
    - 6th and OR 99; alley exist onto 6th

- 18th Street
- Greenwood
- High Pass, Maple and Prairie Roads at offset intersection; not safe for cars or walkers
- High Pass Road from OR 99 to Oaklea
- High Pass Road needs more police presence to prevent speeding
- Rose and Quince Drive

Other Comments/Issues

- Holly Street repairs are needed
- Striping on 6th Avenue is confusing near Holly Street
- There is a safety issue on 6th Avenue between OR 99 and Holly Street due to the location of driveways near OR 99; conflicting turn movements from OR 99 and driveways on the south side of 6th Avenue; multiple access points and short distance from OR 99
- Lower 45 mph speed limit on OR 99 between 1st Avenue and Hwy 36; police enforcement may be difficult
- Cameras on both ends of town at stop lights for the protection of our businesses, children and speeders
- Improve visibility at four-way intersections that do not have stop-signs or signals; there are currently obstructions on private property in some locations
- Bridge next to high school soccer field at Maple Street

About You

13. How did you find out about this open house?

Method	Responses
Email	6
City website	3
Poster/flyer	1
Chamber of Commerce	1
Family/friend/neighbor	0
Newspaper	0

summary

Junction City Transportation System Plan Update

Community Open House

August 13, 2013

The City of Junction City is updating its Transportation System Plan (TSP), the transportation element of the City's comprehensive plan. The purpose of the TSP is to describe the City's plans for all modes of travel for the next 20 years, including projects, policies and other transportation-related actions. The result of this project will be a plan that will include improvements to meet the long-term transportation needs of Junction City's residents, businesses and visitors.

The City hosted a Community Open House on Thursday, July 11th from 6 to 8 p.m. at the Viking Sal Senior Center. Junction City residents, property and business owners and other stakeholders participated in the Open House. Participants reviewed proposed roadway, bicycle and pedestrian improvements to the transportation system and indicated their priorities for future improvements. An online survey was created to allow those who could not attend the Open House to share their comments. The following is a summary of comments from 42 people gathered at the Open House and through the online survey.

Transportation Improvement Priorities

Driving

1. With limited funding to make improvements to the transportation system, which motor vehicle improvement projects are most important for making Junction City better and safer for driving? Please mark your top five motor vehicle improvement priorities.

Motor Vehicle Improvements

Type	Map ID	Project Description	Limits	Priority Votes
New Roadway/Roadway Extensions	MV9	Phase 1: Acquire right-of-way for Hatton Ln extension and construct a pedestrian and bicycle connection Phase 2: Extend Hatton Ln as a new Collector Street	To Prairie Rd Connect Prairie Rd to OR 99	**10**
	MV6	Construct new Frontage Road to Collector standards	1st Ave to Prairie Rd	**5**
	MV2	Extend 10th Ave	Oaklea Dr to west UGB	**1**
	MV4	Construct new Collector Street	West of Oaklea Dr from north UGB to High Pass Rd	**1**
	MV5	Construct new Collector Street	West UGB to MV4	**1**
	MV7	Construct Prairie Meadows Ave to Collector standards	Extend west to Pitney Ln	**1**
	MV1	Extend 6th Ave	Oaklea Dr to new Collector Street (MV5)	
	MV3	Construct new Collector Street	North UGB to 10th Ave	
	MV8	Construct Coral St to Collector standards	Extend west to Pitney Ln	

summary

Type	Map ID	Project Description	Limits	Priority Votes
Roadway Modernizations	MV12	Construct 1st Ave/High Pass Rd to Minor Arterial standards	Oaklea Dr to OR 99	**8**
	MV20	Construct Pitney Ln to Collector standards	1st Ave/High Pass Rd to Bailey Ln	**6**
	MV17	Construct Prairie Rd to Collector standards	1st Ave to Bailey Ln	**6**
	MV11	Construct Oaklea Dr to Minor Arterial standards	18th Ave to 1st Ave/High Pass Rd	**4**
	MV15	Construct 18th Avenue to Minor Arterial standards	Oaklea Dr to Juniper St	**4**
	MV13	Construct 1st Ave/River Rd to Minor Arterial standards	OR 99 to East UGB	**3**
	MV14	Construct 6th Ave to Collector standards	Oaklea Drive to Timothy St	**2**
	MV18	Construct Prairie Rd to Collector standards	Bailey Ln to OR 99	**2**
	MV16	Construct 18th Ave to Collector standards	OR 99 to East UGB	**1**
	MV19	Construct Prairie Rd to Collector standards	OR 99 to East UGB	**1**
	MV10	Construct Meadowview Rd to Collector standards	OR 99 to East UGB	
	MV21	Construct Milliron Rd to Collector standards	West UGB to East UGB	
Safety Improvements	MV23	Access improvements along 6th Ave to reduce potential conflicts	OR 99 to Holly St	**17**
	MV24	Convert 6th Ave from front-facing angle parking to parallel parking	OR 99 to Front St	**16**
	MV 25	Upgrade OR 99 traffic signal	OR99E/OR99W, OR99/OR36, and OR99/Milliron Rd	**9**
	MV22	Improve Oaklea Dr/18th Ave intersection sight distance for northbound approach	Oaklea Dr/ 18th Ave intersection	**3**
Traffic Operations Improvements	MV26	Realign Maple Rd/Prairie Rd and 1st Ave intersections and add left turn lanes	Maple Rd/Prairie Rd and 1st Ave intersection	**18**
	MV27	Review traffic signal timings along OR 99 to optimize operations	OR 99E/OR 99W junction to Milliron Rd	**12**

2. Are there any motor vehicle improvement projects missing?
   - Fix uneven surface due to the railroad in Holly Street (5)
   - Enforce speed limits and implement traffic calming measures to mitigate high speeds on High Pass Road, west of Maple Street (2)
   - Implement a four-way stop at the intersection of Front Street and 6th Avenue (2)
   - Additional access needed north of the OR 99 E/W junction
   - Alignment of Prairie Road at OR 99
   - Don't touch the cemetery
   - Enforce existing traffic laws
   - Fixing front-facing parking on 6th Avenue should be your 100% top priority; it is a very bad idea
   - Holly Street
   - Limit parking to one side of the street near the elementary school to address conflicts between bus, parked cars and cars dropping off kids
   - Move train tracks away from city center (create a bypass) in order to reduce horn blowing and noise pollution throughout the night

- Narrow OR 99 to slow down traffic to 30 MPH and add a segregated bike lane and pedestrian crosswalk beacon to improve safety, walkablility, and bikablility between the OR 99 E/W junction
- Need a queue lane for pick-up and drop-off at high school on Prairie Road/Maple Street
- Pedestrian safety on OR 99
- Protected left turn from 1st Avenue onto OR 99
- Repave Front Street
- Rose Street near the middle school is not wide enough for buses and parked cars
- Sidewalks on 6th Avenue
- Sight distance at Birch Street and River Road
- Stops at OR 99 and Maple, Prairie Road and 1st Avenue
- Upgrade 18th Avenue from Dane Lane to OR 99

Walking

3. With limited funding to make improvements to the transportation system, which pedestrian improvement projects are most important for making Junction City better and safer for walking? Please mark your top five pedestrian improvement priorities.

Pedestrian Facility Improvements

Type	Map ID	Project Description	Limits	Priority Votes
Sidewalk Infill/Construction	SW2	W 10th Ave sidewalk construction/infill	Oaklea Dr to Maple St	**16**
	SW3	W 6th Ave sidewalk construction/infill	Timothy St to Pine Ct	**11**
	SW7	Rose St sidewalk infill	W 18th Ave to W 13th Ave	**10**
	SW9	Birch St sidewalk infill	E 2nd Ave to E 1st Ave	**4**
	SW10	Sidewalk construction along west side of OR 99	W 1st Ave to approximately 1,300 feet south of Milliron Rd	**3**
	SW1	Bailey Ln sidewalk construction	Pitney Ln to Prairie Rd	**2**
	SW4	Prairie Meadows sidewalk infill	West end to Prairie Rd	**2**
	SW5	SW Quince St sidewalk infill	Prairie Meadows to Bailey Ln	**2**
	SW6	SW Coral St sidewalk infill	SW Quince St to Prairie Rd	
	SW8	Green Meadows sidewalk infill	SW Quince St to Prairie Meadows	**1**
Intersection Crossing Improvements	C6	Construct curb extensions on the opposing west corner of Maple St and east corner of Prairie Rd Consider adding pedestrian-activated Rectangular Rapid Flashing Beacons; evaluate the need for crosswalk pavement markings	W 1st Ave/Prairie Rd/Maple St	**12**
	C8	Install intersection lighting; upgrade pedestrian signals	W 6th Ave/ OR 99	**8**

summary

Type	Map ID	Project Description	Limits	Priority Votes
	C10	Consider installing pedestrian activated crossing treatments on OR 99 at mid-block locations between: • 15th Ave and 12th Ave, • 9th Ave and 7th Ave, and • 5th Ave and 3rd Ave.	OR 99 from 18th Ave to 1st Ave	**8**
	C1	Install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings	Oaklea Dr/W 10th Ave	**7**
	C7	Upgrade pedestrian signals	W 10th Ave/OR 99	**7**
	C5	Consider enhanced pavement markings and signage	W 6th Ave/Shared Use Path Connection	**6**
	C11	Implement safety education programs including pedestrian crossing education for school children.	NA	**6**
	C4	Consider improved intersection lighting, and striping the crosswalk on the south leg of the intersection	W 10th Ave/Rose St	**4**
	C2	Install intersection lighting, consider refuge island/curb extensions, and reevaluate need for crosswalk pavement markings	Oaklea Dr/W 6th Ave	**3**
	C3	Connect existing sidewalk on north side of E 10th Ave; replace curb ramps on all corners to meet ADA standards	E 10th Ave/Front St	**2**
	C9	Upgrade pedestrian signals	W 1st Ave /OR 99	**2**
Shared-Use Path Alignments	SUP2	East side of OR 99 between highway and railroad	1st Ave to Milliron Rd	**7**
	SUP1	Connect existing Shared-Use Path to Maple St	Junction City High School to Maple St	**6**

4. Are there any pedestrian improvement projects missing?
   - Consider a shared use path and pedestrian bridge over the canal between the high school and High Pass Road for students living in the Pitney/Prairie Meadows area
   - Crosswalk at the intersection of Pitney Lane and High Pass Road would be helpful
   - Crosswalk at Maple Street and 1st Avenue or High Pass Road and Prairie Road
   - Fix the sidewalk on 6th Avenue between Front and Greenwood streets
   - Having many interconnecting bike paths would be awesome
   - Install more street lamps lights and pedestrian crossings on Ivy Street
   - Pathway between 6th and 10th avenues
   - Sidewalk along 18th Avenue
   - Sidewalks and shoulders along High Pass Road

Biking

5. With limited funding to make improvements to the transportation system, which bicycle improvement projects are most important for making Junction City better and safer for biking? Please mark your top five bicycle improvement priorities.

Bicycle Facility Improvements Priorities

Map ID	Limits	Priority Votes
BLVD1	Nyssa St/Oak St from Laurel Elementary School to W 6th Ave	**10**
BL4	E 6th Ave from Front St to Birch St	**7**
BL5	E 10th Ave from OR 99 to Deal St	**6**
BBL1	W 10th Ave from Nyssa St to OR 99	**6**
BL3	W 10th Ave from Oaklea Dr to Nyssa St	**5**
BL6	Birch St from E 1st Ave to E 6th Ave	**5**
BL1	Rose St from W 18th Ave to W 13th Ave	**4**
BL2	W 6th Ave from Timothy Pl to OR 99	**4**
BL/SB7	Bailey Ln from Pitney Ln to Prairie Rd	**4**
SLM2	Maple St from W 6th Ave to W 1st Ave	**4**
SLM3	E 6th St from OR 99 to Front St	**3**
BL8	Hatton Rd from Prairie Rd to OR 99 (new segment to be constructed as part of MV9)	**2**
SLM1	Rose St from W 13th Ave to W 10th Ave	**1**
SLM4	Deal St from E 6th Ave to Dane Ln	**1**

6. Please indicate your preferred bicycle facility improvement option.

Bicycle Facility Improvements Options

Map ID	Project Description	Limits	Preferred Option Votes
BL2	Option 1: Bike Lanes Option 2: Shared-Lane Markings	W 6th Ave from Timothy Pl to OR 99	**Option 1 - 2** **Option 2 – 16**
BL3	Option 1: Bike Lanes (removes on-street parking) Option 2: Shared-Lane Markings	W 10th Ave from Oaklea Dr to Nyssa St	**Option 1 - 3** **Option 2 – 14**
BL4	Option 1: Bike Lanes Option 2: Shared-Lane Markings	E 6th Ave from Front St to Birch St	**Option 1 - 1** **Option 2 – 16**
BL5	Option 1: Bike Lanes (removes on-street parking) Option 2: Shared-Lane Markings	E 10th Ave from OR 99 to Deal St	**Option 1 - 2** **Option 2 - 13**
BL6	Option 1: Bike Lanes Option 2: Buffered Bike Lanes (removes on-street parking, one side only) Option 3: Shared-Lane Markings	Birch St from E 1st Ave to E 6th Ave	**Option 1 - 1** **Option 2 - 1** **Option 3 – 14**
BL8	Option 1: Bike Lanes (removes on-street parking) Option 2: Shared-Lane Markings	Hatton Rd from Prairie Rd to OR 99 (new segment to be constructed as part of MV9)	**Option 1 - 2** **Option 2 - 13**
BBL1	Option 1: Buffered Bike Lane (removes on-street parking) Option 2: Bike Lanes (removes on-street parking, one side only) Option 3: Shared-Lane Markings	W 10th Ave from Nyssa St to OR 99	**Option 1 - 2** **Option 2 - 1** **Option 3 - 12**

summary

Map ID	Project Description	Limits	Preferred Option Votes
SLM1	Option 1: Shared-Lane Markings Option 2: Bike Lanes (removes on-street parking)	Rose St from W 13th Ave to W 10th Ave	**Option 1 - 14** **Option 2 – 1**
SLM2	Option 1: Shared-Lane Markings Option 2: Bike Lanes (removes on-street parking)	Maple St from W 6th Ave to W 1st Ave	**Option 1 – 14** **Option 2 – 1**
SLM3	Option 1: Shared-Lane Markings Option 2: Bike Lanes	E 6th St from OR 99 to Front St	**Option 1 – 14** **Option 2 – 2**
SLM4	Option 1: Shared-Lane Markings Option 2: Bike Lanes (removes on-street parking, one side only)	Deal St from E 6th Ave to Dane Ln	**Option 1 – 11** **Option 2 - 2**

7. Are there any bicycle improvement projects missing?
   - Bike improvements on High Pass Road between Prairie Road and Oaklea Drive
   - Do not take street parking away from people who have lived there 50 years and have paid taxes
   - Enforce and educate people about traffic laws, especially pertaining to skateboards
   - Kids should not have to go around parked cars but property owners should not have to give up parking
   - Our town does not have enough year-round bike riders to make designated bike lanes worth it for us
   - Segregated/buffered bike lane along OR 99 after narrowing to slow traffic, if the City has the right-of-way
   - The City needs more bicycle racks and education for people to use bike locks
   - We need bike racks at the library and downtown at 6th Avenue and Holly Street or Greenwood Street and along Ivy Street; there are currently only bike racks at Safeway and Dairymart

8. Is there anything else we should know?
   - Add sidewalk on 6th Avenue and Timothy Street to Pine Court
   - Enhance education and enforcement efforts
   - I really appreciate the emphasis on walking and biking - that is the first step toward a vibrant community: http://ite.org/bookstore/RP036.pdf
   - Please fix the front-facing parking on 6th Avenue
   - Thank you for reaching out to the public
   - The recommendation regarding narrowing OR 99 is based on the assumption that the City is responsible for maintaining the highway within the city limits
   - There is not enough parking in the downtown area, to remove parking for bike lanes makes no sense given that there is not that much bike activity
   - There is plenty of work needed around the OR 99 corridor through town; don't waste money on the Prairie Road/Pitney Lane/Bailey Lane sites
   - There needs to be signage on Oaklea Drive, High Pass Road and Prairie Road to watch for cyclists and pedestrians who need to use the roadway because there isn’t a solid shoulder

summary

- While it is important to share the road with everyone, why don't the bicyclists have to pay a license fee to use the road? If we have to give up part of the road we pay for with our license tabs, why shouldn't they have to buy some kind of license to be on the same roads?
- You should specify project costs, and where funding would come from for all these possibilities and give that information out with the survey

summary

Junction City Transportation System Plan Update
Technical Advisory Committee (TAC) Meeting #1

Meeting Date: September 27, 2012
Meeting Time: 3:00 p.m. to 5:00 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
TAC Members:
- Natalie Stiffler, Lane Transit District
- Melisa Bowers, City of Junction City
- Dean Chappell, Lane Rural Fire/Rescue
- Ed Moore, DLCD
- Amanda Salyer, ODOT Region 2 Traffic

Project Management Team:
- Stacy Clauson, Lane Council of Governments/City of Junction City
- John Bosket, DKS Associates
- Savannah Crawford, Oregon Department of Transportation

Sign-in, Introductions, and Agenda Overview
This was the first meeting of the Junction City Transportation System Plan (TSP) Update Technical Advisory Committee (TAC). The purpose of the meeting was to provide a brief project orientation, introduce the Mission, Goals, and Policies from the current TSP, and review and discuss key findings from the Existing Conditions report.

Project Orientation and Status
The TSP Update project has actually been active for well over a year, but we are just now completing the review of Existing Conditions. The TSP is being updated in response to a Comprehensive Plan amendment that is still in progress and has experienced delays. Since the TSP must be in line with the Comprehensive Plan, the project team was hesitant to move forward too quickly until the Plan was approved. There are two phases to the Comprehensive Plan Amendment process. Phase 1 was launched in 2010 and included an urban growth boundary (UGB) expansion that was approved and has been annexed into the city. Phase 2 included a UGB expansion along the west side of Highway 99 for commercial and residential development as well as parks to support the new development. The Plan was approved by City Council on September 17, 2012. The next steps in the process are for Lane County to co-adopt the Plan before it goes to the state for review and approval.

In May, the City Council directed staff to move forward with elements of the TSP that are not impacted by the Comprehensive Plan Amendment. DKS Associates prepared the existing conditions report, which the TAC will discuss today. We will discuss this again with the Citizen Advisory Committee (CAC) following this meeting. The next step will be to compile future transportation needs and improvements.

TSP Mission, Goals, and Policies
The current TSP Mission, Goals, and Policies have been reviewed with the CAC and the CAC has provided feedback on topics of interest to consider when updating this section of the plan. John distributed the current Mission, Goals, and Policies to the TAC, along with a summary of the CAC feedback. While these won't be reviewed or discussed in detail today, TAC members are encouraged to send comments back to the project team. Ed Moore noted that he had a number of comments to offer and would email them later.

Input from Alley Access Management Subcommittee
The Alley Access Management Subcommittee also met about one year ago to discuss concerns with the use of public alleys for property/business access to OR 99 between 17th Avenue and 1st Avenue as recommended in the OR 99 Junction City Refinement Plan. Concerns include utilities, garbage cans and other obstructions in alleyways. Also of concern is ensuring a business friendly approach that avoids costly improvements that could negatively impact development. Other concerns include alleys being blocked for periods of time by garbage or utility trucks and already constrained lot depths of approximately 100 feet. Dean Chappell also noted that use of the alleys for exclusive access would not meet the fire code. The code requires a 20-foot accessway.

Draft Chapter 3: Existing Conditions
John reviewed the draft Existing Conditions report by mode of transportation. The study area for the report includes the entire transportation network within the Junction City UGB. The current mapping was based on the adopted Comprehensive Plan prior to September 2012. Ed Moore noted that the entire area to be incorporated into the UGB needs to be included. The maps and study area will be updated as needed to ensure they align with the adopted Comprehensive Plan.

Oregon Statewide Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces) is mentioned briefly in the report. Streams and wetlands are mapped and historic and archaeological sites were identified, though not mapped to protect their potential sensitivity. These resources will be referenced and considered as future potential projects are discussed. Ed Moore noted that only those resources identified as being locally significant need to be acknowledged.

<u>Pedestrians</u>
Most destinations in Junction City (downtown shops, schools, parks) are located within what is considered a comfortable walking distance of ½-mile of population centers including transportation-disadvantaged populations. The city's flat topography also adds to a walkable environment.

Streets located near the downtown core typically have sidewalks on either one side or both sides of the street. Moving away from downtown, areas that were developed in the 1970s have fewer or no sidewalks. Sidewalks are more common in either the older or newer residential developments.

Significant gaps in the sidewalk network are found along Oaklea Drive, 18th Avenue, 1st Avenue and the western ends of 10th and 6th Avenues. Other gaps are found on Prairie Road from 1st Avenue to at least Bailey Lane. Sidewalks are generally five to six feet wide, which is considered adequate. Stacy questioned whether sidewalks in the downtown should be wider to better accommodate street furnishings, storefront displays, and a walking zone.

Many sidewalks have an older design, which the city is retrofitting over time to meet Americans with Disability Act (ADA) standards. There are some maintenance issues that will not be dealt with through the TSP but will be referred to the public works department. In regards to paths, the Parks Master Plan includes a recommendation to connect 6th to 10th Avenues and 10th to the rest of the network through a shared-use path.

Most crossing improvements are needed along OR 99. Signaled crossings are too far apart to be usable for many pedestrians. John noted that during field observations school children were frequently seen crossing OR 99 at signalized intersections, but doing so improperly. It is recommended that crossing safety education be provided through the schools. ODOT can help with this. Dean noted that there is also a need for lighting improvements to enhance pedestrian safety along OR 99. The intersection on OR 99 at 6th Avenue, in particular, would benefit from better lighting. Safety on OR 99 south of 1st Street is also a concern.

Off of OR 99, the greatest need for crossing improvements is at 1st Avenue/Maple Street.

Bicycles

Bikeways are required on all arterials and collectors by state law (bikeways can include a variety of treatments such as bike lanes, shoulder bikeways, shared roadways or shared-use paths). There are some shoulders on portions of OR 99, but there are no designated bike lanes in Junction City. Most streets in the city can accommodate bike traffic on shared roadways due to low auto volumes and/or speeds. As bike facility improvements are developed, we will customize treatments as appropriate for each roadway.

Dean Chappell suggested that a bike bridge on OR 99W at Toftdahl Road would be useful.

Ed Moore suggested that bike route signing for through bicycle trips to get through town without traveling down OR 99 could be beneficial. This could be particularly useful for recreational cyclists passing through the area.

Rose Street is only partially developed and could use bike lanes to improve access to Oaklea Middle School.

Bike parking in the city is limited, but required by code for certain types of new commercial and residential development. The Downtown Plan also addresses increased bike parking in the downtown.

Much like the pedestrian safety outreach discussed that would be targeted at school

children, ODOT and the Fire District could work together to deliver bicycle safety education.

Transit

Junction City is served by Rural Route 95, provided by Lane Transit District (LTD), and two Park & Ride lots. It was asked if the current route for Rural Route 95 was adequately serving the city, but this was not known. It was noted that people wait on the side of OR 99 at Meadowview, Milliron, and OR 36 for the bus.

Natalie Stiffler noted that the bus service times reported are a little off.

It was asked how heavily the Park and Ride lots are being used. This was not known. DKS will contact LTD about ridership data.

LTD provides their required paratransit service through RideSource within the Eugene-Springfield Metropolitan Planning Organization (MPO). Currently, paratransit service is only available within Junction City for people covered by Medicaid. Junction City would need to join the MPO to receive complementary paratransit service from RideSource. It is believed that Junction City will have a large enough population to join the MPO when results of the 2020 census are available.

LTD is open to discussing route modifications if those are desired by the community to improve service.

Access to Corvallis was previously available through service supported by the Benton County Special Transportation Fund. Due to budget cuts and low ridership, service was cancelled a year ago.

Stacy asked if vanpool and carpool service could be discussed in the TSP.

Motor Vehicles

There is some confusion regarding street functional classifications in the current TSP that will need to be resolved. Ed Moore noted that improving consistency between functional classifications used by the City and ODOT could help pursuits for funding.

Pavement conditions are documented in the memorandum using ratings provided by ODOT and the County. ODOT uses qualitative descriptions to match rating values. Does the County have qualitative descriptions as well? DKS will investigate and include them if so. It was also asked if there are or should be policies or goals for maintaining a certain percentage of roadways at a minimum quality. Doe the City use a pavement rating system? DKS will investigate.

It was noted that the speed limit on OR 99 south of 1st Avenue (Figure 8) is incorrect. The 55 mph zone should extend further north.

There do not appear to be any issues related to congestion in the City, including on OR 99 (all standards for mobility are being met). It was noted by a TAC member that surges of traffic do occur in response to football games. John noted that this is very different than when the OR 99 corridor was analyzed in 2006 for the Refinement Study. At that time, congestion levels were noticeably higher and the intersection on OR 99 at 1st Avenue was failing to meet mobility standards. Much of this congestion was caused by employees leaving Country Coach.

Most motor vehicle collisions occur along OR 99, with the intersection at 10th Avenue having the highest frequency of crashes. Overall, the most common collision types are rear-end, but at 10th Avenue turning crashes are more prevalent. In addition to intersections along OR 99, the intersection at 18th and Oaklea was noted as a safety concern due to limited sight distance. Police Chief Mark Chase could not attend the meeting, but send comments in advance regarding a desire to lower the posted speed on OR 99 to improve safety. There are also a number of streets within the city where lowering posted speeds may be of interest.

Rail

Previous efforts to relocate the railroad tracks along Holly Street appear to have halted. Bike and pedestrian crossings along the railroad continue to be an issue. It was noted that while pavement conditions along Holly Street are bad because of the railroad loads, the railroad is gradually improving sections as funding allows.

Railroad crossing safety for pedestrians has been expressed as a concern. The UPRR crossing at 6th was recently improved.

Fencing is being installed along Front Street to keep pedestrians from cutting across the grassy areas and over the UPRR tracks.

It was recommended that educational outreach with school kids be implemented regarding railroad safety.

Next Steps and Adjourn

The project team will be meeting with the CAC at 5:30 p.m. to review these same materials. DKS will revise the project schedule in coordination with Stacy and Savannah after confirming the project direction with City Council. Next steps will be to identify future needs and improvements and vet them and the existing conditions at a public meeting.

Junction City Transportation System Plan Update
Technical Advisory Committee (TAC) Meeting #2

Meeting Date: January 31, 2013
Meeting Time: 4:00 p.m. to 5:00 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
TAC Members:
- Kevin Watson, City of Junction City
- Melissa Bowers, City of Junction City
- Dean Chappell, Lane Rural Fire/Rescue
- Ed Moore, DLCD

Project Management Team:
- Stacy Clauson, Lane Council of Governments/City of Junction City
- John Bosket, DKS Associates
- Savannah Crawford, Oregon Department of Transportation
- Mat Dolata, DKS Associates
- Lydia McKinney, Lane County

Sign-in, Introductions, and Agenda Overview
This was the second meeting of the Junction City Transportation System Plan (TSP) Update Technical Advisory Committee (TAC). The purpose of the meeting was to provide a brief project status update and review and discuss key findings from the Future Transportation Needs report.

Project Status
John provided an overview of the project status within the timeline identified for the TSP. The TSP Update project has been active for well over a year. Review of Existing Conditions (Chapter 3) has been completed. The review of Future Transportation Needs (Chapter 4) is now underway and was delayed in response to land use changes associated with the City's Comprehensive Plan Amendment.

A Citizen Advisory Committee (CAC) Meeting will be held following this TAC Meeting to review Draft Chapter 4 and to have a preliminary discussion about pedestrian and bicycle improvements. On February 21st, we will have our first Open House to introduce the project to the general public and get feedback on current transportation issues and priorities.

Following the Open House, we will be developing solutions through the spring, then drafting the TSP through the summer. The adoption process is expected to occur this fall. There will be two more TAC meetings to review draft solutions and the draft TSP.

Draft Chapter 4: Future Transportation Needs
The findings of the Future Transportation Needs analysis are based on the future "no-build" transportation conditions and, along with the needs identified in Existing Conditions (Chapter 3), will focus the development of transportation solutions in the next phase of the TSP development project.

Mat reviewed the draft Future Transportation Needs report, which is based on analysis for the planning horizon year of 2035. The study area for the report includes the entire transportation network within the Junction City urban growth boundary (UGB), including the expansion areas identified in the City's Comprehensive Plan Amendment.

Future Land Use
Land use is a key factor affecting the demands placed on Junction City's transportation system. The housing and employment estimates for Junction City were obtained from several sources and are consistent with the Lane County coordinated population forecasts and the City's Comprehensive Plan Amendment. The Junction City UGB is estimated to grow by 1,862 households and 3,695 employees between 2010 and 2035.

The land use estimates were allocated to Transportation Analysis Zones (TAZs) within the city. Key growth areas were identified in maps that illustrated household and employment changes by TAZ. The majority of household growth is expected to occur on the west side of OR 99. Most employment growth is expected to occur in the southern portion of Junction City, along OR 99 south of OR 36. Much of this growth corresponds to the proposed Oregon State Hospital and the State Correctional Facility. Ed Moore noted that another significant development in the area that should be expressly mentioned in the text of the chapter is the Grain Millers, Inc. site.

Future Traffic Volumes
Traffic volumes for the year 2035 were developed using a combination of the local land use growth along with growth in regional through trips. A travel forecasting tool was developed specifically for Junction City that converted land uses into motor vehicle trips.

Most of the growth in traffic volumes will occur along OR 99 and other key arterial routes such as High Pass Road, Oaklea Drive, and 18th Avenue. Pitney Lane, OR 36, and Prairie Road also experience moderate levels of traffic growth due the relationship between residential growth on the west side of the city and employment opportunities to the south.

Future Traffic Operations
The 2035 traffic volumes were analyzed at the TSP study intersections to assess how the intersections will operate compared to applicable mobility targets/standards. The TAC requested clarification on the traffic analysis as it relates to the PM peak "design hour." The design hour is the 30th highest hour of traffic volume for the year and is estimated by using standard methodologies outlined by ODOT. The 30th highest hour was chosen as the design hour because it is a common design hour used in engineering practice and is the period on which ODOT has based their mobility targets.

The results of the traffic analysis indicated that, while traffic volumes and congestion will increase citywide, nearly all study intersections will continue to meet mobility standards. The only exception is the High Pass Road/Maple Street intersection, where the southbound Maple Street approach will experience relatively long delays by the year 2035.

These findings are very different from when the OR 99 corridor was analyzed in 2006 for the OR 99 Refinement Study, which had a horizon year of 2026. The difference is primarily attributed to lower traffic counts likely resulting from economic changes since the previous study was undertaken in 2006, especially the loss of Country Coach as a major employer. Traffic volumes in Junction City have decreased by approximately 25% since 2006. While forecasted traffic volume growth is comparable to what was previously identified, the lower current volumes result in the need for significant operational improvements (such as the OR 99 couplet) to be extended beyond the planning horizon of the TSP update. In other words, the need for major highway improvements has not gone away as much as it has been delayed. At the time of the next TSP update in 8 to 10 years, the need for such improvements within that 20-year planning period will likely return.

Future Motor Vehicle Needs

The majority of motor vehicle issues were identified in Existing Conditions (Chapter 3). However, some additional issues are anticipated to arise as the city develops.

Most motor vehicle collisions occur along OR 99, with the intersection at 10th Avenue having the highest frequency of crashes. As traffic volumes increase, these safety issues may become more frequent.

Policies and strategies for safely accessing properties adjacent to OR 99 will need to be identified. Concerns have been raised related to high-speed vehicles on OR 99 south of 1st Avenue mixing with turning vehicles accessing new developments along the corridor. Kevin Watson noted that properties along OR 99 are often lower than the roadway, resulting in highly sloped driveways that could present sight and safety issues. Requirements for having driveways built up to safe standards should be explored.

In addition to intersections along OR 99, the intersection at 18th and Oaklea was noted as a safety concern due to limited sight distance. Other motor vehicle issues were noted including difficulties with widening High Pass Road without impacting the historic cemetery, constructing street extensions of key collector roadways to serve new areas of development, and identifying travel demand management policies for large employers to manage peak hour traffic demand.

Future Transit Needs

Junction City is served by Rural Route 95, provided by Lane Transit District (LTD). LTD is open to discussing route modifications if those are desired by the community to improve service. The need to modify transit service should be monitored as the city grows.

Currently, paratransit service is only available within Junction City for people covered by Medicaid. Junction City would need to join the MPO to receive complementary paratransit service from RideSource. It is believed that Junction City will have a large enough population to join the MPO when results of the 2020 census are available.

Transit access to Monroe and Corvallis was previously available through service supported by the Benton County Special Transportation Fund. Due to budget cuts and low ridership, service was cancelled.

Accessibility of existing bus stops for bicycles and pedestrians should be enhanced to encourage transit use.

Future Pedestrian Needs

Significant gaps in the sidewalk network are found along Oaklea Drive, 18th Avenue, 1st Avenue and the western ends of 10th and 6th Avenues. Other gaps are found on Prairie Road from 1st Avenue to at least Bailey Lane. As new developments are constructed, the need to fill pedestrian network gaps to these areas will be increased. New roadway extensions should be built with required sidewalk facilities. The Parks Master Plan includes a recommendation to connect 6th to 10th Avenues and 10th to the rest of the network through a shared-use path.

Most crossing improvements are needed along OR 99. Signaled crossings are too far apart to be usable for many pedestrians. There is also a need for lighting improvements to enhance pedestrian safety along OR 99. The intersection on OR 99 at 6th Avenue, in particular, would benefit from better lighting. Sidewalks along OR 99 in the downtown area are relatively narrow and don't provide a buffer between vehicle traffic and pedestrians. Off of OR 99, the greatest need for crossing improvements is at 1st Avenue/Maple Street and at railroad crossings, which can create hazardous barriers for pedestrians.

Many sidewalks have an older design, which the city is retrofitting over time to meet Americans with Disability Act (ADA) standards. There are some maintenance issues that will not be dealt with through the TSP but will be referred to the public works department.

Future Bicycle Needs

Bikeways are required on all arterials and collectors by state law (bikeways can include a variety of treatments such as bike lanes, shoulder bikeways, shared roadways or shared-use paths). There are some shoulders on portions of OR 99, but there are no designated bike lanes in Junction City. Most streets in the city can accommodate bike traffic on shared roadways due to low auto volumes and/or speeds. As bike facility improvements are developed, we will customize treatments as appropriate for each roadway.

Similar to the issue identified for pedestrians, infrequent crossing opportunities along OR 99 and railroad crossings present barriers to safe bicycle travel in Junction City. In addition, the shared-use paths are somewhat narrow (8 feet wide) for comfortable bicycle riding.

Bike parking in the city is limited, but required by code for certain types of new commercial and residential development. The Downtown Plan also addresses increased bike parking in the downtown.

Much like the pedestrian safety outreach discussed that would be targeted at school children, ODOT and the Fire District could work together to deliver bicycle safety education.

A discussion related to recreational bicylists and other through-traveling riders may benefit from a route off of OR 99. The TAC noted that way-finding signs may be useful to orient bicycle riders along a preferred route through the city.

Future Funding Availability

Future estimates for Junction City's transportation funding through the year 2035 were summarized. A total of approximately $2.4 million was estimated to be available for capital improvements through 2035. The estimate was based on historical data for routine revenues and costs as well as anticipated growth in land development. These expenditures, needed to maintain the current system, were subtracted from the total estimated revenues to calculate the net balance available for capital improvement projects.

The TAC noted that the funding estimate does not include any one-time or project-specific funding grants or other non-routine sources of revenue from other jurisdictions.

Next Steps and Adjourn

The project team will be meeting with the CAC at 5:30 p.m. to review these same materials. Next steps will be to identify future improvement strategies and vet the identified transportation needs at a public Open House.

Junction City Transportation System Plan Update
Technical Advisory Committee (TAC) Meeting #3

Meeting Date: July 8, 2013
Meeting Time: 2:30 p.m. to 4:30 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Participants
TAC Members:
- Melissa Bowers, City of Junction City
- Ed Moore, DLCD
- Sasha Luftig, Lane Transit District
- Dean Chappell, Lane Rural Fire/Rescue (Arrived later after meeting concluded, but provided comments)

Project Management Team:
- Stacy Clauson, Lane Council of Governments/City of Junction City
- John Bosket, DKS Associates
- Savannah Crawford, Oregon Department of Transportation

Sign-in, Introductions, and Agenda Overview
This was the third meeting of the Junction City Transportation System Plan (TSP) Update Technical Advisory Committee (TAC). The purpose of the meeting was to provide a brief project status update and discuss the recommended transportation solutions from Technical Memorandum #4.

Project Status
Today we will be discussing potential solutions to the transportation issues noted in previous tasks. These solutions, documented in Technical Memorandum #4, will also be discussed with the Citizen Advisory Committee (CAC) at a meeting later this evening. Then this Thursday we will have an open house to gain public input.

Following these meetings we will develop needed code/policy amendments to implement the plan, will create a financially constrained list of priority projects, will break down project funding in more detail, and will develop the Draft TSP. Then we will have another TAC and CAC meeting, followed by a joint work session with Junction City Planning Commission and City Council. After this we will begin the adoption process, likely completing the project in January 2014.

Stacy noted that the City Council has been updated periodically, but not the Planning Commission (although we do have a Planning Commission member on the CAC). Also, joint work sessions with the Planning Commission and City Council are not commonly done, so the city will need to figure out how to do that.

Draft Transportation Solutions (Technical Memorandum #4)
All attendees had read the memo prior to the meeting. Therefore, the discussion was focused on specific questions/comments from each committee member.

It was asked if the funding discussion could identify which portions of new streets would be characterized as exactions vs. being SDC creditable. Such a refinement would be helpful in better understanding the true costs (to the city) of some projects. We will need to break funding down into more detail for the upcoming Tech Memo #5: Implementation Action Strategy. This issue in particular would be important. Another question is whether SDCs can be applied to improvements on county and state facilities or if they are restricted to only city facilities. John will help frame these questions for Stacy and she will work with the city to get the answers. Stacy noted that there is a street fund for Prairie Road, but she will need to look into it to better understand how it is being applied.

It was asked if the county would approve improvements on their facilities even if the city or others were paying for them (because it would increase maintenance/operations costs for the county).

On Figure 3, should sharrows be offered as an alternative to bike lanes to allow for a smaller street design? The preference would be not to make sharrows a standard practice for collectors (especially new ones), but rather use them through the variance process where needed and appropriate. We do have a number of such options being considered on collectors right now in the current work being considered.

On Figure 5, should there be a volume trigger to identify when the Neighborhood Local Street should be used? We could do this – might be something like "<1,000 ADT."

With ODOT's access management regulations changing, will the access management references in the TSP be consistent for long? We have changed all references to point to whatever ODOT's regulations are at the time action is being taken. So we would always be "current." The access management plan from the OR 99 Refinement Plan is also being replaced with this language, as well as some supporting policy statements.

LTD's preference for streets is to have minimum travel lane widths of 11 feet. This would only be a problem for new local streets, but it is unlikely that buses will be routed down any of those.

When would Junction City be eligible for rural transit funding? Sasha will look into this.

Regarding Transit Coordinators for large employers, the likely action would be for the employer to identify a coordinator and to have that coordinator work with Point to Point.

There was question as to whether or not city staff was okay with the 9-foot travel lanes for local streets. According to Jason Knope's email, a minimum width of 9-feet is okay. The fire district may feel differently.

Regarding the proposed functional classification changes, the city does not want to make any changes that would jeopardize future funding opportunities. If this would be the case, affected streets would remain classified as they currently are. There was some question as to whether or not the Federal Classification recognized minor collectors. Savannah will check on this. If it does not, reclassifying minor collectors to local streets would be okay.

Regarding the description of grant opportunities, because available grants will change over time it was agreed that it would be best to just list grant categories and agencies.

The city applied to ODOT for funding of the Maple/Prairie realignment at 1st Avenue. ODOT has developed a detailed cost estimate. Savannah will provide that for John to include in the TSP.

The recommendation for pedestrian/bicycle safety education for school children will be emphasized more strongly. ODOT and the city police should partner in delivering such educational programs.

Dean Chappell arrived after the meeting had adjourned. He offered the following comments.

The fire district does not like many of the traffic calming devices described. Specific devices he would not like implemented include: islands, curb extensions, and chokers. He would prefer that stop signs were used to calm traffic. Roundabouts are okay as long as they are designed for fire trucks. Note that the fire district would like a minimum of a 20-foot roadway width provided on all roads (traveled way, not including parking).

Next Steps and Adjourn
The project team will be meeting with the CAC at 5:30 p.m. to review these same materials. Next steps will be to obtain community input on project interests and priorities at a public Open House Thursday evening.

Action items include:

- John will provide questions related to SDC application and exactions to Stacy and she will work with the city to get the answers.
- Stacy will look into how the street fund for Prairie Road is managed.
- Sasha will look into eligibility for rural transit funding.
- Savannah will check to see if the Federal Classification recognizes minor collectors.
- Savannah will provide ODOT's 1st Avenue/Maple/Prairie cost estimate to John.

summary

Junction City Transportation System Plan Update
Alley Access Management Subcommittee Meeting

Meeting Date: September 29, 2011
Meeting Time: 2:00 p.m. to 4:00 p.m.
Meeting Location: Junction City Council Chambers at 680 Greenwood St.

Purpose: To discuss the use of the public alleys for property/business access to OR 99 between 17th Avenue and 1st Avenue.

Attendees: Mike Kaiser (Citizen Advisory Committee), Jack Sumner (Citizen Advisory Committee) Kay Bork (City of Junction City), Savannah Crawford (ODOT), David Knitowski (ODOT), John Bosket (DKS Associates)

Background – Why is this being discussed?
The OR 99 Junction City Refinement Plan (adopted in 2008) includes an access management plan that directs how access to OR 99 is to be taken from adjacent properties. The plan spans from Link Ln./Toftdahl Rd. at the north end to OR 36/Prairie Rd. at the south end.

The direction for how access is to be taken from properties abutting OR 99 in the segment between 17th Avenue and 1st Avenue has created some challenges for recent development proposals. In particular, there was a recent development at 13th/Ivy that is now taking all access from the alley behind the property, with no access taken directly from OR 99. The alley access is constrained and not wide enough to support two-way travel. The lots in this area aren't deep enough to provide a side street access and an alley access. In addition, the alleys currently act as utility corridors and many of them may not have been constructed to support high volumes of traffic.

The City would like to revisit the access management plan recommendations for OR 99 between 17th Avenue and 1st Avenue and determine whether or not they are sufficient to safely and efficiently support commercial development. This may be a good time to do this since the City is updating the TSP and ODOT is currently modifying their access management standards.

Why was an Access Management Plan included in the OR 99 Junction City Refinement Plan?
An access management plan was included in the OR 99 Junction City Refinement Plan to help improve corridor safety and operations and to extend the functional life of investments made in future improvements.

Access management deals with the manner in which vehicles enter and leave a roadway. This applies to both public street intersections and private driveways. Proper design and location of access points along a roadway can reduce potential conflicts and have significant safety benefits for all modes of travel. This problem was raised during the OR 99 Junction City Refinement Plan process, when a Citizen Advisory Committee member noted that they don't feel safe walking along OR 99 because they have to constantly cross driveways and streets to get anywhere. While improving safety through managing access often means reducing the number of access points directly to the roadway, it must also be remembered that in commercial corridors such as this one, accessibility of businesses is important as well.

What does the Access Management Plan require?
John Bosket led an overview of the access management plan in the OR 99 Junction City Refinement Plan.

The first major area of the plan is the Access Management Plan Objectives. It is important to understand that the objectives listed here are provided as documentation of key criteria used to guide decision-making during plan development. They are not requirements for future action.

It was noted that many of the criteria were based on regulations in place at the time that governed ODOT's decision-making process regarding access to state highways. However, some of these regulations are currently being amended, with a new set of rules to be in place January 2012. Therefore, it may be appropriate to reevaluate some of the objectives of the plan once the new rules are in place. Some potential changes to consider include:

> Objective #1: The definition of what constitutes "reasonable access" may be changing to better account for the economic development needs of the property. Also, the access spacing standards listed in Table 6-3 will be changing to allow for less distance between adjacent driveways.
>
> Objective #6: Again, the change in defining "reasonable access" may alter how this objective guides decisions on access.

The second major area of the plan is the Access Management Action Plan. Plan actions are divided into short, medium, and long-range actions. This was done because it is a specific requirement of ODOT's regulations describing how access management plans must be developed (OAR 734-051-0155(5)(f)). As described, the short-range actions are

those that can be completed at any time and are not dependent on site redevelopment or future improvement projects. The medium-range actions represent those that are dependent on site redevelopment due to potential hardships that could result by modifying property access given current infrastructure locations. The long-range actions are those that are dependent on improvement projects to be constructed before access changes could be made. The actions for each property are described in Table 6-4 and illustrated in Figures 6-9A through D (the segment of OR 99 being discussed in shown in Figure 6-9B).

Clarification was offered on a couple of aspects of the actions. It is acknowledged in the plan that the timing of opportunities such as future construction projects and property development is uncertain. Therefore, it may be appropriate to complete a long or medium-range action sooner than a short-range action if opportunities arise. Also, the term "further development," used in the plan actions, is intended to refer to any degree of development activity. The term "redevelopment" is intended to refer to a level of development activity that would allow for site circulation to be modified as a result of such actions as building relocations or on-site circulation changes.

The last major area of the plan is the Access Management Plan Modification Recommendation. This section acknowledges that unforeseen circumstances in the future may warrant modifications to plan recommendations. Several examples are described, with two examples being directly related to access to properties along OR 99 between 17th and 1st Avenues.

> Shared Mid-block Access: While the plan calls for removal of direct access to OR 99 and relocation of access to the side streets, this provision allows for the establishment of a mid-block access point to the highway where neighboring property owners agree to record appropriate easements for shared use. However, it must be demonstrated that side street access alone cannot adequately serve existing and proposed development and that the mid-block access would benefit the highway.
>
> Recommended Modifications to Public Alley Design: While the plan calls for removal of direct access to OR 99 and relocation of access to the side streets, most properties between 17th and 1st Avenues are served by alleys connecting to the side streets approximately 100 feet from their intersections with OR 99. This makes the establishment of an additional side street access undesirable. However, use of the alleys as currently constructed would not be appropriate since they are only 20 feet wide. Therefore, this provision recommends that the alleys be improved when properties are redeveloped to widen them to a minimum of 24 feet or to consider one-way travel on the alleys.

In summary, the access management plan does offer some flexibility to deviate from the actions described. While further discussion of the need for more flexibility than offered may be warranted, especially given the constrained nature of the alley system, on-going

changes in ODOT's access management regulations will likely affect this discussion. Therefore, it may be better to wait until the changes are complete in January 2012 to discuss this further.

What are the concerns about the Plan recommendations?

- Utilities underground and overhead could make alley modifications to support use as primary property access point costly.
- The City should take a business-friendly approach to development/highway access.
- An access management plan should be structured so that it will continuously align with ODOT policies/standards as they change in the future.
- Too much reliance on the public street intersections for property access may not be safe or could cause more congestion.
- The alleys are used by garbage and delivery trucks that periodically block the roadway.
- Lot depths make these properties difficult to develop.

Next Steps

This discussion, including concerns and preferred direction for change, will be documented. However, because ODOT access management policies/regulations are currently being changed, we will wait until January 2012 (when changes will be complete and new rules will be effective) to develop recommended actions. Proposed changes to the access management plan will be included as part of the TSP update.