City of Independence

Transportation System Plan

Volume II: Technical Appendix

August 2021

City of Independence Transportation System Plan

Independence, Oregon

Prepared For:
City of Independence
555 S Main Street
Independence, Oregon 97351
(503) 838-1212

Prepared By:
Kittelson & Associates, Inc.
851 SW 6th Avenue, Suite 600
Portland, OR 97204
(503) 228-5230

Project Principal: Matt Hughart, AICP
Project Manager: Matt Bell
Deputy Project Manager: Molly McCormick

August 2021

TECHNICAL APPENDIX

Attachment A Tech Memo #1: Plans and Policy Review

MEMORANDUM

Technical Memorandum #1: Plans and Policy Framework

Independence Transportation System Plan Update

DATE	April 6, 2020
TO	Project Management Team
FROM	Matt Hastie, Clinton "CJ" Doxsee, & Emma Porricolo, Angelo Planning Group
CC	Matt Bell and Molly McCormick, Kittelson & Associates

OVERVIEW

This memorandum presents a review of existing plans, regulations, and policies that affect transportation planning in Independence. The review explains the relationship between the documents and this planning process, identifying key issues that will factor into the Transportation System Plan (TSP) update process, particularly given the number of plans and policies that have been adopted or updated since adoption of the City's 2007 TSP. This memorandum is intended to guide decisions regarding selection of preferred transportation solutions and identifies potential amendments to related plan documents and regulations, steps that will occur later in the TSP update process.

Some documents included in this review establish transportation-related standards, targets, and guidelines with which the TSP update must be coordinated and consistent with; others contain transportation improvements that will need to be factored into the future demand modeling and otherwise reflected in the draft TSP. Local policy and regulatory requirements described in this review – such as the Independence Development Code – may be subject to recommended amendments in order to implement the recommendations of the updated TSP. This memorandum helps set the stage for those potential amendments, which will be prepared as part of project implementation (Task 6).

The following documents were reviewed.

STATE PLANS

Statewide Planning Goals

The foundation of Oregon's statewide land use planning program is a set of 19 Statewide Planning Goals. The goals express the state's policies on land use and on related topics, such as citizen involvement, housing, and natural resources. Oregon's statewide goals are achieved through local comprehensive planning, including the development and implementation of TSPs.

All of Oregon's Statewide Goals have an influence on transportation planning, either directly or indirectly. However only certain Goals directly apply to transportation planning at a local level; the Goals listed in Table 1 are most relevant to Independence's TSP update.

Table 1: Statewide Planning Goals

Statewide Planning Goal	Relevancy to the Independence TSP Update
Goal 1: Citizen Involvement	Establishes citizen involvement as the primary goal of the land use planning process in Oregon. The Independence TSP Update process is guided by a robust public involvement plan that includes public involvement goals, identified affected and interested stakeholder and target audiences, and critical factors that will gage success. In addition, this project will be guided by project advisory committees that will inform the TSP update throughout the course of the project.
Goal 2: Land Use Planning	Establishes a process and policy framework for all decisions and actions related to uses of land; ensures that such decisions and actions are premised on an adequate factual base. Existing and future transportation needs will be based on inventories of existing conditions in Tech Memo #3, including existing and planned land uses, as well as improving efficient multi-modal connections to housing, public services, employment areas, and recreational opportunities.
Goal 5: Natural Resources, Scenic and Historic Areas, and Open Spaces	Existing natural resources and environmental features influence the siting, construction, and cost of transportation improvements. Tech Memo #3 will provide inventories of these resources and describe areas within Independence that may pose barriers to providing transportation access or improvements.
Goal 7: Natural Hazards	The risk of natural hazards affects site selection and alignment decisions and design standards. Transportation improvement projects in Independence should avoid natural hazard areas, such as floodplains, to the extent feasible.
Goal 9: Economic Development	Addresses the need for a variety of economic opportunities in support of the health, welfare, and prosperity of Oregon's citizens. The TSP Update process should be coordinated with current and planned economic development activities.

Statewide Planning Goal	Relevancy to the Independence TSP Update
Goal 10: Housing	Cities are required to anticipate ongoing needs for housing, and to provide adequate infrastructure to serve residential uses. Transportation facilities and project prioritization will be based, in part, on the demands generated by current and projected housing needs.
Goal 11: Public Facilities and Services	Local governments are required to provide adequate public facilities, including transportation facilities, in a timely and efficient manner. The TSP Update will coordinate with or consider the provision of other public facilities consistent with adopted plans.
Goal 12: Transportation	Requires multi-modal transportation plans for transportation service providers that need to: • Be based upon factual inventories, • Minimize adverse social, environmental, economic, and energy impacts, • Meet the needs of the transportation disadvantaged, • Facilitate the flow of goods and services, and • Be consistent with related local and regional plans. As described in more detail elsewhere in this memo, Goal 12 is implemented through the Transportation Planning Rule (OAR 660, Division 12).
Goal 13: Energy Conservation	Land uses shall be managed and controlled to maximize the conservation of all forms of energy based upon sound economic principles. In transportation planning, this includes consideration of travel distances and mode share.
Goal 14: Urbanization	Requires land within the Urban Growth Boundary to "provide an orderly and efficient transition from rural to urban land use." Findings of feasibility of providing adequate transportation and other public facilities is required for expansion of UGB's.

Project Relevance: The TSP Update will be consistent with the Statewide Planning Goals.

ODOT TSP Guidelines

The Oregon Department of Transportation's (ODOT) Transportation System Plan (TSP) Guidelines is an on-line resource that provides technical guidance on how to prepare a TSP.[1] The guidelines provide citizens and planning professionals with information that is relevant during each phase of TSP development, including scoping, plan preparation, adoption, and implementation.

[1] The TSP Guidelines are on-line at: https://www.oregon.gov/ODOT/Planning/TSP-Guidelines/Pages/What.aspx.

The preparation phase lists seven steps to develop a TSP. The phase starts with the formulation of a public involvement plan and ends with the preparation of the actual TSP document. The steps in between relate to information gathering and analysis needed to develop elements of the TSP. Each step is further broken down into relevant topic areas that further describe elements and processes that are necessary or helpful in developing or updating a TSP. The steps and topics include:

- Step 1: Agency/Public Engagement Plan
  - Agency Coordination Plan
  - Public Involvement Plan
- Step 2: Goals & Objectives
  - The Intent (Why you do it)
  - The Approach (How you do it)
  - Evaluation and Prioritization Criteria
- Step 3: Existing Conditions
  - Plans and Policy Review
  - Existing Conditions Inventory
  - Existing Needs Determination
  - Funding Review
  - Documentation of Existing Conditions and Needs
- Step 4: Future Conditions
  - Future Conditions Overview
  - Future Capacity Determination
  - Future Travel Demand Determination
  - Future Deficiencies Determination
  - Future Needs Determination
- Step 5: Solution Development & Evaluation
  - Solution Development and Evaluation Overview
  - Developing Solutions
  - Evaluating Proposed Solutions
  - Selecting and Prioritizing Preferred Solutions
  - Documentation
- Step 6: Funding Program
  - Development of a Financially Constrained List of Transportation Projects/Programs
  - Identifying Potential Funding Sources
  - Documentation
- Step 7: TSP Documentation
  - What a TSP Shall, Should, and Could Include

Project Relevance: The ODOT TSP Guidelines provides guidance on how to update a TSP. They can be used as a resource for the Independence TSP update process for advisory committee members, elected and appointed officials, and the consultant team who will consider and apply technical guidance from the TSP Guidelines throughout the planning process. The workplan for this project is consistent with these guidelines.

Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is the state's long-range multi-modal transportation plan that addresses the future transportation needs of the State of Oregon through the year 2030. The primary function of the OTP is to establish goals, policies, strategies, and initiatives that are translated into a series of modal plans, such as the Oregon Highway Plan and Oregon Bike and Pedestrian Plan. The OTP considers all modes of Oregon's transportation system, including Oregon's airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation, and railroads. It assesses state, regional, and local public and private transportation facilities. In addition, the OTP provides the framework for prioritizing transportation improvements based on varied future revenue conditions, but it does not identify specific projects for development.

The OTP provides broad policy guidance and sets seven (7) overarching goals for the state.[2] Through these goals and associated policies and strategies, the OTP emphasizes:

- Maintaining and maximizing the assets in place.
- Optimizing the performance of the existing system through technology.
- Integrating transportation, land use, economic development, and the environment.
- Integrating the transportation system across jurisdictions, ownerships, and modes.
- Creating sustainable funding.
- Investing in strategic capacity enhancements.

The Implementation Framework section of the OTP describes the implementation process and how state multimodal, modal/topic plans, regional and local TSPs and master plans will further refine the OTP's broad policies and investment levels. Local TSPs can further OTP implementation by defining standards, instituting performance measures, and requiring that operational strategies be developed.

The last chapter of the OTP provides implementation and investment frameworks and key initiatives to be consulted in developing TSP projects and implementation measures.

> **Project Relevance:** The OTP's key initiatives will guide the TSP update, specifically in the areas of system management, maximizing performance of the existing transportation system using technology and creative design solutions, pursuing sustainable funding sources, and investing strategically in capacity projects. Consistent with a central OTP policy, the TSP update will seek to maximize the performance of the existing local transportation system using technology and system management before considering larger and costlier additions to the system.

Oregon Highway Plan (1999, last amended 2018)

The Oregon Highway Plan (OHP) is a modal plan of the OTP that guides planning, operations, and financing for ODOT's Highway Division. Policies in the OHP emphasize the efficient management of

[2] The seven goals are Goal 1 – Mobility and Accessibility; Goal 2 – Management of the System; Goal 3 – Economic Vitality; Goal 4 – Sustainability; Goal 5 – Safety and Security; Goal 6 – Funding the Transportation System; and Goal 7 – Coordination, Communication, and Cooperation.

the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The following policies are relevant to the TSP update process.

Policy 1A: State Highway Classification System

The OHP classifies the state highway system into four levels of importance: Interstate, Statewide, Regional, and District. ODOT uses this classification system to guide management and investment decisions regarding state highway facilities. The system guides the development of the facility plans, as well as ODOT's review of local plan and zoning amendments, highway project selection, design and development, and facility management decisions including road approach permits.

The Monmouth-Independence Highway (OR 51) is a classified highway in the state classification system. The purpose and management objectives of this highway is provided in Policy 1A, as summarized below.

- **District highways** (OR 51) are typically significant for county-wide connections and are largely county or city arterials and collectors. They typically provide connections to and links between small urbanized areas, rural centers, and urban hubs. The management objective 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 for traffic flow and for pedestrian and bicycle movements. Inside Special Transportation Areas, local access is a priority. Inside Urban Business Areas, mobility is balanced with local access.

Policy 1B: Land Use and Transportation

Policy 1B addresses the relationship between highways and development on either side of the highway. As a District highway, OR 51 must accommodate accessibility. Highway segment designations within Independence have been identified by ODOT as Special Transportation Areas (STAs) and Commercial Centers (CC).

- Special Transportation Areas (STAs): A Special Transportation Area (STA) is a designated district of compact development located on a state highway within an urban growth boundary in which the need for appropriate local access outweighs the considerations of highway mobility except on designated OHP Freight Routes where through highway mobility has greater importance. Specific guidance for planning in STAs includes lower setbacks, wider sidewalks, a focus on pedestrian use, mixed-use development, and interconnected street network facilities, and lower speed limits.
- Commercial Centers (CCAs): These areas are defined as large, regional centers or nodes with limited access to the state highway. Commercial Centers generally include a high level of regional accessibility and connections to the local road network and accommodates pedestrian and bicycle access and circulation and, where appropriate, transit movements. The portion of Monmouth Street in Independence identified as a CC essentially serves as the City's downtown area and provides access to motorists to Monmouth and Salem via the connecting road system.

Policy 1F: Highway Mobility Standards Access Management Policy

Policy 1F sets mobility standards for ensuring a reliable and acceptable level of mobility on the state highway system. The standards are used to assess system needs as part of long-range, comprehensive planning for transportation projects, during development review, and to demonstrate compliance with the TPR.

Significant amendments to Policy 1F were adopted at the end of 2011. The 2011 revisions were made to address concerns that state transportation policy and requirements have led to unintended consequences and inhibited economic development. Policy 1F now provides a clearer policy framework for considering measures other than v/c ratios for evaluating mobility performance. Also, v/c ratios established in Policy 1F were changed from being standards to "targets." These targets are to be used to determine significant effect pursuant to TPR Section -0060.

Table 2 presents mobility targets for the state facilities in the TSP study area. A target of 1.0 to 0.90 apply to OR 51, depending on STA designation and highway speed.

Table 2: V/C Ratio Targets Outside the Portland Metropolitan Region

VOLUME TO CAPACITY RATIO TARGETS OUTSIDE METRO[17A, B, C, D]							
Highway Category	**Inside Urban Growth Boundary**					**Outside Urban Growth Boundary**	
	STA[E]	**MPO**	**Non-MPO Outside of STAs where non-freeway posted speed <= 35 mph, or a Designated UBA**	**Non-MPO outside of STAs where non-freeway speed > 35 mph but < 45 mph**	**Non-MPO where non-freeway speed limit >= 45 mph**	**Unincorporated Communities[F]**	**Rural Lands**
Interstate Highways	N/A	0.85	N/A	N/A	0.80	0.70	0.70
Statewide Expressways	N/A	0.85	0.85	0.80	0.80	0.70	0.70
Freight Route on a Statewide Highway	0.90	0.85	0.85	0.80	0.80	0.70	0.70
Statewide (not a Freight Route)	0.95	0.90	0.90	0.85	0.80	0.75	0.70
Freight Route on a regional or District Highway	0.95	0.90	0.90	0.85	0.85	0.75	0.70
Expressway on a Regional or District Highway	N/A	0.90	N/A	0.85	0.85	0.75	0.70
Regional Highways	1.0	0.95	0.90	0.85	0.85	0.75	0.70
District/Local Interest Roads	1.0	0.95	0.95	0.90	0.90	0.80	0.75

[A] Unless the Oregon Transportation Commission has adopted an alternative mobility target for the impacted facility, the mobility targets in Tables 6 are considered standards for purposes of determining compliance with OAR 660-012, the Transportation Planning Rule.

[B] For the purposes of this policy, the peak hour shall be the 30th highest annual hour. This approximates weekday peak hour traffic in larger urban areas. Alternatives to the 30th highest annual hour may be considered and established through alternative mobility target processes.

[C] Highway design requirements are addressed in the Highway Design Manual (HDM).

[D] See Action 1F.1 for additional technical details.

[E] Interstates and Expressways shall not be identified as Special Transportation Areas.

[F] For unincorporated communities inside MPO boundaries, MPO mobility targets shall apply.

Source: OHP Table 6

Policy 1G: Major Improvements

This policy requires maintaining performance and improving safety on the highway system by improving efficiency and management on the existing roadway network before adding capacity. The state's highest priority is to preserve the functionality of the existing highway system. Tools that could be employed to improve the function of the state facility include access management, transportation demand management, traffic operations modifications, and changes to local land use designations or development regulations.

After existing system preservation, the second priority is to make minor improvements to existing highway facilities, such as adding traffic signals, or making improvements to the local street network to minimize local trips on the state facility.

The third priority is to make major roadway improvements such as adding lanes to increase capacity on existing roadways. As part of this TSP process, ODOT will work with the City and other stakeholders to determine appropriate strategies and tools that can be implemented at the local level that are consistent with this policy.

Policy 2B: Off-System Improvements

This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system. As part of this TSP update process, ODOT will work with the City and project stakeholders to identify improvements to the local road system that support the planned land use designations in the study area and that will help preserve capacity and ensure the long-term efficient and effective operation of high functional class facilities.

Policy 2F: Traffic Safety

This policy emphasizes the state's efforts to improve safety of all users of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues. The TSP update process will include a citywide crash analysis to identify sites with a history of fatal and serious injury crashes and identify potential countermeasures to reduce crashes.

Policy 2G: Rail and Highway Compatibility

This policy recognizes the need to increase safety and transportation efficiency through the reduction and prevention of conflicts between railroads and highway users. The Portland & Western Railroad (PNWR) currently provides the only rail service (freight) through Independence.

Policy 3A: Classification and Spacing Standards

State policy seeks to manage the location, spacing, and type of road intersections on state highways in a manner that ensures the safe and efficient operation of state highways consistent with their highway classification.

Action 3A.2 calls for spacing standards to be established for state highways based on highway classification, type of area, and posted speed. Tables in OHP Appendix C present access spacing standards which consider urban and rural highway classification, traffic volumes, speed, safety, and operational needs. The access management spacing standards established in the OHP are implemented by OAR 734, Division 51, addressed later in this report. The TSP update process will include an analysis of how existing spacing on ODOT facilities compares to these standards.

Policy 4B: Alternative Passenger Modes

Policy 4B encourages the development of alternative passenger services and systems as part of broader corridor strategies. The policy promotes the development of alternative passenger transportation services located off the highway system to help preserve the performance and function of the state highway system. Cherriots provides public transportation service in Independence along the Monmouth-Independence Highway. Improving safety, access, and mobility for pedestrians and bicyclists and enhanced connections to transit are objectives of this update process.

Policy 4D: Transportation Demand Management

This policy supports the efficient use of the state transportation system through investment in transportation demand management (TDM) strategies. Action 4D.1 calls for reducing peak period single-occupancy vehicle travel and to move traffic demand out of the peak period to improve the flow of traffic on state highways. The TSP update process will explore TDM strategies that may be appropriate for Independence, including requirements for new development and incentives for employers that can reduce vehicle trips.

> **Project Relevance:** OHP policies provide guidance related to the accessibility, mobility, and function of state highways. The TSP planning process will consider policies in the OHP to guide proposed improvements, modifications, or policies that could affect any of the state facilities in the city. The TSP is being developed in coordination with ODOT so that projects, policies, and regulations proposed as part of the TSP will be consistent with the standards and targets established in the OHP related to safety, access, and mobility.

Oregon Freight Plan (2011)

The Oregon Freight Plan (OFP) is a modal plan of the OTP that implements the state’s goals and policies related to the movement of goods and commodities. Its purpose statement identifies the intent to "improve freight connections to local, Native American, state, regional, national and global markets in order to increase trade-related jobs and income for workers and businesses." The objectives of the plan include prioritizing and facilitating investments in freight facilities (including rail, marine, air, and pipeline infrastructure) and adopting strategies to maintain and improve the freight transportation system.

The plan defines a statewide strategic freight network. While there is a freight rail within Independence (PNWR), it does not have a specific designation.

> **Project Relevance:** Maintaining and enhancing efficiency of the rail freight system in the study area will be an objective of the updated TSP. The project advisory committees include representatives from ODOT. In addition, representatives of ODOT Rail will be consulted about policies or recommendations related to rail facilities as part of this effort.

Oregon Public Transportation Plan (2018)

The Oregon Public Transportation Plan (OPTP) is the modal plan of the OTP that provides guidance for ODOT and public transportation agencies regarding the development of public transportation systems. The OPTP is intended to establish common understandings for local, regional, and state agencies by addressing the following:

- Vision and goals for public transportation
- Policy and strategy framework to inform decision making
- Possible priorities under different levels of funding for public transportation
- Opportunities and challenges in investment and implementation
- Positioning public transportation as a key part of Oregon's transportation system

The vision stated in the OPTP is:

> *In 2045, public transportation is an integral, interconnected component of Oregon's transportation system that makes Oregon's diverse cities, towns, and communities work. Because public transportation is convenient, affordable, and efficient, it helps further the state's quality of life and economic vitality and contributes to the health and safety of all residents, while reducing greenhouse gas emissions.*

The OPTP establishes and is organized into the following 10 goal areas:

1. Mobility – Public Transportation User Experience
2. Accessibility and Connectivity – Getting from Here to There
3. Community Livability and Economic Vitality
4. Equity
5. Health
6. Safety and Security
7. Environmental Sustainability
8. Land Use
9. Strategic Investment
10. Communications, Collaboration and Coordination

While the OPTP does not recommend specific projects or investments, new efforts in planning for transit come with the passage of HB 2017 (Keep Oregon Moving Act) and the establishment of a new dedicated source of funding for expanding public transportation service in Oregon.[3] The Statewide Transportation Improvement Fund, or STIF, provides the impetus for coordinating the prioritization of needed infrastructure. STIF funds are continuously appropriated to finance investments and improvements in public transportation services and may be used for public transportation purposes that support the effective planning, deployment, operation, and administration STIF-funded public transportation programs. STIF funds may be also used as the local match for state and federal funds that also provide public transportation service.[4]

> **Project Relevance:** The TSP will consider the needs of the transit system in Independence while developing recommended policies and projects related to improving transit service. In addition, representatives of Cherriots will be asked to review the transit related elements of the TSP and advise on transit needs and improvements.

Oregon State Rail Plan (2014)

The Oregon State Rail Plan is a state modal plan under the OTP that addresses long-term freight and passenger rail planning in Oregon. The plan provides a comprehensive assessment of the state's rail planning, freight rail, and passenger rail systems. It identifies specific policies concerning rail in the state, establishes a system of integration between freight and passenger elements into the land use and transportation planning process, and calls for cooperation between state, regional, and local jurisdictions in planning for rail.

PNWR provides rail service through Independence. The railroad is the largest non-Class 1 railroad in Oregon from a carload traffic perspective and provides no passenger service.

> **Project Relevance:** The TSP will consider the needs of the freight rail system within the City's UGB while developing recommended policies and projects.

Oregon Aviation Plan V6.0

The Oregon Aviation Plan (OAP) is a modal plan of the OTP that defines policies and investment strategies for Oregon's public use aviation system for the next 20 years. The plan addresses the existing conditions, economic benefits, and jurisdictional responsibilities for the existing aviation infrastructure. The plan contains policies and recommended actions to be implemented by Oregon Department of Aviation in coordination with other state and local agencies and the Federal Aviation Administration.

The OAP categorizes airports based on functional role and service criteria. The Independence State Airport is a state-owned airport located in Independence. It is a Category IV - Local General Aviation Airports. Typically, Category IV airports support primarily support local air transportation needs and

---

[3] https://www.oregon.gov/ODOT/Pages/HB2017.aspx

[4] https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=245662

special use aviation activities. Salem McNary Field airport is a Category II airport, and is intended to service a large/multi-state geographic region, or experience high levels of general aviation activity.

> **Project Relevance:** The TSP update will generally account for airports in the region and how Independence's residents and businesses access these facilities in developing TSP policies and projects.

Oregon Bicycle and Pedestrian Plan (2016)

The intent of the Oregon Bicycle and Pedestrian Plan (OBPP) is to create a policy foundation that supports decision-making for walking and biking investments, strategies, and programs that help to develop an interconnected, robust, efficient, and safe transportation system. The OBPP establishes the role of walking and biking as essential modes of travel within the context of the entire transportation system and recognizes the benefit of these modes to the people and places in Oregon.

The OBPP provides direction for what needs to be achieved, including 20 policies and associated strategies designed to help develop, sustain, and improve walking and biking networks. It identifies nine goals based upon the broader goals of the OTP that reflect statewide values and desired accomplishments relating to walking and biking:

- Goal 1: Safety
- Goal 2: Accessibility and Connectivity
- Goal 3: Mobility and Efficiency
- Goal 4: Community and Economic Vitality
- Goal 5: Equity
- Goal 6: Health
- Goal 7: Sustainability
- Goal 8: Strategic Investment
- Goal 9: Coordination, Cooperation, and Collaboration

The OBPP also provides background information related to state and federal law, funding opportunities, and implementation strategies proposed by ODOT to improve bicycle and pedestrian transportation. It outlines the role that local jurisdictions play in the implementation of the Plan, including the development of local pedestrian and bicycle plans as stand-alone documents within TSPs.

The Oregon Bicycle and Pedestrian Design Guide is the technical element of the plan that guides the design and management of bicycle and pedestrian facilities on state-owned facilities. It is an appendix to the HDM and provides best practices and design guidelines for bicycle and pedestrian facilities.

> **Project Relevance:** The policies and design guidance in the OBPP apply to state highway facilities in Independence. State policy and design guidance will be considered in evaluating and planning for the TSP's local street standards and bicycle and pedestrian system elements. Through this TSP update, the City will work with regional and state agencies to help identify gaps in the regional walking and biking network and prioritize projects accordingly.

Oregon Transportation Safety Action Plan (2016)

An element of the OTP, the Oregon Transportation Safety Action Plan (TSAP) provides long-term goals, policies and strategies and near-term actions to eliminate deaths and life-changing injuries. The TSAP addresses all modes on all public roads in Oregon. Over the long term, the goals of the TSAP are:

- Infrastructure – Develop and improve infrastructure to eliminate fatalities and serious injuries for users of all modes.
- Healthy, Livable Communities – Plan, design, and implement safe systems. Support enforcement and emergency medical services to improve the safety and livability of communities, including improved health outcomes.
- Technology – Plan, prepare for, and implement technologies (existing and new) that can affect transportation safety for all users.

The plan identifies actions that jurisdictions can take to increase transportation safety. They include adopting a Safe Communities Program and Safe Routes to School, which is a collaborative partnership with the National Highway Traffic Safety Administration and ODOT to promote safety. The Safe Routes to School program is a local initiative supported by grant funding that targets safety improvements to encourage walking and biking to school.

In addition, the TSAP also identifies activities and roles for local jurisdictions that can improve safety. They include:

- Evaluate local spot-specific systemic safety needs; develop plans and programs to address needs.
- Collaborate with the state and stakeholder partners to educate the public about transportation safety-related behavioral issues.
- Integrate safety programming, planning, and policy into local planning.

Project Relevance: The TSAP will be used as a resource while updating the TSP to develop local goals, policies, and strategies to improve safety in Independence.

State law on Reduction in Vehicle-Carrying Capacity (ORS 366.215)

Oregon law prohibits permanent reductions in vehicle carrying capacity on an identified freight route based on ORS 366.215 — Reduction of Vehicle Carrying Capacity. Exceptions are allowed if safety or access considerations require the reduction. The OTC may grant an exception if it is in the best interest of the state and freight movement is not unreasonably impeded.

There are no reduction review routes (RRR) within the boundaries of Independence, nor are there any OHP identified freight routes within Independence. The nearest RRR to Independence is 99W in Monmouth.

Project Relevance: This law should not have an impact on any roads within Independence.

Access Management Rule (OAR 734-051) (2014)[5]

Oregon Administrative Rule (OAR) 734-051 defines the State's role in managing access to highway facilities to maintain functional use and safety and to preserve public investment. OHP Policy 3A and OAR 734-051 set access spacing standards for driveways and approaches to the state highway system.[6] The most recent amendments presume that existing driveways with access to state highways have written permission from ODOT as required by ORS 734. The standards are based on state highway classification and differ depending on posted speed and average daily traffic volume.

> **Project Relevance:** Analysis for the TSP update and final project recommendations will need to reflect state requirements for state facilities; the updated TSP will comply or move in the direction of meeting access management standards for state facilities. Implementation measures that will be developed for the TSP update may entail amendments to the development code to ensure its requirements are consistent with these access management requirements as well as the draft TSP recommendations related to access management.

Transportation Planning Rule (OAR 660-012) (Last Updated 2012)

The Transportation Planning Rule (TPR), OAR 660-012, implements Goal 12 (Transportation) of the Statewide Planning Goals. The TPR contains numerous requirements governing transportation planning and project development, including the required elements of a TSP. In addition to plan development, the TPR requires each local government to amend its land use regulations (e.g., development code) to implement its TSP (OAR 660-012-0045). It also requires local government to adopt land use or subdivision ordinance regulations consistent with applicable federal and state requirements "to protect transportation facilities, corridors and sites for their identified functions."

Local compliance with TPR Section -0045 provisions is achieved through a variety of measures, including access control requirements, standards to protect future operations of roads, and notice and coordinated review procedures for land use applications. Local development codes should also include a process to apply conditions of approval to development proposals, and regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP.

The TPR does not regulate access management. ODOT adopted OAR 734-051 to address access management and it is expected that ODOT, as part of this project, will coordinate with the City in planning for access management on state roadways consistent with its Access Management Rule. See the review of OAR 734-051 in the previous section.

Amendments to the TPR adopted in 2012 include new language in Section -0060 that allows a local government to exempt a zone change from the "significant effect" determination if the proposed

---

[5] Amendments to OAR 734-051 were adopted in early 2014 based on passage of Senate Bill 1024 (2010, Senate Bill 264 (2011, and Senate Bill 408 (2014). The amendments were intended to allow more consideration for economic development when developing and implementing access management rules and involved changes to how ODOT deals with approach road spacing, highway improvement requirements with development, and traffic impact analyses requirements for approach road permits.

[6] ODOT Access Management Standards – OHP Appendix C Revisions to Address Senate Bill 264 (2011): http://www.oregon.gov/ODOT/TD/TP/docs/ohp_am/apdxc.pdf

zoning is consistent with the comprehensive plan map designation and the TSP. The amendments also allow a local government to amend a functional plan, comprehensive plan, or land use regulation without applying mobility standards (volume-to-capacity (v/c), for example) if the subject area is within a designated multi-modal mixed-use area (MMA).

> **Project Relevance:** The TPR directs local TSP development and requires specific transportation elements be implemented in the local development ordinance. Local requirements such as access management, coordinated land use review procedures, and transportation facility standards and requirements – consistent with TPR Sections -0045 and -0060 – are meant to protect road operations, enhance safety, and provide for multi-modal access and mobility. They will be reviewed and amendments to them will be updated, as needed, to ensure consistency with the TPR.

ODOT Funding Projections (2019)

This summary report presents a selection of State Other Funds Revenue forecasts for the Oregon Department of Transportation. It is published twice a year to assist in financial planning, the formulation of transportation budgets, and to support other decision-making activities. The forecast report summarizes future revenues from sources like registration fees, weight-mile and flat fees, and gas taxes. There are minimal changes compared to previous forecasts; employment growth is expected to be slow but remain above one percent. On a fiscal year basis, total gross revenues show a sharp increase year over year beginning in Fiscal Year (FY) 2018, continuing through FY 2025, with the largest increases coming in FY 2018 and FY 2019. House Bill (HB) 2017 is identified as a change in the revenue outlook and changes the outlook dramatically for projected revenue.

> **Project Relevance:** State funding sources for projects identified in the TSP may be impacted by available revenue. If revenue is expected to increase, new funding may be made available for projects through the state.

Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is the four-year programming and funding document for transportation projects and programs on state and regional transportation systems, including federal land and Indian reservation road systems, interstate, state, and regional highways, bridges, and public transit. It includes state- and federally-funded system improvements that have approved funding and are expected to be undertaken during the upcoming four-year period. The projects and programs undergo a selection process managed by ODOT Regions or ODOT central offices, a process that is held every two years to update the STIP.

The current 2018-2021 STIP includes the following preservation projects in Independence:

- OR 194 – Key # 19962; Upgrade substandard ADA curb ramps at OR 51: 4th Street to B Street
- OR 138 – Key # 20354; Replace existing structure with a new bridge at South Fork Ash Creek Bridge

> **Project Relevance:** The TSP update analysis will take into account projects that are programmed in the STIP. An expected outcome of this planning process is proposed recommendations to amend the STIP to include projects from the updated TSP.

Projects recommended in the updated TSP may be eligible for funding through the ODOT Enhance program, which awards funding through a competitive application process.

ODOT Highway Design Manual (2012)

The 2012 Highway Design Manual (HDM) provides ODOT with uniform standards and procedures for planning studies and project development for the state's roadways. It is intended to provide guidance for the design of new construction; major reconstruction (4R); resurfacing, restoration, and rehabilitation (3R); or resurfacing (1R) projects. It has not been updated since the release of AASHTO's current Policy on Geometric Design of Highways and Streets (2018). Therefore, sound engineering judgment will continue to be a vital part in the process of applying the design criteria to individual projects. The flexibility contained in the 2012 HDM supports the use of Practical Design concepts and Context Sensitive Design practices.

The HDM is used for all projects that are located on state highways. National Highway System or Federal-aid projects on roadways that are under local jurisdiction will typically use the 2011 AASHTO design standards or ODOT 3R design standards. Table 3 shows which design standards are applicable for certain projects based on project type, and if the project involves a state route. State and local planners also use the manual to determine design requirements as they relate to the state highways in TSPs, Corridor Plans, and Refinement Plans. Some projects under ODOT roadway jurisdiction traverse across local agency boundaries; for such facilities, local agencies may have adopted design standards and guidelines that differ from ODOT design standards. Although the appropriate ODOT design standards are to be applied on ODOT roadway jurisdiction facilities, local agency publications and design practices can also provide additional guidance, concepts, and strategies related to roadway design.

Table 3: Design Standards Selections Matrix, ODOT HDM

Project Type	**Roadway Jurisdiction, Classification and Standards**				
	State Highways			**Local Agency Roads**	
	Interstate	**Urban State Highway**	**Rural State Highways**		
Modernization/ Bridge New/Replacement	ODOT 4R/New Freeway	ODOT 4R/New Urban	ODOT 4R/New Rural	Urban	Rural
Preservation/ Bridge Rehabilitation	ODOT 3R Freeway	ODOT 3R Urban	ODOT 3R Rural	AASHTO	ODOT 3R Rural
Preventive Maintenance	1R	1R	1R	NA	NA
Safety- Operations-Miscellaneous/ Special Programs	ODOT Freeway	ODOT Urban	ODOT Rural	AASHTO	ODOT 3R Rural

Source: HDM Table 1-1

The HDM includes mobility standards related to project development and design that are applicable to all modernization projects, except for development review projects (see Table 4). The v/c ratios in the HDM are different than those shown in the Oregon Highway Plan (OHP). The v/c ratio values in the OHP are used to assist in the planning phase to identify future system deficiencies; the HDM v/c ratio values provide a mobility solution that corrects those previously identified deficiencies and provides the best investment for the State over a 20-year design life.

Table 4: 20-Year Design Mobility Standards (Volume/Capacity [V/C]) Ratio

Highway Category	Land Use Type/Speed Limits			
	Inside Urban Growth Boundary			
	STAs	MPO	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit >=45 mph
Statewide (NHS) Non-Freight Routes and Regional or District Expressways	0.90	0.80	0.75	0.70
Regional Highways	0.95	0.85	0.75	0.75
District/Local Interest Roads	0.95	0.85	0.80	0.75

Source: HDM Table 10-2

Urban Design Blueprint

The Blueprint for Urban Design is a “bridging document” that establishes revised criteria to be used when designing urban projects on the state system. The document provides guidance for urban design on Oregon state highways until such tie that all ODOT manuals related to urban are updated to include the revised design criteria.

> **Project Relevance:** The ODOT HDM and Urban Design Blueprint provide design standards on state roadways; Statewide and MPO standards are not directly relevant to the Independence area although can be considered for additional guidance, concepts, and strategies for future design of roadways there.

Oregon Roadway Departure Safety Implementation Plan (2017)

The Roadway Departure Plan provides specific information and identifies areas regarding roadway departure safety improvements to implement the current TSAP.

The traditional approach of relying primarily on pursuing major improvements at high-crash roadway departure locations must be complemented with two additional approaches:

- Systemic application of low-cost counter measures at targeted location with a history of locations that have a moderate or high number of roadway departure crashes. This approach is based on the Federal Highway Administration’s Strategic Approach to Roadway Departure Safety.
- Comprehensive application of education and enforcement initiatives targeted at corridors that exhibit a roadway departure crash history associated with unsafe driving characteristics (e.g., alcohol and drugs, and speed).

The systematic improvement categories to be deployed include the following: sign and marking enhancements on curves, centerline rumble strips on rural two-lane highways, edge line rumble stripes and shoulder rumble strips, alignment delineation, and selective rural tree removal.

The systematic and comprehensive approaches will generate a higher number of roadway departure improvements statewide, and Region personnel will require training as they are asked to take a more active role in identifying the appropriateness of systematic improvements within their Regions.

Low-cost, cost-effective countermeasures should be considered on other types of projects, as appropriate (e.g., resurfacing, surface transportation projects), when a crash history exists within the area of the work and the countermeasure can reduce future crash potential. In these cases, safety-specific funding can be used to supplement the project funds when necessary.

> **Project Relevance:** Safety measures and countermeasures for specific types of roadway departure crashes within Independence should refer to the Implementation Plan for recommendations based on the type of facility and type of crashes which occur in that facility.

Oregon Intersection Safety Implementation Plan (2012)

The Intersection Safety Plan provides specific information and identifies areas regarding intersection safety improvements to implement the current Action Plan. It directs that the traditional approach of relying primarily on pursuing major improvements at high-crash intersections be complemented with an expanded systematic approach. This approach should involve deploying large numbers of relatively low-cost, cost-effective countermeasures at many targeted high-crash intersections and coordinating engineering, education, and enforcement (3E) initiatives on corridors with high numbers of severe intersection crashes.

> **Project Relevance:** The TSP update process will apply objective methods to screen, diagnose, and suggest countermeasures to reduce crash potential. The TSP will consider safety in the selection and prioritization of transportation projects to meet the City's future system needs for all modes of transportation.

Oregon Bicycle and Pedestrian Safety Implementation Plan (2014)

The Bicycle and Pedestrian Safety Implementation Plan provides a systemic safety planning process to prioritize corridors across all public roads in Oregon. The Plan also identifies corridors with the most potential for reducing frequency and severity of pedestrian and bicycle crashes.

The plan identifies several corridors as priority segments from a crash frequency and severity screening process. Corridor segments are listed in Tables 18 through 20 and illustrated in Figure 7 and 8 of the Plan.

> **Project Relevance:** The TSP update process will apply objective methods to screen, diagnose, and suggest countermeasures to reduce crash potential. The TSP will consider safety in the selection and prioritization of transportation projects to meet the City's future system needs for all modes of transportation.

Oregon Standard Specifications for Construction, Oregon Standard Drawing, and Oregon Standard Details (2018)

The standard specifications for construction, drawing, and details are the requirements for any engineering projects. Standard drawings and details are templates that have been approved and stamped by ODOT for public works projects.

Standard drawings are stamped by an ODOT Engineer of Record and are backed by engineering analysis, calculations, and/or justification to support them. Standard drawings are available for use on public works projects, but cannot be modified by designers on a project-by-project basis. Standard drawings are compliant with Oregon Standard Specifications.

Standard details are tools used to quickly add detail to a specific project. Generally, these fit into one of three scenarios:

- A template that needs project-specific data added.
- A new design style that is being tried.
- The item is not used often, such that updates may need to be added.

Standard details may require modification by the project professional of record. Standard details are the responsibility of the project professional and as such incorporated into the project plans.

> **Project Relevance:** If the TSP update includes specific public works projects, those projects may need to follow the standards within these files.

Oregon Resilience Plan (2013)

The Oregon Resilience Plan provides policy guidance and recommendations to protect lives and keep commerce flowing during and after a Cascadia earthquake and tsunami. The seismic integrity of Oregon's multi-modal transportation was assessed, including bridges and highways, rail, airports, water ports, and public transit systems. For transportation facilities, the study recommends prioritization of seismic lifeline routes according to tiers with associated resilience targets. The report also identifies seismic vulnerabilities of critical facilities and resources and recommends options to improve transportation facility resiliency.

No facilities in Independence are considered Tier 1 or 2 routes for the backbone system, which have requirements for minimum level for service to be restored within restored within 1-3 days, a functional level of service within 3-7 days, and restore the facility to 90% capacity within 1-4 weeks. OR 22, which connects to Hwy 15, is a Tier 3; applicable resilience targets are shown Table 5. Local road and street systems are also essential. It recommends they are retrofitted for the following reasons:

- In a few locations, critical emergency service facilities are separated from the state lifeline system by a substandard bridge. These bridges need to be retrofitted at the same time as the nearby state highway.
- Local road and street detours should be retrofitted wherever either of the following conditions exist:
  - The local road detour can be retrofitted for much less money than a retrofit on the section of state highway or bridge.

- The local road detour can provide a substantially reduced time to restore the lifeline corridor to the minimal level of service for the use of emergency responders, repair crews, and vehicles transporting food and other critical supplies.

Table 5 - Oregon Transportation Resiliency Status

Infrastructure Facilities	Event Occurs	0-24 Hours	1-3 Days	3-7 Days	1-4 Weeks	1-3 Months	3-6 Months	6-12 Months	1-3 Years	3+ Years
Oregon State Highway System										
State Highway Systems – Tier 1 SLR (I-5)			R	Y	G			S	X	
Roadways			R	Y	G		X			
Bridges			R	Y	G		S	X		
Landslides			R	Y	G			S	X	
State Highway Systems – Tier 3 SLR (OR-22)				R		Y	G		S	X
Roadways				R		Y	G	S	X	
Bridges				R		Y	G		S	X
Landslides				R		Y	G		S	X
State Highway Systems – Other Routes					R		Y	G	S	X
Roadways					R		Y	G	X	
Bridges					R		Y	G	S	X
Landslides					R		Y	G	S	X
Airports & Air Transportation										
Airports & Air Transportation (FAA Facility)			R	Y	G					
Oregon Public Transit										
Admin & Maintenance Facilities						R	Y	G	S	X
Local Area Paratransit On-Demand Service (critical)				R	Y	S	G	X		
Local Area Paratransit On-Demand Service (full)						R	Y	G	S	X
Local Roadway Fixed Route Service (emergency)				R	Y	S	G	X		
Local Roadway Fixed Route Service (regular)						R	Y	G	S	X
Intercity & Commuter Bus						R	Y	G	S	X
Minimal: (A minimum level of service is restored, primarily for the use of emergency responders, repair crews, and vehicles transporting food and other critical supplies.)										R
Functional: (Although service is not yet restored to full capacity, it is sufficient to get the economy moving again— e.g. some truck/freight traffic can be accommodated. There may be fewer lanes in use, some weight restrictions, and lower speed limits.)										Y
Operational: (Restoration is up to 90% of capacity: A full level of service has been restored and is sufficient to allow people to commute to school and to work.)										G
ESTIMATED TIME FOR RECOVERY TO 60% OPERATIONAL GIVEN CURRENT CONDITIONS:										S
ESTIMATED TIME FOR RECOVERY TO 90% OPERATIONAL GIVEN CURRENT CONDITIONS:										X

Source: Oregon Resilience Plan, Table 5

Project Relevance: The Oregon Resilience Plan provides guidance on and priorities for Oregon's multi-modal transportation system. Policies and standards adopted by Independence should be considered for additional guidance, concepts, and strategies for design. The resiliency of River Rd. Bridge, along a primary route to Salem, also should be considered.

The Greenhouse Gas Emissions Reduction Toolkit

The Greenhouse Gas, or GHG, Emissions Reduction Toolkit is a collection of strategy reports and case studies designed to help local jurisdictions identify and explore the kinds of actions and programs they can undertake to reduce vehicle emissions. Additionally, strategies are designed to meet other community goals, such as spur economic development, increase biking and walking, support downtowns, create healthy livable communities and more.

The Strategy Reports relevant to transportation in Independence are:

- Bicycle and Pedestrian Connectivity
- Bicycle and Pedestrian Marketing Campaigns
- Bicycle and Pedestrian Safety
- Bicycle Facilities
- Car Sharing
- Complete Streets
- Increased Connectivity and Shorter Block Lengths
- Parking Management
- Parking Pricing
- Pedestrian Crossings
- Pedestrian Environment
- Transit Services and Facilities
- Transportation Demand Management
- Transportation System Development Charges
- Vehicle Access Management to Public Roads
- Yield Signs and Roundabouts

Project Relevance: The TSP will consider strategies identified in the STS and the Greenhouse Gas Emissions Reduction Toolkit and will reflect Indepenedence's commitment to reducing GHG emissions in the development of plan recommendations.

LOCAL PLANS

City of Independence Comprehensive Plan (Various)

The City of Independence Comprehensive Plan is a long-range guide for land use in the Independence urban growth boundary (UGB) consistent with Statewide Planning Goals. Its goals and policies work in concert with goals and objectives in the City's 2007 TSP to provide direction on transportation system and land use decision-making in the city.

Transportation policies in the adopted Comprehensive Plan are established in the *Transportation* element of the plan and are included below.

> *TRANSPORTATION*
>
> *GOAL: To provide and encourage a safe, convenient and economic transportation system.*
>
> *1. Independence shall develop a coordinated street network which facilitates the mobility and accessibility of community residents.*
>
> *2. Independence shall consider access to public transit in making deliberations on residential development patterns.*
>
> *3. Independence shall promote the development and maintenance of alternative transportation modes, such as bikeways, pedestrian ways, and public transit.*
>
> *4. Independence shall encourage transportation modes which are energy efficient and enhance the air, noise, and visual environment of the community.*
>
> *5. Independence shall promote a regional mass transportation system in its planning efforts.*
>
> *6. Independence shall promote and give high priority to pedestrian ways m the downtown area.*
>
> *7. Independence shall encourage additional use and development of air and rail facilities in the city.*
>
> *8. Independence shall cooperate with the State of Oregon Aeronautics Division in the implementation of the goals of the Independence State Airport Master Plan, 1985-2005.*
>
> *9. Independence will cooperate with the Oregon Department of Transportation in the implementation of the ODOT Six-Year Highway Improvement Program.*

The Comprehensive Plan also includes transportation background chapter that includes street standards. The street standards are designed to serve their anticipated function. See Figures 1 through 3 below.

Figure 1: Independence Comprehensive Plan Street Standards

Street Standards

Section	Type of Street	Right-of-Way Width	Paving Width
A	Arterial	88'	44'
B	Collector Streets	66'	36'
C	Commercial and Industrial other than arterials	80'	44'
D	Local Residential Streets serving more than 20 dwelling units. .	60'	36'
E	Local Streets and cul-de-sacs serving 20 or less dwelling units	50'	28'
F	Circular ends of cul-de-sacs	112' diameter	90'

Figure 2: Independence Comprehensive Plan Street Cross Sections

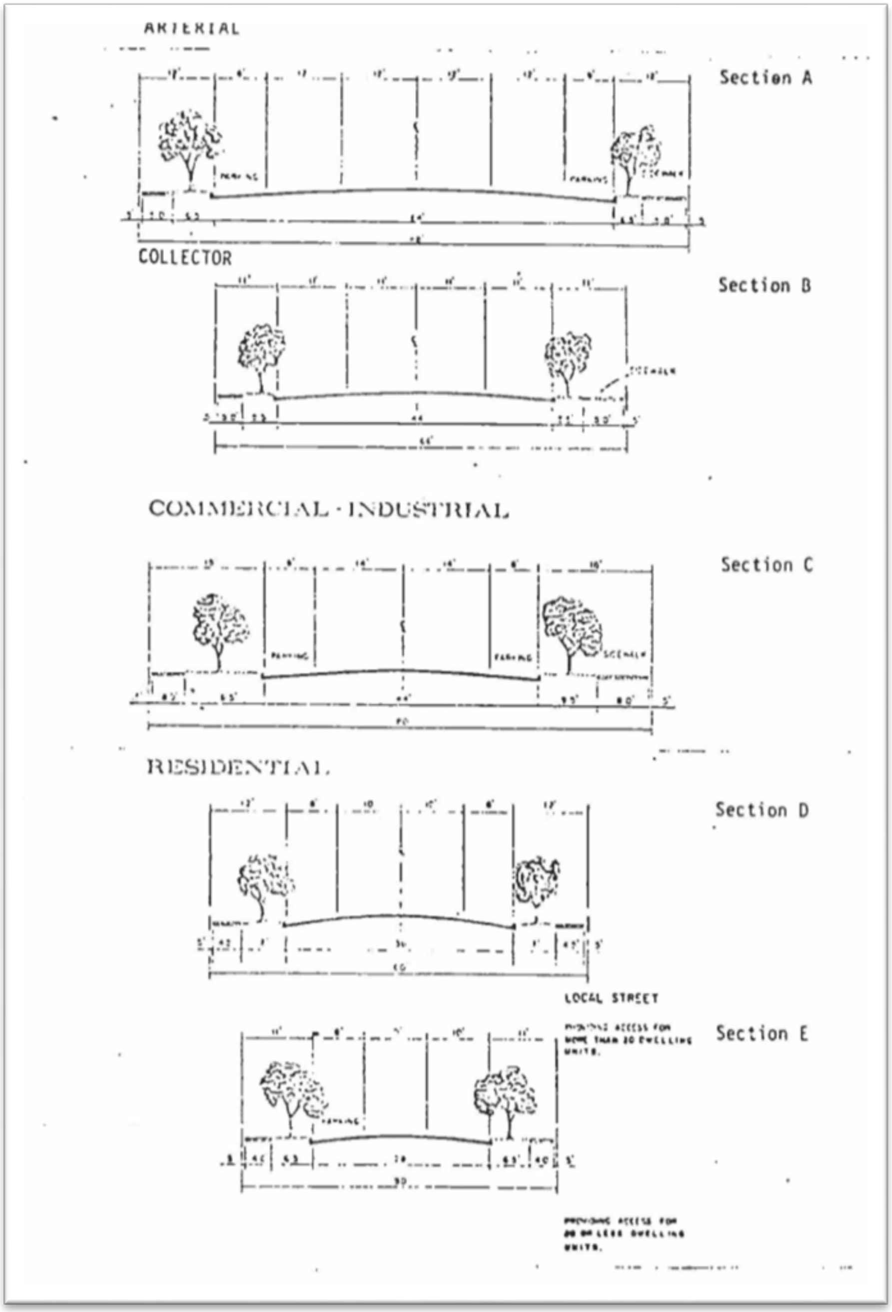
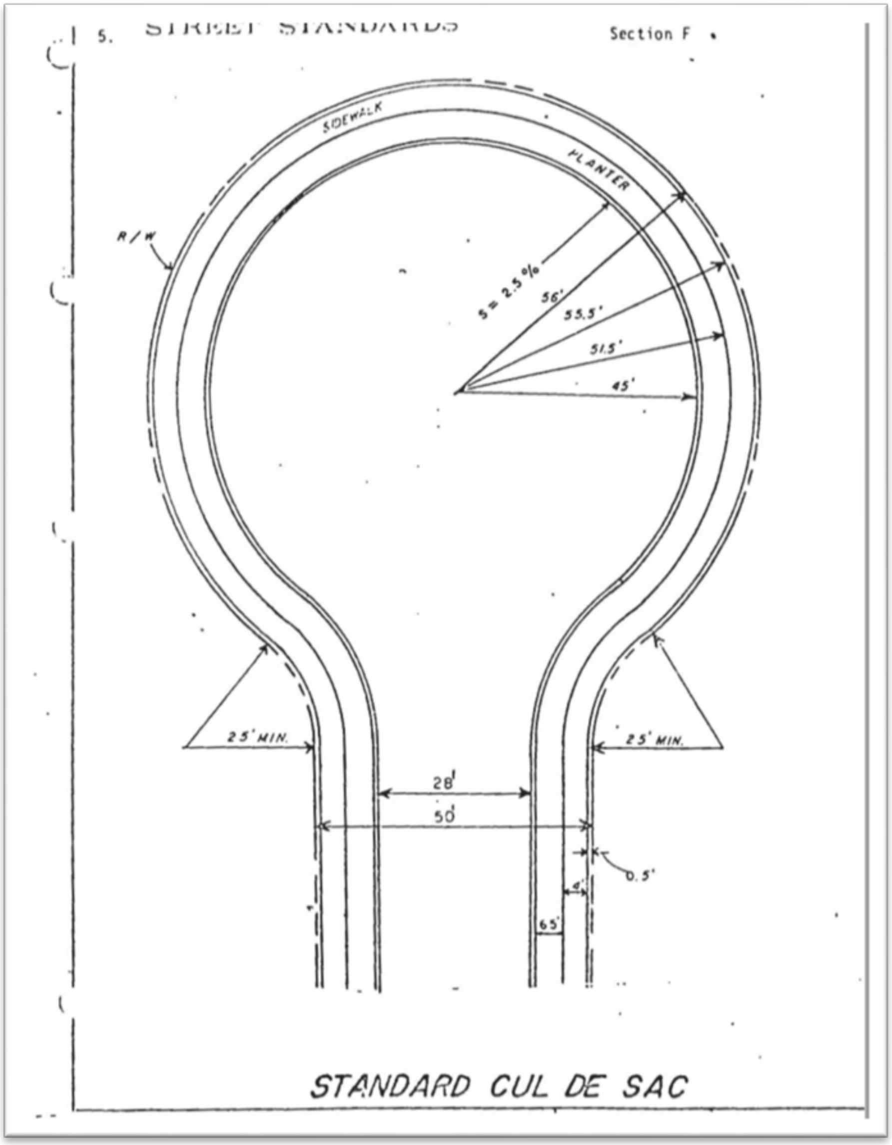


Figure 3: Independence Comprehensive Plan Cul-de-sac Street Cross Section



Project Relevance: The TSP update process will evaluate existing transportation goals and policies and street design standards as to whether they are still applicable and reflect community needs. In addition to updated goals and policies, implementation of the TSP may prompt other policy-level changes in areas related to transportation, including economic development and land use. The street design standards in the Comprehensive Plan will need to be amended to be consistent with the updated TSP.

City of Independence Transportation System Plan (2007)

The Independence Transportation System Plan (TSP) establishes the City's goals, policies, and action strategies for developing and improving the transportation system within the City's UGB. The TSP includes the following elements:

- Transportation Goals, Objectives, and Policies
- Roadway Element
- Public Transit Element
- Bikeway System Element
- Pedestrian System Element
- Air, Truck Freight, Rail, Water, and Pipeline Transportation Elements
- Transportation System Demand and Management Element

In addition, the TSP features a section on implementation, which includes implementing ordinances, financing, and a capital improvement program.

The TSP includes the following goal and objectives. The objectives are similar to policies contained in the Comprehensive Plan.

> *Goal: To provide a balanced, multi-modal, safe, convenient, and efficient transportation system for Independence.*
>
> *Objectives:*

1. *Independence shall develop a coordinated transportation system which facilitates the mobility and accessibility of community residents, and encourages alternatives to and reduced reliance upon the automobile.*
2. *Independence will protect the character of the Historic District from adverse impacts related to changes in the transportation system.*
3. *Independence shall consider access to public transit in making deliberations on residential development patterns.*
4. *Independence shall promote the development and maintenance of all transportation modes including bikeways, pedestrian ways, and public transportation to all planned land uses.*
5. *Independence shall encourage transportation modes which are energy efficient and enhance the air, noise, and visual environment of the community.*
6. *Independence shall cooperate with and support regional public transportation planning efforts.*
7. *Independence shall promote and give high priority to bike and pedestrian ways in the downtown area, and in the vicinity of schools and parks.*
8. *Independence shall protect the function of air and rail facilities in the City and develop and implement strategies that minimize conflicts with other transportation modes and adjacent land uses.*
9. *Independence shall cooperate with the Oregon Department of Aviation in the development and implementation of the goals of the Independence State Airport Layout Plan, 1998-2015.*

10. *Independence will coordinate with the Oregon Department of Transportation and Polk County in the planning and provision of transportation services and in the implementation of the ODOT State Transportation Improvement Program.*
11. *Independence will coordinate with affected transportation facility or service providers whenever a proposal for a plan or regulation amendment or development action would significantly affect a transportation facility.*
12. *Independence shall utilize the Transportation System Plan for guidance in all land use planning and project development activities.*
13. *Independence shall use tools such as performance standards to protect transportation facilities, corridors, and sites for their intended functions as identified in this plan.*
14. *Independence shall develop land use regulations and subdivision ordinances that allow needed transportation facilities and improvements and encourage development patterns that are friendly to pedestrians, bicyclists and public transportation users.*

In addition, the TSP includes policies embedded in other elements of the TSP. They are:

Transportation Element

- *The City shall coordinate with governmental and private agencies in the planning and provision of public transportation services and shall ensure that a given level of service is adequate for the costs incurred.*
- *The City will coordinate with willing private property owners to establish park-and-ride facilities for public transit and carpool users.*

Bikeway System Element. The following three goals are taken from the Master Bicycle Plan. The TSP incorporates these goals, and the thirteen objectives associated with the goals, by reference.

- *Goal. To provide and maintain safe, convenient, and pleasing citywide bicycle system that is integrated with other transportation systems.*
- *Goal. To encourage and support bicycle safety, education, and enforcement programs.*
- *Goal. To develop a comprehensive system of through routes, a perimeter beltline loop, secondary connecting routes, and recreational routes.*

Pedestrian System Element

- *Low curb crosswalks shall be built as part of all intersection projects, consistent with ADA guidelines, to facilitate use by the transportation disadvantaged, the elderly, and people with disabilities.*
- *The City shall remove physical obstruction of sidewalks, such as utility poles, sigh posts or guy wires, to ensure 4' of passable sidewalk (consistent with ADA guidelines).*

- *Visibility and unobstructed views shall be promoted for all areas of high pedestrian use.*
- *Bicycle traffic on sidewalks shall be prohibited.*

Air Transportation Element

- *The City shall protect and maintain the Independence Airport site and coordinate with Polk County and the Oregon Department of Aviation in protection and maintenance efforts.*
- *The City, in cooperation with Polk County, shall maintain an airport overlay zoning which coincides with the future approach surfaces and FAR Part 77 surfaces. Airport overlay zoning should conform with Oregon Department of Aviation guidelines.*
- *City supports designating Runway 34 as the calm wind runway in order to minimize noise exposure on nearby residential areas south of the airport. The City also supports a review of airport operating procedures to ensure that appropriate noise abatement procedures and standard traffic pattern elevations and locations are being utilized at the airport.*

Rail Transportation

- *Improve safety by continuing to work with the W&P Railroad and the Rail Division of ODOT to identify crossing closures and safety improvements to existing crossings.*
- *Improve the trackage on 2nd Street to decrease pedestrian tripping and bicycling hazards, and vehicular and rail conflicts, between "B" and "E" Streets. Since its inception in 1993, W&P has encouraged Independence to consider a median strip on 2nd Street to separate train and vehicular traffic such as was done on 6th Street in Corvallis. The City will keep all design solutions to the existing railroad subgrade failure along 2nd Street open for discussion.*
- *Work with the railroad to identify, and evaluate the financial feasibility of, alternatives that would improve public safety, reduce roadway wear and tear, and reduce conflicts. For instance, a track alignment that ran down the eastern edge of the City adjacent to the Willamette River would reduce the number of at-grade crossings and improve access and emergency response capabilities. A small roadway underpass located on the south end of the City might also permit passage of emergency response vehicles.*
- *Reduce environmental degradation (noise impacts) and conflicts by requiring residential development adjacent to the railroad to use sound mitigation structures or planting buffers.*
- *Promote safe and efficient operation of the railroad and road system by allowing no new at-grade crossings by local roads and minimize the number of arterial and collector street at-grade crossings.*
- *Identify and evaluate the economic feasibility of various alternatives to provide for emergency access and response capabilities to the entire City. Some alternatives*

include building an overpass at an existing at-grade crossing or an unbuilt collector or arterial crossing, constructing an underpass near the existing trestle near Ash Street, or providing a satellite emergency response capability for the east side of Independence.

Section 3.2 (Roadway Element) in the TSP includes roadway system improvement recommendations for the following topics. Some of the recommendations in the Section are implemented through the development code.

- Street Standards
- Access Management
- Traffic Impact Analysis
- New Roadway Recommendations
- Roadway Capacity Improvements
- Roadway Safety Improvements
- Other Roadway System Policy Recommendations

The street standards recommendations provide street design standards based on street functional classification. Figure 4 summarizes the street design standards provided in the TSP. The TSP indicates the street design standards are implemented through the City's development code.

Figure 4: Independence Street Design Standards

Table 3-1. Independence Street Design Standards

	Major Arterial Streets	Minor Arterial Streets	Collector Streets	Local Streets(1)
Right-of-way width	84 feet(2)	66 feet(2)	66 feet(2)	52 feet
Curb-to-curb width	60 feet	36 feet	36 feet	28 feet
Moving Lanes	2-4	2	2	2
Turn Lanes	(3)	(3)	(3)	0
Bike Lanes	2 @ 6'	2 @ 6'	(4)	Shared
Parking Lanes	(5)	(5)	(4)	2 sides
Sidewalks	2 @ 6'	2 @ 6'	2 @ 6'	2 @ 6'
Planting Strips(6)	2 @ 6'	2 @ 6'	2 @ 5'	Allowed

(1) The City may require up to 36 foot wide (60 foot right-of-way) Local Service streets in or along high density residential, industrial or commercially zoned areas, or those expected to exceed 400 ADT.

(2) Additional right-of-way and roadway improvements may be required at major intersections to provide for turn lanes.

(3) At all intersections where separate lanes are needed due to volume of turning movement activity.

(4) Collectors with < 2,000 ADT can accommodate on-street parking and shared use of road space by bicyclists and motor vehicles. These shared roadways will be designated with "sharrows." "Sharrows" are markings painted directly onto the road to promote the awareness that the road is a shared traffic lane to be used by both motorists and bicyclists. For collectors with > 2,000 ADT the city will study the need to eliminate on-street parking and provide bike lanes.

(5) The City of Independence may allow parking along sections of Major and Minor Arterial Streets, balancing the needs for accessibility to property, public safety, bicycle facilities, and roadway congestion. Parking allowances will be evaluated on an on-going basis as a part of roadway projects.

(6) Planting strips are encouraged, but not required, along Local Service streets. If built along Local Service streets, planting strips should be at least 4 feet wide, to accommodate tree plantings. In commercially zoned areas, the City may require wider sidewalks which encroach into the planting strip area.

The access management recommendations provide guidance for updating the access management standards applicable to District Highways. The TSP's recommendation is to be consistent with state standards and is summarized in Figure 5 below.

Figure 5: Access Management Spacing Standards

Table 3-2. Access Management Spacing Standards for Private and Public Approaches on District Highways[(1)(2)(3)(4)] (Measured in Feet)*

Posted Speed [(5)]	Urban**	STA
55	700	
50	550	
40 & 45	500	
30 & 35	350	(6)
≤25	350	(6)

* Measurement of the approach road spacing is from center to center on the same side of the roadway.

**These standards also apply to Commercial Centers.

Notes on Tables 3-2:

(1) These access management spacing standards are for unsignalized approaches only. Signal spacing standards supersede access management spacing standards for approaches.

(2) These access management spacing standards do not apply to approaches in existence prior to April 1, 2000, except as provided in OAR 734-051-0115(1)(c) and 734-051-0125(1)(c).

(3) For infill and redevelopment, see OAR 734-051-0135(4).

(4) For deviations to the designated access management spacing standards see OAR 734-051-0135.

(5) Posted (or Desirable) Speed: Posted speed can only be adjusted (up or down) after a speed study is conducted and that study determines the correct posted speed to be different than the current posted speed. In cases where actual speeds are suspected to be much higher than posted speeds, the Department reserves the right to adjust the access management spacing accordingly. A determination can be made to go to longer access management spacing standards as appropriate for a higher speed. A speed study will need to be conducted to determine the correct speed.

(6) Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mid-block if the current city block spacing is less than 350 feet (110 meters).

The performance standards in the TSP were previously updated to be consistent with standards found in the 1999 OHP. The peak hour, maximum V/C standards applied to various portions of OR 51 are summarized in Figure 6.

Similarly, the TSP establishes a V/C standard of 0.95 for all city-owned intersections bounded by B Street to E Street and 2nd Street to Main Street. Other streets are subject to a V/C standards of 0.80.

Figure 6: Mobility Standards

Table 3-3. Oregon 51 (Hwys 193 & 43) Peak Hour, Maximum V/C Standards

District Highway, Inside UGB, Non-MPO Designations	Maximum V/C Ratio
STA	0.95
Posted speed <=35 mph or UBA	0.90
Posted speed >35 mph	0.85
Posted speed >=45 mph	0.80

Source: Oregon Highway Plan, Policy 1F Mobility Standards, Table 6.

The TSP recommends establishing thresholds for when the City can require a Traffic Impact Analysis. The recommended language is summarized below. The TSP indicates the street design standards are implemented through the City's development code.

> *"Traffic Impact Analysis. The City Manager or designee may require a traffic impact analysis report, prepared by an Oregon professional traffic engineer or an Oregon registered Professional Engineer with expertise in traffic engineering, for any development permit or land use application. A traffic impact analysis report shall be required for all development permits and land use applications which:*
>
> *1. Generate a net increase of 200 or more vehicle trips per day; or*
>
> *2. Are likely to increase the V/C ratio or decrease the safety of a State transportation facility.*
>
> *Traffic Impact Analysis Reports shall include:*
>
> *1. The total estimated vehicular, pedestrian, bicycle and other transit service trips to be generated from the proposed development;*
>
> *2. The impact of the total estimated vehicular, pedestrian, bicycle and other transit service trips on the existing street, sidewalk, bicycle and other transit systems within the City; and*
>
> *3. Identification of improvement(s) necessary to mitigate the total impact from the proposed development as identified in item 2."*

The TSP recommends several improvements to the roadway network. A summary of the projects is provided in Tables 3-4 and 3-5. There are two new roadway improvements identified in the TSP. The first would be a new minor arterial running parallel to, and to the south of, OR 51 (Monmouth Street). The second is a new directional circulator that will divert southbound to westbound OR 51 traffic away from the Main and Monmouth Street intersection.

Bicycle and pedestrian projects are listed individually under the respective TSP elements; they are not individually listed in Table 3-4.

Table 4-1 in the TSP provides a summary of the TSP financial needs and revenues. See Figure 7 below for a summary of this information.

Figure 7: Summary of Independence TSP System Needs and Revenues

Table 4-1. Summary of the City of Independence Transportation System Needs and Revenues*

	Years 1-5 2006-2011	Years 6-10 2011-2016	Years 11-15 2016-2021	Years 16-20 2021-2026	Total 2006-2026
Revenue Estimates (Ex. Sources)					
Gas Tax	$2,200,121	$2,661,944	$2,939,001	$3,244,895	$11,045,961
Transportation SDCs	$1,256,920	$1,256,920	$1,256,920	$1,256,920	$5,027,680
Interest	$25,000	$25,000	$25,000	$25,000	$100,000
Cash carried forward from prior year	$101,365	$0	$0	$0	$101,365
Total	**$3,583,406**	**$3,943,864**	**$4,220,921**	**$4,526,815**	**$16,275,006**
Cost Estimates					
Maintenance & Operations	$2,608,294	$3,105,807	$3,415,934	$3,771,467	$12,901,502
Cash Reserves (year end)	$0	$0	$0	$0	$0
Debt Service	$1,157,915	$0	$0	$0	$1,157,915
Capital Outlay	$3,535,800	$3,535,800	$4,109,624	$4,109,624	$15,290,848
Total	**$7,302,009**	**$6,641,607**	**$7,525,558**	**$7,881,091**	**$29,350,265**
Shortfall	**($3,718,603)**	**($2,697,743)**	**($3,304,637)**	**($3,354,276)**	**($13,075,259)**

*Revenue estimates and all cost estimates other than Capital Outlay's provided by City of Independence staff

Project Relevance: The TSP update process will review the goals, objectives, standards, and recommended projects from the 2007 TSP to determine what needs to be retained or changed in the updated TSP. This planning process will update recommended transportation improvement projects for all modes, based on existing and projected needs. Updated data, stakeholder and community involvement, and evaluation criteria will be used in making these recommendations.

Independence Development Code (2019)

The City of Independence Development Code (Development Code or Code) implements the long-range land use vision embodied in the Independence Comprehensive Plan, regulates uses within the city, and establishes standards for development and land divisions. Key existing development standards are summarized below.

Traffic, Parking, and Circulation Considerations

The site design review criteria and standards in Chapter 80 of the Development Code provide general requirements related to vehicular, bicycle, and pedestrian connectivity. In addition, the provisions allow the City to require right-of-way dedication and improvements for development anticipated to cause V/C standards to be exceeded. The V/C standards specified in the code range from 0.80 to 0.95 depending on the location and highway category.

Additional pedestrian standards for the Mixed-Use Pedestrian Friendly Zone (MUPC) and Downtown Riverfront zone require connections for parking lots with greater than 10 spaces.

Access Management and Connectivity

Access standards are established as part of the development standards for most zones and vary depending on the type of zone. Generally, access standards seek to utilize existing access points where possible and to minimize conflicts or congestion when new access is proposed.

Vehicle and Bicycle Parking

Automobile parking provisions are provided in Subchapter 73 of the Development Code. The provisions provide the minimum and maximum required number of automobile parking spaces required for specified uses. Parking space requirements for uses not listed require Planning Commission review and approval. The provisions provide a limited amount of reduction to requirements for development that provides transit-oriented parking uses (i.e. carpool parking, public transit stations, etc.). There are no minimum off-street parking requirements in the Downtown Overlay zone. Additional off-street parking is provided in the development standards of the Downtown Riverfront zone.

Bicycle parking provisions are also provided in Subchapter 73. The provisions provide minimum bicycle parking requirements for public or industrial uses, uses within the MUPC, and multi-family residential uses with four or more dwellings. Bicycle parking areas are required to be sheltered. Additional bicycle parking design standards are in the development standards section of the MUPC and Downtown Riverfront zones.

Traffic Impact Analyses and Performance Standards

Traffic impact analysis requirements are addressed in site design review requirements under chapter 80. The provisions require an analysis, prepared by a professional engineer, for all development permits and land use applications that generate a net increase of 200 or more vehicle trips per day or are likely to increase the V/C ration, or decrease safety of a State transportation facility.

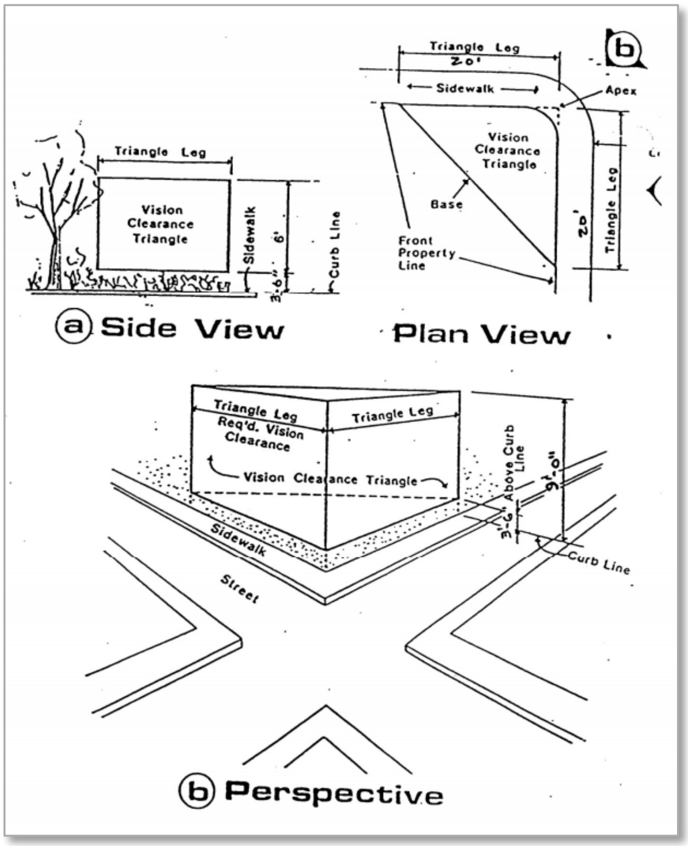
Sidewalk Construction Standards

Sidewalk construction standards and specifications are provided in Subchapter 57 of the Development Code. The subchapter provides construction specifications for sidewalks, driveways, and typical cross-sections. Note, cross-sections do not specify design standards for other street-related elements (i.e. ROW width, lane width, bicycle lane width, etc.).

Visions Clearance

Vision clearance provisions are provided in Subchapter 75 of the Development Code. They are shown in Figure 8 below.

Figure 8: Vision Clearance Requirements.



Project Relevance: Amendments to the Development Code will be considered as part of implementation of the updated TSP. Proposed amendments will address consistency with the TPR and will implement recommendations in the updated TSP. Consistency will need to be ensured between requirements in the Development Code and updated TSP, particularly for transportation facility design standards that may be found in both documents. In generally, we typically recommend that standards be included only in one document (generally the Development Code) to avoid future confusion or the need to update multiple documents if standards are refined.

City of Independence Action Plan

The Independence 2020 Action Plan is the result of a community-wide visioning process. The plan is shaped by the values and ideas of the community. The plan identifies specific strategies and actions to ensure its implementation. The actions are organized by seven goals. They include:

- Enhance Independence's historic character

- Develop a vibrant downtown
- Create an accessible community
- Focus on youth
- Improve and promote community assets
- Sustainability at work
- Promote economic vitality

Transportation-related strategies and actions found in the Action Plan include:

Goal: Develop a Vibrant Downtown

Strategy: Create a Downtown Experience.

Action 5: Expand Main Street streetscape improvements up side streets (B, C, D, and E Streets)

Strategy: Implement and Manage a Parking Strategy for Downtown.

Action 1: Review current parking strategy and create a Parking and Pedestrian Circulation Plan for downtown that identifies vacant lots that are potential sites for public parking

Action 2: Use new ballfield off Grand Street for event parking and build a bridge and path to Amphitheater

Goal: Create an Accessible Community

Strategy 1: Provide/Champion More Transportation Options

Action 1: Promote and provide opportunities for walkability and bikability (emphasize accessibility)

Action 2: Create a Monmouth Street "Community Corridor"

Action 3: Work to create more north-south and east-west collectors

Action 4: Increase frequency of bus service between Monmouth and Independence (look at developing a rubber-tired trolley system)

Strategy: Improve ADA Accessibility

Action 2: Continue current sidewalk repair program

Action 4: Use 2007 sidewalk inventory to develop a citywide sidewalk repair program. Use Central Plaza as an example.

Goal: Improve and Promote Community Assets

Strategy 1: Reconstruct Along Railroad Track

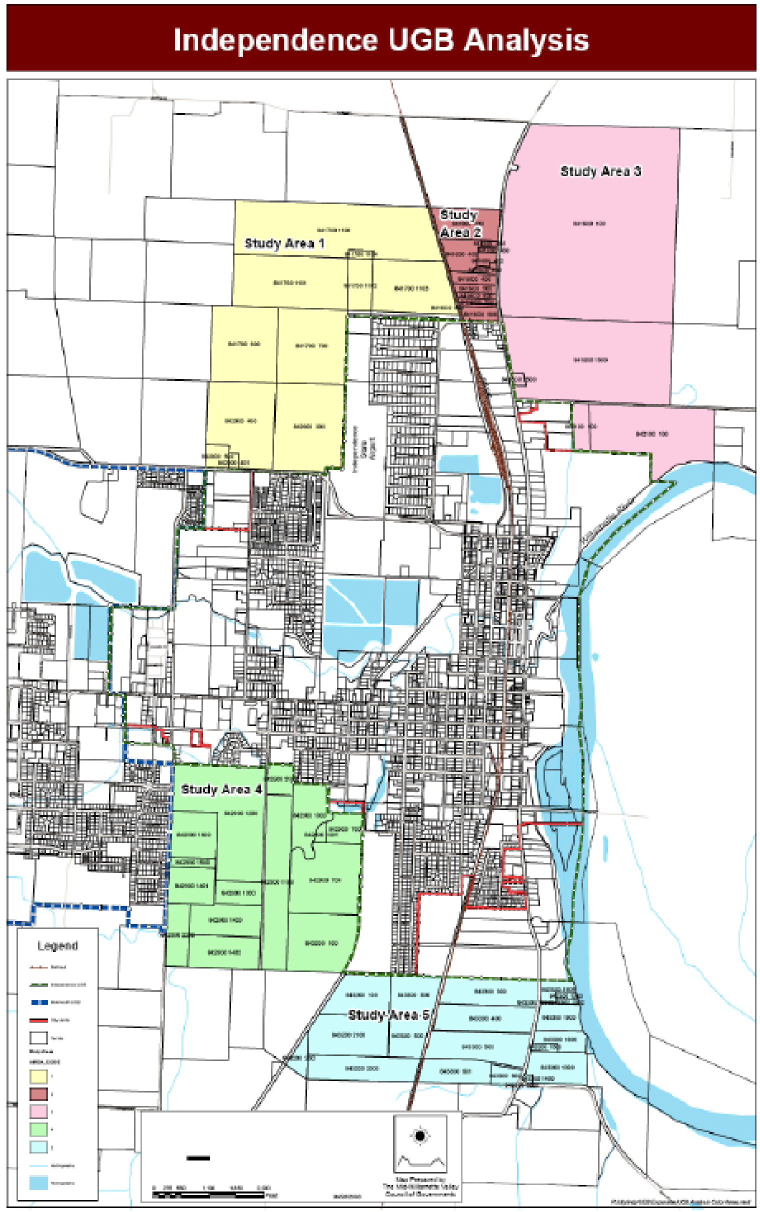
Action 1: Meet with Railroad and ODOT Rail Division to determine a solution

Action 2: Build new or repair tracks

Project Relevance: Strategies and actions identified in the Action Plan will need to be factored into the TSP update as potential transportation projects or modeled into future demand analysis.

UGB Expansion Area Analysis, Periodic Review and Urban Growth Boundary Amendments Findings of Facts (2009)

Figure 9: Independence UGB Analysis



In 2009, the City of Independence completed residential and employment need studies to identify areas for expanding the UGB (see the Residential Land Needs Analysis and Buildable Lands Inventory as well as the Economic Opportunities Analysis and Development Strategies Report sections below for additional information). The analysis led the City to identify five areas for potential UGB expansion (see Figure 9). Findings were provided for the study areas to determine their eligibility for inclusion with the UGB. Of those, two were found eligible.[7] They include portions of Study Area 4 to serve residential needs and portions of Study Area 1 to serve commercial and industrial needs. Study Area 4 is located near the southwest portion of the City's UGB. Study Area 1 is located near the north portion of the City's UGB, adjacent to the airport. Because the study areas are larger than the forecasted land demands for their respective uses, only portions of the study areas that met the boundary location factors from Goal 14 were selected for inclusion in the UGB amendment which was ultimately adopted. The following two documents were prepared prior to and served as foundations for the UGB expansion.

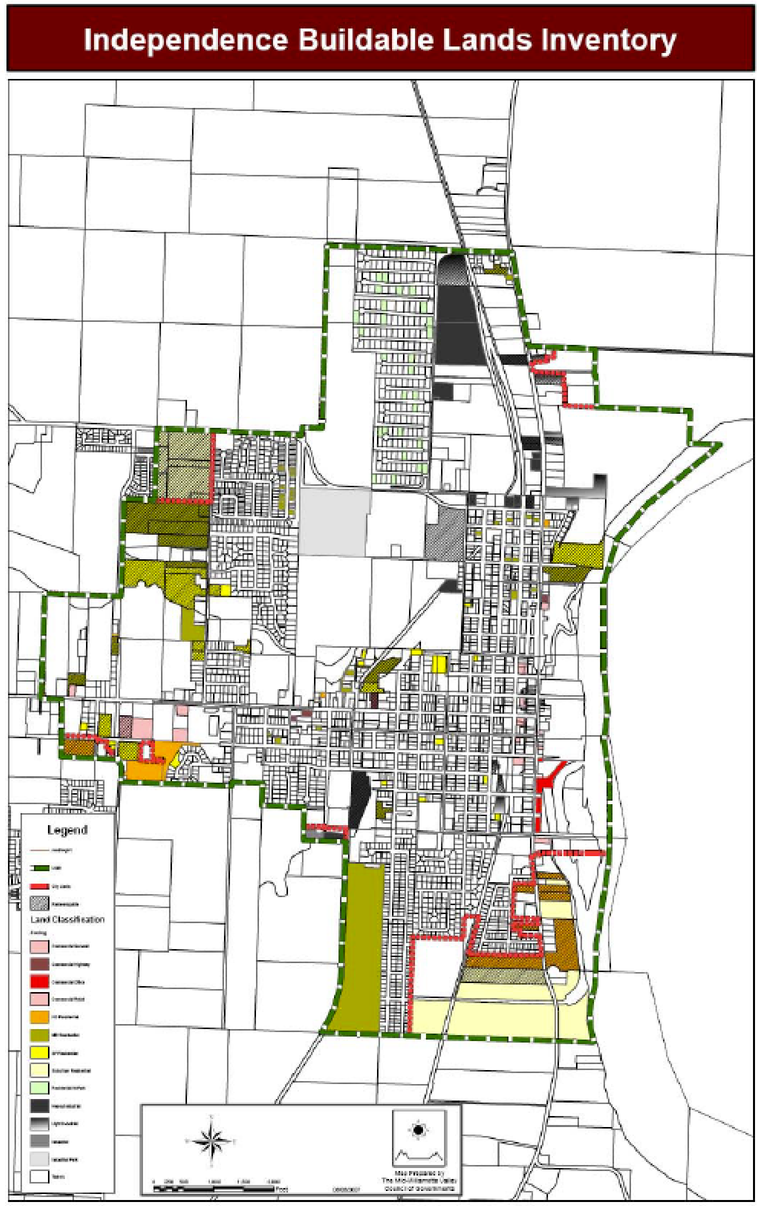
[7] The eligible study areas have been adopted and the UGB has been expanded because of the analysis

Residential Lands Need Analysis and Buildable Lands Inventory (2009)

The City completed a buildable lands inventory (BLI) in 2007. See Figure 10 for a map of the BLI. The inventory describes the amount of net buildable land, by zoning district, within existing city limits and within the UGB. According to the BLI at the time of adoption, there were approximately 101 acres of residential land within City limits and 73 acres within the UGB area.

The future residential land needs identified a need for an additional 2,307 residential units to meet the forecasted 2029 population demand. It estimated an additional 440 acres of land would be necessary to accommodate the demand.[8] After factoring for land currently available within the existing UGB for potential residential development, the land needs analysis estimated that an additional 260 acres would be necessary to meet the 2029 demand. The lands needs analysis identified specific properties that were added to the UGB to cover the land deficit (see Figure 11). As noted above, the BLI and the identified properties were used to inform the UGB amendments that was adopted in 2009.

Figure 10: Independence Buildable Lands Inventory (2007)



[8] Estimate includes land dedicated for public use (i.e. ROW dedication).

Figure 11: Urban Growth Boundary Expansion to Meet 2029 Projected Need for Residential Land

Land Use Element - Table 8
Urban Growth Boundary Expansion to Meet 2029 Projected Need for Residential Land

Assessor Map/Tax Lot	Plan Designation (Polk County)	Zoning (Polk County)	New Plan Designation	New (Proposed) Zoning	Acres
842900 700	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	9.4
842900 1001	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	1.8
842900 1000	Farm and Forest	Exclusive Farm Use (EFU)	Medium Density Residential	Mixed Density Residential (MX)	19.9
842900 704	Farm and Forest	Exclusive Farm Use (EFU)	Medium Density Residential	Mixed Density Residential (MX)	46.7
843200 100	Farm and Forest	Exclusive Farm Use (EFU)	Medium Density Residential	Mixed Density Residential (MX)	35.5[1]
842900 1100	Farm and Forest	Exclusive Farm Use (EFU)	Medium Density Residential	Mixed Density Residential (MX)	39.7
842900 2100	Farm and Forest	Exclusive Farm Use (EFU)	Medium Density Residential	Mixed Density Residential (MX)	7.0
842900 1300	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	10.0
842900 1200	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	70.2
842900 1600	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	19.8
842900 1500	Farm and Forest	Exclusive Farm Use (EFU)	Low Density Residential	Low Density Residential (RS)	4.0
Total					264.0
Unbuildable land[2]					4.7
Total buildable land					259.3

Source: MWVCOG, 2008.
[1] The total size of Tax Lot 100 is 58.9 acres. Approximately 23.4 acres of Tax Lot 100 would remain outside of the UGB after expansion.
[2]Unbuildable land includes wetland areas as identified on the National Wetland Inventory, and the riparian corridor area located adjacent to South Fork Ash Creek.

Project Relevance: The forecasted demand for residential land needs will need to be considered in determining transportation demand forecasts. Land identified outside of City limits that is intended for incorporation will also need to be factored into transportation demand modeling.

Economic Opportunities Analysis and Development Strategies Report (2009)

The Economic Opportunity Analysis (EOA) identified the existing and anticipated needs for commercial and industrial businesses over a 20-year planning horizon for the City of Independence.[9] It also provides guidance for infrastructure planning and investments to accommodate the anticipated commercial and industrial needs.

The EOA estimated a demand for 6,096 employees in the year 2029; an increase of approximately 3,106 from the base year. Based on the anticipated increase an employment, the EOA estimated a

[9] The EOA for Independence is embedded in the City's Comprehensive Plan.

need for an additional 178 acres of land, most of which would be for industrial use. The EOA was used to inform the UGB amendments that were adopted in 2009.

The Economic Development Strategies report is an action document that implements the EOA. The development strategies report is organized into the general categories listed below. Each category identifies specific tasks for implementing the EOA.

- Quality of Life
- Educational and Technical Training Program
- Economic Development Initiatives
- Ready to Develop Industrial Sites
- Target Industries
- Land Use

Of those, the following tasks could have a bearing in the TSP update.

- *Task 2.A. Improve the historic downtown and the Willamette River frontage in downtown (Quality of Life)*
- *Task 11. Three industrial sites needing additional analysis (Ready to Develop Industrial Sites)*
- *Task 13. Large manufacturing site (Land Use)*
- *Task 16. Industrial site 3-5 acres (Land Use)*

Project Relevance: The UGB amendment has been adopted and will be factored in the overall TSP update process. The forecasted demand for residential and employment land needs will need to be considered in determining transportation demand forecasts. Transportation-related projects identified in the action plan will need to be considered for incorporation into the TSP.

Population and Employment Projections

Portland State University's (PSU) Population Research Center (PRC) forecasts populations for regions around Oregon. In 2017, the PRC developed population forecasts for Polk County. As shown in Table 6, Polk County is expected to have an annual average growth rate (AAGR) of 1.5% between 2017 and 2035. In comparison, Independence is expected to have 2.2% AAGR in the same period. A similar relationship is shown for AAGR from 2035 to 2067, Polk County and Independence are expected to have 1.1% and 1.4% AAGR growth, respectively.

Table 6: Polk County and Sub-Areas – Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

Figure 1. Polk County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

	Historical			Forecast				
	2000	2010	AAGR (2000-2010)	2017	2035	2067	AAGR (2017-2035)	AAGR (2035-2067)
Polk County	*62,380*	*75,403*	*1.9%*	*81,089*	*105,217*	*149,203*	*1.5%*	*1.1%*
Dallas UGB	13,277	15,356	1.5%	16,414	22,665	33,208	1.8%	1.2%
Falls City UGB	966	947	-0.2%	1,003	1,119	1,285	0.6%	0.4%
Independence UGB	6,248	8,696	3.4%	9,326	13,803	21,741	2.2%	1.4%
Monmouth UGB	7,834	9,598	2.1%	9,944	12,943	17,708	1.5%	1.0%
Salem/Keizer UGB (Polk)	19,919	26,139	2.8%	27,888	36,936	54,045	1.6%	1.2%
Willamina UGB (Polk)	731	866	1.7%	898	1,049	1,277	0.9%	0.6%
Outside UGBs	13,405	13,801	0.3%	15,616	16,702	19,940	0.4%	0.6%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

Project Relevance: Population forecasts and AAGR growth rates will be considered in transportation demand modeling and forecasting.

Parks and Recreation Master Plan (2015)

The Independence Parks and Recreation Master Plan provides a vision for the City's parks, trails, and natural areas. It includes a park classification system, park planning guidelines and development strategy, and future park and trail recommendations.

Relevant recommendations from the Master Plan include the following.

Overall Park System Recommendations

- *Recommendation b: Create a bicycle-centric facility in or adjacent to Downtown Independence, including an information kiosk about local routes and businesses.*
- *Recommendation d: Coordinate parks projects with City transportation improvement projects to continue updating city sidewalk system for overall city connectivity and access.*

Wildfang Park

- *Recommendation Wi b: Create permanent open easement with Pacific Power for access from Wildfang Park south to the intersection of South 11th and Monmouth Avenue.*
- *Recommendation Wi c: Provide pedestrian bridge crossing of Ash Creek to create crucial north south linkage between neighborhood to the north of Ash Creek (using City owned easement connection to North 12th Street) to neighborhoods to the south of Ash Creek.*

Independence Sports Park

- *Recommendation ISP b: Provide access road, parking, and circulation to accommodate sports tournaments.*

Un-named Park

- *<u>Recommendation UN b</u>: Create north/south pedestrian/bicycle connection through park from existing sidewalk on Birch Street to Chestnut Street with fitness stations in order to enhance accessibility, improve the overall safety of the park, improve community health, and provide neighborhood connections.*

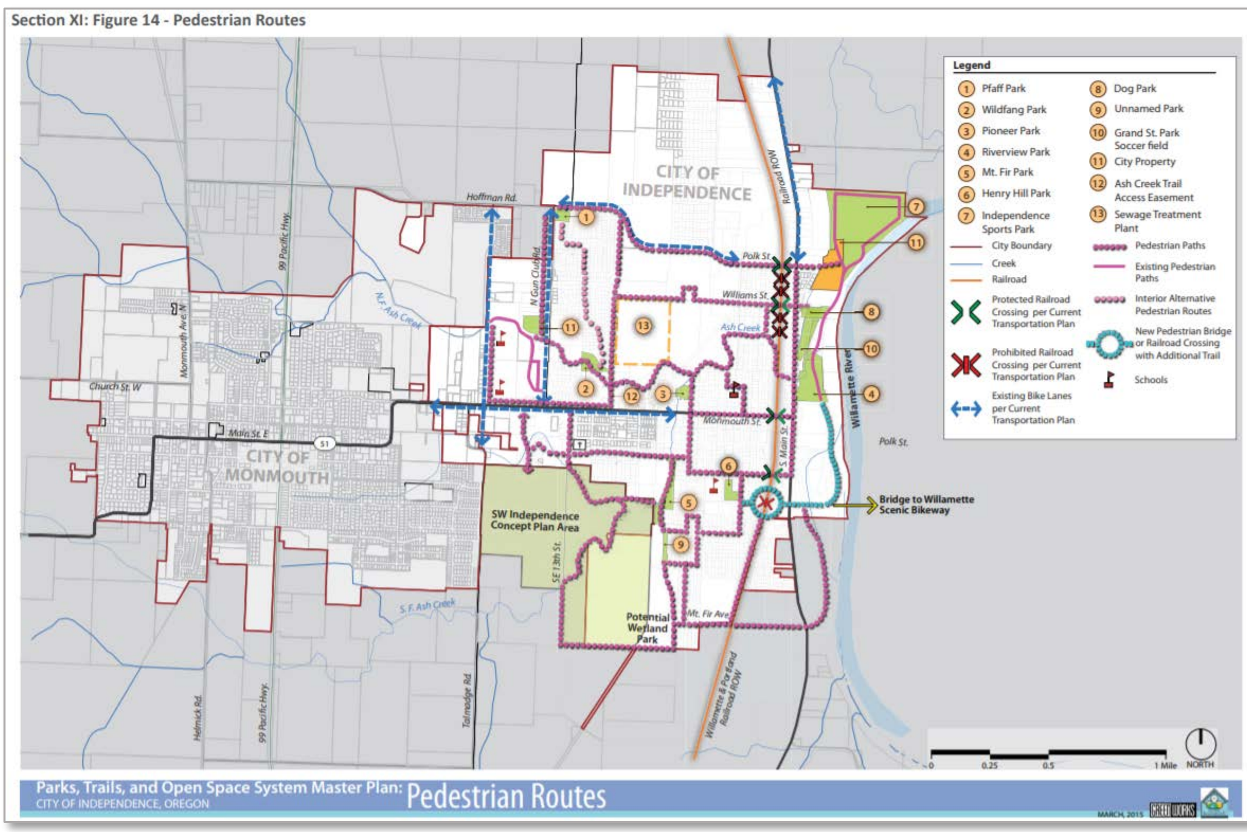
Polk Street Park

- *<u>Recommendation PO e</u>: Create pedestrian/bicycle access to internal path system within the park to enhance accessibility and improve the overall safety of the park. Provide sidewalks to provide perimeter access around site.*

The Master Plan also recommends acquiring and developing five new parks within the City. The highest priority location is in south Independence, followed by north Independence.

In addition, the Master Plan identifies a list of trail connectivity improvement projects to create connectivity and access across the City. Figure 12 illustrates the identified pedestrian connections. Project details for individual projects are provided in the plan.

Figure 12: Pedestrian Routes



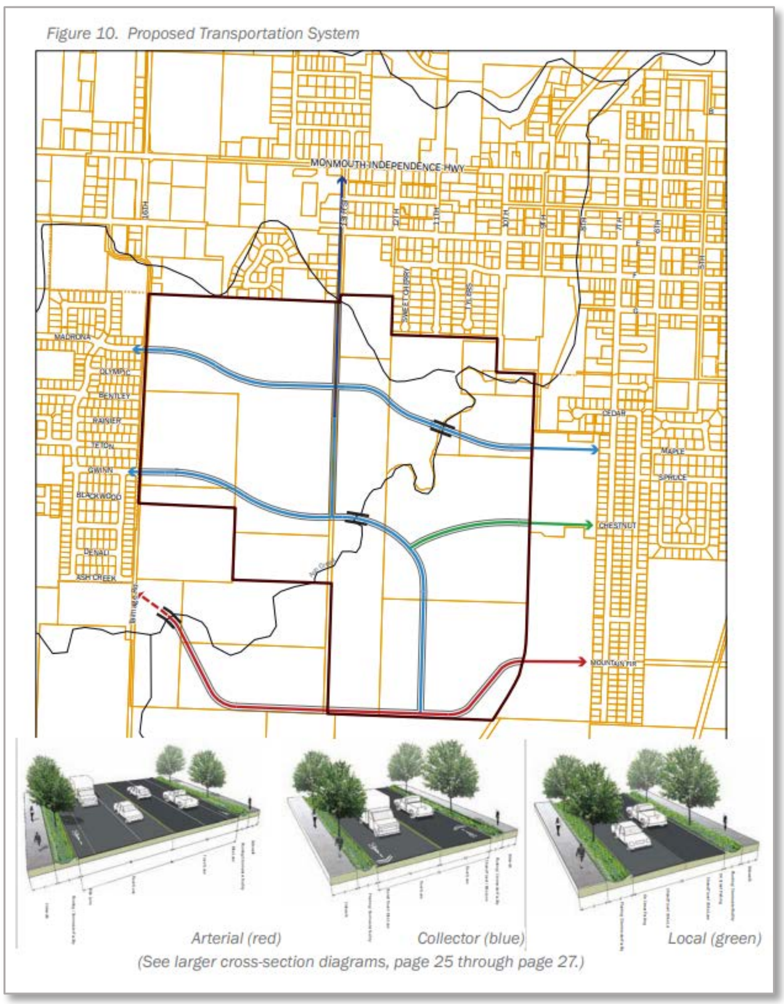
Project Relevance: Projects identified in the Master Plan will need to be factored into the TSP update.

SW Independence Concept Plan (2012)

The Southwest Independence Concept Plan includes approximately 270 acres of land located at the southwest corner of Independence that was brought into the UGB in 2008. The Plan identifies future land uses, including a mix of housing types and densities, transportation system improvements including collector and arterial roadways and bicycle/pedestrian connections, and natural resource preservation.

Figure 13 illustrates the network of collector and arterial roads identified in the Plan. Traffic analysis conducted in the Plan indicates that signals may be necessary at the intersection of 13th Street and OR 51. Inside the planning area, the southerly arterial would lie within the UGB and connect to Mountain Fir.

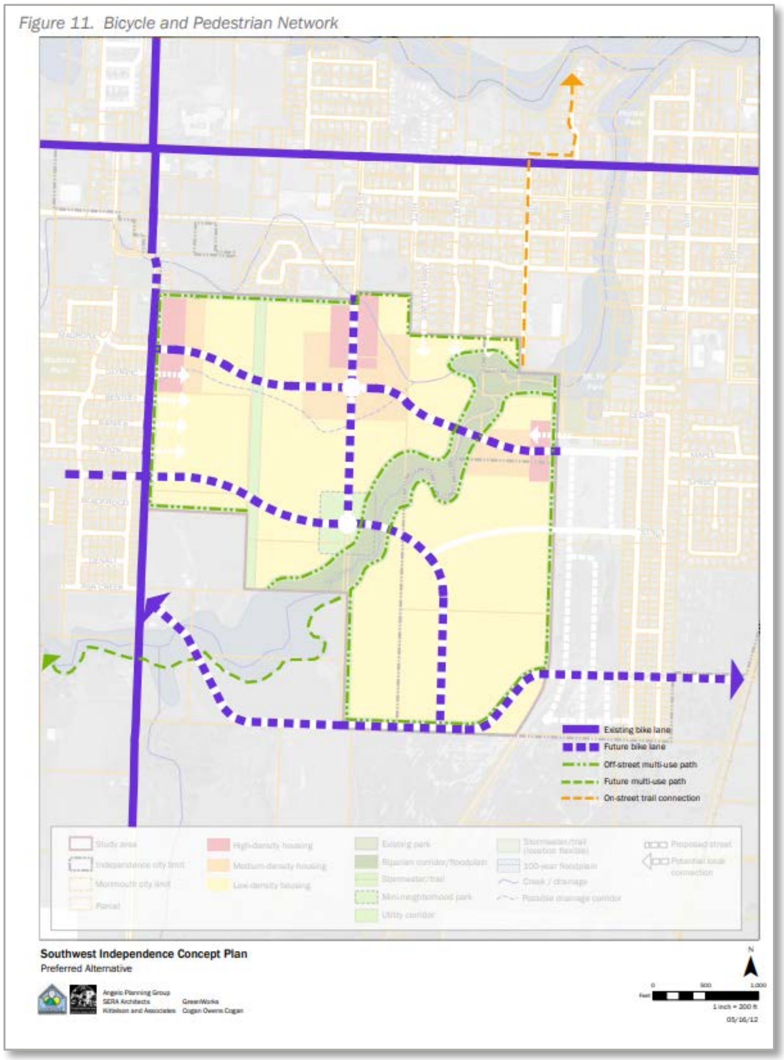
Figure 13: Proposed SW Independence Concept Plan Transportation System[10]



[10] Note, larger cross-section diagrams are provided on pages 25 through 27 in the Plan.

Figure 14 illustrates the network of bicycle and pedestrian facilities. All of the collector roadways would include striped bicycles lanes and sidewalks, providing continuous east-west and north-south connections.

Figure 14: Proposed SW Independence Concept Plan Bicycle and Pedestrian Network



In addition, the Concept Plan identifies the following transportation implementation measures to support development of the Plan

- *Update city transportation plans to reflect updated standards, recommended improvements, and cost estimates.*
- *Refine plans for needed Ash Creek crossing facilities within the Planning Area, including how to minimize environmental impacts.*
- *Work with Monmouth and Polk County to plan for a future southern connector, including a proposed alignment outside the Planning Area, projected timing, cost estimates, and funding strategy.*

Project Relevance: Projects and improvements identified in the Concept Plan will need to be factored into the TSP update.

Independence State Airport Master Plan (Adoption Pending)

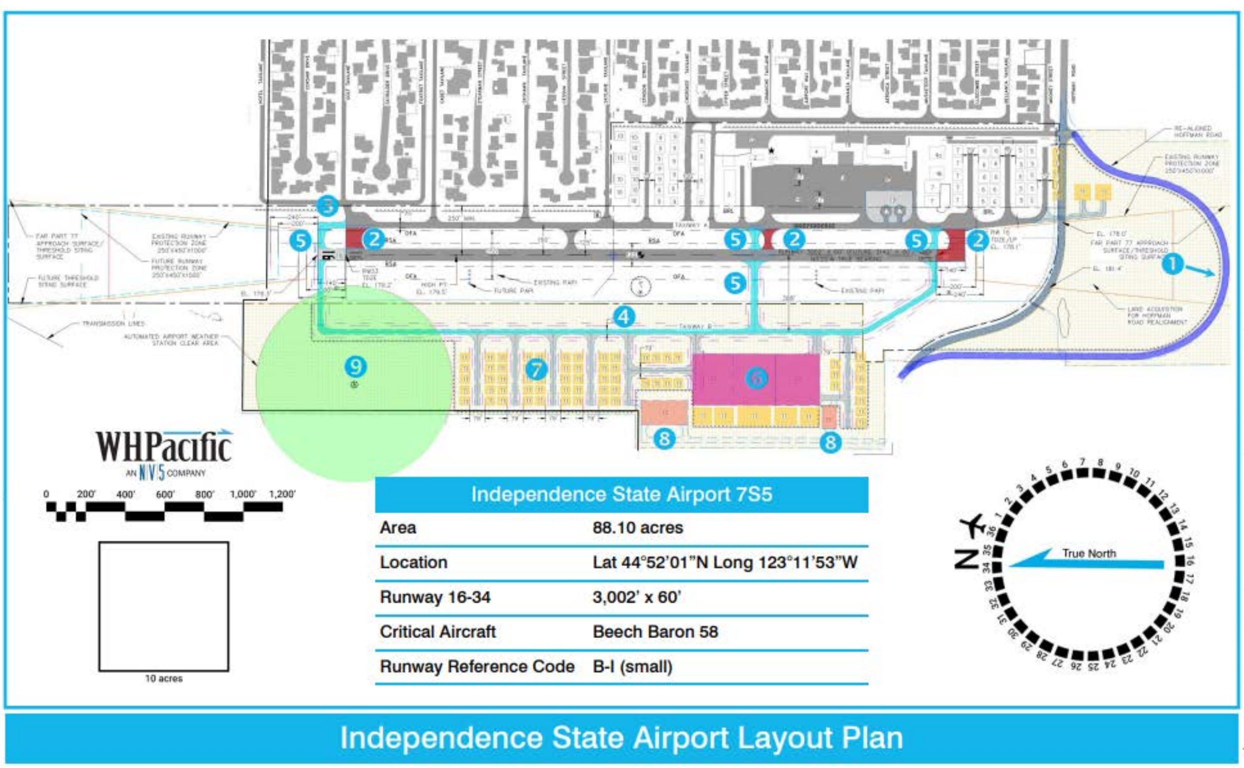
The purpose of Independence State Airport Master Plan (Master Plan) is to identify necessary airport improvements to serve current and projected aviation demand over a 20-year planning horizon. A draft version of the Master Plan is currently available, with adoption anticipated in 2020.

The Master Plan identifies a series of facility requirements to provide for improved safety, efficient operations, and enhanced services. Improvements identified in the plan that may be relevant to the TSP include:

- *Hoffman Road Realignment. Land south of the airport will be acquired to enable Hoffman Road to be realigned.*
- *West Side land Acquisition and Hangers. Additional property will be acquired on the west side of the airport for new airport development.*
- *West Side Vehicle Access and Parking. Vehicle access and parking will be constructed to serve the west side airport development.*

Figure 15 below provides the airport layout plan, illustrating the recommendations listed above as well as other site improvements.

Figure 15: Independence State Airport Layout Plan



Project Relevance: The current operations and planned expansions of the Independence State Airport and planned west side development will be considered in the development of the TSP.

City of Independence Targeted Industry Analysis (2019)

The Targeted Industry Analysis (TIA) identifies potential target industries and site development opportunities and constraints. The TIA focuses on preparing additional properties for development, with a focus on the 85-acre Gentemann property located west of the airport. As part of its findings, it identified unknown wetland constraints within vacant properties surrounding the airport as posing one of the largest barriers to development in the near-term. Among its near-term recommendations, it recommends inventorying and identifying mitigation for wetlands in the surrounding area. Although not explicitly identified as a barrier to development, the analysis recognizes the need for infrastructure improvements to these areas as part of its long-term recommendations. It recommends "updating public facility infrastructure master plans to serve current and future development with adequate transportation, water, sanitary, sewer, and stormwater facilities."

Project Relevance: Future conditions analysis performed for the TSP update process will be based on transportation demand projected for planned land uses identified in the TIA.

City of Independence Adopted Budget FY 2019-2020 and Capital Improvements Plan (2019-2023)

The City of Independence Adopted Budget for fiscal years 2019-2020 provides the financial plan for the City over the next year. It also includes the City's five-year capital improvement plan.

The City gathers funding from a combination of fees, grants, bonds, and property taxes. City funds are used for personnel services, materials, capital improvements, and debt service. A summary of the City's recent and current funding sources and requirements are summarized in Figure 16.

Figure 16: Financial Summary – Resources and Requirements

FINANCIAL SUMMARY - RESOURCES			
TOTAL OF ALL FUNDS	Actual 2017-18	Projected This Year 2019	Proposed Budget Next Year 2019-20
Beginning Fund Balance/Net Working Capital	6,225,502	6,343,200	7,918,742
Fees, Licenses, Permits, Fines, Assessments & Other Service Charges	6,574,998	7,454,909	7,524,466
Federal, State and All Other Grants, Gifts, Allocations and Donations	1,630,118	3,077,805	2,471,062
Revenue from Bonds and Other Debt	6,730,000	2,350,000	3,469,000
Interfund Transfers / Internal Service Reimbursements	4,261,023	4,419,406	5,720,569
All Other Resources Except Property Taxes	1,103,041	703,328	658,202
Property Taxes Estimated to be Received	2,323,187	2,443,300	2,463,720
Total Resources	**28,847,869**	**26,791,948**	**30,225,761**
Personnel Services	5,088,992	5,693,500	6,213,000
Materials and Services	2,986,883	3,816,246	5,233,739
Capital Outlay	921,165	2,414,077	5,392,500
Debt Service	8,696,701	1,860,192	1,931,519
Interfund Transfers	4,810,928	4,940,385	6,143,006
Contingencies	0	0	5,009,743
Special Payments	0	0	0
Unappropriated Ending Balance and Reserved for Future Expenditure	6,343,200	8,067,547	302,254
Total Requirements	**28,847,869**	**26,791,948**	**30,225,761**

A portion of the financial resources are dedicated to transportation funding. The FY 2019-2020 budget appropriates just under $3 million between the Transportation and Transportation SDC funds.

Figure 17: Transportation Fund and Transportation SDC Fund Summary

Transportation Fund	
Personnel Services	$ 101,000
Materials & Services	878,250
Capital Outlay	474,000
Debt Service	4,804
Transfers/Interfund Loans	418,508
Contingency	228,676
Total	$ 2,105,238

Transportation SDC Fund	
Materials & Services	$ 50,000
Capital Outlay	100,000
Transfers/Interfund Loans	11,294
Contingency	666,816
Total	$ 828,110

Capital Improvement Plans (CIPs) program the funding and construction of significant capital projects, typically for a five-year period. The CIP is organized as follows:

- Summary spreadsheet of the five-year plan; and
- Individual sections organized by Department with summary spreadsheets and individual projects.

The summary CIP in the City's 2019-2023 budget is shown in Figure 18. The transportation CIP is shown in Figure 19.

Figure 18: Summary Spreadsheet of 5-year CIP

SUMMARY	Budgeted FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023	TOTAL
COMMUNITY SERVICES	$ 150,000	$ -	$ 1,050,000	$ -	$ -	$ 1,200,000
INFORMATION SERVICES	$ 125,000	$ -	$ -	$ -	$ -	$ 125,000
PARKS/RECREATION	$ 1,530,000	$ 1,030,000	$ 3,402,364	$ 3,097,364	$ -	$ 9,059,728
PUBLIC SAFETY	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 250,000
STORMWATER	$ 40,000	$ 526,850	$ 221,600	$ 50,000	$ 50,000	$ 888,450
TRANSPORTATION	$ 300,000	$ 1,275,000	$ 1,140,000	$ 600,000	$ 200,000	$ 3,515,000
URD-ED	$ 470,000	$ -	$ -	$ -	$ -	$ 470,000
WATER	$ 1,100,000	$ 506,300	$ 200,000	$ 200,000	$ 200,000	$ 2,206,300
WASTEWATER	$ 1,966,280	$ 5,087,331	$ 4,889,838	$ 10,648,686	$ 250,000	$ 22,842,135
TOTALS	**$ 5,731,280**	**$ 8,475,481**	**$ 10,953,802**	**$ 14,646,050**	**$ 750,000**	**$ 40,556,613**

Figure 19: Transportation Capital Improvement Plan

line #	TRANSPORTATION	Rank	Source Type	Source Fund	Budgeted FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023	TOTAL
1	F Street Bridge Replacement		11% city match ODOT Grant, split with stormwater	Transportation Operating and SDC ODOT Grant	$ 200,000	$ 940,000	$ 940,000	$ -	$ -	$ 2,080,000
2	TSP Update		ODOT Grant, SDC, IFA loans	Transportation/Urban Renewal	$ 100,000	$ -	$ -	$ -	$ -	$ 100,000
3	Southern Arterial / Continued Engineering	Phase A	SDC, Development Contributions	Transportation Operating and SDC City/Private	$ -	$ -	$ -	$ 200,000	$ -	$ 200,000
4	Southern Arterial / Engineering	Phase B	SDC, Development Contributions	Transportation Operating and SDC City/Private	$ -	$ -	$ -	$ 200,000	$ -	$ 200,000
6	Annual Pavement Maintenance		Gas Tax, General Fund	Transportation Operating	$ -	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 800,000
7	Sweeper Purchase		Street/Storm Funds	Street Equip & Storm Equip Funds	$ -	$ 135,000	$ -	$ -	$ -	$ 135,000
TOTALS					$ 300,000	$ 1,275,000	$ 1,140,000	$ 600,000	$ 200,000	$ 3,515,000

Project Relevance: The capital improvement projects that have a committed funding source will be included in the future baseline transportation conditions for the updated TSP. The updated TSP will include capital improvement projects as part of the future conditions analysis and in the development of proposed improvements.

City of Monmoth Transportation System Plan (2009)

The City of Monmoth Transportation System Plan (TSP) establishes the City's goals, policies, and proposed improvements for developing and improving the transportation system within Monmoth. The Monmoth TSP was updated in 2009 to reflect the future transportation network. The update includes goals and objectives and evaluation of existing and future conditions.

The east edge of Monmoth's UGB abuts Independence's city limits. Several projects proposed in the Monmoth TSP are connected to existing and proposed facilities in Independence. Those projects include improvements and extensions to roadways, shown in Figure 7-10B of the TSP, and the Ash Creek Trail, shown in Figure 7-8 of the TSP. The proposed projects are as follows:

- RE-25: Jackson Street extension
- RE-08d: Gwinn Street East extensions[11]
- RE-11c: Ash Creek Drive extension, east (not in financially constrained plan, long term- by 2021- 2030), including a multi-use path for portion of the Ash Creek Trail.

  Project Relevance: Monmoth is a neighboring jurisdiction that borders Independence. The Independence TSP should encourage coordination with Monmoth on planned transportation projects, such as roadway extensions and extension of bicycle and pedestrian facilities across city limits.

Polk County Transportation System Plan (2009)

The Polk County Transportation System Plan (TSP) establishes the County's goals, policies, and proposed improvements for developing and improving the transportation system within Polk County. The TSP includes the following elements:

- Transportation Goals and Policies
- Road Plan
- Bicycle and Pedestrian Element
- Air, Rail, Water and Transmission Lines Element
- Public Transportation Element
- Transportation Forecast and Deficiencies
- Proposed System Improvements

Several policies in the Polk County TSP relate to coordination with state and local partners and policies for County roadways in jurisdictions. Those policies are as follows.

> *Goal 2: To maintain an ongoing transportation planning process keyed to meet the needs of the traveling public and coordinated among the state, regional, and local jurisdictions.*
>
> *Objective 2.3 Polk County will continue to participate in and support state and regional transportation planning efforts.*
>
> *Objective 2.10 Polk County recognizes that Oregon Highways 51, 221, and 223 provide important connections between urban areas in Polk County and provide a link for rural*

[11] In the TSP, this project was slated to be completed in the near term by 2020. However, it hasn't been developed.

areas to the urban centers. The county supports a continuing effort to ensure that these routes retain an adequate level of service for the variety of uses that these highways serve.

Facility Improvements recommended in the TSP that are in or bordering the City of Independence, shown in Figure 12 of the TSP, are:

2. Buena Vista Road Bridge Improvements – estimated cost $1.1 million

14. Talmadge Road Sidewalk Improvements (Between Madrona and 16th Ave) - estimated cost $40,000

Project Relevance: The Independence TSP should reflect the Polk County coordination policies and the incorporate County projects in Independence.

Attachment B Tech Memo #2: Goals, Objectives, and Evaluation Criteria

TECH MEMO #2: GOALS, OBJECTIVES, AND EVALUATION CRITERIA

Date: June 17, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Hughart, Matt Bell, Molly McCormick, Alec Kauffman, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Tech Memo #2: Goals, Objectives, and Evaluation Criteria

TABLE OF CONTENTS

INTRODUCTION

This memorandum presents the goals, objectives, and evaluation criteria that will be used to guide development of the Independence Transportation System Plan (TSP) update. The goals and objectives will help ensure key issues are addressed throughout the planning process while the evaluation criteria will be used to select and prioritize preferred transportation system improvements for the TSP. The goals, objectives, and evaluation criteria will also inform recommendations for policy language that will serve as guidance for future land use decision making, such as approval criteria related to zone change and comprehensive plan amendments.

BACKGROUND

The existing Independence TSP was adopted in 2007 and includes one goal and 14 corresponding objectives, as listed below. A review of the goal and objectives highlights a focus on multimodal accessibility, land use and planning integration, and coordination between Independence and other regional partners. In addition, the goal and objectives in the existing TSP align with and add on to those provided in the 1998 Independence Comprehensive Plan.

Existing Goal

To provide a balanced, multi-modal, safe, convenient, and efficient transportation system for Independence.

Existing Objectives

1. Independence shall develop a coordinated transportation system which facilitates the mobility and accessibility of community residents, and encourages alternatives to and reduced reliance upon the automobile.
2. Independence will protect the character of the Historic District from adverse impacts related to changes in the transportation system.
3. Independence shall consider access to public transit in making deliberations on residential development patterns.
4. Independence shall promote the development and maintenance of all transportation modes including bikeways, pedestrian ways, and public transportation to all planned land uses.
5. Independence shall encourage transportation modes which are energy efficient and enhance the air, noise, and visual environment of the community
6. Independence shall cooperate with and support regional public transportation planning efforts.
7. Independence shall promote and give high priority to bike and pedestrian ways in the downtown area, and in the vicinity of schools and parks.
8. Independence shall protect the function of air and rail facilities in the City and develop and implement strategies that minimize conflicts with other transportation modes and adjacent land uses.
9. Independence shall cooperate with the Oregon Department of Aviation in the development and implementation of the goals of the Independence State Airport Layout Plan, 1998-2015.
10. Independence will coordinate with the Oregon Department of Transportation and Polk County in the planning and provision of transportation services and in the implementation of the ODOT State Transportation Improvement Program.
11. Independence will coordinate with affected transportation facility or service providers whenever a proposal for a plan or regulation amendment or development action would significantly affect a transportation facility.
12. Independence shall utilize the Transportation System Plan for guidance in all land use planning and project development activities.
13. Independence shall use tools such as performance standards to protect transportation facilities, corridors, and sites for their intended functions as identified in this plan.
14. Independence shall develop land use regulations and subdivision ordinances that allow needed transportation facilities and improvements and encourage development patterns that are friendly to pedestrians, bicyclists and public transportation users.

The goal and objectives in the existing TSP remain relevant to the City and many can be adapted to provide guidance in this update process. In addition to the objectives that can transition to high-level goals, several can be incorporated into policies provided in the Independence Comprehensive Plan or Independence Development Code.

PROPOSED GOALS AND OBJECTIVES

The proposed goals and objectives for the Independence TSP update are described below. The goals provide direction for where the City would like to go, while the objectives provide a more detailed breakdown of the goals with specific outcomes the City desires to achieve. The proposed TSP goals and objectives are based on a review of the existing TSP goal and objectives, information from the ODOT TSP guidelines, and discussions with City staff about the important issues prevalent in the community and transportation system.

Goal 1 – Consistency with Community Vision

Develop and maintain a transportation system that is *consistent with the community vision* of a vibrant, historic, riverfront, full-service community that celebrates its unique multi-cultural heritage and respects the environment while fostering a stable, diversified economy.

Objective 1A: Enhance connectivity within and between major activity centers including employment centers, high density residential areas, and community resources like major parks

Objective 1B: Ensure planned improvements are consistent with community goals and vision

Objective 1C: Complement natural resources, scenic and historic areas, and open spaces to the greatest extent possible, while minimizing negative impacts

Objective 1D: Minimize negative impacts to existing and future neighborhoods

Objective 1E: Minimize negative impacts to developable and developed commercial and industrial sites

Objective 1F: Ensure consistency with local plans including the Comprehensive Plan, state plans, and the plans of neighboring jurisdictions

Goal 2 – Smooth and Safe Traffic Flow

Optimize the performance of the transportation system to provide *smooth and safe traffic flow* along area roads.

Objective 2A: Provide additional north-south and east-west routes through the City

Objective 2B: Improve vehicular mobility (over the no build scenario)

Objective 2C: Reduce vehicular delay at key intersections

Objective 2D: Address known safety issues at locations with a history of fatal or severe injury crashes

Objective 2E: Improve mobility on designated freight truck and rail routes (over the no build scenario)

Objective 2F: Manage access to key state, county, and city roadways

Objective 2G: Support roadway improvements that provide safe access for all users, regardless of age, ability, or mode of transportation

Goal 3 – Increased Walking, Bicycling, Scooter, and Non-motorized Trips

Enhance and expand the multimodal transportation system to encourage *increased walking, bicycling, scooter, and other non-motorized trips*.

Objective 3A: Create a non-motorized network that has a high degree of comfort (i.e. minimal Level of Traffic Stress) and, where possible, showcases Independence's unique natural and physical attributes

Objective 3B: Provide pedestrian or non-motorized connectivity to schools, business districts, transit stops and corridors, and/or parks

Objective 3C: Close key gaps in the pedestrian or non-motorized system, creating short, easy, and accessible loops within the network

Objective 3D: Address locations with a history of pedestrian and bicycle-related crashes

Objective 3E: Serve neighborhoods that have limited existing nonmotorized transportation routes

Goal 4 – Increased Transit Ridership

Support the development of an efficient public transportation system to encourage *increased transit ridership*.

Objective 4A: Support frequent and reliable transit service for transit stops and corridors

Objective 4B: Promote ridership by improving access to and amenities at transit stops

Objective 4C: Promote ridership by increasing transit frequency

Goal 5 – Future Focused

Support the development and implementation of transportation solutions that are *future focused* and enhance the mobility and safety of all travel modes.

Objective 5A: Encourage innovative and emerging transportation and mobility solutions where appropriate

Objective 5B: Provide flexibility in planned projects, planned programs, and the development code to consider evolving practices and standards within the transportation field

Goal 6 – Financial Stability

Develop funding solutions for transportation system improvements that maintain the *financial stability* of the City.

Objective 6A: Maximize the efficiency and life of existing transportation facilities

Objective 6B: Leverage investments in the existing transportation system where the existing system can meet future needs

Objective 6C: Prioritize investments and maximize partnerships to provide maximum benefit and return on investment for the associated cost

Objective 6D: Consider future operation and maintenance costs in investment choices

Objective 6E: Ensure planned improvements can be achieved given the City's existing financial stream and/or potential financial sources

EVALUATION CRITERIA

The proposed evaluation criteria are based on the proposed goals and objectives. A qualitative process using the evaluation criteria will be used to evaluate potential modal solutions and prioritize projects developed through the TSP update. The rating method used to evaluate the alternatives is described below.

Most Desirable: The concept addresses the criterion and/or makes substantial improvements in the criteria category. (+2)

Desirable: The concept addresses the criterion and/or makes improvements in the criteria category. (+1)

No Effect: The criterion does not apply to the concept or the concept has no influence on the criteria. (0)

Less Desirable: The concept does not support the intent of and/or negatively impacts the criteria category. (-1)

Least Desirable: The concept does not support the intent of and/or substantially negatively impacts the criteria category. (-2)

At this level of screening, the criteria will not be weighted; the ratings will be used to inform discussions about the benefits and tradeoffs of each alternative. Table 1 presents the evaluation criteria that will be used to qualitatively evaluate the solutions developed through the TSP update.

Table 1: Evaluation Criteria

Objective	Evaluation Criteria	Evaluation Score
Goal 1 – Consistency with Community Vision		
Objective 1A	Enhances connectivity within and between major activity centers and community resources	(-2 to +2)
Objective 1B	Is consistent with community goals and vision	(-2 to +2)
Objective 1C	Complements natural resources, scenic and historic areas, and open spaces to the greatest extent possible, while minimizing negative impacts	(-2 to +2)
Objective 1D	Minimizes negative impacts to existing and future neighborhoods	(-2 to +2)
Objective 1E	Minimizes negative impacts to developable and developed commercial and industrial sites	(-2 to +2)
Objective 1F	Is consistent with local plan including the Comprehensive Plan, state plans, and the plans of neighboring jurisdictions	(-2 to +2)
Goal 2 – Smooth and Safe Traffic Flow		
Objective 2A	Provides additional north-south and east-west routes through the City	(-2 to +2)
Objective 2B	Improves vehicle mobility (over the no build scenario)	(-2 to +2)
Objective 2C	Reduces vehicle delay at key intersections	(-2 to +2)
Objective 2D	Addresses known safety issues at a location with a history of fatal or sever injury (Injury A) crashes	(-2 to +2)
Objective 2E	Improves mobility on designated freight truck and rail routes (over the no build scenario)	(-2 to +2)
Objective 2F	Manages access to key state, county, and city roadways	(-2 to +2)
Objective 2G	Supports roadway improvements that provide safe access for all users, regardless of age, ability, or mode of transportation	(-2 to +2)

Goal 3 – Increased Walking, Bicycling, Scooter, and Nonmotorized Trips		
Objective 3A	Creates a non-motorized network that has a high degree of comfort (i.e. minimal Level of Traffic Stress) and, where possible, showcases Independence's unique natural and physical attributes	(-2 to +2)
Objective 3B	Provides pedestrian or non-motorized connectivity to schools, business districts, transit stops and corridors, and/or parks	(-2 to +2)
Objective 3C	Closes key gaps in the pedestrian or non-motorized system, creating short, easy, and accessible loops within the network	(-2 to +2)
Objective 3D	Addresses locations with a history of pedestrian and bicycle-related crashes	(-2 to +2)
Objective 3E	Serves a neighborhood that has limited existing nonmotorized transportation routes	(-2 to +2)
Goal 4 – Increased Transit Ridership		
Objective 4A	Support frequent and reliable transit service for transit stops and corridors	(-2 to +2)
Objective 4B	Promote ridership by improving access to and amenities at transit stops	(-2 to +2)
Objective 4C	Promote ridership by increasing transit frequency	(-2 to +2)
Goal 5 – Future Focused		
Objective 5A	Encourages innovative and emerging transportation and mobility solutions	(-2 to +2)
Objective 5B	Provides flexibility in planned projects, planed programs, and the development code to consider evolving practices and standards within the transportation field	(-2 to +2)
Goal 6 - Financial Stability		
Objective 6A	Maximizes the efficiency and life of existing transportation facilities	(-2 to +2)
Objective 6B	Leverages investments in the existing transportation system where the existing system can meet future needs	(-2 to +2)
Objective 6C	Prioritizes investments and maximizes partnerships to provide maximum benefit and return on investment for the associated cost	(-2 to +2)
Objective 6D	Considers future operation and maintenance costs in investment choices	(-2 to +2)
Objective 6E	Ensures planned improvements can be achieved given the City's existing financial stream, and/or potential financial sources	(-2 to +2)

Attachment C Tech Memo #3A: Inventory

TECHNICAL MEMORANDUM #3A: EXISTING CONDITIONS INVENTORY

Date: June 17, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Alec Kauffman, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Draft Tech Memo #3A: Existing Conditions Inventory

TABLE OF CONTENTS

INTRODUCTION

This memorandum provides an inventory of existing transportation facilities and services within Independence. The information provided in this memorandum will serve as the foundation for identifying existing gaps and deficiencies in the transportation system and for evaluating existing and projected future traffic conditions for the Independence Transportation System Plan (TSP) update. *Attachment A* contains the existing land use and population inventory for Independence. The description of activity centers provided in *Attachment A* supports the modal system descriptions provided below.

Figure 1 illustrates the study area for the Independence TSP update. The study area consists of all areas within the Independence city limits and Urban Growth Boundary (UGB). State and local facilities within the City limits and UGB are addressed in the TSP.

The Oregon Transportation Planning Rule (TPR) indicates that the study of roadways and intersections is generally limited to those with the highest classifications (collectors and arterials). However, local street issues, such as street connectivity and safety, are also discussed where appropriate.

ROADWAY SYSTEM INVENTORY

The roadway system within Independence serves the majority of trips across all travel modes. In addition to motor vehicles, pedestrians, cyclists, transit riders, and others use the roadway system to travel to and from essential destinations and neighboring cities. This section describes the existing Independence roadway system.

The roadway system within Independence was inventoried based on Geographic Information System (GIS) data obtained from ODOT, as well as a review of recent aerial imagery and field observations. The inventory was supplemented by information provided in the 2007 Independence TSP and by information provided by the City and ODOT.

Jurisdiction

Streets within Independence are owned and operated by ODOT and the City. Each jurisdiction is responsible for determining the functional classification of the streets, defining major design and multimodal features, and approving construction and access permits. Coordination is required among the jurisdictions to ensure that the streets are planned, operated, maintained, and improved to safely meet public needs. Figure 2 illustrates the jurisdiction of streets within Independence. The following summarizes information related to ODOT and City facilities within Independence.

State Highway

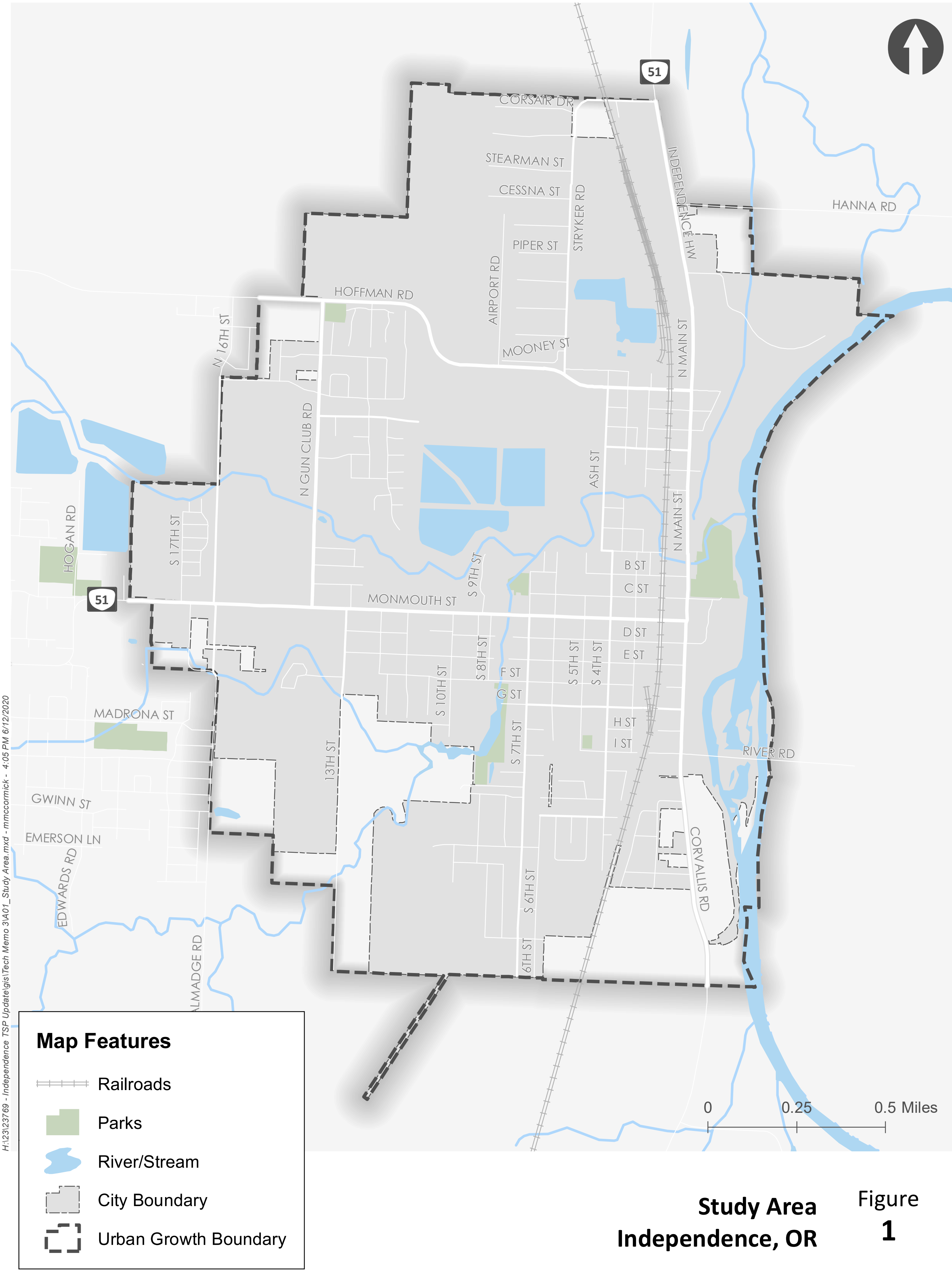
ODOT owns and operates one facility within Independence, OR 51. OR 51 is the main route through Independence, connecting with OR 22 to the north near Eola and with OR 99W and OR 194 to the west in Monmouth. Within the Independence UGB, OR 51 includes the north-south segment of Main Street between the northern UGB and Monmouth Street and the east-west segment of Monmouth Street between Main Street and the western UGB.

City Streets

The City owns and operates all other major facilities within Independence, including:

- 4th Street
- 7th Street
- 13th Street
- 16th Street
- Ash Street
- Corvallis Road
- G Street
- Gun Club Road
- Hoffman Road
- Polk Street
- Picture Street
- Main Street
- Spruce Avenue
- Stryker Road
- Williams Street

Additional information related to the ODOT and City facilities within Independence is provided throughout the remaining sections of this memorandum.

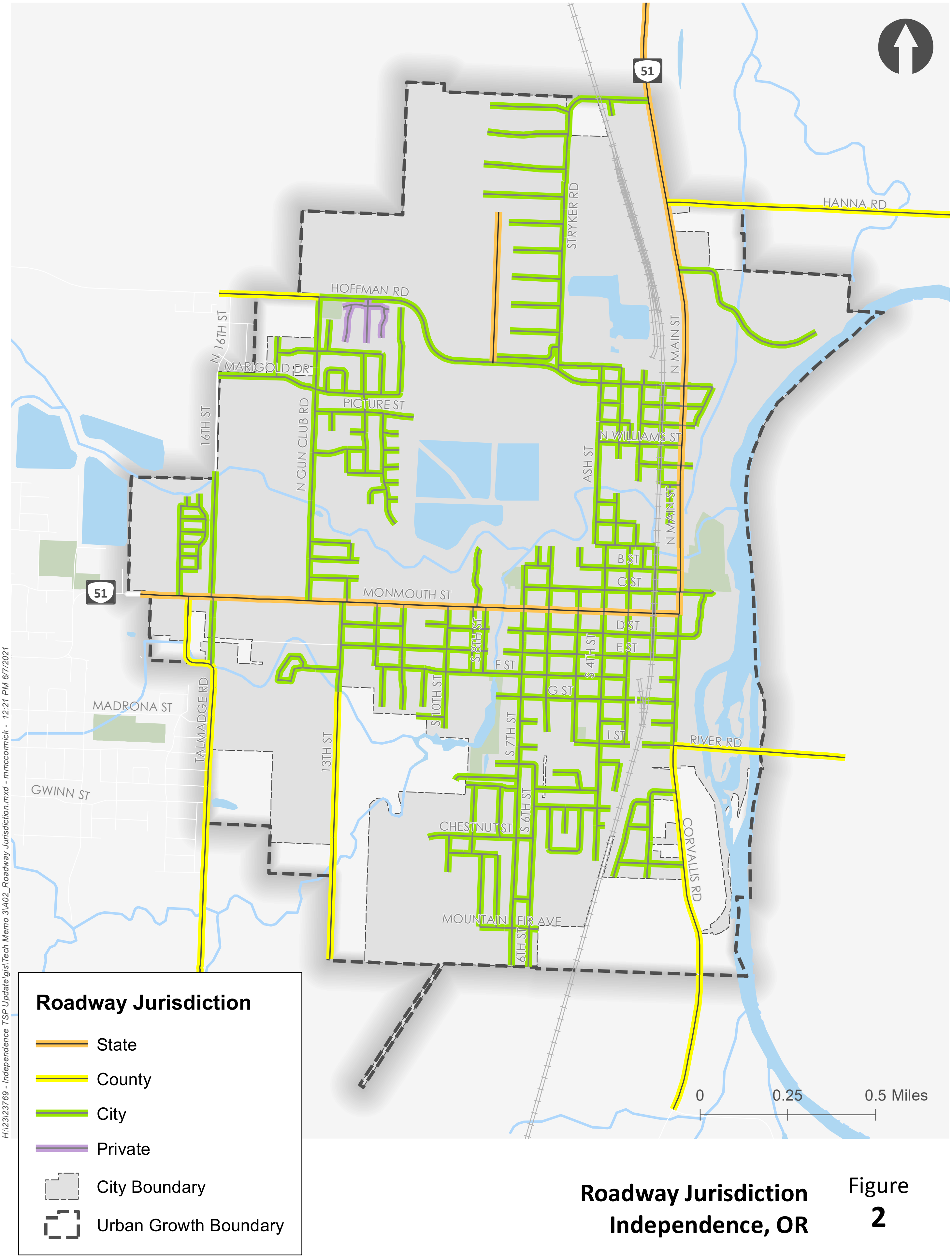


Study Area
Independence, OR

Figure
1

Data Source: Pok County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A01_Study Area.mxd - mmccormick - 4:05 PM 6/12/2020



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A02_Roadway Jurisdiction.mxd - mmccormick - 12:21 PM 6/7/2021

Roadway Jurisdiction
Independence, OR

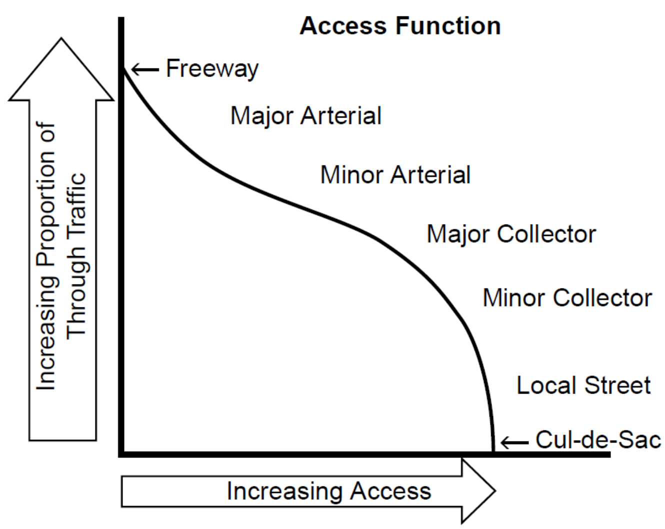
Figure
2

Data Source: Pok County Data Portal, ODOT

Functional Classification

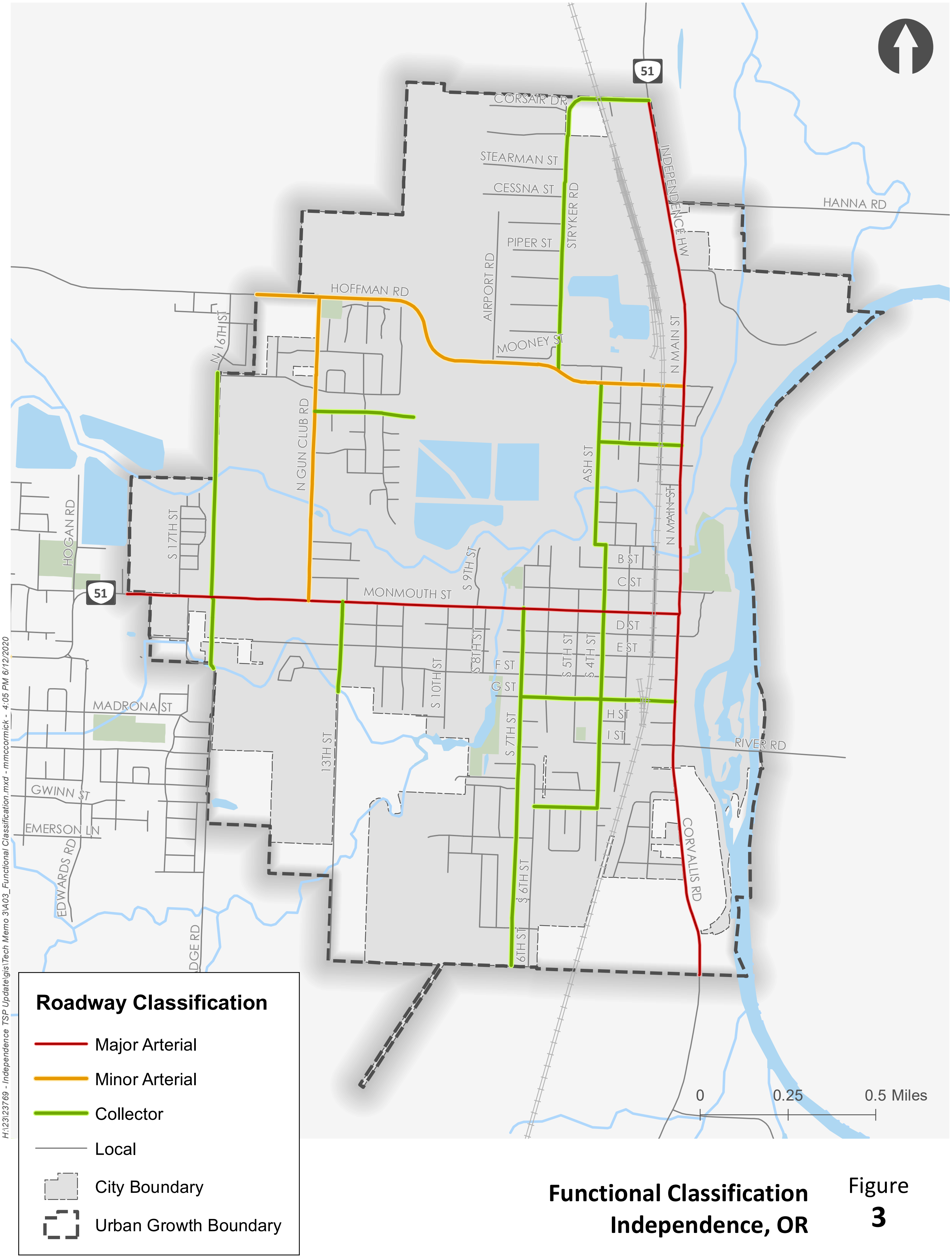
A street's functional classification defines its role in the transportation system and reflects desired operational and design characteristics such as right-of-way requirements, pavement widths, pedestrian and bicycle features, and driveway (access) spacing standards. Figure 3 illustrates the functional classification of streets within Independence. The following provides a description of each functional classification per the 2007 Independence TSP.

- **Major Arterial:** This is a major facility for moving large volumes of inter-area traffic primarily carrying through traffic. An arterial is intended to provide for the majority of regional travel passing through an area as well as the majority of local trips entering and leaving the urban area. It should also provide continuity for all rural arterials which intercept the UGB and should include connections to all rural collectors. Arterials generally emphasize mobility over land access. Access to arterials should be managed to protect the mobility function of the street as much as possible.
- **Minor Arterial:** This is a two-lane facility that is designed to carry "through" traffic. Although a minor arterial is intended to provide more access than a major arterial, mobility is still the primary function of the street and should be preserved as much as possible. Minor arterials place more emphasis on land access and offer a lower level of traffic volume and mobility than major arterials.
- **Collector:** This facility connects intra-area traffic to the arterial system. Collectors provide links between an area or neighborhood and the arterial system. They supply abutting property with the same degree of land service as a local street but are usually given priority over local streets in any traffic control installations. Collectors penetrate into all areas of a City. Collectors provide a direct route to many destinations, and for longer trips, collectors connect to arterials or rural collectors.
- **Local:** This type of street primarily provides access to abutting properties and is protected from "through" traffic. Local streets entail all those not otherwise defined as arterials or collectors. While connectivity is encouraged for all streets, through traffic movement is not the intended purpose of a local street.



This image displays the relationship between functional classification and the proportion of through traffic and access. Image source: Wisconsindot.gov

Main Street south of Monmouth Street is a major arterial under City jurisdiction. Image source: Kittelson, 2020.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A03_Functional Classification.mxd - mmccormick - 4:05 PM 6/12/2020

Functional Classification
Independence, OR

Figure
3

Data Source: Pok County Data Portal, ODOT

Table 1 summarizes the functional classifications of the arterial and collector streets within Independence and identifies the overlapping jurisdictional relationships that exist. As shown in Table 1, there are several inconsistencies in classification between jurisdictions within Independence. These discrepancies will be addressed as part of the TSP update. The federal and state classifications reflect information from ODOT's TransGIS database. The county classifications reflect the 2009 Polk County TSP. The city classifications reflect the 2007 Independence TSP.

Table 1: Functional Classification Comparison of Collector and Higher Streets by Jurisdiction

Roadway	Jurisdiction	Functional Classification			
		Federal	State	County	City
OR 51-Main Street	ODOT	Principal Arterial	District Highway	Minor Arterial	Major Arterial
OR 51-Monmouth Street	ODOT	Principal Arterial	District Highway	Minor Arterial	Major Arterial
Main Street	City	Minor Arterial	--	Minor Arterial	Major Arterial
Corvallis Road	City	Major Collector	-	Minor Arterial	Major Arterial
Gun Club Road	City	Minor Arterial	--	Minor Arterial	Minor Arterial
Hoffman Road-Polk Street	City	Minor Arterial	--	Minor Arterial	Minor Arterial
River Road	County	Minor Arterial	--	Major Collector	-
Stryker Road	City	Major Collector	--	Local	Collector
Williams Street	City	Major Collector	--	Local	Collector
Picture Street	City	Local Road	--	Local	Collector
Ash Street	City	Minor Arterial	--	Local	Collector
4th Street (north of OR 51)	City	Minor Arterial	--	Local	Collector
4th Street (south of OR 51)	City	Major Collector	--	Local	Collector
7th Street	City	Major Collector	--	Local	Collector
13th Street	City	Local Road	--	Local	Collector
16th Street	City	Major Collector	--	Local	Collector
G Street	City	Major Collector	--	Local	Collector
Spruce Avenue	City	Local Road	--	Local	Collector
Airport Road	City	Major Collector	--	Local	Local
10th Street	City	Major Collector	--	Local	Local
F Street	City	Major Collector	--	Local	Local

It should be noted that there are several streets in Independence that were identified as planned arterials and collectors in the 2007 Independence TSP as well as other more recent planning documents. These streets include Mountain Fir Avenue, Marigold Street, and F Street. While these streets are shown as local streets in Figure 3 and Table 1, they are treated as higher classification streets by the City. One outcome of the TSP update will be the reclassification of these streets as appropriate.

Special Transportation Areas

In addition to the functional classifications identified above, the segment of OR 51-Main Street from B Street to Monmouth Street and the segment of OR 51-Monmouth Street from Main Street to 4th Street are designated as Special Transportation Areas (STA) by the Oregon Highway Plan (OHP). Per the OHP, an STA is a designated district of compact development located on a state highway within an urban growth boundary in which the need for appropriate local access outweighs the considerations of highway mobility.

Commercial Centers

The segment of OR 51-Monmouth Street from 10th Street to east of 17th Street is designated as a Commercial Center (CC) by the OHP. Per the OHP, a CC is a large, regional center or node with limited access to the state highway. CCs generally include a high level of regional accessibility and connections to the local road network and accommodates pedestrian and bicycle access and circulation and, where appropriate, transit movements. These centers are intended for commercial or mixed commercial/retail/ office activities, which may include public uses, public buildings, and leasable land. The primary objective of the state highway adjacent to a CC is to maintain through mobility, regional accessibility, and connectivity to the local road network. In addition, pedestrian, bicycle, and transit access and circulation should be provided along a CC.

Roadway Characteristics

State Highway Approach Permits

State highway approach permits along OR 51 are discussed in *Tech Memo 3B: Existing Conditions Analysis*.

Number and Width of Travel Lanes

The number and width of travel lanes along ODOT and City facilities varies throughout the City. The number of travel lanes along arterial and collector facilities is shown in Figure 4. In general, all roadways have two to three lanes within the UGB, including roadways with unmarked centerlines. Travel lane widths vary between 11 and 19 feet depending on the presence of bike lanes, on-street parking, and shoulder width; the 19-foot travel lanes include unmarked on-street parking.

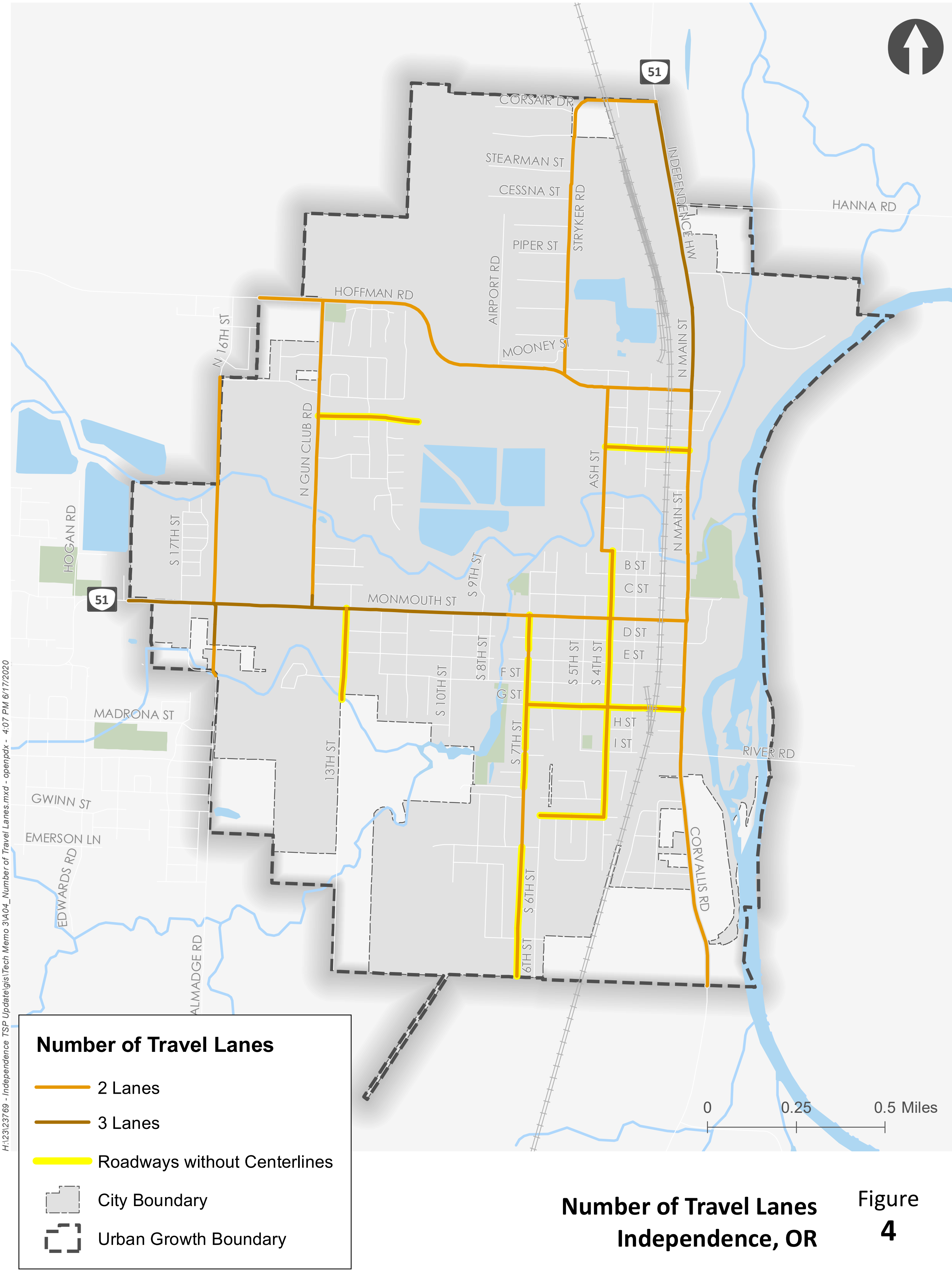
Posted Speed Limits

Speed limits typically correspond with the functional classification of the roadway. Roadways with higher functional classifications (e.g. arterials and collectors) typically have higher speeds than roadways with lower classifications (e.g. locals). The posted speed limits within Independence are shown in Figure 5. Roadways without a posted speed limit were assumed to be 25 MPH.

Pavement Type and Condition

Pavement type and condition information along ODOT facilities was obtained from the ODOT TransGIS database. Pavement type along ODOT facilities within Independence is Asphalt Concrete Unknown. Pavement condition reported for ODOT facilities within Independence show OR 51-Main Street in fair condition and OR 51-Monmouth Street in poor condition.

In 2015, the City of Independence conducted a pavement condition study of the 27.6 miles of roadway managed by the City Public Works Department. The study included a walking inspection using a qualitative rating system for pavement conditions along City facilities. The system rates facilities as good, fair, and poor. Based on data provided by the City, approximately 56% of City streets are rated in good condition, 22% are fair, and 22% are poor. Figure 6 illustrates pavement conditions in Independence for ODOT and City facilities.

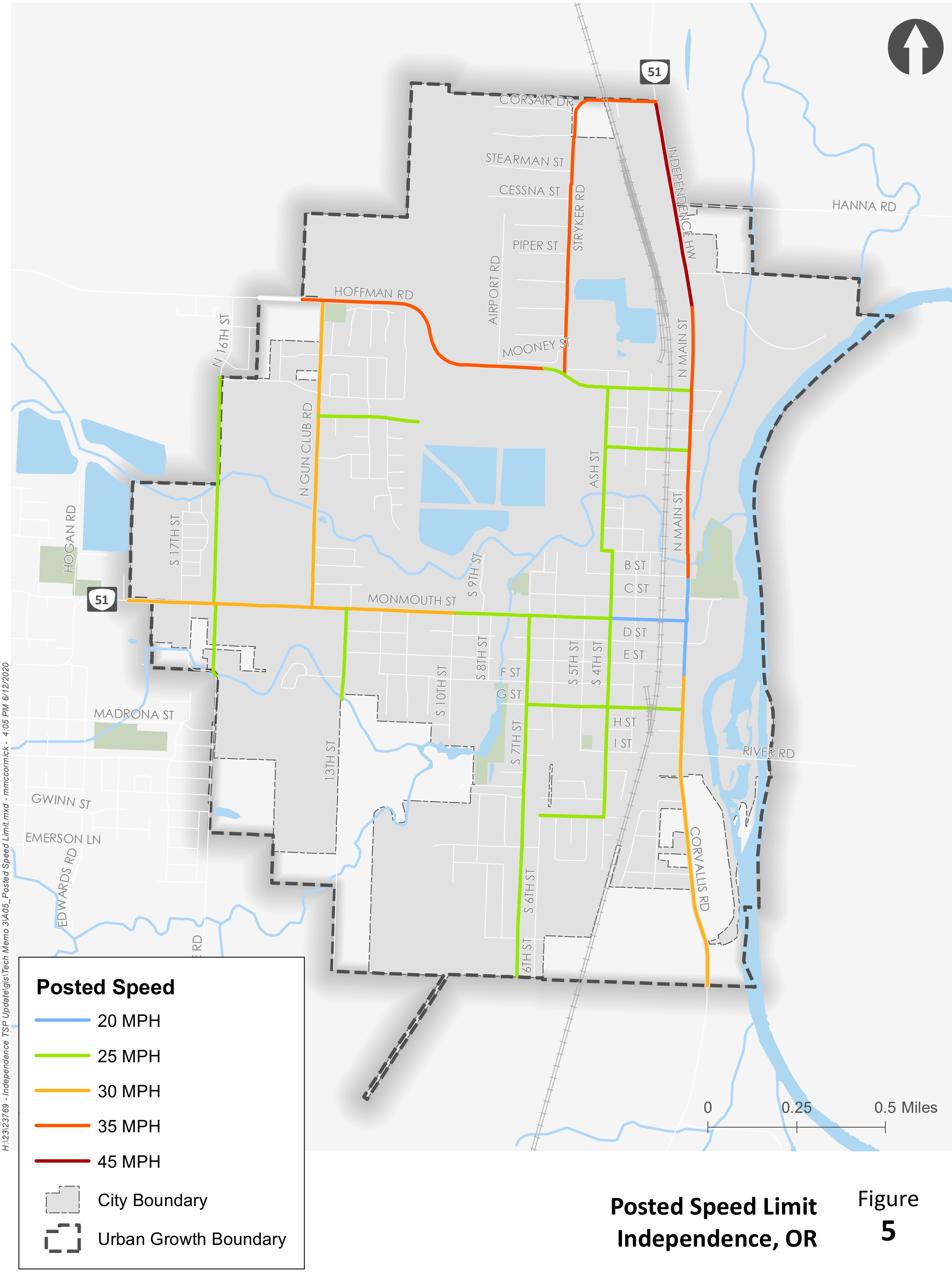


Number of Travel Lanes
Independence, OR

Figure
4

Data Source: Pok County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A04_Number of Travel Lanes.mxd - openpdx - 4:07 PM 6/17/2020

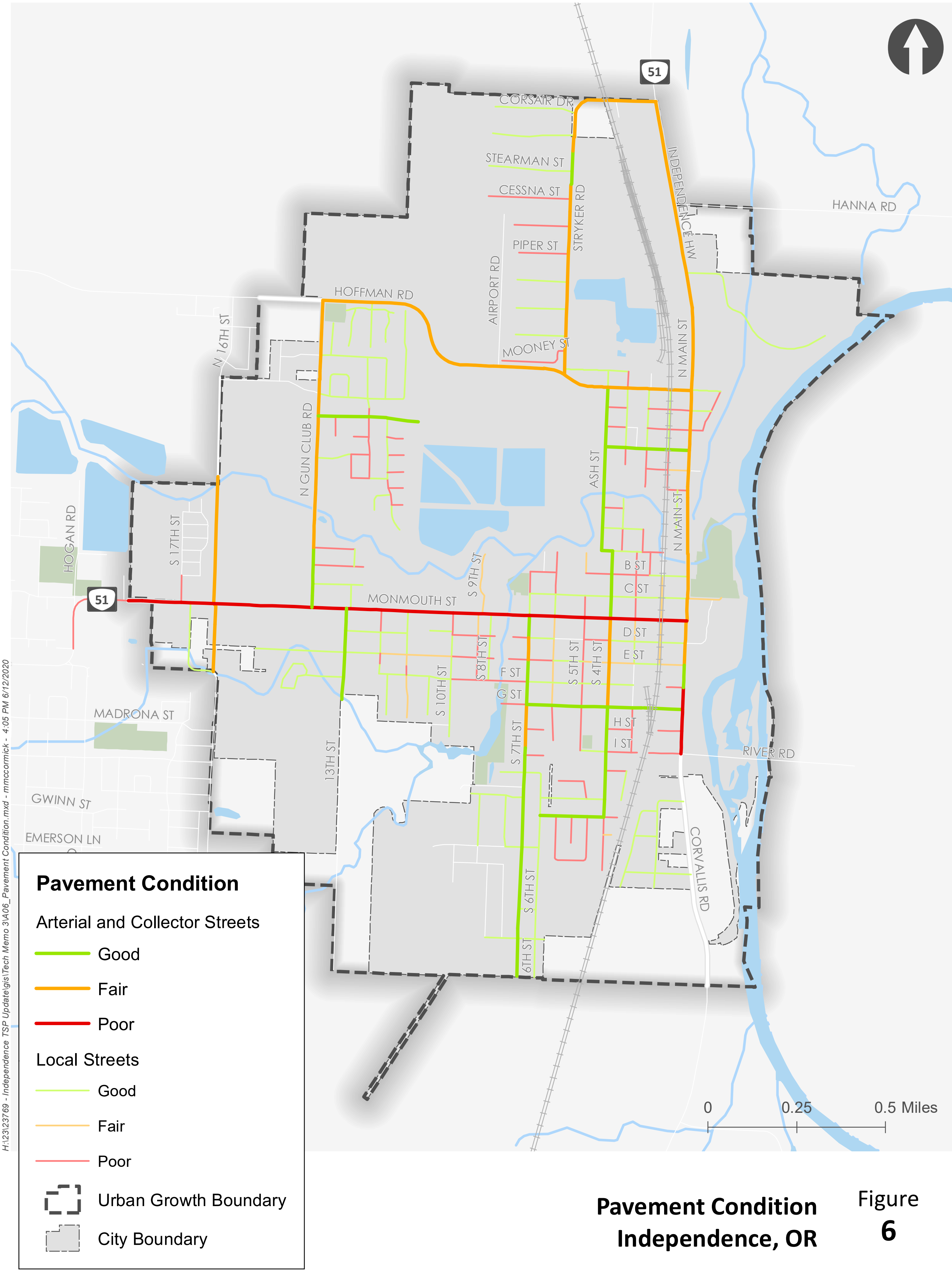


H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A05_Posted Speed Limit.mxd - mmccormick - 4:05 PM 6/12/2020

Posted Speed Limit
Independence, OR

Figure
5

Data Source: Pok County Data Portal, ODOT



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A06_Pavement Condition.mxd - mmccormick - 4:05 PM 6/12/2020

Pavement Condition
Independence, OR

Figure
6

Data Source: Pok County Data Portal, ODOT

Geometry for Study Intersections

The geometry of the study intersections included in the TSP update are discussed in *Tech Memo 3B: Existing Conditions Analysis*.

Traffic Control

The traffic control of the study intersection is shown in Figure 7 and further discussed in *Tech Memo 3B: Existing Conditions Analysis*.

On-Street Parking

On-street parking is prohibited along the majority of arterial and collector streets in Independence as shown in Figure 8. However, on-street parking is allowed in the downtown area along Main Street and Monmouth Street adjacent to commercial businesses. It is also allowed along several other arterial and collector streets throughout the city with wide travel lanes and/or a lack of bicycle facilities or striped shoulders.

Right of Way

Right-of-way refers to the overall width of roadway jurisdiction that typically expands beyond the physical roadway section and provides space for future roadway improvements, such as roadway widening, added bicycle or pedestrian facilities, etc. Right-of-way data is not readily available for all State and City facilities; however, the City has indicated that there is generally 66-feet of right-of-way available along City streets.

Intelligent Transportation System Facilities

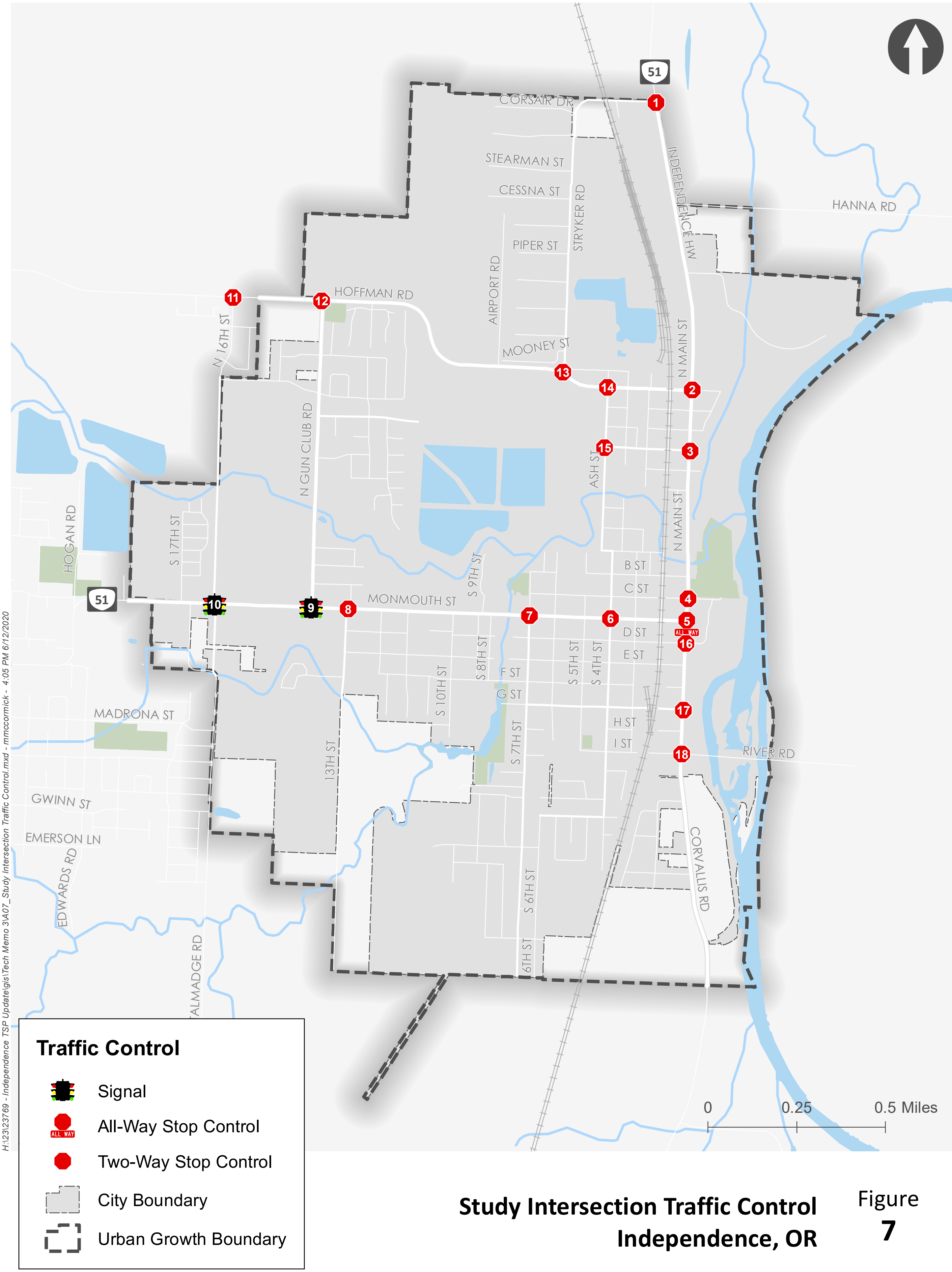
There are no Intelligent Transportation System (ITS) facilities within the City of Independence. The closest ITS facilities are located northeast and include cameras within Salem and variable message signs in support of I-5.

Freight Routes

The OHP identifies all interstate highways and certain Statewide, Regional, and District Highways as freight routes. These routes are intended to facilitate efficient and reliable interstate, intrastate, and regional truck movement through a designated freight route system. There are no OHP designated freight routes in Independence. The closest OHP freight route is OR 99W, which is a north-south roadway that passes through Monmouth. There are also no City designated freight routes in Independence; however, Hoffman Road-Polk Street, between the western UGB and OR 51-Main Street, operates as the primary local and regional route for trucks traveling through the city. Passive measures, such as the curb extensions in place at the intersection of Main Street and Monmouth Street, make truck turning movements difficult, providing a disincentive for trucks to remain on OR 51 when traveling through Independence.

National Highway System

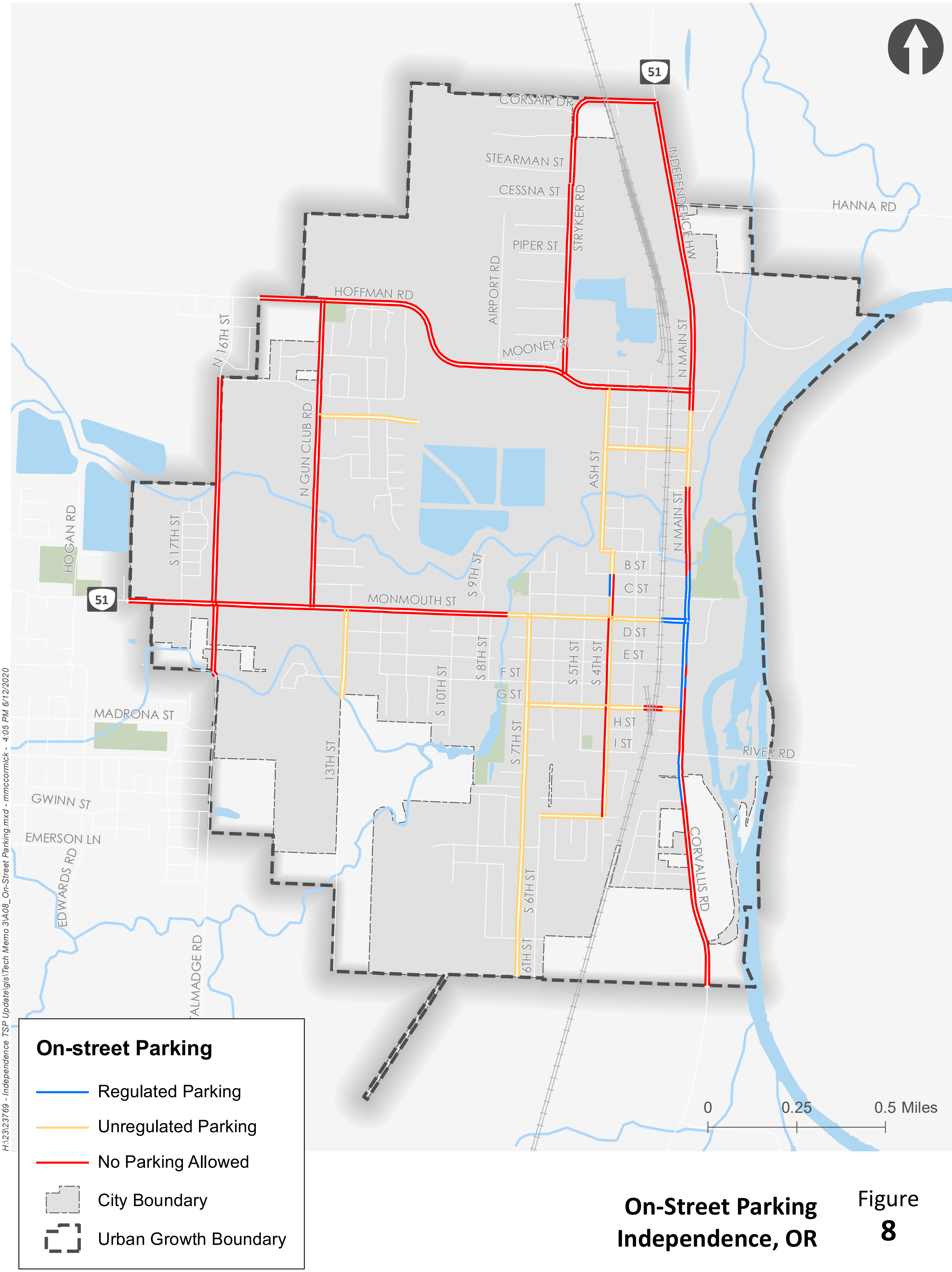
The National Highway System (NHS) is a network of highways, including interstate highways, that serve strategic economic, defense, and transportation facilities, such as airports, ports, rail or truck terminals, railway stations, and pipeline terminals. There are no NHS routes within Independence. The closest NHS route is OR 99W, which is a north-south roadway that passes through Monmouth.



Study Intersection Traffic Control
Independence, OR

Figure
7

Data Source: Pok County Data Portal, ODOT



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A08_On-Street Parking.mxd - mmccormick - 4:05 PM 6/12/2020

On-Street Parking
Independence, OR

Figure
8

Data Source: Pok County Data Portal, ODOT

Intermodal Connectors

Intermodal connectors are roadways that provide the "last-mile" connection between the NHS network and major intermodal freight facilities, such as ports, airports, and rail yards. There are no intermodal connectors within 50 miles of Independence. The closest intermodal connections are located in Portland and Eugene.

Existing Gaps and Deficiencies

The following provides a summary of the existing gaps and deficiencies in the roadway system:

- There are several inconsistencies in how various jurisdictions classify streets within Independence.
- Based on the 2015 pavement study, approximately 44% of City streets are rated as being lower than good condition, which is likely to have increased in the last five years. The following arterial and collector streets have pavement conditions rated as poor:
  - OR 51-Monmouth Street from western UGB to Main Street
  - Main Street from F Street to River Road

Additional gaps and deficiencies identified through discussions with Independence Planning Commission, include:

- River Road Bridge and integration with downtown is poor.
- Corvallis Road at the south end of town is fast and there are often bikes on road.
- Randall Way speeds are excessive.
- People travel fast from the north into town and sometimes maintain that speed into downtown.
- Polk and Main Street is dark in the winter and it is difficult to see pedestrians.

PUBLIC TRANSPORTATION INVENTORY

The public transportation system within Independence was inventoried based on information provided by Cherriots, as well as a review of recent aerial imagery and field observations. The inventory was supplemented by information provided in the 2007 Independence TSP.

Transit Service and Facilities

The public transportation system in Independence consists of fixed-route and demand-responsive service provided as part of the Cherriots Regional system. There are no other public bus or rail passenger services in the city. Cherriots operates the regional express routes and flex services, providing transportation options to Polk County and Marion County residents. All regional express routes connect to the Salem Downtown Transit Center and the Cherriots Local system.

In addition to the services provided by Cherriots, the educational institutions in the area provide services for their students.

- The Central School District 13J covers the cities of Independence and Monmouth, providing school bus service within and between the two cities. Students in Grades K-5 who live more than one mile from their school, and students in Grades 6-12 who live more than 1.5 miles from their school can receive bus services.
- Western Oregon University provides the WOLF Ride Program, which is operated by students and funded through student fees. The safe ride shuttle service is available on a first come, first served basis every day of the week from 5:00 p.m. to 12:00 a.m.

Cherriots Regional Route 40X: Polk County/Salem Express

Figure 9 shows the transit facilities and service in Independence. As shown, fixed-route transit service is provided along OR 51, Main Street, and Monmouth Street via Cherriots Route 40X: Polk County/Salem Express. The route operates along OR 22 and OR 51 between the Salem Downtown Transit Center and Independence and provides east-west service through Independence and Monmouth via Monmouth Street/OR 194. West of Monmouth, the route operates along Ridell Lane and Clow Corner Road between Monmouth and Dallas. The route operates Monday through Friday between 6:00 a.m. and 9:30 p.m. with eight daily trips with headways ranging from 60 to 180 minutes. Reduced service is provided on Saturday between 7:40 a.m. and 7:40 p.m. with four daily trips with headways ranging from 135 to 370 minutes. Route 40X does not operate on Sundays. For Cherriot's 2019 fiscal year (July 2018 through June 2019), Route 40X ridership was 42,000 boardings, which does not capture ridership changes due to the increased service that began in September 2019.

Cherriots provides five bus stops in Independence: two located at the intersection of N Main Street/N Polk Street, two near the public library at the intersection of Monmouth Street/S 2nd Street, and one stop serving both route directions at S 13th Street/Monmouth Street. All bus stops have a sign and pole designating the stop. In addition to signage, the three bus stops provided for service to Salem include shelters, trash receptacles, and posted schedules.

Cherriots Regional Polk County Flex Service

The Cherriots Regional Polk County Flex is an origin-to-destination service provided within and between the cities of Independence, Monmouth, and Dallas. Polk County Flex is available to all riders and does not require an application to use. The service operates on weekdays between 7:00 a.m. and 4:30 p.m., with alternating thirty-minute intervals between serving Independence/Monmouth and Dallas. Rides must be scheduled one business day before the trip by calling the Cherriots Call Center. To keep the bus on schedule, the number of rides may be limited, and reservations are taken on a first come, first served basis. The fare price for Polk County Flex service is the same as other Cherriots Regional services. For Cherriot's 2019 fiscal year, Polk County Flex ridership was 6,000 boardings.

Current Service Planning Efforts

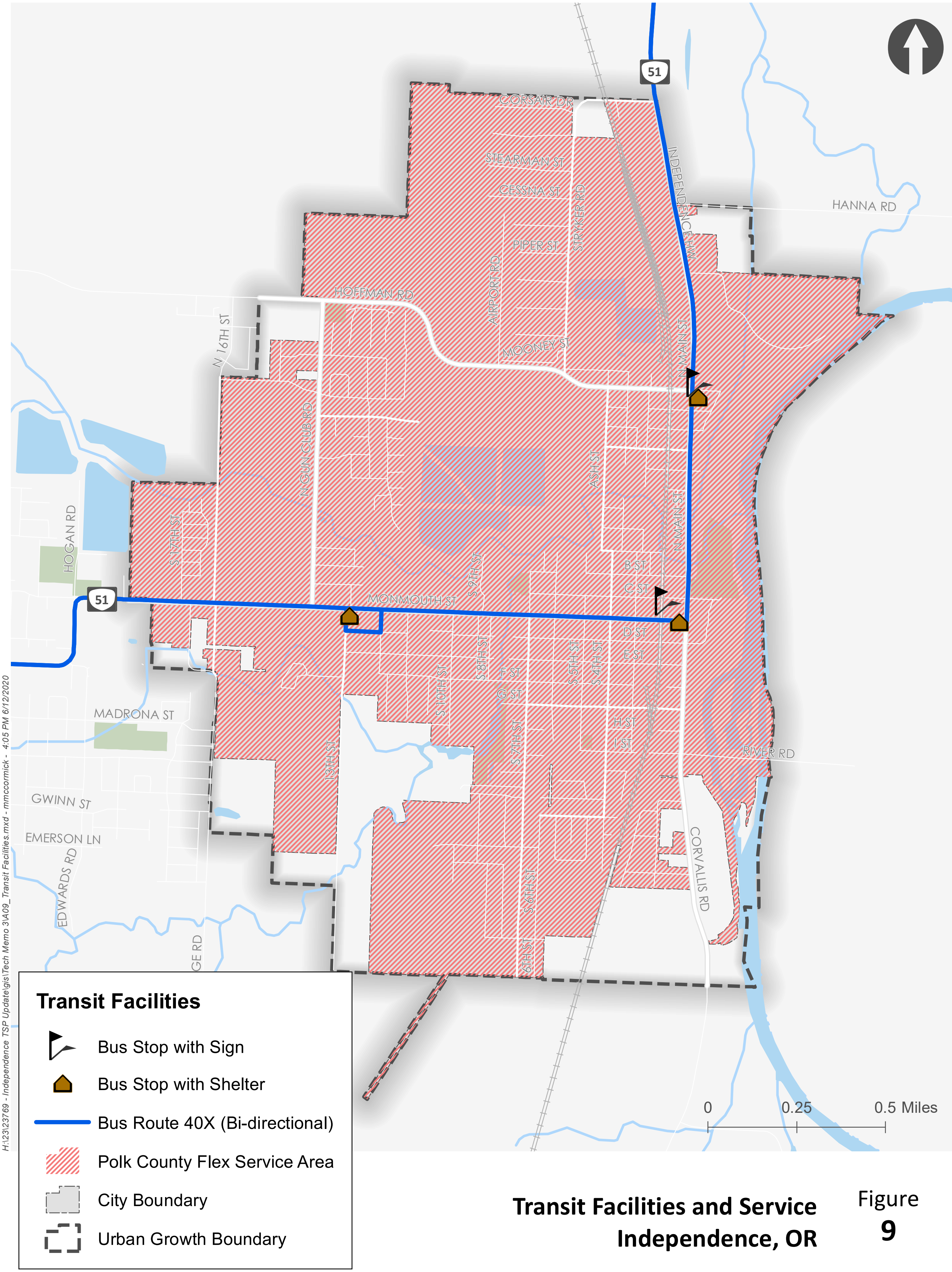
Cherriots has developed a new service plan, which would replace the Polk County Flex Service. Implementation slated for mid-year 2020.

In fall 2020, Cherriots plans to adjust the Polk County Flex to become a deviated fixed route service called Cherriots Regional Route 45: Central Polk County. The service change was first considered by Cherriots in February 2019. Before initiating route planning, a survey was conducted in summer 2019, which showed that the public was in favor of a service redesign. Cherriots staff worked with the cities of Independence, Monmouth, and Dallas and in coordination with ODOT to determine a route and bus stop locations. The service will operate on a fixed route, including 50 stops within the three cities, but will also allow riders to call beforehand and request service at any location within the Route 45 service area. Service will be provided on weekdays from 7:00 a.m. to 5:00 p.m. with 2-hour headways.

Paratransit Service

Cherriots does not provide paratransit service in Independence since Route 40X is classified as a "commuter express" service, which is exempt from the requirement to provide paratransit service. This type of service is limited to one to three stops in each city or rural community served. If more transit stops are desired for Independence, a service that satisfies the paratransit requirement should be provided, such as a deviated fixed-route.

H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A09_Transit Facilities.mxd - mmccormick - 4:05 PM 6/12/2020



Transit Facilities and Service
Independence, OR

Figure
9

Data Source: General Transit Feed Service

The current Polk County Flex and future Route 45 are exempt from the paratransit requirement because they are demand-responsive services that provide access within three quarters of a mile from the route path. The Polk County Flex is not paratransit since it is open to the general public, not just those who would be eligible for paratransit through the typical application process. For customers of all abilities who require pickup or drop-off for a location that is deviated from the designated route, they may call the Cherriotts Call Center to make a reservation one business day before the trip.

Rider Demographics

Cherriots conducted an on-board survey regarding fares in spring 2016. The survey showed that while existing users largely represent low-income populations, Route 40X riders come from a variety of age and racial groups. Table 2 shows the user characteristics provided through the survey for Route 40x, which reflects the input of 34 respondents.

Table 2: 2016 Survey of Cherriots Regional Route 40X User Characteristics

User Characteristic		Percent
Household Income Level	$0-$9,999	37.0%
	$10,000-$19,999	11.1%
	$20,000-$29,999	29.6%
	$30,000-$39,999	11.1%
	$40,000-$49,999	7.4%
	$50,000 or more	3.7%
Age	18 and under	2.9%
	19-34	53.0%
	35-64	38.2%
	65 and over	5.9%
Race	African American or Black	8.8%
	Asian	2.9%
	Native Hawaiian or Pacific Islander	8.8%
	American Indian or Alaska Native	8.8%
	White or Caucasian	52.9%
	Two or More Race Groups	5.9%
	Other	11.8%
Ethnicity	Hispanic or Latino	19.4%
	Not Hispanic or Latino	80.6%
Gender	Male	42.9%
	Female	57.1%
Primary Language Spoken at Home	English	82.4%
	Spanish	8.8%
	Other	8.8%

Source: Cherriots

Existing Gaps and Deficiencies

The following provides a summary of the existing gaps and deficiencies in the public transportation system:

- There is a lack of consistent marketing for existing public transit facilities and service in Independence (i.e. continued references to the previous CARTS regional bus system).
- Cherriots staff identified a service change need for the Polk County Flex service, which was verified by the public. Future Route 45 will fill this deficiency.
- Gaps and deficiencies in the pedestrian and bicycle systems that provide access to public transportation facilities as well as other key destinations in Independence are identified below.

PEDESTRIAN INVENTORY

The pedestrian system within Independence was inventoried based on GIS data obtained from ODOT, as well as a review of recent aerial imagery and field observations. The inventory was supplemented by information provided in the 2007 Independence TSP and by information provided by the City.

Pedestrian Facilities

Pedestrian facilities in Independence consists of sidewalks, shared-use paths, and off-street trails, as well as marked and unmarked, signalized and unsignalized pedestrian crossings. These facilities provide residents with the ability to travel between residential areas, schools, parks, churches, retail/commercial centers, and other essential destinations in Independence by foot. Figure 10 illustrates the location and type of pedestrian facilities in Independence. The following summarizes information on pedestrian facilities, including geometry, condition, and use, as well as consistency with state and local standards.

Sidewalks

Sidewalks are provided along at least one side of all arterial and collector streets in Independence, with only short segments where there are adjacent gaps on both sides of the roadway. Sidewalks are also provided along a majority of local streets, especially within the downtown area and adjacent to residential land uses.

Shared-use Paths and Trails

Shared-use paths and trails create circulation and connection systems for non-motorized travelers. These paths and trails also provide recreational opportunities for residents and visitors. The following shared-use paths and trails are located in Independence:

- **Ash Creek Trail:** Phase 1 of the Ash Creek Trail has been constructed and provides a half mile concrete path along Ash Creek, connecting 16th Street and Gun Club Road. The existing paved shared-use path is adjacent to Talmadge Middle School and Central High School. The full proposed Ash Creek Trail would provide an east-west connection between Independence and Monmouth, running from the Willamette River to Church Street W.
- **Willamette River Trail:** The Willamette River Trail is a three-mile paved shared-use path that connects the Riverview Park Amphitheater and the North Riverfront Ballfield Complex along the Willamette River. Access to the shared-use path is provided at Riverview Park at the Ash Creek pedestrian bridge, the dog park on Grand Street, and the Independence Boat Ramp on DeAnn Drive. The shared-use path is known for birdwatching and nature viewing opportunities.

- **Mt. Fir Park:** As part of the narrow park running north-south along South Fork Ash Creek, a paved shared-use path is provided from F Street to Becken Road. As described in Attachment A, Mt. Fir Park is an identified activity center for Independence.

Crosswalks

Marked crosswalks are located at several major intersections (signalized and unsignalized) and at key midblock locations, particularly within the downtown area and along Monmouth Street – most crosswalks on the state highways have not been approved by the State Traffic Engineer. Figure 10 shows the existing marked crosswalk locations. There are enhanced pedestrian crossings with overhead flashing beacons at the midblock crossing on Monmouth Street south of Central High School and the west leg crosswalk at the Monmouth Street/4th Street intersection. There is also an enhanced pedestrian crossing with rectangular rapid flash beacons (RRFBs) at the Polk Street/Stryker Road intersection.

ODOT inspected the curb ramps along Monmouth Street and OR 51-Main Street in 2016 and found all curb ramp locations to be in poor condition or missing. A similar inspection is not available for City facility curb ramps

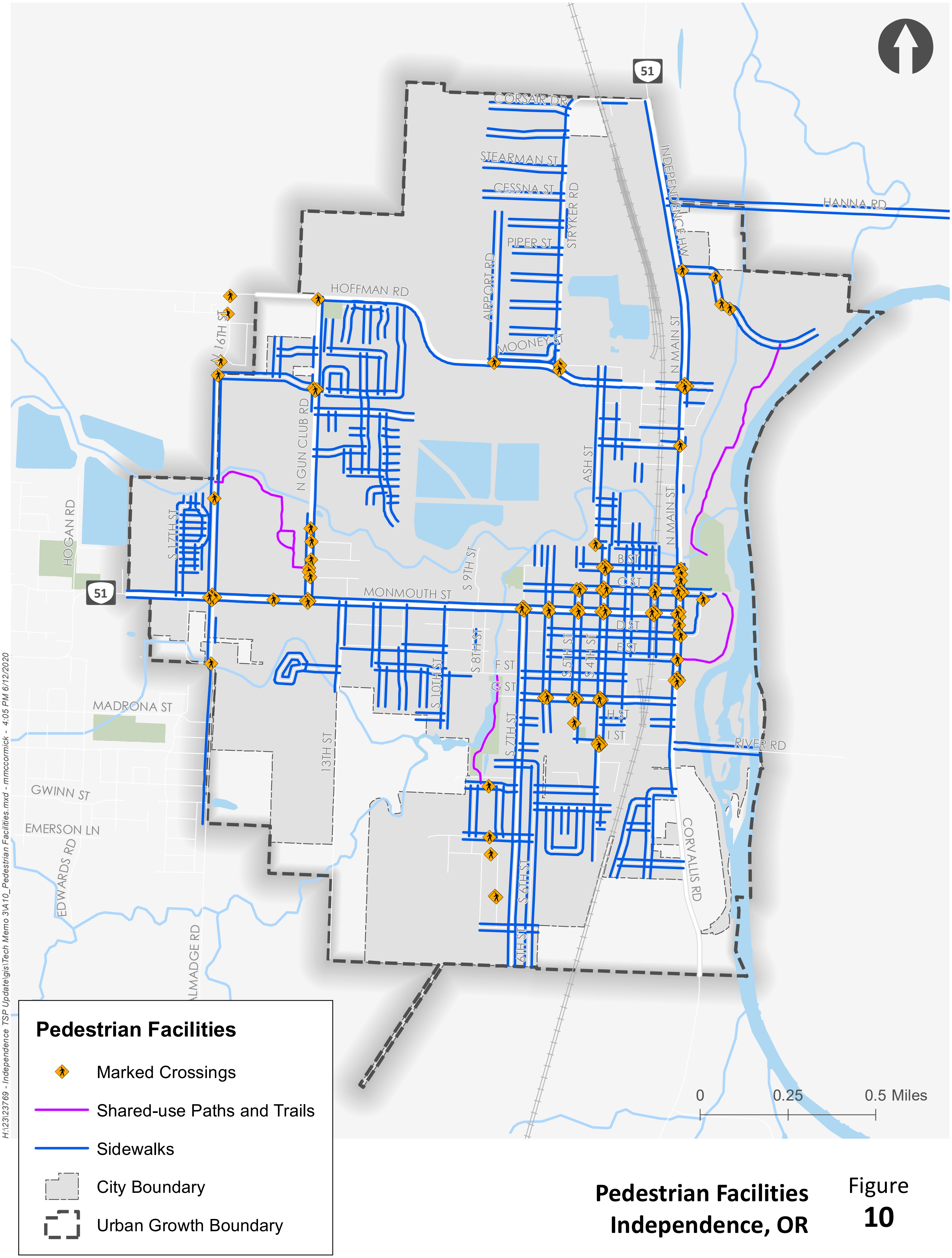
Safe Routes to School

The Monmouth-Independence Safe Routes to School Program is a collaboration between the two Cities, the Independence Police Department, the Independence Traffic Safety Commission, and Central School District 13J (the joint school district between the two Cities). The purpose of the program is to integrate health, fitness, environmental awareness, and safety into one collective program.

The Safe Routes to School Program focuses on engineering, encouragement, enforcement, and education to enable children to walk and cycle to school. As part of the program, the City of Independence is working to:

- Hold encouragement activities,
- Address school-related safety concerns through the traffic safety commission,
- Integrate walking and cycling safety education into the classroom,
- Increase traffic enforcement around the schools, and
- Construct a safe off-street route for pedestrian travel.

Midblock crossing south of Central High School including overhead flashing beacons and a crossing guard. *Source: Google Earth*



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A10_Pedestrian Facilities.mxd - mmccormick - 4:05 PM 6/12/2020

Pedestrian Facilities
Independence, OR

Figure
10

Data Source: Pok County Data Portal, ODOT

Pedestrian Activity

Traffic counts conducted at the study intersections include the total number of pedestrians that entered the intersections in 15-minute intervals. Table 3 summarizes the pedestrian crossing volume data for the evening peak period (2:00 to 6:00 p.m.) based on the pedestrian peak hour for each individual intersection (the map IDs shown in Table 3 correspond to the map IDs shown in Figure 1).

As shown in Table 3, the highest pedestrian crossing volumes were observed at intersections located along Monmouth Street near the commercial and institutional land uses and on Hoffman Road-Polk Street at the crosswalk that connects a large parking lot to industrial land uses. Potential pedestrian improvements should be prioritized at these locations to ensure safe and convenient access for pedestrians.

Table 3: Pedestrian Crossing Volumes at Study Intersections

Map ID	Intersection	Pedestrian Peak Hour	East/West Volume	North/South Volume
ODOT Study Intersections				
1	OR 51/Stryker Road	4:15-5:15 p.m.	--	1
2	OR 51/Polk Street	4:15-5:15 p.m.	10	--
3	Main Street/Williams Street	2:00-3:00 p.m.	--	6
4	Main Street/C Street	3:00-4:00 p.m.	25	7
5	Main Street/Monmouth Street	4:15-5:15 p.m.	8	17
6	Monmouth Street/4th Street	4:30-5:30 p.m.	8	2
7	Monmouth Street/7th Street	3:00-4:00 p.m.	41	8
8	Monmouth Street/13th Street	2:00-3:00 p.m.	30	4
9	Monmouth Street/Gun Club Road	2:00-3:00 p.m.	74	67
10	Monmouth Street/16th Street	2:00-3:00 p.m.	166	143
City Study Intersections				
11	Hoffman Road/16th Street	4:45-5:45 p.m.	1	--
12	Hoffman Road/Gun Club Road	2:00-3:00 p.m.	6	--
13	Hoffman Road/Stryker Road	4:30-5:30 p.m.	1	96
14	Polk Street/Ash Street	3:30-4:30 p.m.	7	1
15	Ash Street/Williams Street	2:00-3:00 p.m.	7	9
16	Main Street/D Street	3:45-4:45 p.m.	4	20
17	Main Street/G Street	4:30-5:30 p.m.	--	10
18	S Main Street/River Road S	3:45-4:45 p.m.	--	7

Pedestrian Generators and Routes

The primary pedestrian generators align with the activity centers described in *Attachment A*. Schools, parks, and community amenities generate multimodal trips, especially when there are redundant networks that support all modes. Main Street, Monmouth Street, 16th Street, 7th Street, and 4th Street are key city pedestrian routes due to the presence of continuous pedestrian facilities adjacent to activity centers.

Existing Gaps and Deficiencies

Adequate pedestrian facilities, such as continuous sidewalks, marked crossings, and ADA-compliant ramps, should be provided to allow for convenient and safe travel between neighborhoods, activity centers, and essential destinations. The following provides a summary of the existing gaps and deficiencies in the pedestrian system:

- There are several pedestrian ramps throughout the city are not ADA-compliant and should be brought into compliance.
- There are several major (and minor) intersections that do not provide marked pedestrian crossings, such as the Monmouth Street/13th Street, Gun Club Road/Picture Street, and Ash Street/Polk Street intersections.
- There are several arterial and collector streets that currently do not have sidewalks along one or two sides of the roadway. These streets include:
    - OR 51-Main Street from northern UGB to B Street – gaps on east side
    - Main Street from F Street to southern UGB – gaps on both sides
    - OR 51-Monmouth Street from Main Street to 3rd Street – gaps on north side
    - Gun Club Road from Hoffman Road to Northway Street – gaps on west side
    - Hoffman Road from western UGB to Airport Road – gaps on north side
    - Polk Street from Ash Street to OR 51-Main Street – gaps on both sides
    - Stryker Road from OR 51-Main Street to Polk Street – gaps on both sides
    - Williams Street from Log Cabin Street to March Street – gaps on north side
    - Ash Street from Albert Street to A Street – gaps on west side
    - 4th Street from I Street to Spruce Avenue – gaps on east side
    - 13th Street from E Street to southern UGB – gaps on both sides
- Several of the gaps and deficiencies identified above limit connectivity between residential areas and activity centers throughout the city, including schools, parks, and transit stops.

Additional gaps and deficiencies identified through discussions with Independence Planning Commission, include:

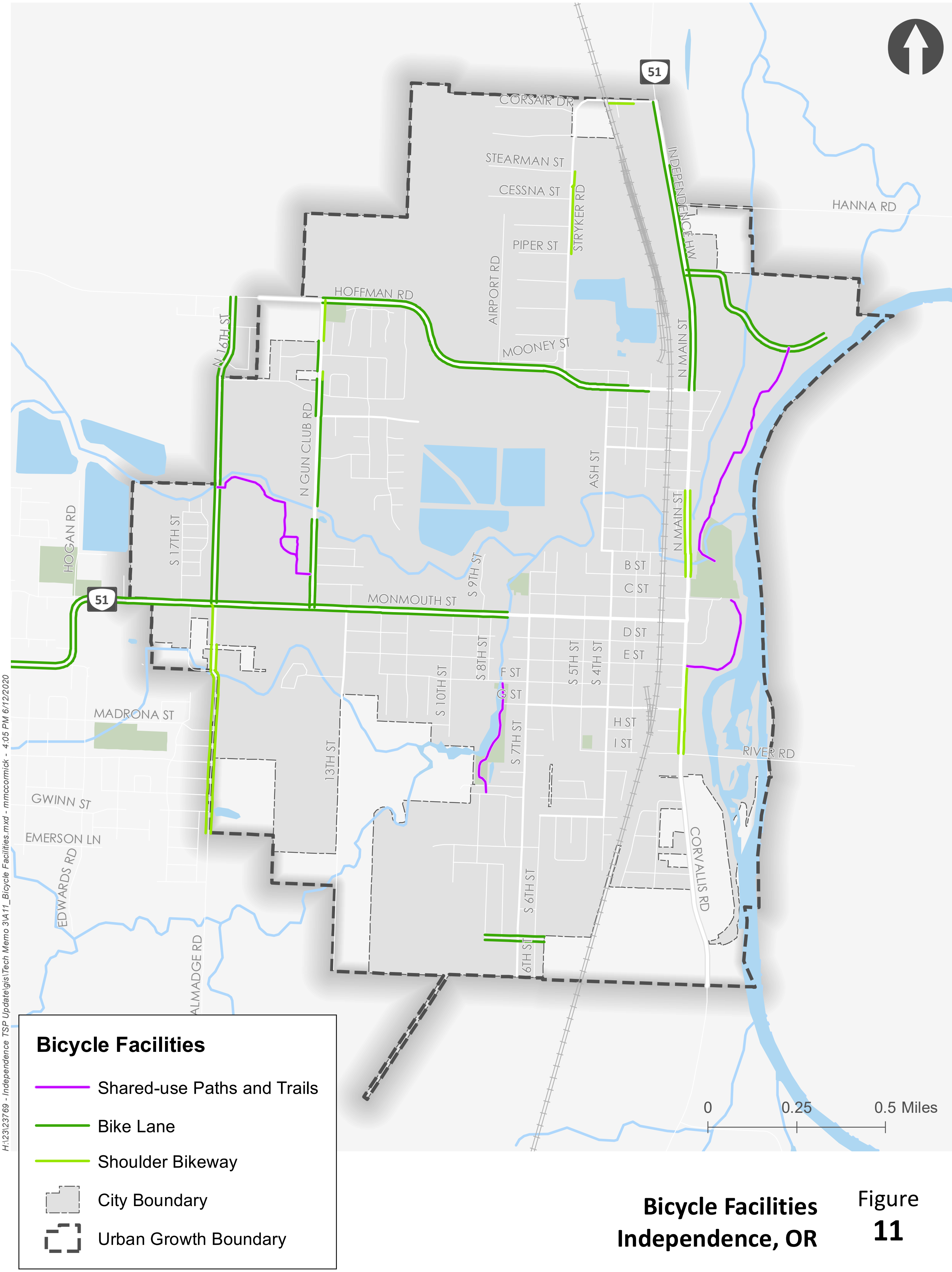
- G Street poor pedestrian crossing. People try and beat traffic on Main Street.
- Crosswalks in the downtown are not visible.
- There is no pedestrian connection into Central Plaza from the Gun Club/Monmouth intersection.

BICYCLE INVENTORY

The bicycle system within Independence was inventoried based on GIS data obtained from ODOT, as well as a review of recent aerial imagery and field observations. The inventory was supplemented by information provided in the 2007 Independence TSP and by information provided by the City.

Bicycle Facilities

Bicycle facilities in Independence consist of on-street bike lanes, shoulder bikeways, and unmarked shared roadways, as well as off-street shared-use paths and trails and bicycle parking. These facilities provide residents with the ability to travel between residential areas, schools, parks, retail/commercial centers, and other activity centers within Independence and neighboring cities by bike. Figure 11 illustrates the location and type of bicycle facilities in Independence.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A11_Bicycle Facilities.mxd - mmccormick - 4:05 PM 6/12/2020

Bicycle Facilities
Independence, OR

Figure
11

Data Source: Pok County Data Portal, ODOT

Bike Lanes

On-street bike lanes are located along a few arterial and collector streets in Independence, including Main Street, Monmouth Street, Gun Club Road, 16th Street, and Hoffman Road-Polk Street. These designated facilities include bike lane striping and bicycle symbols. Bike lane width and condition information along the State and City facilities is limited; however, aerial imagery shows that the bike lanes are generally 5 to 6-feet wide and appear to be in fair to good condition.

Shoulder Bikeways

Shoulder bikeways are located along short segments of arterial and collector streets in Independence, including Main Street, Stryker Road, Gun Club Road, and 16th Street. All striped shoulders could be considered shoulder bikeways; however, shoulder bikeways can range from 4 to 8-feet wide depending on the functional classification of the roadway and ADT. Shoulders that are less than 4-feet wide should not be considered shoulder bikeways. Shoulder width and condition information along the State and City facilities is fairly limited; however, aerial imagery shows that the shoulders are generally 4 to 6-feet wide and are in fair to good condition.

Shared Roadways

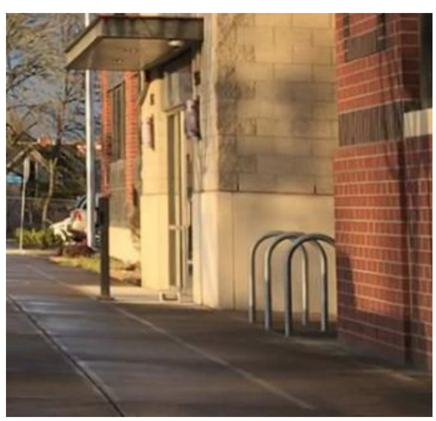
There are no roadways with shared lane pavement markings (“sharrows”) in Independence. However, all roadways that lack bike lanes or shoulder bikeways could be considered shared roadways. Shared roadways typically have posted speed limits of 25 miles per hour (MPH) or less and average daily traffic (ADT) of 2,000 vehicles or less, as noted in the City’s Public Works Design Standards.

Within Independence, this includes the majority of local streets as well as a few arterial and collector streets. Streets with higher travel speeds or traffic volumes should not be considered shared roadways. The 2007 Independence TSP does not identify any shared roadways; however, with posted speed limits of 25 MPH and/or ADTs of 2,000 or less, these roadways could be considered shared roadways:

- Williams Street
- Ash Street
- 4th Street
- 7th Street
- 13th Street
- Spruce Avenue

Bicycle Parking

The majority of bicycle parking provided on arterials and collectors in Independence is located along OR 51 in downtown and adjacent to local businesses. The typical bicycle parking stalls along OR 51 can accommodate up to five bicycles and are in good condition.



Bicycle Activity

Traffic counts conducted at the study intersections include the total number of cyclists that entered the intersections in 15-minute intervals. Table 4 summarizes the bicycle crossing volume data for the evening peak period (2:00 to 6:00 p.m.) based on the bicycle peak hour for each individual intersection (the map IDs shown in Table 4 correspond to the map IDs shown in Figure 1). As shown in Table 4, the highest bicycle crossing volumes were observed at intersections located along Monmouth Street near the commercial and institutional land uses.

Table 4: Bicycle Crossing Volumes at Study Intersections

Map ID	Intersection	Bicycle Peak Hour	North/South Volume	East/West Volume
ODOT Study Intersections				
1	OR 51/Stryker Road	5:00-6:00 p.m.	2	--
2	OR 51/Polk Street	--	--	--
3	Main Street/Williams Street	3:15-4:15 p.m.	--	1
4	Main Street/C Street	--	--	--
5	Main Street/Monmouth Street	5:00-6:00 p.m.	--	1
6	Monmouth Street/4th Street	2:00-3:00 p.m.	--	2
7	Monmouth Street/7th Street	2:45-3:45 p.m.	1	5
8	Monmouth Street/13th Street	4:30-5:30 p.m.	--	2
9	Monmouth Street/Gun Club Road	2:00-3:00 p.m.	5	--
10	Monmouth Street/16th Street	4:30-5:30 p.m.	1	4
City Study Intersections				
11	Hoffman Road/16th Street	--	--	--
12	Hoffman Road/Gun Club Road	--	--	--
13	Hoffman Road/Stryker Road	3:15-4:15 p.m.	1	--
14	Polk Street/Ash Street	3:15-4:15 p.m.	2	--
15	Ash Street/Williams Street	3:15-4:15 p.m.	1	1
16	Main Street/D Street	4:30-5:30 p.m.	4	--
17	Main Street/G Street	4:30-5:30 p.m.	--	1
18	S Main Street/River Road S	--	--	--

Bicycle Generators and Routes

The bicycle generators in Independence include the activity centers described in *Attachment A*. Monmouth Street west of 7th Street and 16th Street are primary bicycle routes in the city due to the presence of bicycle facilities adjacent to schools and commercially zoned areas. The majority of activity centers are located in the historic district of downtown Independence, which is not supported by on-street bike lanes, shoulder bikeways, or designated shared roadways.

Two major regional bikeways run north-south adjacent to Independence, outside of the UGB. The Willamette Valley Scenic Bikeway is located on the east side of the Willamette River. A shared-use path is located on the west side of OR 99W, with the southern end connecting to existing sidewalks in Monmouth at Church Street E.

Existing Gaps and Deficiencies

Streets with no bicycle facilities or intermittent bicycle facilities force cyclists to share the travel lane with motor vehicles or use the shoulder if available. In many cases, this is not a desirable option for cyclists due to narrow lane widths or uneven pavement conditions. Adequate bicycle facilities should be provided to allow for safe travel between neighborhoods and essential destinations. The following provides a summary of the existing gaps and deficiencies in the bicycle system:

- There are no designated and marked shared roadways on streets where the speed and traffic conditions would support mixed traffic.
- There are gaps in the bicycle facilities provided on the following streets:
  - OR 51-Main Street from Polk Street to Monmouth Street – gaps on both sides
  - OR-51-Monmouth Street from west of 7th Street to Main Street – gaps on both sides
  - Gun Club Road from Hoffman Road to south of Ash Creek – gaps on both sides
  - Hoffman Road from western UGB to Gun Club Road – gaps on both sides
  - Polk Street from Walnut Street to OR 51-Main Street – gaps on both sides
- There are no bicycle facilities provided on the following arterial and collector streets:
  - Main Street from Monmouth Road to River Road
  - Corvallis Road from River Road to southern UGB
  - Williams Street from Ash Street to OR 51-Main Street
  - Ash Street from Polk Street to A Street
  - 4th Street from A Street to Spruce Avenue
  - 7th Street from Monmouth Street to Mountain Fir Avenue
  - 13th Street from Monmouth Street to southern UGB
  - G Street from 7th Street to Main Street
  - Spruce Avenue from 6th Street to 4th Street
- Several of the gaps and deficiencies limit connectivity between residential areas and bicycle destinations throughout the city, including schools, parks, and transit stops.
- Local connectivity to regional bicycle facilities is lacking.

Additional gaps and deficiencies identified through discussions with Independence Planning Commission, include:

- It is hard to ride a bike on Monmouth Street with and without the bike lane. The grates go into the bike lane and make it difficult to ride along the road.
- Not fun to ride a bike on North Main Street. Speeds too fast.
- Bike system is disjointed. Makes car the only option.
- Bike connection from south part of town east of the railroad is very poor. Have to ride on sidewalks to get into downtown.

AIR TRANSPORT INVENTORY

The air transport system within Independence was inventoried based on the March 2020 Draft Independence State Airport Master Plan. The inventory was supplemented by information provided in the 2007 Independence TSP and by information provided by the City.

Air Facilities

There is one airport located in Independence. The Independence State Airport is located on the northern edge of the City and accommodates light single- and multi-engine aircraft weighing less than or equal to 12,500 pounds. Although the majority of the airport property resides within the City's UGB, a small portion stretches across the northern UGB boundary. The airport is owned, operated, and maintained by the Oregon Department of Aviation. The single north-south paved runway is 2,935 feet long by 60 feet wide.

The airport does not have an instrument landing system, so operations are limited to visual flight rules. There is no scheduled service provided by commercial air carriers.

Nearby Land Use Implications

There is a residential airpark development located on the east side of the airport. The airpark development currently has 90 homes with hangars and has attained national recognition. As shown in *Attachment A*, the zoning within the residential airpark includes a Residential Single Family Airport Overlay zone designed to minimize "exposure to crash hazards and high noise levels generated by air field operations by encouraging future development which is compatible with the continued operation of airfields, and established Airpark development" (Independence Development Code).

The City of Independence also has an Airport Safety and Compatibility Overlay Zone, intended to "support the continued operation and vitality of public use airports with only visual approaches by establishing compatibility and safety standards to promote air navigational safety at Independence State Airport and to reduce potential safety hazards for persons living, working or recreating near such public use airports." The Overlay Zone includes an airport approach zone, a fan-shaped area extending from the end of the runway for a distance of 4,000 feet and to a width of 1,250 feet. The Overlay Zone also includes an airport clear zone, a fan-shaped area extending from the edge of the airport for a distance of 1,000 feet and to a width of 312.5 feet. The width of both zones at the end of the runway is 250 feet. The northern zones are located mainly in Polk County, but the southern zones extend over Independence. The southernly clear zone extends to Monmouth Street.

Existing Gaps and Deficiencies

The March 2020 Draft Independence State Airport Master Plan provides a range of improvements to support the airport operations, which will be discussed in future technical memorandums focused on project alternatives and development.

RAIL INVENTORY

The rail system within Independence was inventoried based on GIS data obtained from ODOT. The inventory was supplemented by information provided in the 2007 Independence TSP and by information provided by the City and the ODOT Rail Division.

Rail Facilities

There is one rail line in Independence. The line runs north and south, parallel to OR 51-Main Street before crossing OR 51-Monmouth Street. South of OR 51-Monmouth Street, the line continues running parallel to Main Street and Corvallis Road, veering to the west as it approaches the southern UGB. The line provides freight service for a large variety of commodities including forest products, iron and steel products, feed grains, fertilizers, and some manufactured consumables, such as food products. No rail passenger service is currently provided in Independence.

Owners and Operators

Union Pacific is the owner of the rail line. It has been leased to Portland & Western Railroad (P&W) since 1993 for operation and maintenance.

Classification

The rail line is classified as a secondary line. P&W is a Class III railroad under the Surface Transportation Board's economic classification regime (Classes I, II and III). With over 500 miles in operation, P&W qualifies to be designated as a "regional" railroad.

Track Condition and Speed

The track condition allows for Federal Railroad Administration Class 2 operations, which permits freight train operation at 25 MPH and passenger train operation at 30 MPH. In 2007, P&W's goal was to maintain its Independence trackage, at a minimum, to Federal Railroad Administration Class 2 standards.

Speed

For the 0.9-mile segment of the rail line through Independence, speed is restricted to 10 MPH until the last car of the train exits 2nd Street.

Rail Activity

Schedule

The rail line does not have a set schedule, but there is at least one train per day each direction between Albany and McMinnville, six days a week. Local railroad switchers, small locomotives used to assemble, disassemble, and move railroad cars, travel between Rickreall and Corvallis on occasion. Although the line connects through to Portland, it has not been operated east of Newberg (over Rex Hill) for several years. Consequently, P&W operates as if Willamina/McMinnville/Newberg were disconnected from the rest of the railroad network. Rail traffic from Newberg has decreased in recent years; however, rail traffic still being received at Rickreall.

Industries Served

The major industries served are Willamina Lumber Co. and Cascade Steel Rolling Mill. Commodities are dimension lumber, scrap metal, steel fence posts and rebar, animal feed and agriculture products, such as fertilizer.

Rail Crossings

There are nine rail crossings in Independence and approximately 2.5 miles of track within the UGB. All crossings are at-grade. The rail line traverses some of the oldest sections of the City. The track runs adjacent to Main Street, including a quarter mile section that runs down 2nd Street. Table 5 summarizes the characteristics of the rail crossings along 2nd Street. Figure 12 illustrates the location of the rail crossings in Independence. In addition to the at-grade crossings described in Table 5 and Figure 12, there is one rail bridge location crossing Ash Creek east of A Street.

Table 5: Rail Crossings in the City of Independence

Map ID	Location	ODOT Crossing Number	Type	Crossing Surface Material
1	Stryker Road, west of OR 51	F-710.9	Gated with flashing lights	Paved
2	Polk Street/Marsh Street	F-710.05	Gated with flashing lights	Paved
3	Williams Street/Marsh Street	F-709.88	Gated with flashing lights	Paved
4	B Street/2nd Street	F-709.54	Passive-sign protected	Paved
5	C Street/2nd Street	F-709.48	Passive-sign protected	Paved
6	OR 51-Monmouth Street/2nd Street	F-709.4	Gated with flashing lights	Paved
7	D Street/2nd Street	F-709.34	Passive-sign protected	Paved
8	E Street/2nd Street	F-709.28	Passive-sign protected	Paved
9	G Street, west of OR 51	F-709.2	Gated with flashing lights	Paved
10	G Street, west of OR 51	F-709.2-C	Passive-sign protected	Paved

The configuration of the railroad crossings results in temporary interruptions on the major east-west routes when trains pass through Independence. Interruptions in east-west traffic on OR 51-Monmouth Street also leads to interruptions to north-south traffic on OR 51-Main Street.

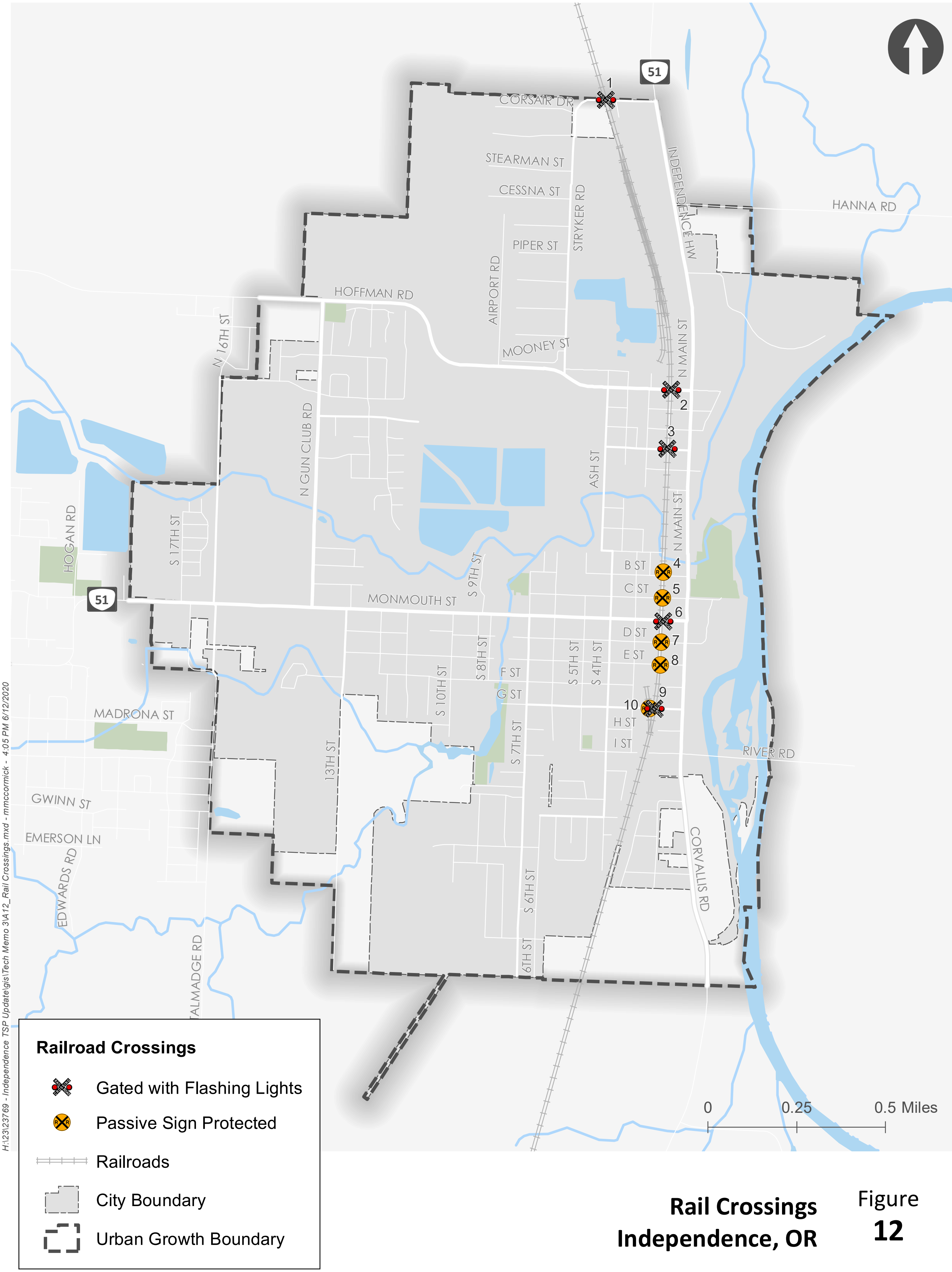
Existing Gaps and Deficiencies

The following gaps and deficiencies were discussed in the 2007 Independence TSP for the rail system:

- Community concern regarding:
  - Line maintenance, especially pavement maintenance on 2nd Street
  - Speed of trains through town
  - High frequency of railroad crossings, particularly the passively protected crossings
  - Potential compromised emergency response capabilities should a train become stalled on the tracks and block crossings. The fire and police stations are located west of the track, which gives them access to most of the city. However, trains can delay and/or cause detours for emergency vehicles trying to reach the eastern edge of town, including the downtown, waterfront park, residences and businesses
- Although the rail line is actively used for freight, no passenger rail service is provided.

WATER TRANSPORTATION

Independence is located on the Willamette River, which has functioned as a transportation facility in the past. Currently, no freight shipping or passenger service occurs on the river, and a limited amount of recreational use, such as kayaking, of the river occurs. Independence has previously investigated the possibility of recreational use of the river oriented towards water transportation. Independence will continue to promote recreational use of the river and investigate the feasibility of river transportation and promote recreational use of the river.



Rail Crossings
Independence, OR

Figure
12

Data Source: Pok County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\A12_Rail Crossings.mxd - mmccormick - 4:05 PM 6/12/2020

PIPELINE TRANSPORTATION

Independence has no major regional pipeline facilities within the UGB. Monmouth has water and sewer mains that traverse Independence. Independence will cooperate with Monmouth regarding their sewer and water line needs.

FREIGHT GENERATORS INVENTORY

Freight generators include industrial sites, distribution centers, truck terminals, and businesses that ship or receive a significant amount of freight. The industrial area on the north side of town is the city's primary origin and destination for freight.

Major Commodities

Major commodities from Independence include dimension lumber, scrap metal, steel fence posts and rebar, animal feed and agriculture products such as fertilizer.

Intermodal Facilities

There are no intermodal facilities in Independence. The airport and Willamette River are primarily used for recreation and non-freight activities.

Connecting Roads

OR 51-Main Street and Hoffman Road-Polk Street experience heavy freight use in Independence.

Existing Gaps and Deficiencies

Although no state or federal freight routes run through Independence, the City should explore designating their own local routes in support of freight movement in Independence.

FUNDING INVENTORY

This section summarizes information on transportation funding in Independence. This information provides context for evaluating projects and defining priorities that will allow Independence to use all funding opportunities and maximize current resources to preserve and improve the transportation system.

Transportation revenue in Independence primarily consists of state revenue from the state gas tax, which was recently changed by House Bill (HB) 2017, and local revenue from a transportation system development charge (SDC). Increases in state revenues will depend primarily on gas consumption.

Table 6 illustrates the historical revenue sources for Fiscal Year (FY) 2010-11 through FY 2017-18 and includes estimates for FY 2015-16[1] and FY 2018-2019. The adopted FY 2019-2020 budget is also provided.

[1] Recorded historical values for revenue sources were not available on the City's website for FY 2015-2016 when this technical memorandum was completed. https://www.ci.independence.or.us/finance/budgets

Table 6: City of Independence Historical Revenue Sources

Revenue Source	FY 2010-2011	FY 2011-2012	FY 2012-2013	FY 2013-2014	FY 2014-2015[1]	FY 2015-2016	FY 2016-2017	FY 2017-2018	*FY 2018-2019[1]*	*FY 2019-2020[2]*
Work by City	--	--	$3,881	$1,990	--	--	--	--	--	--
Gas Tax	$395,958	$468,473	$469,337	$455,425	$496,479	$525,500	$541,077	$599,227	$677,000	$698,395
State Fund Exchange Program	$82,414	--	$180,535	$86,460	$50,291	$70,638	$78,687	--	--	$217,000
ROW Fee Allocation /Transfers In	--	--	--	$13,000	--	--	--	$165,794	$152,000	$153,750
Capital Loans	--	$216,844	$60,000	$100,000	$70,735	$75,000	$100,000	--	--	--
Investment Income	--	--	--	--	--	--	--	$1,416	$4,000	$3,000
Misc. Revenues	$1,700	$4,298	$1,713	$5,389	$127	$543	$3,070	--	$4,800	$4,800
Grants	--	$37,665	--	--	--	--	--	$5,000	--	$460,000
Transp. SDC Fund	$31,966	$35,106	$999,305	$468,514	$746,849	$127,089	$188,675	$87,978	$171,847	$172,316
Total	$512,038	$762,386	$1,714,771	$1,130,778	$1,364,481	$798,770	$911,509	$859,415	$1,009,647	$1,709,261

1. Estimated
2. Adopted Budget

State Transportation Revenue

The primary state revenue source is the state gas tax. State gas taxes are comprised of proceeds from excise taxes imposed by the state and federal government to generate revenue for transportation funding. The proceeds from these taxes are distributed to Oregon counties and cities in accordance with Oregon Revised Statute (ORS) 366.764, by county registered vehicle number, and ORS 366.805, by city population. The Oregon Constitution states that revenue from the state gas tax is to be used for the construction, reconstruction, improvement, maintenance, operation and use of public highways, roads, streets, and roadside rest areas.

Based on data provided by the City, total revenue from the state gas tax has increased steadily since fiscal year 2010-2011. The increase between 2015 and 2016 reflects an adjustment in the population estimate used by the state to determine the amount of funding to distribute to the City. While the population is expected to continue to increase by approximately 2.7 percent per year over the next several years (see *Attachment A*), revenue from the state gas tax depends on gas consumption, which is expected to go down over time.

Transportation System Development Charges

The primary local revenue source is from Transportation SDCs. Transportation SDCs are fees assessed on developments for impacts to the transportation infrastructure. All revenue is dedicated to transportation capital improvement projects designed to accommodate growth. The City can offer SDC credits to developers that provide public improvements beyond the required street frontage, including those that can be constructed by the private sector at a lower cost. For example, SDC credits might be given for providing off-site improvements, such as sidewalks and bike lanes that connect the site to nearby transit stops. Independence uses the revenue from SDCs on eligible projects that cannot be funded by other means.

ATTACHMENTS

A. Land Use and Population Inventory

Attachment A Land Use and Population Inventory

MEMORANDUM

Existing Conditions Inventory and Analysis (Technical Memorandum #3, Task 3.1)

Independence Transportation System Plan Update

DATE	May 14, 2020
TO	Project Management Team
FROM	Matt Hastie & Clinton "CJ" Doxsee, APG
CC	FILE

This memorandum includes an inventory of existing land use patterns, economic development opportunities, and population forecasts to help inform the analysis of transportation system needs in the City of Independence over the next 20 years. This information will also help the community and project team develop future alternatives that address transportation system deficiencies and identify the projects, programs, and policies needed to support economic development in a manner consistent with the City's existing Comprehensive Plan and Zoning. The land and population inventory identifies existing, planned, and potential future land uses and environmental constraints to development. The following information for the City of Independence is included:

- Vacant & Developable Land
- Zoning
- Natural Resources
- Activity Centers
- Historic and Projected Growth Patterns
- Title VI & Environmental Justice Populations
- Transportation Costs

Zoning (Current and Planned)

Current Zoning

The zoning map, shown in Figure 1, provides the location of zones within the City Limits. There are 13 zones shown on the map, depicting residential, commercial, industrial, public facility, and agricultural zones. Allowed uses and development regulations for each of the City's zones are provided for in the Independence Development Code and are summarized in Table 1. The City's zoning is intended to be informed by its Comprehensive Plan designations; however, the Comprehensive Plan does not elaborate on the intentions of the various land use designations shown on the comprehensive plan map.

Table 1: City of Independence Zoning Summary

Zone		Description
Residential Zones		
RS	Low-Density Residential	The purpose of the RS zone is to define and protect areas for low-density residential uses. Residential density in the zone is limited to eight units per acre.
RM	Medium-Density Residential	The purpose of the RM zone is to define and protect areas suitable for low or medium-density residential uses. Such areas are intended for the development and use of single-family dwellings and medium density residential structures such as duplexes, row houses, or townhouses. Residential density in the zone is limited to 12 units per acre.
RH	High-Density Residential	The purpose of the RH zone is to define and protect areas suitable for medium and high-density residential uses. Residential density in the zone is limited to 20 dwelling units per acre.
MX	Mixed Density	The purpose of the MX zone is to allow a creative mixture of housing styles and types. Development is encouraged to provide coordinated and attractive living environments that emphasize multi-modal circulation. The zone is intended to implement the SW Independence Concept Plan. Residential density requires a minimum average density of 9 units per acre and requires 15 percent of development be multi-family or attached single-family.
RSA	Residential Single-Family Airpark Overlay	The purpose of the RSA zone is to recognize the impacts and hazards associated with the operation of the Independence State Airport and related development. The zone promotes the public health and safety in the vicinity of airfields by minimizing exposure to crash hazards and high noise levels by encouraging future development that is compatible with airfields. Residential density in the zone is limited to three units per acre.

Zone		Description
Commercial Zones		
MUPC	Mixed-Use Pedestrian Friendly Commercial	The purpose of the MUPC zone is to allow a mixture of complimentary land uses, develop a friendly multi-modal environment, support downtown development, and to preserve natural areas.
DRZ	Downtown Riverfront Zone	The purpose of the DRZ zone is to allow a mixture of complimentary land uses, develop a friendly multi-modal environment, support downtown development, and to preserve natural areas
Industrial Zones		
IL	Light Industrial	The purpose of the IL zone is to define and protect areas suitable for a wide range of light manufacturing and related activities.
IH	Heavy Industrial	The purpose of the IH zone is to define and protect areas suitable for manufacturing and heavy industry; for uses which are potentially incompatible with most other land uses; or for uses which require major rail, truck, or aircraft shipping facilities.
IP	Industrial Park	The IP zone is intended to define and protect areas for manufacturing and related industrial activities that are designed to be compatible with surrounding land uses and the general community.
Other Zones		
PS	Public Services	The purpose of the PS zone is to define and protect areas suitable for structures and uses owned and operated by governmental agencies or for public uses and facilities serving the general community.
AG	Agriculture	The purpose of the AG zone is to provide areas for the continued practice of agriculture and permit the establishment of agriculturally compatible uses.
AD	Airport Development District	The AD zone is intended to accommodate the facilities necessary for general aviation purposes and to minimize potential dangers from, and conflicts with, the use of aircraft. The purpose of the zone is to encourage and support the continued operation of the airport by allowing compatible uses.
Overlay Zones		
	Downtown Overlay	The Downtown Overlay Zone applies to specific portions of the MUPC zone as defined in the Development Code. It provides additional restrictions and design standards for development within the overlay.

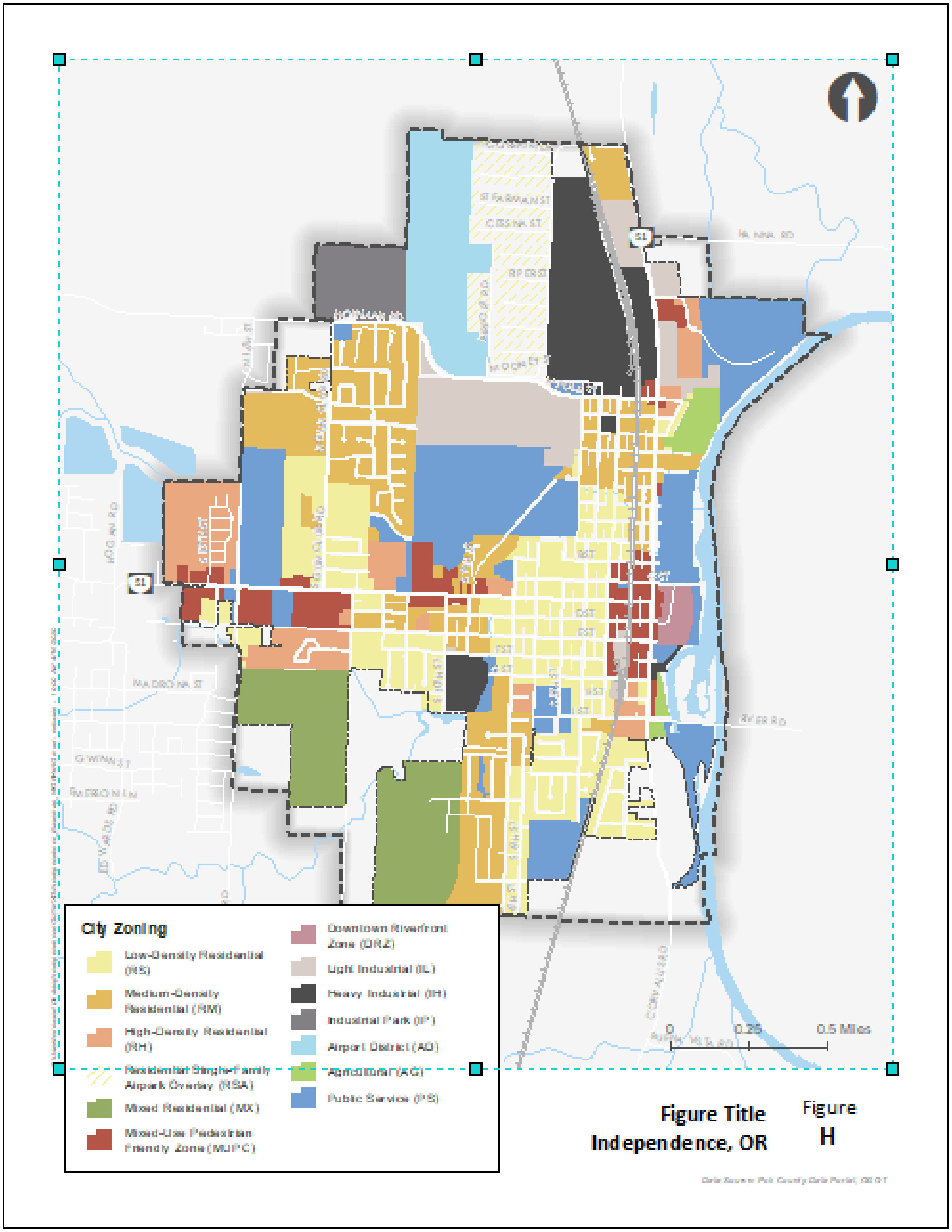
Most of Independence's land is zoned residential, with RM and RS zones being the predominant residential zone throughout the City. In addition, there is a large pocket of MX zoned land in the southwest corner of the City that is intended to implement the SW Independence Concept Plan. Areas with the RH designation are found near Monmouth Street, along I Street, on DeAnn Drive, around Falcon Loop, and near the western City boundary. The only RSA zoning is located adjacent to the airport to the east.

Commercial zones are either concentrated in the downtown area on 2nd and Main Streets or distributed along Monmouth Street. The City's downtown area is bounded on the north by A Street, bounded on the east by the Willamette River, bounded on the south by G Street and bounded on the west by 3rd Street, excluding Tax Lot No. 8428AC 00100 & Tax Lot No. 8428AB 02600. Most of the industrial zones are in the northern portion of the City, adjacent to the airport. A small heavy industrial zone is located near the southern City limits.

Planned Zoning

Land that is within the City's UGB but outside the city limits is regulated through Polk County rural zoning. A City of Independence zoning designation is applied at the time urban public services become available and the land is annexed into the city limits. Within the Southwest Area, the zone is planned to be Mixed Residential (MX), consistent with the SW Independence Concept Plan recommendations. Polk County zoning located within the City's UGB is primarily Suburban Residential or Exclusive Farm Use zoning. A small portion of land within the City's UGB is zoned Heavy Industrial.

Figure 1: Current Zoning



Vacant & Developable Land

The City of Independence provided the consultant team with an inventory of vacant land within the UGB. The vacant land inventory was supplemented to include an inventory of land that is potentially redevelopable over the planning horizon. The assumptions for identifying potentially redevelopable land include:

- Partially Vacant land has an improvement value of between 5% and 40% of the property's land value.

Note, the vacant and developable land summary does not deduct environmental constraints from amount of acreage. As such, the amount of vacant and redevelopable land shown here is likely higher than what is realistically developable. Information on vacant and redevelopable land should be considered within this context. For example, the SW Independence Concept Plan identified riparian buffers and wetlands as constraints and subsequently deducted from the overall amount of vacant land.

Table 2 provides a summary of vacant and redevelopable land by zoning. There are approximately 274 parcels comprising of approximately 702 acres of vacant or redevelopable land within the City of Independence. Of that, most of the available land is considered vacant; approximately 230 parcels comprising of approximately 594 acres. More than half of the vacant or redevelopable land is zoned MX – Mixed Residential[1] or does not currently have City zoning applied to it yet due to its location outside of City limits but inside the UGB. The amount of remaining vacant and redevelopable land among parcels in the City are fairly distributed between the zones, ranging from 19 acres of RS zoned land to 68 acres of IH zoned land. Outliers among this include RH and RSA zoned land at 10 and 6 acres respectively. As noted above, these estimated acreages do not reflect subtraction of areas constrained by natural constraints or hazards.

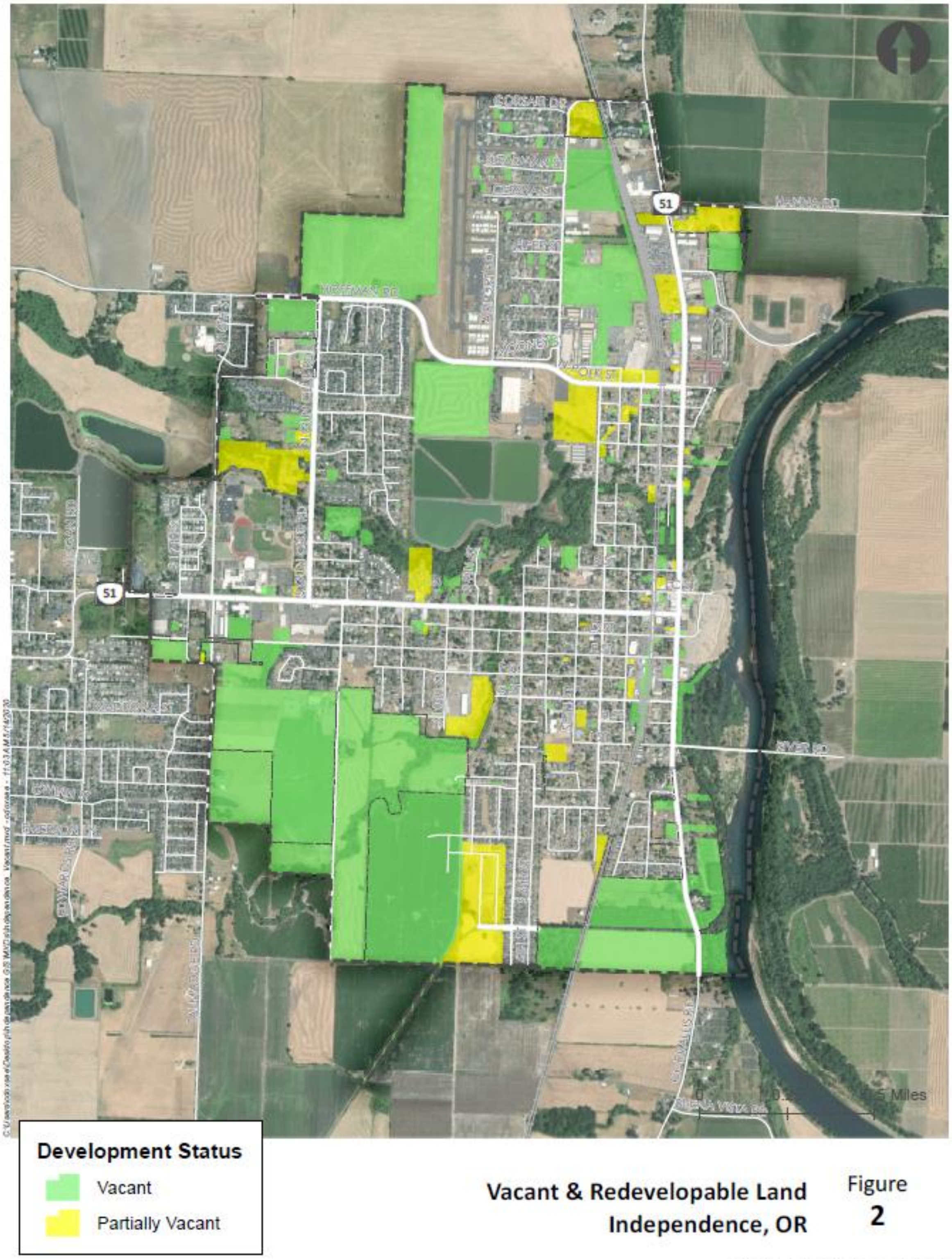
Table 2: Vacant Land

Zone	Tax Lots	Acres
RS – Low Density Residential	33	19
Partial	4	9
Vacant	29	10
RM – Medium Density Residential	62	46
Partial	8	32
Vacant	54	14
RH – High Density Residential	11	10
Partial	1	0
Vacant	10	10
MX – Mixed Residential	7	149

[1] The MX zoned is intended to implement the SW Independence Concept Plan, which is applied to land annexed into City limits.

Zone	Tax Lots	Acres
Vacant	7	149
RSA – Residential Single-Family Airpark Overlay	17	6
Vacant	17	6
MUPC – Mixed-Use Pedestrian Friendly Commercial	38	21
Partial	10	9
Vacant	28	12
IL – Light Industrial	12	47
Partial	3	14
Vacant	9	33
IH – Heavy Industrial	18	68
Partial	7	18
Vacant	11	50
IP – Industrial Park	1	43
Vacant	1	43
PS – Public Service	6	14
Partial	5	13
Vacant	1	0
AD – Airport District	2	41
Vacant	2	41
Not Zoned (Outside City Limits)	62	238
Partial	7	13
Vacant	55	225

Figure 2: Vacant & Developable Land



Natural Resources and Environmental Barriers

Existing natural resources and environmental features influence the siting, construction, and cost of transportation improvements. The following sections illustrate and describe areas within the City of Independence that may pose barriers to providing transportation access or improvements. The inventory is based on available GIS data, previous reports, and known resource sites.

Flood Zones

The City of Independence is an area subject to stream flooding, and the City participates in the National Flood Insurance Program. Stream flooding is an annual problem throughout Polk County and often occurs more than once a year, primarily during the winter months. Figure 3 provides the general location of FEMA flood zones in Independence. As shown, the base floodplain elevation (AE zone) exists along the Willamette River located on the eastern City boundary. It also extends west along Ash Creek, which traverses centrally across City limits. A portion of Ash Creek forks at the South Fork Ash Creek, which includes a mix of base floodplain elevation and areas subject to one percent annual chance of flooding (A zone).

Riparian Areas and Wetlands

Wetlands, including swamps, bogs, fens, marshes, and estuaries, perform important natural functions, such as controlling floodwater and cleaning and storing water. Wetlands also play a crucial role in healthy ecosystems by providing essential habitat for waterfowl, fish, amphibians, and many other animal and plant species. The State defines a wetland as an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions (OAR 660-023-0100).

The City of Independence completed a large wetland delineation study as part of the SW Independence Concept Plan and related UGB expansion effort. However, the City does not currently have an adopted Local Wetlands Inventory for all areas within the UGB. As such, existing wetland information for the City of Independence was supplemented with data from the National Wetlands Inventory (NWI). The NWI represents the extent, approximate location, and type of wetlands and deepwater habitats.

As shown in Figure 4, wetland areas are located in the same general locations as flood zones. Riverine wetland areas exist along the Willamette River and extend through the City along Ash Creek and South Fork Ash Creek. There are a mix of freshwater forested/shrub and emergent wetlands located along the riverine wetland areas throughout the City. In addition, there are several freshwater pond areas located in central/northern Independence north of Ash Creek and north of Polk Street.

Figure 3: FEMA Flood Zones

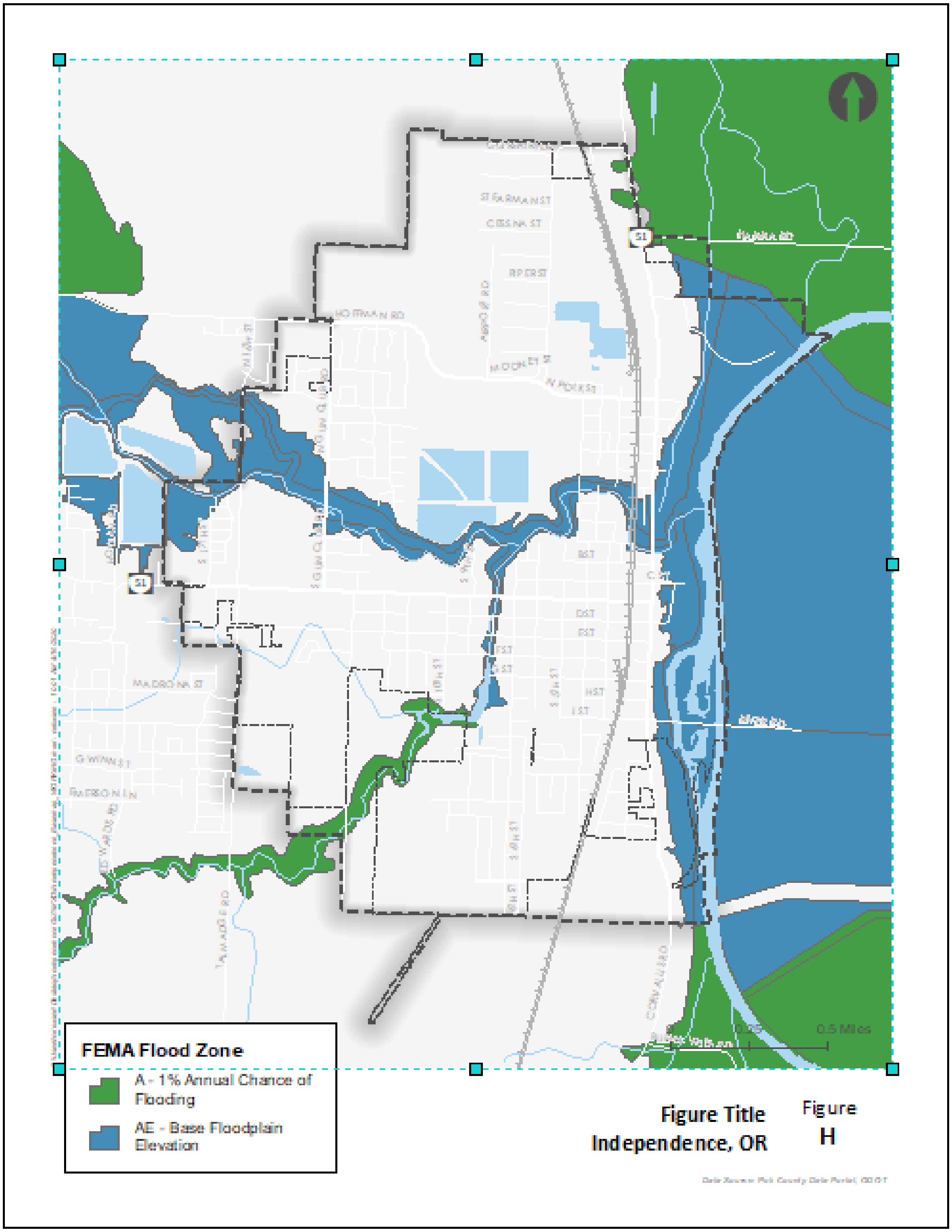
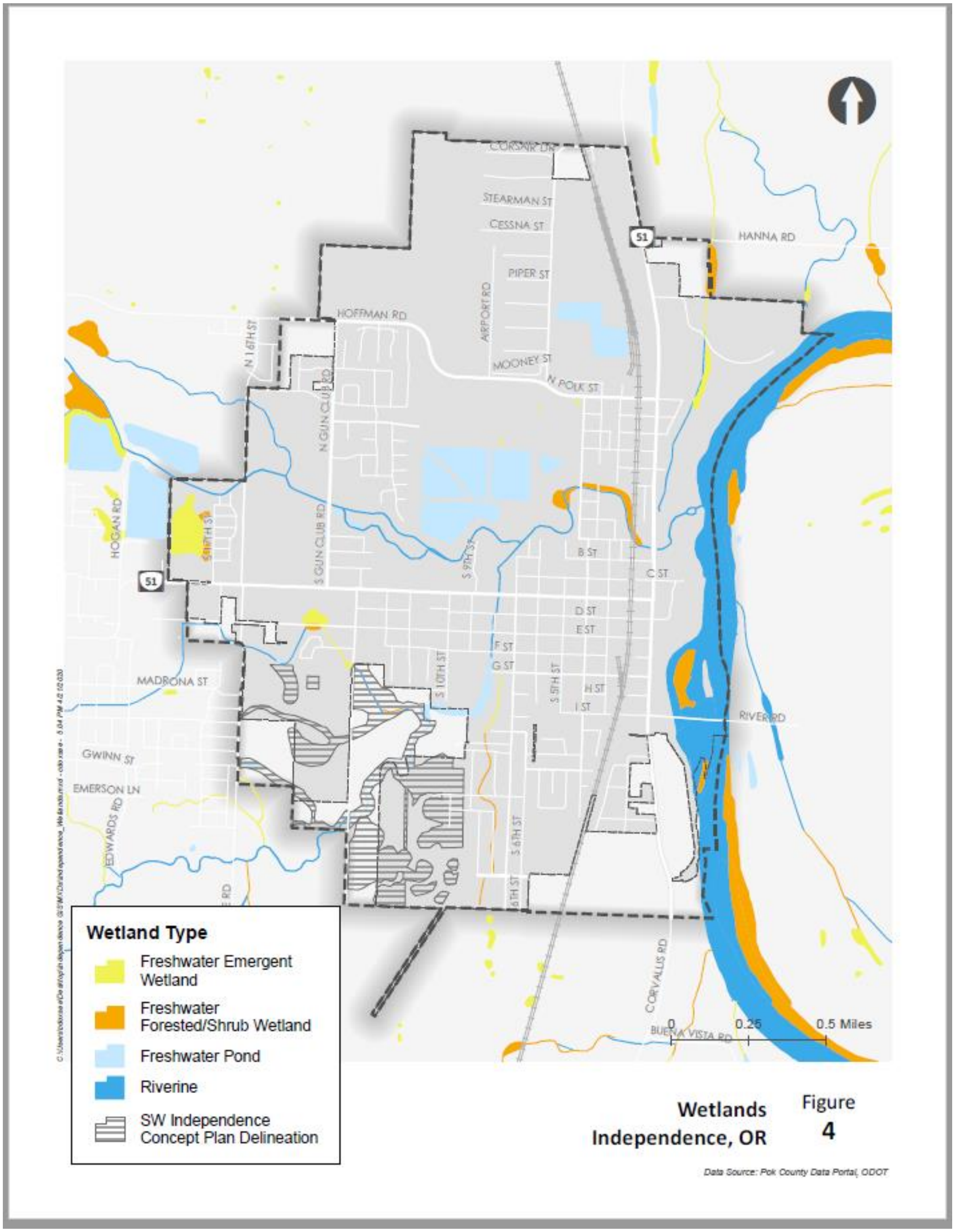


Figure 4: National Wetlands Inventory



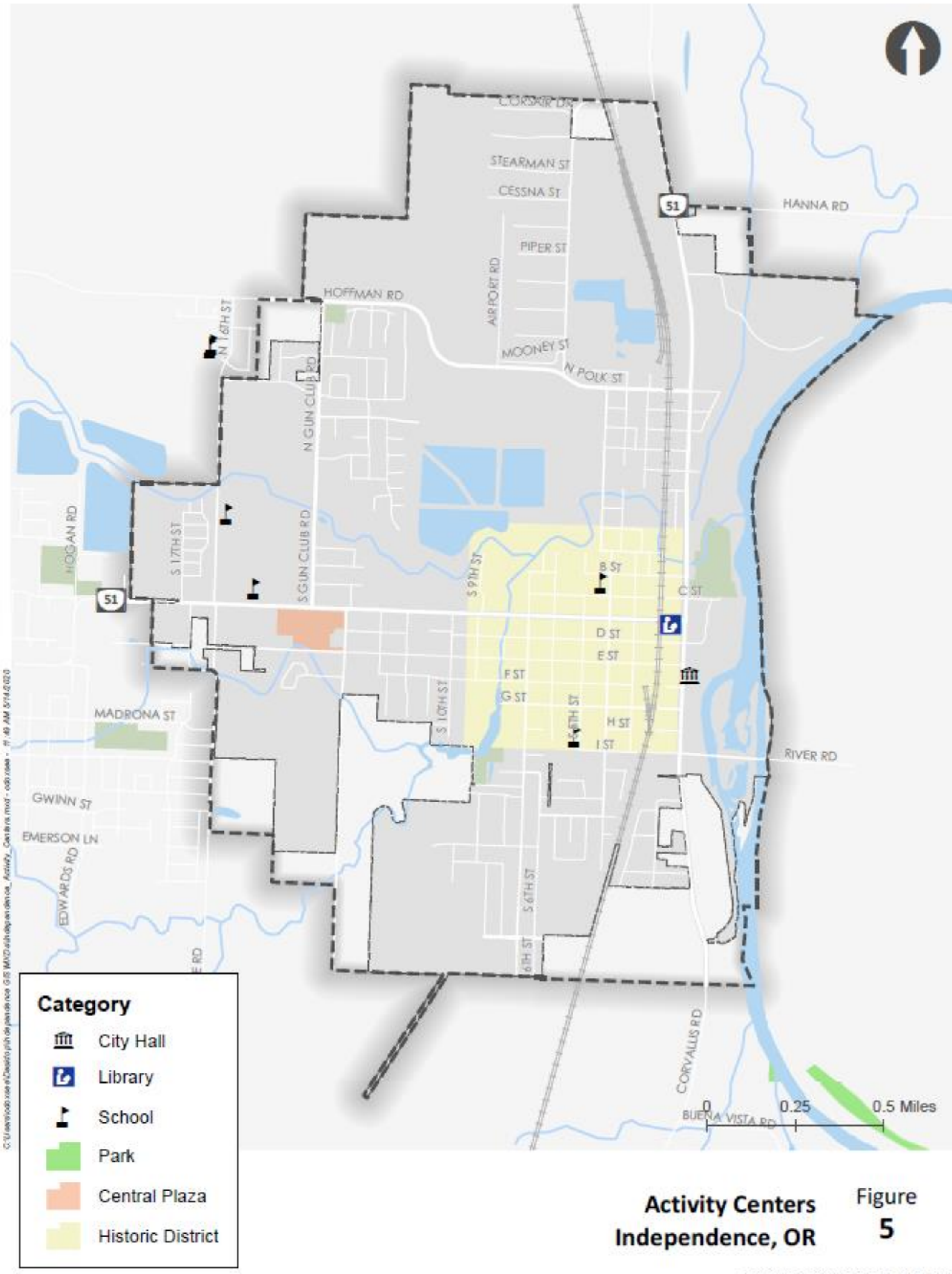
Activity Centers

Connecting residents and workers to services they use on a daily basis can be accomplished by well-considered land use and transportation planning. Activity centers where the transportation network should support multi-modal and accessible public transportation are shown in Figure 5. Key activity centers in the City of Independence include:

- Independence Public Library
- Independence Post Office
- Independence City Hall & Civic Center
- Central Plaza
- Independence Elementary School
- Ash Creek Elementary School
- Henry Hill Elementary School
- Talmadge Middle School
- Central High School
- Independence Heritage Museum
- Riverview Park
- Pioneer Park
- Henry Hill Park
- Mt. Fir Park
- John Pfaff Park

As shown in Figure 5, most of the activity centers in the City of Independence are clustered in and around the City's historic downtown area. Commercially zoned areas are located on the eastern edge of the historic downtown area and along Monmouth Street near the western City boundary. There are two key recreation sites located near the historic downtown area: Mt Fir Park and Riverview Park. Independence's schools are distributed throughout the UGB, with the high school located near the commercial area on Monmouth Street in the western portion of the City. Riverview Park includes a number of key facilities that draw both residents and visitors to the park – an amphitheater that host numerous local events, hiking and running trails, a bicycle-boater camping area, disc golf course, and boat launch. Central Plaza also is the site of a variety of activities and events.

Figure 5: Activity Centers



Historic and Projected Growth Patterns

Historic and projected population information was obtained from the Portland State University (PSU) Population Research Center (PRC).[2] By estimating future populations based on historic and current trends population, forecasts provide necessary information to help plan for the impacts of population growth in local areas. The PRC generates coordinated forecasts with a 50-year forecast horizon for Oregon counties and cities no less than once every four years. Forecasts are prepared and released in three groups, each consisting of roughly one-third of Oregon's counties. The most recent coordinated population forecast for Polk County was released in 2017.[3] Updated forecasts for Independence will be released in 2021.

Table 3 shows the 2000, 2010, and 2017 populations as well as the latest population projections, shown for 2035-2067, that were prepared in 2017 for Polk County. The table illustrates the City of Independence population and the total Polk County population. In 2017 Independence represented approximately 11.5% of the County's total population.

Table 3. Historic and Projected Population

Year	Independence UGB Population	Polk County Population
2000	6,035	62,380
2010	8,696	75,403
2017	9,326	81,089
2035	13,803	105,217
2067	21,741	149,203

Historic Population

As shown in Table 3, the population in Independence grew by approximately 3,291 people between 2000 and 2017—approximately 55% growth over that time. The City had a much higher average annual rate of growth between 2000 and 2010, compared to 2010 to 2017. Older historical data is available through U.S. Census population counts. As shown in Table 4, Independence's population increased from 4,024 in 1980 to 6,035 in 2000—an approximate 50% increase over 20 years with an average annual increase of approximately 2.5%, or approximately 2,011 people.

Table 4: U.S. Census Historic Population

Year	Independence Population
1980	4,024
1990	4,425
2000	6,035

2 https://www.pdx.edu/prc/home

3 https://www.pdx.edu/prc/sites/www.pdx.edu.prc/files/Lincoln_Report_2017_Final.pdf

Projected Population

Projected population is one of the primary tools for developing planning policies as well as determining future urban growth boundary expansions. PRC develops projected population forecasts based on historic and current trends, as well as assuming the likelihood of future events. Historically, Oregon law required counties to prepare coordinated population forecasts. In recent years, responsibility for coordinated population forecasting has been assigned to the PRC at Portland State University.[4]

Historically, Independence has grown at a faster rate than Polk County as a whole; 3.4% Average Annual Growth Rates (AAGR) in Independence between 2000 to 2010 compared to 1.9% AAGR in the County during the same period. AARG for 2017 through 2067 is expected to follow a similar trend. Average annual growth is projected to be 2.2% between 2017 and 2035, and 1.4% from 2035 to 2067. According to PSU's Coordinated Population Forecast Report, Independence is expected to capture an increasing share of Polk County's total population growth.

Table 5: Projected Population and Average Annual Growth Rate (AAGR)

	2017	2035	2067	Share of County 2017	Share of County 2035	Share of County 2067
Independence (UGB)	9,326	13,803	21,741	11.5%	13.1%	14.6%
Polk County	81,089	105,217	149,203	100%	100%	100%

As part of the analysis of future conditions, the net increase in projected population between 2020 and 2040 will be distributed throughout city based on the location of developable and redevelopable lands, existing zoning designations, and future assumptions about the number of people per household in different types of housing. Much of the future population is expected to be located in the Southwest Concept Plan area, given the supply of buildable land there. The net increase in projected population and households will be used to determine the transportation-related impacts of the increase in population.

[4] Oregon House of Representatives and Senate approved HB 2253, requiring the PRC to issue population forecasts for land use planning.

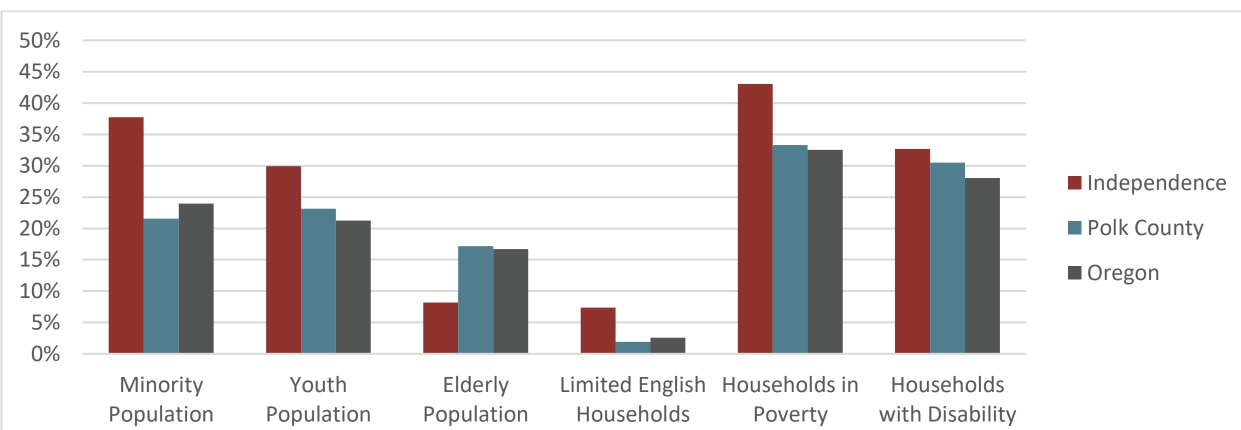
Title VI & Environmental Justice Populations

Title VI and Environmental Justice (EJ) populations are a special focus in transportation planning and project development. Identifying Title VI and EJ populations early on is intended to make participation in transportation planning and project development more inclusive of diverse communities. The analysis is also valuable in identifying the transportation needs that will provide the most benefits to identified populations. Six population groups are considered for transportation impact susceptibility, representing those who may rely more heavily on public infrastructure or transit for access to day-to-day needs and jobs. They include minority groups, low-income populations, populations under 17 or over 64 years of age, low-English proficiency households, and people with disabilities.

Demographic Summary[5]

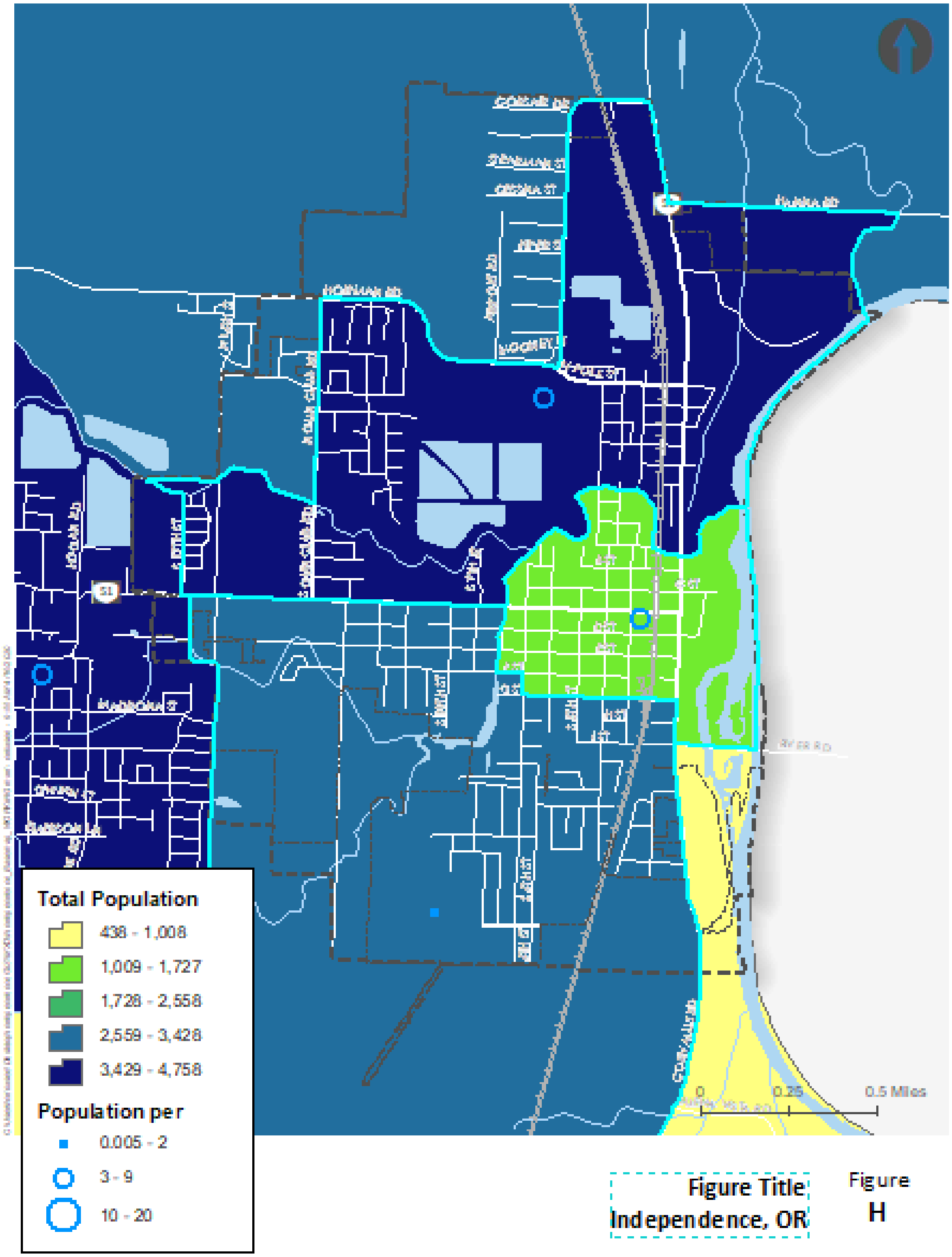
Independence has approximately 9,530 people as of 2019, according to Portland State University's Population Research Center. The highest concentration of people is located in Census Block Groups close together near the downtown area, with the highest density being approximately five people per acre (see Figure 7). Density in Northern Independence is approximately four people per acre, while density in Southern Independence is approximately two persons per acre. Population and population density are important considerations when evaluating and comparing EJ populations. A Census Block Group may have high percentage of a specific population, but may contain relatively fewer people in the area altogether. Conversely, a Census Block Group may have a large concentration of a specific population that may not be as prominently featured in the figures below due to the overall population in that area. The make-up of specific EJ populations in Independence is summarized in Figure 6.

Figure 6: Environmental Justice Summary



[5] Information provided in the EJ analysis includes a combination of data gathered from the American Community Survey. The American Community Survey (ACS) is conducted every year to provide a sample of up-to-date information about the social and economic needs. Given the relatively small sampling sizes in smaller communities like Independence, margins of error associated with ACS data can be moderately high.

Figure 7: Population Density



Minority Groups

Information on minority groups reflects Hispanic or Latino origins as well as race. Origin can be viewed as the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestors before their arrival in the US. People who identify their origin as Hispanic or Latino may be of any race. Data on race is based on racial classifications issued by the Office of Management and Budget. Race categories include white, black or African American, American Indian or Alaska Native, Asian, Native Hawaiian or other Pacific Islander, and some other race.

Table 6 summarizes the minority groups for the State of Oregon, Polk County, and the City of Independence. Compared to the state and Polk County, Independence has an overall higher share of minority groups; approximately 24 percent of the overall state and 22 percent of the county is of a minority race or ethnicity, compared to approximately 38 percent for Independence. Most of the minority population in the City is of Hispanic or Latino ethnicity (35 percent), more than double that of the state and county.

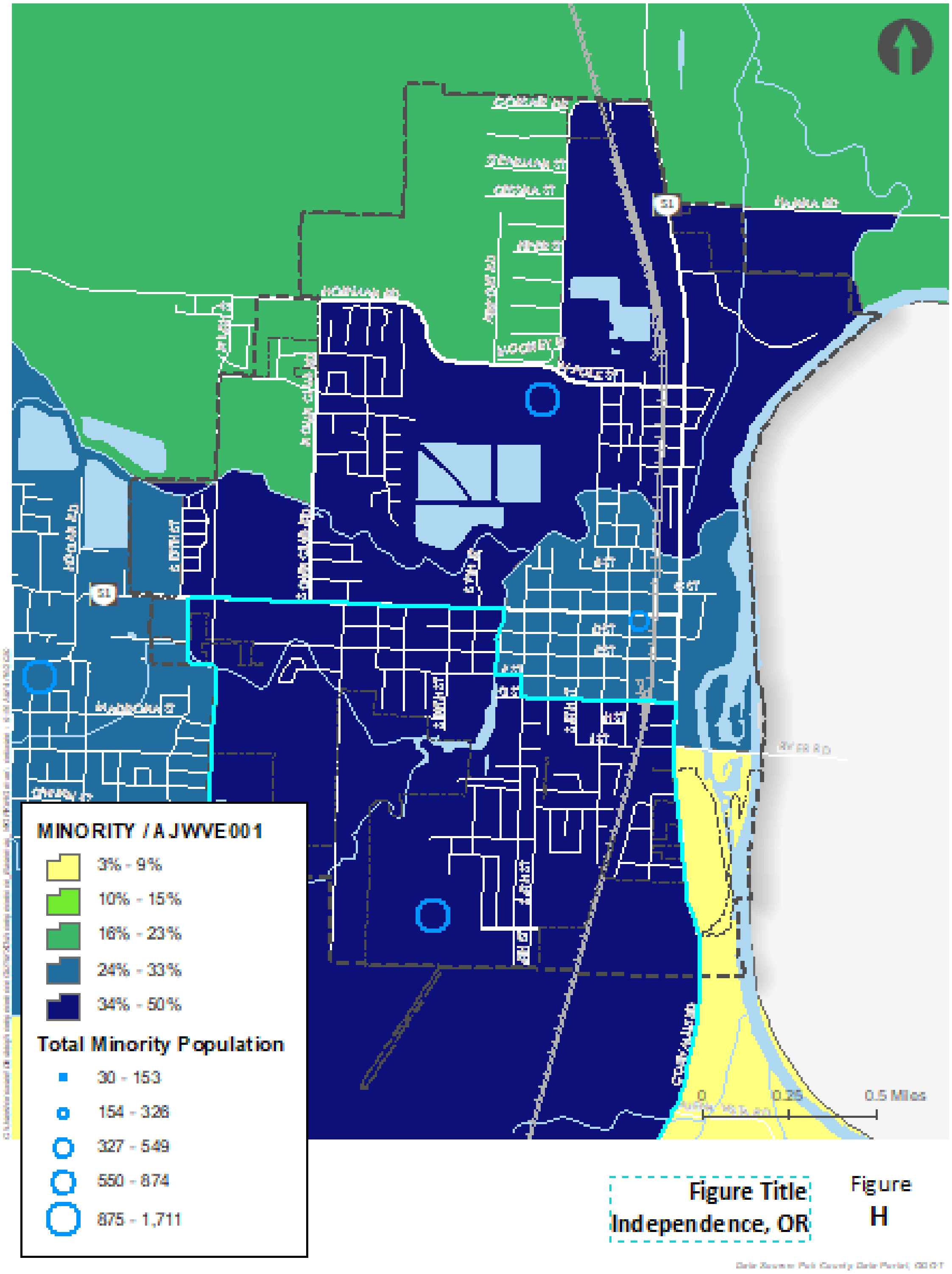
Table 6: Hispanic or Latino, and Not Hispanic or Latino by Race (Table P004, 2010 Decennial Census)

RACE/ETHNICITY	OREGON		POLK COUNTY		INDEPENDENCE	
Total:	4,081,943		81,427		9,556	
Hispanic or Latino	523,956	13%	11,126	14%	3,369	35%
Not Hispanic or Latino:	3,557,987	87%	70,301	86%	6,187	65%
White	3,103,557	76%	63,876	78%	5,950	62%
Black or African American	74,356	2%	853	1%	19	0%
American Indian and Alaska Native	36,776	1%	1,403	2%	23	0%
Asian	172,505	4%	1,515	2%	33	0%
Native Hawaiian and Other Pacific Islander	15,301	0%	353	0%	28	0%
Some other race alone	6,410	0%	35	0%	-	0%
Population of two or more races	149,082	4%	2,266	3%	134	1%

With a few notable exceptions, Figure 8 shows the minority population is relatively distributed throughout the City.[6] The areas with the highest concentrations of minorities are located outside of the downtown area in northern and southern Independence and range from 40 to 50 percent of the population. The downtown area also has a high proportion of minority population with approximately 30 percent of the population.

[6] In Figure 8, minority groups are shown as the combination of all classifications except for Non-Hispanic/Latino and white.

Figure 8: Minority Populations



Age

Data on age is derived from a two-part census question (age and date of birth). Both age and date of birth is used in combination to determine the most accurate age as of the census reference date. Age data are tabulated in age groupings, including populations 65 and older (Elderly) and populations 17 and younger (Youth).

As summarized in Table 7, youth populations (ages 17 and younger) comprise approximately 30 percent of the overall population in the City. The share of youth population within the City is relatively high compared to the State (21 percent) and the County (23 percent). Conversely, the City has a relatively low portion of seniors (population ages 65 and older) at eight percent of the overall population. This is more than half the share of senior population compared to the State and County, both of which have a 17 percent share of seniors.

Table 7: Youth and Elderly Populations

AGE	OREGON		POLK COUNTY		INDEPENDENCE	
Total:	4,081,943		81,427		9,556	
Youth (Age 17 and Younger)	868,178	21%	18,830	23%	2,862	30%
Senior (Age 65 and Older)	682,546	17%	13,995	17%	782	8%

As shown in Figure 9, the youth population is distributed relatively evenly outside of the downtown area. In northern and southern Independence, the youth population comprises approximately one-third of the population. As shown in Figure 10, the elderly population in Independence is relatively low throughout the City. The elderly population comprises under one-tenth of the population within the City.

Figure 9: Youth Populations

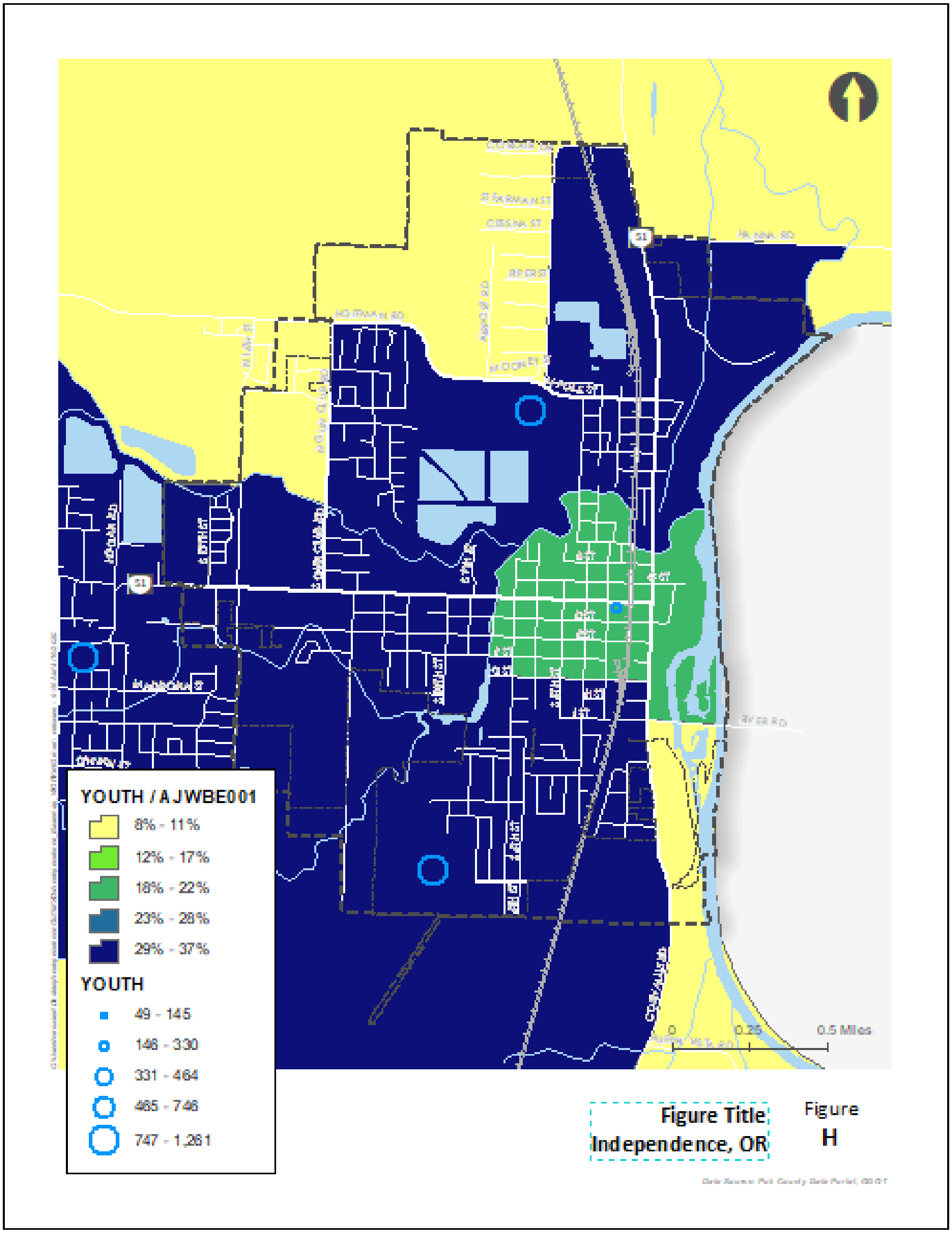
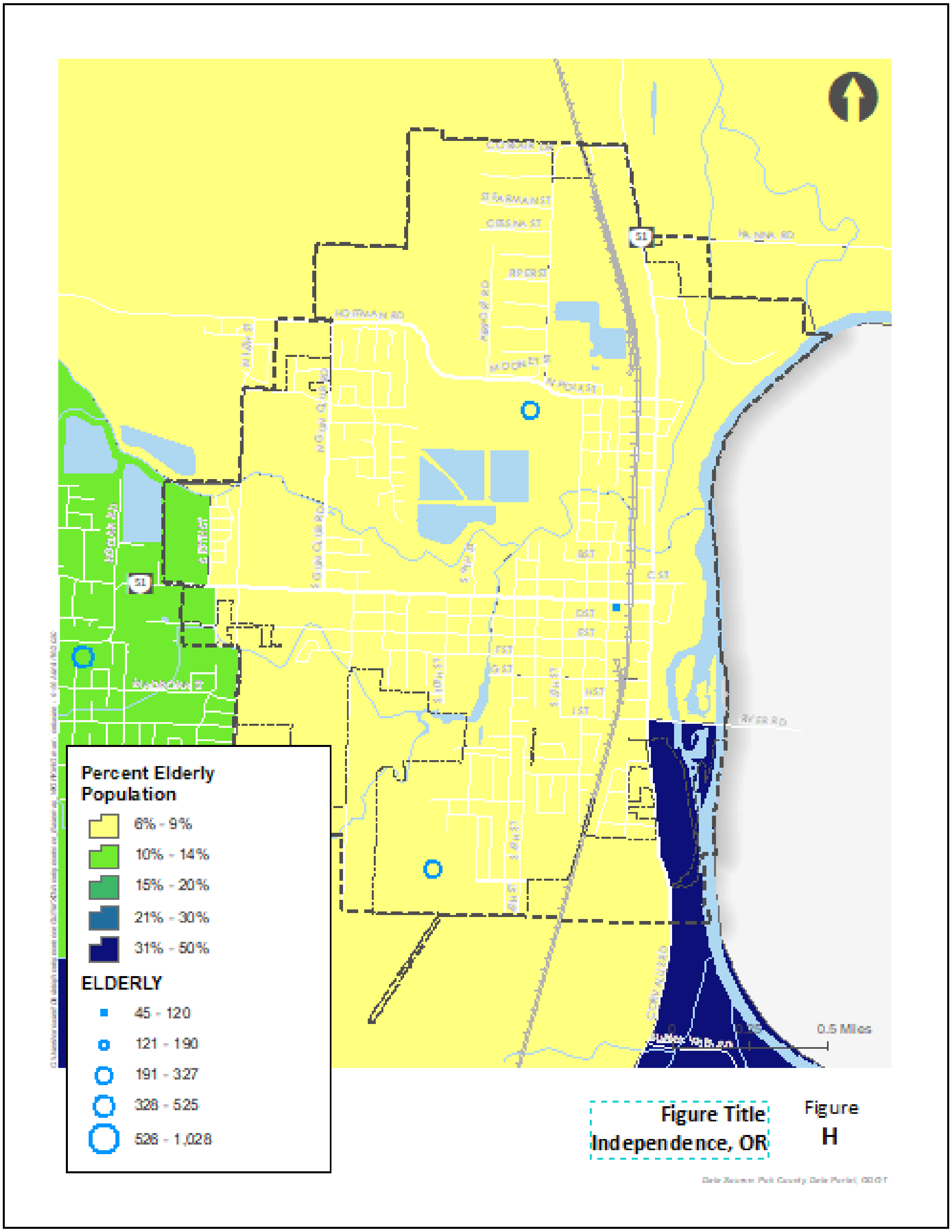


Figure 10: Senior Populations



Low-Income Population

Poverty statistics are shown in Table 8 and Figure 11. The data are based on the Federal Poverty Level (FPL) which uses a set of dollar value thresholds that vary by various family characteristic. A person's poverty status is determined by comparing the person's total family income in the last 12 months with the poverty threshold appropriate for that person's family size and composition.

As shown in Table 11, compared to the State of Oregon and Polk County, a higher portion of the overall population in Independence is in poverty with a ratio of income to poverty below 2.0.[7] Approximately 43 percent of the population in Independence is in poverty, compared to approximately 33 percent of the overall State and Polk County.

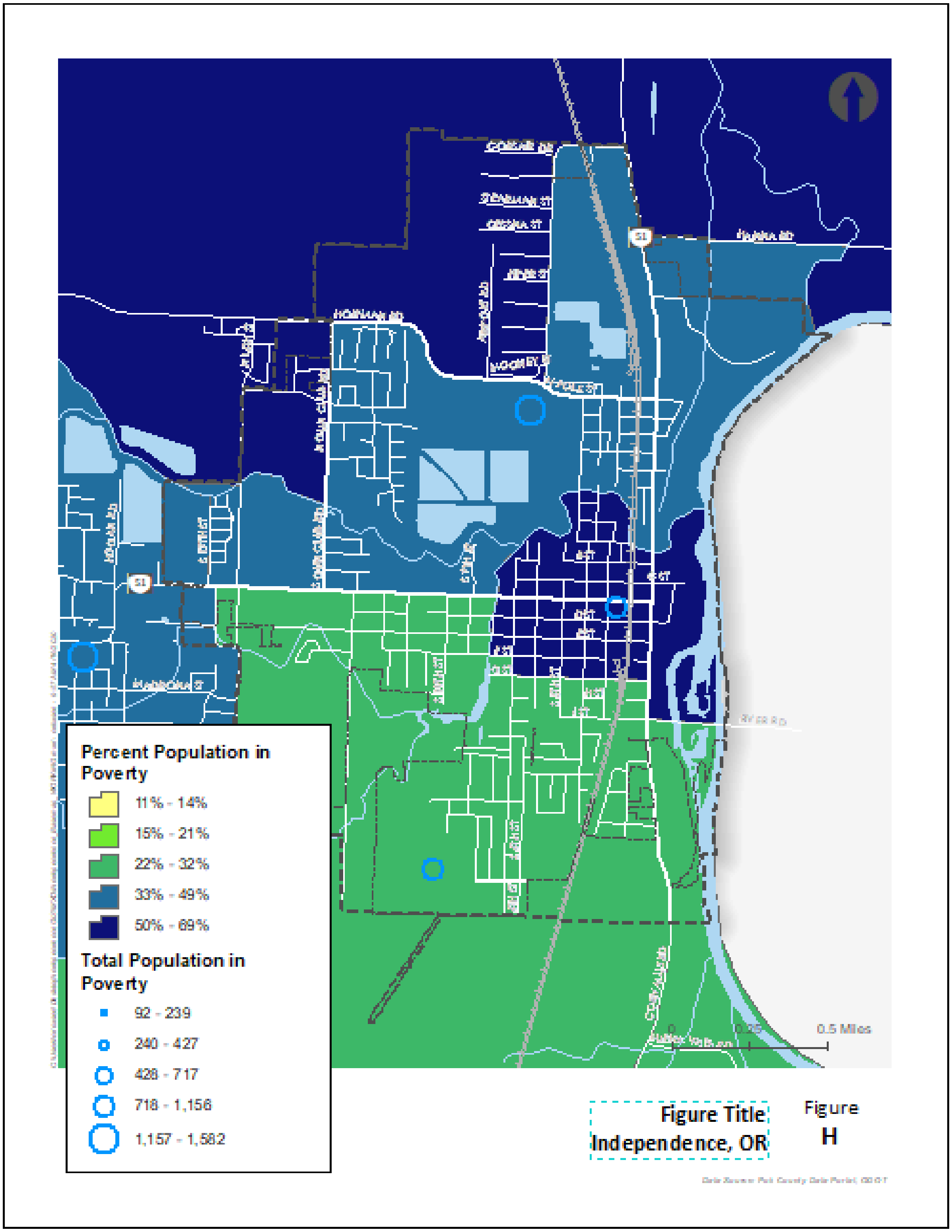
Table 8: Ratio of Income to Poverty

INCOME TO POVERTY RATIO	OREGON		POLK COUNTY		INDEPENDENCE	
Total:	4,004,544		79,511		9,466	
Under .50	249,940	6%	5,589	7%	615	6%
.50 to .99	315,307	8%	5,625	7%	332	4%
1.00 to 1.24	186,149	5%	3,963	5%	1,136	12%
1.25 to 1.49	181,530	5%	3,479	4%	215	2%
1.50 to 1.84	255,407	6%	5,338	7%	1,606	17%
1.85 to 1.99	113,868	3%	2,488	3%	171	2%
2.00 and over	2,702,343	67%	53,029	67%	5,391	57%

As shown in Figure 11, the Census Block Group located inside the City boundary near the downtown area has the highest concentration of low-income population. Approximately 60 percent of people in this Census Block Group experiences poverty. Outside of the downtown area, the percent of people in poverty drops to between 30 and 40 percent.

[7] The Federal Poverty Level (FPL) is considered by many researchers to be too low to accurately represent income levels necessary for self-sufficiency; thus, using two-times the FPL may be a more accurate measure of income sufficiency.

Figure 11: Low-Income Populations



Non-English-Speaking Population[8]

Data on language spoken at home were derived from two answers to American Community Survey data. Respondents were instructed to mark "Yes" if they sometimes or always spoke a language other than English at home and "No" if a language was spoken only at school or if speaking was limited to a few expressions or slang. The second question asked respondents to list the name of the non-English language they spoke at home.

As shown in Table 9, large portion of households in Independence speak a language other than English - approximately 27 percent. Of those, approximately seven percent of the population have limited English-speaking proficiency.

Table 9: Limited English Proficiency Households

	OREGON		POLK COUNTY		INDEPENDENCE	
Total:	1,591,835		29,692		3,232	
English Only	1,347,182	85%	25,318	85%	2,338	72%
Other Languages	203,307	13%	3,753	13%	656	20%
Limited English Proficiency	41,346	3%	621	2%	238	7%

Population with Disabilities

Information on disabled population was gathered from American Community Survey data on Food Stamp benefits – also known as the Supplemental Nutrition Assistance Program (SNAP). Disability within American Community Survey data is limited to four basic areas of functioning – hearing, vision, cognition, and ambulation. It is further supplemented by Katz Activities of Daily Living (ADL) and Lawton Instrumental Activities of Daily Living (IADL) scales which relate to difficulty with bathing, dressing, and performing errands.

As shown in Table 10, nearly one-third of households in Independence reported as having one or more persons with a disability. This is a slightly higher rate compared to households throughout the County (31 percent) and the State (28 percent).

Table 10: Households with One or More Persons with a Disability

	OREGON		POLK COUNTY		INDEPENDENCE	
Total:	1,591,835		29,692		3,232	
Disability	446,240	28%	9,058	31%	1,056	33%

[8] Due to the low number of limited English proficient households and the limitations in displaying American Community Survey data, a figure would not be meaningful.

Figure 12: Limited English Proficiency Households

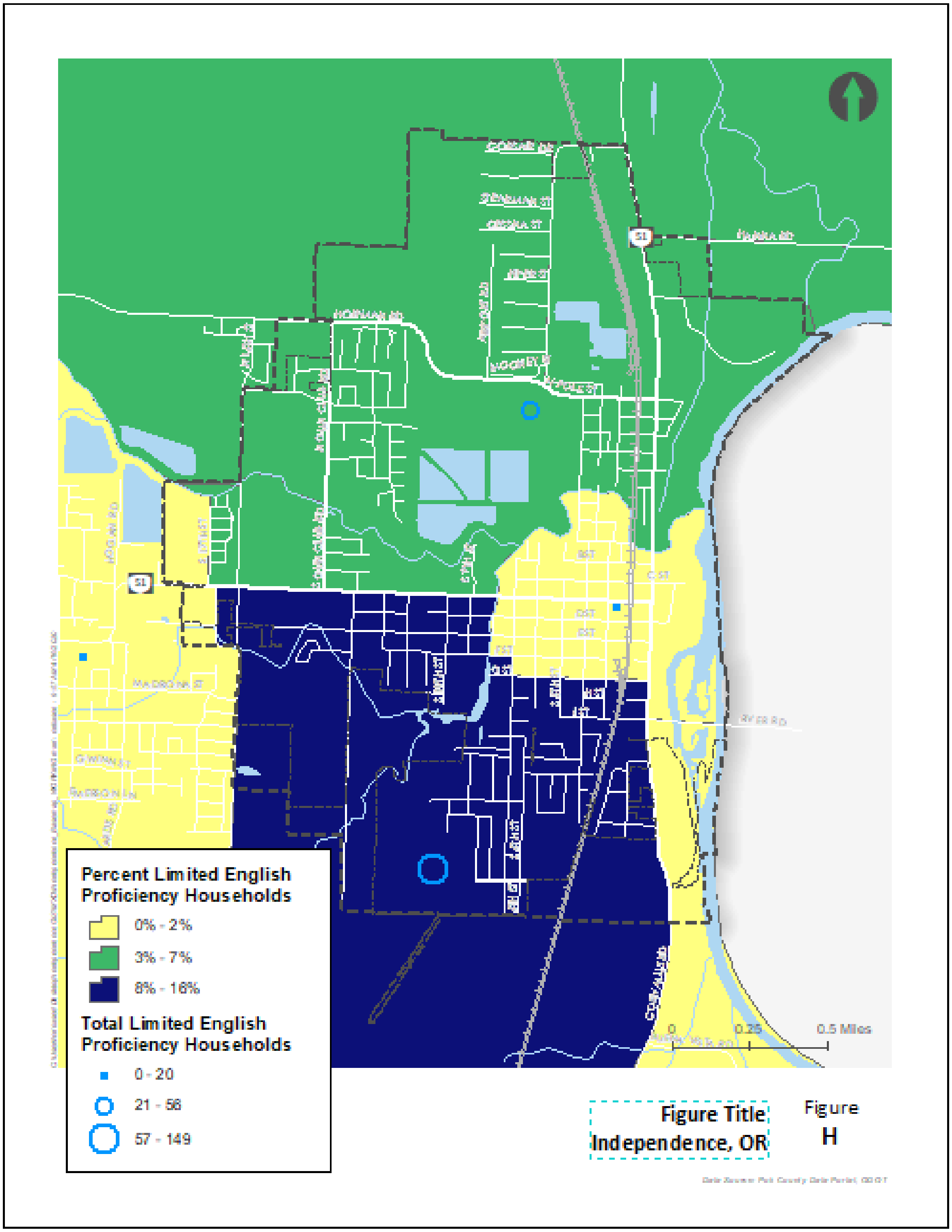
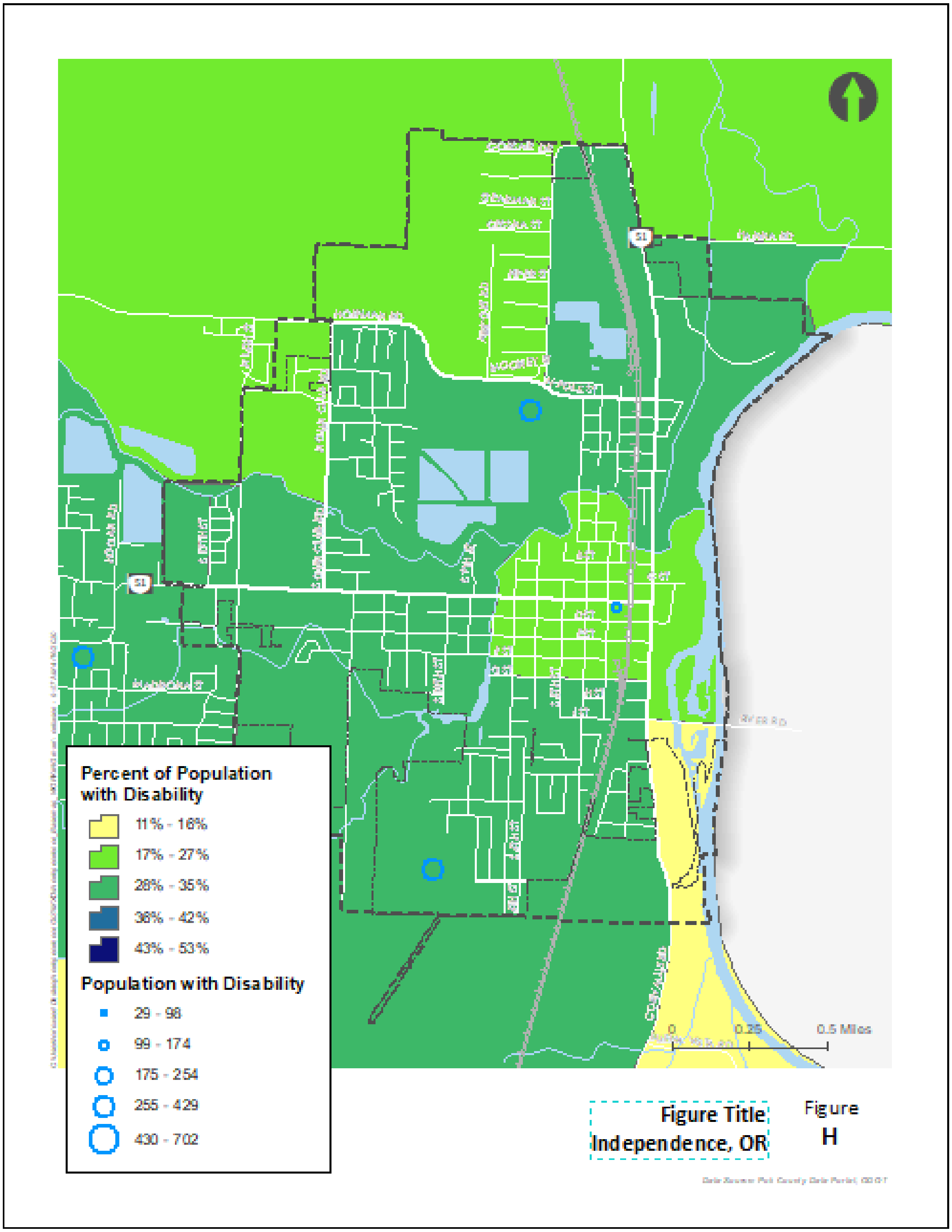


Figure 13: Households with One or More Persons with a Disability



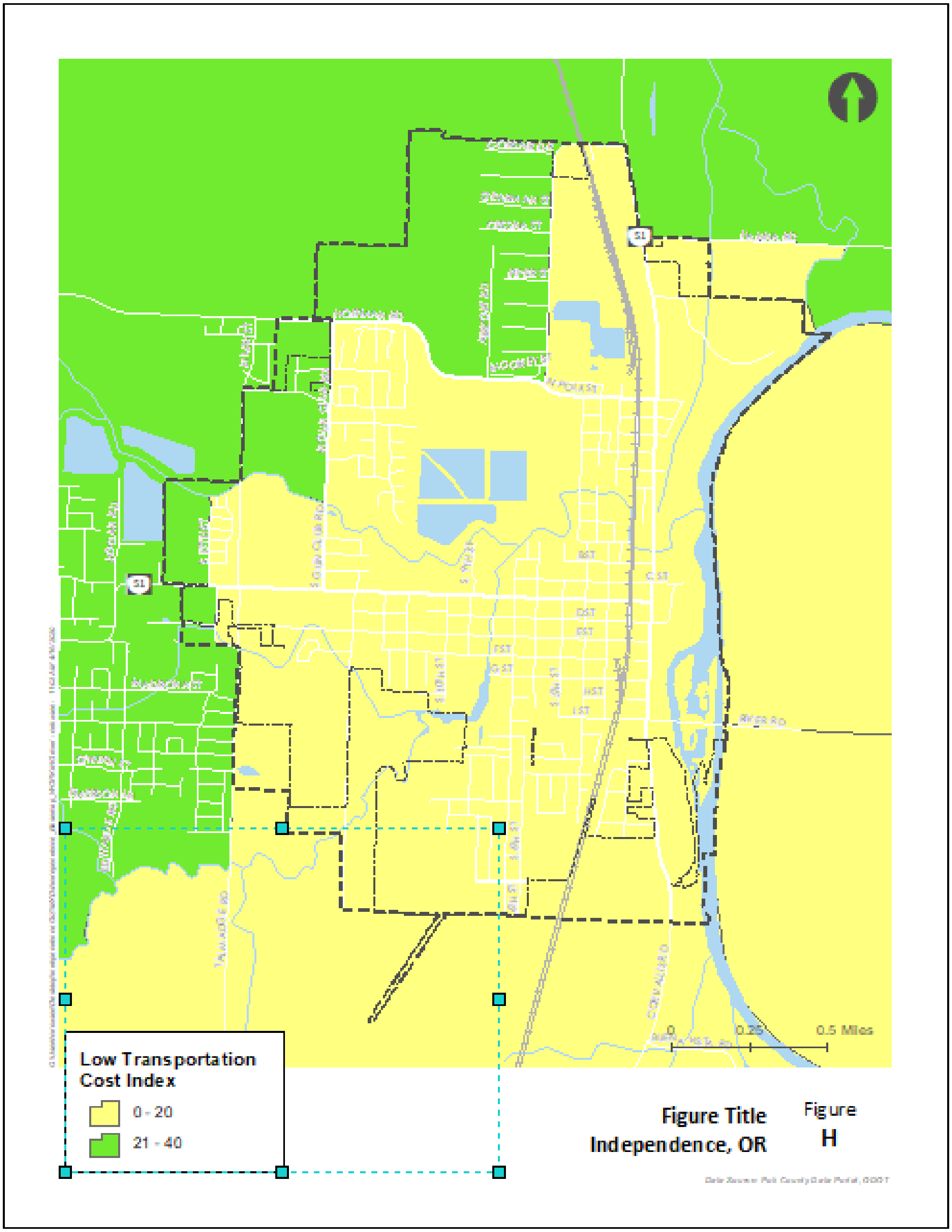
Transportation Costs

Information for transportation costs was gathered using the Low Transportation Cost Index from the US Department of Housing and Urban Development (HUD). The Low Transportation Cost Index is based on estimates of transportation expenses for a family that meets the following description: a 3-person single-parent family with income at 50% of the median income for renters for the region. More specifically, among this household type, information is summarized as transportation costs as a percent of income for renters. Neighborhoods are defined as census tracts.

Values are inverted and percentile ranked nationally, with values ranging from 0 to 100. The higher the transportation cost index, the lower the cost of transportation in that neighborhood. Transportation costs may be low for a range of reasons, including greater access to public transportation and the density of homes, services, and jobs in the neighborhood and surrounding community.

As shown on Figure 14, most Independence has a cost index of 20 or below. Portions of north and northwest Independence have a cost index of between 20 to 40. The low-cost index numbers suggest that the City experiences high overall transportation costs compared to other regions across the nation. This may be due to limited public transit options, longer than average commuting distance for Independence residents, lower than average wages, and/or other factors, as noted above.

Figure 14: Low Transportation Cost Index



Attachment D Tech Memo #3B: Traffic Operations

TECHNICAL MEMORANDUM #3B: EXISTING CONDITIONS ANALYSIS

Date: June 17, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Alec Kauffman, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Draft Tech Memo #3B: Existing Conditions Analysis

TABLE OF CONTENTS

INTRODUCTION

This memorandum summarizes information related to existing transportation system conditions in the City of Independence for the Independence Transportation system Plan (TSP) update. This memorandum includes information on traffic counts conducted at the study intersections and the results of the intersection operations analysis, non-automobile analysis, crash analysis, access management analysis, and environmental analysis. The information provided in this memorandum addresses the requirements identified in Oregon Administrative Rule 660-012-020 (Elements of a Transportation System Plan) for providing a general assessment of existing transportation facilities and services. The information provided in this memorandum will serve as the basis for developing and evaluating transportation system alternatives and identifying improvement projects for the Independence TSP update.

TRAFFIC COUNTS

The study intersections for the Independence TSP update were determined based on direction provided by City of Independence (City) in coordination with the Oregon Department of Transportation (ODOT). There are a total of 18 study intersections located along City, County, and ODOT facilities, including two signalized intersections (9 - Monmouth Street/Gun Club Road and 10 - Monmouth Street/16th Street) and 16 unsignalized intersections. Figure 1 illustrates the location of the study intersections. Figure 2 illustrates the current lane configurations and traffic control devices at the study intersections.

Turning movement counts were conducted at the study intersections on October 15th and 16th, 2019. The counts were conducted on a typical mid-weekday when local schools were in session. Nine counts were conducted over a 16-hour period (6:00 AM. to 10:00 PM.) and nine counts were conducted over a 4-hour period (2:00 to 6:00 PM). All the counts include the total number of pedestrians, cyclists, and motor vehicles that entered the study intersections in 15-minute intervals from 2:00 to 6:00 PM and in 60-minute intervals throughout all other time periods, as applicable.

The *Analysis Methodology and Assumptions Memorandum* includes information related to the peak hour development, seasonal adjustment factors, and historical factors used to develop traffic volumes for the traffic operations analysis. Per the memorandum, a system-wide peak hour of 4:30 to 5:30 PM was selected as a basis for the analysis; seasonal adjustment factors of approximately 1.04 and 1.03 were applied to the counts to reflect the peak season, and no historical factors were applied given that the counts were conducted in 2019. The traffic volumes were also balanced as appropriate. Figure 3 summarizes the traffic volumes developed at the study intersections for the traffic operations analysis.

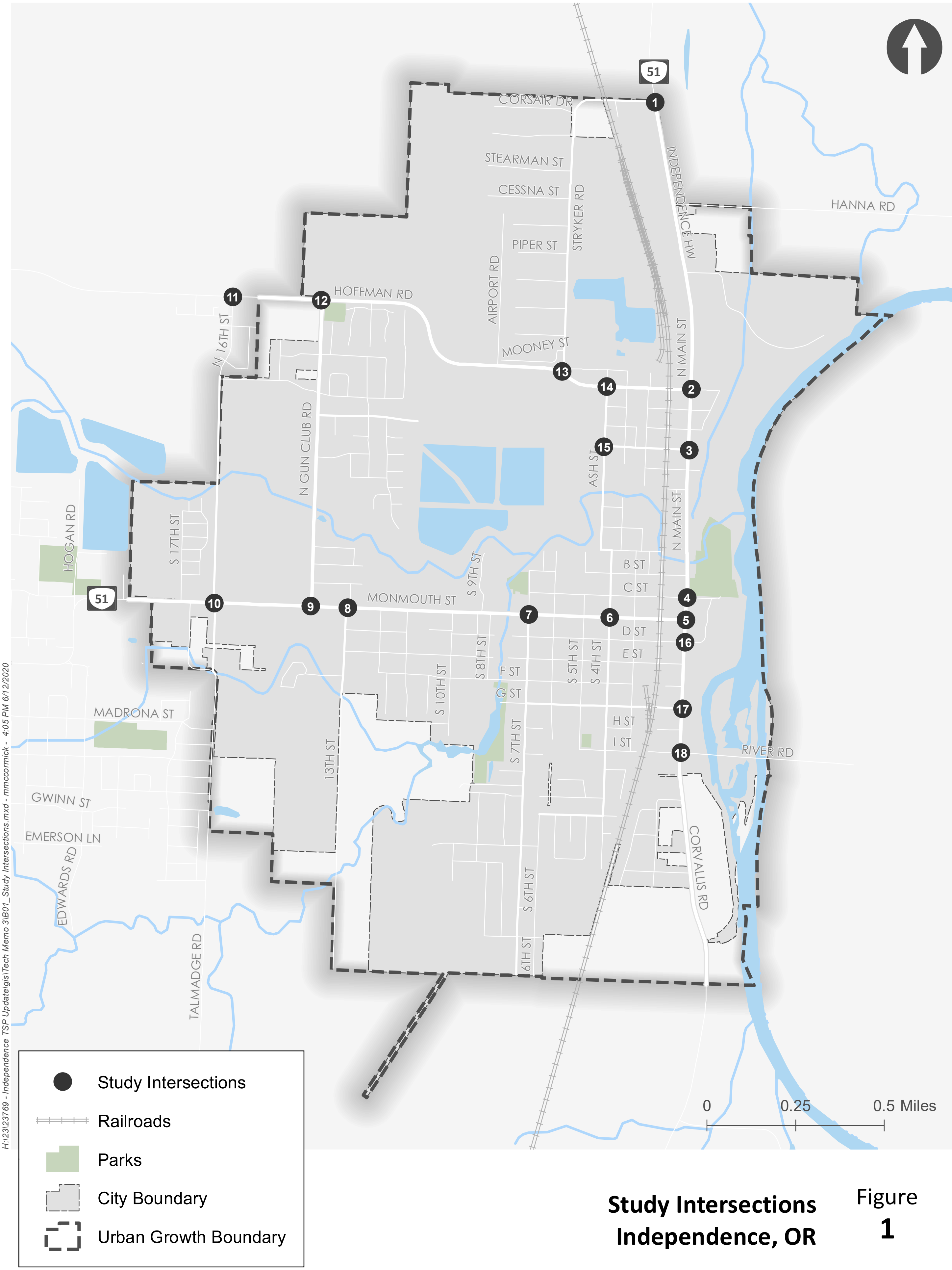
TRAFFIC OPERATIONS ANALYSIS

The traffic operations analysis identifies how the study intersections operate under existing traffic conditions during the weekday PM peak hour. The weekday PM peak hour was selected as a basis for the analysis given that it generally represents the most critical time period throughout the day. However, other peak hours may be more critical in some locations, such as near schools.

Intersection Operations Analysis

The intersection operations analysis was conducted using Synchro 10, which is a software tool designed to assist with operations analyses in accordance with Highway Capacity Manual (HCM) methodologies. The analysis results include level-of-service (LOS), delay (del), and volume-to-capacity (v/c) ratios at all intersections, regardless of jurisdiction. The LOS, del, and v/c ratios are reported for the overall intersection at signalized intersections and the critical movement at unsignalized intersections – the overall intersection v/c ratios were hand-calculated in accordance with the methodologies outlined in ODOT's Analysis Procedures Manual (APM).

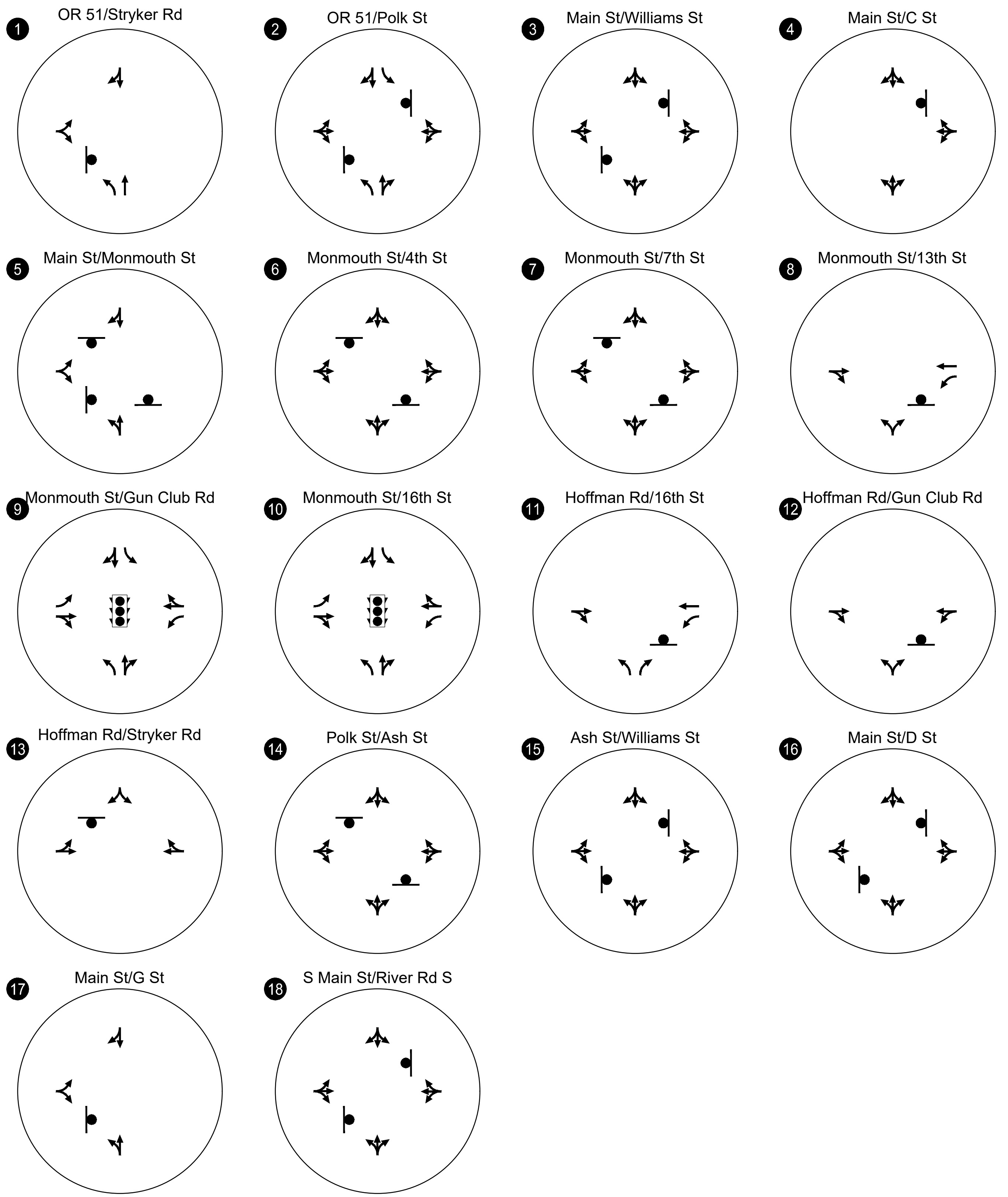
Table 1 and Figure 3 summarize the results of the intersection operations analysis and compares the results to the applicable mobility standards and targets which were presented in the *Analysis Methodology and Assumptions Memorandum. Attachment A contains the existing traffic conditions worksheets.*



Study Intersections
Independence, OR

Figure
1

Data Source: Pok County Data Portal, ODOT



- STOP SIGN

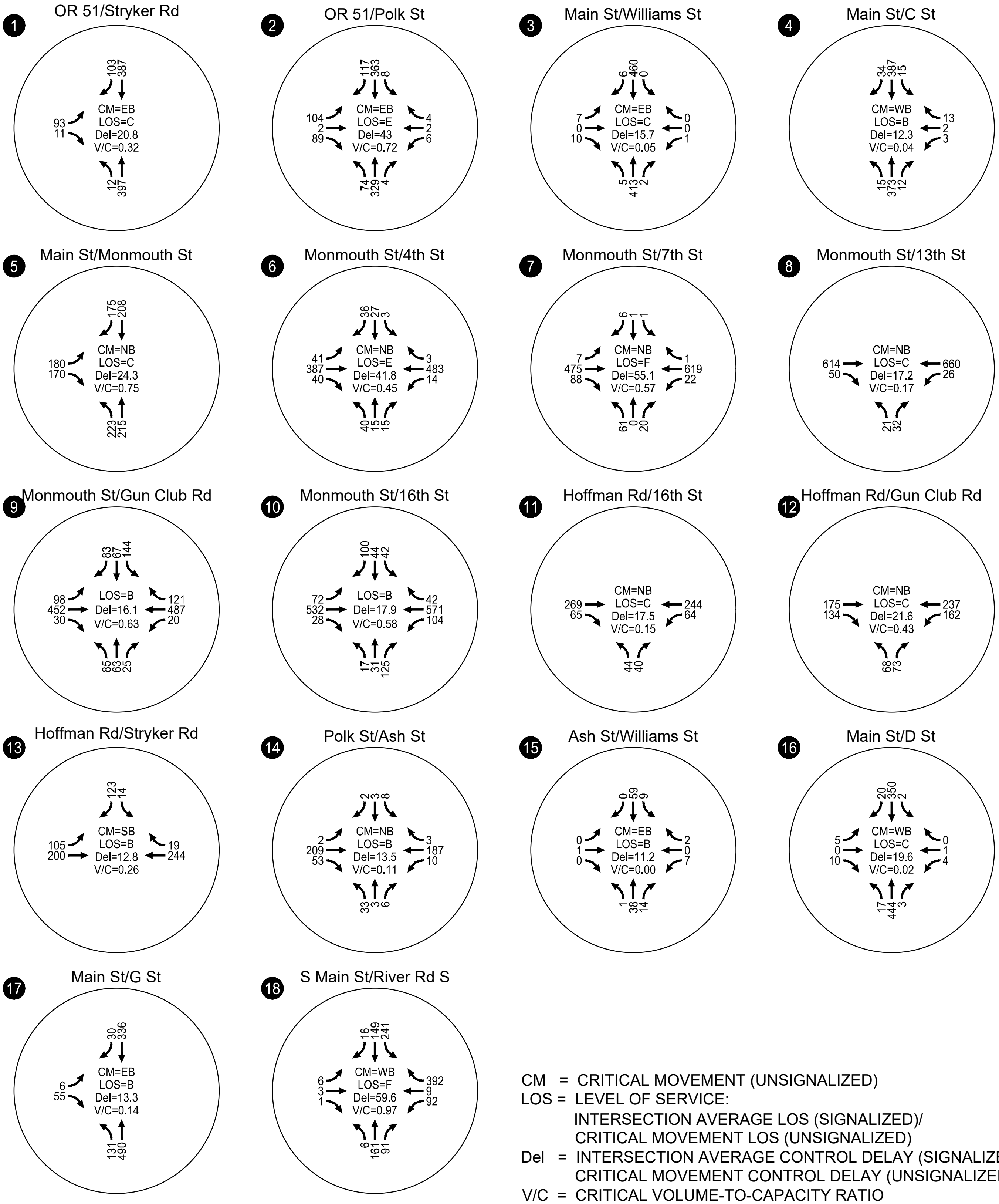
- TRAFFIC SIGNAL

Existing Lane Configurations & Traffic Control Devices
Independence, OR

Figure 2

H:\23\23769 - Independence TSP Update\analysis\Figures\23769 Ops Figures.dwg May 13, 2020 - 8:18am - mbell Layout Tab: B02_Lane Configuration

KITTELSON & ASSOCIATES



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = LEVEL OF SERVICE:
INTERSECTION AVERAGE LOS (SIGNALIZED)/
CRITICAL MOVEMENT LOS (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

Existing Traffic Conditions
Weekday PM Peak Hour
Independence, OR

Figure 3

H:\23\23769 - Independence TSP Update\analysis\Figures\23769 Ops Figures.dwg May 13, 2020 - 8:19am - mbell Layout Tab: B03_Existing Conditions

Table 1: Intersection Operations, Weekday PM Peak Hour

Map ID	Intersection	Control Type	Mobility Standard/ Target	Intersection Operations			
				CM	LOS	Del	v/c
1	OR 51/Stryker Road	TWSC	0.90	EB	C	20.8	0.32
2	OR 51/Polk Street	TWSC	0.95	EB	E	43.0	0.72
3	Main Street/Williams Street	TWSC	0.95	EB	C	15.7	0.05
4	Main Street/C Street	TWSC	1.0	WB	B	12.3	0.04
5	Main Street/Monmouth Street	AWSC	1.0	NB	C	24.3	0.75
6	Monmouth Street/4th Street	TWSC	1.0	NB	E	41.8	0.45
7	Monmouth Street/7th Street	TWSC	0.95	NB	F	55.1	0.57
8	Monmouth Street/13th Street	TWSC	0.95	NB	C	17.2	0.17
9	Monmouth Street/Gun Club Road	Signal	0.95	-	B	16.1	0.70
10	Monmouth Street/16th Street	Signal	0.95	-	B	17.9	0.61
11	Hoffman Road/16th Street	TWSC	LOS C	NB	C	17.5	0.15
12	Hoffman Road/Gun Club Road	TWSC	0.80	NB	C	21.6	0.43
13	Hoffman Road/Stryker Road	TWSC	0.80	SB	B	12.8	0.26
14	Polk Street/Ash Street	TWSC	0.80	NB	B	13.5	0.11
15	Ash Street/Williams Street	TWSC	0.80	EB	B	11.2	0.00
16	Main Street/D Street	TWSC	0.95	WB	C	19.6	0.02
17	Main Street/G Street	TWSC	0.80	EB	B	13.3	0.14
18	S Main Street/River Road S	TWSC	0.80	WB	F	59.6	**0.97**

CM = Critical movement.
LOS = Intersection Level of Service (Signal); CM Level of Service (TWSC, AWSC).
Delay = Intersection average vehicle delay (Signal); CM vehicle delay (TWSC, AWSC).
v/c = Intersection v/c (Signal); CM v/c (TWSC, AWSC).

As shown in Table 1 and Figure 3, all study intersections currently operate acceptably during the weekday PM peak hour except the S Main Street/River Road S intersection. The westbound left-turn movement operates with a v/c ratio of 0.97 under weekday PM peak hour conditions, exceeding the city's 0.80 v/c mobility target. *Attachment A includes the intersection operations analysis worksheets.*

Queueing Analysis

A queuing analysis was conducted at the signalized study intersections using Synchro 10. Table 2 summarizes the 95th percentile queues during the weekday PM peak hour and indicates if existing storage can accommodate the queues. The vehicle queue and storage lengths were rounded up to the nearest 25-feet. The storage lengths reflect the striped storage for each movement at the intersections. *Attachment A contains the queuing analysis worksheets.*

As shown in Table 2, the striped storage lengths at the signalized study intersections are currently adequate for the 95th percentile queues except for the southbound left-turn queue at the Monmouth Street/Gun Club Road intersection. The southbound left-turn lane length on Gun Club Road is restricted by the pavement width between Monmouth Street and C Street. The left turn lane is provided along the segment of Gun Club Road where the southbound bike lane ends north of Monmouth Street.

Table 2: Queuing Summary, Weekday PM Peak Hour

Map ID	Intersection	Movement	Storage Length (feet)	95th Percentile Queue (feet)	Adequate?
9	Monmouth Street/Gun Club Road	EBL	150	50	Yes
		WBL	150	<25	Yes
		NBL	100	100	Yes
		SBL	50	150	**No**
10	Monmouth Street/16th Street	EBL	250	50	Yes
		WBL	225	50	Yes
		NBL	100	50	Yes
		SBL	225	75	Yes

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left

NON-AUTOMOBILE TRANSPORTATION ANALYSIS

The non-automobile transportation analysis was conducted in accordance with the methodologies identified in Chapter 14 of ODOT's APM. Per the APM, Bicycle Level of Traffic Street, Pedestrian Level of Traffic Stress, and Transit Qualitative Multimodal Assessment are appropriate analysis methodologies for TSP updates.

Transit Qualitative Multimodal Assessment

A transit qualitative multimodal assessment was conducted in accordance with the methodology described in ODOT's APM. Transit factors that should be considered are frequency and on-time reliability, schedule speed/travel times, transit stop amenities, and connecting pedestrian/bicycle network. This methodology applies a rating system similar to that used for pavement conditions; excellent, good, fair, and poor. Table 3 outlines the methodology used for conducting a transit qualitative multimodal assessment within Independence.

Table 3: Transit Qualitative Multimodal Assessment Methodology – For Rural Express Service

Category	Excellent	Good	Fair	Poor
Frequency	12 daily round trips	8-10 daily round trips	5-7 daily round trips	4 or fewer daily round trips
Schedule Speed/ Travel Times	<20% slower than driving	20% to 40% slower than driving	40% to 60% slower than driving	>60% slower than driving
Transit Stop Amenities	Shelter with bench and sign	Bench with sign	Sign with waiting area	No sign and/or no waiting area
Connecting Pedestrian/ Bicycle Network	Wide shoulders or bike lanes and sidewalks with frequent crossing	Standard shoulders or bike lanes and sidewalks with crossings	Substandard shoulders or bike lanes and sidewalks with no crossing	No shoulders, bike lanes, or sidewalks and no crossings
ADA Accessibility	All stops are ADA-compliant and have adjacent parking prohibited	85-99% of stops are ADA-compliant and have adjacent parking prohibited	70-84% of stops are ADA-compliant and have adjacent parking prohibited	Less the 70% of stops are ADA-compliant and have adjacent parking prohibited

Frequency

From the user's perspective, *frequency* determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance and at the times the user wishes to travel. Frequency also helps determine the convenience of transit service to riders and is one component of overall transit trip time (helping to determine the wait time at a stop).

The only fixed route service provided in Independence is the Cherriots Route 40X: Polk County/Salem Express. On weekdays, the service operates eight daily trips with frequencies is between 60 and 180 minutes. On Saturdays, the service operates four daily trips with frequencies between 135 and 370 minutes. The frequency rating for Route 40X is good.

Per the APM, on-time reliability is typically evaluated along with frequency. Per information provided by Cherriots, the on-time reliability of Route 40X is 89 percent in Fiscal Year 2019, which is higher that the Cherriots Regional average of 85 percent.

Schedule Speed/Travel Times

Schedule speed and travel time refer to the time it takes to complete a transit route in full and the length of time between stops. Cherriots operates as a hub and spoke system, with Downtown Salem as the main hub of service. Route 40X: Polk County/Salem Express connects Salem to Dallas via Independence and Monmouth. On one full roundtrip, the bus makes six stops in Independence (two served by the same transit stop on 13th Street) and 18 stops total in 120 minutes. The same route driven in a single-occupancy vehicle is approximately 90 minutes roundtrip. The schedule speed/travel speed rating for Route 40X is good.

Transit Stop Amenities

Amenities at transit stops, such as bus benches and bus shelters, enhance a transit route and make it more user-friendly. Steps that can make this mode as comfortable and accommodating as possible may help encourage ridership. For Route 40X, Cherriots provides five transit stops in Independence. All transit stops have a sign and pole designating the stop. In addition to signage, the three transit stops provided for service to Salem include shelters, trash receptacles, and posted schedules. The transit stop amenities rating for Route 40X is good.

Connecting Pedestrian/Bicycle Network

Pedestrian facilities are provided adjacent to all bus stops in Independence. In addition, marked crosswalks are provided within a city block of all bus stops. Designated bicycle facilities are not provided adjacent to bus stops in Independence, although stops on Monmouth Street in the downtown area and on 13th Street are supported by low-speed roadways where mixed traffic may support cyclists. Filling gaps in the existing bicycle network would help create more of a multimodal system to support transit within Independence as well. The connecting pedestrian/bicycle network rating for Route 40X is good.

ADA Accessibility

Based on ODOT's TransGIS inventory, all pedestrian ramps adjacent to bus stops within the city are rated as poor or missing. In addition, parking is allowed adjacent to three of the five bus stops serving Independence. Adjacent parking can block buses from reaching the curb space, impacting the ability of passengers to board and alight from the vehicle. The ADA accessibility rating for Route 40X is poor.

Pedestrian Level of Traffic Stress

Pedestrian level of traffic stress (PLTS) is a perception-based analysis methodology that is used to evaluate the adequacy of streets to accommodate pedestrians in urban and rural environments. As applied by ODOT, this methodology classifies four levels of traffic stress that a pedestrian can experience on the street, ranging from PLTS 1 (little traffic stress) to PLTS 4 (high traffic stress). A street or street segment that is rated PLTS 1 generally has low traffic volumes and travel speeds and has a sidewalk that is separated from vehicle traffic. These segments are generally suitable for all pedestrians, including children. A street or street segment that is rated PLTS 4 generally has high traffic volumes and travel speeds and is perceived as unsafe by most adults. Segments rated PLTS 4 also include those with no sidewalks or other pedestrian facilities. Per the APM, PLTS 2 is considered a reasonable target for streets due to its acceptability with most pedestrians.

The PLTS score is determined based on four criteria, including sidewalk condition, physical buffer type, total buffering width, and general land use. All four criteria are scored from 1 to 4 and the highest score determines the overall score for the road segment. Table 4 summarizes the results of the PLTS analysis. Figure 4 illustrates the results of the PLTS analysis for the arterial and collector streets in Independence. It is important to note that while some segments are shown as PLTS 3 or 4, they may have shorter segments with lower PLTS scores.

As shown in Figure 4, several arterial and collector streets in Independence have segments that are rated PLTS 3 and PLTS 4. The segments rated PLTS 3 may have curb-tight sidewalks on roadways with speeds of 30 mph or higher. In order for these segments to be rated PLTS 2, the speeds would need to be reduced to 25 mph or a buffer would need to be installed between the sidewalk and vehicle travel lane. Other segments rated PLTS 3 may have narrow sidewalks. In order for these segments to be rated PLTS 2, the sidewalks would need to be widened to at least five feet wide. Other segments may be located adjacent to industrial land uses, such as those in northern Independence. Per the APM, these segments are automatically rated PLTS 3 or 4 given the auto-oriented nature of these land uses. For these segments, the priority is filling gaps instead of reaching PLTS 2.

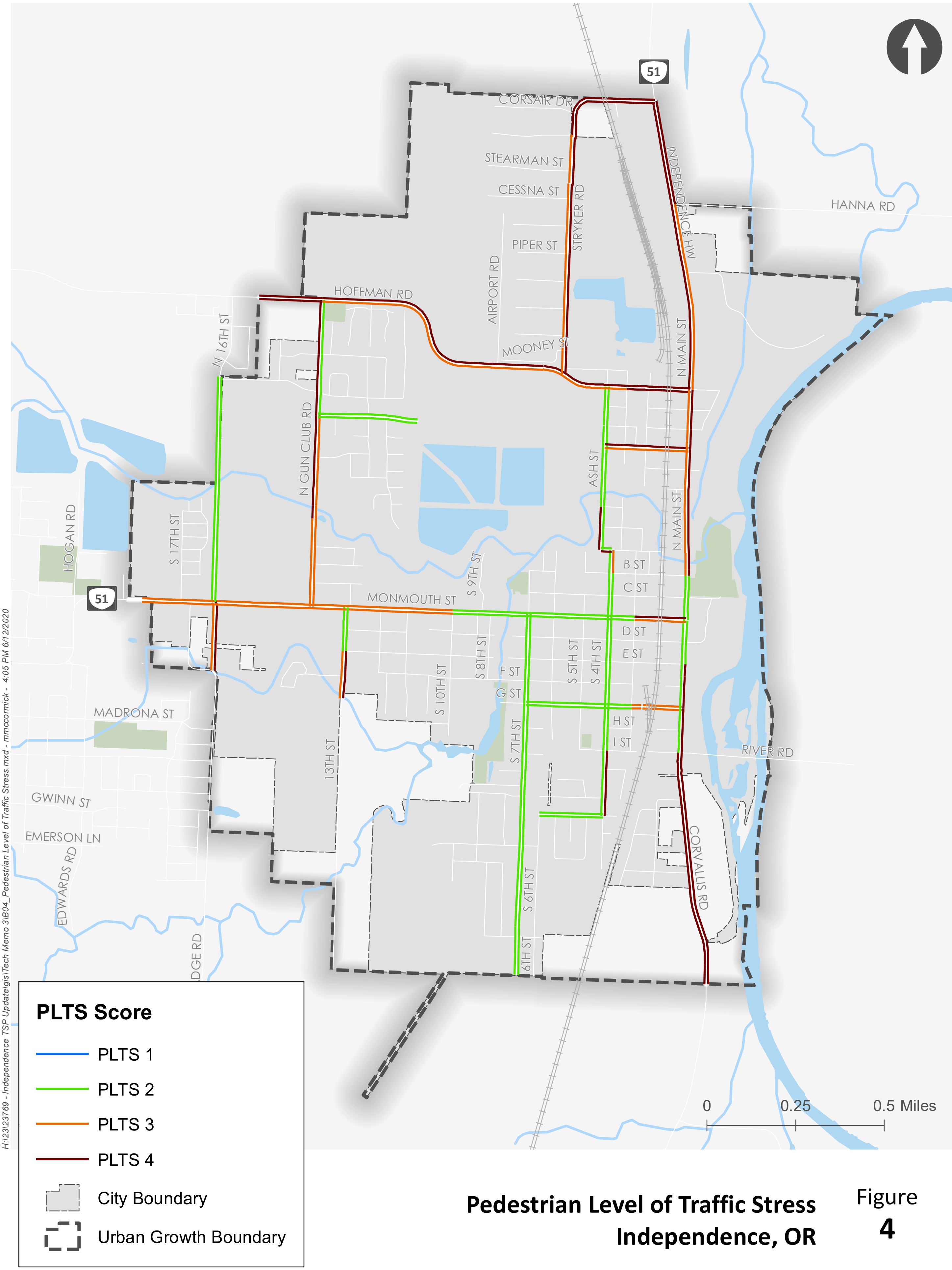
The majority of segments rated PLTS 4 have no sidewalks or other pedestrian facilities. In order for these segments to be rated PLTS 2, sidewalks with appropriate sidewalk and buffer widths would need to be installed along the full length of the roadway. *Attachment B* contains detailed information on the PLTS analysis results.

Table 4: Pedestrian Level of Traffic Stress (PLTS) Analysis Results

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
OR 51	Stryker Road	Hanna Road	East	4	4	2	2	4
	Stryker Road	Hanna Road	West	2	4	2	3	4
	Hanna Road	Polk Street	East	2	3	2	3	3
	Hanna Road	Polk Street	West	2	3	2	4	4
	Polk Street	B Street	East	4	3	3	1	4
	Polk Street	B Street	West	3	3	2	1	3
OR 51-Main Street	B Street	Monmouth Street	East	2	2	2	1	2
	B Street	Monmouth Street	West	2	2	2	1	2
Main Street	Monmouth Street	E Street	East	2	2	2	1	2
	Monmouth Street	E Street	West	2	2	2	1	2
	E Street	River Road	East	4	3	1	1	4
	E Street	River Road	West	2	2	1	1	2
Corvallis Road	River Road	Southern UGB	East	4	N/A	N/A	N/A	4
	River Road	Southern UGB	West	4	3	2	1	4
OR 51-Monmouth Street	Western UGB	10th Street	North	2	3	2	2	3
	Western UGB	10th Street	South	2	3	2	2	3
	10th Street	3rd Street	North	2	2	2	2	2
	10th Street	3rd Street	South	2	2	2	2	2
	3rd Street	Main Street	North	4	2	2	1	4
	3rd Street	Main Street	South	3	2	2	1	3
Gun Club Road	Hoffman Road	Picture Street	East	2	2	2	1	2
	Hoffman Road	Picture Street	West	4	2	1	1	4
	Picture Street	South of Ash Creek	East	2	3	2	1	3
	Picture Street	South of Ash Creek	West	4	N/A	N/A	N/A	4
	South of Ash Creek	Monmouth Street	East	2	3	2	1	3

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
	South of Ash Creek	Monmouth Street	West	2	3	2	1	3
Hoffman Road	Western UGB	Gun Club Road	North	4	N/A	N/A	N/A	4
	Western UGB	Gun Club Road	South	4	N/A	N/A	N/A	4
	Gun Club Road	West of Stryker Road	North	4	1	1	1	4
	Gun Club Road	West of Stryker Road	South	2	1	2	3	3
Polk Street	West of Stryker Road	Walnut Street	North	2	1	1	4	4
	West of Stryker Road	Walnut Street	South	2	1	1	3	3
	Walnut Street	OR 51-Main Street	North	4	2	2	4	4
	Walnut Street	OR 51-Main Street	South	4	2	2	4	4
Stryker Street	OR 51	Skyraider Drive	East	4	3	1	1	4
	OR 51	Skyraider Drive	West	4	2	2	4	4
	Skyraider Drive	Polk Street	East	4	3	1	4	4
	Skyraider Drive	Polk Street	West	2	3	2	1	3
Williams Street	Ash Street	OR 51-Main Street	North	4	2	2	1	4
	Ash Street	OR 51-Main Street	South	3	2	2	1	3
Picture Street	Gun Club Road	End of road	North	2	2	2	1	2
	Gun Club Road	End of road	South	2	2	2	1	2
Ash Street	Polk Street	Albert Street	East	2	2	2	1	2
	Polk Street	Albert Street	West	2	2	2	1	2
	Albert Street	4th Street	East	2	2	2	1	2
	Albert Street	4th Street	West	4	2	2	1	4
4th Street	Ash Street	B Street	East	3	1	1	1	3
	Ash Street	B Street	West	2	1	1	1	2

Street	From	To	Side	PLTS Criteria				PLTS
				Sidewalk Condition	Physical Buffer Width	Total Buffer Width	General Land Use	
	B Street	I Street	East	2	1	1	1	2
	B Street	I Street	West	2	2	2	1	2
	I Street	Spruce Avenue	East	4	N/A	N/A	N/A	4
	I Street	Spruce Avenue	West	2	2	2	1	2
7th Street	Monmouth Street	Southern UGB	East	2	2	2	1	2
	Monmouth Street	Southern UGB	West	2	1	2	1	2
13th Street	Monmouth Street	E Street	East	2	2	2	1	2
	Monmouth Street	E Street	West	2	2	2	2	2
	E Street	Southern City Limits	East	4	N/A	N/A	N/A	4
	E Street	Southern City Limits	West	3	2	2	1	3
	Southern City Limits	Southern UGB	East	4	N/A	N/A	N/A	4
	Southern City Limits	Southern UGB	West	4	N/A	N/A	N/A	4
16th Street	Northern UGB	Monmouth Street	East	2	2	2	1	2
	Northern UGB	Monmouth Street	West	2	2	2	1	2
	Monmouth Street	Southern UGB	East	4	2	3	2	4
	Monmouth Street	Southern UGB	West	3	2	1	1	3
G Street	7th Street	3rd Street	North	2	1	2	1	2
	7th Street	3rd Street	South	2	2	2	1	2
	3rd Street	Main Street	North	2	2	2	3	3
	3rd Street	Main Street	South	2	2	2	3	3
Spruce Avenue	6th Street	4th Street	North	2	2	2	1	2
	6th Street	4th Street	South	2	2	2	1	2



Pedestrian Level of Traffic Stress
Independence, OR

Figure
4

Data Source: Pok County Data Portal, ODOT

Bicycle Level of Traffic Stress

Similar to PLTS, Bicycle level of traffic stress (BLTS) is a perception-based analysis methodology that is used to evaluate the adequacy of streets to accommodate cyclists in urban and rural environments. As applied by ODOT, this methodology classifies four levels of traffic stress that a cyclist can experience on the street, ranging from BLTS 1 (little traffic stress) to BLTS 4 (high traffic stress). A street or street segment that is rated BLTS 1 generally has low traffic volumes and travel speeds and is suitable for all cyclists, including children. A street or street segment that is rated BLTS 4 generally has high traffic volumes and travel speeds and is perceived as unsafe by most adults. Per the APM, BLTS 2 is considered a reasonable target for streets due to its acceptability with most cyclists.

The BLTS score is determined based on the speed of the street, the number of travel lanes per direction, the presence and width of an on-street bike lane and/or adjacent parking lane, and several other factors. Table 5 summarizes the results of the BLTS analysis. Figure 5 illustrates the results of the BLTS analysis for the arterial and collector streets in Independence. It is important to note that while some segments are shown as BLTS 3 or 4, they may have shorter segments with lower BLTS scores.

As shown in Figure 5, several arterial and collector streets in Independence have segments that are rated BLTS 3 and BLTS 4. The segments rated BLTS 3 or BLTS 4 may have bike lanes that are too narrow for roadway conditions (i.e. posted speed). In order for these segments to be rated BLTS 2, the bike lanes would need to be widened to seven feet and/or the posted speed would need to be 30 mph. For example, the segment of OR 51-Monmouth Street between Hanna Road and Polk Street has striped bike lanes that are approximately six feet wide and posted speeds of 35 and 45 mph. For this segment to be rated BLTS 2, the posted speed would need to be 30 mph or the bike lane would need to be widened to seven feet and the posted speed would need to be 35 mph. Other segments rated BLTS 3 may not have bike lanes and may be considered mixed traffic (shoulder bikeways or no bicycle facilities present). In order for these segments to be rated BLTS 2, the shoulder would need to be restriped as a bike lane with appropriate width or traffic volumes would need to be below 2,500 ADT and the posted speed would need to be 25 mph. It should also be noted that a majority of the segments evaluated as mixed traffic that were rated BLTS 2 could include signage and/or striping to remind motorists to share the road. The signing and striping can also provide important wayfinding for cyclists to inform them of the preferred bicycle routes.

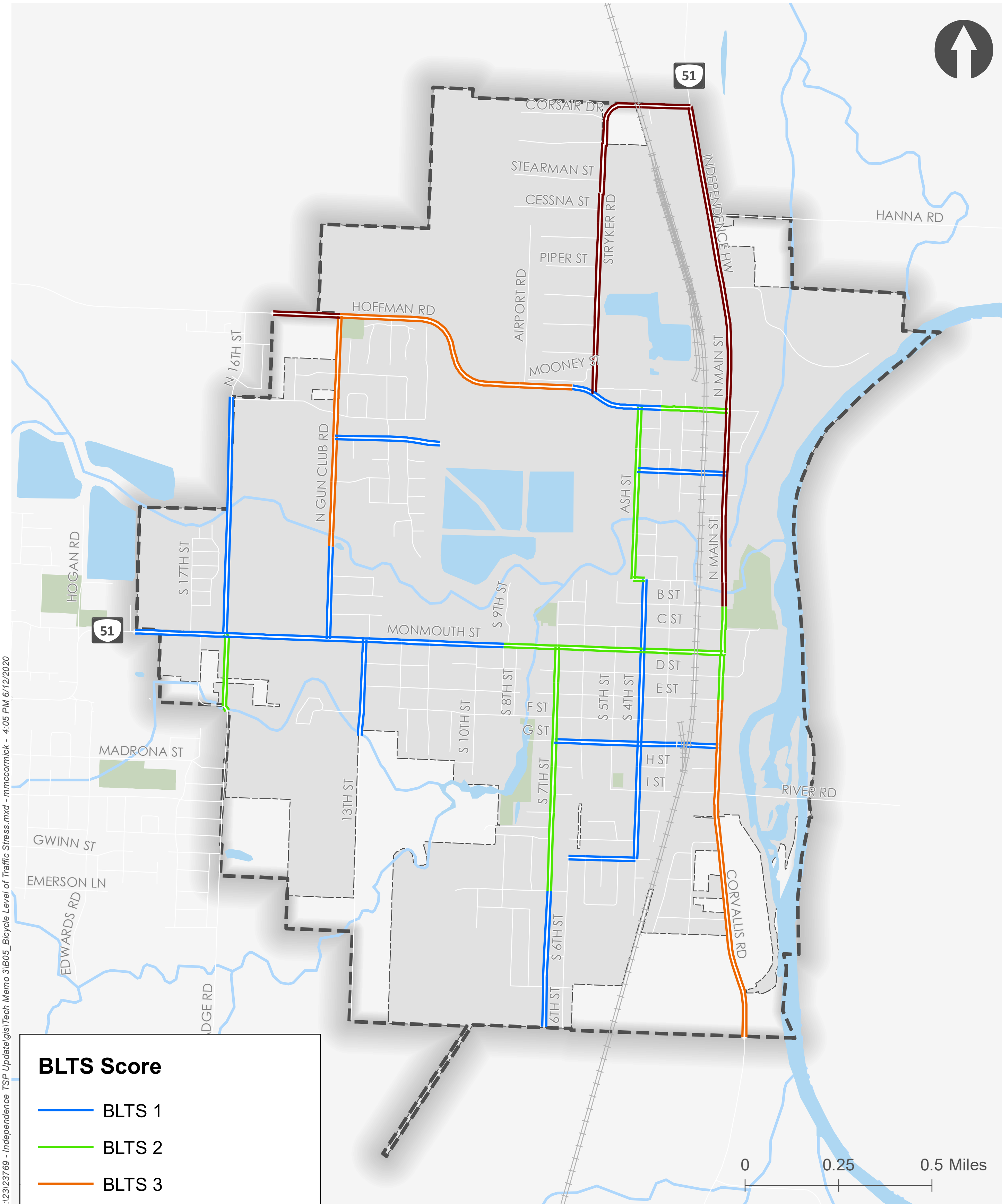
Table 5: Bicycle Level of Traffic Stress (BLTS) Analysis Results

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
OR 51	Stryker Road	Hanna Road	East	None/Bike Lane	45	1	None/7	None	No	4
	Stryker Road	Hanna Road	West	Bike Lane	45	1	6	None	No	4
	Hanna Road	Polk Street	East	Bike Lane	35 - 45	1	5.5 - 6	None	No	4
	Hanna Road	Polk Street	West	Bike Lane	35 - 45	1	5.5 - 6	None	No	4
	Polk Street	B Street	East	None/ Shoulder Bikeway	35	1	None/9 - 11	None/ Permitted	No	4
	Polk Street	B Street	West	None/ Shoulder Bikeway	35	1	None/4 - 11	None/ Permitted	No	4
OR 51-Main Street	B Street	Monmouth Street	East	None	20	1	None	Yes	No	2
	B Street	Monmouth Street	West	None	20	1	None	Yes	No	2
Main Street	Monmouth Street	E Street	East	None	20	1	None	Yes	No	2
	Monmouth Street	E Street	West	None	20	1	None	Yes	No	2
	E Street	River Road	East	None/ Shoulder Bikeway	20 - 30	1	None/6	None/Marked	No	3
	E Street	River Road	West	None/ Shoulder Bikeway	20 - 30	1	None/6	None/Marked	No	3
Corvallis Road	River Road	Southern UGB	East	None	30	1	None	None	No	3
	River Road	Southern UGB	West	None	30	1	None	None/Marked	No	3
	Western UGB	9th Street	North	Bike Lane	25 – 30	1	5	None	No	1

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
OR 51-Monmouth Street	Western UGB	9th Street	South	Bike Lane	25 – 30	1	5	None	No	1
	9th Street	Main Street	North	None/Bike Lane	20 – 25	1	None/5	None/Permitted/Marked	No	2
	9th Street	Main Street	South	None/Bike Lane	20 – 25	1	None/5	None/Permitted/Marked	No	2
Gun Club Road	Hoffman Road	Picture Street	East	None/Bike Lane/ Shoulder Bikeway	30	1	None/4 - 6	None	No	3
	Hoffman Road	Picture Street	West	None/Bike Lane	30	1	None/6 - 8	None	No	3
	Picture Street	South of Ash Creek	East	None/Bike Lane	30	1	None/6 - 8	None	No	3
	Picture Street	South of Ash Creek	West	None	30	1	None	None	No	3
	South of Ash Creek	Monmouth Street	East	Bike Lane	30	1	6	None	No	1
	South of Ash Creek	Monmouth Street	West	Bike Lane	30	1	6	None	No	1
Hoffman Road	Western UGB	Gun Club Road	North	None	35 - 40	1	None	None	No	4
	Western UGB	Gun Club Road	South	None	35 - 40	1	None	None	No	4
	Gun Club Road	West of Stryker Road	North	Bike Lane	35	1	4	None	No	3
	Gun Club Road	West of Stryker Road	South	Bike Lane	35	1	4	None	No	3
Polk Street	West of Stryker Road	Walnut Street	North	Bike Lane	25	1	4	None	No	1

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
	West of Stryker Road	Walnut Street	South	Bike Lane	25	1	4	None	No	1
	Walnut Street	OR 51-Main Street	North	None/Bike Lane	25	1	None/4 - 6	No	No	2
	Walnut Street	OR 51-Main Street	South	None	25	1	None	None	No	2
Stryker Road	OR 51	Polk Street	East	None/ Shoulder Bikeway	35	1	None/5	None	No	4
	OR 51	Polk Street	West	None/ Shoulder Bikeway	35	1	None/5	None	No	4
Williams Street	Ash Street	OR 51-Main Street	North	None	25	1	None	Permitted	No	1
	Ash Street	OR 51-Main Street	South	None	25	1	None	Permitted	No	1
Picture Street	Gun Club Road	End of road	North	None	25	1	None	Permitted	No	1
	Gun Club Road	End of road	South	None	25	1	None	Permitted	No	1
Ash Street	Polk Street	4th Street	East	None	25	1	None	Permitted	No	2
	Polk Street	4th Street	West	None	25	1	None	Permitted	No	2
4th Street	Ash Street	Spruce Avenue	East	None	25	1	None	None/Permitted/Marked	No	1
	Ash Street	Spruce Avenue	West	None	25	1	None	None/ Permitted	No	1
7th Street	Monmouth Street	Chestnut Street	East	None	25	1	None	None	No	2
	Monmouth Street	Chestnut Street	West	None	25	1	None	Permitted	No	2

Street	From	To	Side	Facility Type	BLTS Criteria					BLTS
					Speed (mph)	Lanes per Direction	Bicycle Facility Width (feet)	Parking	Frequent Blockage	
	Chestnut Street	Southern UGB	East	None	25	1	None	None	No	1
	Chestnut Street	Southern UGB	West	None	25	1	None	Permitted	No	1
13th Street	Monmouth Street	Southern UGB	East	None	25	1	None	None	No	1
	Monmouth Street	Southern UGB	West	None	25	1	None	None/ Permitted	No	1
16th Street	Northern UGB	Monmouth Street	East	Bike Lane	25	1	5	None	No	1
	Northern UGB	Monmouth Street	West	Bike Lane	25	1	5	None	No	1
	Monmouth Street	Southern UGB	East	None/ Shoulder Bikeway	25	1	None/4 - 11	None	No	2
	Monmouth Street	Southern UGB	West	Shoulder Bikeway	25	1	5	None	No	2
G Street	7th Street	Main Street	North	None	25	1	None	None/ Permitted	No	1
	7th Street	Main Street	South	None	25	1	None	None/ Permitted	No	1
Spruce Avenue	6th Street	4th Street	North	None	25	1	None	Permitted	No	1
	6th Street	4th Street	South	None	25	1	None	Permitted	No	1



H:\23\23769 - Independence TSP Update\gis\Tech Memo 3\B05_Bicycle Level of Traffic Stress.mxd - mmccormick - 4:05 PM 6/12/2020

BLTS Score

- BLTS 1
- BLTS 2
- BLTS 3
- BLTS 4
- City Boundary
- Urban Growth Boundary

Bicycle Level of Traffic Stress
Independence, OR

Figure
5

Data Source: Pok County Data Portal, ODOT

CRASH ANALYSIS

Crash records were obtained from ODOT for the five-year period from January 1, 2013 through December 31, 2017 for the overall study area. Figure 6 illustrates the location, severity, and type of crashes that occurred within the study area over the five-year period. Based on the data, a total of 269 crashes occurred in Independence, of which one resulted in a fatality, 144 resulted in injuries, and 124 resulted in property-damage-only. The following summarizes the results of the intersection and segment crash analysis based on the five years of crash data.

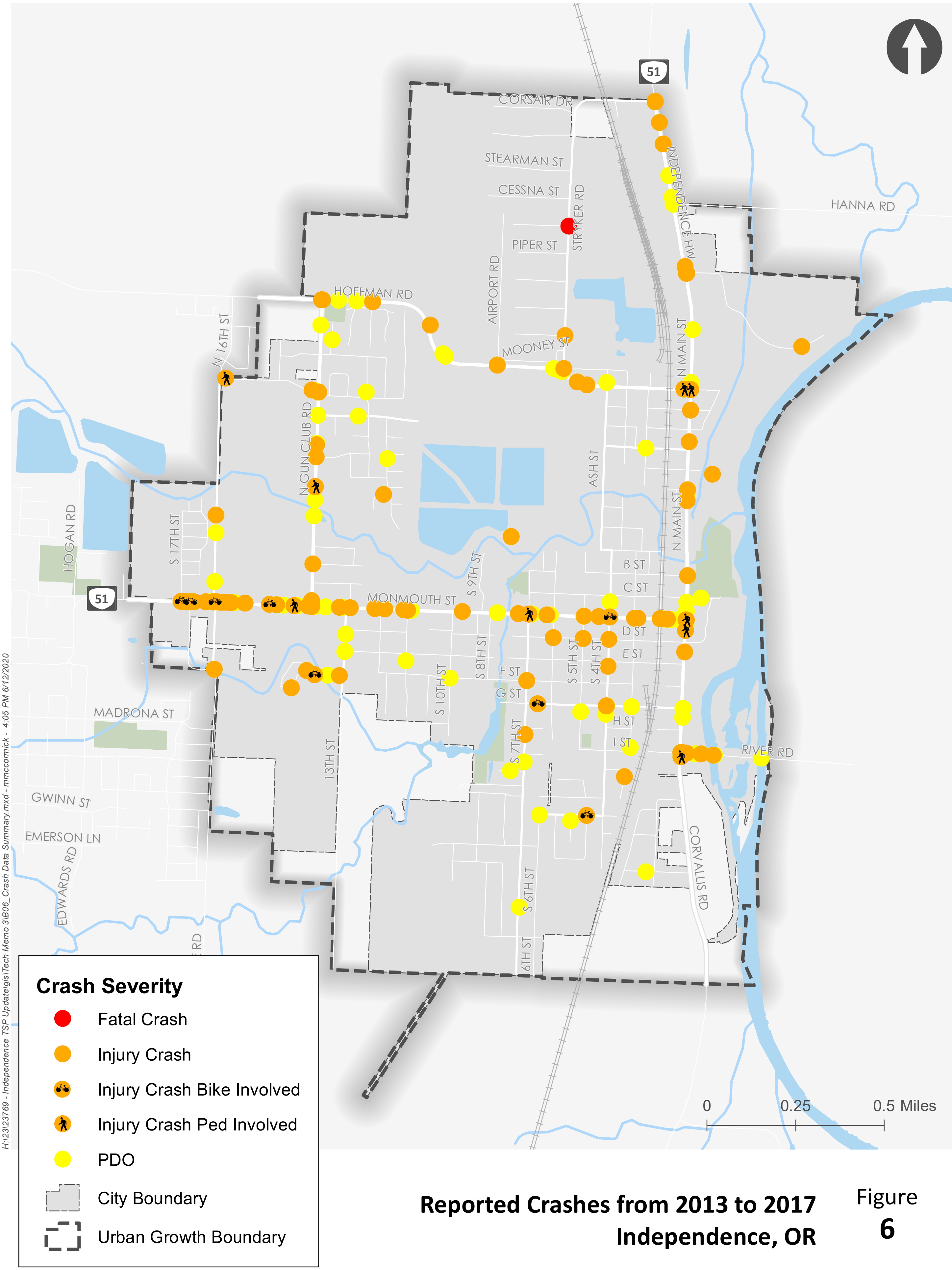
Intersection Crash Analysis

The intersection crash analysis includes an evaluation of intersection crash rates, critical crash rates, and excess proportion of specific crash types. The intersection crash analysis identifies the study intersections where existing safety issues may exist – based on the data, 61 of the 269 reported crashes occurred at the study intersections. Table 6 summarizes the collision type and crash severity for all reported crashes at the study intersections.

Table 6: Intersection Crash History (January 1, 2013 through December 31, 2017)

Map ID	Intersection	Collision Type					Crash Severity			Total
		Angle	Turn	Rear-End	Ped/Bike	Other	Fatal	Injury	PDO	
1	OR 51/Stryker Road		4					3	1	4
2	OR 51/Polk Street	2	3		1	1		4	3	7
3	Main Street/Williams Street									0
4	Main Street/C Street									0
5	Main Street/Monmouth Street			1	1	2		2	2	4
6	Monmouth Street/4th Street	2						2		2
7	Monmouth Street/7th Street	1	1	2		1		5		5
8	Monmouth Street/13th Street			1				1		1
9	Monmouth Street/Gun Club Road	2	8	3				8	5	13
10	Monmouth Street/16th Street		2						2	2
11	Hoffman Road/16th Street	2	3	3	1			6	3	9
12	Hoffman Road/Gun Club Road		2	2				3	1	4
13	Hoffman Road/Stryker Road		1	1	1			1	2	3
14	Polk Street/Ash Street									0
15	Ash Street/Williams Street									0
16	Main Street/D Street									0
17	Main Street/G Street									0
18	S Main Street/River Road S	1	1	4		1		4	3	7

Fatal: Includes fatal and incapacitating injuries
Injury: Includes non-incapacitating injuries and possible injuries/complaint of pain
PDO: Property Damage Only:



Reported Crashes from 2013 to 2017
Independence, OR

Figure
6

Data Source: Pok County Data Portal, ODOT

Intersection Crash Rates

Intersection crash rates were developed for the study intersections based on the total number of crashes reported at the intersections over the five-year period and the total entering volume, or million entering vehicles (MEV). Intersection crash rates were compared to 90th percentile crash rates developed by ODOT and documented in Table 4-1 of the ODOT APM. Table 7 summarizes the total number of crashes reported at the study intersections over the five-year period, the intersection crash rates, and the corresponding 90th percentile crash rates as identified in the APM.

Table 7: Intersection Crash Rates vs. ODOT 90th Percentile Rates

Map ID	Intersection	Total Crashes	Intersection Crash Rate	90th Percentile Rate	Exceed 90th Percentile Rate?
1	OR 51/Stryker Road	4	0.22	0.29	No
2	OR 51/Polk Street	7	0.35	0.41	No
3	Main Street/Williams Street	0	0.00	0.41	No
4	Main Street/C Street	0	0.00	0.41	No
5	Main Street/Monmouth Street	4	0.19	0.29	No
6	Monmouth Street/4th Street	2	0.10	0.41	No
7	Monmouth Street/7th Street	5	0.21	0.41	No
8	Monmouth Street/13th Street	1	0.04	0.41	No
9	Monmouth Street/Gun Club Road	13	0.43	0.51	No
10	Monmouth Street/16th Street	2	0.06	0.86	No
11	Hoffman Road/16th Street	9	0.68	0.29	**Yes**
12	Hoffman Road/Gun Club Road	4	0.26	0.29	No
13	Hoffman Road/Stryker Road	3	0.26	0.29	No
14	Polk Street/Ash Street	0	0.00	0.41	No
15	Ash Street/Williams Street	0	0.00	0.29	No
16	Main Street/D Street	0	0.00	0.41	No
17	Main Street/G Street	0	0.00	0.29	No
18	S Main Street/River Road S	7	0.33	0.41	No

As shown in Table 7, the Hoffman Road/16th Street intersection currently exceeds the corresponding 90th percentile crash rate. *Attachment C contains the intersection crash rate analysis worksheet.*

Critical Crash Rates

Critical crash rates were developed for the study intersections with sufficient reference populations based on the total number of crashes reported at the intersections over the five-year period, intersection type, and the total entering volume or average annual daily traffic (AADT). This method is only applicable where at least 5-10 intersections are available with similar characteristics (i.e. traffic control and legs/approaches). Otherwise, the critical crash rate defaults to the 90th percentile crash rates outlined in Table 8. Critical crash rates were calculated for the study intersections using ODOT's Critical Crash Rate Calculator tool. Table 8 summarizes the total number of crashes reported at the study intersections over the five-year period, the intersection crash rates, and the corresponding critical crash rates.

Table 8: Intersection Crash Rates vs. Critical Crash Rates

Map ID	Intersection	Total Crashes	Intersection Crash Rate	Critical Crash Rate	Exceed Critical Crash Rate?
1	OR 51/Stryker Road	4	0.22	0.45	No
2	OR 51/Polk Street	7	0.35	0.29	**Yes**
3	Main Street/Williams Street	0	0.00	0.31	No
4	Main Street/C Street	0	0.00	0.31	No
5	Main Street/Monmouth Street	4	0.19	0.43	No
6	Monmouth Street/4th Street	2	0.10	0.29	No
7	Monmouth Street/7th Street	5	0.21	0.27	No
8	Monmouth Street/13th Street	1	0.04	0.27	No
9	Monmouth Street/Gun Club Road	13	0.43	N/A	N/A
10	Monmouth Street/16th Street	2	0.06	N/A	N/A
11	Hoffman Road/16th Street	9	0.68	0.49	**Yes**
12	Hoffman Road/Gun Club Road	4	0.26	0.47	No
13	Hoffman Road/Stryker Road	3	0.26	0.49	No
14	Polk Street/Ash Street	0	0.00	0.38	No
15	Ash Street/Williams Street	0	0.00	0.96	No
16	Main Street/D Street	0	0.00	0.31	No
17	Main Street/G Street	0	0.00	0.44	No
18	S Main Street/River Road S	7	0.33	0.28	**Yes**

As shown in Table 8, the OR 51/Polk Road, Hoffman Road/16th Street, and Main Street/River Road intersections currently exceed their corresponding critical crash rates. *Attachment C contains the critical crash rate analysis worksheet.*

Excess Proportion of Specific Crash Types

The Excess Proportion of Specific Crash Types analysis method quantifies the extent to which a specific crash type is overrepresented at an intersection when compared to the average representation within a reference population (five or more intersections with the same configuration). The analysis method does not consider the overall frequency or rate of crashes, instead it considers only the types of crashes observed. It is useful for identifying locations that may benefit from targeted countermeasures. This method is best used in conjunction with the Critical Crash Rate analysis described above, as the two methods have complementary strengths and weaknesses.

Table 9 summarizes the intersections with a high probability (over 90 percent) that the long-term expected proportion of specific crash types will be greater than the long-term expected proportion of the specific crash types when compared to other intersections in the reference population. The table shows the study intersection, intersection type/reference population, the collision type in excess, the probability of future occurrences, and the proportion of benefit or the likelihood that the intersection will benefit from a countermeasure targeted at the specific crash type. *Attachment C contains the excess proportion of specific crash types analysis worksheet.*

Table 9: Excess Proportions of Specific Crash Types

Map ID	Intersection	Intersection Type/Reference Population	Collision Type in Excess	Probability of Future Occurrence	Proportion of Benefit
1	OR 51/Stryker Road	3ST	Turn	100%	0.58
6	Monmouth Street/4th Street	4ST	Angle	99%	0.73
7	Monmouth Street/7th Street	4ST	Rear-end	92%	0.08*
12	Hoffman Road/Gun Club Road	3ST	Rear-end	93%	0.21
18	S Main Street/River Road S	4ST	Rear-end	97%	0.25

*A proportion of benefit below 0.10 indicates that a countermeasure will have limited impact on proportion of crash type.

Segment Crash Analysis

This section evaluates crashes along study area roadways, excluding crashes at study intersections, by comparing their overall crash rates in Table II of the 2017 statewide Crash Rate Book. Table II lists crash rates for mainline State highways for the past five years, by federally defined urban and rural areas and functional classification.

Segment crash rates were developed for study area roadways and roadway segments based on the total number of crashes reported along the segments over the five-year period along with the segments lengths, and traffic volumes. The total number of crashes along the segments and the segment lengths were obtained from GIS data. Traffic volume data were estimated for the segments based on the traffic counts collected at the study intersections. Table 10 summarizes the segment crash rates for each study segment and compares them to ODOT's state highway system crash rates.

Table 10: Segment Crash Rates vs. ODOT State Highway System Crash Rates

Map ID	Street (from/To)	Segment Length (mile)	Segment Crash Rate	State Highway Crash Rate	Exceed State Highway Rate?
1	OR 51-Main Street from Stryker Road to Polk Street	0.82	1.07	2.39	No
2	OR 51-Main Street from Polk Street to Monmouth Street	0.62	1.14	2.39	No
3	Main Street from OR 51-Monmouth Street to south city limits	0.44	0.76	2.39	No
4	OR 51-Monmouth St from west city limits to Gun Club Road	0.39	4.06	2.39	Yes
5	OR 51-Monmouth Street from Gun Club Road to 7th Street	0.61	1.55	2.39	No
6	OR 51-Monmouth Street from 7th Street to OR 51-Main Street	0.44	2.72	2.39	No
7	16th Street from OR 51-Monmouth Street to north city limits	0.34	1.48	1.70	No
8	16th Street from OR 51-Monmouth Street to south city limits	0.20	1.60	1.70	No
9	Gun Club Rd from OR 51-Monmouth St to Hoffman Rd	0.87	1.96	2.77	No
10	13th Street from OR 51-Monmouth Street to south city limits	0.26	4.91	1.70	No
11	7th Street from OR 51-Monmouth Street to south city limits	1.02	1.42	2.77	No
12	4th Street from A Street to OR 51-Monmouth Street	0.19	2.22	1.70	No
13	4th Street from OR 51-Monmouth Street to Spruce Street	0.56	3.91	1.70	Yes
14	Stryker Road from OR 51-Main Street to Polk Street	0.99	0.76	1.70	No
15	Hoffman-Polk from Gun Glub Road to OR 51-Main Street	1.15	1.59	2.77	No

16	Picture Street from Gun Club Road to 12th Street	0.19	2.81	1.70	No
17	Williams Street from Ash Street to OR 51-Main Street	0.24	7.75	1.70	No
18	G Street from 7th Street to OR 51-Main Street	0.44	2.52	1.70	No
19	Spruce Street from 6th Street to 4th Street	0.18	6.09	1.70	No
20	River Road from Main Street to East City Limits	0.25	2.42	1.70	No

As shown in Table 10, the segment of OR 51-Monmouth Street from the west city limits to Gun Club Road and the segment of 4th Street from OR 51-Monmouth Street to Spruce Street currently exceed the crash rates for similar facilities throughout the state. *Attachment C contains the segment crash analysis worksheet.*

It should also be noted that one fatal crash occurred along the segment of Stryker Road from OR 51-Main Street to Polk Street over the five-year period. The crash occurred at the Stryker Road/Stinson Street intersection in April 2014 on a rainy, wet, day. The crash occurred when a motorist entered the intersection from a private driveway on the east side of Stryker Road and was struck by a motorist traveling south on Stryker Road. Based on the crash data, the crash occurred because the westbound motorist failed to yield the right-of-way to the southbound motorist.

Safety Priority Index System

The Safety Priority Index System (SPIS) was developed by ODOT to identify sites along state and local roads where potential safety issues warrant further investigation. The SPIS compares the total number of crashes reported on city streets, county roads, and state highways and generates a list of sites (intersections and roadway segments) with calculated SPIS scores. The scores are based on crash frequency, crash rate, and crash severity. SPIS sites with scores in the top five percent are investigated by ODOT staff and reported to the Federal Highway Administration (FHWA). Per the most recent SPIS list (2017), there are no sites within Independence in the top five or ten percent of SPIS sites; however, there is one site in the top 15 percent. The site is located along Monmouth Street at the eastbound approach to 16th Street. Given that it is in the top 15 percent, no additional data is available for the site.

Additional Safety Concerns

Additional safety concerns identified through discussions with Independence Planning Commission, include:

- The 7th Street intersection with Monmouth needs some form of traffic control.
- It is difficult to turn left onto Monmouth at certain times of the day from 11th Street.
- The turn from River Road south onto Main Street is a difficult turn. Tough to find a gap, and speeds of northbound traffic can sometimes be too fast. Northbound Main Street/Corvallis Road drops from 50 to 35 right before the bridge, and sometimes people do not slow before the bridge.
- The three way stop in downtown has many close calls for pedestrians.
- Access from dog park has poor visibility at Main.
- Osprey Lane gets blocked by traffic backups at 3-way stop.
- The Gun Club and Hoffman intersection is not stellar. The speed on Hoffman is 35 to 40 mph, and people have to dart between traffic.

- The Polk and Main Street intersection is difficult. A lot of activity comes into the small intersection – truck travel, pedestrian traffic, bus stop nearby, etc. People potentially cut by on Stryker to get around the intersection.
- Downtown intersections sometimes unsafe for pedestrians. Sometimes people don't stop.
- 6th has lots of cars between Monmouth and G, and visibility on side streets is poor.
- The three-way stop at Main and Monmouth is not safe for pedestrians.

ACCESS MANAGEMENT ANALYSIS

ODOT and the City of Independence have adopted access spacing standards for study area roadways. This analysis identifies ODOT's access spacing standards, as defined in Oregon Administrative Rule (OAR) 734 Division 51, and the City's access spacing standards as defined in the 2007 Independence TSP. This analysis also identifies the access points along ODOT and City arterial and collector streets that do not meet their applicable standards.

ODOT Access Spacing Standards

Access spacing standards for approaches to state highways are based on the classification of the highway and differ depending on posted speed and AADT. Within Independence, OR 51 is classified as a district highway with speeds that range from 20 to 45 MPH, and all AADTs are above 5,000 vehicles. Table 11 summarizes ODOT's current access spacing standards for OR 51 within Independence.

Table 11: ODOT Access Spacing Standards

Posted Speed (MPH)	Urban Areas Access Management Spacing Standards for >5,000 AADT (Feet)
25 and lower	250
30 and 35	350
40 and 45	500
50	550
55 or higher	700

There are six segments with different posted speeds along OR 51 within Independence. Table 12 summarizes the posted speeds, segment lengths, the total number of intersections and driveways located along the segments, and the average intersection and driveway spacing. As shown, average intersection spacing generally meets ODOT's access spacing standards, and average driveway spacing generally exceeds ODOT's access spacing standards. It should be noted that there may be intersections and driveways that meet the standards within each segment where the average spacing exceeds the standards.

Table 12: OR 51 Access Spacing Analysis

Roadway Segments	Posted Speed	Segment Length (ft)	Inter-sections	Average Intersection Spacing (ft)	Driveways	Average Driveway Spacing (ft)
OR 51 – Main Street						
Stryker Rd to North of Polk St	45	2,440	3	813	28	**87**
North of Polk St to B St	35	3,690	7	527	17	**217**

B St to Monmouth Street	20	670	2	**335**	3	223
OR 51 – Monmouth Street						
Main Street to 3rd Street	20	750	2	375	9	**83**
3rd Street to 10th Street	25	2,730	7	390	30	**91**
10th Street to west UGB	30	4,800	7	686	57	**84**

City Access Spacing Standards

The City's access spacing standards are determined by functional classification and posted speed and apply to driveways and intersections. Table 13 summarizes the City's access spacing standards.

Table 13: City Access Spacing Standards

Functional Classification	Minimum Posted Speed	Minimum Spacing Between Driveways	Spacing Between Intersections
Major Arterial	35 – 50 MPH	250 feet	1,320 feet
Minor Arterial	35 – 50 MPH	250 feet	250 feet
Major Collector	25 – 40 MPH	100-150 feet	250 feet
Collector	25 – 40 MPH	100-150 feet	250 feet

Table 14 below lists the non-state arterial and collector streets in Independence, including posted speeds, segment lengths, the total number of intersections and driveways located along the segments, and the average intersection and driveway spacing. As shown, average intersection spacing generally meets the City's access spacing standards, and average driveway spacing generally exceeds the City's access spacing standards. It should be noted that there may be intersections and driveways that meet the standards within each segment where the average spacing exceeds the standards.

Table 14: City Roadway Access Spacing Analysis

Roadway Segments	Posted Speed	Segment Length (feet)	Inter-sections	Average Intersection Spacing (ft)	Driveways	Average Driveway Spacing (ft)
Major Arterials						
Main St – OR 51 to F St	20	1,000	4	50	15	67
Main St – F St to S of River Rd	30	1,200	4	300	11	109
Main St – S of River Rd to UGB	40	1,960	3	**653**	39	**50**
Minor Arterials						
Gun Club Rd – OR 51 to Hoffman Rd	30	4,570	12	381	52	88
Polk St – OR 51 to Stryker Rd	25	1,990	6	332	27	74
Hoffman Rd – Stryker Rd to Gun Club Rd	35	4,100	4	1,025	7	586
Collectors						
Stryker Rd – Polk St to OR 51	35	5,180	14	370	29	179
Ash St – Polk St to A St	25	2,420	7	346	30	**81**
Williams St – Ash St to OR 51	N/A	1,280	5	256	26	**49**

4th St – A St to OR 51	20	1,020	4	255	16	**64**
Picture St – Gun Club Rd to End of Road	N/A	1,430	4	358	32	**45**
16th St – OR 51 to North UGB	25	3,360	6	560	23	146
16th St – OR 51 to South UGB	25	1,000	2	500	7	143
13th St – OR 51 to UGB	N/A	5,350	4	1,338	31	173
7th St – OR 51 to UGB	N/A	5,360	14	**83**	142	**38**
G St – 7th St to OR 51	N/A	2,330	6	388	42	**55**
Spruce Ave – 6th St to 4th St	N/A	940	5	**188**	15	**63**

State Highway Approach Permits

The state highway approach permits information was obtained from the ODOT TransGIS database. Table 15 shows the number of approach permits recorded along OR 51 in Independence.

Table 15: State Highway Approach Permits

Street	From	To	Number of Approach Permits
OR 51-Main Street	Stryker Road	Polk Street	23
OR 51-Main Street	Polk Street	Picture Street	0
OR 51-Main Street	Picture Street	Monmouth Street	3
OR 51-Monmouth Street	Western UGB	10th Street	37
OR 51-Monmouth Street	10th Street	Main Street	0

ENVIRONMENTAL ANALYSIS

Title VI and Environmental Justice (EJ) population information is provided in *Tech Memo 3A: Transportation Inventory, Attachment A*. The information will be used to identifying transportation system improvements that will provide the most benefits to identified populations. Six population groups are considered for transportation impact susceptibility, representing those who may rely more heavily on public infrastructure or transit for access to day-to-day needs and jobs. They include minority groups, low-income populations, populations under 17 or over 64 years of age, low-English proficiency households, and people with disabilities. See *Tech Memo 3A: Transportation Inventory, Attachment A* for additional information.

ATTACHMENTS

A. Existing Traffic Conditions Worksheets
B. Detailed Pedestrian Level of Traffic Stress Results
C. Crash Data

Attachment A Existing Traffic Conditions Worksheets

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	93	11	12	397	387	103
Future Vol, veh/h	93	11	12	397	387	103
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	-	190	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	2	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	0	0	5	2	0
Mvmt Flow	95	11	12	405	395	105

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	877	448	500	0	-	0
Stage 1	448	-	-	-	-	-
Stage 2	429	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	320	615	1075	-	-	-
Stage 1	646	-	-	-	-	-
Stage 2	659	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	615	1075	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	639	-	-	-	-	-
Stage 2	659	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	20.8	0.2	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1075	-	333	-	-
HCM Lane V/C Ratio	0.011	-	0.319	-	-
HCM Control Delay (s)	8.4	-	20.8	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1.3	-	-

Intersection	
Int Delay, s/veh	8.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	2	89	6	2	4	74	329	4	8	363	117
Future Vol, veh/h	104	2	89	6	2	4	74	329	4	8	363	117
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	200	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	112	2	96	6	2	4	80	354	4	9	390	126

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	990	989	462	1045	1050	356	516	0	0	358	0	0
Stage 1	471	471	-	516	516	-	-	-	-	-	-	-
Stage 2	519	518	-	529	534	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	222	249	600	209	229	693	1055	-	-	1212	-	-
Stage 1	566	563	-	546	538	-	-	-	-	-	-	-
Stage 2	533	536	-	537	528	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	205	229	595	162	210	693	1055	-	-	1212	-	-
Mov Cap-2 Maneuver	205	229	-	162	210	-	-	-	-	-	-	-
Stage 1	523	559	-	505	497	-	-	-	-	-	-	-
Stage 2	487	495	-	442	524	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	43	21.7	1.6	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1055	-	-	293	229	1212	-	-
HCM Lane V/C Ratio	0.075	-	-	0.716	0.056	0.007	-	-
HCM Control Delay (s)	8.7	-	-	43	21.7	8	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5.1	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	0	10	1	0	0	5	413	2	0	460	6
Future Vol, veh/h	7	0	10	1	0	0	5	413	2	0	460	6
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	0	10	0	0	0	0	6	0	0	2	17
Mvmt Flow	8	0	11	1	0	0	5	449	2	0	500	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	965	968	505	971	970	452	508	0	0	453	0	0
Stage 1	505	505	-	462	462	-	-	-	-	-	-	-
Stage 2	460	463	-	509	508	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.3	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.39	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	236	256	551	234	255	612	1067	-	-	1118	-	-
Stage 1	553	544	-	584	568	-	-	-	-	-	-	-
Stage 2	585	568	-	550	542	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	235	254	550	228	253	611	1066	-	-	1116	-	-
Mov Cap-2 Maneuver	235	254	-	228	253	-	-	-	-	-	-	-
Stage 1	549	543	-	579	563	-	-	-	-	-	-	-
Stage 2	581	563	-	539	541	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	20.9	0.1	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1066	-	-	354	228	1116	-	-
HCM Lane V/C Ratio	0.005	-	-	0.052	0.005	-	-	-
HCM Control Delay (s)	8.4	0	-	15.7	20.9	0	-	-
HCM Lane LOS	A	A	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	3	2	13	15	373	12	15	387	34
Future Vol, veh/h	0	0	0	3	2	13	15	373	12	15	387	34
Conflicting Peds, #/hr	6	0	10	10	0	6	7	0	2	2	0	7
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	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	3	0
Mvmt Flow	0	0	0	3	2	14	16	410	13	16	425	37

Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				937	952	425	469	0	0	425	0	0
Stage 1				451	451	-	-	-	-	-	-	-
Stage 2				486	501	-	-	-	-	-	-	-
Critical Hdwy				6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1				5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy				3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver				296	261	634	1103	-	-	1145	-	-
Stage 1				646	574	-	-	-	-	-	-	-
Stage 2				623	546	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver				281	0	629	1103	-	-	1143	-	-
Mov Cap-2 Maneuver				281	0	-	-	-	-	-	-	-
Stage 1				632	0	-	-	-	-	-	-	-
Stage 2				606	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.3	0.3	0.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1103	-	-	510	1143	-	-
HCM Lane V/C Ratio	0.015	-	-	0.039	0.014	-	-
HCM Control Delay (s)	8.3	0	-	12.3	8.2	0	-
HCM Lane LOS	A	A	-	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	180	170	223	215	208	175
Future Vol, veh/h	180	170	223	215	208	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	189	179	235	226	219	184
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	18.6	24.3	18
HCM LOS	C	C	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	51%	51%	0%
Vol Thru, %	49%	0%	54%
Vol Right, %	0%	49%	46%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	438	350	383
LT Vol	223	180	0
Through Vol	215	0	208
RT Vol	0	170	175
Lane Flow Rate	461	368	403
Geometry Grp	1	1	1
Degree of Util (X)	0.747	0.619	0.632
Departure Headway (Hd)	5.836	6.048	5.643
Convergence, Y/N	Yes	Yes	Yes
Cap	613	593	633
Service Time	3.918	4.13	3.73
HCM Lane V/C Ratio	0.752	0.621	0.637
HCM Control Delay	24.3	18.6	18
HCM Lane LOS	C	C	C
HCM 95th-tile Q	6.6	4.2	4.5

Intersection	
Int Delay, s/veh	4.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	41	387	40	14	483	3	40	15	15	3	27	36
Future Vol, veh/h	41	387	40	14	483	3	40	15	15	3	27	36
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	46	430	44	16	537	3	44	17	17	3	30	40

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	546	0	0	476	0	0	1152	1124	456	1140	1145	545
Stage 1	-	-	-	-	-	-	546	546	-	577	577	-
Stage 2	-	-	-	-	-	-	606	578	-	563	568	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	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	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	1023	-	-	1097	-	-	176	207	569	180	201	542
Stage 1	-	-	-	-	-	-	526	521	-	506	505	-
Stage 2	-	-	-	-	-	-	487	504	-	514	510	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1017	-	-	1095	-	-	134	189	567	152	183	539
Mov Cap-2 Maneuver	-	-	-	-	-	-	134	189	-	152	183	-
Stage 1	-	-	-	-	-	-	492	488	-	472	491	-
Stage 2	-	-	-	-	-	-	414	490	-	451	477	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	0.2	41.8	22.2
HCM LOS			E	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	173	1017	-	-	1095	-	-	282
HCM Lane V/C Ratio	0.45	0.045	-	-	0.014	-	-	0.26
HCM Control Delay (s)	41.8	8.7	0	-	8.3	0	-	22.2
HCM Lane LOS	E	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.1	0.1	-	-	0	-	-	1

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	475	88	22	619	1	61	0	20	1	1	6
Future Vol, veh/h	7	475	88	22	619	1	61	0	20	1	1	6
Conflicting Peds, #/hr	4	0	12	12	0	4	0	0	2	2	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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	8	516	96	24	673	1	66	0	22	1	1	7

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	678	0	0	624	0	0	1318	1318	578	1319	1366	678
Stage 1	-	-	-	-	-	-	592	592	-	726	726	-
Stage 2	-	-	-	-	-	-	726	726	-	593	640	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	923	-	-	967	-	-	136	159	519	135	149	456
Stage 1	-	-	-	-	-	-	496	497	-	419	433	-
Stage 2	-	-	-	-	-	-	419	433	-	496	473	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	919	-	-	956	-	-	126	148	512	123	139	454
Mov Cap-2 Maneuver	-	-	-	-	-	-	126	148	-	123	139	-
Stage 1	-	-	-	-	-	-	484	485	-	412	414	-
Stage 2	-	-	-	-	-	-	395	414	-	468	462	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.3	55.1	18.3
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	155	919	-	-	956	-	-	280
HCM Lane V/C Ratio	0.568	0.008	-	-	0.025	-	-	0.031
HCM Control Delay (s)	55.1	8.9	0	-	8.9	0	-	18.3
HCM Lane LOS	F	A	A	-	A	A	-	C
HCM 95th %tile Q(veh)	2.9	0	-	-	0.1	-	-	0.1

Intersection						
Int Delay, s/veh	0.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	614	50	26	660	21	32
Future Vol, veh/h	614	50	26	660	21	32
Conflicting Peds, #/hr	0	4	4	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	1	2	4	1	0	0
Mvmt Flow	675	55	29	725	23	35

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	734	0	1492	707
Stage 1	-	-	-	-	707	-
Stage 2	-	-	-	-	785	-
Critical Hdwy	-	-	4.14	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	862	-	137	439
Stage 1	-	-	-	-	493	-
Stage 2	-	-	-	-	453	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	859	-	132	437
Mov Cap-2 Maneuver	-	-	-	-	271	-
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	437	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	17.2
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	352	-	-	859	-
HCM Lane V/C Ratio	0.165	-	-	0.033	-
HCM Control Delay (s)	17.2	-	-	9.3	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.1	-

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	103	508	21	640	89	92	152	158
v/c Ratio	0.25	0.48	0.04	0.71	0.41	0.25	0.59	0.42
Control Delay	6.3	10.9	4.9	18.8	33.3	23.4	38.3	21.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	10.9	4.9	18.8	33.3	23.4	38.3	21.8
Queue Length 50th (ft)	13	83	2	193	36	28	64	40
Queue Length 95th (ft)	37	264	11	413	85	72	134	99
Internal Link Dist (ft)		1366		439		96		4493
Turn Bay Length (ft)	145		150		100		50	
Base Capacity (vph)	682	1210	766	1127	487	800	580	777
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.42	0.03	0.57	0.18	0.12	0.26	0.20

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	98	452	30	20	487	121	85	63	25	144	67	83
Future Volume (veh/h)	98	452	30	20	487	121	85	63	25	144	67	83
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.98		0.97	0.97		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1736	1736	1750	1736	1736	1750	1723	1723	1750	1750	1750
Adj Flow Rate, veh/h	103	476	32	21	513	127	89	66	26	152	71	87
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	1	1	0	2	2	0	0	0
Cap, veh/h	395	893	60	492	688	170	283	260	102	345	157	192
Arrive On Green	0.07	0.56	0.56	0.02	0.51	0.51	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1641	1605	108	1667	1340	332	1221	1163	458	1290	701	859
Grp Volume(v), veh/h	103	0	508	21	0	640	89	0	92	152	0	158
Grp Sat Flow(s),veh/h/ln	1641	0	1713	1667	0	1671	1221	0	1621	1290	0	1560
Q Serve(g_s), s	1.7	0.0	11.5	0.3	0.0	18.5	4.2	0.0	2.9	6.7	0.0	5.4
Cycle Q Clear(g_c), s	1.7	0.0	11.5	0.3	0.0	18.5	9.5	0.0	2.9	9.6	0.0	5.4
Prop In Lane	1.00		0.06	1.00		0.20	1.00		0.28	1.00		0.55
Lane Grp Cap(c), veh/h	395	0	953	492	0	858	283	0	362	345	0	348
V/C Ratio(X)	0.26	0.00	0.53	0.04	0.00	0.75	0.31	0.00	0.25	0.44	0.00	0.45
Avail Cap(c_a), veh/h	819	0	1256	995	0	1226	608	0	793	688	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.0	0.0	8.6	6.6	0.0	11.8	24.7	0.0	19.6	23.6	0.0	20.6
Incr Delay (d2), s/veh	0.3	0.0	2.1	0.0	0.0	4.9	0.5	0.0	0.3	0.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.0	0.1	0.0	6.8	1.2	0.0	1.1	2.0	0.0	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	0.0	10.7	6.6	0.0	16.7	25.2	0.0	19.9	24.2	0.0	21.3
LnGrp LOS	A	A	B	A	A	B	C	A	B	C	A	C
Approach Vol, veh/h		611			661			181			310	
Approach Delay, s/veh		10.5			16.4			22.5			22.7	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	38.1		17.7	8.1	35.5		17.7				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	20.0	45.0		30.0	20.0	45.0		30.0				
Max Q Clear Time (g_c+I1), s	2.3	13.5		11.6	3.7	20.5		11.5				
Green Ext Time (p_c), s	0.0	10.7		1.1	0.2	11.0		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			16.1
HCM 6th LOS			B

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	572	106	626	17	160	43	147
v/c Ratio	0.18	0.63	0.24	0.68	0.07	0.53	0.18	0.47
Control Delay	6.5	17.4	6.8	18.1	27.0	19.0	28.0	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	17.4	6.8	18.1	27.0	19.0	28.0	24.2
Queue Length 50th (ft)	10	182	15	203	6	13	15	26
Queue Length 95th (ft)	31	371	43	410	26	84	51	108
Internal Link Dist (ft)		1726		1366		496		3282
Turn Bay Length (ft)	250		215		110		215	
Base Capacity (vph)	710	1391	738	1400	474	813	468	821
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.41	0.14	0.45	0.04	0.20	0.09	0.18

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	532	28	104	571	42	17	31	125	42	44	100
Future Volume (veh/h)	72	532	28	104	571	42	17	31	125	42	44	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.98	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1723	1723	1750	1736	1736	1750	1709	1709	1750	1750	1750
Adj Flow Rate, veh/h	73	543	29	106	583	43	17	32	128	43	45	102
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	2	2	0	1	1	0	3	3	0	0	0
Cap, veh/h	387	814	43	432	818	60	245	44	175	233	80	181
Arrive On Green	0.06	0.50	0.50	0.06	0.51	0.51	0.02	0.15	0.15	0.04	0.17	0.17
Sat Flow, veh/h	1654	1618	86	1667	1596	118	1667	293	1172	1667	469	1063
Grp Volume(v), veh/h	73	0	572	106	0	626	17	0	160	43	0	147
Grp Sat Flow(s),veh/h/ln	1654	0	1704	1667	0	1714	1667	0	1465	1667	0	1532
Q Serve(g_s), s	1.3	0.0	16.6	1.9	0.0	18.6	0.6	0.0	6.9	1.4	0.0	5.8
Cycle Q Clear(g_c), s	1.3	0.0	16.6	1.9	0.0	18.6	0.6	0.0	6.9	1.4	0.0	5.8
Prop In Lane	1.00		0.05	1.00		0.07	1.00		0.80	1.00		0.69
Lane Grp Cap(c), veh/h	387	0	858	432	0	878	245	0	218	233	0	261
V/C Ratio(X)	0.19	0.00	0.67	0.25	0.00	0.71	0.07	0.00	0.73	0.18	0.00	0.56
Avail Cap(c_a), veh/h	794	0	1543	827	0	1552	588	0	663	541	0	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	9.3	0.0	12.3	9.0	0.0	12.4	22.2	0.0	26.9	22.7	0.0	25.2
Incr Delay (d2), s/veh	0.2	0.0	3.4	0.2	0.0	4.1	0.1	0.0	3.5	0.3	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	6.2	0.6	0.0	7.0	0.2	0.0	2.5	0.6	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.5	0.0	15.7	9.2	0.0	16.5	22.3	0.0	30.4	22.9	0.0	26.7
LnGrp LOS	A	A	B	A	A	B	C	A	C	C	A	C
Approach Vol, veh/h		645			732			177			190	
Approach Delay, s/veh		15.0			15.5			29.7			25.8	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.3	37.3	5.3	15.3	7.7	37.9	6.7	13.9				
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0				
Max Green Setting (Gmax), s	20.0	60.0	15.0	30.0	20.0	60.0	15.0	30.0				
Max Q Clear Time (g_c+I1), s	3.9	18.6	2.6	7.8	3.3	20.6	3.4	8.9				
Green Ext Time (p_c), s	0.2	12.0	0.0	0.7	0.1	13.3	0.0	0.8				
Intersection Summary												
HCM 6th Ctrl Delay			17.9									
HCM 6th LOS			B									

Intersection	
Int Delay, s/veh	2.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	269	65	64	244	44	40
Future Vol, veh/h	269	65	64	244	44	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	86	86	86	86	86	86
Heavy Vehicles, %	3	0	2	3	2	0
Mvmt Flow	313	76	74	284	51	47

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	389	0	783	351
Stage 1	-	-	-	-	351	-
Stage 2	-	-	-	-	432	-
Critical Hdwy	-	-	4.12	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.3
Pot Cap-1 Maneuver	-	-	1170	-	362	697
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1170	-	339	697
Mov Cap-2 Maneuver	-	-	-	-	339	-
Stage 1	-	-	-	-	713	-
Stage 2	-	-	-	-	614	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.7	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	339	697	-	-	1170	-
HCM Lane V/C Ratio	0.151	0.067	-	-	0.064	-
HCM Control Delay (s)	17.5	10.5	-	-	8.3	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	0.2	-	-	0.2	-

Intersection	
Int Delay, s/veh	5.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	175	134	162	237	68	73
Future Vol, veh/h	175	134	162	237	68	73
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	87	87	87	87	87	87
Heavy Vehicles, %	3	1	0	3	3	3
Mvmt Flow	201	154	186	272	78	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	355	0	922	278
Stage 1	-	-	-	-	278	-
Stage 2	-	-	-	-	644	-
Critical Hdwy	-	-	4.1	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.2	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1215	-	299	758
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	521	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1215	-	245	758
Mov Cap-2 Maneuver	-	-	-	-	245	-
Stage 1	-	-	-	-	767	-
Stage 2	-	-	-	-	427	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.5	21.6
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	377	-	-	1215	-
HCM Lane V/C Ratio	0.43	-	-	0.153	-
HCM Control Delay (s)	21.6	-	-	8.5	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	2.1	-	-	0.5	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	105	200	244	19	14	123
Future Vol, veh/h	105	200	244	19	14	123
Conflicting Peds, #/hr	1	0	0	1	104	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	86	86	86	86	86	86
Heavy Vehicles, %	11	4	2	6	33	1
Mvmt Flow	122	233	284	22	16	143

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	307	0	-	0	877	296
Stage 1	-	-	-	-	296	-
Stage 2	-	-	-	-	581	-
Critical Hdwy	4.21	-	-	-	6.73	6.21
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	2.299	-	-	-	3.797	3.309
Pot Cap-1 Maneuver	1204	-	-	-	282	746
Stage 1	-	-	-	-	689	-
Stage 2	-	-	-	-	503	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1203	-	-	-	249	745
Mov Cap-2 Maneuver	-	-	-	-	249	-
Stage 1	-	-	-	-	608	-
Stage 2	-	-	-	-	502	-

Approach	EB	WB	SB
HCM Control Delay, s	2.9	0	12.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1203	-	-	-	619
HCM Lane V/C Ratio	0.101	-	-	-	0.257
HCM Control Delay (s)	8.3	0	-	-	12.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.3	-	-	-	1

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	209	53	10	187	3	33	3	6	8	3	2
Future Vol, veh/h	2	209	53	10	187	3	33	3	6	8	3	2
Conflicting Peds, #/hr	2	0	0	0	0	2	2	0	0	0	0	2
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	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	0	4	4	0	2	0	0	0	0	0	0	0
Mvmt Flow	2	249	63	12	223	4	39	4	7	10	4	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	229	0	0	312	0	0	539	538	281	541	567	229
Stage 1	-	-	-	-	-	-	285	285	-	251	251	-
Stage 2	-	-	-	-	-	-	254	253	-	290	316	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1351	-	-	1260	-	-	456	453	763	455	436	815
Stage 1	-	-	-	-	-	-	727	679	-	758	703	-
Stage 2	-	-	-	-	-	-	755	701	-	722	659	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1348	-	-	1260	-	-	446	446	763	443	429	812
Mov Cap-2 Maneuver	-	-	-	-	-	-	446	446	-	443	429	-
Stage 1	-	-	-	-	-	-	726	678	-	755	694	-
Stage 2	-	-	-	-	-	-	739	692	-	710	658	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.4	13.5	12.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	474	1348	-	-	1260	-	-	472
HCM Lane V/C Ratio	0.105	0.002	-	-	0.009	-	-	0.033
HCM Control Delay (s)	13.5	7.7	0	-	7.9	0	-	12.9
HCM Lane LOS	B	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1	0	7	0	2	1	38	14	9	59	0
Future Vol, veh/h	0	1	0	7	0	2	1	38	14	9	59	0
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	82	82	82	82	82	82	82	82	82	82	82	82
Heavy Vehicles, %	0	100	0	0	0	0	0	0	0	11	2	0
Mvmt Flow	0	1	0	9	0	2	1	46	17	11	72	0

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	152	160	72	153	152	56	72	0	0	64	0	0
Stage 1	94	94	-	58	58	-	-	-	-	-	-	-
Stage 2	58	66	-	95	94	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.21	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.3	3.5	4	3.3	2.2	-	-	2.299	-	-
Pot Cap-1 Maneuver	820	586	996	819	743	1016	1541	-	-	1483	-	-
Stage 1	918	661	-	959	851	-	-	-	-	-	-	-
Stage 2	959	682	-	917	821	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	813	580	996	812	736	1015	1541	-	-	1482	-	-
Mov Cap-2 Maneuver	813	580	-	812	736	-	-	-	-	-	-	-
Stage 1	917	656	-	957	849	-	-	-	-	-	-	-
Stage 2	956	681	-	908	814	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	9.3	0.1	1
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1541	-	-	580	850	1482	-	-
HCM Lane V/C Ratio	0.001	-	-	0.002	0.013	0.007	-	-
HCM Control Delay (s)	7.3	0	-	11.2	9.3	7.4	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	0	10	4	1	0	17	444	3	2	350	20
Future Vol, veh/h	5	0	10	4	1	0	17	444	3	2	350	20
Conflicting Peds, #/hr	0	0	1	1	0	0	12	0	8	8	0	12
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	5	0	11	4	1	0	18	467	3	2	368	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	900	909	392	902	918	477	401	0	0	478	0	0
Stage 1	395	395	-	513	513	-	-	-	-	-	-	-
Stage 2	505	514	-	389	405	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	262	277	661	261	274	592	1169	-	-	1095	-	-
Stage 1	634	608	-	548	539	-	-	-	-	-	-	-
Stage 2	553	539	-	639	602	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	254	266	653	250	263	587	1156	-	-	1087	-	-
Mov Cap-2 Maneuver	254	266	-	250	263	-	-	-	-	-	-	-
Stage 1	614	600	-	533	523	-	-	-	-	-	-	-
Stage 2	540	523	-	627	594	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.7	19.6	0.3	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1156	-	-	429	252	1087	-	-
HCM Lane V/C Ratio	0.015	-	-	0.037	0.021	0.002	-	-
HCM Control Delay (s)	8.2	0	-	13.7	19.6	8.3	0	-
HCM Lane LOS	A	A	-	B	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection						
Int Delay, s/veh	1.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	6	55	131	490	336	30
Future Vol, veh/h	6	55	131	490	336	30
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	89	89	89	89	89	89
Heavy Vehicles, %	0	2	1	2	1	3
Mvmt Flow	7	62	147	551	378	34

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1240	395	412	0	-	0
Stage 1	395	-	-	-	-	-
Stage 2	845	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	195	654	1152	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	425	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	159	654	1152	-	-	-
Mov Cap-2 Maneuver	159	-	-	-	-	-
Stage 1	559	-	-	-	-	-
Stage 2	425	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	1.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1152	-	501	-	-
HCM Lane V/C Ratio	0.128	-	0.137	-	-
HCM Control Delay (s)	8.6	0	13.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.5	-	-

Intersection	
Int Delay, s/veh	27.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	1	92	9	392	6	161	91	241	149	16
Future Vol, veh/h	6	3	1	92	9	392	6	161	91	241	149	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	3	3	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	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	98	10	417	6	171	97	256	159	17
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1125	963	168	917	923	223	176	0	0	271	0	0
Stage 1	680	680	-	235	235	-	-	-	-	-	-	-
Stage 2	445	283	-	682	688	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	6.7	6.1	6.02	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	184	258	881	282	301	827	1412	-	-	1292	-	-
Stage 1	444	454	-	793	733	-	-	-	-	-	-	-
Stage 2	596	681	-	478	486	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	73	199	881	230	233	825	1412	-	-	1288	-	-
Mov Cap-2 Maneuver	73	199	-	230	233	-	-	-	-	-	-	-
Stage 1	442	354	-	787	727	-	-	-	-	-	-	-
Stage 2	289	676	-	369	379	-	-	-	-	-	-	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	44.4			59.6			0.2			5		
HCM LOS	E			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1412	-	-	102	540	1288	-	-
HCM Lane V/C Ratio	0.005	-	-	0.104	0.971	0.199	-	-
HCM Control Delay (s)	7.6	0	-	44.4	59.6	8.5	0	-
HCM Lane LOS	A	A	-	E	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	13.1	0.7	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	98	452	30	20	487	121	85	63	25	144	67	83
Future Volume (vph)	98	452	30	20	487	121	85	63	25	144	67	83
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	0.99		1.00	0.97	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	0.96		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1627	1715		1661	1662		1623	1637		1643	1561	
Flt Permitted	0.27	1.00		0.39	1.00		0.60	1.00		0.70	1.00	
Satd. Flow (perm)	468	1715		689	1662		1017	1637		1206	1561	
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)	103	476	32	21	513	127	89	66	26	152	71	87
RTOR Reduction (vph)	0	2	0	0	6	0	0	14	0	0	45	0
Lane Group Flow (vph)	103	506	0	21	634	0	89	78	0	152	113	0
Confl. Peds. (#/hr)	14		3	3		14	15		7	7		15
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	0%	0%	1%	2%	0%	2%	0%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	43.8	41.9		43.8	38.6		14.7	14.7		14.7	14.7	
Effective Green, g (s)	43.8	41.9		43.8	38.6		14.7	14.7		14.7	14.7	
Actuated g/C Ratio	0.62	0.59		0.62	0.55		0.21	0.21		0.21	0.21	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.8		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	376	1019		454	909		212	341		251	325	
v/s Ratio Prot	c0.02	c0.30		0.00	c0.38			0.05			0.07	
v/s Ratio Perm	0.15			0.03			0.09			c0.13		
v/c Ratio	0.27	0.50		0.05	0.70		0.42	0.23		0.61	0.35	
Uniform Delay, d1	6.9	8.2		5.5	11.7		24.2	23.2		25.3	23.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	1.3		0.0	3.6		1.0	0.2		3.5	0.5	
Delay (s)	7.2	9.5		5.5	15.2		25.2	23.4		28.7	24.3	
Level of Service	A	A		A	B		C	C		C	C	
Approach Delay (s)		9.1			14.9			24.3			26.5	
Approach LOS		A			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	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												
Traffic Volume (vph)	72	532	28	104	571	42	17	31	125	42	44	100
Future Volume (vph)	72	532	28	104	571	42	17	31	125	42	44	100
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.88		1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1645	1701		1660	1710		1657	1479		1655	1538	
Flt Permitted	0.27	1.00		0.30	1.00		0.58	1.00		0.52	1.00	
Satd. Flow (perm)	459	1701		527	1710		1019	1479		900	1538	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	73	543	29	106	583	43	17	32	128	43	45	102
RTOR Reduction (vph)	0	1	0	0	1	0	0	110	0	0	62	0
Lane Group Flow (vph)	73	571	0	106	625	0	17	50	0	43	85	0
Confl. Peds. (#/hr)	6		9	9		6	4		7	7		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	0%	0%	1%	2%	0%	3%	1%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	42.8	37.4		42.8	37.9		13.6	9.9		13.6	11.7	
Effective Green, g (s)	42.8	37.4		42.8	37.9		13.6	9.9		13.6	11.7	
Actuated g/C Ratio	0.59	0.52		0.59	0.52		0.19	0.14		0.19	0.16	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.1		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	351	878		396	895		208	202		207	248	
v/s Ratio Prot	0.01	0.34		c0.02	c0.37		0.00	0.03		c0.01	c0.06	
v/s Ratio Perm	0.11			0.14			0.01			0.03		
v/c Ratio	0.21	0.65		0.27	0.70		0.08	0.25		0.21	0.34	
Uniform Delay, d1	7.9	12.7		7.7	13.0		24.1	27.9		24.5	26.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.2	2.8		0.3	3.6		0.1	0.5		0.4	0.6	
Delay (s)	8.1	15.6		7.9	16.6		24.3	28.4		24.9	27.5	
Level of Service	A	B		A	B		C	C		C	C	
Approach Delay (s)		14.7			15.3			28.0			26.9	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	72.4	Sum of lost time (s)	16.0
Intersection Capacity Utilization	69.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

INTERSECTION	9. Gun Club Road & Monmouth Street				
CYCLE LENGTH	107				
TOTAL LOST TIME	12				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	**EB (L)**	**WB (TR)**	**SB (TR)**	**NB (L)**	
	EXISTING PM				
Adj Flow Rate, (veh/h)	103	640	158	89	
Sat Flow (veh/h)	1641	1672	1560	1221	
Flow Ratio	0.06	0.38	0.10	0.07	
CRITICAL INTERSECTION V/C RATIO	**0.70**				

INTERSECTION	10. 16th Street & Monmouth Street				
CYCLE LENGTH	141				
TOTAL LOST TIME	16				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	**EB (L)**	**WB (TR)**	**NB (TR)**	**SB (L)**	
	EXISTING PM				
Adj Flow Rate, (veh/h)	73	626	159	43	
Sat Flow (veh/h)	1654	1714	1465	1667	
Flow Ratio	0.04	0.37	0.11	0.03	
CRITICAL INTERSECTION V/C RATIO	**0.61**				

Attachment B Detailed Pedestrian Level of Traffic Stress Results

Detailed PLTS Analysis Results

Table B1 summarizes the detailed PLTS analysis results for the state highways and the arterial and collector streets within Independence.

Table B1: Detailed PLTS Analysis Result

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
OR 51	Stryker Road	Hanna Road	East	45	3	0-7	0	Fair with sidewalk gaps	0-7	No buffer	Yes	Un-incorporated communities	4
	Stryker Road	Hanna Road	West	45	3	6	0	Fair	5.5-6	No buffer/ Landscaped with trees	Yes	Residential/Light industrial	4
	Hanna Road	Polk Street	East	35	3	5.5-6	0	Fair	6	No buffer/ Landscaped with trees	Yes	Light industrial	3
	Hanna Road	Polk Street	West	35	3	5.5-6	0	Fair	6	No buffer/ Landscaped with trees	Yes	Heavy industrial	4
	Polk Street	B Street	East	35	2-3	0-10	0	Fair/poor with sidewalk gaps	0-6	No buffer	Yes	Residential/Parks and other public facilities	4
	Polk Street	B Street	West	35	2-3	0-6	0	Fair	4-6	No buffer/ Landscaped with trees	Yes	Residential	3
OR 51-Main Street	B Street	Monmouth Street	East	20	2	0	7	Good	14	No buffer	Yes	Central business districts/Parks and other public facilities	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	B Street	Monmouth Street	West	20	2	0	7	Good	14	No buffer	Yes	Central business districts	2
Main Street	Monmouth Street	E Street	East	20	2	0	7	Good	10-14	No buffer	Yes	Central business districts	2
	Monmouth Street	E Street	West	20	2	0	7	Good	6-14	No buffer/ Landscaped with trees	Yes	Central business districts	2
	E Street	River Road	East	20-30	2	5-6	0-7	Good with sidewalk gaps	0-9	No buffer	Yes	Central business districts/Residential	4
	E Street	River Road	West	20-30	2	0-6	0-7	Good/Fai r	6-14	Landscaped/ Landscaped with trees	Yes	Central business districts/Residential	2
Corvallis Road	River Road	Southern UGB	East	30	2	0	0	No sidewalk	0	N/A	Partial	Un-incorporated communities	4
	River Road	Southern UGB	West	30	2	0	0-9	Fair with sidewalk gaps	0-6	No buffer	Partial	Residential	4
OR 51-Monmouth Street	Western UGB	10th Street	North	30	3	5	0	Good	6	No buffer	Yes	Residential/Mixed employment/Strip commercial	3
	Western UGB	10th Street	South	30	3	5	0	Good	6	No buffer	Yes	Residential/Mixed employment/Strip commercial	3

Street	From	To	Side	PLTS Criteria: Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	PLTS
	10th Street	3rd Street	North	20-25	2-3	0-5	0	Good	5-6	No buffer/ Landscaped with trees	Yes	Residential/Mixed employment	2
	10th Street	3rd Street	South	20-25	2-3	0-5	0	Good	5-6	No buffer/ Landscaped with trees	Yes	Residential/Mixed employment	2
	3rd Street	Main Street	North	20	2	0	0-7	Good with sidewalk gaps	0-10	No buffer	Yes	Central business districts	4
	3rd Street	Main Street	South	20	2	0	0-7	Good/ Poor	5-10	No buffer/ Landscaped	Yes	Central business districts	3
Gun Club Road	Hoffman Road	Picture Street	East	30	2	0-6	0	Fair	6	Landscaped	Yes	Residential	2
Gun Club Road	Hoffman Road	Picture Street	West	30	2	0-8	0	Good with sidewalk gaps	0-6	Landscaped/ Landscaped with trees	Yes	Residential	4
Gun Club Road	Picture Street	South of Ash Creek	East	30	2	6-8	0	Good	6-6.5	No buffer/ Landscaped with trees	Yes	Residential	3
Gun Club Road	Picture Street	South of Ash Creek	West	30	2	0	0	No sidewalk	0	N/A	Yes	Residential	4
Gun Club Road	South of Ash Creek	Monmouth Street	East	30	2	6	0	Good	5-6	No buffer	Yes	Residential	3

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	South of Ash Creek	Monmouth Street	West	30	2	6	0	Good	6-7	No buffer/ Landscaped with trees	Yes	Residential	3
Hoffman Road	Western UGB	Gun Club Road	North	35-40	2	0	0	No sidewalk	0	N/A	No	Un-incorporated communities/Light industrial	4
	Western UGB	Gun Club Road	South	35-40	2	0	0	No sidewalk	0	N/A	No	Residential	4
	Gun Club Road	West of Stryker Road	North	35	2	4	0	Fair with sidewalk gaps	0-6	Landscaped with trees	Yes	Residential/Mixed employment/Light industrial	4
	Gun Club Road	West of Stryker Road	South	35	2	4	0	Fair	6	Landscaped with trees	Yes	Residential/Light industrial	3
Polk Street	West of Stryker Road	Walnut Street	North	25	2	4	0	Fair	6	Landscaped with trees	Yes	Heavy industrial	4
	West of Stryker Road	Walnut Street	South	25	2	4	0	Fair	6	Landscaped with trees	Yes	Light industrial	3
	Walnut Street	OR 51-Main Street	North	25	2	0-4	0	Fair with sidewalk gaps	0-7	No buffer/ Landscaped with trees	Yes	Heavy industrial	4
	Walnut Street	OR 51-Main Street	South	25	2	0	0	Fair with sidewalk gaps	0-7	No buffer	Yes	Heavy industrial	4

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
Stryker Street	OR 51	Skyraider Drive	East	35	2	0-5	0	Good with sidewalk gaps	0-6	No buffer	Partial	Residential/Heavy industrial	4
	OR 51	Skyraider Drive	West	35	2	0	0	Good with sidewalk gaps	0-5	Landscaped	Partial	Residential/Un-incorporated communities/Heavy industrial	4
	Skyraider Drive	Polk Street	East	35	2	0-5	0	Good with sidewalk gaps	0-6	No buffer	Yes	Heavy industrial	4
	Skyraider Drive	Polk Street	West	35	2	0	0	Good/ Fair	5	No buffer	Yes	Residential	3
Williams Street	Ash Street	OR 51-Main Street	North	25	2	0	0	Fair with sidewalk gaps	0-5	No buffer/ Landscaped	No	Residential	4
	Ash Street	OR 51-Main Street	South	25	2	0	0	Fair	5	No buffer	No	Residential	3
Picture Street	Gun Club Road	End of road	North	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
	Gun Club Road	End of road	South	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
Ash Street	Polk Street	Albert Street	East	25	2	0	0	Fair	5-6	No buffer	Yes	Residential/Parks and other public facilities	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	Polk Street	Albert Street	West	25	2	0	0	Fair	5-6	No buffer	Yes	Residential/Parks and other public facilities	2
	Albert Street	4th Street	East	25	2	0	0	Fair	5	No buffer/ Landscaped	Yes	Residential/Parks and other public facilities	2
	Albert Street	4th Street	West	25	2	0	0	Fair with sidewalk gaps	0-5	No buffer	Yes	Residential/Parks and other public facilities	4
4th Street	Ash Street	B Street	East	25	2	0	0	Poor	5	Landscaped	Yes	Residential	3
	Ash Street	B Street	West	25	2	0	0	Fair	5	Landscaped with trees	Yes	Residential	2
	B Street	I Street	East	25	2	0	0	Fair	5	Landscaped/ Landscaped with trees	Yes	Residential	2
	B Street	I Street	West	25	2	0	0-15	Good/ Fair	5-7	No buffer/ Landscaped with trees	Yes	Residential	2
	I Street	Spruce Avenue	East	25	2	0	0	No sidewalk	0	N/A	Yes	Residential	4
	I Street	Spruce Avenue	West	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
7th Street	Monmouth Street	Southern UGB	East	25	2	0	0	Fair	5	No buffer/ Landscaped with trees	Yes	Residential	2

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	Monmouth Street	Southern UGB	West	25	2	0	0	Fair	5	Landscaped/ Landscaped with trees	Yes	Residential	2
13th Street	Monmouth Street	E Street	East	25	2	0	0	Fair	5	No buffer	Yes	Residential	2
	Monmouth Street	E Street	West	25	2	0	0	Fair	5	No buffer	Yes	Residential/Strip commercial	2
	E Street	Southern City Limits	East	25	1-2	0	0	No sidewalk	0	N/A	Partial	Residential/Un-incorporated communities	4
	E Street	Southern City Limits	West	25	1-2	0	0	Fair	5	No buffer	Partial	Residential	3
	Southern City Limits	Southern UGB	East	25	1	0	0	No sidewalk	0	N/A	No	Un-incorporated communities	4
	Southern City Limits	Southern UGB	West	25	1	0	0	No sidewalk	0	N/A	No	Residential	4
16th Street	Northern UGB	Monmouth Street	East	25	2	5	0	Good	6	No buffer	Yes	Parks and other public facilities	2
	Northern UGB	Monmouth Street	West	25	2	5	0	Good	6	No buffer	Yes	Residential	2
	Monmouth Street	Southern UGB	East	25	2-3	0-4	0	Good with sidewalk gaps	0-5	No buffer	Partial	Residential/Strip commercial	4

Street	From	To	Side	PLTS Criteria									PLTS
				Speed (mph)	Total Number of Lanes	Bicycle Facility Width (feet)	Parking Width (feet)	Sidewalk Condition	Sidewalk Width (feet)	Buffer Type	Illumination?	Land Use	
	Monmouth Street	Southern UGB	West	25	2-3	5	0	Good/ Fair	5	No buffer	Partial	Residential/Strip commercial	3
G Street	7th Street	3rd Street	North	25	2	0	0	Fair	5	Landscaped/ Landscaped with trees	Yes	Residential	2
	7th Street	3rd Street	South	25	2	0	0	Fair	5	No buffer/ Landscaped	Yes	Residential	2
	3rd Street	Main Street	North	25	2	0	0	Fair	5	No buffer/ Landscaped	Yes	Central business districts/Light industrial	3
	3rd Street	Main Street	South	25	2	0	0	Fair	5	No buffer	Yes	Residential/Light industrial	3
Spruce Avenue	6th Street	4th Street	North	25	2	0	0	Fair	5	No buffer/ Landscaped with trees	Yes	Residential	2
	6th Street	4th Street	South	25	2	0	0	Good/ Fair	5	No buffer/ Landscaped with trees	Yes	Residential	2

Attachment C Crash Data

General & Site Information	
Analyst:	Kittelson & Associates, Inc.
Agency/Company:	ODOT
Date:	4/24/2020
Project Name:	Independence TSP

Intersection Crash Data							
	Intersection	**Year**					
Intersection	**Type**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**
OR 51/Stryker Road	Urban 3ST	4					4
OR 51/Polk Street	Urban 4ST	7					7
Main Street/Williams Street	Urban 4ST	0					0
Main Street/C Street	Urban 4ST	0					0
Main Street/Monmouth Street	Urban 3ST	4					4
Monmouth Street/4th Street	Urban 4ST	2					2
Monmouth Street/7th Street	Urban 4ST	5					5
Monmouth Street/13th Street	Urban 4ST	1					1
Monmouth Street/Gun Club Road	Urban 3SG	13					13
Monmouth Street/16th Street	Urban 4SG	2					2
Hoffman Road/16th Street	Urban 3ST	9					9
Hoffman Road/Gun Club Road	Urban 3ST	4					4
Hoffman Road/Stryker Road	Urban 3ST	3					3
Polk Street/Ash Street	Urban 4ST	0					0
Ash Street/Williams Street	Urban 3ST	0					0
Main Street/D Street	Urban 4ST	0					0
Main Street/G Street	Urban 3ST	0					0
S Main Street/River Road S	Urban 4ST	7					7
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
							0
	Total	61	0	0	0	0	61

Intersection Population Type Crash Rate				
Average Crash Rate per intersection type				
Intersection Pop. Type	Sum of Crashes	Sum of 5-year MEV	Avg Crash Rate for Ref Pop.	INT in Pop
Rural 3SG	0	0		
Rural 3ST	0	0		
Rural 4SG	0	0		
Rural 4ST	0	0		
Urban 3ST	24	103	0.2335	7
Urban 3SG	13	31	0.4253	1
Urban 4ST	22	168	0.1307	9
Urban 4SG	2	31	0.0642	1

Critical Rate Calculation								
Intersection	AADT Entering Intersection	5-year MEV	Crash Total	Intersection Population Type	Intersection Crash Rate	Reference Population Crash Rate	Critical Rate	Over Critical
OR 51/Stryker Road	10,030	18.3	4	Urban 3ST	0.22	0.23	0.45	Under
OR 51/Polk Street	11,010	20.1	7	Urban 4ST	0.35	0.13	0.29	**Over**
Main Street/Williams Street	9,040	16.5	0	Urban 4ST	0.00	0.13	0.31	Under
Main Street/C Street	8,540	15.6	0	Urban 4ST	0.00	0.13	0.31	Under
Main Street/Monmouth Street	11,710	21.4	4	Urban 3ST	0.19	0.23	0.43	Under
Monmouth Street/4th Street	11,030	20.1	2	Urban 4ST	0.10	0.13	0.29	Under
Monmouth Street/7th Street	13,010	23.7	5	Urban 4ST	0.21	0.13	0.27	Under
Monmouth Street/13th Street	14,160	25.8	1	Urban 4ST	0.04	0.13	0.27	Under
Monmouth Street/Gun Club Road	16,750	30.6	13	Urban 3SG	0.43	APM Exhibit 4-1		
Monmouth Street/16th Street	17,080	31.2	2	Urban 4SG	0.06	APM Exhibit 4-1		
Hoffman Road/16th Street	7,260	13.2	9	Urban 3ST	0.68	0.23	0.49	**Over**
Hoffman Road/Gun Club Road	8,490	15.5	4	Urban 3ST	0.26	0.23	0.47	Under
Hoffman Road/Stryker Road	7,050	12.9	3	Urban 3ST	0.23	0.23	0.49	Under
Polk Street/Ash Street	5,190	9.5	0	Urban 4ST	0.00	0.13	0.38	Under
Ash Street/Williams Street	1,310	2.4	0	Urban 3ST	0.00	0.23	0.96	Under
Main Street/D Street	8,560	15.6	0	Urban 4ST	0.00	0.13	0.31	Under
Main Street/G Street	10,480	19.1	0	Urban 3ST	0.00	0.23	0.44	Under
S Main Street/River Road S	11,670	21.3	7	Urban 4ST	0.33	0.13	0.28	**Over**

General & Site Information	
Analyst:	Kittelson
Agency/Company:	ODOT
Date:	4/24/20
Project Name:	Independence TSP Update
Highway Number and Name:	Hwy 43
Mile Points:	0-10
Crash Years Pulled:	2013-2017

Intersection Population Type Crash Rate

Sample Alpha	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear
3ST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.787	9.627
3SG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4ST	0.568	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.250
4SG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample Beta													
3ST	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.50082	13.47725
3SG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4ST	0.31534	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.73530
4SG	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Threshold Proportions													
3ST	0.083	0.000	0.000	0.000	0.000	0.000	0.083	0.000	0.125	0.000	0.000	0.417	0.292
3SG	0.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.615	0.231
4ST	0.273	0.000	0.000	0.000	0.000	0.000	0.136	0.000	0.045	0.000	0.000	0.227	0.318
4SG	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.000

Excess Proportion with a probability of greater than 0.9
Type of Crash

MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road												0.58		
0.20	4ST	OR 51	Polk Street														
0.30	4ST	Main Street	Williams Street														
0.40	4ST	Main Street	C Street														
0.50	3ST	Main Street	Monmouth Street														
0.60	4ST	Monmouth Street	4th Street	0.73													
0.70	4ST	Monmouth Street	7th Street													0.08	
0.80	4ST	Monmouth Street	13th Street														
0.90	3SG	Monmouth Street	Gun Club Road														
1.00	4SG	Monmouth Street	16th Street														
1.10	3ST	Hoffman Road	16th Street														
1.20	3ST	Hoffman Road	Gun Club Road													0.21	
1.30	3ST	Hoffman Road	Stryker Road														
1.40	4ST	Polk Street	Ash Street														
1.50	3ST	Ash Street	Williams Street														
1.60	4ST	Main Street	D Street														
1.70	3ST	Main Street	G Street														
1.80	4ST	S Main Street	River Road S													0.25	

Probability
Type of Crash

MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road												1.00		
0.20	4ST	OR 51	Polk Street	0.59													
0.30	4ST	Main Street	Williams Street														
0.40	4ST	Main Street	C Street														
0.50	3ST	Main Street	Monmouth Street														
0.60	4ST	Monmouth Street	4th Street	0.99													
0.70	4ST	Monmouth Street	7th Street													0.92	
0.80	4ST	Monmouth Street	13th Street														
0.90	3SG	Monmouth Street	Gun Club Road														
1.00	4SG	Monmouth Street	16th Street														
1.10	3ST	Hoffman Road	16th Street												0.36	0.88	
1.20	3ST	Hoffman Road	Gun Club Road												0.69	0.93	
1.30	3ST	Hoffman Road	Stryker Road														
1.40	4ST	Polk Street	Ash Street														
1.50	3ST	Ash Street	Williams Street														
1.60	4ST	Main Street	D Street														
1.70	3ST	Main Street	G Street														
1.80	4ST	S Main Street	River Road S													0.97	

Observed Proportions
Type of Crash

MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	
0.10	3ST	OR 51	Stryker Road	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
0.20	4ST	OR 51	Polk Street	0.29	0	0	0	0	0	0	0	0	0	0	0.43	0	0.714285714
0.30	4ST	Main Street	Williams Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.40	4ST	Main Street	C Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.50	3ST	Main Street	Monmouth Street	0	0	0	0	0	0	0.50	0	0	0	0	0	0	0.5
0.60	4ST	Monmouth Street	4th Street	1.00	0	0	0	0	0	0	0	0	0	0	0	0	1
0.70	4ST	Monmouth Street	7th Street	0	0	0	0	0	0	0	0	0	0	0	0	0.40	0.4
0.80	4ST	Monmouth Street	13th Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0.90	3SG	Monmouth Street	Gun Club Road	0.15	0	0	0	0	0	0	0	0	0	0	0.62	0.23	1
1.00	4SG	Monmouth Street	16th Street	0	0	0	0	0	0	0	0	0	0	0	1.00	0	1
1.10	3ST	Hoffman Road	16th Street	0.22	0	0	0	0	0	0	0	0	0	0	0.33	0.33	0.888888889
1.20	3ST	Hoffman Road	Gun Club Road	0	0	0	0	0	0	0	0	0	0	0	0.50	0.50	1
1.30	3ST	Hoffman Road	Stryker Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.40	4ST	Polk Street	Ash Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.50	3ST	Ash Street	Williams Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.60	4ST	Main Street	D Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.70	3ST	Main Street	G Street	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.80	4ST	S Main Street	River Road S	0	0	0	0	0	0	0	0	0	0	0	0	0.57	0.571428571
																	0
																	0

Intersection Crash Data
Type of Crash

MP	Reference Pop	Street 1	Street 2	Angle	Back	Bike	Fix	Head	NonCol	OTH	Park	Ped	SS-M	SS-O	Turn	Rear	Total
0.10	3ST	OR 51	Stryker Road												4		4
0.20	4ST	OR 51	Polk Street	2						1		1			3		7
0.30	4ST	Main Street	Williams Street														0
0.40	4ST	Main Street	C Street														0
0.50	3ST	Main Street	Monmouth Street							2		1				1	4
0.60	4ST	Monmouth Street	4th Street	2													2
0.70	4ST	Monmouth Street	7th Street	1						1					1	2	5
0.80	4ST	Monmouth Street	13th Street													1	1
0.90	3SG	Monmouth Street	Gun Club Road	2											8	3	13
1.00	4SG	Monmouth Street	16th Street												2		2
1.10	3ST	Hoffman Road	16th Street	2								1			3	3	9
1.20	3ST	Hoffman Road	Gun Club Road												2	2	4
1.30	3ST	Hoffman Road	Stryker Road									1			1	1	3
1.40	4ST	Polk Street	Ash Street														0
1.50	3ST	Ash Street	Williams Street														0
1.60	4ST	Main Street	D Street														0
1.70	3ST	Main Street	G Street														0
1.80	4ST	S Main Street	River Road S	1						1					1	4	7

General & Site Information	
Analyst:	Kittelson
Agency/Company:	ODOT
Date:	4/24/2020
Project Name:	Independence TSP Update

Reference Population Type Crash Rates						
Segment Reference Population Type	Population Type Number	No. of Segs in Reference Population	Sum of Crashes	Sum of MVMT	Avg Crash Rate for Ref Pop.	2017 Rate
Principal Arterial	1	6	98	53.2	1.84	2.39
Minor Arterial	2	3	36	20.9	1.73	2.77
Collector	3	11	33	15.2	2.18	1.7
	4					
	5					
	6					

Critical Rate Calculation												
Segment	Ref. Pop. Type	Begin Milepoint	End Milepoint	5 Year Crash Total	AADT	Segment Length	Pop. Type Number	MVMT	Segment Crash Rate	Ref. Pop. Crash Rate	Critical Rate	Over Critical
1	Principal Arterial			12	7500	0.82	1	11	1.07	1.84	2.55	Under
2	Principal Arterial			10	7700	0.62	1	9	1.14	1.84	2.65	Under
3	Principal Arterial			5	8200	0.44	1	7	0.76	1.84	2.79	Under
4	Principal Arterial			35	12200	0.39	1	9	4.06	1.84	2.66	**Over**
5	Principal Arterial			17	9800	0.61	1	11	1.55	1.84	2.56	Under
6	Principal Arterial			19	8600	0.44	1	7	2.72	1.84	2.76	Under
7	Collector			3	3300	0.34	3	2	1.48	2.18	4.13	Under
8	Collector			2	3500	0.20	3	1	1.60	2.18	4.75	Under
9	Minor Arterial			18	5800	0.87	2	9	1.96	1.73	2.50	Under
10	Collector			3	1300	0.26	3	1	4.91	2.18	6.10	Under
11	Minor Arterial			5	1900	1.02	2	4	1.42	1.73	3.02	Under
12	Collector			1	1300	0.19	3	0	2.22	2.18	6.91	Under
13	Collector			6	1500	0.56	3	2	3.91	2.18	4.46	Under
14	Collector			3	2200	0.99	3	4	0.76	2.18	3.52	Under
15	Minor Arterial			13	3900	1.15	2	8	1.59	1.73	2.54	Under
16	Collector			1	1000	0.19	3	0	2.81	2.18	7.66	Under
17	Collector			1	300	0.24	3	0	7.75	2.18	12.80	Under
18	Collector			2	1000	0.44	3	1	2.52	2.18	5.53	Under
19	Collector			2	1000	0.18	3	0	6.09	2.18	7.93	Under
20	Collector			9	8300	0.25	3	4	2.42	2.18	3.57	Under
21												
22												
23												

Attachment E Tech Memo #4: Future Conditions

TECHNICAL MEMORANDUM #4: FUTURE SYSTEMS CONDITIONS

Date: October 2, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Alec Kauffman, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Tech Memo #4: Future System Conditions

TABLE OF CONTENTS

INTRODUCTION

This memorandum summarizes future (no-build) transportation system conditions in Independence for the Independence Transportation System Plan (TSP) update. The information provided in this memorandum is based on population and employment forecasts developed for Independence and corresponding growth in traffic volumes throughout the City. The future deficiencies identified in this memorandum will serve as the basis for developing transportation system alternatives and improvement projects for the TSP update.

POPULATION AND EMPLOYMENT FORECASTS

Population and employment forecasts were developed for Independence based on state and local data and an assessment of the capacity for additional growth and development within the current Urban Growth Boundary (UGB). The following provides a summary of the forecast; a more detailed summary is provided in Attachment A.

Population Forecast

Historic and projected population information for Independence was obtained from the Portland State University (PSU) Population Research Center (PRC). The PRC generates coordinated forecasts for Oregon counties and cities every four years. The most recent coordinated population forecast for Polk County was released in 2017. The 2017 report includes historic and projected population estimates for Polk County and Independence as well as estimates of persons per household.

According to the report, the base year (2017) population for Independence is 9,326 persons. The population is expected to increase by 2.2 percent per year between 2017 and 2035 and by 1.4 percent per year between 2035 and 2067. Therefore, the end year (2040) population for Independence is expected to be 15,023 persons.

The report also shows that persons per household remained unchanged between the 2000 and 2010 census. Therefore, the assumption for Independence is that it will remain 3.0 persons per household for the base year (2017), but decrease to 2.7 persons per household through 2040. After accounting for adjustments related to recent development, there is an estimated 3,322 households in the base year (2017) and 5,735 households in the end year (2040). The difference between the base year and end year is 2,413 households.

Employment Forecast

The most recent employment data available for Independence is provided from the Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Statistics. This data provides employment information by North American Industry Classification System (NAICS) sector that serves as a general basis of comparison with the Employment Department's employment forecast analysis.

The data shows that base year (2017) employment for Independence is 2,467 jobs. Employment is expected to increase by an overall average of 1.4 percent between 2017 and 2040, with higher increases in construction, retail, transportation/warehousing, education services, and health care/social assistance. Therefore, the end year (2040) employment for Independence is expected to be 3,252 jobs.

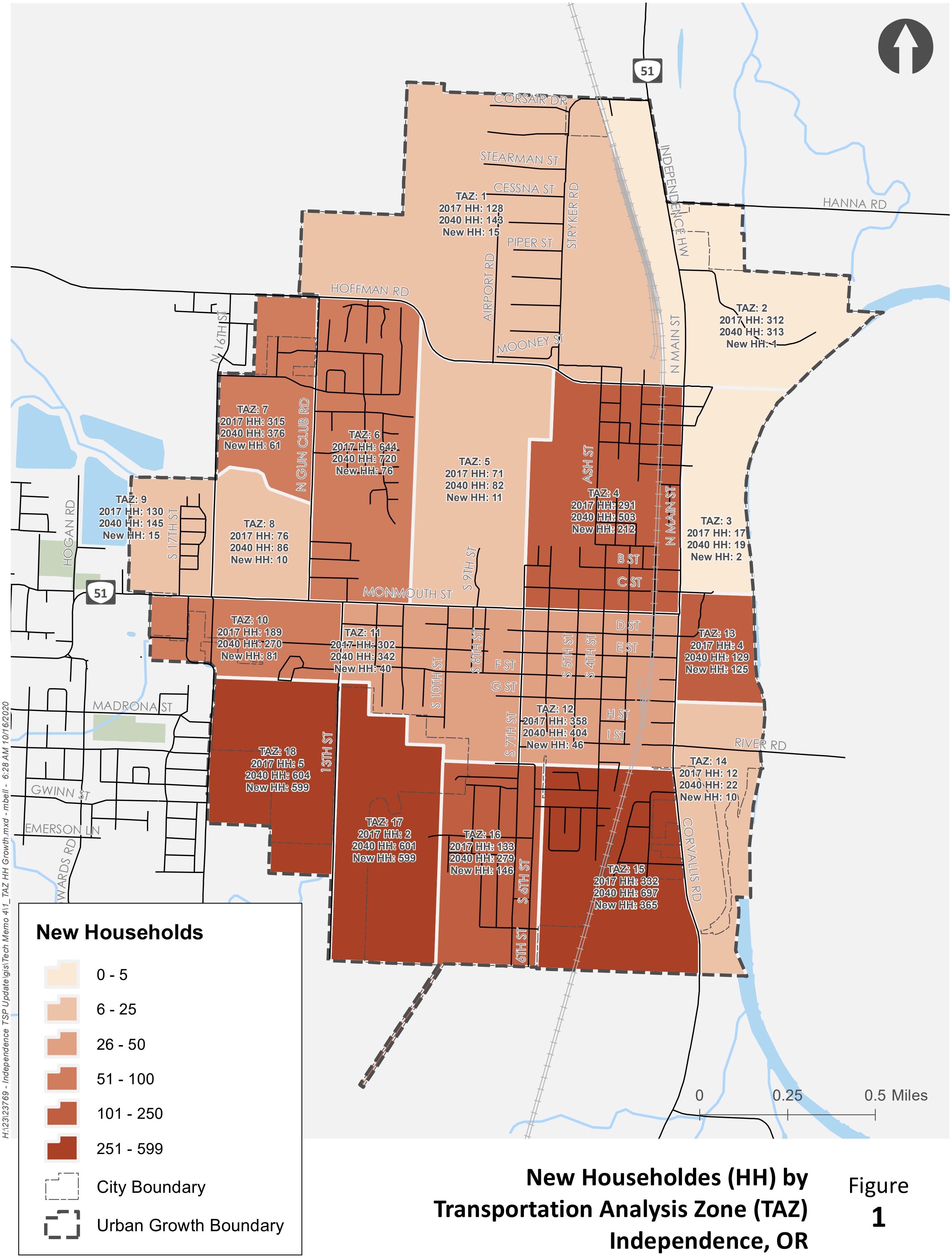
Table 1 summarizes the population and employment data for year 2017 and forecast year 2040 conditions. As shown, population is expected to grow at a higher rate than the employment over the 23-year period, primarily due to growth in the SW Independence Concept Plan area.

Table 1: Population, Household, and Employment Summary

Land Use	2017	2040	Change	Percent Change
Population	9,326	15,023	5,697	61%
Households	3,322	5,735	2,413	73%
Employment	2,467	3,252	785	32%

The population and employment data shown in Table 1 was distributed throughout the City based on current zoning designations and an evaluation of developable and re-developable lands. Based on the evaluation, there is adequate capacity within the City to accommodate the projected growth in population, households, and employment over the planning horizon without changes to current zoning designations, development patterns, and/or the UGB.

Figures 1 and 2 illustrate the changes in households and employment by Transportation Analysis Zone (TAZ). The TAZs shown in Figures 1 and 2 were developed based on the current zoning designations and the location of major roadways and intersections throughout the City. The TAZs provide a convenient way of evaluating and summarizing the population and employment data for the City.

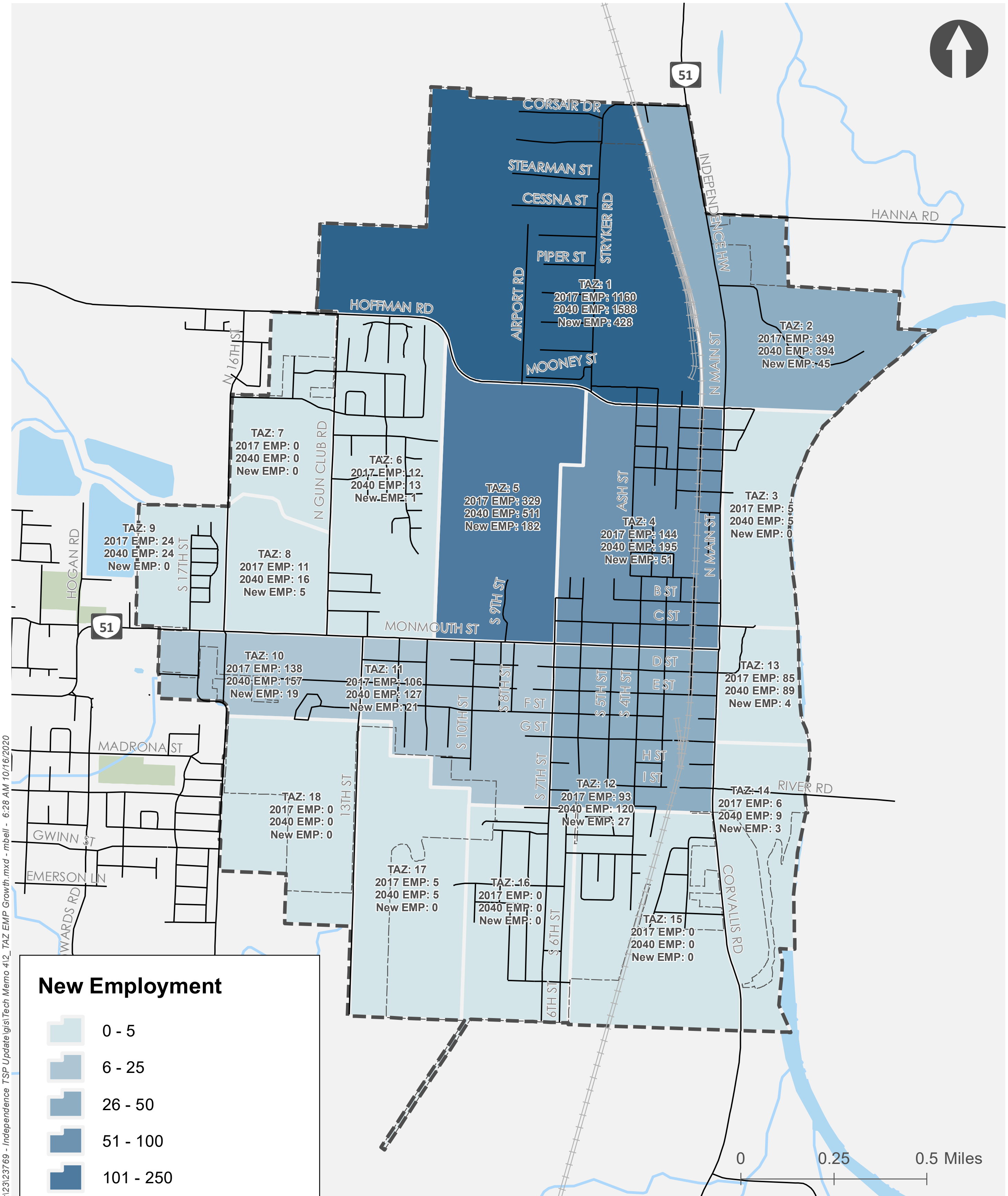


H:\23\23769 - Independence TSP Update\gis\Tech Memo 4\1_TAZ HH Growth.mxd - mbell - 6:28 AM 10/16/2020

New Householdes (HH) by Transportation Analysis Zone (TAZ) Independence, OR

Figure **1**

Data Source: Polk County Data Portal, ODOT



New Employment

- 0 - 5
- 6 - 25
- 26 - 50
- 51 - 100
- 101 - 250
- 251 - 428
- City Boundary
- Urban Growth Boundary

New Employment (EMP) by Transportation Analysis Zone (TAZ) Independence, OR

Figure **2**

Data Source: Polk County Data Portal, ODOT

PLANNED IMPROVEMENTS

This section summarizes planned improvements identified in the Statewide Transportation Improvement Program (STIP) and the Independence Capital Improvement Program (CIP). One expected outcome of the Independence TSP update is the identification of projects for inclusion in updated/amended versions of the STIP and CIP.

Statewide Transportation Improvement Program

The Statewide Transportation Improvement Program (STIP) is the Oregon Department of Transportation's (ODOT) capital improvement program for state and federally funded projects. The Oregon Transportation Commission (OTC) and ODOT develop the STIP in coordination with a wide range of stakeholders, including local jurisdictions and the public. The Commission allocates funding among the following categories:

- **Fix-it** programs fund projects that fix or preserve the state's transportation system, including bridges, pavement, culverts, traffic signals, and others.
- **Enhance it** programs fund projects that enhance or expand the transportation system, these are typically high-priority projects from state and local transportation plans, such as the Independence TSP.
- **Safety** programs reduce deaths and injuries on Oregon roads. This includes the All Roads Transportation Safety (ARTS) program, which includes projects on state highways and local roads.
- **Non-highway** programs fund bicycle and pedestrian projects and public transportation.
- **Local government** programs direct funding to local governments so they can fund projects.

The current STIP (2018-2021) includes several projects in Independence, many of which are currently under construction or complete. Table 2 summarizes projects from the current STIP.

Table 2: Statewide Transportation Improvement Program Projects for Independence

Key	Project Name	Description	Work Type	Status	Project Total
2018-2021 STIP					
20296	River Rd S: Willamette River (Independence) Bridge	Erosion repairs and install bridge rail to preserve the bridge structure	Bridge	Project Under Construction	$2,850,800
19962	OR194: Monmouth Ave. to Catron St (Monmouth) & OR51: 4th St. to B St. (Independence)	Upgrade substandard ADA curb ramps	ADAP, ADAR	Project Under Construction	$1,187,049
20354	F Street: South Fork Ash Creek Bridge	Replace the existing structure with a new bridge	Bridge	Project Under Design	$2,329,500
20693	IOF Independence Landing (City of Independence)	Immediate Opportunity Funds (IOF) to aid in various road improvements to include 1,000 ft of new roadway and a roundabout at C Street	Modern	Project is Complete	$250,000

The projects shown in Table 2 will be accounted for in the future (no-build) traffic conditions analysis and alternatives analysis summarized in Tech Memo 5; however, all have limited or no impact on overall capacity within the UGB.

Independence Capital Improvement Plan

The Independence Capital Improvement Plan (CIP) establishes, prioritizes, and ensures funding for projects to improve existing infrastructure or to pave the way for new development. Projects generally increase functionality, efficiency, and capacity of the infrastructure, or increase capacity to meet the demands of growth, or provide community livability and enhancement.

The current CIP identifies several projects for Fiscal Year (FY) 2016/2017 along with projects for FY 2017-2018, FY 2018-2019 and FY 2019-2020, each of which are expected to be completed within the planning horizon. Table 3 summarizes key characteristics of relevant projects.

Table 3: Independence Capital Improvement Plan

Fiscal Year	Fund	Projects	Estimated Cost	Funding Source
FY 2017-2018*	Parks/Recreation and SDC	Riverfront Bike/Ped Extension	$330,173	SDC, Grants, GO Bond
FY 2018-2019*	Parks/Recreation and SDC	Unnamed Park Development	$267,600	SDC, Grants, GO Bond
FY 2018-2019*	Transportation Operating and SDC	Southern Arterial Phase A	$1,978,250	SDC and Development Contributions
FY 2019-2020*	Transportation Operating and SDC	Southern Arterial Phase B	$4,279,050	SDC and Development Contributions
FY 2018-2019*	Transportation Operating and SDC	Southern Arterial Bridge	$4,776,980	SDC and Development Contributions, and Grants

*Budget calls for funding in multiple FYs, the FY with the largest project budget is displayed

All the projects shown in Table 3 will be accounted for in the future (no-build) traffic conditions analysis except the Southern Arterial Phase A, Phase B, and Bridge projects, which will be evaluated in the alternatives analysis and summarized in Tech Memo 5.

FUTURE TRAFFIC VOLUMES

Future traffic volumes were developed for the study intersections based on the Zonal Cumulative Analysis methodology described in ODOT's Analysis Procedures Manual (APM). This type of analysis combines growth in regional traffic volumes with growth in local traffic volumes associated with household and employment growth in the city. The traffic volume projection process includes three major steps: trip generation, trip distribution, and trip assignment. The process accounts for the following four categories of vehicle trips:

- **External-External (through trips):** vehicles with an origin and destination outside the UGB. An example of an external-external trip is someone traveling from Monmouth to Salem.
- **External-Internal (inbound trips):** vehicles with an origin outside the UGB and a destination inside the UGB. An example of an external-internal trip is someone who works in Salem and returns home to Independence during the evening peak hour.

- **Internal-External (outbound trips):** vehicles with an origin inside the UGB and a destination outside the UGB. An example of an internal-external trip is someone who works in Independence and returns home to Salem during the evening peak hour.
- **Internal-Internal (local trips):** vehicles with an origin and destination inside the UGB. An example of an internal-internal trip is someone who travels from their home to the grocery store without leaving the UGB.

Using these vehicle trip types, the basic steps for a zonal cumulative analysis are:

- Develop regional growth rates for highway traffic volumes;
- Identify where household and employment growth is likely to occur in the community;
- Develop estimates of the number of vehicle trips associated with household and employment growth, and;
- Allocate those trips across the city to various growth areas.

An overview of each of these steps is presented below.

Regional Traffic Growth

ODOT's Future Volume Tables were used to develop regional growth rates for OR 51. Based on the tables, traffic volumes along OR 51 are expected to increase by approximately 18.7 percent north of the City limits on Main Street and 3.6 percent west of the City limits on Monmouth Street over the 20-year planning horizon. These growth rates were applied to existing traffic volumes along OR 51 (Main Street and Monmouth Street) to estimate growth in regional traffic volumes. Similar growth rates were developed for River Road, Corvallis Road, and Hoffman Road to capture the potential for regional traffic growth associated with these routes.

Household and Employment Growth

Projected household and employment growth also contribute to future growth in traffic volumes. Growth estimates were developed based on the PRC's Coordinated Population Forecast for Polk County, the Census Bureau's LEHD Origin-Destination Statistics, and the Oregon Employment Department's employment forecast analysis. The distribution of new households and employment within the City was determined based on an evaluation of developable and re-developable lands as well as a review of existing land use, zoning designations, and development patterns. *Additional information on projected household and employment growth is provided earlier in this memo and in Attachment A.*

Trip Generation

The projected household and employment growth can be equated to increases in local traffic volumes by calculating the trip generation of the future uses. Trip generation estimates were prepared based on information provided in the standard reference, *Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineers (ITE). *Table B-1 in Attachment B summarizes the total trips by TAZ.*

Transportation Analysis Zone

The trips associated with the projected household and employment growth were distributed throughout the city based on the type of trips (i.e. external-internal, internal-external, internal-internal) and the location of the TAZs developed for the project. *Additional information on the TAZs is provided earlier in this memo and in Attachment A.*

INTERSECTION OPERATIONS ANALYSIS

The intersection operations analysis was conducted using Synchro 10, which is a software tool designed to assist with operations analyses in accordance with Highway Capacity Manual (HCM) methodologies. The analysis results include level-of-service (LOS), delay, and volume-to-capacity (v/c) ratios at all intersections, regardless of jurisdiction. The LOS, delay, and v/c ratios are reported for the overall intersection at signalized intersections and the critical movement at unsignalized intersections – the overall intersection v/c ratios were hand-calculated in accordance with the methodologies outlined in ODOT's APM.

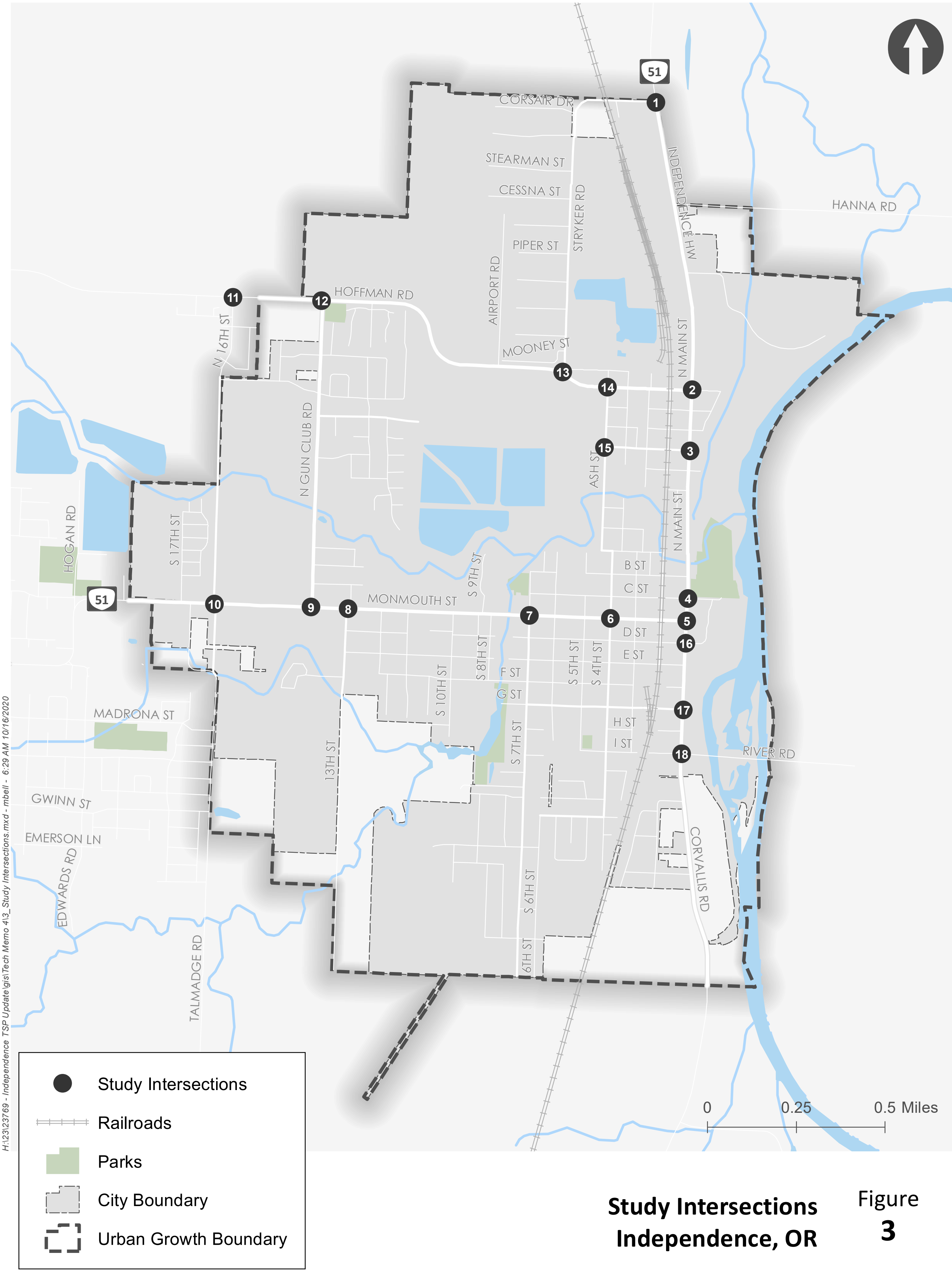
Figure 3 illustrates the location of the study intersections. Table 4 and Figure 4 summarize the results of the intersection operations analysis and compares the results to the applicable mobility standards and targets which were presented in the *Analysis Methodology and Assumptions Memorandum*.

Table 4: Intersection Operations, Weekday PM Peak Hour

Map ID	Intersection	Control Type	Mobility Standard/ Target	Intersection Operations			
				Critical Movement/ Approach	LOS	Delay	v/c
1	OR 51/Stryker Road	TWSC	0.90	EB	D	31.9	0.54
2	OR 51/Polk Street	TWSC	0.95	EB	F	205.7	**1.27**
3	Main Street/Williams Street	TWSC	0.95	EB	C	21.7	0.24
4	Main Street/C Street	TWSC	1.0	WB	C	19.5	0.18
5	Main Street/Monmouth Street	AWSC	1.0	NB	F	100.4	**1.14**
6	Monmouth Street/4th Street	TWSC	1.0	NB	F	1492.0	**>2.0**
7	Monmouth Street/7th Street	TWSC	0.95	NB	F	746.7	**>2.0**
8	Monmouth Street/13th Street	TWSC	0.95	NB	F	86.0	0.95
9	Monmouth Street/Gun Club Road	Signal	0.95	-	C	31.8	**0.97**
10	Monmouth Street/16th Street	Signal	0.95	-	C	24.6	0.85
11	Hoffman Road/16th Street	TWSC	LOS C	NBL	C	18.4	0.16
12	Hoffman Road/Gun Club Road	TWSC	0.80	NB	D	26.0	0.57
13	Hoffman Road/Stryker Road	TWSC	0.80	SB	D	29.4	0.66
14	Polk Street/Ash Street	TWSC	0.80	NB	C	15.1	0.18
15	Ash Street/Williams Street	TWSC	0.80	EB	B	12.2	0.18
16	Main Street/D Street	TWSC	0.95	WB	E	35.9	0.26
17	Main Street/G Street	TWSC	0.80	EB	C	18.6	0.23
18	S Main Street/River Road S	TWSC	0.80	WB	F	186.6	**1.32**

LOS = Intersection Level of Service (Signal); CM Level of Service (TWSC, AWSC).
Delay = Intersection average vehicle delay (Signal); CM vehicle delay (TWSC, AWSC).
v/c = Intersection v/c (Signal); CM v/c (TWSC, AWSC).

As shown in Table 4 and Figure 4, six intersections are forecast to exceed their applicable mobility standards/targets in 2040 during the weekday PM peak hour. The intersections include:

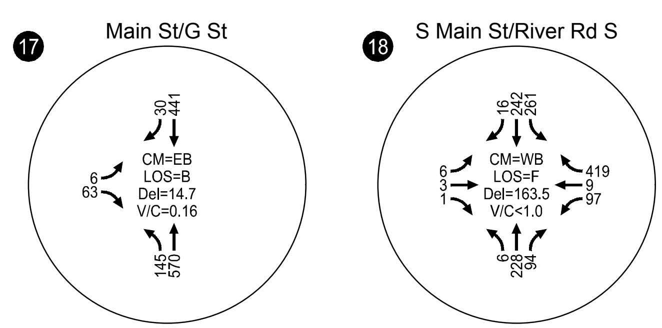


H:\23\23769 - Independence TSP Update\gis\Tech Memo 4\3_Study Intersections.mxd - mbell - 6:29 AM 10/16/2020

Study Intersections
Independence, OR

Figure
3

Data Source: Polk County Data Portal, ODOT



CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = LEVEL OF SERVICE:
INTERSECTION AVERAGE LOS (SIGNALIZED)/
CRITICAL MOVEMENT LOS (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/
CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2040 Traffic Conditions
Weekday PM Peak Hour
Independence, OR

Figure
4

H:\23\23769 - Independence TSP Update\analysis\Figures\23769 Ops Figures.dwg Jul 31, 2020 - 11:12am - mmccormick Layout Tab: 04_Future Conditions

- **OR 51/Polk Street** – The eastbound approach to the intersection is forecast to operate at LOS F and above capacity (v/c > 1.0). This is primarily due to growth in TAZ 1 as well as growth in through traffic along OR 51-Main Street.
- **Main Street/Monmouth Street** – All approaches to the intersection are forecast to operate at LOS F and above capacity (v/c > 1.0). This is primarily due to growth in TAZs throughout the city. Many trips go through this intersection as it is the primary connector for east-west to north-south traffic on the east side of the city. Growth in most TAZs is routed through this intersection.
- **Monmouth Street/4th Street** – The northbound and southbound approaches to the intersection are forecast to operate at LOS F and above capacity (v/c > 1.0). This is primarily due to growth in TAZs north and south of the intersection as well as growth in through traffic along OR 51-Monmouth Street. The intersection also serves cut-through traffic from Polk Street to OR 51-Monmouth Street via 4th Street and Ash Street.
- **Monmouth Street/7th Street** – The northbound approach to the intersection is forecast to operate at LOS F and above capacity (v/c > 1.0). This is primarily due to growth in TAZs south of the intersection as well as through traffic along OR 51-Monmouth Street.
- **Monmouth Street/Gun Club Road** – The intersection is forecast to operate at LOS C and below capacity (v/c = 0.97); however, it is expected to exceed its applicable mobility standard. This is primarily due to growth in through traffic along OR 51-Monmouth Street and traffic to/from Gun Club Road.
- **Main Street/River Road** – The eastbound and westbound approaches to the intersection are forecast to operate at LOS F and above capacity (v/c > 1.0). This is primarily due to growth in through traffic along Corvallis Road and traffic to/from River Road.

All other study intersections are forecast to operate acceptably during the weekday PM peak hour with respect to their applicable mobility standards and targets. *Attachment C includes the intersection operations analysis worksheets.*

Queueing Analysis

A queuing analysis was conducted at the signalized study intersections using Synchro 10. Table 5 summarizes the 95th percentile queues during the weekday PM peak hour and indicates if existing storage can accommodate the queues. The vehicle queue and storage lengths were rounded up to the nearest 25-feet. The storage lengths reflect the striped storage for each movement.

Table 5: Queuing Summary, Weekday PM Peak Hour

Map ID	Intersection	Movement	Storage Length (feet)	95th Percentile Queue (feet)	Adequate?
9	Monmouth Street/Gun Club Road	EBL	150	125	Yes
		WBL	150	25	Yes
		NBL	100	100	Yes
		SBL	50	275	**No**
10	Monmouth Street/16th Street	EBL	250	50	Yes
		WBL	225	100	Yes
		NBL	100	50	Yes
		SBL	225	75	Yes

EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, L = Left

As shown in Table 5, the striped storage lengths at the signalized study intersections are currently adequate for the 95th percentile queues except for the southbound left-turn queue at the Monmouth Street/Gun Club Road intersection. The storage length of the southbound left-turn lane on Gun Club Road is restricted by the pavement width between Monmouth Street and C Street. The left turn lane is provided along the segment of Gun Club Road where the southbound bike lane ends north of Monmouth Street. *Attachment C contains the queuing analysis worksheets.*

NON-AUTOMOBILE TRANSPORTATION ANALYSIS

Transit Qualitative Multimodal Assessment

As described in *Technical Memorandum #3A: Existing Conditions Inventory,* public transit services for Independence are provided by Cherriots. These existing services include Cherriots Regional Route 40X: Polk County/Salem Express fixed-route service and the Polk County Flex origin-to-destination service. In fall 2020, Cherriots plans to adjust the Polk County Flex to become a deviated fixed route service called Cherriots Regional Route 45: Central Polk County. Cherriots staff worked with the cities of Independence, Monmouth, and Dallas and in coordination with ODOT to determine a route and identify bus stop locations. The service will operate on a fixed route, including 50 stops within the three cities, but will also allow riders to call beforehand and request service at any location within the Route 45 service area. Service will be provided on weekdays from 7:00 a.m. to 5:00 p.m. with 2-hour headways. Figure 5 shows the future transit facilities based on this planned service change.

A future transit qualitative multimodal assessment was conducted in accordance with the methodology described in ODOT's APM, similar to the assessment conducted under existing conditions in *Technical Memorandum #3B: Existing Conditions Analysis*. Table 6 outlines the methodology used for conducting a future transit qualitative multimodal assessment within Independence. The assessment ratings for Cherriots Regional Route 40X: Polk County/Salem Express have not changed from the existing conditions analysis.

Table 6: Transit Qualitative Multimodal Assessment Methodology – For Rural Express Service

Category	Excellent	Good	Fair	Poor
Frequency	12 daily round trips	8-10 daily round trips	5-7 daily round trips	4 or fewer daily round trips
Schedule Speed/ Travel Times	<20% slower than driving	20% to 40% slower than driving	40% to 60% slower than driving	>60% slower than driving
Transit Stop Amenities	Shelter with bench and sign	Bench with sign	Sign with waiting area	No sign and/or no waiting area
Connecting Pedestrian/ Bicycle Network	Wide shoulders or bike lanes and sidewalks with frequent crossing	Standard shoulders or bike lanes and sidewalks with crossings	Substandard shoulders or bike lanes and sidewalks with no crossing	No shoulders, bike lanes, or sidewalks and no crossings
ADA Accessibility	All stops are ADA-compliant, provide concrete landing pads, and have adjacent parking prohibited	85-99% of stops are ADA-compliant, provide concrete landing pads, and have adjacent parking prohibited	70-84% of stops are ADA-compliant, provide concrete landing pads, and have adjacent parking prohibited	Less the 70% of stops are ADA-compliant, provide concrete landing pads, and have adjacent parking prohibited

Frequency

From the user's perspective, *frequency* determines how many times an hour a user has access to transit service, assuming that service is provided within acceptable walking distance and at the times the user wishes to travel. Frequency also helps determine the convenience of transit service to riders and is one component of overall transit trip time (helping to determine the wait time at a stop). The planned future Route 45 service operates five daily trips with 120-minute frequencies. Service is not provided on weekends. The frequency rating for Route 45 is fair. As discussed in *Technical Memorandum #3B,* the frequency rating for existing Route 40X is good with eight daily weekday trips.

Schedule Speed/Travel Times

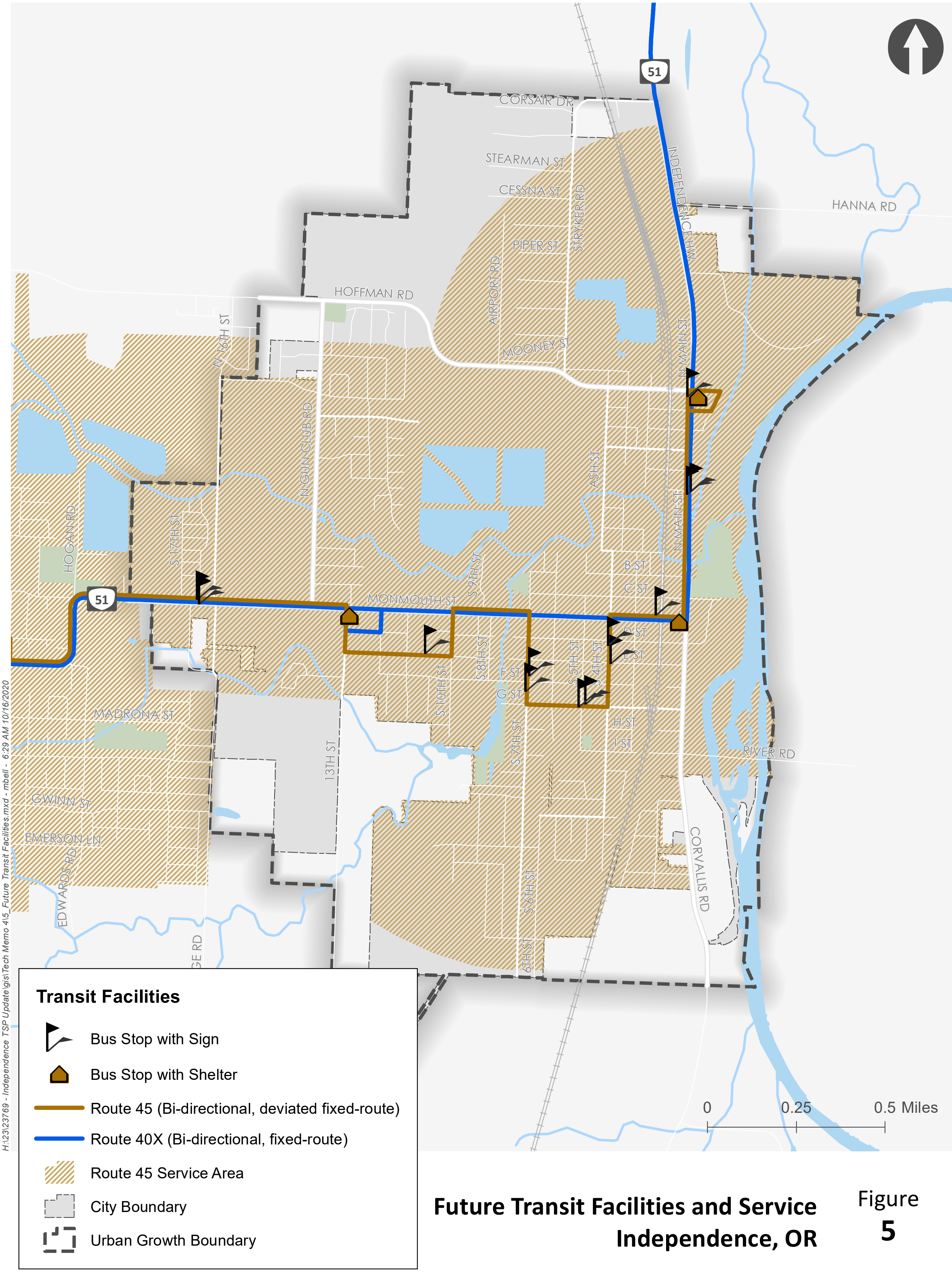
Schedule speed and travel time refer to the time it takes to complete a transit route in full and the length of time between stops. The planned future Route 45: Central Polk County connects Independence, Monmouth, and Dallas. On one full roundtrip, the bus makes 18 stops in Independence (two served by the same transit stop on 13th Street) and 52 stops total in 120 minutes. The same route driven in a single-occupancy vehicle is approximately 95 minutes roundtrip. The schedule speed/travel speed rating for Route 45 is good. As discussed in *Technical Memorandum #3B,* the schedule speed/travel speed rating for existing Route 40X is good with a schedule speed approximately 33 percent slower than driving.

Transit Stop Amenities

Amenities at transit stops, such as bus benches and bus shelters, enhance a transit route and make it more user-friendly. Steps that can make this mode as comfortable and accommodating as possible may help encourage ridership. The planned future Route 45 will use the existing Route 40X transit stops as well as 11 new transit stops within Independence. Cherriots plans to install a sign and pole at every new transit stop for Route 45. No additional shelters, trash receptacles, or posted schedules are planned at this time. The transit stop amenities rating for Route 45 is fair. As discussed in *Technical Memorandum #3B,* the transit stop amenities rating for existing Route 40X is good with three of five transit stops providing shelters and other amenities in addition to signage.

Connecting Pedestrian/Bicycle Network

Pedestrian facilities are provided adjacent to all existing and proposed bus stops in Independence. Of the 11 proposed new transit stops to serve planned future Route 45, marked crosswalks are only provided within a city block of the G Street/5th Street stops. Designated bicycle facilities, such as on-street bike lanes, are not provided adjacent to the majority of bus stops in Independence, except at the Main Street/Oak Street and OR 51/Talmadge Street stops. For the bus stops not on OR 51, mixed traffic may support cyclists due to low-speed roadways. The connecting pedestrian/bicycle network rating for Route 45 is fair. As discussed in *Technical Memorandum #3B,* the connecting pedestrian/bicycle network rating for existing Route 40X is good with adjacent pedestrian facilities, nearby marked crosswalks, and several stops on low-speed roadways that support mixed traffic. Filling gaps in the existing bicycle network would help create more of a multimodal system to support transit within Independence.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 4\5_Future Transit Facilities.mxd - mbell - 6:29 AM 10/16/2020

Future Transit Facilities and Service
Independence, OR

Figure
5

Data Source: General Transit Feed Service

ADA Accessibility

Pedestrian ramp ratings are only available along OR 51 through ODOT's TransGIS inventory. Based on TransGIS, all pedestrian ramps adjacent to existing and new bus stops along OR 51 within the city are rated as poor or missing. Based on information from Cherriots staff, bus stop landing pads will not be provided at five of the 11 future bus stops to be added with planned future Route 45 service. In addition, parking is currently allowed adjacent to nine of the future Route 45 bus stops. Cherriots is working with the City to establish no parking zones for these locations as part of the bus stop installations. The ADA accessibility rating for Route 45 is poor. As discussed in *Technical Memorandum #3B,* the ADA accessibility rating for existing Route 40X is also poor with three of five transit stops allowing parking and all adjacent pedestrian ramps rated as poor or missing.

Pedestrian Level of Traffic Stress

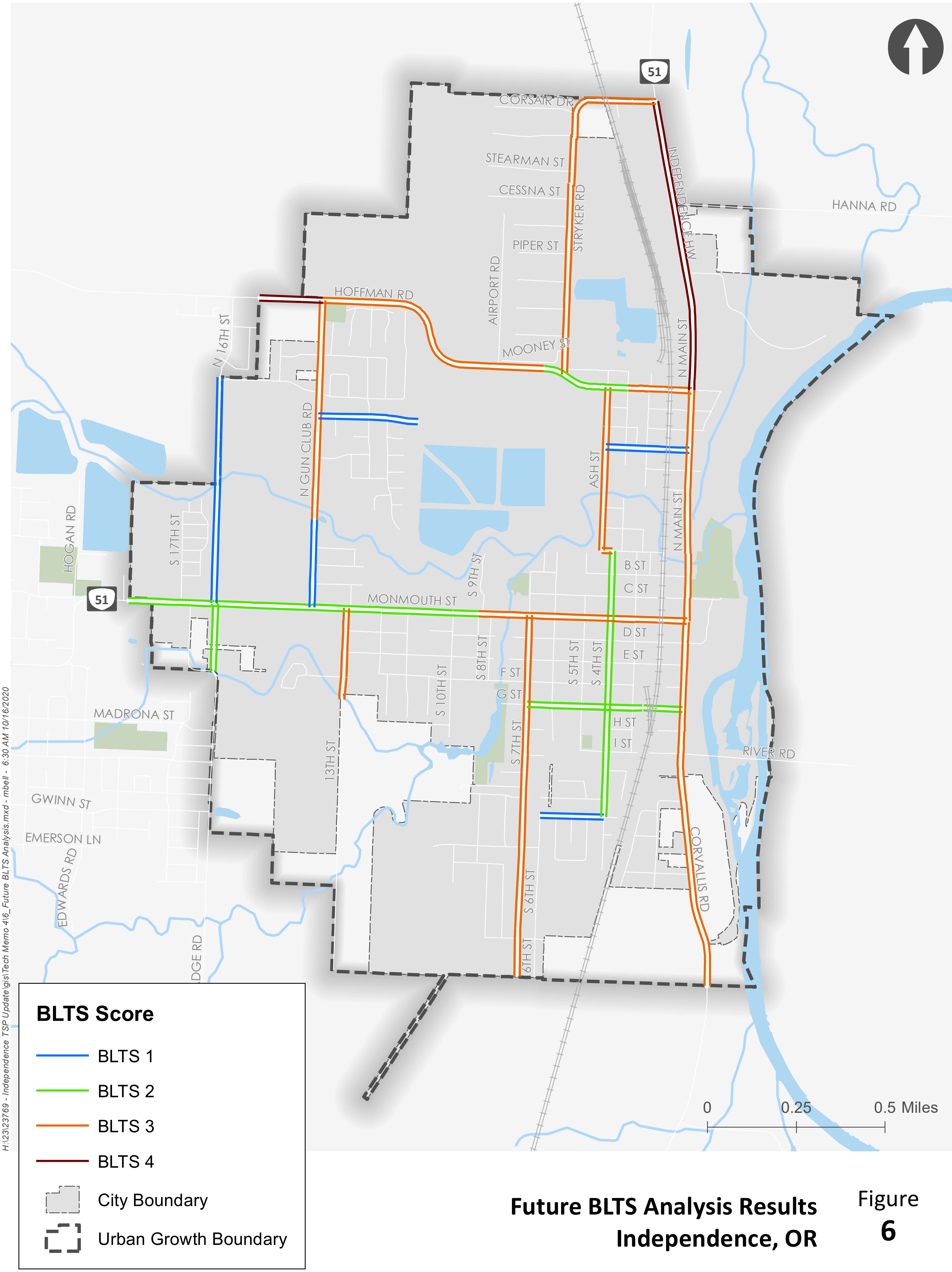
Pedestrian Level of Traffic Stress (PLTS) along roadway segments is determined based on sidewalk condition, physical buffer type, total buffering width, and general land use. Traffic volumes do not impact PLTS along roadway segments. Therefore, the forecast traffic volumes describe above are not expected to change the PLTS analysis results relative to existing conditions. In addition, none of the planned improvements identified in the STIP or the CIP are expected to change the factors that determine PLTS along roadway segments. Therefore, the PLTS analysis results summarized in *Tech Memo #3B: Existing Conditions Analysis* remain the same under future (no-build) traffic conditions.

Bicycle Level of Traffic Stress

Bicycle Level of Traffic Stress (BLTS) along roadway segments is determined based on traffic volumes, travel speeds, the number of travel lanes per direction, the presence and width of on-street bicycle lanes and/or adjacent parking lanes, and several other factors. Unlike PLTS, the forecast traffic volumes described above are expected to change the BLTS analysis results relative to existing conditions. Table D-1 in Attachment D summarizes the BLTS analysis results under future (no-build) traffic conditions. Figure 6 illustrates the BLTS analysis results for arterial and collector streets. It is important to note that while some segments are shown as BLTS 3 or 4, they may have shorter segments with lower BLTS scores. As shown in Figure 6, several arterial and collector streets in Independence are forecast to have segments that are rated BLTS 3 or 4. These segments may have bike lanes that are too narrow for roadway conditions or may be shared roadways (i.e. *mixed traffic*) with relatively high traffic volumes.

ATTACHMENTS

A. Population and Employment Forecast Methodology Memorandum
B. Trip Generation Estimate
C. Future Traffic Operations and Queuing Analysis Worksheets
D. Future BLTS Analysis Results



H:\23\23769 - Independence TSP Update\gis\Tech Memo 4\6_Future BLTS Analysis.mxd - mbell - 6:30 AM 10/16/2020

Future BLTS Analysis Results
Independence, OR

Figure
6

Data Source: Polk County Data Portal, ODOT

Attachment A Population and Employment Forecast Methodology Memorandum

MEMORANDUM

Population and Employment Forecast Methodology (Technical Memorandum #4, Task 4A)

Independence Transportation System Plan Update

DATE	September 7, 2020
TO	Project Management Team
FROM	Matt Hastie and Clinton "CJ" Doxsee, Angelo Planning Group
CC	FILE

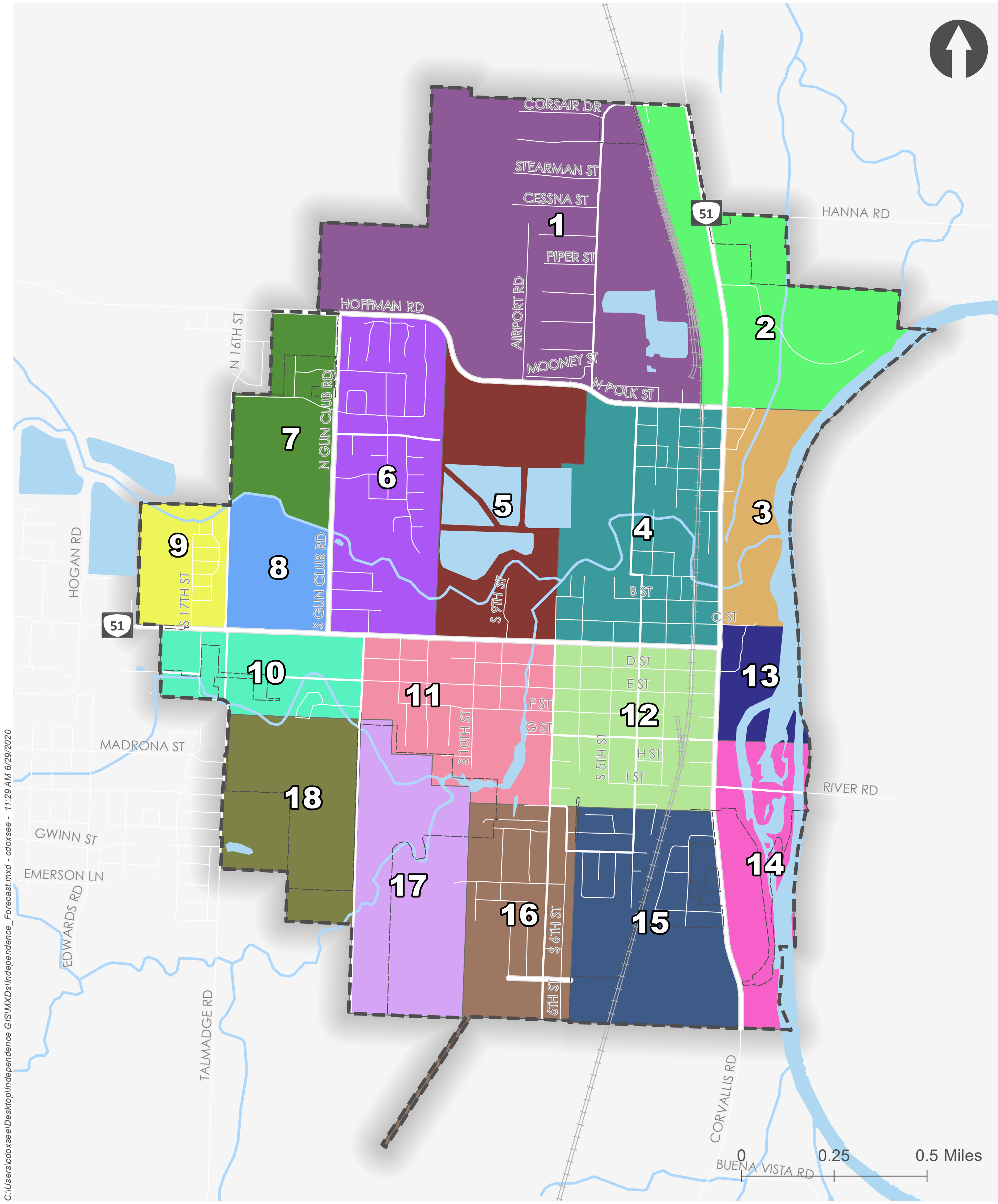
INTRODUCTION

This memorandum describes the land use forecast for the City of Independence Transportation System Plan (TSP) update, and the methodology behind the forecast. This forecast will ultimately provide the following:

- Number of single family detached (SFD), single family attached (SFA), and multifamily (MF) housing units in each Transportation Analysis Zone (TAZ) in base year (2017) and end year (2040).
- Square footage of employment uses (as categorized by the draft Independence Economic Opportunities Analysis), current year and end year.

The forecast assumes that growth will occur within the City of Independence's current Urban Growth Boundary (UGB). This forecast relies on an assessment of the estimated capacity for additional growth and development within the current UGB, using existing land use designations. In general, the forecast assumes that future development will occur at the average densities identified in a combination of the City's adopted buildable land inventory and SW Independence Concept Plan, although densities of actual development ultimately may be lower than allowed.

TAZs were developed for the City using existing zoning and considerations of particular corridors/ intersections of concern. The 18 TAZs are shown on Figure 1 below.



Transportation Analysis Zones (TAZs)
Independence, OR

Figure
1

Data Source: Pok County Data Portal, ODOT

POPULATION AND HOUSEHOLD FORECAST

Portland State University's Population Research Center (PRC) is responsible for forecasting populations for cities and counties within the State of Oregon. Their Coordinated Population Forecast for Polk County, its Urban Growth Boundaries (UGB), and Area Outside UGBs 2017-2067 was published in 2017 and is the basis for population and household analysis.

Figure 2 shows the historical and forecast population for communities within Polk County. Base-year population for the Independence UGB is 9,326 persons. The average annual growth rate (AAGR) is expected to be 2.2% through the year 2035 and will drop to 1.4% between 2035 to 2067. Projecting to the year 2040 with the AAGR period results in an end-year population of **15,023 persons in the year 2040.**

Figure 3 shows the persons per household for Independence, which remained unchanged between the 2000 and 2010 census. The assumption for the base year is that persons per household will remain at 3.0 person per household. The assumption for 2040 is that the average will decrease to 2.7 persons per household. After accounting for adjustments related to recent development[1], there is an estimated 3,322 households in the base year and 5,735 households in the end year 2040. The difference between the Base Year and End Year is 2,413 households. This is the overall growth in housing units estimated for Independence during the planning period.

Figure 2: Polk County and Sub-Areas – Historical and Forecast Populations and Average Annual Growth Rates (AAGR)

Figure 1. Polk County and Sub-Areas—Historical and Forecast Populations, and Average Annual Growth Rates (AAGR)

	Historical			Forecast				
	2000	2010	AAGR (2000-2010)	2017	2035	2067	AAGR (2017-2035)	AAGR (2035-2067)
Polk County	*62,380*	*75,403*	*1.9%*	*81,089*	*105,217*	*149,203*	*1.5%*	*1.1%*
Dallas UGB	13,277	15,356	1.5%	16,414	22,665	33,208	1.8%	1.2%
Falls City UGB	966	947	-0.2%	1,003	1,119	1,285	0.6%	0.4%
Independence UGB	6,248	8,696	3.4%	9,326	13,803	21,741	2.2%	1.4%
Monmouth UGB	7,834	9,598	2.1%	9,944	12,943	17,708	1.5%	1.0%
Salem/Keizer UGB (Polk)	19,919	26,139	2.8%	27,888	36,936	54,045	1.6%	1.2%
Willamina UGB (Polk)	731	866	1.7%	898	1,049	1,277	0.9%	0.6%
Outside UGBs	13,405	13,801	0.3%	15,616	16,702	19,940	0.4%	0.6%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses; Forecast by Population Research Center (PRC).

[1] Adjustments based on recent development are summarized in the *Locating Households and Housing* Types section below.

Source: Portland State University Population Research Center Coordinated Population Forecast for Polk County, 2017

Figure 3: Polk County and Sub-Areas – Persons per Household (PPH) and Occupancy Rate

Figure 14. Polk County and Sub-Areas—Persons per Household (PPH) and Occupancy Rate

	Persons Per Household (PPH)			Occupancy Rate		
	2000	2010	Change 2000-2010	2000	2010	Change 2000-2010
Polk County	*2.6*	*2.6*	*0.0*	*94.3%*	*93.4%*	*-0.9%*
Dallas	2.6	2.5	-0.1	95.3%	93.8%	-1.5%
Falls City	2.9	2.6	-0.3	90.6%	92.7%	2.0%
Independence	3.0	3.0	0.0	93.6%	90.3%	-3.3%
Monmouth	2.5	2.5	0.0	94.0%	94.1%	0.1%
Salem/Keizer (Polk)	2.5	2.6	0.1	94.5%	94.0%	-0.5%
Willamina (Polk)	2.8	2.8	0.0	94.3%	89.6%	-4.7%
Outside UGBs	2.8	2.6	-0.1	93.6%	93.1%	-0.5%

Sources: U.S. Census Bureau, 2000 and 2010 Censuses.

Note: For simplicity each UGB is referred to by its primary city's name.

Source: Portland State University Population Research Center Coordinated Population Forecast for Polk County, 2017

RESIDENTIAL CAPACITY OF THE INDEPENDENCE UGB

The project team produced a land inventory as part of *Technical Memorandum #3, Existing Conditions Inventory and Analysis*. The inventory is used as the basis for determining future residential capacity in Independence. The inventory produced as part of *Technical Memorandum #3* includes an inventory of vacant land within the UGB that was provided to the project team by City staff. The vacant land inventory was supplemented to include an inventory of land that is potentially redevelopable over the planning horizon. Land identified as potentially redevelopable is assumed to include partially vacant land with an improvement value of between 5% and 40% of the property's land value.

This analysis incorporates elements of the buildable lands inventory the City adopted in 2007. The amount of vacant and developable land identified in the 2007 buildable lands inventory is dated and not used as the basis for this analysis. However, the adopted buildable lands inventory provides standards and policy guidance for evaluating densities in individual zones. It describes the average and maximum densities that are applicable for determining residential capacity. The average and maximum residential densities are summarized in Table 1 below.

Table 1: Residential Development Density

ZONE	AVERAGE DENSITY	MAXIMUM DENSITY
Low Density Residential (RS)	Single-family: 5.5 units/acre Multi-family: 12 units/acre	8 units/acre
Medium Density Residential (RM)		12 units/acre
High Density Residential (RH)		20 units/acre
Residential Single-Family Airpark (RSA)*	1 unit/lot	1 unit/lot
Mixed Residential Density (MX)**	9 units/acre	

* The Residential Single-Family Airpark (RSA) zone is a specialized zoning designation reserved for single family dwellings that have access to the Independence State Airport by a taxiway and contain aircraft hangars for personal aviation use. Due to the unique characteristics associated with this type of housing, this analysis assumes one unit per vacant lot.
** The Mixed Residential Density (MX) designation is applied to areas that were recently annexed into the City, consistent with the SW Independence Concept Plan.

Table 2 provides a summary of residential zones within the Independence UGB. The table also lists the assumptions for the types of residential housing that is used in this forecast. Overall, the forecast assumes that approximately 60 percent of new development will be detached single-family residential. This assumption is supported by inspection of the diversity of residential development using Google Street View at various locations throughout the City.

Table 2: Zoning Summary

ZONE	DESCRIPTION	ASSUMPTION
Low Density Residential (RS)	The purpose of the RS Zone is to define and protect areas suitable for low-density residential uses.	Assume 5.5 DU/acre at 100% single-family detached dwellings.
Medium Density Residential (RM)	The purpose of the RM Zone is to define and protect areas suitable for low or medium-density residential uses. Such areas are intended for the development and use of single-family dwellings and medium density residential structures such as duplexes, row houses, and townhouses.	Assume 5.5 DU/acre at 60% single-family detached dwellings. 5.5 DU/acre at 30% single-family attached dwellings. 12 DU/acre at 10% multi-family dwellings. The estimate assumes that most development will utilize single-family residential housing types due to the availability of developable land.
High Density Residential (RH)	The purpose of the RH Zone is to define and protect areas suitable for medium and high-density residential uses.	Assume 5.5 DU/acre at 20% for single-family. attached. 12 DU/acre at 80% at multi-family.
Residential Single-Family Airpark		Assume 1 DU per parcel.

ZONE	DESCRIPTION	ASSUMPTION
Mixed Residential Density (MX)	The purpose of the MX Zone is to allow a creative mixture of housing types that is coordinated with local conditions and emphasizes multi-modal circulation.	The MX Zone implements the 2012 SW Independence Concept Plan. This analysis will use the buildable acreage and housing unit capacity from the Concept Plan, assuming the Scenario 2 estimate (assumes 50% of wetlands preserved). Capacity from the estimate will be reduced to account for any development construction since adoption of the Concept Plan. The average density is 9 DU/acre. The analysis assumes 60% single-family detached. 10% single-family attached. 30% multi-family.
Polk County Suburban Residential (SR) Zone	The purpose of Polk County's SR Zone is to provide a transition between urban and rural living within an officially designated sewered area, or an area that may be served with sewers.	For lots or parcels in the SR zone and located outside of the Southwest Area UGB (MX zones), the following assumptions will apply. New lots or parcels within an urban growth boundary are required to conform with requirements identified in the urban growth management agreement between the County and the City. Most parcels are assumed to have similar growth as the RS Zone summarized above: 5.5 DU/acre at 100% single-family detached dwellings. Limited areas are assumed to be incorporated into the City with RM Zoning, which will use the same assumptions.

This analysis assumes that most of the growth and capacity will be in the MX Zone, consistent with SW Independence Concept Plan. As noted in Table 2 above, the analysis will use the buildable acreage and housing unit capacity from the Concept Plan, assuming the middle range estimate. It assumes that the Concept Plan area will be built out over the planning horizon. Housing built since the MX zone was applied will be deducted from the SW Independence Concept Plan's capacity. At the time of this memorandum, 48 housing units have been constructed, reducing the unit capacity from 1,235 to 1,197. The remainder of the forecasted growth is assumed to be distributed in the vacant and redevelopable areas outside of the MX Zone.

The expected capacity of households within the remaining UGB is estimated using the following assumptions.

- Vacant lots are assumed to add a minimum of one residential unit regardless of size or constraints.
- Vacant lots assume 15% are set aside for future streets and right-of-way dedication.
- Half of partially vacant lots are available for new residential development.

Table 3: Capacity and Unit Split of Buildable Land within Independence UGB

ZONE	BUILDABLE ACRES	ASSUMED DENSITY (DU/ACRE)	UNIT CAPACITY	UNIT SPLIT
RS	Partially Vacant: 0.8 Vacant: 4.4	5.5	37	100% single-family detached
RM	Partially Vacant: 29.8 Vacant: 16.3	5.5 – 12	194	60% single-family detached 30% single-family attached 10% multi-family
RH	Partially Vacant: 0.2 Vacant: 9.2	5.5 – 12	85	20% single-family attached 80% multi-family
RSA	Vacant: 6.0	1 per lot	17	100% single-family detached
MX*	139.4 acres	9	1,197	60% single-family detached 10% single-family attached 30% multi-family
SR	Partially Vacant: 0.2 Vacant: 76.7	5.5	355	100% single-family detached
TOTAL	Partially Vacant: 31.0 Vacant: 252.1		1,885	

* Buildable acres and unit capacity in the MX zone are based on Scenario 2 from SW Independence Concept Plan analysis. Housing built since the UGB was expanded has been deducted from the capacity.

Given these assumptions, the UGB has approximately enough capacity to accommodate the new housing units expected within the planning period.

LOCATING HOUSEHOLDS AND HOUSING TYPES

For the base year, households are assigned to TAZs based on block-level US Census data, which provides total population per census block for the year 2010.[2] Table 4 shows the 2010 population for each TAZ and the share of the city's 2010 population within each TAZ, and applies that share to the 2017 (Current Year) population and household totals. The following adjustments were made to individual TAZs to account for past development.

- Riverplace Apartments. 210 apartments located in TAZ 2 and constructed in 2014. Persons per household assumed at 1.4.[3]
- Legacy Oaks Apartments. 196 apartments located in TAZ 7 and constructed in 2009. Persons per household assumed at 1.4.

Table 4: TAZ Share of 2010 Population and 2017 Population

TAZ	2010 POPULATION	SHARE OF POPULATION	2017 POPULATION	2017 HOUSEHOLDS
1	382	4.4%	385	128
2	304	3.5%	600	312
3	50	0.6%	50	17
4	865	9.9%	872	291
5	212	2.4%	214	71
6	1,916	22.0%	1,931	644
7	371	4.3%	640	315
8	227	2.6%	229	76
9	388	4.5%	391	130
10	561	6.5%	566	189
11	899	10.3%	906	302
12	1,064	12.2%	1,073	358
13	13	0.1%	13	4
14	37	0.4%	37	12
15	989	11.4%	997	332
16	396	4.6%	399	133
17	6	0.1%	6	2
18	16	0.2%	16	5
TOTAL	8,696	**100%**	9,326	3,109

Source: 2010 US Decennial Census Data

[2] 2010 is the most recent year for which block-level data is available. Census block boundaries do not always align with TAZ boundaries – blocks were assigned to the TAZ in which the preponderance of residential units was located, based on review of aerial imagery. One census block was apportioned evenly between TAZ 18 and TAZ 19.

[3] A lower average household size was assumed for these developments in comparison to the average household size for the city as a whole for two reasons. First, multi-family developments have lower average households sizes in general. Second, assuming a higher average size would have resulted in decreases in population in other TAZs across the City, given the overall levels of growth in population and households between 2010 and 2017 and the need to distribute that growth across all TAZs.

Table 5 assigns the number of households and household types to individual TAZs based on the 2017 population estimate. The number of households assumes approximately three persons per household in the base year. The distribution of housing types is based on the acreage of zoning in each TAZ and the assumptions described in Tables 2 and 3. The following adjustments were made to individual TAZs to account for the mix of housing types associated with recent development.

- Riverplace Apartments. 210 apartments located in TAZ 2 and constructed in 2014.
- Creekside Meadows. 69 apartments located in TAZ 6 and constructed in 1996.
- Legacy Oaks Apartments. 196 apartments located in TAZ 7 and constructed in 2009.

Table 6 distributes the forecasted population growth among TAZs based on the amount of vacant and partially vacant land within each. The number of households assumes approximately 2.7 persons per household in the year 2040. Environmental constraints such as wetlands and steep slopes were deducted from the supply of vacant and partially vacant land. Partially vacant land was assumed to have 50% of the site available for infill or redevelopment. The following adjustments were made to individual TAZs to account for development that is under construction or recently approved.

- Housing Mix. 110 multi-family and 14 single-family attached units are under construction currently in TAZ 3.
- Independence Landing and Osprey Point. 146 multi-family and 14 single-family attached units are approved for construction in TAZ 4.
- SW Area. 48 single-family units located between TAZs 16 and 17.
-

Table 5: Base-Year Household Distribution

TAZ	2017 POPULATION	2017 HOUSEHOLDS	SINGLE-FAM DETACHED	SINGLE-FAM ATTACHED	MULTI-FAMILY
1	385	128	128	-	-
2	600	312	61	31	220
3	50	17	11	4	1
4	872	291	219	54	18
5	214	71	36	20	15
6	1,931	644	513	46	84
7	640	315	89	22	203
8	229	76	76	-	-
9	391	130	-	26	104
10	566	189	67	24	97
11	906	302	154	76	72
12	1,073	358	218	28	112
13	13	4	-	-	-
14	37	12	12	-	-
15	997	332	332	-	-
16	399	133	80	40	13
17	6	2	1	0	1
18	16	5	3	1	2
TOTAL	9,326	3,322	2,002	373	943

Table 6: Residential Growth and 2040 Households

TAZ	POPULATION GROWTH	2040 POPULATION	2040 HOUSEHOLDS	SINGLE-FAM DETACHED	SINGLE-FAM ATTACHED	MULTI-FAMILY
1	-	385	143	143	-	-
2	1	601	313	62	31	220
3	1	52	19	13	5	2
4	487	1,359	503	259	77	167
5	8	222	82	42	23	17
6	14	1,945	720	581	52	86
7	165	805	376	134	34	207
8	4	232	86	86	-	-
9	1	392	145	-	29	116
10	164	730	270	96	35	139
11	16	922	342	174	86	81
12	19	1,092	404	246	32	127
13	335	348	129	-	14	110
14	22	59	22	22	-	-
15	885	1,882	697	697	-	-
16	353	752	279	183	72	24
17	1,616	1,622	601	364	59	177
18	1,616	1,632	604	363	60	181
TOTAL	5,706	15,032	5,735	3,464	610	1,656

EMPLOYMENT BLI

Projected Employment

The Oregon Employment Department Workforce and Economic Research Division publishes employment forecasts by industry. These ten-year forecasts are defined by regions (as opposed to counties or cities) and organize employment forecasts by primary industry. The region that includes Polk County also includes Linn, Marion, and Yamhill Counties.

Table 7 provides a summary of forecasted changes by employment industry. As shown in the table, overall employment is expected to grow by 33,400 (12% increase). Self-employment and private sector employment are expected to have the highest growth rate at 14% and 13% respectively. Overall growth in government employment is also expected to increase, but at a much lower rate of 7%.

With few exceptions, all industries in the private sector are anticipated to have over 10% growth. Most of the growth is expected to occur in construction (20% increase) and private educational and health services (19% growth). Industries that are expected to experience the least growth – under 10% - include manufacturing (7% growth), information (6% growth), and financial activities (5% growth).

Employment growth in the government sector is only expected to grow for state and local employment at 9% and 5% growth, respectively. There is no anticipated growth among federal government employees in this region.

Table 7: 2017 – 2027 Industry Employment Forecast

	2017	2027	CHANGE	% CHANGE
Total Employment	**277,200**	**310,600**	**33,400**	**12%**
Total payroll employment	261,000	292,100	31,100	12%
Total private	208,800	236,400	27,600	13%
Natural resources and mining	17,700	20,100	2,400	14%
Construction	14,700	17,700	3,000	20%
Manufacturing	27,700	30,100	2,400	9%
Trade, transportation, and utilities	42,500	47,600	5,100	12%
Information	1,800	1,900	100	6%
Financial activities	9,200	9,700	500	5%
Professional and business services	19,000	21,000	2,000	11%
Private educational and health services	43,700	51,800	8,100	19%
Leisure and hospitality	22,400	25,400	3,000	13%
Other services and private households	10,100	11,100	1,000	10%
Government	52,200	55,700	3,500	7%
Federal government	2,100	2,100	0	0%
State government	21,900	23,900	2,000	9%
Local government	28,200	29,700	1,500	5%
Self-employment	16,200	18,500	2,300	14%

Source: Industry Employment Forecast, 2017-2027 (Linn, Marion, Polk, and Yamhill Counties)

The most recent employment data by North American Industry Classification System (NAICS) sector available for the City of Independence is provided from the Census Bureaus' Longitudinal Employer-

Household Dynamics (LEHD) Origin-Destination Statistics. This provides a general basis of comparison with the Oregon Employment Department's employment forecast analysis. As summarized in Table 8, nearly 2,500 people worked in Independence in the year 2017. Over half of the employment in the City is concentrated in three sectors: manufacturing, educational services, and agriculture/forestry/fishing/ hunting. Approximately one-quarter of the jobs in the City are in the manufacturing sector (25.1%). Both the educational services and agriculture/forestry/fishing/hunting sectors employ over 10% of the population each at 14.5% and 12% respectively of the City's employment. The next largest employment sectors include health care/social assistance (9.9%), retail trade (8.6%) and accommodation/food services (6.9%).

Table 8 also shows the estimated forecast for current employment sectors within the City. The assumption is that employment growth in the City will have similar trends to the regional growth forecasts. Actual growth rates for individual employment sectors in the City may vary depending on changing market conditions. The forecasts apply an average annual growth rate (AAGR) to each employment sector based on the regional forecast growth rates. AAGR rates are applied according to the employment industry forecast it most closely aligns with in Table 7 above to provide a general estimate. As summarized in the table, employment is anticipated to grow at an overall AAGR of 1.4%. Based on regional growth estimates, the sectors with AAGR growth rates higher than the City average include construction, retail, transportation/warehousing, education services, and health care/social assistance.

Table 8: Independence Employment by NAICS Sector

INDEPENDENCE EMPLOYMENT BY NAICS SECTOR	2017		AAGR	2040	
	Emp	%		Emp	%
Total Employment	2,467	100%	1.4%	3,252	
Agriculture, Forestry, Fishing and Hunting	295	12.0%	1.4%	390	12.0%
Mining, Quarrying, and Oil and Gas Extraction	0	0.0%	1.4%	0	0.0%
Utilities	0	0.0%	1.2%	-	0.0%
Construction	26	1.1%	2.0%	38	1.2%
Manufacturing	620	25.1%	0.9%	748	23.0%
Wholesale Trade	30	1.2%	0.6%	34	1.0%
Retail Trade	212	8.6%	2.0%	310	9.5%
Transportation and Warehousing	84	3.4%	2.0%	123	3.8%
Information	18	0.7%	0.6%	20	0.6%
Finance and Insurance	14	0.6%	0.5%	16	0.5%
Real Estate and Rental and Leasing	14	0.6%	0.5%	16	0.5%
Professional, Scientific, and Technical Services	19	0.8%	1.1%	24	0.7%
Management of Companies and Enterprises	2	0.1%	1.1%	3	0.1%
Admin. & Support, Waste Management and Remediation	167	6.8%	1.1%	209	6.4%
Educational Services	357	14.5%	1.9%	513	15.8%
Health Care and Social Assistance	244	9.9%	1.9%	351	10.8%
Arts, Entertainment, and Recreation	25	1.0%	1.3%	32	1.0%
Accommodation and Food Services	169	6.9%	1.3%	220	6.8%
Other Services (excluding Public Administration)	109	4.4%	1.0%	134	4.1%
Public Administration	62	2.5%	0.7%	72	2.2%

Source: US Census Bureau, on the Map Application and LEHD Origin-Destination Statistics (Beginning of Quarterly Employment, 2nd Quarter of 2002-2017)

Table 9 translates the forecasted employment growth into six general employment categories. The table estimates the square footage needs for each of these typologies. The estimate for the square footage is based on the following assumptions:

- Commercial Uses (Office, Institutional, Flex, and Retail) typically have about 400 square feet per employee on average
- Industrial Uses (General Industrial and Warehouse) typically have approximately 750 square feet per employee on average

Table 9: Independence Employment Needs

EMPLOYMENT CATEGORY	2017		2040		CHANGE	
	Emp.	Sq. Ft.	Emp.	Sq. Ft.	Emp.	Sq. Ft.
TOTAL	2,467	1,216,194	3,252	1,599,022	785	382,829
Office	581	232,220	759	303,415	178	71,195
Institutional	348	139,016	493	197,018	145	58,002
Flex	231	173,573	290	217,414	58	43,841
Gen. Industrial	411	164,212	500	200,141	90	35,929
Warehouse	424	317,985	563	422,017	139	104,032
Retail	473	189,188	648	259,017	175	69,829

The project team produced a land inventory as part of *Technical Memorandum #3* like that for the population analysis described above. The inventory is used as the basis for determining future employment capacity in Independence. It includes an inventory of vacant land within the UGB that was provided to the project team by City staff and was supplemented to include potentially redevelopable areas. Land identified as potentially redevelopable is assumed to include partially vacant land with an improvement value of between 5% and 40% of the property's land value.

As summarized in Table 10, Independence is anticipated have enough buildable land to accommodate the forecasted growth within the planning horizon. The amount of buildable area assumes that undeveloped and partially developed lots will develop with a floor-to-area ratio (FAR) of 0.25. Vacant lots assume 15% are set aside for future streets and right-of-way dedication. Half of partially vacant lots available for new commercial or industrial development.

Table 10: Buildable Employment Capacity

ZONE	PARTIALLY VACANT	VACANT	COMBINED ACRES	SQ. FT. CAPACITY
TOTAL	22.1	107.6	129.7	1,412,448
IH	8.0	34.4	42.4	461,735
IL	10.7	28.2	38.9	423,778
IP		36.4	36.4	396,663
MUPC	3.4	8.6	12.0	130,271

LOCATING EMPLOYMENT USES BY TAZ

Employment square footage was assigned to TAZs by determining the overall amount of employment-designated land and the amount of buildable employment land within each TAZ using GIS data. Table 11 summarizes overall amount of employment acres and the amount of buildable employment acres. Buildable employment acres include vacant and partially vacant employment land identified in the Technical Memorandum #3.

Table 11: Employment Designated and Buildable Land

TAZ	EMPLOYMENT ACRES	SHARE	BUILDABLE ACRES	SHARE
1	243.5	49.1%	74.35	57.3%
2	67.3	13.6%	6.97	5.4%
3	1.0	0.2%	0.00	0.0%
4	27.8	5.6%	7.93	6.1%
5	63.5	12.8%	28.47	22.0%
6	2.4	0.5%	0.00	0.0%
7	0.0	0.0%	0.00	0.0%
8	2.1	0.4%	0.73	0.6%
9	4.7	0.9%	0.00	0.0%
10	26.7	5.4%	2.85	2.2%
11	20.5	4.1%	3.17	2.4%
12	17.9	3.6%	4.18	3.2%
13	16.4	3.3%	0.55	0.4%
14	1.2	0.2%	0.48	0.4%
15	0.0	0.0%	0.00	0.0%
16	0.0	0.0%	0.00	0.0%
17	0.9	0.2%	0.01	0.0%
18	0.0	0.0%	0.00	0.0%

Existing employment square footage is assigned to TAZs based on the proportion of overall employment land within each TAZ (Table 12). Land that is zoned for residential uses are screened from the allocation assignment.

Table 13 provides a summary of forecasted growth by TAZ. The 2040 forecast adds all the growth projected through 2040 to TAZs using the share of buildable acreage contained within each TAZ. The results are summarized in the table below.

Table 12: Base Year Employment Square Footage

TAZ	OFFICE	INSTITUTIONAL	FLEX	GEN. INDUSTRIAL	WAREHOUSE	RETAIL
1	135,044	80,843	100,939	95,495	184,920	-
2	25,917	15,515	19,371	18,327	35,488	50,456
3	383	229	286	271	525	746
4	10,717	6,416	8,011	7,579	14,676	20,865
5	24,441	14,631	18,268	17,283	33,468	47,583
6	927	555	693	655	1,269	1,804
7	-	-	-	-	-	-
8	817	489	611	578	1,119	1,591
9	1,791	1,072	1,339	1,266	2,452	3,487
10	10,268	6,147	7,675	7,261	14,060	19,991
11	7,893	4,725	5,900	5,582	10,809	15,368
12	6,890	4,125	5,150	4,873	9,435	13,415
13	6,316	3,781	4,721	4,466	8,648	12,296
14	466	279	348	329	638	907
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	349	209	261	247	478	680
18	-	-	-	-	-	-
TOTAL	232,220	139,016	173,573	164,212	317,985	189,188

Table 13: 2040 Employment Square Footage

TAZ	OFFICE	INSTITUTIONAL	FLEX	GEN. INDUSTRIAL	WAREHOUSE	RETAIL
1	184,945	120,879	132,043	121,257	257,573	-
2	28,324	17,618	20,767	19,408	39,066	60,460
3	376	225	281	266	514	780
4	13,832	9,029	9,883	9,080	19,259	30,585
5	35,907	24,169	25,210	22,886	50,306	81,243
6	908	544	679	642	1,243	1,886
7	-	-	-	-	-	-
8	1,106	731	785	718	1,544	2,468
9	1,755	1,051	1,312	1,241	2,403	3,645
10	11,261	7,013	8,252	7,709	15,536	24,058
11	9,064	5,726	6,592	6,129	12,540	19,568
12	8,510	5,490	6,119	5,647	11,821	18,654
13	6,421	3,897	4,767	4,491	8,815	13,467
14	658	439	464	423	920	1,478
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	348	209	259	245	477	725
18	-	-	-	-	-	-
TOTAL	303,415	197,018	217,414	200,141	422,017	259,017

Attachment B Trip Generation Estimate

TRIP GENERATION ESTIMATE

Trip generation estimates were prepared for the forecast household and employment growth based on information provided in the standard reference, *Trip Generation Manual, 10th Edition*, published by the Institute of Transportation Engineers (ITE). Table B-1 summarizes the total trips by Transportation Analysis Zone (TAZ).

Table B-1: Trip Generation Estimate – Net New Trips

	Households			Employment			Total		
TAZ	Total	In	Out	Total	In	Out	Total	In	Out
1	15	9	5	168	34	134	183	43	139
2	1	1	0	46	20	26	47	21	27
3	4	2	1	0	0	0	4	2	1
4	146	92	54	47	20	28	193	112	82
5	10	6	4	167	69	97	177	76	101
6	74	47	28	0	0	0	75	47	28
7	59	37	22	0	0	0	59	37	22
8	10	6	4	4	2	3	14	8	6
9	10	6	4	0	0	0	10	6	4
10	63	40	23	19	8	11	82	48	34
11	35	22	13	20	8	11	55	30	24
12	40	25	15	25	11	15	65	36	30
13	75	48	28	5	2	3	80	50	31
14	10	6	4	3	1	2	13	7	5
15	361	228	134	0	0	0	361	228	134
16	140	88	52	0	0	0	140	88	52
17	516	325	191	0	0	0	517	325	191
18	515	324	191	0	0	0	515	324	191
Total	**2,084**	**1313**	**771**	**505**	**176**	**329**	**2,589**	**1,489**	**1,100**

Attachment C Future Traffic Operations and Queuing Analysis Worksheets

Intersection						
Int Delay, s/veh	4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	103	46	31	477	476	105
Future Vol, veh/h	103	46	31	477	476	105
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	-	190	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	2	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	1	0	0	5	2	0
Mvmt Flow	105	47	32	487	486	107

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1091	540	593	0	-	0
Stage 1	540	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Critical Hdwy	6.41	6.2	4.1	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.3	2.2	-	-	-
Pot Cap-1 Maneuver	239	546	993	-	-	-
Stage 1	586	-	-	-	-	-
Stage 2	579	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	231	546	993	-	-	-
Mov Cap-2 Maneuver	231	-	-	-	-	-
Stage 1	567	-	-	-	-	-
Stage 2	579	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	31.9		0.5		0	
HCM LOS	D					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	993	-	281	-	-
HCM Lane V/C Ratio	0.032	-	0.541	-	-
HCM Control Delay (s)	8.7	-	31.9	-	-
HCM Lane LOS	A	-	D	-	-
HCM 95th %tile Q(veh)	0.1	-	3	-	-

Intersection	
Int Delay, s/veh	33.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Future Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	200	-	-
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, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	126	2	107	6	2	4	104	467	4	8	525	146

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1293	607	1355	1364	469	671	0	0	471	0	0
Stage 1	614	614	-	677	677	-	-	-	-	-	-	-
Stage 2	680	679	-	678	687	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	164	496	128	149	598	924	-	-	1101	-	-
Stage 1	472	486	-	446	455	-	-	-	-	-	-	-
Stage 2	434	454	-	445	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 122	144	492	89	131	598	924	-	-	1101	-	-
Mov Cap-2 Maneuver	~ 122	144	-	89	131	-	-	-	-	-	-	-
Stage 1	419	483	-	396	404	-	-	-	-	-	-	-
Stage 2	380	403	-	341	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	205.7	34.6	1.7	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	186	134	1101	-	-
HCM Lane V/C Ratio	0.113	-	-	1.268	0.094	0.008	-	-
HCM Control Delay (s)	9.4	-	-	205.7	34.6	8.3	-	-
HCM Lane LOS	A	-	-	F	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	13	0.3	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	0	45	1	0	0	10	540	2	0	601	14
Future Vol, veh/h	20	0	45	1	0	0	10	540	2	0	601	14
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	2	2	0	1
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	10	0	0	0	0	6	0	0	2	17
Mvmt Flow	21	0	47	1	0	0	11	568	2	0	633	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1233	1236	642	1257	1242	571	649	0	0	572	0	0
Stage 1	642	642	-	593	593	-	-	-	-	-	-	-
Stage 2	591	594	-	664	649	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.3	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.39	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	155	178	460	149	176	524	947	-	-	1011	-	-
Stage 1	466	472	-	496	497	-	-	-	-	-	-	-
Stage 2	497	496	-	453	469	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	153	174	460	132	172	523	946	-	-	1009	-	-
Mov Cap-2 Maneuver	153	174	-	132	172	-	-	-	-	-	-	-
Stage 1	458	472	-	487	488	-	-	-	-	-	-	-
Stage 2	489	487	-	406	469	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.7	32.5	0.2	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	946	-	-	284	132	1009	-	-
HCM Lane V/C Ratio	0.011	-	-	0.241	0.008	-	-	-
HCM Control Delay (s)	8.8	0	-	21.7	32.5	0	-	-
HCM Lane LOS	A	A	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0	0	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	2	17	9	25	17	487	12	35	535	42
Future Vol, veh/h	6	0	2	17	9	25	17	487	12	35	535	42
Conflicting Peds, #/hr	6	0	10	10	0	6	7	0	2	2	0	7
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	4	0	0	3	0
Mvmt Flow	6	0	2	18	9	26	18	513	13	37	563	44

Major/Minor	Minor1			Major1			Major2		
Conflicting Flow All	1227	1246	528	614	0	0	528	0	0
Stage 1	558	558	-	-	-	-	-	-	-
Stage 2	669	688	-	-	-	-	-	-	-
Critical Hdwy	6.4	6.5	6.2	4.1	-	-	4.1	-	-
Critical Hdwy Stg 1	5.4	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.4	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	199	175	554	975	-	-	1049	-	-
Stage 1	577	515	-	-	-	-	-	-	-
Stage 2	513	450	-	-	-	-	-	-	-
Platoon blocked, %					-	-		-	-
Mov Cap-1 Maneuver	181	0	550	975	-	-	1047	-	-
Mov Cap-2 Maneuver	181	0	-	-	-	-	-	-	-
Stage 1	561	0	-	-	-	-	-	-	-
Stage 2	481	0	-	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	19.5	0.3	0.5
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	975	-	-	301	1047	-	-
HCM Lane V/C Ratio	0.018	-	-	0.178	0.035	-	-
HCM Control Delay (s)	8.8	0	-	19.5	8.6	0	-
HCM Lane LOS	A	A	-	C	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	-	-

Intersection	
Intersection Delay, s/veh	87.7
Intersection LOS	F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	254	257	280	257	285	262
Future Vol, veh/h	254	257	280	257	285	262
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	267	271	295	271	300	276
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	73.2	100.4	88.9
HCM LOS	F	F	F

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	52%	50%	0%
Vol Thru, %	48%	0%	52%
Vol Right, %	0%	50%	48%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	537	511	547
LT Vol	280	254	0
Through Vol	257	0	285
RT Vol	0	257	262
Lane Flow Rate	565	538	576
Geometry Grp	1	1	1
Degree of Util (X)	1.109	1.023	1.078
Departure Headway (Hd)	7.394	7.197	7.098
Convergence, Y/N	Yes	Yes	Yes
Cap	497	506	518
Service Time	5.394	5.197	5.098
HCM Lane V/C Ratio	1.137	1.063	1.112
HCM Control Delay	100.4	73.2	88.9
HCM Lane LOS	F	F	F
HCM 95th-tile Q	17.9	14.6	17

Intersection	
Int Delay, s/veh	149.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Future Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	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, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	147	553	55	16	619	43	62	41	21	22	52	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	668	0	0	610	0	0	1665	1577	585	1587	1583	647
Stage 1	-	-	-	-	-	-	877	877	-	679	679	-
Stage 2	-	-	-	-	-	-	788	700	-	908	904	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	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	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	922	-	-	979	-	-	78	111	479	88	110	475
Stage 1	-	-	-	-	-	-	346	369	-	445	454	-
Stage 2	-	-	-	-	-	-	387	444	-	332	358	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	917	-	-	977	-	-	~ 19	81	477	41	80	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 19	81	-	41	80	-
Stage 1	-	-	-	-	-	-	261	278	-	335	439	-
Stage 2	-	-	-	-	-	-	207	430	-	204	270	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.2	$ 1492	$ 330.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	33	917	-	-	977	-	-	162
HCM Lane V/C Ratio	3.764	0.161	-	-	0.016	-	-	1.559
HCM Control Delay (s)	$ 1492	9.7	0	-	8.7	0	-	$ 330.4
HCM Lane LOS	F	A	A	-	A	A	-	F
HCM 95th %tile Q(veh)	14.6	0.6	-	-	0	-	-	16.9

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	82.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Future Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Conflicting Peds, #/hr	4	0	12	12	0	4	0	0	2	2	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	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	660	105	146	800	1	89	0	123	1	1	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	805	0	0	777	0	0	1835	1836	727	1887	1888	805
Stage 1	-	-	-	-	-	-	739	739	-	1097	1097	-
Stage 2	-	-	-	-	-	-	1096	1097	-	790	791	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	828	-	-	848	-	-	~ 59	77	427	54	71	386
Stage 1	-	-	-	-	-	-	412	427	-	261	291	-
Stage 2	-	-	-	-	-	-	261	291	-	386	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	825	-	-	838	-	-	~ 42	51	421	28	47	385
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 42	51	-	28	47	-
Stage 1	-	-	-	-	-	-	401	416	-	256	199	-
Stage 2	-	-	-	-	-	-	175	199	-	268	393	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.6	$ 746.7	40.4
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	88	825	-	-	838	-	-	110
HCM Lane V/C Ratio	2.416	0.009	-	-	0.175	-	-	0.077
HCM Control Delay (s)	$ 746.7	9.4	0	-	10.2	0	-	40.4
HCM Lane LOS	F	A	A	-	B	A	-	E
HCM 95th %tile Q(veh)	19.6	0	-	-	0.6	-	-	0.2

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	11.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	695	133	110	741	117	115
Future Vol, veh/h	695	133	110	741	117	115
Conflicting Peds, #/hr	0	4	4	0	2	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	20	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	1	2	4	1	0	0
Mvmt Flow	732	140	116	780	123	121

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	876	0	1820	806
Stage 1	-	-	-	-	806	-
Stage 2	-	-	-	-	1014	-
Critical Hdwy	-	-	4.14	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	-	-	2.236	-	3.5	3.3
Pot Cap-1 Maneuver	-	-	762	-	~ 86	385
Stage 1	-	-	-	-	443	-
Stage 2	-	-	-	-	353	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	759	-	~ 72	384
Mov Cap-2 Maneuver	-	-	-	-	194	-
Stage 1	-	-	-	-	441	-
Stage 2	-	-	-	-	298	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	86
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	257	-	-	759	-
HCM Lane V/C Ratio	0.95	-	-	0.153	-
HCM Control Delay (s)	86	-	-	10.6	-
HCM Lane LOS	F	-	-	B	-
HCM 95th %tile Q(veh)	8.8	-	-	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	153	572	32	816	91	122	249	226
v/c Ratio	0.60	0.57	0.08	1.01	0.43	0.27	0.84	0.49
Control Delay	23.8	17.0	7.5	59.6	35.4	23.9	56.7	22.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	17.0	7.5	59.6	35.4	23.9	56.7	22.6
Queue Length 50th (ft)	34	228	7	~513	43	46	135	71
Queue Length 95th (ft)	102	371	18	#854	97	98	#274	151
Internal Link Dist (ft)		1366		439		96		4493
Turn Bay Length (ft)	145		150		100		50	
Base Capacity (vph)	428	1004	608	809	262	550	368	552
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.57	0.05	1.01	0.35	0.22	0.68	0.41

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	145	513	30	30	523	252	86	81	35	237	83	132
Future Volume (vph)	145	513	30	30	523	252	86	81	35	237	83	132
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.98		1.00	0.99		1.00	0.96	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.98	1.00		0.99	1.00	
Frt	1.00	0.99		1.00	0.95		1.00	0.95		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1630	1716		1662	1612		1621	1629		1639	1529	
Flt Permitted	0.10	1.00		0.33	1.00		0.47	1.00		0.65	1.00	
Satd. Flow (perm)	167	1716		572	1612		798	1629		1122	1529	
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)	153	540	32	32	551	265	91	85	37	249	87	139
RTOR Reduction (vph)	0	1	0	0	14	0	0	15	0	0	55	0
Lane Group Flow (vph)	153	571	0	32	802	0	91	107	0	249	171	0
Confl. Peds. (#/hr)	14		3	3		14	15		7	7		15
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	2%	1%	0%	0%	1%	2%	0%	2%	0%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases	6			2			8			4		
Actuated Green, G (s)	57.2	53.7		57.2	47.3		24.5	24.5		24.5	24.5	
Effective Green, g (s)	57.2	53.7		57.2	47.3		24.5	24.5		24.5	24.5	
Actuated g/C Ratio	0.61	0.57		0.61	0.50		0.26	0.26		0.26	0.26	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.8		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	256	983		389	813		208	425		293	399	
v/s Ratio Prot	c0.06	0.33		0.00	c0.50			0.07			0.11	
v/s Ratio Perm	0.30			0.05			0.11			c0.22		
v/c Ratio	0.60	0.58		0.08	0.99		0.44	0.25		0.85	0.43	
Uniform Delay, d1	16.3	12.8		8.4	22.9		28.9	27.4		32.9	28.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	1.9		0.1	28.3		1.1	0.2		19.7	0.5	
Delay (s)	19.4	14.7		8.5	51.2		29.9	27.6		52.6	29.3	
Level of Service	B	B		A	D		C	C		D	C	
Approach Delay (s)		15.7			49.6			28.6			41.5	
Approach LOS		B			D			C			D	

Intersection Summary			
HCM 2000 Control Delay	35.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	93.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	513	30	30	523	252	86	81	35	237	83	132
Future Volume (veh/h)	145	513	30	30	523	252	86	81	35	237	83	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.97	0.98		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1723	1736	1736	1750	1736	1736	1750	1723	1723	1750	1750	1750
Adj Flow Rate, veh/h	153	540	32	32	551	265	91	85	37	249	87	139
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	1	1	0	1	1	0	2	2	0	0	0
Cap, veh/h	210	889	53	410	565	272	269	319	139	366	169	269
Arrive On Green	0.07	0.55	0.55	0.03	0.51	0.51	0.28	0.28	0.28	0.28	0.28	0.28
Sat Flow, veh/h	1641	1619	96	1667	1102	530	1163	1128	491	1266	596	952
Grp Volume(v), veh/h	153	0	572	32	0	816	91	0	122	249	0	226
Grp Sat Flow(s),veh/h/ln	1641	0	1715	1667	0	1632	1163	0	1619	1266	0	1548
Q Serve(g_s), s	3.8	0.0	19.8	0.7	0.0	42.6	6.2	0.0	5.1	16.6	0.0	10.7
Cycle Q Clear(g_c), s	3.8	0.0	19.8	0.7	0.0	42.6	17.0	0.0	5.1	21.7	0.0	10.7
Prop In Lane	1.00		0.06	1.00		0.32	1.00		0.30	1.00		0.62
Lane Grp Cap(c), veh/h	210	0	942	410	0	837	269	0	458	366	0	438
V/C Ratio(X)	0.73	0.00	0.61	0.08	0.00	0.97	0.34	0.00	0.27	0.68	0.00	0.52
Avail Cap(c_a), veh/h	474	0	942	739	0	839	338	0	554	442	0	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	19.9	0.0	13.3	10.2	0.0	20.8	33.5	0.0	24.4	32.8	0.0	26.4
Incr Delay (d2), s/veh	3.6	0.0	2.9	0.1	0.0	25.3	0.5	0.0	0.2	2.7	0.0	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	7.7	0.2	0.0	20.5	1.8	0.0	2.0	5.2	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.5	0.0	16.3	10.2	0.0	46.1	34.1	0.0	24.6	35.5	0.0	27.1
LnGrp LOS	C	A	B	B	A	D	C	A	C	D	A	C
Approach Vol, veh/h		725			848			213			475	
Approach Delay, s/veh		17.8			44.7			28.6			31.5	
Approach LOS		B			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	52.1		28.8	9.9	48.9		28.8				
Change Period (Y+Rc), s	4.0	4.0		4.0	4.0	4.0		4.0				
Max Green Setting (Gmax), s	20.0	45.0		30.0	20.0	45.0		30.0				
Max Q Clear Time (g_c+I1), s	2.7	21.8		23.7	5.8	44.6		19.0				
Green Ext Time (p_c), s	0.0	10.4		1.0	0.2	0.3		0.6				

Intersection Summary			
HCM 6th Ctrl Delay			31.8
HCM 6th LOS			C

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	598	152	664	22	276	64	203
v/c Ratio	0.23	0.75	0.43	0.74	0.07	0.76	0.27	0.46
Control Delay	11.8	30.7	14.2	28.0	27.9	44.2	30.6	32.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.8	30.7	14.2	28.0	27.9	44.2	30.6	32.7
Queue Length 50th (ft)	18	307	40	343	10	131	31	88
Queue Length 95th (ft)	47	573	89	631	32	263	71	200
Internal Link Dist (ft)		1726		1366		496		3282
Turn Bay Length (ft)	250		215		110		215	
Base Capacity (vph)	517	1090	531	1105	410	558	362	580
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.14	0.55	0.29	0.60	0.05	0.49	0.18	0.35

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	553	33	149	594	57	22	82	188	63	99	100
Future Volume (vph)	72	553	33	149	594	57	22	82	188	63	99	100
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.99		1.00	0.90		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	1699		1662	1703		1657	1502		1658	1594	
Flt Permitted	0.21	1.00		0.23	1.00		0.49	1.00		0.31	1.00	
Satd. Flow (perm)	372	1699		401	1703		859	1502		538	1594	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	73	564	34	152	606	58	22	84	192	64	101	102
RTOR Reduction (vph)	0	2	0	0	2	0	0	58	0	0	25	0
Lane Group Flow (vph)	73	596	0	152	662	0	22	218	0	64	178	0
Confl. Peds. (#/hr)	6		9	9		6	4		7	7		4
Confl. Bikes (#/hr)			1									
Heavy Vehicles (%)	1%	2%	0%	0%	1%	2%	0%	3%	1%	0%	0%	0%
Turn Type	D.P+P	NA		D.P+P	NA		D.P+P	NA		D.P+P	NA	
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	6			2			4			8		
Actuated Green, G (s)	57.6	47.8		57.6	52.1		28.1	21.9		28.1	25.8	
Effective Green, g (s)	57.6	47.8		57.6	52.1		28.1	21.9		28.1	25.8	
Actuated g/C Ratio	0.57	0.47		0.57	0.51		0.28	0.22		0.28	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	6.1		2.5	6.1		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	279	798		348	872		255	323		216	404	
v/s Ratio Prot	0.01	0.35		c0.04	c0.39		0.00	c0.15		c0.02	c0.11	
v/s Ratio Perm	0.13			0.20			0.02			0.06		
v/c Ratio	0.26	0.75		0.44	0.76		0.09	0.67		0.30	0.44	
Uniform Delay, d1	13.4	22.0		13.7	19.8		27.2	36.6		28.3	31.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	5.2		0.6	5.1		0.1	5.0		0.6	0.6	
Delay (s)	13.8	27.2		14.4	24.9		27.3	41.6		28.8	32.5	
Level of Service	B	C		B	C		C	D		C	C	
Approach Delay (s)		25.8			22.9			40.6			31.6	
Approach LOS		C			C			D			C	

Intersection Summary			
HCM 2000 Control Delay	27.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	101.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	78.0%	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												
Traffic Volume (veh/h)	72	553	33	149	594	57	22	82	188	63	99	100
Future Volume (veh/h)	72	553	33	149	594	57	22	82	188	63	99	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.99	0.99		0.98	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1736	1723	1723	1750	1736	1736	1750	1709	1709	1750	1750	1750
Adj Flow Rate, veh/h	73	564	34	152	606	58	22	84	192	64	101	102
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	1	2	2	0	1	1	0	3	3	0	0	0
Cap, veh/h	305	765	46	364	776	74	277	99	226	207	189	191
Arrive On Green	0.05	0.48	0.48	0.07	0.50	0.50	0.02	0.22	0.22	0.05	0.24	0.24
Sat Flow, veh/h	1654	1605	97	1667	1559	149	1667	457	1044	1667	792	800
Grp Volume(v), veh/h	73	0	598	152	0	664	22	0	276	64	0	203
Grp Sat Flow(s),veh/h/ln	1654	0	1702	1667	0	1708	1667	0	1501	1667	0	1592
Q Serve(g_s), s	1.8	0.0	23.8	3.8	0.0	26.8	0.8	0.0	14.8	2.5	0.0	9.3
Cycle Q Clear(g_c), s	1.8	0.0	23.8	3.8	0.0	26.8	0.8	0.0	14.8	2.5	0.0	9.3
Prop In Lane	1.00		0.06	1.00		0.09	1.00		0.70	1.00		0.50
Lane Grp Cap(c), veh/h	305	0	811	364	0	851	277	0	325	207	0	380
V/C Ratio(X)	0.24	0.00	0.74	0.42	0.00	0.78	0.08	0.00	0.85	0.31	0.00	0.53
Avail Cap(c_a), veh/h	619	0	1216	644	0	1220	535	0	536	428	0	569
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	17.7	13.6	0.0	17.3	23.7	0.0	31.6	25.1	0.0	27.9
Incr Delay (d2), s/veh	0.3	0.0	5.0	0.6	0.0	6.0	0.1	0.0	5.4	0.6	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	9.7	1.3	0.0	11.0	0.3	0.0	5.8	1.0	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	0.0	22.7	14.2	0.0	23.3	23.8	0.0	36.9	25.8	0.0	28.8
LnGrp LOS	B	A	C	B	A	C	C	A	D	C	A	C
Approach Vol, veh/h		671			816			298			267	
Approach Delay, s/veh		21.8			21.6			36.0			28.0	
Approach LOS		C			C			D			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	44.0	6.0	24.1	8.1	45.8	7.9	22.2
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	20.0	60.0	15.0	30.0	20.0	60.0	15.0	30.0
Max Q Clear Time (g_c+I1), s	5.8	25.8	2.8	11.3	3.8	28.8	4.5	16.8
Green Ext Time (p_c), s	0.2	11.8	0.0	1.0	0.1	13.0	0.1	1.2

Intersection Summary		
HCM 6th Ctrl Delay		24.6
HCM 6th LOS		C

Intersection						
Int Delay, s/veh	3.1					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	277	67	104	249	48	76
Future Vol, veh/h	277	67	104	249	48	76
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	160	-	125	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	0	2	3	2	0
Mvmt Flow	292	71	109	262	51	80

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	363	0	808	328
Stage 1	-	-	-	-	328	-
Stage 2	-	-	-	-	480	-
Critical Hdwy	-	-	4.12	-	6.42	6.2
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.3
Pot Cap-1 Maneuver	-	-	1196	-	350	718
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	622	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1196	-	318	718
Mov Cap-2 Maneuver	-	-	-	-	318	-
Stage 1	-	-	-	-	730	-
Stage 2	-	-	-	-	565	-

Approach	EB	WB	NB
HCM Control Delay, s	0	2.4	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	318	718	-	-	1196	-
HCM Lane V/C Ratio	0.159	0.111	-	-	0.092	-
HCM Control Delay (s)	18.4	10.6	-	-	8.3	-
HCM Lane LOS	C	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	0.4	-	-	0.3	-

Intersection						
Int Delay, s/veh	6.8					

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	215	138	213	281	69	136
Future Vol, veh/h	215	138	213	281	69	136
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	95	95	95	95	95	95
Heavy Vehicles, %	3	1	0	3	3	3
Mvmt Flow	226	145	224	296	73	143

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	371	0	1043	299
Stage 1	-	-	-	-	299	-
Stage 2	-	-	-	-	744	-
Critical Hdwy	-	-	4.1	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	2.2	-	3.527	3.327
Pot Cap-1 Maneuver	-	-	1199	-	253	738
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	468	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1199	-	196	738
Mov Cap-2 Maneuver	-	-	-	-	196	-
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	363	-

Approach	EB	WB	NB
HCM Control Delay, s	0	3.7	26
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	382	-	-	1199	-
HCM Lane V/C Ratio	0.565	-	-	0.187	-
HCM Control Delay (s)	26	-	-	8.7	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.4	-	-	0.7	-

Intersection	
Int Delay, s/veh	9.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	181	227	268	74	64	194
Future Vol, veh/h	181	227	268	74	64	194
Conflicting Peds, #/hr	1	0	0	1	104	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	95	95	95	95	95	95
Heavy Vehicles, %	11	4	2	6	33	1
Mvmt Flow	191	239	282	78	67	204

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	361	0	-	0	1047	322
Stage 1	-	-	-	-	322	-
Stage 2	-	-	-	-	725	-
Critical Hdwy	4.21	-	-	-	6.73	6.21
Critical Hdwy Stg 1	-	-	-	-	5.73	-
Critical Hdwy Stg 2	-	-	-	-	5.73	-
Follow-up Hdwy	2.299	-	-	-	3.797	3.309
Pot Cap-1 Maneuver	1150	-	-	-	221	721
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	428	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1149	-	-	-	178	720
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	541	-
Stage 2	-	-	-	-	428	-

Approach	EB	WB	SB
HCM Control Delay, s	3.9	0	29.4
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1149	-	-	-	410
HCM Lane V/C Ratio	0.166	-	-	-	0.662
HCM Control Delay (s)	8.8	0	-	-	29.4
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.6	-	-	-	4.6

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	238	101	10	234	3	65	3	6	8	3	2
Future Vol, veh/h	2	238	101	10	234	3	65	3	6	8	3	2
Conflicting Peds, #/hr	2	0	0	0	0	2	2	0	0	0	0	2
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	4	4	0	2	0	0	0	0	0	0	0
Mvmt Flow	2	251	106	11	246	3	68	3	6	8	3	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	251	0	0	357	0	0	582	581	304	585	633	252
Stage 1	-	-	-	-	-	-	308	308	-	272	272	-
Stage 2	-	-	-	-	-	-	274	273	-	313	361	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	1326	-	-	1213	-	-	427	428	740	425	400	792
Stage 1	-	-	-	-	-	-	706	664	-	738	688	-
Stage 2	-	-	-	-	-	-	736	688	-	702	629	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1323	-	-	1213	-	-	418	422	740	414	394	789
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	422	-	414	394	-
Stage 1	-	-	-	-	-	-	705	663	-	735	679	-
Stage 2	-	-	-	-	-	-	721	679	-	691	628	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.3	15.1	13.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	433	1323	-	-	1213	-	-	441
HCM Lane V/C Ratio	0.18	0.002	-	-	0.009	-	-	0.031
HCM Control Delay (s)	15.1	7.7	0	-	8	0	-	13.4
HCM Lane LOS	C	A	A	-	A	A	-	B
HCM 95th %tile Q(veh)	0.6	0	-	-	0	-	-	0.1

Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	41	40	8	12	2	46	56	22	9	93	14
Future Vol, veh/h	14	41	40	8	12	2	46	56	22	9	93	14
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	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	0	100	0	0	0	0	0	0	0	11	2	0
Mvmt Flow	16	46	44	9	13	2	51	62	24	10	103	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	315	320	111	353	316	75	119	0	0	87	0	0
Stage 1	131	131	-	177	177	-	-	-	-	-	-	-
Stage 2	184	189	-	176	139	-	-	-	-	-	-	-
Critical Hdwy	7.1	7.5	6.2	7.1	6.5	6.2	4.1	-	-	4.21	-	-
Critical Hdwy Stg 1	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	6.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4.9	3.3	3.5	4	3.3	2.2	-	-	2.299	-	-
Pot Cap-1 Maneuver	642	465	948	606	603	992	1482	-	-	1454	-	-
Stage 1	877	633	-	829	756	-	-	-	-	-	-	-
Stage 2	822	592	-	831	785	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	609	445	948	514	576	991	1482	-	-	1453	-	-
Mov Cap-2 Maneuver	609	445	-	514	576	-	-	-	-	-	-	-
Stage 1	845	629	-	798	728	-	-	-	-	-	-	-
Stage 2	776	570	-	730	780	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.2	11.6	2.8	0.6
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1482	-	-	604	573	1453	-	-
HCM Lane V/C Ratio	0.034	-	-	0.175	0.043	0.007	-	-
HCM Control Delay (s)	7.5	0	-	12.2	11.6	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.1	0	-	-

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	6	11	15	19	4	19	538	14	51	463	22
Future Vol, veh/h	6	6	11	15	19	4	19	538	14	51	463	22
Conflicting Peds, #/hr	0	0	1	1	0	0	12	0	8	8	0	12
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	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	0	0	2	0	0	2	0
Mvmt Flow	6	6	12	16	20	4	20	566	15	54	487	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1245	1248	512	1239	1252	582	522	0	0	589	0	0
Stage 1	619	619	-	622	622	-	-	-	-	-	-	-
Stage 2	626	629	-	617	630	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	7.1	6.5	6.2	4.1	-	-	4.1	-	-
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	3.5	4	3.3	3.5	4	3.3	2.2	-	-	2.2	-	-
Pot Cap-1 Maneuver	152	175	566	154	174	517	1055	-	-	996	-	-
Stage 1	480	483	-	478	482	-	-	-	-	-	-	-
Stage 2	475	478	-	481	478	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	124	154	559	134	153	513	1043	-	-	988	-	-
Mov Cap-2 Maneuver	124	154	-	134	153	-	-	-	-	-	-	-
Stage 1	461	441	-	461	465	-	-	-	-	-	-	-
Stage 2	438	461	-	428	436	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	23.9	35.9	0.3	0.8
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1043	-	-	215	156	988	-	-
HCM Lane V/C Ratio	0.019	-	-	0.113	0.256	0.054	-	-
HCM Control Delay (s)	8.5	0	-	23.9	35.9	8.9	0	-
HCM Lane LOS	A	A	-	C	E	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1	0.2	-	-

Intersection						
Int Delay, s/veh	2.1					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	13	61	143	590	454	37
Future Vol, veh/h	13	61	143	590	454	37
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	95	95	95	95	95	95
Heavy Vehicles, %	0	2	1	2	1	3
Mvmt Flow	14	64	151	621	478	39

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1421	498	517	0	-	0
Stage 1	498	-	-	-	-	-
Stage 2	923	-	-	-	-	-
Critical Hdwy	6.4	6.22	4.11	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.318	2.209	-	-	-
Pot Cap-1 Maneuver	152	572	1054	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	390	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	119	572	1054	-	-	-
Mov Cap-2 Maneuver	119	-	-	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	390	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	18.6	1.8	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1054	-	343	-	-
HCM Lane V/C Ratio	0.143	-	0.227	-	-
HCM Control Delay (s)	9	0	18.6	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.5	-	0.9	-	-

Intersection	
Int Delay, s/veh	71.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Future Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	3	3	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	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	102	9	441	6	259	99	276	265	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1372	1199	274	1152	1158	312	282	0	0	361	0	0
Stage 1	826	826	-	324	324	-	-	-	-	-	-	-
Stage 2	546	373	-	828	834	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	6.7	6.1	6.02	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	124	187	770	200	225	741	1292	-	-	1198	-	-
Stage 1	369	389	-	718	677	-	-	-	-	-	-	-
Stage 2	526	622	-	404	424	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	134	770	154	162	739	1292	-	-	1195	-	-
Mov Cap-2 Maneuver	38	134	-	154	162	-	-	-	-	-	-	-
Stage 1	367	282	-	712	671	-	-	-	-	-	-	-
Stage 2	208	616	-	290	308	-	-	-	-	-	-	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	85.3			186.6			0.1			4.4		
HCM LOS	F			F								

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	55	419	1195	-	-
HCM Lane V/C Ratio	0.005	-	-	0.191	1.319	0.231	-	-
HCM Control Delay (s)	7.8	0	-	85.3	186.6	8.9	0	-
HCM Lane LOS	A	A	-	F	F	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	25	0.9	-	-

Intersection						
Int Delay, s/veh	0					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	1	810	850	10	2	2
Future Vol, veh/h	1	810	850	10	2	2
Conflicting Peds, #/hr	5	0	0	5	0	2
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	20	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	1	853	895	11	2	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	911	0	-	0	1761	908
Stage 1	-	-	-	-	906	-
Stage 2	-	-	-	-	855	-
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	756	-	-	-	94	336
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	420	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	752	-	-	-	93	334
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	396	-
Stage 2	-	-	-	-	418	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	18.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	752	-	-	-	271
HCM Lane V/C Ratio	0.001	-	-	-	0.016
HCM Control Delay (s)	9.8	-	-	-	18.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0

HCM 6th Edition Analysis May 2020

Based on ODOT Analysis Procedures Manual, Volume 2, Chapter 13

INTERSECTION	9. Gun Club Road & Monmouth Street				
CYCLE LENGTH	107				
TOTAL LOST TIME	12				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	**EB (L)**	**WB (TR)**	**NB (TR)**	**SB (L)**	
	EXISTING PM				
Adj Flow Rate, (veh/h)	153	816	122	249	
Sat Flow (veh/h)	1641	1632	1619	1266	
Flow Ratio	0.09	0.50	0.08	0.20	
CRITICAL INTERSECTION V/C RATIO	**0.97**				

INTERSECTION	10. 16th Street & Monmouth Street				
CYCLE LENGTH	141				
TOTAL LOST TIME	16				
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS	**EB (TR)**	**WB (L)**	**NB (TR)**	**SB (L)**	
	EXISTING PM				
Adj Flow Rate, (veh/h)	598	152	276	102	
Sat Flow (veh/h)	1702	1667	1501	800	
Flow Ratio	0.35	0.09	0.18	0.13	
CRITICAL INTERSECTION V/C RATIO	**0.85**				

INTERSECTION					
CYCLE LENGTH					
TOTAL LOST TIME					
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS					
Adj Flow Rate, (veh/h)					
Sat Flow (veh/h)					
Flow Ratio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
CRITICAL INTERSECTION V/C RATIO	**#DIV/0!**				

INTERSECTION					
CYCLE LENGTH					
TOTAL LOST TIME					
TOTAL LOST TIME (2025)					
CRITICAL MOVEMENTS					
Adj Flow Rate, (veh/h)					
Sat Flow (veh/h)					
Flow Ratio	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
CRITICAL INTERSECTION V/C RATIO	**#DIV/0!**				

Attachment D Future BLTS Analysis Results

FUTURE BLTS ANALYSIS RESULTS

Table D-1 summarizes the BLTS analysis results under future (no-build) traffic conditions. It is important to note that while some segments are shown as BLTS 3 or 4, they may have shorter segments with lower BLTS scores. As shown, several arterial and collector streets in Independence are forecast to have segments that are rated BLTS 3 or 4. These segments may have bike lanes that are too narrow for roadway conditions or may be shared roadways (i.e. mixed traffic) with relatively high traffic volumes.

Table D-1: Future Bicycle Level of Traffic Stress (BLTS) Analysis Results

Street	From	To	Side	Facility Type	BLTS Criteria						BLTS
					ADT	Speed (mph)	Lanes per Direction	Bike Lane Width (feet)	Parking Lane Width (feet)	Frequent Blockage	
OR 51-Main Street	Stryker Road	Hanna Road	East	Bike Lane	>3,000	45	1	None/7	None	No	4
	Stryker Road	Hanna Road	West	Bike Lane	>3,000	45	1	6	None	No	4
	Hanna Road	Polk Street	East	Bike Lane	>3,000	35 - 45	1	5.5 - 6	None	No	4
	Hanna Road	Polk Street	West	Bike Lane	>3,000	35 - 45	1	5.5 - 6	None	No	4
	Polk Street	B Street	East	Mixed Traffic/ Shoulder Bikeway	>3,000	35	1	None/9 - 11	None/ Permitted	No	3
	Polk Street	B Street	West	Mixed traffic/ Shoulder Bikeway	>3,000	35	1	None/4 - 11	None/ Permitted	No	3
	B Street	Monmouth Street	East	Mixed Traffic	>3,000	20	1	None	Yes	No	3
	B Street	Monmouth Street	West	Mixed Traffic	>3,000	20	1	None	Yes	No	3
Main Street	Monmouth Street	E Street	East	Mixed Traffic	>3,000	20	1	None	Yes	No	3

Street	From	To	Side	Facility Type	BLTS Criteria						BLTS
					ADT	Speed (mph)	Lanes per Direction	Bike Lane Width (feet)	Parking Lane Width (feet)	Frequent Blockage	
	Monmouth Street	E Street	West	Mixed Traffic	>3,000	20	1	None	Yes	No	3
	E Street	River Road	East	Mixed Traffic/ Shoulder Bikeway	>3,000	20 - 30	1	None/6	None/ Marked	No	3
	E Street	River Road	West	Mixed Traffic/ Shoulder Bikeway	>3,000	20 - 30	1	None/6	None/ Marked	No	3
Corvallis Road	River Road	Southern UGB	East	Mixed Traffic	>3,000	30	1	None	None	No	3
	River Road	Southern UGB	West	Mixed Traffic	>3,000	30	1	None	None/ Marked	No	3
OR 51-Monmouth Street	Western UGB	9th Street	North	Bike Lane	>3,000	25 – 30	1	5	None	No	2
	Western UGB	9th Street	South	Bike Lane	>3,000	25 – 30	1	5	None	No	2
	9th Street	OR 51-Main Street	North	Mixed Traffic/Bike Lane	>3,000	20 – 25	1	None/5	None/ Permitted/ Marked	No	3
	9th Street	OR 51-Main Street	South	Mixed Traffic/Bike Lane	>3,000	20 – 25	1	None/5	None/ Permitted/ Marked	No	3
Gun Club Road	Hoffman Road	Picture Street	East	Mixed Traffic/Bike Lane/ Shoulder Bikeway	>3,000	30	1	None/4 - 6	None	No	3
	Hoffman Road	Picture Street	West	Mixed Traffic/Bike Lane	>3,000	30	1	None/6 - 8	None	No	3

Street	From	To	Side	Facility Type	BLTS Criteria						BLTS
					ADT	Speed (mph)	Lanes per Direction	Bike Lane Width (feet)	Parking Lane Width (feet)	Frequent Blockage	
	Picture Street	South of Ash Creek	East	Mixed Traffic/Bike Lane	>3,000	30	1	None/6 - 8	None	No	3
	Picture Street	South of Ash Creek	West	Mixed Traffic	>3,000	30	1	None	None	No	3
	South of Ash Creek	Monmouth Street	East	Bike Lane	>3,000	30	1	6	None	No	1
	South of Ash Creek	Monmouth Street	West	Bike Lane	>3,000	30	1	6	None	No	1
Hoffman Road	Western UGB	Gun Club Road	North	Mixed Traffic	>3,000	35 - 40	1	None	None	No	4
Hoffman Road	Western UGB	Gun Club Road	South	Mixed Traffic	>3,000	35 - 40	1	None	None	No	4
Hoffman Road	Gun Club Road	West of Stryker Road	North	Bike Lane	>3,000	35	1	4	None	No	3
Hoffman Road	Gun Club Road	West of Stryker Road	South	Bike Lane	>3,000	35	1	4	None	No	3
Polk Street	West of Stryker Road	Walnut Street	North	Bike Lane	>3,000	25	1	4	None	No	2
Polk Street	West of Stryker Road	Walnut Street	South	Bike Lane	>3,000	25	1	4	None	No	2
Polk Street	Walnut Street	OR 51-Main Street	North	Mixed Traffic/Bike Lane	>3,000	25	1	None/4 - 6	No	No	3

Street	From	To	Side	Facility Type	BLTS Criteria						BLTS
					ADT	Speed (mph)	Lanes per Direction	Bike Lane Width (feet)	Parking Lane Width (feet)	Frequent Blockage	
	Walnut Street	OR 51-Main Street	South	Mixed Traffic	>3,000	25	1	None	None	No	3
Stryker Road	OR 51	Polk Street	East	Mixed Traffic/ Shoulder Bikeway	>3,000	35	1	None/5	None	No	3
	OR 51	Polk Street	West	Mixed Traffic/ Shoulder Bikeway	>3,000	35	1	None/5	None	No	3
Williams Street	Ash Street	OR 51-Main Street	North	Mixed Traffic	750 - ≤1,500	25	0	None	Permitted	No	1
	Ash Street	OR 51-Main Street	South	Mixed Traffic	750 - ≤1,500	25	0	None	Permitted	No	1
Picture Street	Gun Club Road	End of road	North	Mixed Traffic	750 - ≤1,500[1]	25	0	None	Permitted	No	1
	Gun Club Road	End of road	South	Mixed Traffic	750 - ≤1,500[1]	25	0	None	Permitted	No	1
Ash Street	Polk Street	A Street	East	Mixed Traffic	1,500 - ≤3,000	25	1	None	Permitted	No	3
	Polk Street	A Street	West	Mixed Traffic	1,500 - ≤3,000	25	1	None	Permitted	No	3
4th Street	A Street	Spruce Avenue	East	Mixed Traffic	1,500 - ≤3,000	25	0	None	None/ Permitted/ Marked	No	2
	A Street	Spruce Avenue	West	Mixed Traffic	1,500 - ≤3,000	25	0	None	None/ Permitted	No	2
7th Street	Monmouth Street	Chestnut Street	East	Mixed Traffic	>3,000	25	0	None	None	No	3

Street	From	To	Side	Facility Type	BLTS Criteria						BLTS
					ADT	Speed (mph)	Lanes per Direction	Bike Lane Width (feet)	Parking Lane Width (feet)	Frequent Blockage	
	Monmouth Street	Chestnut Street	West	Mixed Traffic	>3,000	25	0	None	Permitted	No	3
	Chestnut Street	Southern UGB	East	Mixed Traffic	>3,000	25	0	None	None	No	3
	Chestnut Street	Southern UGB	West	Mixed Traffic	>3,000	25	0	None	Permitted	No	3
13th Street	Monmouth Street	Southern UGB	East	Mixed Traffic	>3,000	25	0	None	None	No	3
	Monmouth Street	Southern UGB	West	Mixed Traffic	>3,000	25	0	None	None/ Permitted	No	3
16th Street	Northern UGB	Monmouth Street	East	Bike Lane	>3,000	25	1	6	None	No	1
	Northern UGB	Monmouth Street	West	Bike Lane	>3,000	25	1	6	None	No	1
	Monmouth Street	Southern UGB	East	Shoulder Bikeway	>3,000	25	1	4 - 11	None	No	2
	Monmouth Street	Southern UGB	West	Shoulder Bikeway	>3,000	25	1	5	None	No	2
G Street	7th Street	Main Street	North	Mixed Traffic	1,500 - ≤3,000	25	0	None	None/ Permitted	No	2
	7th Street	Main Street	South	Mixed Traffic	1,500 - ≤3,000	25	0	None	None/ Permitted	No	2
Spruce Avenue	6th Street	4th Street	North	Mixed Traffic	750 - ≤1,500[1]	25	0	None	Permitted	No	1
	6th Street	4th Street	South	Mixed Traffic	750 - ≤1,500[1]	25	0	None	Permitted	No	1

1. Estimated from similar roadways.

Attachment F Tech Memo #5: Alternatives Analysis

TECH MEMO #5: ALTERNATIVES ANALYSIS AND FUNDING PROGRAM

Date: October 2, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Alec Kauffman, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Tech Memo #5: Alternatives Analysis and Funding Program

TABLE OF CONTENTS

INTRODUCTION

This memorandum summarizes the alternatives analysis and funding program for the Independence Transportation System Plan (TSP) update. This memorandum includes information on projects that address identified deficiencies and needs in the City of Independence. The information provided in this memorandum will serve as the basis for alternatives solutions packages for the TSP update.

STREET SYSTEM

Streets serve a majority of trips within Independence across all travel modes. In addition to motor vehicles, pedestrians, bicyclists, and public transit riders use the street network to access local and regional destinations. This section identifies alternatives to address gaps and deficiencies in the street system as well as alternatives that will facilitate improvements to the pedestrian, bicycle, and public transit systems.

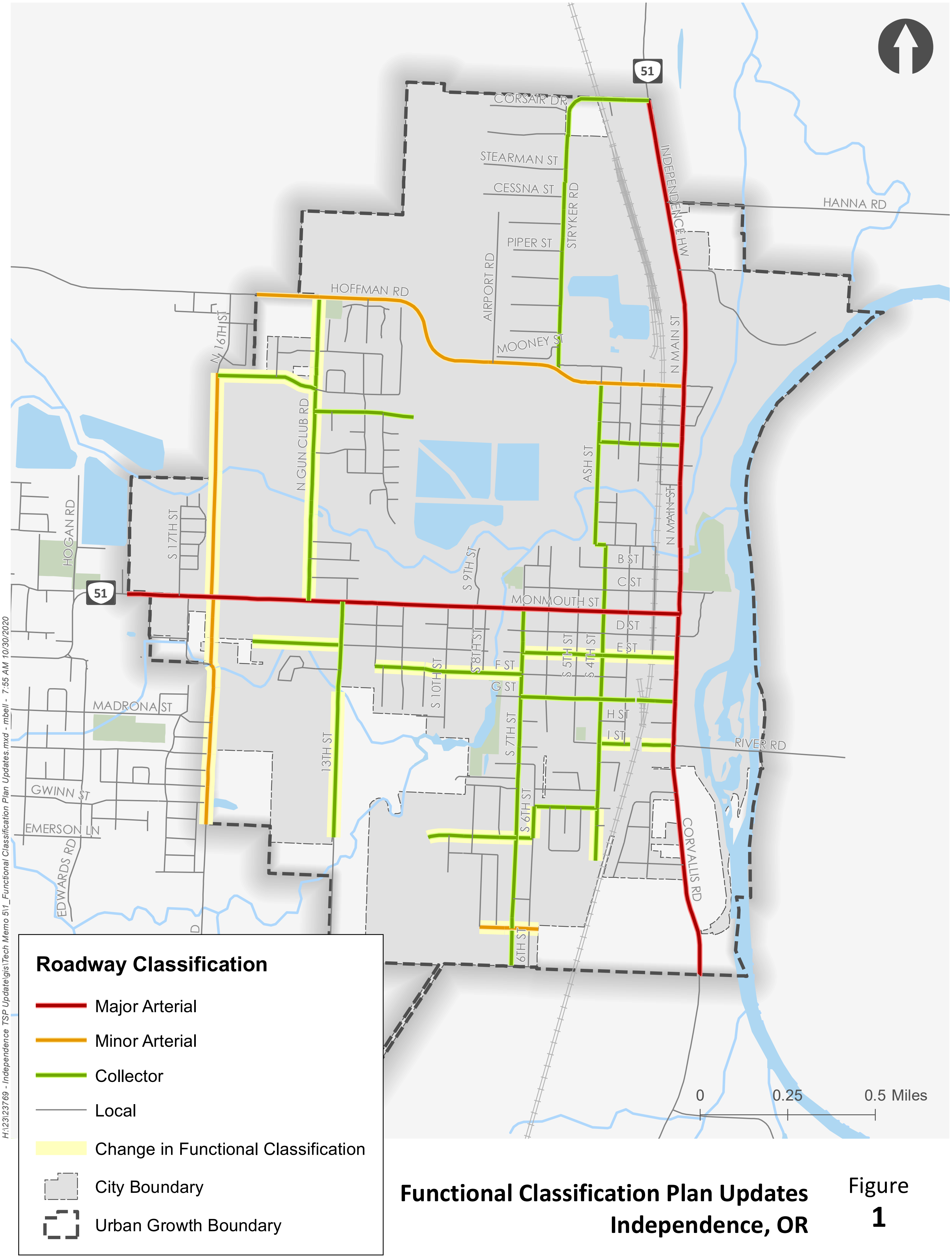
Functional Classification

Functional classification designations align the design of a roadway with its intended function, such as operating as a local freight route or offering a parallel route connection. A review of the existing Independence functional classification system indicates opportunities to better align with the roadway uses and to provide further arterial and collector connectivity within the built network. The functional classification opportunities are shown in Figure 1 and listed below.

- Re-designate 16th Street (north city limits to Talmadge Road) from a collector to a minor arterial.
- Re-designate 16th Street (Talmadge Road to south city limits) from a local street to a minor arterial.
- Re-designate Marigold Drive (16th Street to Gun Club Road) from a local street to a collector.
- Re-designate Gun Club Road from a minor arterial to a collector.
- Re-designate E Street (western end to 13th Street) from a local street to a collector.
- Re-designate Randall Way-F Street (12th Street to 7th Street) from a local street to a collector.
- Re-designate E Street (7th Street to OR 51-Main Street) from a local street to a collector.
- Re-designate 13th Street (F Street to the south City limits)from a local street to a collector.
- Re-designate I Street (4th Street to OR 51-Main Street) from a local street to a collector, assuming a rail crossing is feasible.
- Re-designate Chestnut Street (7th Street to western extents) from a local street to a collector.
- Re-designate Cedar Street/6th Street (7th Street to Spruce Avenue) from a local street to a collector.
- Re-designate 4th Street (Spruce Avenue to southern extents) from a local street to a collector.
- Re-designate Mountain Fir Avenue from a local street to a minor arterial.

Major Street Connectivity

A review of the existing arterial and collector system indicates a need for new major street connections within Independence. The future street system needs to balance the benefits of providing a well-connected grid system with the connectivity challenges in the city due railroads and Ash Creek running through the city and existing development.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 51_Functional Classification Plan Updates.mxd - mbell - 7:55 AM 10/30/2020

Functional Classification Plan Updates
Independence, OR

Figure
1

Data Source: Polk County Data Portal, ODOT

In addition to new local streets discussed in a later section, there are opportunities to extend existing major streets and to provide new major street connections, as listed below and shown in Figure 2.

- Extend E Street west to Monmouth City Limits.
- Extend Randal Way west to 13th Street at F Street.
- Extend Chestnut Street southwest to the new east-west collector.
- Extend 4th Street south to the new east-west minor arterial.
- Construct a new east-west collector from 16th Street at Madrona Street to 13th Street.
- Construct a new east-west collector from 13th Street to G Street.
- Construct a new north-south collector from F Street at 8th street to the new east-west collector.
- Construct a new east-west collector from 16th Street at Gwinn to the new east-west minor arterial.
- Construct a new east-west minor arterial from 16th Street at Ash Creek Drive to Corvallis Road.

Intersection Operations

The intersection operations analysis summarized in *Tech Memo #4: Future (No-build) Conditions*, identifies six intersections that are projected to exceed their applicable mobility standards or targets within the planning horizon. The queuing analysis identifies one additional intersection where vehicle queues are projected to exceed the striped storage. This section summarizes the alternatives considered for implementation to address intersection operations and queueing deficiencies at the study intersections. *Attachment A contains the intersection operations analysis worksheets*..

Intersection Treatments

The intersection treatments considered include geometric changes and changes to existing lane configurations and traffic control.

Turn Lane

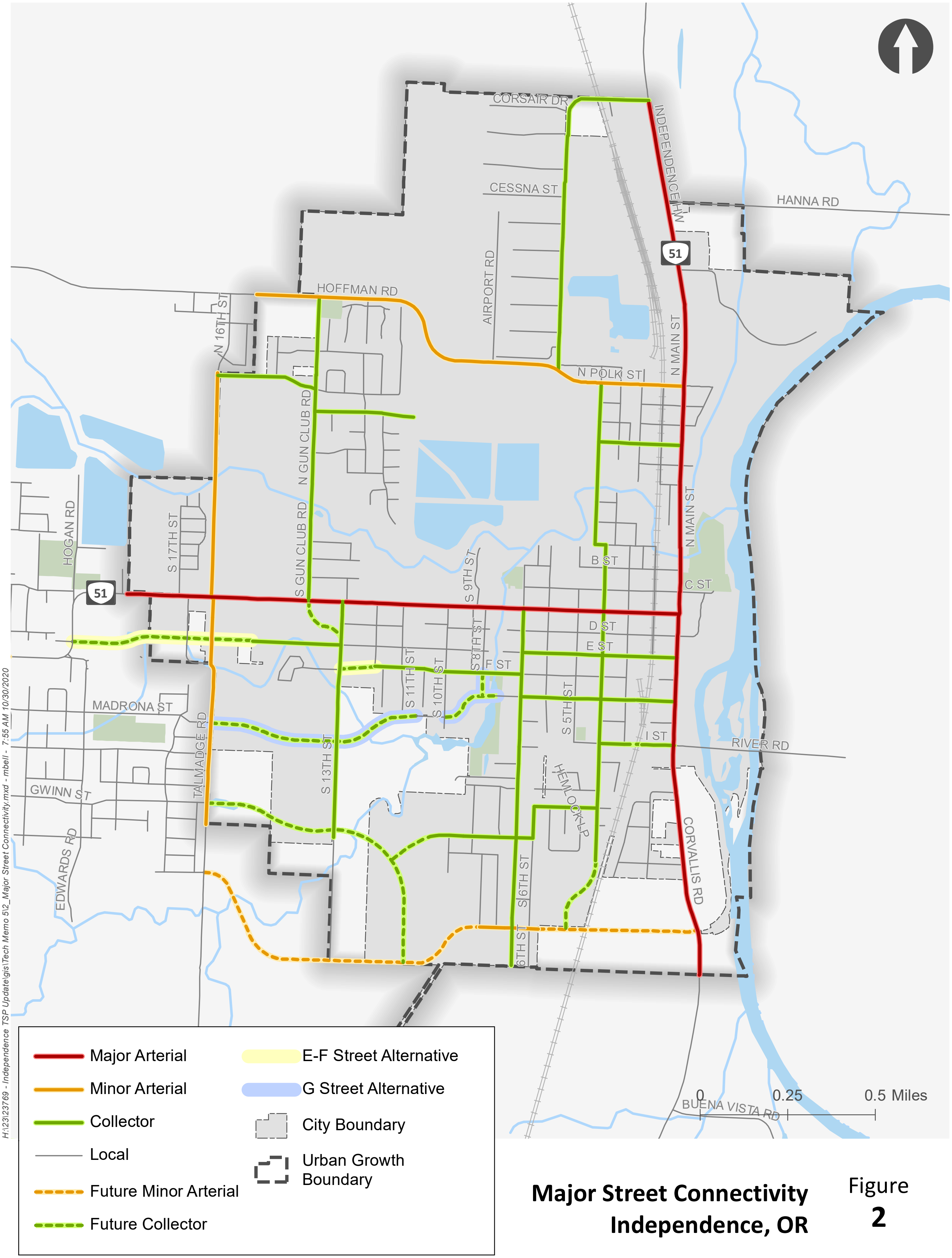
Separate left and right-turn lanes, as well as two-way left-turn lanes (TWLT), can provide significant increases in the capacity of intersections to accommodate turn movements. They can also provide a safety benefit by creating separation between slowed or stopped vehicles waiting to turn left and through vehicles. The design of turn lanes is largely determined based on a traffic study that identifies the need for the turn lane and the storage length needed to accommodate vehicle queues. Turn lanes are commonly used at intersections where the turning volumes warrant the need for separation.

Traffic Signal

Traffic signals allow opposing streams of traffic to proceed through an intersection in alternating patterns. When used, traffic signals can effectively manage high traffic volumes and provide dedicated times in which pedestrians and bicyclists can cross roadways. Because they continuously draw from a power source and must be periodically re-timed, signals typically have higher maintenance costs than other types of intersection control. Signals can also provide a safety benefit where signal warrants are met, however, they may result in an increase in rear-end crashes compared to other solutions. Signals have a significant range in costs depending on the number of approaches, how many through and turn lanes at each approach, and, if it is in an urban or rural area.

Signal Timing/Phasing Optimization

Signal timing/phasing optimization refers to updating signal timing/phasing plans to better match prevailing traffic conditions. Timing optimization can be applied to existing systems or may include



Major Street Connectivity
Independence, OR

Figure
2

Data Source: Polk County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 5\12_Major Street Connectivity.mxd - mbell - 7:55 AM 10/30/2020 upgrading signal technology, such as signal communication infrastructure, signal controllers, or cabinets. Signal timing/phasing optimization can reduce travel times and be especially beneficial to improving travel time reliability. In high pedestrian or desired pedestrian areas, signal retiming/phasing optimization can facilitate pedestrian movements through intersections by increasing minimum green times to give pedestrians time to cross during each cycle. Signals can also facilitate bicycle movements with the inclusion of bicycle detectors.

Signal upgrades often come at a higher cost than signal timing/phasing optimization and usually require further coordination between jurisdictions. However, upgrading signals provides the opportunity to incorporate advanced signal systems to further improve the efficiency of a transportation network. Strategies include coordinated signal operations across jurisdictions, centralized control of traffic signals, adaptive or active signal control, and transit or freight signal priority. These advanced signal systems can reduce delay, travel time and the number of stops for transit, freight, and other vehicles. In addition, these systems may help reduce vehicle emissions and improve travel time reliability.

Roundabout

Roundabouts are circular intersections where entering vehicles yield to vehicles already in the circle. They are designed to slow vehicle speeds to 20 to 30 mph or less before they enter the intersection, which promotes a more comfortable environment for pedestrians, bicyclists, and other non-motorized users. Roundabouts have fewer conflict-points and have been shown to reduce the severity of crashes, as compared to signalized intersections. Roundabouts can be more costly to design and install when compared to other intersection control types, but they have a lower operating and maintenance cost than traffic signals. Topography must be carefully evaluated in considering a roundabout, given that slope characteristics at an intersection may render a roundabout infeasible.

Intersection Alternatives

OR 51/Polk Street

The eastbound approach to the intersection is forecast to operate at LOS F and above capacity (v/c>1.0). This is primarily due to high through traffic on OR 51-Main Street and increases in turning movements to/from Polk Street. The intersection is not forecast to meet preliminary signal warrants. Therefore, the following alternatives are being considered at the intersection:

- Install a left-turn lane (LTL) at the eastbound approach – the eastbound left would continue to operate at LOS F and above capacity (v/c>1.0).
- Reconfigure OR 51-Main Street to provide a center two-way left-turn (TWLT) lane at the northbound and southbound approaches – operations could be further enhanced by a left-turn lane on Polk Street.
- Install a single-lane roundabout – this alternative could require additional right-of-way.

Alternative	CM	V/C	Delay	LOS	Mobility Standard/Target	Meets Standard/Target
LTL	EBL	1.04	160.0	F	v/c ≤ 0.95	No
TWLT	EB	0.76	45.7	E	v/c ≤ 0.95	Yes
TWLT & LTL	EBL	0.54	36.6	E	v/c ≤ 0.95	Yes
Roundabout	SB	0.56	9.6	A	v/c ≤ 0.95	Yes

Main Street/Monmouth Street

All approaches to the intersection are forecast to operate at LOS F and above capacity (v/c>1.0). This is primarily due to increased traffic volumes throughout the City. The intersection is not forecast to meet preliminary signal warrants; however, a sensitivity analysis indicates that the intersection meets preliminary signal warrants with an additional two percent increase in traffic volumes on OR 51-Monouth Street. Therefore, the following alternatives are being considered at the intersection.

- Install a separate northbound left-turn lane (LTL) and a separate southbound right-turn lane (RTL) with 100ft of storage – operations could be further enhanced by a separate eastbound right-turn lane – each of these alternatives would require restricting on-street parking for up to two blocks.
- Install an actuated-uncoordinated traffic signal when warrants are met – operations could be further enhanced with an eastbound right, southbound right, or northbound left-turn lane with 100ft of storage – each of these alternatives would require restricting on-street parking for up to two blocks.
- Reconfigure OR 51-Monmouth Street as one-way eastbound from 4th Street OR 51-Main Street and reconfigure C Street to one-way westbound from 2nd Street to 4th Street – assumes five percent of traffic will use D Street to travel west.
- Reconfigure OR 51-Monmouth Street as one-way eastbound from 2nd Street OR 51-Main Street – assumes five percent of traffic will use D Street to travel west.
- Install southern corridor – this alternative is expected to improve operations relative to future no-build conditions but is not summarized below.

Alternative	CM	V/C	Delay	LOS	Mobility Standard/Target	Meets Standard/Target
NB LTL & SB RTL	EB	0.96	57.7	F	v/c ≤ 1.0	Yes
NB LTL, SB RTL, EB RTL	NBL	0.64	23.5	C	v/c ≤ 1.0	Yes
Traffic Signal	-	1.20	89.7	F	v/c ≤ 1.0	No
Traffic Signal & EBR	-	0.91	27.5	C	v/c ≤ 1.0	Yes
Traffic Signal & SBR	-	1.06	45.5	D	v/c ≤ 1.0	No
Traffic Signal & NBL	-	0.77	39.7	D	v/c ≤ 1.0	Yes
Couplet	NB	0.99	63.0	F	v/c ≤ 1.0	Yes
Square-about	NB	0.99	63.0	E	v/c ≤ 1.0	Yes

OR 51-Monmouth Street/4th Street

The northbound and southbound approaches to the intersection are forecast to operate at LOS F and above capacity (v/c>1.0). This is primarily due to high through traffic along OR 51-Monmouth Street and increases in traffic volumes to/from the south. The intersection is not forecast to meet preliminary signal warrants. Therefore, the following alternatives are being considered at the intersection.

- Install a TWLT lane on OR 51-Monmouth Street from the Ash Creek Bridge to 4th Street and taper to two lanes east of 4th Street – the northbound approach would continue to operate at LOS F and above capacity (v/c>1.0).
- Install a TWLT on OR 51-monmouth Street as indicated above and a separate left-turn lane at the northbound approach with 100 ft of storage – this alternative could require additional right-of-way – the northbound approach would continue to operate at LOS F and above capacity (v/c>1.0).

- Restrict the eastbound left, westbound right, northbound through, and southbound through movements for motorists. This could reduce the potential for cut-through traffic along 4th Street and improve circulation near Independence Elementary School – Bicyclists could still complete the restricted movements.
- Install southern corridor – this alternative is expected to improve operations relative to future no-build conditions but is not summarized below.

Alternative	CM	V/C	Delay	LOS	Mobility Standard/Target	Meets Standard/Target
TWLT	NB	1.28	264.5	F	v/c ≤ 1.0	No
TWLT & NB LTL	NB	1.05	248.3	F	v/c ≤ 1.0	No
Movement Restrictions	NB	0.93	161.9	F	v/c ≤ 1.0	Yes

OR 51-Monmouth Street/7th Street

The northbound approach to the intersection is forecast to operate at LOS F and above capacity (v/c>1.0). This is primarily due to high through traffic along OR 51-Monmouth Street and increases in traffic volumes to/from the south. The intersection is not forecast to meet preliminary signal warrants; however, a sensitivity analysis indicates that the intersection meets preliminary signal warrants with an additional two percent increase in traffic volumes on OR 51-Monouth Street. Therefore, the following alternatives are being considered at the intersection.

- Install a TWLT lane on OR 51-Monmouth Street from the Ash Creek Bridge to 4th Street and taper to two lanes east of 4th Street.
- Install a TWLT on OR 51-monmouth Street as indicated above and a separate northbound left-turn lane with 100 ft of storage – this alternative could require additional right-of-way.
- Install an actuated-uncoordinated traffic signal with separate eastbound and westbound left-turn lanes with 100 ft of storage when warrants are met.
- Install a single lane roundabout.
- Install southern corridor – this alternative is expected to improve operations relative to future no-build conditions but is not summarized below.

Alternative	CM	V/C	Delay	LOS	Mobility Standard/Target	Meets Standard/Target
TWLT	NB	0.80	57.1	F	v/c ≤ 0.95	Yes
TWLT & NB LTL	NBL	0.51	44.9	EF	v/c ≤ 0.95	Yes
Traffic Signal	NA	0.87	12.1	B	v/c ≤ 0.95	Yes
Roundabout	WB	0.76	15.4	C	v/c ≤ 0.95	Yes

Main Street/River Road

The westbound approach to the intersection is forecast to operate at LOS F and above capacity (v/c>1.0). This is primarily due to increased traffic volumes on the westbound and southbound approaches from vehicles entering and exiting the city. The intersection is not forecast to meet preliminary signal warrants. Therefore, the following alternatives are being considered at the intersection.

- Install a westbound left-turn lane (LTL) with 100 ft of storage – this alternative would require widening the bridge and is less viable with the southern corridor.

- Reconfigure the intersection with all-way stop-control (AWSC), install a westbound right-turn lane (RTL) with 100 ft of storage and a southbound left-turn lane (LTL) with 100 ft of storage – this alternative would require widening the bridge.
- Reconfigure the intersection with all-way stop-control (AWSC) as indicated above and allow the westbound right and southbound left/through/right to operate free – this alternative cannot be modeled in Synchro.
- Install a single-lane roundabout – this alternative could require additional right-of-way.

Alternative	CM	V/C	Delay	LOS	Mobility Standard/Target	Meets Standard/Target
WB LTL	WBL	0.66	65.4	F	v/c ≤ 0.80	Yes
RTL	WBL	0.72	72.4	F	v/c ≤ 0.80	Yes
AWSC, RTL, & LTL	WBR	0.79	30.4	D	v/c ≤ 0.80	Yes
Roundabout	WB	0.54	10.3	B	v/c ≤ 0.80	Yes

OR 51-Monmouth Street/Gun Club Road

The intersection is forecast to operate at LOS C and below capacity (v/c = 0.97); however, it is forecast to exceed its applicable mobility standard. This is primarily due to growth in through traffic along OR 51-Monmouth Street and traffic to/from Gun Club Road. The southbound left-turn queue is also forecast to exceed the striped storage available for the movement. Therefore, the following alternatives are being considered at the intersection:

- Optimize the signal timing/phasing to provide more green time to the southbound left-turn movement – this would impact other movements at the intersection, including those along OR 51-Monmouth Street.
- Extend the southbound left-turn storage – this would further impact the on-street bike lane on the west side of the road; however, the City could install a shared bike lane/right-turn lane to accommodate bicyclists.

ACCESS MANAGEMENT AND SPACING

The term "access management" is commonly used to describe the practice of managing the number, placement, and movements of intersections and driveways that provide access to adjacent land uses. Access management policies can be an important tool to improve transportation system efficiency by limiting the number of opportunities for turning movements on to or off of certain streets. In addition, well deployed access management strategies can help manage travel demand by improving travel conditions for pedestrian and bicycles. Eliminating the number of access points on roadways allows for continuous sidewalk and bicycle facilities and reduces the number of potential interruptions and conflict points between pedestrians, bicyclists, and cars. Access management is typically adopted as a policy in development guidelines. It can be extremely difficult to implement an access management program once properties have been developed along a corridor. Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary to establish an access management plan that benefits all roadway users and businesses.

Access Management Alternatives

The TSP should identify access management techniques and strategies that help to preserve transportation system investments and guard against deteriorations in safety and increased congestion. The City's approach to access management should balance the need for land use activities and property parcels to be served with appropriate access while preserving safe and efficient movement of traffic. Access management alternatives include:

- Update the city-wide access spacing standards to reflect conditions in the city;
- Defining a variance process for when the standard cannot be met, and;
- Establishing an approach for access consolidation over time to move in the direction of the standards at each opportunity.

Access Spacing Standards

As indicated in *Tech Memo 3B: Existing Conditions Analysis*, ODOT and the City have adopted access spacing standards for study area roadways. ODOT's access spacing standards are defined in Oregon Administrative Rule (OAR) 734 Division 51 and apply to access points along OR 51-Main Street and OR 51-Monmouth Street. The City's access spacing standards are defined in the current TSP. Table 1 summarizes the City's access spacing standards.

Table 1: City Access Spacing Standards

Functional Classification	Minimum Posted Speed	Minimum Spacing Between Driveways	Spacing Between Intersections
Major Arterial	35 – 50 MPH	250 feet	1,320 feet
Minor Arterial	35 – 50 MPH	250 feet	250 feet
Major Collector	25 – 40 MPH	100-150 feet	250 feet
Collector	25 – 40 MPH	100-150 feet	250 feet

As shown in Table 1, the City's access spacing standards are currently determined by functional classification and posted speed and apply to driveways and intersections. The standards could be updated to remove the major collector designation under functional classification and the minimum posted speed criteria – there are no major collectors in the city and many of the posted speeds are outside of the ranges shown). The standards could also be refined to reflect conditions in the City – most intersections are currently spaced at about 350-feet. Table 2 summarizes potential modifications to the City's access spacing standards.

Table 2: City Access Spacing Standards

Functional Classification	Minimum Intersection Spacing	Minimum Driveway Spacing
Major Arterial	350	175
Minor Arterial	350	175
Collector	350	100
Local Street	350	50

Access Spacing Variances

Access spacing variances may be provided to parcels whose highway/street frontage, topography, or location would otherwise preclude issuance of a conforming permit and would either have no reasonable access or cannot obtain reasonable alternate access to the public road system. In such a situation, a conditional access permit may be issued by ODOT or the City, as appropriate, for a connection to a property that cannot be accessed in a manner that is consistent with the spacing standards. The permit can carry a condition that the access may be closed at such time that reasonable access becomes available to a local public street. The approval condition might also require a given land owner to work in cooperation with adjacent land owners to provide either joint access points, front and rear cross-over easements, or a rear access upon future redevelopment.

The requirements for obtaining a deviation from ODOT's minimum spacing standards are documented in OAR 734-051-3050. For streets under the City's jurisdiction, the City may reduce the access spacing standards at the discretion of the City Engineer if the following conditions exist:

- Joint access driveways and cross access easements are provided consistent with the standards;
- The site plan incorporates a unified access and circulation system consistent with the standards;
- The property owner enters into an agreement with the City that pre-existing connections on the site will be closed and eliminated after construction of each side of the joint use driveway; and/or,
- The proposed access plan for redevelopment properties moves in the direction of the standards.

The City Engineer may modify or waive the access spacing standards for streets under the City's jurisdiction where the physical site characteristics or layout of abutting properties would make development of a unified or shared access and circulation system impractical, subject to the following considerations:

- Unless modified, application of the access standard will result in the degradation of operational and safety integrity of the transportation system.
- The granting of the variance shall meet the purpose and intent of these standards and shall not be considered until every feasible option for meeting access standards is explored.
- Applicants for variance from these standards must provide proof of unique or special conditions that make strict application of the standards impractical. Applicants shall include proof that:
    - Indirect or restricted access cannot be obtained;
    - No engineering or construction solutions can be applied to mitigate the condition; and,
    - No alternative access is available from a road with a lower functional classification than the primary roadway.

No variance shall be granted where such hardship is self-created. Consistency between access spacing requirements and exceptions in the TSP and the municipal code is an important regulatory solution to be addressed as part of this TSP update.

Access Consolidation

From an operational perspective, access management measures limit the number of redundant access points along roadways. This enhances roadway capacity, improves safety, and benefits circulation. Enforcement of the access spacing standards should be complemented with provision of alternative access points. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously affect the viability of the impacted properties. Thus, if an access management approach is taken, alternative access should be developed to avoid "land-locking" a given property.

As part of every land use action, the City should evaluate the potential need for conditioning a given development proposal with the following items in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

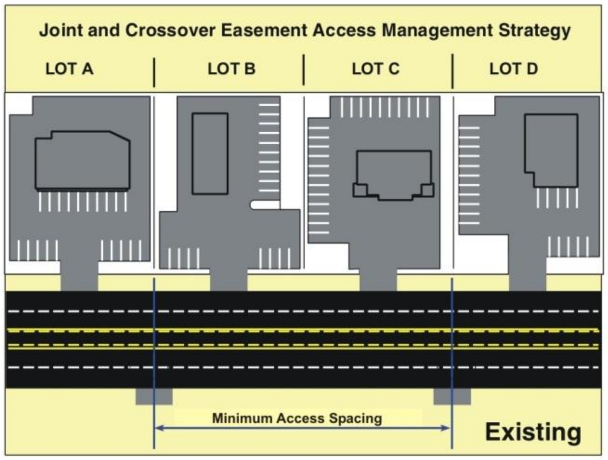
- Providing access only to the lower classification roadway when multiple roadways abut the site.
- Provision of crossover easements on all compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.
- Issuance of conditional access permits to developments having proposed access points that do not meet the designated access spacing policy and/or can align with opposing driveways.
- Right-of-way dedications to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) along site frontages that do not have full build-out improvements in place at the time of development.

Exhibit 3 illustrates the application of cross-over easements and conditional access permits over time to achieve access management objectives. The individual steps are described in Table 3. As illustrated in the exhibit and supporting table, by using these guidelines, all driveways along the highways/streets can eventually move in the overall direction of the access spacing standards as development and redevelopment occur.

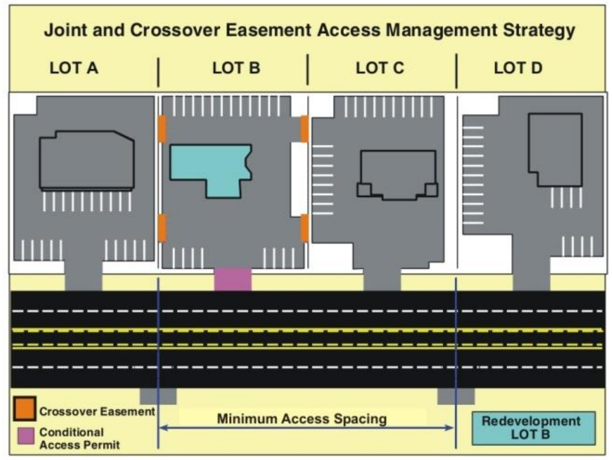
Table 3: Example of Crossover Easement/Indenture/Consolidation

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria of 500 feet nor align with driveways or access points on the opposite side of the highway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the highway
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City would issue conditional permits for the development to provide crossover easements with Lots A and C, and ODOT/City would grant a conditional access permit to the lot. After evaluating the land use action, ODOT/City would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of highway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City/ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario ODOT and the City would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. ODOT/City would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the highway, but will also eliminate the conflicting left-turn movements the highway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City and ODOT will be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

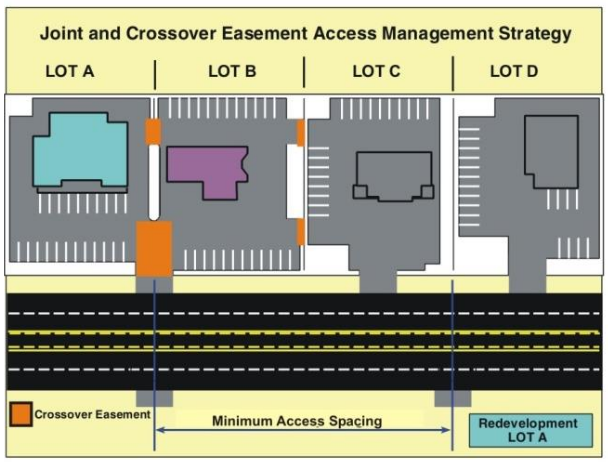
Exhibit 3: Cross Over Easement



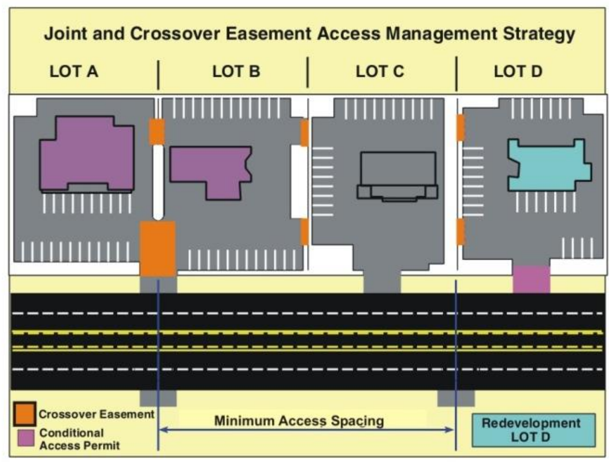
Step 1



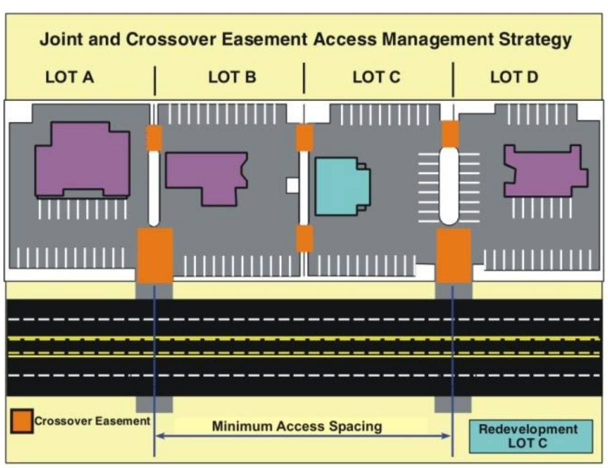
Step 2



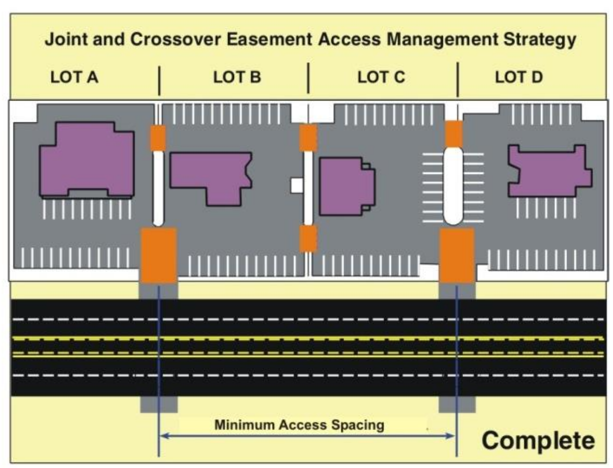
Step 3



Step 4



Step 5



Step 6

PEDESTRIAN CONNECTIVITY

This section provides an overview of pedestrian facilities that could be implemented within Independence to improve access and circulation for pedestrians. This section also identifies the pedestrian alternatives developed to address gaps and deficiencies in pedestrian connectivity along arterial and collector streets.

Pedestrian Facilities

Pedestrian facilities are the elements of the transportation system that enable people to walk and roll safely and efficiently between residential neighborhoods and schools, parks, retail/commercial centers, employment areas, and transit stops. These include facilities for pedestrian movement along roadways (e.g., sidewalks, shared-use paths, and trails) and for safe roadway crossings (e.g., crosswalks, flashing beacons, pedestrian refuge islands). Each facility plays an important role in developing a comprehensive pedestrian system.

Sidewalks

Sidewalks are the primary building block of the pedestrian system. They provide an important means of mobility for walkers as well as people with disabilities, families with strollers, and others who may not be able to travel on an unimproved surface. Sidewalks are usually 6-feet wide and constructed from concrete. They are also frequently separated from the roadway by planting strips, on-street parking, and/or on-street bike lanes or other bike facilities (see below). Sidewalks are widely used in urban and suburban areas. Ideally, sidewalks could be provided on both sides of the roadway; however, some areas with physical or right-of-way constraints may require that a sidewalk be located on only one side.

The City's street design standards currently require 6-foot sidewalks on both sides of all arterial, collector, and local streets. The standards also require 6-foot planting strips on arterials, 5-foot planting strips on collectors, and encourages 4-foot planting strips on local streets. ODOT's Highway Design Manual (HDM) also requires 6-foot sidewalks on both sides of all streets and 10-foot sidewalks in special transportation areas (STA), such as downtown Independence. The recently adopted Blueprint for Urban Design (BUD) provides additional guidance on how to determine the most appropriate sidewalk width and configuration that reflects the context of the area and the physical and operational characteristics of the roadway. When applied, these standards can provide comfortable pedestrian facilities for most pedestrians along City and ODOT roadways.

Crosswalks

Crosswalks enable people to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate crosswalks requires the community to balance vehicular mobility needs with providing crossing locations along the desired routes of pedestrians. Enhanced crosswalk treatments include geometric features such as curb extensions and raised median islands with pedestrian refuges as well as signing and striping, flashing beacons, signals, countdown heads, and leading pedestrian intervals. Many of these treatments can be applied simultaneously to further alert drivers of the presence of pedestrians in the roadway. *Attachment B contains a description of several enhanced crosswalk treatments.*

ODOT provides guidance on the types of enhanced crosswalk treatments that can be applied along ODOT facilities. Additional guidance is available from the Federal Highway Administration (FHWA) and the National Cooperative Highway Research Program (NCHRP). The guidance generally considers the physical and operational characteristics of roadways at the crosswalk location, including number of lanes, traffic volumes, travel speeds, and (in some cases) pedestrian activity. With this information, the City or ODOT can determine the most appropriate treatment for a given crossing; however, this is not typically done as part of a TSP.

Shared-use Paths and Trails

Shared-use paths and trails are improved (i.e. paved) and unimproved (i.e. dirt and gravel) facilities that serve pedestrians and bicyclists. Shared-use paths and trails can be constructed adjacent to roadways where topography, right-of-way, or other issues preclude construction of sidewalks and bike facilities. A minimum width of 10 feet is recommended in areas with low levels of pedestrian/bicycle traffic (8-feet in constrained areas); 12 feet should be considered in areas with moderate to high levels of pedestrian/bicycle traffic. Shared-use paths and trails can be used to create long distance links within and between communities and provide regional connections. They play an integral role in recreation, commuting, and accessibility due to their appeal to users of all ages and skill levels.

Pedestrian Amenities

In addition to pedestrian facilities focused on throughput and movements, there are pedestrian amenities that can be provided to enhance the user experience. Street furniture, such as benches and garbage cans, can be provided in the public right-of-way in support of pedestrian and bike trips. In addition, amenities including street patios or parklets utilize space between the curbs that might have been previously used for another purpose such as parking.

Pedestrian Alternatives

The pedestrian alternatives summarized below are intended to enhance the existing pedestrian system as well as address gaps and deficiencies in pedestrian connectivity. Figure 3 illustrates the pedestrian gaps and deficiencies addressed by the alternatives described below.

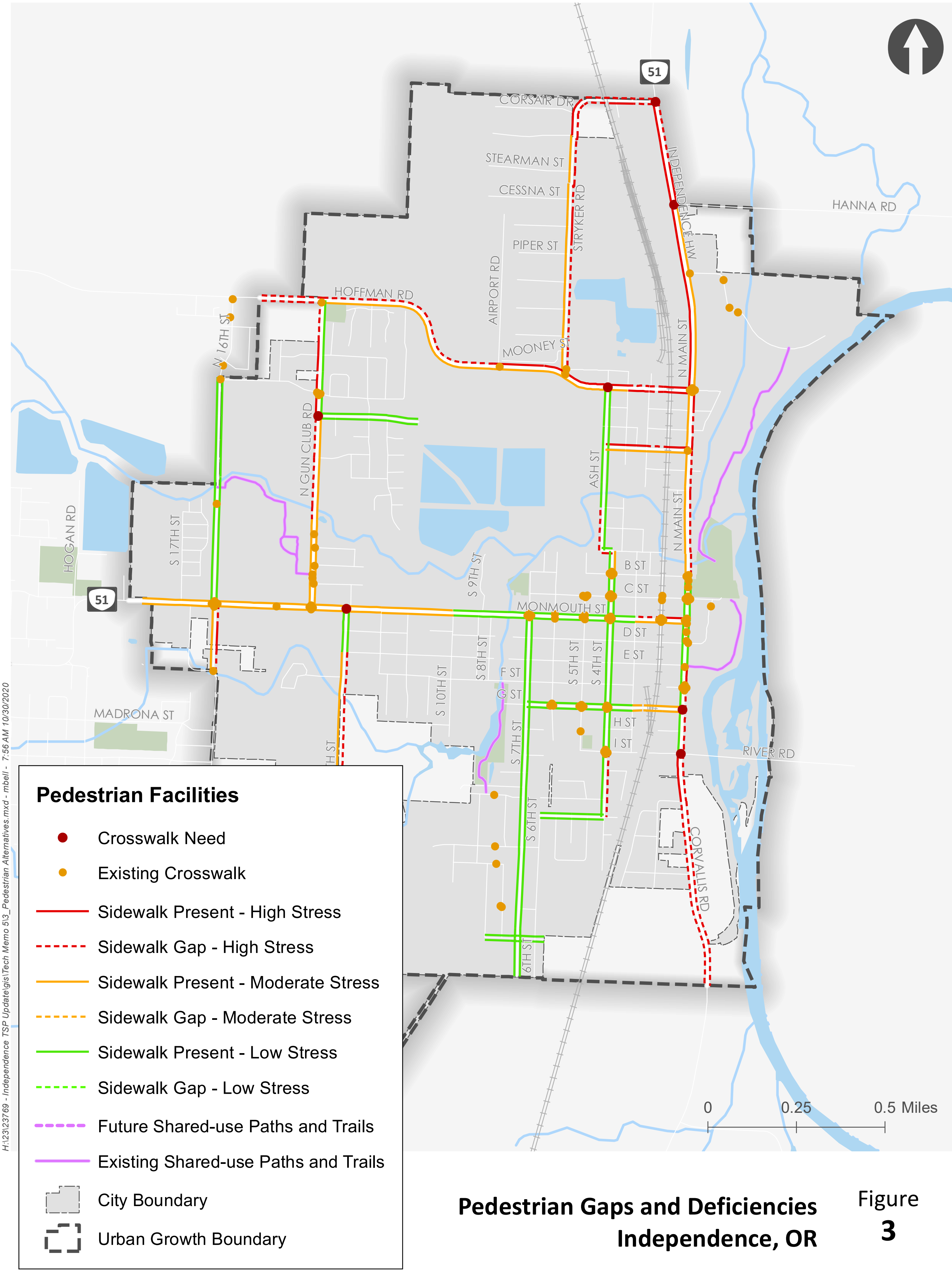
OR 51-Main Street

There are continuous sidewalks on the west side of OR 51-Main Street from Stryker Road to OR 51-Monmouth Street and gaps on the east side from Stryker Road to Hanna Road and from Polk Street to B Street. There are also several crosswalks at major intersections. The pedestrian level of traffic stress (PLTS) analysis indicates that the sidewalks north of B Street and the areas with sidewalk gaps may NOT be suitable for most pedestrians. This is primarily due to sidewalk gaps, lack of a buffer, limited street lighting, and relatively high travel speeds in some areas. Therefore, the alternatives include:

- Fill in the gaps on the east side of the roadway with new sidewalks
- Reconstruct the sidewalks following ODOT guidelines for low stress facilities
- Provide enhanced pedestrian crossing treatments at major crossing locations
- Consider opportunities for street patios, street furniture, and other amenities in the downtown area

OR 51-Monmouth Street

There are continuous sidewalks on both sides of OR 51-Monmouth Street from the west city limits to OR 51-Main Street, except for a gap on the north side from 3rd Street to 2nd Street. There are also several crosswalks at major intersections. The PLTS analysis indicates that the sidewalks from the west city limits to 10th Street and from 3rd Street to OR 51-Main Street, which includes the gap, may NOT be suitable for most pedestrians. This is primarily due to the lack of a buffer and relatively high travel speeds in some areas. Therefore, the alternatives include:



Pedestrian Gaps and Deficiencies
Independence, OR

Figure
3

Data Source: Polk County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 5\13_Pedestrian Alternatives.mxd - mbell - 7:56 AM 10/30/2020

- Fill in the gap on the north side of the roadway with new sidewalks
- Reconstruct the sidewalks following ODOT guidelines for low stress facilities
  - Install 6-foot buffered sidewalks from the west city limits to 4th Street
  - Install 8-foot buffered sidewalks or 10-foot curb tight sidewalks from 4th Street to OR 51-Main Street
- Provide enhanced pedestrian crossing treatments at major crossing locations
- Consider opportunities for street patios, street furniture, and other amenities in the downtown area

Corvallis Road

There are continuous sidewalks on the west side of the roadway from OR 51-Monmouth Street to the south city limits and gaps on the east side from E Street to River Road and the south city limits. There are also several crosswalks at major intersections. The PLTS analysis indicates that the areas without sidewalks may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gap on the east side of the roadway with new sidewalks
- Provide enhanced pedestrian crossing treatments at major crossing locations

Hoffman Road/Polk Street

There are continuous sidewalks on the south side of the roadway from the west city limits to OR 51-Main Street, except for a small gap from Log Cabin Street to Marsh Street, and there are several gaps on the north side of the roadway. There are also several crosswalks at major intersections. The PLTS analysis indicates that the existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on the north and south side of the roadway with new sidewalks
- Reconstruct the sidewalks consistent per City standards as part of future development/ redevelopment projects
- Provide enhanced pedestrian crossing treatments at major crossing locations, such as the north leg of the Stryker Road/Hoffman Road intersection

Gun Club Road

There are continuous sidewalks on the east side of the roadway from Hoffman Road to OR 51-Monmouth Street and gaps on the west side of the roadway from Picture Street to the high school property. There are also several crosswalks at major intersections, particularly adjacent to the high school. The PLTS analysis indicates that existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on west side of the roadway with new sidewalks
- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects
- Provide enhanced pedestrian crossing treatments at major crossing locations

Stryker Road

There are gaps on both sides of the road from Hoffman Road to OR 51-Main Street. The PLTS analysis indicates that existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on both sides of the roadway with new sidewalks
- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects
- Provide enhanced pedestrian crossing treatments across the rail line

Ash Street/4th Street

There are continuous sidewalks on both sides of the roadway from Polk Street to OR 51-Monmouth Street, except for a gap from Albert Street to A Street. There are also several crosswalks at major intersections. The PLTS analysis indicates that areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on west side of the roadway with new sidewalks

16th Street

There are continuous sidewalks on the west side of the roadway from OR 51-Monmouth Street to the south city limits and gaps on the east side. The PLTS analysis indicates that the existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on the east side of the roadway with new sidewalks
- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects

13th Street

There are continuous sidewalks on the west side of the roadway from OR 51-Monmouth Street to the south city limits and gaps on the east side of the roadway. The PLTS analysis indicates that the existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on the east side of the roadway with new sidewalks
- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects

4th Street

There are continuous sidewalks on both sides of the roadway from OR 51-Monmouth Street to I Street and on the west side I street to the south terminus. There are also several crosswalks at major intersections. The PLTS analysis indicates that the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on the east side of the roadway with new sidewalks

Williams Street

There are continuous sidewalks on both sides of the roadway from Ash Street to OR 51-Main Street, except for a gap on the north side from Log Cabin Street to Marsh Street. The PLTS analysis indicates that the existing sidewalks and the areas with sidewalk gaps may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Fill in the gaps on the north side of the roadway with new sidewalks
- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects

G Street

There are continuous sidewalks on both sides of the roadway from 7th Street to Corvallis Road. There are also several crosswalks at major intersections. The PLTS analysis indicates that some of the existing sidewalks may NOT be suitable for most pedestrians. Therefore, the alternatives include:

- Reconstruct the sidewalks consistent with City standards as part of future development/ redevelopment projects.

Shared-use Paths/Trails

The Independence Parks and Open Space Master Plan identifies the following shared-use path/trail connections. These connections were determined based on a comprehensive review of potential connections within the City.

- North South Connector Trail #1 – south of Hoffman Road to Wildfang Park.
- North South Connector Trail #2 – north from OR 51-Monmouth Street to Wildfang Park
- Ash Creek Trail Phase I – east/west trail connection from Riverview Park to Wildfang Park
- Mt. Fir North-South Trail – north/south trail from F Street to Mt. Fir Park and south across Becken Road – this connection may include some on-street segments
- Mt. Fir Connector Trail – east/west connection from Mt. Fir Street to Corvallis Road
- River Trail – north/south trail along Willamette Riverfront
- Going to the River Trail – east/west connection from Williams Street to Howard Court – this connection may include some on-street segments
- Central High School (HS) Connector Trail – north/south connection from Central High School to neighborhoods south of OR 51-Monmouth Street

The following shared-use path/trail connections were idented in the SW Independence Concept Plan:

- South Fork Trail – two north/south connections on the east/west sides of the South Fork Ash Creek
- Drainage Trail – an east/west connection from 13th Street to the South Fork Trails

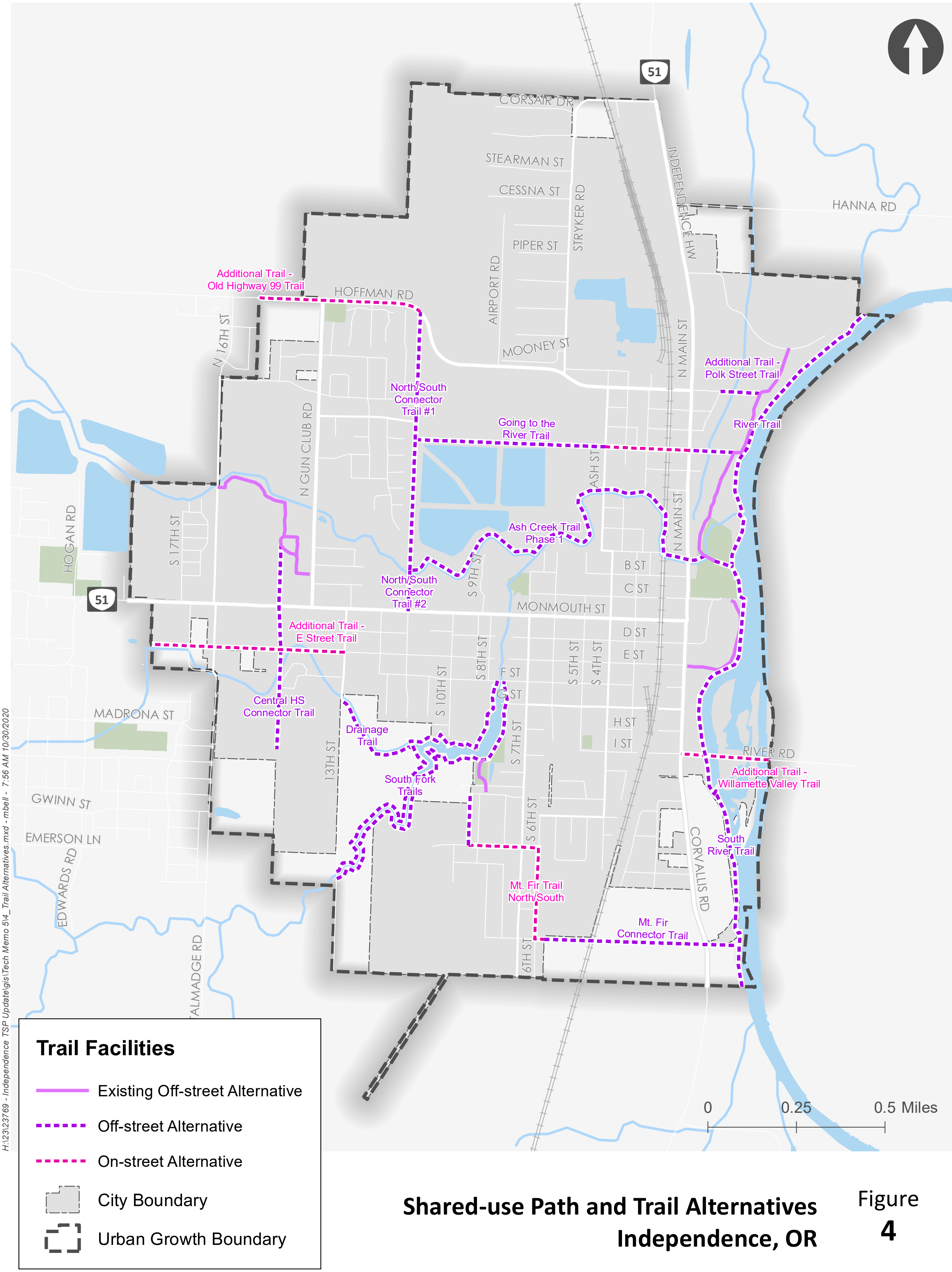
The following shared-use path/trail connections were identified throughout the planning process:

- Old Highway 99 Trail – an east/west connection to the existing shared-use path along OR 99 – this connection may include some on-street segments.
- Willamette Valley Trail – an east/west connection to the Willamette Valley Scenic Bikeway – this connection may include some on-street segments.
- Polk Street Trail – an east/west connection from the eastern terminus of Polk Street to the River Trail
- E Street Trail – an east/west connection from 13th Street at E Street to OR 51-Monmouth Street – this connection may include some on-street segments.

Figure 4 illustrates the location of the share-use path/trail connections.

BICYCLE CONNECTIVITY

This section provides an overview of bicycle facilities that could be implemented within Independence to improve access and circulation for bicyclists. This section also identifies the bicycle alternatives developed to address gaps and deficiencies in bicycle connectivity along arterial and collector streets.



Shared-use Path and Trail Alternatives
Independence, OR

Figure
4

Data Source: Polk County Data Portal, ODOT

Bicycle Facilities

Bicycle facilities are the elements of the transportation system that enable people to travel safely and efficiently between residential neighborhoods and destinations in the city and the surrounding area by bike. These include facilities for bicycle movement along key roadways (e.g. shared lane pavement markings, on-street bike lanes, buffered bike lanes, and separated bike lanes) and facilities at key crossing locations (e.g., enhanced bike crossings). These also include end of trip facilities (e.g. bike parking, bike hubs, tune-up stations, changing rooms, and showers at worksites); however, most of these facilities are addressed through the development code. Each facility plays an important role in developing a comprehensive bicycle system.

Low-Traffic Bikeway

Low-traffic bikeways, also known as "bicycle boulevards," are streets with low vehicular volumes and speeds that can be optimized for bicycle travel by including treatments for traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments. Bike boulevards are ideal on local streets that parallel larger, high traffic routes and provide connections to similar destinations.

Shared Lane Pavement Markings

Shared lane pavement markings (often called "sharrows") are used to indicate a shared space for cyclists and motorists and are typically centered in the roadway, or approximately four feet from the edge of the travel lane, and spaced approximately 50 to 250-feet apart depending on the traffic volumes and travel speeds. Sharrows are suitable on roadways with relatively low traffic volumes (<2,500 Average Daily Traffic [ADT]) and low travel speeds (<25 MPH); however, they may also be used to transition between discontinuous bicycle facilities along roadways with higher volumes and speeds.

On-Street Bike Lanes

On-street bike lanes provide a dedicated space for the exclusive use of cyclists on the roadway surface. They are usually 5 to 6-feet wide and include an 8-inch stripe along the roadway and bike symbols at intersections; they may also include a buffer as indicated below. On-street bike lanes are typically placed at the outer edge of the roadway surface but to the inside of right-turn lanes and/or on-street parking. On-street bike lanes can improve safety and security of cyclists and (if comprehensive) can provide direct connections between origins and destinations.

The City's street design standards currently require 6-foot bike lanes on both sides of arterial streets and define a two-phase process for implementing 6-foot bike lanes on collector streets:

- Collectors with < 2,000 ADT can accommodate on-street parking and shared use of road space by bicyclists and motor vehicles.
- For collectors with > 2,000 ADT, the City will study the need to eliminate on-street parking and provide bike lanes.

ODOT's HDM also requires 6-foot bike lanes on both sides of all state highways in urban areas; however, it provides exceptions in designated STAs, such as downtown Independence. The recently adopted BUD provides additional guidance on how to determine the most appropriate bicycle facility and configuration that reflects the context of the area and the physical and operational characteristics of the roadway. When applied, these standards can provide a comfortable environment for most bicyclists along City and ODOT roadways.

Buffered Bike Lanes

Buffered bike lanes are enhanced versions of conventional on-street bike lanes that include an additional striped buffer of typically 2-3 feet between the bike lane and the vehicle travel lane and/or between the bike lane and the vehicle parking lane. They are typically located along streets that require a higher level of separation to improve the comfort of bicycling.

Separated Bike Lanes

Separated bike lanes (often called "cycle tracks") are bike lanes that are physically separated from motor vehicle traffic by a vertical element such as a planter, flexible post, parked car, or a mountable curb. One-way separated bike lanes are typically found on each side of the street, like conventional bike lanes, while two-way separated bike lanes are typically found on one side of the street.

Bicycle Crossings

Bicycle crossings enable cyclists to travel safely through intersections and across streets, railroad tracks, and other transportation facilities. Planning for appropriate bicycle crossings requires the community to balance vehicular mobility needs with providing crossing locations along the desired routes of cyclists. Enhanced bicycle crossing treatments include pavement markings through conflict areas, bike boxes, two-stage left-turn bike boxes, bike only signals, and bicycle detection

Wayfinding Signs

Wayfinding signs are physical signs or travel lane markings located along roadways or at intersections that direct cyclists between destinations along low-stress and comfortable bicycle routes. Wayfinding signs help inexperienced and/or less confident cyclists overcome perceived barriers by identifying lower speed and lower volume routes that do not require a bicycle facility. They typically include distances and average walk/cycle times. Wayfinding signs are generally used along bicycle routes and shared-use paths.

Bicycle Parking

Bicycle parking is a vital component of a city's bicycle system and can be provided in a variety of sizes, shapes, and unique pieces of infrastructure that resemble the city's character. Bicycle parking can generally be categorized into two types: short-term and long-term.

- **Short-term bicycle parking** is designed to meet the needs of cyclists visiting businesses, institutions, and other destinations where visits typically last up to two hours. Short-term bicycle parking must be readily accessible, visible, and self-explanatory.
- **Long-term bicycle parking** places an emphasis on security and weather protection and is designed to meet the needs of cyclists who may leave their bicycle unattended for several hours or more. Long-term bicycle parking is typically located at residences or apartment buildings, workplaces, transit centers, and other routinely visited destinations.

Bike Corral

This treatment coverts vehicle parallel parking stalls into bicycle parking. These facilities can be installed on segments or near intersections. If installed near an intersection, it can be an effective alternative to vehicle parking which can cause sight distance hazards. Bike corrals are often designed to hold approximately 12-24 bikes and have been shown to have a positive impact on business.

Bike Sharing

Bicycle sharing has been growing rapidly in recent years along with the overall trend of micro mobility. Bike sharing in particular can be a key component in the public transit system while utilizing the bicycle infrastructure of the city. The strategic location of stations can highlight key destinations around the city and be an important asset to tourists and visitors seeking to experience the city without using a vehicle.

Bicycle Alternatives

The bicycle alternatives were developed to enhance the existing bicycle system as well as address gaps and deficiencies in bicycle connectivity. Figure 5 illustrates the bicycle gaps and deficiencies addressed by the alternatives described below.

OR 51-Main Street

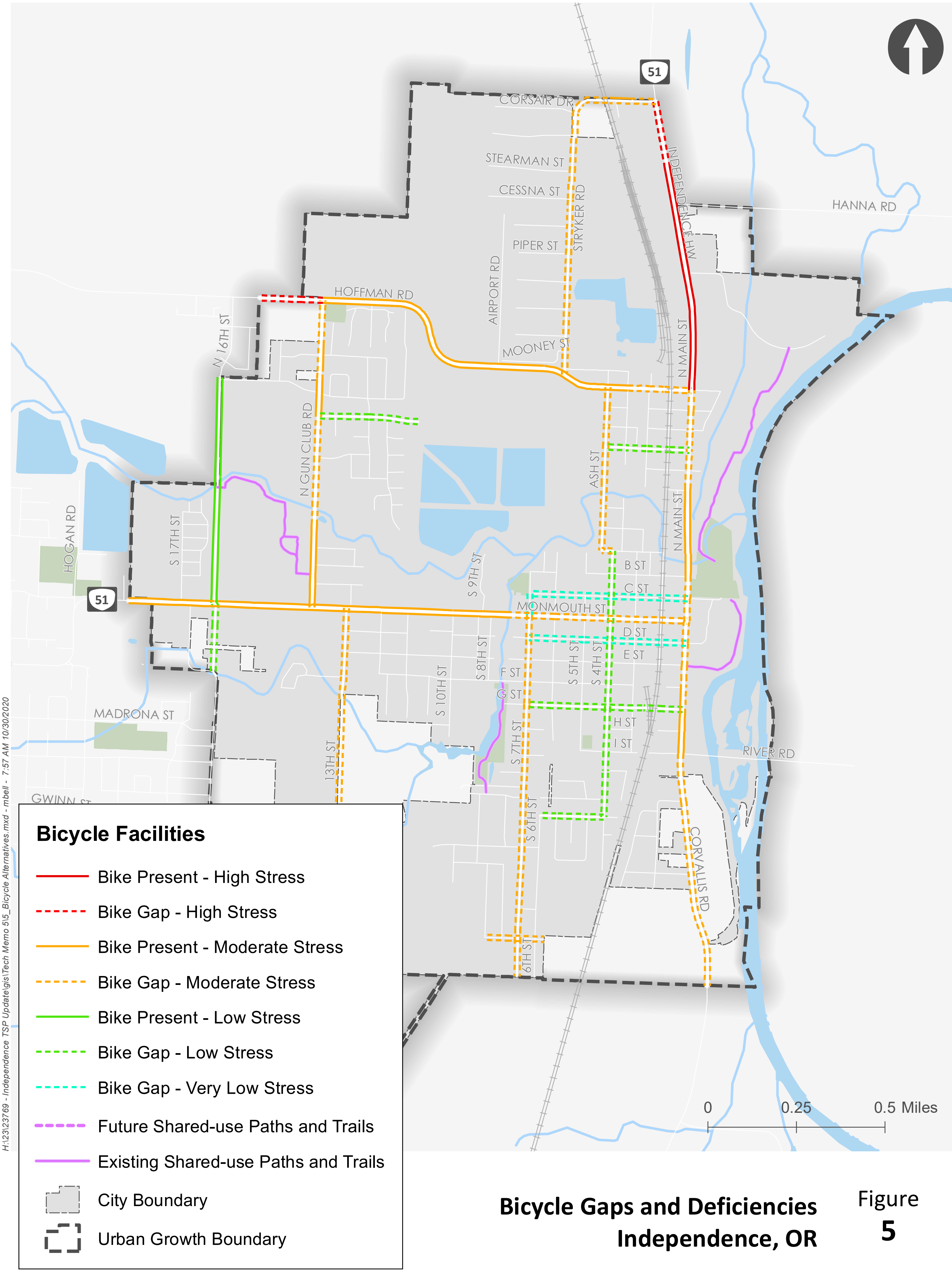
There are bike lanes on both sides of the OR 51-Main Street from Stryker Road to Polk Street and shoulder bikeways on both sides from Oak Street to B Street. The bicycle level of traffic stress (BLTS) analysis indicates that the segments with bike lanes, shoulder bikeways, and gaps located north of B Street may NOT be suitable for most bicyclists. This is primarily due to limited to no bicycle facilities and relatively high travel speeds in some areas. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roadway from Stryker Road to B Street consistent with ODOT standards
- Install 7-foot buffered bike lanes on both sides of the roadway from Stryker Road to B Street (5-foot bike lane, 2-foot buffer) consistent with the BUD
- Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway from Stryker Road to B Street
- Install shared lane pavement markings (Sharrows) on both sides of the roadway from B Street to OR 51-Monmouth Street
- Install a bike corral on OR 51-Main Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection

OR 51-Monmouth Street

There are bike lanes on both sides of the OR 51-Monmouth Street from the west City limits to the Ash Creek bridge and no bike lanes from the Ash Creek Bridge to OR 51-Main Street. The BLTS analysis indicates that the segments with and without bike lanes are suitable for most bicyclists. This is primarily due to relatively low travel speeds in areas with bike lanes and low travel speeds in areas without bike lanes. Despite the analysis results, anecdotal information indicates that the existing facilities are not comfortable for most bicyclists. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roadway from the west city limits to 4th Street consistent with ODOT standards
- Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to 4th Street (5-foot bike lane, 2-foot buffer)
- Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway from the west city limits to 4th Street
- Install shared lane pavement markings (sharrows) on both sides of the roadway from 4th Street to OR 51-Main Street
- Install a bike corral on OR 51-Monmouth Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection



Bicycle Gaps and Deficiencies
Independence, OR

Figure
5

Data Source: Polk County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 515_Bicycle Alternatives.mxd - mbell - 7:57 AM 10/30/2020

Corvallis Road

There are shoulder bikeways on the east side of the road from E Street to G Street and on both sides of the roadway from G Street to River Road. The BLTS analysis indicates that the segments with and without shoulder bikeways located south of E Street are NOT suitable for most bicyclists. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roadway from D Street to the south city limits consistent with City standards
- Install 7-foot buffered bike lanes on both sides of the roadway from D Street to the south city limits (5-foot bike lane, 2-foot buffer)
- Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway from D Street to the south city limits
- Install shared lane pavement markings (Sharrows) on both sides of the roadway from OR 51-Main Street to D Street
- Install a bike corral on OR 51-Main Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection

Hoffman Road/Polk Street

There are bike lanes on both sides of the road from Gun Club Road to Ash Street and on the south side of the road from Ash Street to Walnut Street. The BLTS analysis indicates that the segments with and without bike lanes west of Stryker Road are NOT suitable for most bicyclists. This is primarily due to the relatively narrow lane width and posted travel speeds. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roadway from the west city limits to OR 51-Main Street
- Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to OR 51-Main Street (5-foot bike lane, 2-foot buffer)
- Install 6-foot separated bike lanes (cycle tracks) on both sides of the road from the west city limits OR 51-Main Street

Gun Club Road

There are bike lanes on both sides of the road from OR 51-Monmouth Street to north of the high school property and gaps on both sides to Hoffman Road. The BLTS analysis indicates that the segments with and without bike lanes north of the high school property may NOT be suitable for most bicyclists. Therefore, the alternatives include:

- Fill in the gaps with 6-foot bike lanes on both sides of the roadway from north of the high school property to Hoffman Road

Stryker Road

There are shoulder bikeways on the east side of the road from Piper Street to Stearman Street and on the south side of the road east of the rail line. The BLTS analysis indicates that the segments with and without shoulder bikeways may NOT be suitable for most bicyclists. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the road from Polk Street to OR 51-Main Street

Ash Street/4th Street

There are no bike facilities on either side of the roads from Polk Street to OR 51-Monmouth Street. The BLTS analysis indicates that the roads may NOT be suitable for most bicyclists. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roads from Polk Street to OR 51-Monmouth Street
  - This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards

4th Street

There are no bike facilities on either side of the road from OR 51-Monmouth Street to Spruce Avenue. The BLTS analysis indicates that the road is suitable for most bicyclists. This is primarily due to relatively low traffic volumes and travel speeds. Therefore, the alternatives provided below are indented to improve wayfinding and plan for the long-term potential of the road:

- Install shared lane pavement markings (sharrows) from OR 51-Monmouth Street to Spruce Avenue
- Install 6-foot bike lanes on both sides of the road from OR 51-Monmouth Street to Spruce Avenue
  - This would likely require restricting on-street parking along the roads and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards

13th Street/7th Street

There are no bike facilities on either side of the roads from OR 51-Monmouth Street to the south city limits. The BLTS analysis indicates that the roads may Not be suitable for most bicyclists. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits
  - This would likely require restricting on-street parking along the roads and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards

Picture Street/Williams Street/G Street/Spruce Avenue

There are no bike facilities on either side of the roads. The BLTS analysis indicates that the roads are suitable for most bicyclists. This is primarily due to relatively low traffic volumes and travel speeds. Therefore, the alternatives provided below are indented to improve wayfinding and plan for the long-term potential of the roads:

- Install shared lane pavement marking (sharrows) on both sides of the roads
- Install 6-foot bike lanes on both sides of the roads
  - This would likely require restricting on-street parking and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards

C Street/D Street

C Street and D Street are local streets and are not required by City code to have on-street bike lanes. However, these streets could serve as parallel routes to OR 51-Monmouth Street and provide direct connections to the waterfront. Therefore, the alternatives include:

- Install low traffic bikeway (bicycle boulevard) treatments along both roadways
- Install shared lane pavement marking (sharrows) on both sides of the roads

River Road

River Road is owned and operated by Polk County and Marion County. However, the City has expressed an interested in providing a bicycle facility on River Road, primarily as a direct connection to the Valley Scenic Bikeway. Therefore, the alternatives include:

- Install 6-foot bike lanes on both sides of the road across the Willamette bridge – this would require widening the bridge or providing cantilevered bike paths on one or two sides of the bridge.
- Install actuated flashing beacons with "bikes on bridge" signs on both ends of the bridge.

TRANSIT

This section provides an overview of transit facilities and services that could be implemented within Independence to improve access and circulation by transit. This section also identifies the transit alternatives developed to address gaps and deficiencies in transit connectivity.

Transit Facilities and Services

Public transit provides important connections to destinations for people that do not drive or bike and can provide an additional option for all transportation system users for certain trips. Public transit can complement walking, bicycling, or driving trips: users can walk/roll to and from transit stops and their homes, shopping, or work places; people can drive to park-and-ride locations to access a bus; or people can bring their bicycles on transit vehicles and bicycle from a transit stop to their final destination.

Providing transit service in smaller cities is typically led by a local or regional transit agency. Cherriots provides fixed-route and demand-responsive transit service within Polk and Marion Counties, including multiple stops in Independence throughout the community.

Fixed-Route Service

Fixed-route service refers to transit service that runs on regular, scheduled routes, with designated transit stops. Fixed-route service is typically characterized by service frequency (the time between arrivals), service hours (the number of hours service is provided throughout the day), and service coverage (the amount of the population, households, and jobs served by transit).

Transit Stops

Transit stops are designated locations where residents can access local transit service. Transit stops are normally located at major intersections. The types of amenities provided at each transit stop (i.e. pole, bench, shelter, ridership information, trash receptacles) tend to reflect the level of usage.

- Pole and bus stop sign – All bus stops require a pole and bus stop sign to identify the bus stop location. Some transit agencies prefer the bus stop signs to be provided on a separate dedicated pole instead of on an existing utility pole, column, or other location.
- Bus stop shelters – Shelters are typically provided at stops with 50 or more boardings per day but may be considered at stops with fewer boardings per day if served by infrequent service (headways greater than 17 minutes) such as in Independence.
- Seating – Seating can be considered at any stop as long as it is accessible and as long as the safety and accessibility of the adjacent sidewalk or other facility are not compromised by seating placement.

- Trash receptacles – Trash cans can be considered at any stop; however, they are most commonly located at stops with shelters and/or seating. Trash cans will require pick-up by the city public works crews.
- Lighting – Lighting is an important amenity for bus stops as it provides visibility and increased security for transit users waiting, boarding, and aligning transit service.
- Bicycle parking, storage, and/or repair stations – As discussed above, public transit and bicycling can work together to support a single person trip. In addition to bicycle connections to bus stops, bicycle amenities located at bus stops further support multi-modal trips, allowing travelers to store their bicycles at one end of their trip or even repair their bicycle en route as needed.
- ADA accessibility – Bus stops should be accessible for users with all ranges of capabilities, including a concrete landing pad, adjacent parking restrictions, and ADA-compliant pedestrian ramps. Based on discussion with Cherriots staff, the concrete pad should be five feet by eight feet, with a slope of two percent or less to be in compliance.
- Real-time bus arrival reader boards -

Park-and-Rides

Park-and-rides provide parking for people who wish to transfer from their personal vehicle to public transportation or carpools/vanpools. Park-and-rides are frequently located near major intersections, at commercial centers, or on express and commuter bus routes. It is Oregon state policy to encourage the development and use of park-and-rides at appropriate urban and rural locations adjacent to or within the highway right-of-way. Park-and-rides can provide an efficient method to provide transit service to lower density areas such as Independence, connecting people to jobs, and providing an alternate mode to complete long-distance commutes.

Park-and-rides may be either shared-use, such as at a school or shopping center, or exclusive-use. Shared-use facilities are generally designated and maintained through agreements reached between the local public transit agency or rideshare program operator and the property owner. Shared-use lots can save the expense of building a new parking lot, increase the utilization of existing spaces, and avoid utilization of developable land for surface parking. In the case of shopping centers, the presence of a shared-use park-and-ride has frequently been shown to be mutually beneficial, as park-and-riders tend to patronize the businesses in the center.

Mobility Hubs

Mobility hubs focus on the connectivity of public transit to a variety of travel modes, supporting non-single-occupancy-vehicle trips and helping to connect people to the different modes they need. Although mobility hubs support a transit stop or station, all services and amenities do not need to be provided immediately adjacent to the stop as long as they are still within an easily accessible area. Shared mobility services such as bikeshare, carshare, e-scooters, and on-demand rideshare zones are all located within the hub, in addition to amenities such as transit waiting areas, pedestrian and bicycle facilities, bicycle parking, bicycle repair stations, and electric vehicle charging. Technology is also used to support a mobility hub with services such as real-time transit travel information and smart parking. Additional information on the mobility hubs is provided under the Emerging Technology section.

Real-Time Transit Information

Transit agencies or third-party sources can disseminate both schedule and system performance information to travelers through a variety of applications, such as in-vehicle, wayside, or in-terminal dynamic message signs, as well as the Internet or wireless devices. Coordination with regional or multimodal traveler information efforts can increase the availability of this transit schedule and system performance information. These systems enhance passenger convenience and may increase the attractiveness of transit to the public by encouraging travelers to consider transit as opposed to driving alone. They do require cooperation and integration between agencies for disseminating the information.

Transit Alternatives

This section summarizes the alternatives developed to address the gaps and deficiencies in the transit facilities and services provided in Independence. The alternatives are shown in Figure 6, as applicable.

New Routes & Existing Route Changes

Cherriots has developed a new service plan, which would replace the Polk County Flex Service. In fall 2020, Cherriots plans to adjust the Polk County Flex to become a deviated fixed route service called Cherriots Regional Route 45: Central Polk County. The service change was first considered by Cherriots in February 2019. Before initiating route planning, a survey was conducted in summer 2019, which showed that the public was in favor of a service redesign. Cherriots staff worked with the cities of Independence, Monmouth, and Dallas and in coordination with ODOT to determine a route and bus stop locations. The service will operate on a fixed route, including 50 stops within the three cities, but will also allow riders to call beforehand and request service at any location within the Route 45 service area. Service will be provided on weekdays from 7:00 a.m. to 5:00 p.m. with 2-hour headways.

In addition to the services provided by Cherriots, the cities of Independence and Monmouth are collaborating with other stakeholders to explore development of a local transit system. A Local Transit Feasibility Study is ongoing, focusing on a link between downtown Independence, downtown Monmouth, and Western Oregon University. This potential new link is likely to use OR 51-Monmouth Street, as a natural connector between the two cities, and will ideally use vehicles that look like the historic trolleys that used to serve this area in the 1800's. Per public comments, preferred vehicles would be electric or solar powered to limit emissions created by new services.

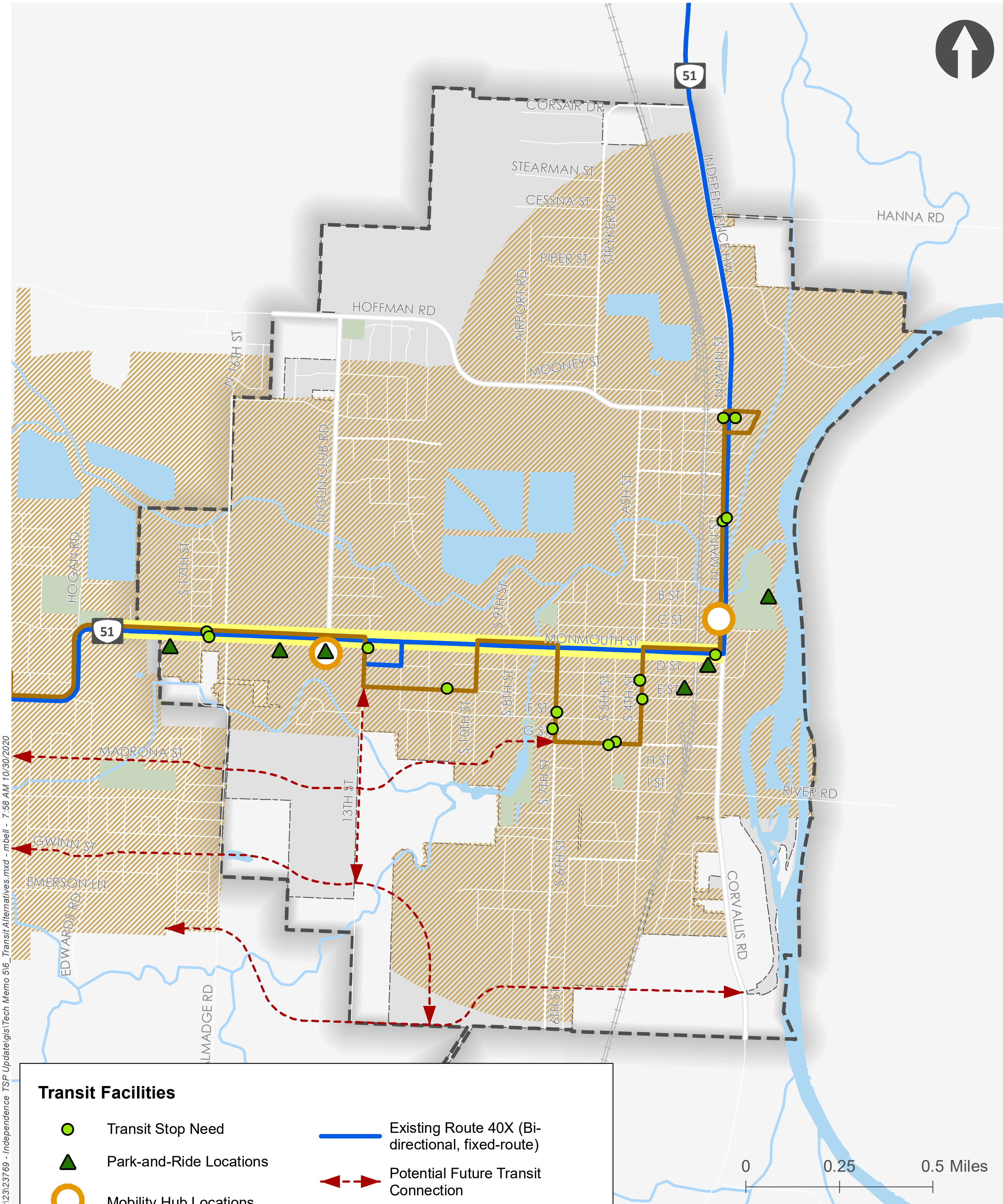
The City is also interested in operating an autonomous shuttle along OR 51-Monmouth Street. Additional information on autonomous shuttles is provided in the Emerging Technology section.

As these additional services are implemented and the street network is further connected in the southern area of the city, potential new transit routes (likely through a local route versus a regional route) should be studied. Based on the future streets discussed above, the following roadways may benefit from transit as development occurs:

- G Street and Madrona Street, if/when those street extensions are completed
- The Gwinn Street extension through southwest Independence
- 13th Street south to the southwest area, potential to connect to the other transit routes serving the city
- The new southern arterial, dependent on the developed land uses adjacent to the roadway

Service Frequency, Hours, & Coverage

Route 40X will stay in place as a regional express service when the Polk County Flex becomes Route 45 to serve local trips. Both routes operate between four and eight daily trips, depending on day of the week. After Route 45 is established and as Independence grows and changes, the frequency of trips for these routes should be verified and modified as appropriate.



Transit Facilities

- Transit Stop Need
- Park-and-Ride Locations
- Mobility Hub Locations
- Future Route 45 Service Area
- Future Route 45 (Bi-directional, deviated fixed-route)
- Existing Route 40X (Bi-directional, fixed-route)
- Potential Future Transit Connection
- Potential Trolley/Autonomous Shuttle Route
- City Boundary
- Urban Growth Boundary

Transit Alternatives
Independence, OR

Figure
6

H:\23\23769 - Independence TSP Update\gis\Tech Memo 516_Transit Alternatives.mxd - mbell - 7:58 AM 10/30/2020

Data Source: General Transit Feed Service

Based on public comment, there is a need for further weekend hours to support workers and travelers. For Route 40X, added Sunday service and extended Saturday service should be explored. For Route 45, monitoring and public outreach should be conducted once the service is in place to understand if weekend service is needed to support the community.

Although the existing Polk Flex Service area, and the service area for the future Route 45 replacement, provide coverage throughout the majority of the city, comments from the public show that these services are not fully understood. Several public comments listed *distance from transit routes* as an obstacle, while these services can pick up riders anywhere within the designated service area by request. The Route 45 service area will cover the majority of the city, as shown in Figure 6. Further marketing, outreach, and education are needed to those who live and work in Independence to provide a better understanding of the services available and how to request pick up and drop off within the service area. It is also important to note that inconsistent marketing for existing public transit facilities and service in Independence (i.e. continued references to the previous CARTS regional bus system) should be updated to further enhance awareness of services.

Transit Stops

Existing Transit Stop Improvements

The following identifies potential improvements at the five existing bus stops located in Independence. *Note: If pedestrian-scale lighting is preferred at the bus stops, all locations except Stop 1515 would require lighting installation.*

- Stop 1516: OR 51-Main Street/Polk Street (to Salem)
  - Provide bicycle parking, storage, and repair station
  - Provide ADA-compliant pedestrian ramps leading to the bus stop
- Stop 1517: Or 51-Main Street/Polk Street (to Dallas)
  - Concrete pad (Cherriots plans to upgrade this bus stop to be ADA-compliant in 2020)
  - Provide ADA-compliant pedestrian ramps leading to the bus stop
  - Provide bicycle parking, storage, and/or repair station
- Stop 1515: Library – OR 51-Monmouth Street/2nd Street (to Salem)
  - New "No Parking" zone
  - Provide bicycle storage and/or repair station (some bike parking already provided)
- Stop 1518: Library – OR 51-Monmouth Street/2nd Street (to Dallas)
  - No potential improvements based on existing conditions through August 2020
- Stop 1502: 13th Street/OR 51-Monmouth Street (bi-directional)
  - Install "No Parking" zone signage in addition to the yellow curb
  - Install lighting
  - Provide ADA-compliant pedestrian ramps leading to the bus stop
  - Street intersection (i.e. marked crossing with pedestrian refuge)
  - Provide bicycle parking, storage, and/or repair station
  - Real-time bus arrival reader board

New Transit Stops

As Cherriots implements Route 45, new bus stops will include a sign and pole. In addition, Cherriots is already working with local agencies to restrict parking at all new bus stop locations as part of stop installation. After Route 45 is in service long enough for ridership trends to be identified, evaluation of the need for shelters, seating, and/or trash cans should be completed.

The identified locations for the new bus stops were reviewed to identify modifications to support comfort and safety when service begins. These modifications are listed below.

- Install lighting. *Note: if pedestrian-scale lighting is preferred at the bus stops, all new stop locations would require lighting installation.*
    - 4th Street/E Street – to Dallas
    - 5th Street/G Street – both directions
    - 7th Street/F Street – both directions
    - E Street/11th Street – both directions
    - Monmouth Street/Talmadge Road – both directions
- Provide ADA-compliant pedestrian ramps leading to the bus stop
    - Main Street/Oak Street – both directions
    - 4th Street/E Street – both directions
    - 5th Street/G Street – both directions
    - 7th Street/F Street – both directions
    - E Street/11th Street – both directions
    - Monmouth Street/Talmadge Road – both directions
- Install an enhanced pedestrian crossing (i.e. marked crossing with pedestrian refuge)
    - Main Street/Oak Street – south leg of intersection

Potential Park-and-Ride Locations

Several potential shared-use park-and-ride locations were identified to support existing Route 40X and future Route 45. As discussed above, any of these locations would require agreements between the public transit agency or rideshare program operator and the property owner.

- Central Plaza (supporting Routes 40X and 45)
- Independence Library/Sterling Savings Bank (supporting Routes 40X and 45)
- Riverview Park (supporting Routes 40X and 45)
- Independence Cinema 8 (supporting Routes 40X and 45)
- First Baptist Church (supporting Routes 40X and 45)
- WinCo (supporting Route 45)

Potential Mobility Hub Locations

Two potential mobility hub locations were identified where a connected range of travel options may be beneficial to those traveling to, from, and within Independence.

- Central Plaza shopping center (supporting Routes 40X and 45)
- Downtown Independence, adjacent to Riverview Park (supporting Routes 40X and 45)

Pedestrian/Bicycle Connectivity

One of the most significant ways to increase ridership and accessibility of a transit route is to provide pedestrian bicycle connectivity to the service. Although there are pedestrian and bicycle facilities in the immediate vicinity of many existing and future transit stops, it is preferred for all stops to be supported by marked crosswalks and pedestrian and bicycle facilities both adjacent and connecting to these locations. Pedestrian and bicycle alternatives are further discussed in the previous sections, including those that would support transit and fill gaps in the surrounding network.

Other

In addition to the alternatives described above, the City can plan for transit-supportive land use patterns and support future transit viability by designing and building streets that will comfortably accommodate transit stops and include the right-of-way that could allow for transit stops to be located as close as possible to important destinations.

The 2007 TSP includes several policies in support of the public transit system:

- The City shall coordinate with governmental and private agencies in the planning and provision of public transportation services and shall ensure that a given level of service is adequate for the costs incurred
- The City will coordinate with willing private property owners to establish park-and-ride facilities for public transit and carpool users
- Transit routes and facilities shall be supported through appropriate measures such as bus stops, pullouts, optimum road geometrics, or parking restrictions (land use requirement)
- New retail, office and institutional developments should include transit routes and facilities and convenient pedestrian access to transit through walkways and connections (land use requirement)
- Allow existing developments to redevelop portions of parking areas for transit-oriented uses, such as carpool parking, park-and-ride parking, and public transit stations and platforms, where appropriate (City of Independence Development Code)

Additional policies in support of the public transit system based on information from Cherriots staff:

- Fares for local service, such as future planned Route 45, are recommended to be cheaper than a trip to Salem via private vehicle
- The City will consider transit stops for any new roadways built within the city, including consideration of planned future routes that are not yet in place
- The City will work with Cherriots and other partner agencies to provide real-time transit information for riders, especially as more routes and service types become available within the city. Coordination between agencies and providers to create a "one-stop-shop" for real-time transit information will allow users to seamlessly integrate the different services.

INTERMODAL ROUTE CONNECTIVITY

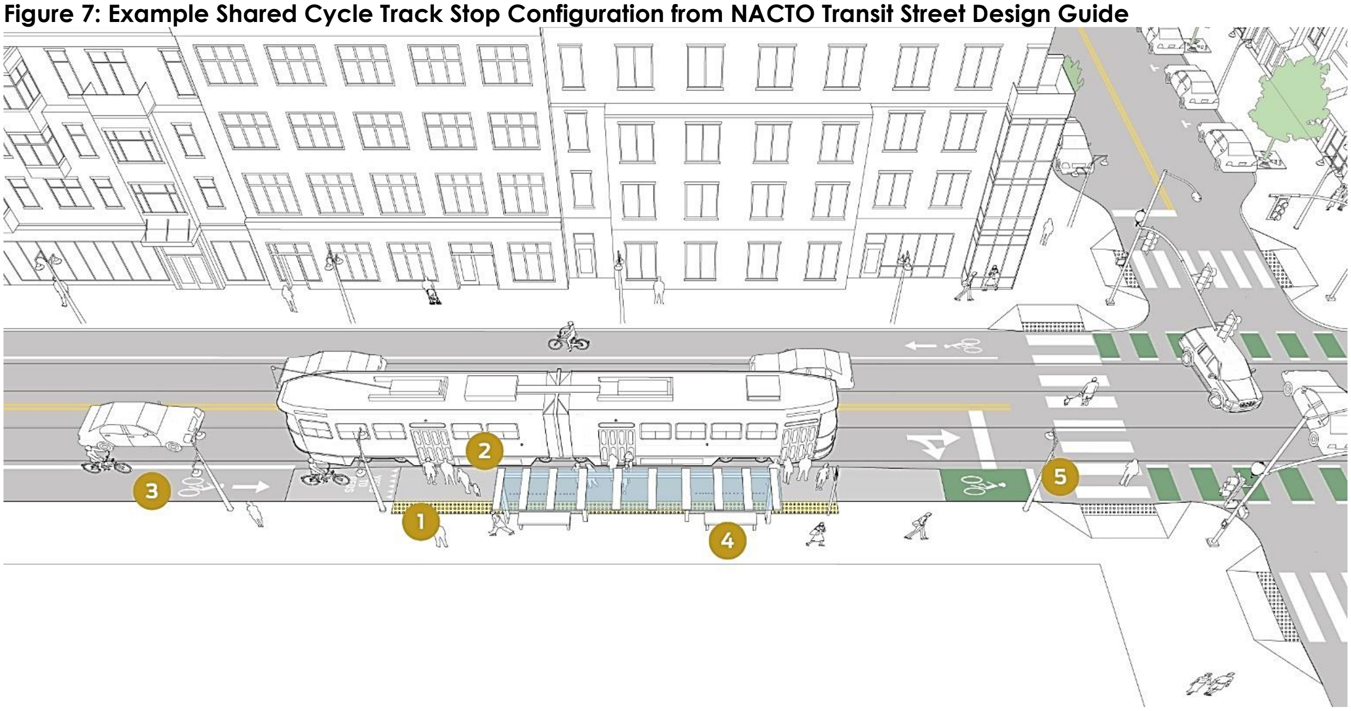
The future transit network was overlaid with existing bicycle and pedestrian facilities to understand intermodal route connectivity. Pedestrian facilities in Independence generally connect the arterial street network to bus stops. Bicycle facilities in Independence provide less connectivity to the transit system.

When considering roadways that need to support transit vehicles, bicycles, and private vehicles, there can be constrained right-of-way to accomplish the range of safety, connectivity, and mobility goals for a particular street. The National Association of City Transportation Officials (NACTO) Transit Street Design

Guide was reviewed for potential intermodal route connectivity solutions. Based on the existing street widths and classifications, future transit routes, and bicycle facility gaps in Independence, the following two solutions will be considered within the city.

- Shared lanes with a mix of transit vehicles, bicycles, and private vehicles. The following recommendations are provided in the NACTO Transit Street Design Guide:
    - This treatment is appropriate on roadways where bus volumes are moderate and/or where bus speeds are low
    - Along segments where buses and bicyclists are not expected to pass each other, shared lanes may be 10 to 11 feet
    - If passing is anticipated, shared lanes may be 13 feet wide
    - For roadways where there is adjacent parking, the combined width of the shared lane and parking lane is recommended to be 19 to 21 feet wide
- Shared cycle track stops. The following recommendations are provided in the NACTO Transit Street Design Guide:
    - This treatment is appropriate on higher classification roadways where there are in-lane stops and a bike lane or protected bike lane along the segment, such as OR 51 or G Street
    - Special consideration is needed for width of cycle track, placement of bicycle ramps, curbside activity restrictions, and proximity to turning traffic

Figure 7: Example Shared Cycle Track Stop Configuration from NACTO Transit Street Design Guide



1. Detectable warning strips and shark's teeth yield markings
2. Accessible waiting and boarding areas
3. Bike ramps that consider maintenance, visually impaired passengers, and curbside conflicts
4. Shelters that are transparent and open to the building side
5. Ensure bicyclists are visible for turning traffic and queue in front of transit vehicles

Source: NACTO Transit Street Design Guide (https://nacto.org/publication/transit-street-design-guide/stations-stops/stop-configurations/shared-cycle-track-stop/)

There are several gaps and areas for improvement for intermodal route connectivity in Independence, including:

- **OR 51-Main Street from Polk Street to OR 51-Monmouth Street** – This segment lacks designated bicycle facilities and continuous sidewalks on the east side of the roadway. The striped bike lanes north of this segment should be extended south to support bicycle access and connectivity. Although providing sidewalks on both sides of the street is preferred, a marked crossing at the future OR 51-Main Street/Oak Street bus stop location would provide connectivity to the continuous sidewalks on the west side of the roadway. Any marked crossings on OR 51 will require coordination with ODOT. Improvements to the existing bicycle/pedestrian facilities would provide further connectivity to transit. See the NACTO excerpt above for a potential configuration.
- **Polk Street from Walnut Street to OR 51-Main Street** – There are gaps in both the pedestrian and bicycle facilities in this segment. Filling these bicycle/pedestrian facility gaps would provide further connectivity to transit.
- **OR 51-Monmouth Street from OR 51-Main Street to 8th Street** – This segment is lacking designated bicycle facilities. In addition, there is a sidewalk gap on the north side of the roadway between 2nd Street and 3rd Street. Filling these bicycle/pedestrian facility gaps would provide further connectivity to transit. See the NACTO excerpt above for a potential configuration.
- **4th Street from OR 51-Monmouth to G Street** – This segment is lacking designated bicycle facilities. As a low-speed, low-volume collector street, a marked and signed shared roadway could be implemented to provide further connectivity to transit.
- **G Street from 4th Street to 7th Street** – This segment is lacking designated bicycle facilities. As a low-speed but higher-volume collector street, a designated bicycle facility such as a bike lane could be implemented to provide further connectivity to transit. See the NACTO excerpt above for a potential configuration.
- **7th Street from OR 51-Monmouth to G Street** – This segment is lacking designated bicycle facilities. As a low-speed, low-volume collector street, a marked and signed shared roadway could be implemented to provide further connectivity to transit.
- **10th Street from OR 51-Monmouth to E Street** – This segment is lacking designated bicycle facilities and has a pedestrian facility gap on the east side of the roadway. As a local street, a marked and signed shared roadway could be implemented to provide further connectivity to transit, in addition to filling the pedestrian facility gaps.
- **E Street from 10th Street to 13th Street** – This segment is lacking designated bicycle facilities and has a pedestrian facility gap on the north side of the roadway. As a local street, a marked and signed shared roadway could be implemented to provide further connectivity to transit, in addition to filling the pedestrian facility gaps.
- **13th Street from OR 51-Monmouth to E Street** – This segment is lacking designated bicycle facilities. As a low-speed, low-volume collector street, a marked and signed shared roadway could be implemented to provide further connectivity to transit.

FREIGHT

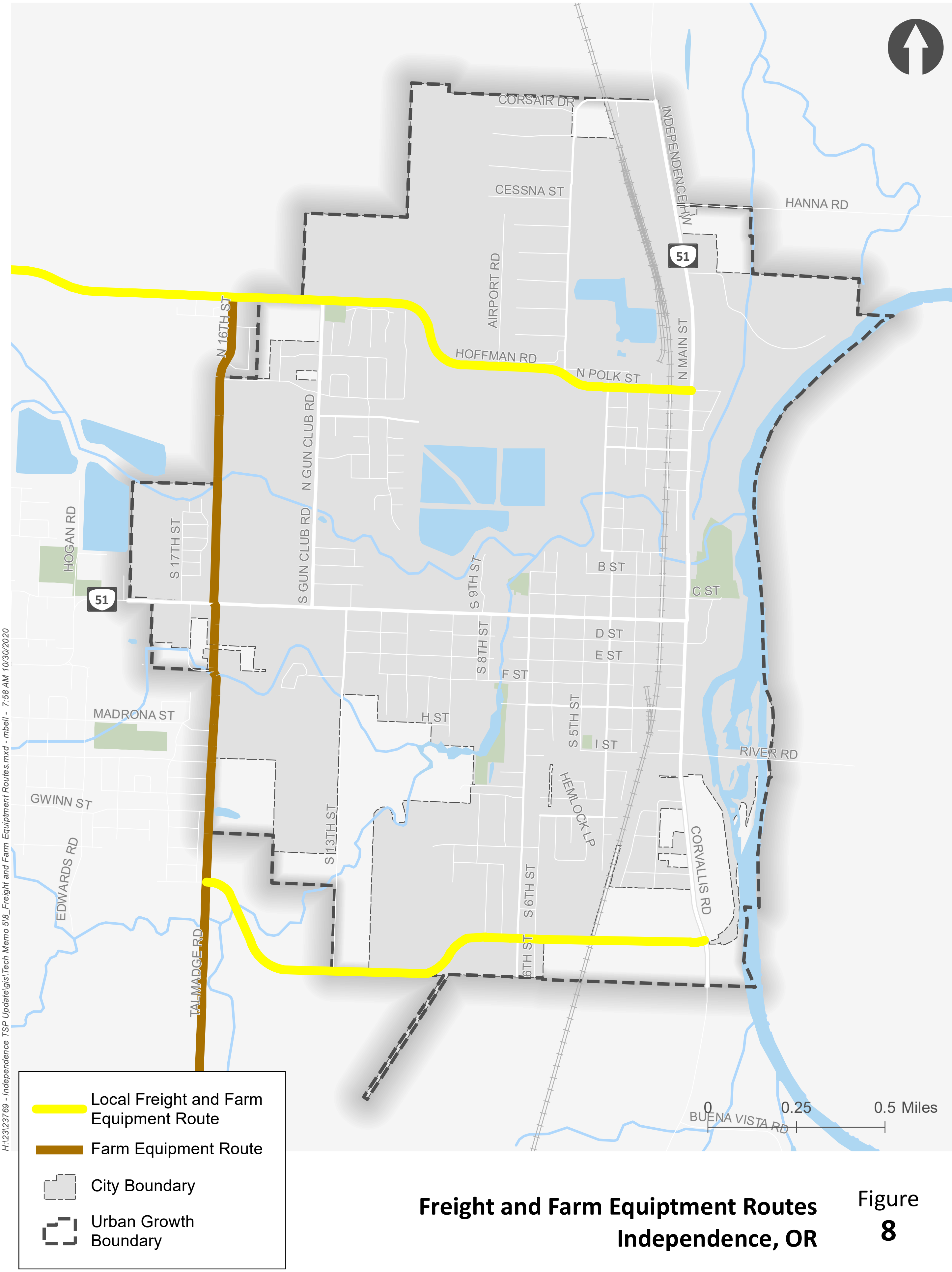
As indicated in *Technical Memorandum #3A: Existing Conditions Inventory*, there are no designated state or federal freight routes in Independence. The majority of freight activity occurs on Hoffman Road-Polk Street between the western UGB and OR 51-Main Street in support of the adjacent industrial land uses. In addition, passive measures, such as the curb extensions in place at the OR 51-Main Street/Monmouth Street intersection, make truck turning movements difficult, providing a disincentive for trucks to remain on OR 51 when traveling through Independence. However, commercial businesses within the downtown area generate freight traffic. Lastly, public comments expressed the difficulty of maneuvering large farm equipment throughout Independence to agricultural land uses north and south of the city. Therefore, the following alternatives were developed to address potential issues with freight and farm equipment traffic:

- Establish designated freight and farm equipment routes within the City that identify where large vehicles can and cannot travel.
    - These routes can include Hoffman Road-Polk Street, 16th Street, and the future southern arterial connection, as shown in Figure 8.
    - Gun Club road is not suggested as a local freight route unless the pedestrian and bicycle facilities are updated.
- Develop policies related to maintenance along designated freight and farm equipment routes to ensure the facilities do not become degraded over time.
- Develop policies related to pedestrian and bicycle facilities along designated freight and farm equipment routes to ensure greater separation of travel modes.
- Establish truck loading zones within the downtown area and develop policies related to the use of the truck loading zones.

RAIL

The rail line in Independence runs north-south along the entirety of the city. This introduces many intersecting locations with other modal networks in the city. Therefore, the following alternatives were developed to address potential issues with the rail network:

- Create a maintenance program to specifically address pavement condition on 2nd Street.
- Create a maintenance/improvement program to ensure ADA compliance of pedestrian crossings of the rail line.
- Create new pedestrian crossings where a pedestrian-only crossing would provide further connectivity between cul-de-sacs
    - Boat Landing Street
    - Picture Street
    - Grand Street
    - I Street
- Work with the rail operators to further reduce speed, and resulting noise, of trains passing through city limits.
    - Follow the Federal Railroad Administration's guidance for creating quiet zones, including installing of flashing lights and gates at each public crossing.
- Work with ODOT rail to determine the location of an at-grade or grade-separated rail crossing that would provide additional east-west connectivity of the roadway network.
    - Consideration can be given to removing a crossing to the north to ensure similar continued rail operations.



Freight and Farm Equiptment Routes
Independence, OR

Figure
8

Data Source: Polk County Data Portal, ODOT

- Work with ODOT rail to consider a new at-grade rail crossing at I Street as part of treatments to the OR 51-Main Street/River Road intersection.
- Work with ODOT rail to consider potential compromised emergency response capabilities should a train become stalled on the tracks and block crossings. The fire and police stations are located west of the track, which gives them access to most of the city. However, trains can delay and/or cause detours for emergency vehicles trying to reach the eastern edge of town, including the downtown, waterfront park, residences and businesses.
- Consider passenger rail service.

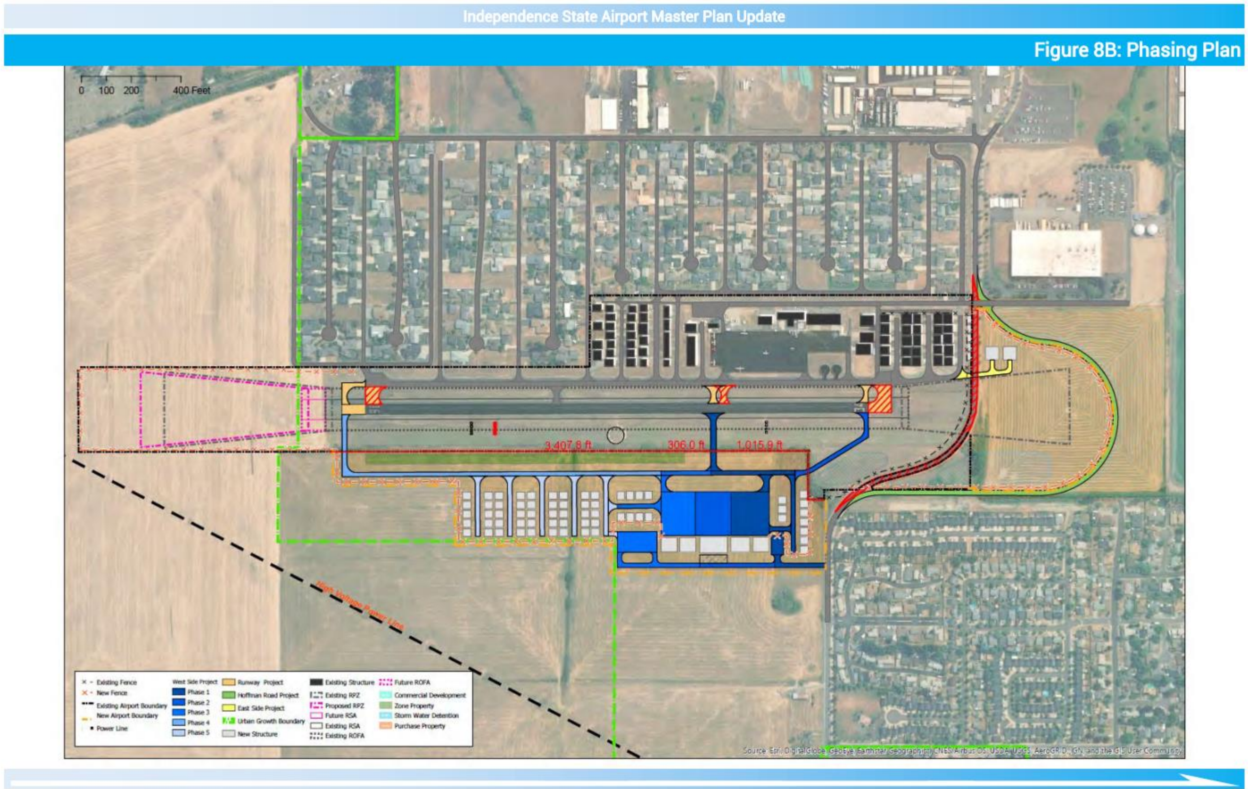
In addition, the 2007 TSP included several policies in support of the rail system:

- Improve safety by continuing to work with the W&P Railroad and the Rail Division of ODOT to identify crossing closures and safety improvements to existing crossings.
- Improve the trackage on 2nd Street to decrease pedestrian tripping and bicycling hazards, and vehicular and rail conflicts, between "B" and "E" Streets. Since its inception in 1993, W&P has encouraged Independence to consider a median strip on 2nd Street to separate train and vehicular traffic such as was done on 6th Street in Corvallis. The City will keep all design solutions to the existing railroad subgrade failure along 2nd Street open for discussion.
- Work with the railroad to identify, and evaluate the financial feasibility of, alternatives that would improve public safety, reduce roadway wear and tear, and reduce conflicts. (This policy is modified from its original content in the 2007 TSP)
- Reduce environmental degradation (noise impacts) and conflicts by requiring residential development adjacent to the railroad to use sound mitigation structures or planting buffers.
- Promote safe and efficient operation of the railroad and road system by allowing no new at-grade crossings by local roads and minimize the number of arterial and collector street at-grade crossings.
- Identify and evaluate the economic feasibility of various alternatives to provide for emergency access and response capabilities to the entire City. Some alternatives include building an overpass at an existing at-grade crossing or an unbuilt collector or arterial crossing or providing a satellite emergency response capability for the east side of Independence.

AIR

The Oregon Department of Aviation (ODA) updated the Independence State Airport Master Plan, with the final report published in March 2020. The master plan highlights a range of projects to support airport operations, presented in three phases. Phase 1 includes short-term elements slated to occur from 2019 to 2023. Phase 2 includes mid-term elements slated to occur from 2024 to 2028. Phase 3 includes long-term elements slated to occur from 2029 to 2038. As noted in the master plan, the project years provided are estimates and subject to change since implementation will be need-driven. Figure 9 shows the projects identified in the 2020 Independence State Airport Master Plan.

Figure 9: 2020 Independence State Airport Master Plan Project Map



Source: 2020 Independence State Airport Master Plan Update
(https://indepndencemasterplan.files.wordpress.com/2020/04/2020-03-20-independence-airport-master-plan-web-1.pdf)

Implications for the Independence TSP Update

The majority of projects from the 2020 Independence State Airport Master Plan are outside of the City of Independence's right-of-way, but there is one long-term project listed that would greatly impact the city's transportations system: realignment of Hoffman Road and extension of Taxiway A. As noted in the master plan, "the City of Independence voiced concerns over rerouting Hoffman Road and increased noise that a larger airport configuration could bring." More specifically, Hoffman Road/Polk Street is one of the few east-west connections in the city and provides a local and regional freight connection. As noted in Section 4.3.13 of the 2020 Independence State Airport Master Plan, "it is recommended that ODA [Oregon Department of Aviation] and the City collaborate to develop an acceptable strategy to mitigate the incompatible land use of Hoffman Road within the Runway Protection Zone (RPZ)." In addition, the 2007 TSP included several policies in support of the air system:

- The City shall protect and maintain the Independence Airport site and coordinate with Polk County and the Oregon Department of Aviation in protection and maintenance efforts.
- The City, in cooperation with Polk County, shall maintain an airport overlay zoning which coincides with the future approach surfaces and FAR Part 77 surfaces. Airport overlay zoning should conform with Oregon Department of Aviation guidelines.
- City supports designating Runway 34 as the calm wind runway in order to minimize noise exposure on nearby residential areas south of the airport. The City also supports a review of airport operating procedures to ensure that appropriate noise abatement procedures and standard traffic pattern elevations and locations are being utilized at the airport.

SAFE ROUTES TO SCHOOL

Safe Routes to School (SRTS) plans make it safer for students to walk, bike, or take public transit to school. Safer routes encourage more walking and biking and provide convenient and accessible options to and from school and in surrounding neighborhoods. SRTS programs include six components known as the Six E's: evaluation, education, encouragement, engineering, enforcement, and equity. This section provides a summary of the Six E's and identifies alternatives to be considered by the City.

Safe Routes to School – Six E's

Education

The education component provides students and residents with information such as transportation options and the benefits of walking and biking to school. Education strategies for SRTS programs include identifying who needs to receive the information, what information needs to be shared, and how to convey the messages. Education components could include:

- Educational videos
- Structured skill practice training
- Lessons integrated into classroom subjects
- Media: radio, internet videos, newspaper articles, and television features

Encouragement

The encouragement component is most closely linked to the education component of a SRTS program. Encouragement strategies generate excitement and interest in walking and biking through events and activities. The encouragement component rewards participation and is used to increase the number of students who walk and bike to school. Encouragement strategies can be used to garner support for other SRTS components such as installing sidewalk. Encouragement components could include:

- Special events, such as international walk to school events
- Mileage clubs and contests
- Ongoing activities
  - Walking school bus or bicycle train
  - Park and walk
  - On-campus walking activities

Engineering

The engineering component of a SRTS program identifies design, implementation, operations and maintenance of physical improvements aimed at addressing specific needs which make walking and biking to school safer, more comfortable and convenient. An evaluation of the school environment is necessary to identify engineering problems and solutions. Engineering components could include:

- Pedestrian and bicycle facilities: sidewalks, crosswalks, bike lanes, bicycle racks, etc.
- Pedestrian and bicycle signage and signals equipment
- Enhanced crossing treatments: curb extensions, raised median islands, flashing beacons

Enforcement

Enforcement is included as part of a SRTS program to reinforce the objectives of the program and deter unsafe traffic behaviors and encourage all road users to obey traffic laws and share the road safely.

Enforcement strategies involve a network of community members who promote safe walking, biking and driving. Enforcement components could include:

- Identifying unsafe behaviors
  - Driver behaviors (e.g. speeding, failing to yield to pedestrians/bicyclists, running red lights, passing stopped school buses, parking in crosswalks, etc.)
  - Pedestrian and bicyclist behaviors (e.g. not following direction of crossing guards, crossing at undesirable locations, riding in traffic, no wearing bike helmet, etc.)
- Community enforcement (e.g. safety patrols, adult school crossing guards, neighborhood speed watch programs, etc.)
- Law enforcement methods (e.g. speed trailers, active speed monitors, traffic complaint hotlines, photo enforcement, etc.)

Evaluation

The evaluation component assesses which strategies and approaches are successful. Evaluation of SRTS programs ensure that initiatives support equitable outcomes, identify unintended consequences or opportunities to improve effectiveness and ensure there are adequate resources to implement all components of a SRTS program. Evaluation components could include:

- Data collection; surveys, observations
- Information sharing
- Walkability assessment
- Records of citations

Equity

Equity in a SRTS program ensures that program initiatives are benefiting all demographic groups. This component is especially important to ensuring safe, healthy, and fair opportunities for low-income students, students of color, students of all genders, students with disabilities and others. Incorporating equity efforts into all components of a SRTS could include:

- Assessing whether the recipient of education efforts reflect larger demographic patterns of the community
- Ensuring encouragement activities are available to low-income students and students of color
- Ensuring policy and physical improvements are implemented in low-income communities and communities of color
- Ensuring law enforcement officers build trust with communities and do not target students of color, low-income students, or other community residents
- Initiating efforts that decrease health disparities

Safe Routes to School Alternatives

The Monmouth-Independence Safe Routes to School Program is a collaboration between the cities of Independence and Monmouth, the Independence Police Department, the Independence Traffic Safety Commission and Central School District 13J. The purpose of the program is to integrate health, fitness, environmental awareness and safety into one collective program.

The Safe Routes to School Program uses a 4-tiered approach which focuses on engineering, encouragement, enforcement and education as means of enabling children to walk and bike to school. An increase in walkers and bikers and a decrease in automobile use benefits students through better health, personal enjoyment, better concentration in school and environmental exposure. The community benefits through cleaner air, increased social interaction and an overall safer environment.

As part of the program, the City of Independence is working to: hold encouragement activities; address school-related safety concerns through the traffic safety commission; integrate walking and biking safety education into the classroom; increase traffic enforcement around the schools and to construct a safe off-street route for pedestrian travel.

The City recently worked with each of the K-8 schools in the district to survey parents and students as a means of evaluating current modes of travel, parent concerns and to look at potential improvements. Data from the survey will be used to strategically improve roadways and other facilities around local schools.

Though the City of Independence has a plan they should consider implementing other elements of a SRTS plan, including:

- Develop an evaluation program that assesses which strategies and approaches are successful, ensures that initiatives support equitable outcomes, and identifies unintended consequences or opportunities.
- Develop an equity program that ensures that program initiatives are benefiting all demographic groups.
- Expand SRTS program to middle school and high school students.
- Continue to implement physical improvements to the transportation system aimed at addressing specific needs which make walking and biking to school safer, more comfortable and convenient.
    - Several alternatives are identified within the pedestrian and bicycle sections of this memorandum that could help the city further enhance the transportation system around school.

SAFETY

Traffic safety plays an important role in developing the most appropriate alternatives for a given gap or deficiency, particularly in areas where real or perceived safety risks may prevent people from using more active travel modes, such as walking, biking, and taking transit. The real or perceived safety risks may reflect the crash history of an area or the physical and/or operational characteristics of the roadways (winding curves, steep grades, high traffic volumes, high travel speeds, excessive heavy vehicles, etc.). Several methodologies have been developed to analyze and identify alternatives for addressing traffic safety within an area. Many of which are documented in the Highway Safety Manual (HSM) as well as several other resources developed by ODOT for addressing safety along roadway segments, at intersections, and for pedestrian and bicyclists.

Countermeasures

This section summarizes the countermeasures considered for implementation to address traffic safety along roadway segments, at intersections, and for pedestrians and bicyclists. Note: many of the countermeasures overlap, which illustrates how some countermeasures address multiple safety issues.

Roadway Segments

There are a variety of potential safety solutions that can be applied within Independence to address systemic crashes that occur along roadway segments, such as head-on collisions, sideswipes, and run off the road crashes as well as general speeding and other driver behaviors.

- Enhanced signs and pavement markings for curves (with and without flashing beacons)
- Tree/vegetation removal
- Street lighting
- Speed reduction treatments/traffic calming
- Enhanced enforcement
- Roadway reconfiguration

Intersections

There are a variety of potential safety solutions that can be applied within Independence to address systemic crashes that occur at intersections, such as angled crashes, turning movement crashes, rear-end crashes, and crashes that involve other travel modes (pedestrian, and bicycles).

- Enhanced signs and pavement markings (e.g. stop signs, warning signs, and/or beacons)
- Enhanced visibility of the intersection for entering vehicles (e.g. warning signs, street name signage on both sides of the road, and intersection lighting)
- Application of traffic control devices (signs, markings and signals)
- Signal improvements (e.g. signal timing, signal phasing)
- Left-turn phasing (e.g. permitted, protected, permitted-protected)
- Enhanced enforcement
- Pedestrian and bicycle improvements (see below)
- Intersection lighting
- Speed reduction treatments/traffic calming
- Roundabouts

Pedestrian and Bicycle

There are a variety of potential safety solutions that can be applied within Independence to address pedestrian and bicycle safety. The following provides a summary of the solutions by traffic control.

Signalized Intersections

Pedestrian Safety Solutions

- Street lighting
- Right-turn channelization
- Countdown pedestrian heads
- Leading pedestrian interval
- Left-turn phasing
- Vehicle turning movement restrictions
- Curb extensions (bulb-outs, neck downs)

Bicycle Safety Solutions

- Street lighting
- Bicycle signal
- Bicycle detection
- Pavement markings
- Right-turn channelization
- Leading bicycle interval
- Left-turn phasing
- Vehicle turning movement restrictions
- Protected intersection design
- Forward bicycle queueing area (bike box)

Unsignalized intersections

Pedestrian Safety Solutions

- Street lighting
- Enhanced crossing treatments
- Reduced curb radii
- Pedestrian refuge island or median
- Speed reduction treatments
- Vehicle turning movement restrictions
- Raised crosswalks

Bicycle Safety Solutions

- Street lighting
- Enhanced crossing treatments
- Reduced curb radii
- Skip Striping
- Supplemental signs and markings
- Bicycle boulevards
- Longitudinal bike stencil
- Speed reduction treatments
- Vehicle turning movement restrictions
- Strip bike lanes
- Raised crossings

Roadway segment – No traffic control

Pedestrian Safety Solutions

- Street lighting
- In-roadway warning lights
- Pedestrian-activated warning beacons
- Access management
- Sidewalks street lighting
- Enhanced mid-block crossing treatments
- Road reconfiguration
- Pedestrian refuge island or median

Bicycle Safety Solutions

- Access management
- Bicycle route signage
- Longitudinal bike stencil
- Separated bike lanes
- Dynamic warning signs
- Enhanced mid-block crossing treatments
- Street lighting
- Restrict on-street parking
- Road reconfiguration
- Refuge Island or median

Safety Alternatives

This section summarizes the alternatives developed to address traffic safety within Independence. The alternatives identified focus on safety issues identified from the crash data and perceived safety issues based on feedback from the PMT, advisory committees, and public comments.

OR 51/Stryker Road Intersection

There is an excess proportion of turning movement crashes that have occurred at this intersection and a high likelihood of future occurrence. In addition, the speed of southbound vehicles on OR 51-Main Street is a perceived safety issue. Potential alternatives include:

- Install advance intersection warning signs and/or flashing beacons as advance warning
- Install street name signage on both sides of the road – street name signs provide clarification on the location of local streets and reduce slowing or stopping near minor street connections
- Install southbound dynamic speed feedback sign after entering Independence
- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on OR 51-Main Street approaching the intersection

OR 51-Main Street/Deann Drive Intersection

Pedestrian crossings and speed are a perceived safety issues at this location, specifically for access to and from the A1 Market in the southeast corner. Potential alternatives include:

- Install advance intersection warning signs
- Install street name signage on both sides of the road
- Provide traffic calming measures on OR 51-Main Street approaching the intersection
- Install enhanced pedestrian crossing treatments

OR 51-Main Street/Polk Street Intersection

The concentration of all modes at this intersection (freight, private vehicles, pedestrians, transit) is a perceived safety issue at this location. Potential alternatives include:

- Install advance intersection warning signs and/or flashing beacons as advance warning
- Install street name signage on both sides of the road
- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Install additional lighting
- Provide traffic calming measures on OR 51-Main Street approaching the intersection

OR 51-Main Street/Grand Street Intersection

Visibility is a perceived safety issue at this location, specifically for access to and from the dog park to the east. Potential alternatives include:

- Install advance intersection warning signs
- Install street name signage on both sides of the road
- Install additional lighting
- Provide traffic calming measures on OR 51-Main Street approaching the intersection
- Conduct regular maintenance to trim vegetation to improve sight distance for vehicles turning from the east leg of Grand Street

OR 51-Main Street/OR 51-Monmouth Street Intersection

Pedestrian safety is a perceived issue at this location. Potential alternatives include:

- Evaluate need for traffic control modification (i.e. traffic signal)
- Install additional lighting to support the existing pedestrian-scale lighting
- Install enhanced pedestrian crossing treatments

OR 51-Monmouth Street/4th Street Intersection

There is an excess proportion of angle movement crashes that have occurred at this intersection and a high likelihood of future occurrence. Potential alternatives include:

- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection

OR 51-Monmouth Street/7th Street Intersection

Lack of mainline traffic control is a perceived safety issue at this location. In addition, there is an excess proportion of rear-end crashes that have occurred at this intersection and a high likelihood of future occurrence. Potential alternatives include:

- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection

Hoffman Road/Stryker Road

There is a perceived safety issues at the Hoffman Road/Stryker Road intersection where motorists disregard the right-turn only sign and turn left from Hoffman Road to Stryker Road. Potential alternatives include:

- Remove the right-turn only sign
- Reconfigure the intersection to reinforce the intent of the right-turn only sign
- Realign Hoffman Road at Stryker Road if/when redevelopment occurs
- Close Hoffman Road at Stryker Road – alternative access is provided to the east

Hoffman Road/Gun Club Road Intersection

There is an excess proportion of rear-end crashes that have occurred at this intersection and a high likelihood of future occurrence. In addition, the speed of vehicles on Hoffman Road is a perceived safety issue. Potential alternatives include:

- Install advance intersection warning signs and/or flashing beacons as advance warning
- Install street name signage on both sides of the road
- Install an eastbound dynamic speed feedback sign after entering Independence
- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on Hoffman Road approaching the intersection

Hoffman Road/16th Street Intersection

The speed of vehicles on Hoffman Road is a perceived safety issue. In addition, the eastbound approach was listed as a top 15 percent SPIS site per the most recent SPIS list (2017). Potential alternatives include:

- Install advance intersection warning signs and/or flashing beacons as advance warning
- Install street name signage on both sides of the road
- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on Hoffman Road approaching the intersection

Main Street/River Road Intersection

There is an excess proportion of rear-end crashes that have occurred at this intersection and a high likelihood of future occurrence. In addition, the speed of northbound vehicles on OR 51-Main Street is a perceived safety issue. Potential alternatives include:

- Install advance intersection warning signs and/or flashing beacons as advance warning
- Install dynamic advance warning signs and/or flashing beacons on the bridge
    - Dynamic warning signage could warn approaching drivers about queued vehicles or about cyclists sharing the road on the bridge
- Install street name signage on both sides of the road
- Install a northbound dynamic speed feedback sign after entering Independence
- Install a "Welcome to Independence" sign south of the intersection
- Evaluate need for traffic control modification (i.e. all-way stop-control, traffic signal, roundabout)
- Provide traffic calming measures on OR 51-Main Street approaching the intersection
- Conduct a speed study to evaluate ability to move the posted speed transition from 40 MPH to 30 MPH further south of the intersection (currently located approximate 250 feet south of the intersection)

OR 51-Main Street Segment (B Street to D Street – Downtown Area)

Pedestrian safety is a perceived issue at this location. Potential alternatives include:

- Install pedestrian crossing signage at all marked crosswalks
- Install bicycle facilities and/or shared roadway pavement markings
- Provide traffic calming measures on OR 51-Monmouth Street

OR 51-Monmouth Street Segment (Gun Club Road to Western City Limits)

This roadway segment exceeds the crash rate for similar facilities. Potential alternatives include:

- Install an eastbound dynamic speed feedback sign after entering Independence
- Install a "Welcome to Independence" sign for eastbound traffic
- Provide traffic calming measures on OR 51-Monmouth Street

Hoffman Road Segment (Airport Road to Western City Limits)

Speed is a perceived safety issue for this roadway segment. Potential alternatives include:

- Install dynamic speed feedback signage
- Provide traffic calming measures on Hoffman Road
- Reconfigure the roadway so that it feels more urban (i.e. narrower lanes travel lanes, bike lanes, plants street trees where there are gaps, etc.)

4^{th} Street Segment (OR 51-Monmouth Street to Spruce Street)

This roadway segment exceeds the crash rate for similar facilities, and speed is a perceived safety issue. Potential alternatives include:

- Create new no parking zones on both sides of the street at intersections
- Install additional lighting at intersections
- Install bicycle facilities and/or shared roadway pavement markings
- Install street name signage on both sides of the road at intersections
- Provide traffic calming measures on 4^{th} Street

6^{th} Street Segment (OR 51-Monmouth Street to G Street)

Visibility is a perceived safety issue at this location, often due to parked vehicles. Potential alternatives include:

- Create new no parking zones on both sides of the street at intersections
- Install additional lighting at intersections

Stryker Road

Speed is a perceived safety issue for this roadway. Potential alternatives include:

- Install dynamic speed feedback signage
- Provide traffic calming measures on Stryker Road
- Enhanced signs and pavement markings for the roadway curve west of OR 51

Gun Club Road

Speed is a perceived safety issue for this roadway. Potential alternatives include:

- Install dynamic speed feedback signage
- Provide traffic calming measures on Gun Club Road

7^{th} Street

Speed is a perceived safety issue for this roadway. Potential alternatives include:

- Install dynamic speed feedback signage
- Provide traffic calming measures on 7^{th} Street

C Street

Speed is a perceived safety issue for this roadway. Potential alternatives include:

- Install dynamic speed feedback signage
- Provide traffic calming measures on C Street

Morning Glory Drive, Northgate Drive, and Marigold Drive

Speed is a perceived safety issue for this neighborhood. Potential alternatives include:

- Provide traffic calming measures on roadways

City-wide

In addition to the alternatives provided above to address location-specific safety issues, the following are potential city-wide alternatives to consider:

- Provide increased community education on sharing the road, both for drivers and bicyclists

- Review lighting and systemically provide additional lighting on arterial and collector street segments and at intersections throughout Independence
- Review sign reflectivity and visibility and systemically upgrade throughout Independence
- Install reflectorized back plates for all traffic signal heads
- Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections
- Install enhanced pedestrian crossings on higher-speed and/or wider cross-section roadways (i.e. marked crossing with pedestrian refuge)

LOCAL STREET CONNECTIVITY AND EXTENSION PLAN

Most streets within Independence are classified as local streets. The local streets within downtown Independence and throughout most of the area south of Ash Creek were built on a grid system, while the local streets north of Ash Creek were built on a network of cul-de-sacs and stub streets, which limits the potential for future connections. These streets can be desirable to residents because they tend to have lower traffic volumes and travel speeds; however, cul-de-sacs and stub streets result in longer trip distances, increased reliance on arterials and collectors for local trips, and limited options for people to walk and bike to the places they want to go.

Incremental improvements to the street system can be planned carefully to provide route choices for motorists, cyclists, and pedestrians while accounting for potential neighborhood impacts. In addition, the quality of the transportation system can be improved by making connectivity improvements to the pedestrian and bicycle system separate from street connectivity, as discussed in the previous sections. The following summarizes the potential local street connection and extension opportunities within Independence.

Local Street Connections

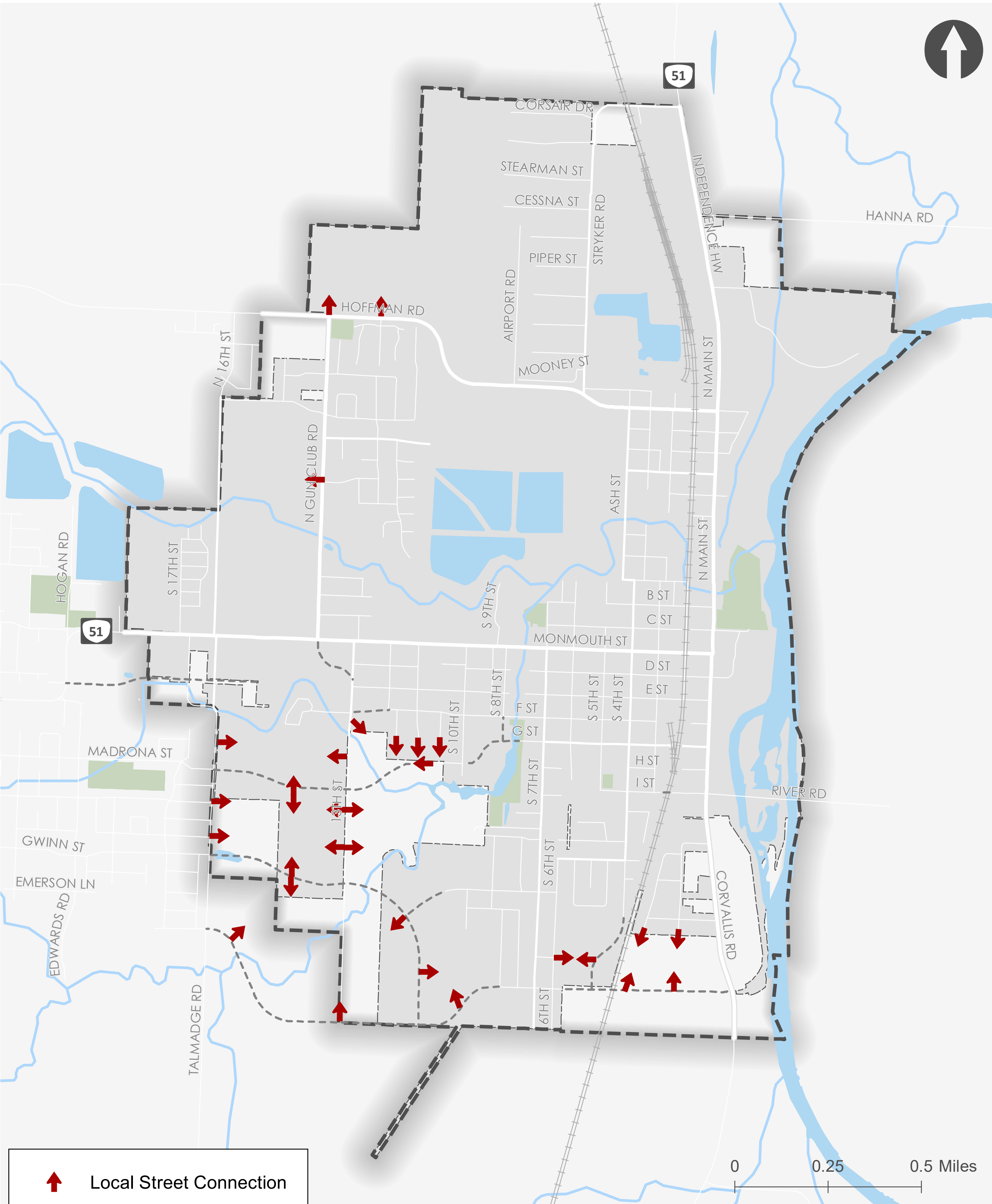
There are a number of areas within Independence that could experience future development or redevelopment, including in the southwest, south, and north parts of the City. Within these areas, there are opportunities for new local streets that could improve access and circulation for all travel modes. Figure 10 illustrates the location of the local street connections. The arrows shown in Figure 10 represent potential connections and the general direction for the placement of the connection. In each case, the specific alignments and design will be determined upon development review.

Street Extensions

In addition to new local streets, there are opportunities to extend existing streets as shown in Figure 10.

EMERGING TECHNOLOGIES

Transportation technologies are rapidly evolving, and cities are evaluating what steps they can take to be prepared. The challenge is that most emerging technologies are initiated by the private sector and can be difficult to predict. So how can cities use their money efficiently while also seeing the benefits of emerging technology? The following summarizes several steps the City can take to prepare for emerging technology.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 5\10_Local Street Connectivity.mxd - mbell - 7:59 AM 10/30/2020

Local Street Connection

Collector; Minor Arterial

City Boundary

Urban Growth Boundary

Local Street Connectivity
Independence, OR

Figure
10

Data Source: Polk County Data Portal, ODOT

Emerging Technologies

Transportation Technology Liaison

A transportation technology liaison is someone who facilitates connections between the city and private sector companies offering various forms of emerging technologies. The liaison could be a City employee, an employee of a public or private organization, or a private contractor. The liaison role could also be developed in coordination with City of Monmouth, Western Oregon University, and/or others (see stakeholder connection for more potential roles and responsibilities of the liaison).

Public Partnerships

Public partnerships are strategic partnerships with public entities in the region, state, or nation which can provide value to the City in the form of collaboration or other means depending on the partnership. The two primary public partnerships which may be most beneficial to the City are university partnerships and city partnerships.

- University partnership can be beneficial to the City by providing them with a direct connection to students and research programs. In addition, the partnership can create student interest and engagement with the City and encourage students to come to Independence after completing their studies.
- City partnership can be beneficial to the City by allowing them to pool resources and collaborate on emerging technologies and to support users in the region so that emerging technologies do not stop at the city limits.

Private Sector Incentives

Private sector incentives are incentives provided to private sector companies that focus on emerging technologies to encourage them to operate in the City. These incentives could include financial assistance to help with the start-up cost or other incentives that lower the bar for operating within the City.

Private Sector Policies

As emerging technologies are primarily initiated by private sector companies, cities need to find a way to effectively work with these companies if they want to be supported by the emerging technologies. The primary connecting point of cities and private sector companies is through policy. Currently, the prime example of this interaction can be found in cities with micro mobility services, such as e-scooters. However, as private sector companies advance autonomous vehicle fleets and other technologies, these policies could become instrumental in maintaining a healthy transportation network. For example, policies that prevent an autonomous vehicle from using a specific cut through route and prioritizing routes that utilize the City's arterial network.

Review Current Policies

In addition to crafting new policy to accommodate emerging technologies, the review of current policies can be an effective first step to prepare the city for emerging technologies. Cities preparing for emerging technologies should review their current policies through the lens of the future technology they plan to accommodate. If the policy hinders or prohibits the desired future technology, alterations should be considered for that policy. Specifically, a review of the development code can be effective to find and alter policies that could prevent future flexible use areas as many innovative technologies push the boundaries of traditional land uses.

Technology Incubators and Startup Labs

As a focus on creative problem solving has emerged and startup businesses have begun to gain popularity, Technology Incubators and Startup Labs have become an effective means to foster innovation and entrepreneurship. Technology Incubators (commonly referred to as Incubators) and Startup Labs provide infrastructure for new ideas and emerging businesses to grow.

Infrastructure

Investing in new infrastructure is often the first step cities take in preparing for emerging technologies. However, as emerging technologies are driven by the private sector, they can change rapidly and may not require major changes to the existing system to be effective. The following summarizes infrastructure improvements that could be useful to consider now in anticipation of the future transportation system.

- **EV Charging Stations** – Electric vehicle (EV) charging stations could be provided in many areas throughout the city to support the growing use of electric vehicles. EV charging stations could be a requirement of private development
- **Curb Management** – As the city develops, curb management will become more important to ensure an efficient use of the space. When an autonomous fleet becomes available to cities, parking in the quantity it is provided today will likely not be necessary. The City should begin to make plans for adaptive reuse of parking areas and find alternative uses for parking around the city, especially near mobility hubs. Considerations for pick-up drop-off zones at key destinations that are more likely to be used by mobility on demand, ride sharing, and taxi services.

Connect with Stakeholders about Emerging Technologies

When adopting emerging technologies into the transportation system, it is important to connect with stakeholders prior to adoption to ensure the service can be offered throughout the city and surrounding area. The transportation needs of the community are not contained within the UGB of the city nor are the needs contained to only streets owned and operated by the City. Key stakeholders for the City include local residents, the City of Monmouth, Polk County, and ODOT.

Mobility on Demand & Innovative Transit

Technology advances in ride hailing and other forms of transit (transportation with vehicles not owned by the user) have allowed for some innovative solutions to challenges that have been present in transportation systems for decades. These new transportation services are all in various phases of development and therefore some may not be practical at this time. A common service available now are services that offer mobility on demand such as Uber and Lyft. Mobility on demand is an effective way to offer a transportation alternative that is generally accepted among users around the world already. The addition of mobility on demand offers users a means to go directly from point A to point B without the need to park or return to a specific destination. Establishing these services in the area can also be used as an effective means to set up the city for a future autonomous shuttle service. Multiple mobility on demand service providers have programs developing autonomous technology. If a public-private relationship can be formed and Independence can be included in the service area, then this can open the door for an autonomous shuttle fleet that is funded/provided via private sector funding and through good policy practices these services can be regulated to function in the best interest of the city.

Mobility Hubs

Another major step Independence can take now is establishing mobility hubs within the city. Designating them early and building the infrastructure needed to support them is important to the success of the mobility hubs. As a first step in the formation of mobility hubs the City of Independence should identify one primary as well as one secondary mobility hub. The primary will be the priority for transportation infrastructure in the City of Independence and the secondary will be developed when funding already satisfies the needs of the primary. Due to the waterfront plan and recent development in the area, the downtown/waterfront area should be the primary mobility hub and a potential secondary hub could be located somewhere in the vicinity of the airport or somewhere in the developing southwest concept area.

Emerging Technology Alternatives

The following summarizes a list of discrete steps (primarily planning and policy related) that the City can take to be prepared for the emergence of new transportation technologies.

- Create a Transportation Technology Liaison Role: This role should be in conjunction with Monmouth and serve to carry out the listed tasks below.
- Connect with cities in the surrounding area (Salem and Monmouth), establish a service zone for any emerging technology coming to the area.
- Develop partnerships and programs with Western Oregon University to attract students.
- Review the development code and create avenues for flexible uses.
- Hold public outreach to determine which emerging technologies local residents are interested in.
- Meet with ODOT, City of Monmouth, Polk County and any other relevant jurisdictions in the surrounding area and discuss emerging technologies.
- Establish a primary and secondary mobility hub in the City.
- Consider adding EV charging requirement to development code.
- Invest in pick-up drop-off loops and adaptive reuse design for any parking structures/lots.
- Allow multiple ride-hailing services and micromobility services (E-scooters, bike share, etc.) to be established in Independence.

PARKING

Parking in downtown Independence is provided along both sides of most streets, including OR 51-Main Street and OR 51-Monmouth Street. Parking is also provided in several public and private off-street parking lots. There are currently no limitations or restrictions on the use of the on-street or off-street parking stalls, in terms of who can park there and for how long. The following summarizes potential alternatives considered to address parking in downtown Independence.

- Prepare a municipal parking management plan for downtown Independence. The plan should consider the following parking management strategies:
  - Truck loading zones, taxi zones, zones for rideshare vehicles (i.e. Uber, Lyft)
  - Time limits (2-hours, 30 minutes, 15 minute) in the marked stalls on OR 51
  - Disabled parking (location and design)
  - Parking enforcement policies and strategies

- Work with local business owners to establish parking areas for employees.
- Develop how to park resources and parking maps

FUNDING PROGRAMS

The following summarizes current and potential future funding sources for transportation improvements.

Current Transportation Funding Sources

State Revenue

The primary state revenue source is the state gas tax. State gas taxes are comprised of proceeds from excise taxes imposed by the state and federal government to generate revenue for transportation funding. The proceeds from these taxes are distributed to Oregon counties and cities in accordance with Oregon Revised Statute (ORS) 366.764, by county registered vehicle number, and ORS 366.805, by city population. The Oregon Constitution states that revenue from the state gas tax is to be used for the construction, reconstruction, improvement, maintenance, operation and use of public highways, roads, streets, and roadside rest areas.

Local Revenue

The primary local revenue source is from Transportation SDCs. Transportation SDCs are fees assessed on developments for impacts to the transportation infrastructure. All revenue is dedicated to transportation capital improvement projects designed to accommodate growth. The City can offer SDC credits to developers that provide public improvements beyond the required street frontage, including those that can be constructed by the private sector at a lower cost. For example, SDC credits might be given for providing off-site improvements, such as sidewalks and bike lanes that connect the site to nearby transit stops. Independence uses the revenue from SDCs on eligible projects that cannot be funded by other means.

Potential Transportation Funding Sources

Based on the current transportation funding sources identified above, Independence will likely need to identify additional funding sources that can be dedicated to transportation-related capital improvement projects over the next 20 years. The City will likely rely upon transportation improvements grants, partnerships with regional and state agencies, and other funding sources to help implement future transportation-related improvements. Table 4 summarizes the funding opportunities and identifies the intended use of the funds and any applicable project types. Attachment C contains detailed descriptions of the funding opportunities identified below.

Table 4: Funding Opportunities Summary

Funding Source	Intended Use
Federal Sources	
FAST Act	Road, bridge, bicycling, and pedestrian improvements
STBG	Preserve and improve surface transportation investments from a flexible funding source
TA Set-Aside	Smaller-scale transportation projects
CMAQ	Support programs that reduce emissions from transportation-related activities

HSIP	Reduce traffic fatalities and serious injuries on all public roads
BUILD	Road, rail, transit, and port projects that achieve national objectives and have significant local and regional impact
Recreational Trails	Develop and maintain recreational trails and trail-related facilities
NHPP	Projects that improve conditions along NHS Routes
State Sources	
STIP	Multi-modal projects on federal, state, and local facilities
State Highway Trust Fund	Bicycle and pedestrian infrastructure improvements
SWIP	Projects that enable people to move across or around the state highway system
SRTS	Projects that improve safety for children walking or biking to school
ARTS	Projects that address hotspot and systemic safety issues and concerns (roadway departure, intersection safety, and bicycle and pedestrian safety); part of STIP program and utilizes federal HSIP funds
OCP	Create and maintain connections through shared-use paths
HB 2017	Create a steady funding stream for statewide transportation improvements
MAT *Rules to be established in 2020**	Expected to support bicycle and pedestrian infrastructure improvements
Local Sources	
SDC	Increase capacity of transportation system to accommodate growth
TUF	Provide additional funding for transportation infrastructure
Local Fuel Tax	Adds a tax on top of gasoline costs that support street operation, maintenance, and preservation
Local Improvement Districts (LIDs)	Pools funds from property owners to make local transportation improvements
Economic Improvement Districts (EIDs)	Pools funds from area businesses to make improvements in the business district.
Urban Renewal/Tax Increment Financing	Raises revenue from increased property values in an area to fund localized improvements
Local Bond Measures	Asks voters for bond funding to finance a set list of infrastructure investments
Street Utility Fee/Road Maintenance Fee	Calculates trips generated for land uses and charges owners a fee relative to the number of trips

Southwest Independence Concept Area

The Southwest Independence Concept Area has special funding considerations because the transportation system does not currently extend into this area. Therefore, there are major investments that will need to be made as development occurs, specifically facilities that provide connectivity for vehicles, pedestrians, and bicyclists. In addition to the funding sources that will be available city-wide, funding sources that may be more specifically targeted to the Southwest Independence Concept Area include the following (all previously described above):

- Better Utilizing Investments to Leverage Development (BUILD) Grant
- Recreational Trails Program
- Statewide Transportation Improvement Program (STIP)

- Safe Routes to School Program (SRTS)
- Oregon Community Paths Program (OCP)
- House Bill (HB) 2017 Transportation Investments
- Multimodal Active Transportation Fund (MAT)
- System Development Charges (SDC)/Transportation Impact Fees
- Local Improvement Districts (LID)

The Southwest Independence Concept Plan also outlined the following mechanisms around cost-sharing approaches as this area develops:

- Require developers to provide for local streets, as well as water, wastewater and stormwater facilities required to serve proposed development, consistent with existing city Comprehensive Plan policies and code provisions.
- Generally, use the City's system development charges to pay for system-wide improvements associated with new growth, including growth and development in the planning area.
- The extent that some needed improvements are not currently included in the Capital Improvement Plans associated with those SDCs, the CIPs and SDC methodologies and/or fees may need to be updated to accurately reflect the cost of improvements needed in the Planning Area or elsewhere, including the following:
  - Collector and arterial roads in the Planning Area
- Use of rough proportionality requirements to ensure that developers construct or pay for their proportional share of new collector and arterial roads within the Planning Area to the extent that they are needed to serve development within that area.
- Consider use of development agreements to clarify responsibilities for funding and constructing new improvements, including cost-sharing among multiple property owners.
- Consider use of "late-comers" agreements to identify how property owners or developers may be reimbursed for a portion of the cost of a needed improvement if the improvement also will benefit other future development but must be constructed before that development occurs.
- Consider the establishment of a Local Improvement District (LID) so that a group of property owners can share in the cost of transportation infrastructure improvements or other types of public improvements such as installing water and sanitary sewer lines.

DEVELOPMENT CODE AMENDMENTS

Oregon Administrative Rule (OAR) 660, Division 12, also known as the Transportation Planning Rule (TPR), defines the necessary elements of a local TSP and how to implement Statewide Planning Goal 12 – Transportation. The overall purpose of the TPR is to provide and encourage a safe, convenient, and economic transportation system. The rule also implements provisions of other statewide planning goals related to transportation planning in order to plan and develop transportation facilities and services in close coordination with urban and rural development. The TPR directs TSPs to integrate comprehensive land use planning with transportation needs and to promote multi-modal systems that make it more convenient for people to walk, bicycle, use transit and drive less. The Independence TSP must be consistent with the TPR, which was amended most recently in 2010.

The TPR requires cities to prepare local TSPs that are consistent with the Oregon Transportation Plan (OTP); Technical Memorandum #1 (Plans and Policy Review) addresses the OTP and other background documents that will be referenced in updating the TSP. Attachment C contains a review of the City's Development Code for compliance with the TPR.. The table contained in Attachment C describes how city development requirements meet particular TPR sections. The table provides a list of recommended Development Code amendments, recommended modifications that may be necessary to implement the updated TSP or where local requirements could be strengthened to be more consistent with the TPR. To the extent necessary, suggested draft code language will be prepared at the implementation phase of the TSP update project that supports the policies and recommendations of the draft TSP.

TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) is a general term used to describe any action that removes single occupancy vehicle (SOV) trips from the roadway during peak time periods. As population and employment increase in the city, the number of trips will also increase. The ability to change travel behavior and provide alternative modes will help accommodate the growth in trips without the need for significant investments in new infrastructure. A major focus of TDM is on major employers; however, there are many things the City can do to support TDM implementation. The following summarizes TDM alternatives that can be applied by the City.

- Learn about TDM and the role it can play in achieving local planning objectives
- Encourage and require local businesses to implement TDM solutions
- Work to build partnerships with community organizations to support TDM implementation.
- Help create TDM programs to provide local TDM services
- Improve non-motorized transportation facilities, public transit services, and other transportation services
- Support carshare, ridesharing, bikeshare, e-scooters, and other micromobility services
- Apply more comprehensive transportation planning, including multimodal level of service indicators when evaluating transportation improvements
- Implement TDM strategies, such as commute trip reductions programs for employees, and special transportation management when sponsoring events that attract crowds.

TDM strategies help achieve many of the City's goals, including reduced traffic congestion, reduced parking demand, improved mobility for non-drivers, improved community livability, improved public fitness and health, and others.

ATTACHMENTS

A. Intersection Operations Analysis Worksheets
B. Enhanced Crossing Treatments
C. Development Code Review

Attachment A Intersection Operations Analysis Worksheets

Intersection	
Int Delay, s/veh	15.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Future Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	100	-	-	200	-	-
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, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	126	2	107	6	2	4	104	467	4	8	525	146

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1293	607	1355	1364	469	671	0	0	471	0	0
Stage 1	614	614	-	677	677	-	-	-	-	-	-	-
Stage 2	680	679	-	678	687	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	164	496	128	149	598	924	-	-	1101	-	-
Stage 1	472	486	-	446	455	-	-	-	-	-	-	-
Stage 2	434	454	-	445	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 122	144	492	89	131	598	924	-	-	1101	-	-
Mov Cap-2 Maneuver	~ 122	144	-	89	131	-	-	-	-	-	-	-
Stage 1	419	483	-	396	404	-	-	-	-	-	-	-
Stage 2	380	403	-	341	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	92.7	34.6	1.7	0.1
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	122	470	134	1101	-	-
HCM Lane V/C Ratio	0.113	-	-	1.035	0.233	0.094	0.008	-	-
HCM Control Delay (s)	9.4	-	-	160	15	34.6	8.3	-	-
HCM Lane LOS	A	-	-	F	C	D	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	7.2	0.9	0.3	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Future Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	100	-	-	200	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	126	2	107	6	2	4	104	467	4	8	525	146

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1293	607	1355	1364	469	671	0	0	471	0	0
Stage 1	614	614	-	677	677	-	-	-	-	-	-	-
Stage 2	680	679	-	678	687	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	164	496	128	149	598	924	-	-	1101	-	-
Stage 1	472	486	-	446	455	-	-	-	-	-	-	-
Stage 2	434	454	-	445	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 123	144	492	90	131	598	924	-	-	1101	-	-
Mov Cap-2 Maneuver	236	263	-	173	229	-	-	-	-	-	-	-
Stage 1	419	483	-	396	404	-	-	-	-	-	-	-
Stage 2	380	403	-	341	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.7	20.9	1.7	0.1
HCM LOS	E	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	310	239	1101	-	-
HCM Lane V/C Ratio	0.113	-	-	0.761	0.053	0.008	-	-
HCM Control Delay (s)	9.4	-	-	45.7	20.9	8.3	-	-
HCM Lane LOS	A	-	-	E	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	5.8	0.2	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Future Vol, veh/h	120	2	102	6	2	4	99	444	4	8	499	139
Conflicting Peds, #/hr	0	0	9	9	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	-	-	-	100	-	-	200	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	6	0	2	0	0	0	1	5	0	0	2	3
Mvmt Flow	126	2	107	6	2	4	104	467	4	8	525	146

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1294	1293	607	1355	1364	469	671	0	0	471	0	0
Stage 1	614	614	-	677	677	-	-	-	-	-	-	-
Stage 2	680	679	-	678	687	-	-	-	-	-	-	-
Critical Hdwy	7.16	6.5	6.22	7.1	6.5	6.2	4.11	-	-	4.1	-	-
Critical Hdwy Stg 1	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.16	5.5	-	6.1	5.5	-	-	-	-	-	-	-
Follow-up Hdwy	3.554	4	3.318	3.5	4	3.3	2.209	-	-	2.2	-	-
Pot Cap-1 Maneuver	137	164	496	128	149	598	924	-	-	1101	-	-
Stage 1	472	486	-	446	455	-	-	-	-	-	-	-
Stage 2	434	454	-	445	450	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 123	144	492	90	131	598	924	-	-	1101	-	-
Mov Cap-2 Maneuver	236	263	-	173	229	-	-	-	-	-	-	-
Stage 1	419	483	-	396	404	-	-	-	-	-	-	-
Stage 2	380	403	-	341	447	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.4	20.9	1.7	0.1
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	924	-	-	236	484	239	1101	-	-
HCM Lane V/C Ratio	0.113	-	-	0.535	0.226	0.053	0.008	-	-
HCM Control Delay (s)	9.4	-	-	36.6	14.6	20.9	8.3	-	-
HCM Lane LOS	A	-	-	E	B	C	A	-	-
HCM 95th %tile Q(veh)	0.4	-	-	2.9	0.9	0.2	0	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Intersection Delay, s/veh	9.1
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	235	12	575	679
Demand Flow Rate, veh/h	245	12	599	694
Vehicles Circulating, veh/h	549	729	144	113
Vehicles Exiting, veh/h	257	14	650	628
Ped Vol Crossing Leg, #/h	0	0	9	0
Ped Cap Adj	1.000	1.000	0.999	1.000
Approach Delay, s/veh	8.4	5.7	8.8	9.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	245	12	599	694
Cap Entry Lane, veh/h	788	656	1191	1230
Entry HV Adj Factor	0.959	1.000	0.959	0.979
Flow Entry, veh/h	235	12	575	679
Cap Entry, veh/h	756	656	1142	1204
V/C Ratio	0.311	0.018	0.503	0.564
Control Delay, s/veh	8.4	5.7	8.8	9.6
LOS	A	A	A	A
95th %tile Queue, veh	1	0	3	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	2	102	6	2	4	99	444	4	8	499	139
Future Volume (veh/h)	120	2	102	6	2	4	99	444	4	8	499	139
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.97	0.98		0.97	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1668	1750	1723	1750	1750	1750	1736	1682	1750	1750	1723	1709
Adj Flow Rate, veh/h	126	2	107	6	2	4	104	467	4	8	525	146
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	6	0	2	0	0	0	1	5	0	0	2	3
Cap, veh/h	476	5	252	245	84	81	443	955	8	606	744	207
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.57	0.57	0.57	0.57	0.57	0.57
Sat Flow, veh/h	1337	27	1423	435	475	455	773	1665	14	937	1297	361
Grp Volume(v), veh/h	126	0	109	12	0	0	104	0	471	8	0	671
Grp Sat Flow(s),veh/h/ln	1337	0	1450	1365	0	0	773	0	1679	937	0	1658
Q Serve(g_s), s	0.2	0.0	2.1	0.0	0.0	0.0	3.6	0.0	5.3	0.2	0.0	9.3
Cycle Q Clear(g_c), s	2.4	0.0	2.1	2.1	0.0	0.0	12.9	0.0	5.3	5.5	0.0	9.3
Prop In Lane	1.00		0.98	0.50		0.33	1.00		0.01	1.00		0.22
Lane Grp Cap(c), veh/h	476	0	257	410	0	0	443	0	963	606	0	951
V/C Ratio(X)	0.26	0.00	0.42	0.03	0.00	0.00	0.23	0.00	0.49	0.01	0.00	0.71
Avail Cap(c_a), veh/h	989	0	813	946	0	0	819	0	1779	1061	0	1756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	11.7	10.9	0.0	0.0	9.5	0.0	4.1	5.7	0.0	4.9
Incr Delay (d2), s/veh	0.3	0.0	1.1	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.6	0.1	0.0	0.0	0.4	0.0	0.5	0.0	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	12.8	11.0	0.0	0.0	9.8	0.0	4.4	5.7	0.0	5.9
LnGrp LOS	B	A	B	B	A	A	A	A	A	A	A	A
Approach Vol, veh/h		235			12			575			679	
Approach Delay, s/veh		12.5			11.0			5.4			5.9	
Approach LOS		B			B			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		22.4		9.7		22.4		9.7				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		34.0		18.0		34.0		18.0				
Max Q Clear Time (g_c+I1), s		14.9		4.4		11.3		4.1				
Green Ext Time (p_c), s		3.5		0.9		4.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			6.8									
HCM 6th LOS			A									

Intersection	
Intersection Delay, s/veh	33
Intersection LOS	D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	254	257	280	257	285	262
Future Vol, veh/h	254	257	280	257	285	262
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	267	271	295	271	300	276
Number of Lanes	1	0	1	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	1
HCM Control Delay	57.7	22.6	20
HCM LOS	F	C	C

Lane	NBLn1	NBLn2	EBLn1	SBLn1	SBLn2
Vol Left, %	100%	0%	50%	0%	0%
Vol Thru, %	0%	100%	0%	100%	0%
Vol Right, %	0%	0%	50%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	257	511	285	262
LT Vol	280	0	254	0	0
Through Vol	0	257	0	285	0
RT Vol	0	0	257	0	262
Lane Flow Rate	295	271	538	300	276
Geometry Grp	7	7	2	7	7
Degree of Util (X)	0.658	0.57	0.975	0.636	0.526
Departure Headway (Hd)	8.032	7.585	6.527	7.628	6.868
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes
Cap	451	476	559	474	524
Service Time	5.783	5.336	4.527	5.377	4.618
HCM Lane V/C Ratio	0.654	0.569	0.962	0.633	0.527
HCM Control Delay	25	20	57.7	22.8	17
HCM Lane LOS	C	C	F	C	C
HCM 95th-tile Q	4.6	3.5	13.4	4.4	3

Intersection	
Intersection Delay, s/veh	19.9
Intersection LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	254	257	280	257	285	262
Future Vol, veh/h	254	257	280	257	285	262
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	267	271	295	271	300	276
Number of Lanes	1	1	1	1	1	1

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	2	2
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	2	2	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	2	0	2
HCM Control Delay	19.5	21.3	19
HCM LOS	C	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	100%	0%	0%	0%
Vol Thru, %	0%	100%	0%	0%	100%	0%
Vol Right, %	0%	0%	0%	100%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	280	257	254	257	285	262
LT Vol	280	0	254	0	0	0
Through Vol	0	257	0	0	285	0
RT Vol	0	0	0	257	0	262
Lane Flow Rate	295	271	267	271	300	276
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.64	0.554	0.602	0.514	0.619	0.511
Departure Headway (Hd)	7.819	7.376	8.105	6.843	7.428	6.674
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	463	490	447	528	486	541
Service Time	5.555	5.111	5.836	4.574	5.163	4.408
HCM Lane V/C Ratio	0.637	0.553	0.597	0.513	0.617	0.51
HCM Control Delay	23.5	18.9	22.4	16.6	21.5	16.2
HCM Lane LOS	C	C	C	C	C	C
HCM 95th-tile Q	4.4	3.3	3.9	2.9	4.1	2.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	254	257	280	257	285	262
Future Volume (veh/h)	254	257	280	257	285	262
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1709	1736	1750	1695	1695	1723
Adj Flow Rate, veh/h	267	271	295	271	300	276
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	1	0	4	4	2
Cap, veh/h	202	205	309	244	524	482
Arrive On Green	0.27	0.27	0.64	0.64	0.64	0.64
Sat Flow, veh/h	756	767	386	379	813	748
Grp Volume(v), veh/h	539	0	566	0	0	576
Grp Sat Flow(s),veh/h/ln	1526	0	764	0	0	1561
Q Serve(g_s), s	24.0	0.0	39.3	0.0	0.0	18.7
Cycle Q Clear(g_c), s	24.0	0.0	58.0	0.0	0.0	18.7
Prop In Lane	0.50	0.50	0.52			0.48
Lane Grp Cap(c), veh/h	407	0	553	0	0	1006
V/C Ratio(X)	1.32	0.00	1.02	0.00	0.00	0.57
Avail Cap(c_a), veh/h	407	0	553	0	0	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	33.0	0.0	26.5	0.0	0.0	9.0
Incr Delay (d2), s/veh	162.2	0.0	44.2	0.0	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.0	0.0	19.1	0.0	0.0	5.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	195.2	0.0	70.6	0.0	0.0	9.8
LnGrp LOS	F	A	F	A	A	A
Approach Vol, veh/h	539			566	576	
Approach Delay, s/veh	195.2			70.6	9.8	
Approach LOS	F			E	A	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		62.0		28.0		62.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		58.0		24.0		58.0
Max Q Clear Time (g_c+I1), s		60.0		26.0		20.7
Green Ext Time (p_c), s		0.0		0.0		5.0

Intersection Summary			
HCM 6th Ctrl Delay			89.7
HCM 6th LOS			F

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	254	257	280	257	285	262
Future Volume (veh/h)	254	257	280	257	285	262
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1709	1736	1750	1695	1695	1723
Adj Flow Rate, veh/h	267	271	295	271	300	276
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	1	0	4	4	2
Cap, veh/h	335	302	363	299	569	523
Arrive On Green	0.21	0.21	0.70	0.70	0.70	0.70
Sat Flow, veh/h	1628	1471	427	428	813	748
Grp Volume(v), veh/h	267	271	566	0	0	576
Grp Sat Flow(s),veh/h/ln	1628	1471	854	0	0	1561
Q Serve(g_s), s	13.1	15.1	39.1	0.0	0.0	14.8
Cycle Q Clear(g_c), s	13.1	15.1	53.9	0.0	0.0	14.8
Prop In Lane	1.00	1.00	0.52			0.48
Lane Grp Cap(c), veh/h	335	302	662	0	0	1092
V/C Ratio(X)	0.80	0.90	0.85	0.00	0.00	0.53
Avail Cap(c_a), veh/h	348	314	728	0	0	1185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	31.8	32.6	17.4	0.0	0.0	6.0
Incr Delay (d2), s/veh	12.0	25.9	9.1	0.0	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.2	7.5	11.0	0.0	0.0	4.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	43.8	58.5	26.5	0.0	0.0	6.4
LnGrp LOS	D	E	C	A	A	A
Approach Vol, veh/h	538			566	576	
Approach Delay, s/veh	51.2			26.5	6.4	
Approach LOS	D			C	A	

Timer - Assigned Phs	2	4	6
Phs Duration (G+Y+Rc), s	63.0	21.3	63.0
Change Period (Y+Rc), s	4.0	4.0	4.0
Max Green Setting (Gmax), s	64.0	18.0	64.0
Max Q Clear Time (g_c+I1), s	55.9	17.1	16.8
Green Ext Time (p_c), s	3.0	0.2	5.1

Intersection Summary	
HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	254	257	280	257	285	262
Future Volume (veh/h)	254	257	280	257	285	262
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1709	1736	1750	1695	1695	1723
Adj Flow Rate, veh/h	267	271	295	271	300	276
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	1	0	4	4	2
Cap, veh/h	261	265	331	257	961	827
Arrive On Green	0.34	0.34	0.57	0.57	0.57	0.57
Sat Flow, veh/h	757	768	476	453	1695	1460
Grp Volume(v), veh/h	539	0	566	0	300	276
Grp Sat Flow(s),veh/h/ln	1528	0	929	0	1695	1460
Q Serve(g_s), s	31.0	0.0	42.6	0.0	8.4	9.1
Cycle Q Clear(g_c), s	31.0	0.0	51.0	0.0	8.4	9.1
Prop In Lane	0.50	0.50	0.52			1.00
Lane Grp Cap(c), veh/h	526	0	587	0	961	827
V/C Ratio(X)	1.02	0.00	0.96	0.00	0.31	0.33
Avail Cap(c_a), veh/h	526	0	587	0	961	827
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	24.7	0.0	10.3	10.4
Incr Delay (d2), s/veh	45.6	0.0	28.1	0.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	0.0	16.6	0.0	3.0	2.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	75.1	0.0	52.8	0.0	10.5	10.7
LnGrp LOS	F	A	D	A	B	B
Approach Vol, veh/h	539			566	576	
Approach Delay, s/veh	75.1			52.8	10.5	
Approach LOS	E			D	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		55.0		35.0		55.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		51.0		31.0		51.0
Max Q Clear Time (g_c+I1), s		53.0		33.0		11.1
Green Ext Time (p_c), s		0.0		0.0		3.2

Intersection Summary			
HCM 6th Ctrl Delay			45.5
HCM 6th LOS			D

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	254	257	280	257	285	262
Future Volume (veh/h)	254	257	280	257	285	262
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	0.99	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1709	1736	1750	1695	1695	1723
Adj Flow Rate, veh/h	267	271	295	271	300	276
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	1	0	4	4	2
Cap, veh/h	261	265	346	961	461	424
Arrive On Green	0.34	0.34	0.57	0.57	0.57	0.57
Sat Flow, veh/h	757	768	850	1695	813	748
Grp Volume(v), veh/h	539	0	295	271	0	576
Grp Sat Flow(s),veh/h/ln	1528	0	850	1695	0	1561
Q Serve(g_s), s	31.0	0.0	28.2	7.4	0.0	22.8
Cycle Q Clear(g_c), s	31.0	0.0	51.0	7.4	0.0	22.8
Prop In Lane	0.50	0.50	1.00			0.48
Lane Grp Cap(c), veh/h	526	0	346	961	0	884
V/C Ratio(X)	1.02	0.00	0.85	0.28	0.00	0.65
Avail Cap(c_a), veh/h	526	0	346	961	0	884
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.5	0.0	32.3	10.1	0.0	13.4
Incr Delay (d2), s/veh	45.6	0.0	18.0	0.2	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	17.7	0.0	8.3	2.7	0.0	7.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	75.1	0.0	50.3	10.2	0.0	15.1
LnGrp LOS	F	A	D	B	A	B
Approach Vol, veh/h	539			566	576	
Approach Delay, s/veh	75.1			31.1	15.1	
Approach LOS	E			C	B	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		55.0		35.0		55.0
Change Period (Y+Rc), s		4.0		4.0		4.0
Max Green Setting (Gmax), s		51.0		31.0		51.0
Max Q Clear Time (g_c+I1), s		53.0		33.0		24.8
Green Ext Time (p_c), s		0.0		0.0		4.7

Intersection Summary		
HCM 6th Ctrl Delay		39.7
HCM 6th LOS		D

Intersection	
Intersection Delay, s/veh	49.5
Intersection LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	254	257	0	523	285	0
Future Vol, veh/h	254	257	0	523	285	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	267	271	0	551	300	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	52.4	63	19.6
HCM LOS	F	F	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	50%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	50%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	523	511	285
LT Vol	0	254	0
Through Vol	523	0	285
RT Vol	0	257	0
Lane Flow Rate	551	538	300
Geometry Grp	1	1	1
Degree of Util (X)	0.996	0.953	0.584
Departure Headway (Hd)	6.51	6.378	7.008
Convergence, Y/N	Yes	Yes	Yes
Cap	556	570	513
Service Time	4.573	4.433	5.084
HCM Lane V/C Ratio	0.991	0.944	0.585
HCM Control Delay	63	52.4	19.6
HCM Lane LOS	F	F	C
HCM 95th-tile Q	14.2	12.6	3.7

Intersection	
Intersection Delay, s/veh	49.5
Intersection LOS	E

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	254	257	0	523	285	0
Future Vol, veh/h	254	257	0	523	285	0
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	3	1	0	4	4	2
Mvmt Flow	267	271	0	551	300	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	1
Conflicting Approach Left	SB	EB	
Conflicting Lanes Left	1	1	0
Conflicting Approach Right	NB		EB
Conflicting Lanes Right	1	0	1
HCM Control Delay	52.4	63	19.6
HCM LOS	F	F	C

Lane	NBLn1	EBLn1	SBLn1
Vol Left, %	0%	50%	0%
Vol Thru, %	100%	0%	100%
Vol Right, %	0%	50%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	523	511	285
LT Vol	0	254	0
Through Vol	523	0	285
RT Vol	0	257	0
Lane Flow Rate	551	538	300
Geometry Grp	1	1	1
Degree of Util (X)	0.996	0.953	0.584
Departure Headway (Hd)	6.51	6.378	7.008
Convergence, Y/N	Yes	Yes	Yes
Cap	556	570	513
Service Time	4.573	4.433	5.084
HCM Lane V/C Ratio	0.991	0.944	0.585
HCM Control Delay	63	52.4	19.6
HCM Lane LOS	F	F	C
HCM 95th-tile Q	14.2	12.6	3.7

Intersection												
Int Delay, s/veh	24.2											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Future Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	147	553	55	16	619	43	62	41	21	22	52	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	668	0	0	610	0	0	1665	1577	585	1587	1583	647
Stage 1	-	-	-	-	-	-	877	877	-	679	679	-
Stage 2	-	-	-	-	-	-	788	700	-	908	904	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	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	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	922	-	-	979	-	-	78	111	479	88	110	475
Stage 1	-	-	-	-	-	-	346	369	-	445	454	-
Stage 2	-	-	-	-	-	-	387	444	-	332	358	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	917	-	-	977	-	-	~ 35	91	477	62	90	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 59	217	-	184	240	-
Stage 1	-	-	-	-	-	-	290	309	-	372	444	-
Stage 2	-	-	-	-	-	-	209	434	-	231	300	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.2	264.5	36.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	97	917	-	-	977	-	-	354
HCM Lane V/C Ratio	1.281	0.161	-	-	0.016	-	-	0.714
HCM Control Delay (s)	264.5	9.7	-	-	8.7	-	-	36.9
HCM Lane LOS	F	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	8.7	0.6	-	-	0	-	-	5.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	15.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Future Vol, veh/h	140	525	52	15	588	41	59	39	20	21	49	170
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	147	553	55	16	619	43	62	41	21	22	52	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	668	0	0	610	0	0	1665	1577	585	1587	1583	647
Stage 1	-	-	-	-	-	-	877	877	-	679	679	-
Stage 2	-	-	-	-	-	-	788	700	-	908	904	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	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	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	922	-	-	979	-	-	78	111	479	88	110	475
Stage 1	-	-	-	-	-	-	346	369	-	445	454	-
Stage 2	-	-	-	-	-	-	387	444	-	332	358	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	917	-	-	977	-	-	~ 35	91	477	62	90	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 59	217	-	184	240	-
Stage 1	-	-	-	-	-	-	290	309	-	372	444	-
Stage 2	-	-	-	-	-	-	209	434	-	231	300	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.9	0.2	135.5	36.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	59	266	917	-	-	977	-	-	354
HCM Lane V/C Ratio	1.053	0.233	0.161	-	-	0.016	-	-	0.714
HCM Control Delay (s)	248.3	22.6	9.7	-	-	8.7	-	-	36.9
HCM Lane LOS	F	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	5	0.9	0.6	-	-	0	-	-	5.3

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	11.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	595	52	15	608	0	59	0	20	21	0	170
Future Vol, veh/h	0	595	52	15	608	0	59	0	20	21	0	170
Conflicting Peds, #/hr	6	0	2	2	0	6	0	0	2	2	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, %	2	1	0	0	2	0	0	0	20	0	0	0
Mvmt Flow	0	626	55	16	640	0	62	0	21	22	0	179

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	646	0	0	683	0	0	1418	1334	658	1344	1361	646
Stage 1	-	-	-	-	-	-	656	656	-	678	678	-
Stage 2	-	-	-	-	-	-	762	678	-	666	683	-
Critical Hdwy	4.12	-	-	4.1	-	-	7.1	6.5	6.4	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	2.218	-	-	2.2	-	-	3.5	4	3.48	3.5	4	3.3
Pot Cap-1 Maneuver	939	-	-	919	-	-	116	155	434	130	150	475
Stage 1	-	-	-	-	-	-	458	465	-	445	455	-
Stage 2	-	-	-	-	-	-	400	455	-	452	452	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	934	-	-	917	-	-	70	150	432	120	145	472
Mov Cap-2 Maneuver	-	-	-	-	-	-	70	150	-	120	145	-
Stage 1	-	-	-	-	-	-	457	464	-	442	440	-
Stage 2	-	-	-	-	-	-	242	440	-	429	451	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	161.9	27.3
HCM LOS			F	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	89	934	-	-	917	-	-	357
HCM Lane V/C Ratio	0.934	-	-	-	0.017	-	-	0.563
HCM Control Delay (s)	161.9	0	-	-	9	0	-	27.3
HCM Lane LOS	F	A	-	-	A	A	-	D
HCM 95th %tile Q(veh)	5.2	0	-	-	0.1	-	-	3.3

Intersection	
Int Delay, s/veh	7.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Future Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Conflicting Peds, #/hr	4	0	12	12	0	4	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	660	105	146	800	1	89	0	123	1	1	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	805	0	0	777	0	0	1835	1836	727	1887	1888	805
Stage 1	-	-	-	-	-	-	739	739	-	1097	1097	-
Stage 2	-	-	-	-	-	-	1096	1097	-	790	791	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	828	-	-	848	-	-	~ 59	77	427	54	71	386
Stage 1	-	-	-	-	-	-	412	427	-	261	291	-
Stage 2	-	-	-	-	-	-	261	291	-	386	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	825	-	-	838	-	-	~ 49	62	421	33	57	385
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	199	-	109	173	-
Stage 1	-	-	-	-	-	-	404	419	-	258	239	-
Stage 2	-	-	-	-	-	-	211	239	-	270	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.6	57.1	19.2
HCM LOS			F	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	265	825	-	-	838	-	-	262
HCM Lane V/C Ratio	0.802	0.009	-	-	0.175	-	-	0.032
HCM Control Delay (s)	57.1	9.4	-	-	10.2	-	-	19.2
HCM Lane LOS	F	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	6.2	0	-	-	0.6	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Future Vol, veh/h	7	627	100	139	760	1	85	0	117	1	1	6
Conflicting Peds, #/hr	4	0	12	12	0	4	0	0	2	2	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	100	-	-	100	-	-	100	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	2	-	-	2	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	2	0	0	1	0	0	0	0	0	0	0
Mvmt Flow	7	660	105	146	800	1	89	0	123	1	1	6

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	805	0	0	777	0	0	1835	1836	727	1887	1888	805
Stage 1	-	-	-	-	-	-	739	739	-	1097	1097	-
Stage 2	-	-	-	-	-	-	1096	1097	-	790	791	-
Critical Hdwy	4.1	-	-	4.1	-	-	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	-	-	2.2	-	-	3.5	4	3.3	3.5	4	3.3
Pot Cap-1 Maneuver	828	-	-	848	-	-	~ 59	77	427	54	71	386
Stage 1	-	-	-	-	-	-	412	427	-	261	291	-
Stage 2	-	-	-	-	-	-	261	291	-	386	404	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	825	-	-	838	-	-	~ 49	62	421	33	57	385
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	199	-	109	173	-
Stage 1	-	-	-	-	-	-	404	419	-	258	239	-
Stage 2	-	-	-	-	-	-	211	239	-	270	396	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.6	28.7	19.2
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	176	421	825	-	-	838	-	-	262
HCM Lane V/C Ratio	0.508	0.293	0.009	-	-	0.175	-	-	0.032
HCM Control Delay (s)	44.9	17	9.4	-	-	10.2	-	-	19.2
HCM Lane LOS	E	C	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	2.5	1.2	0	-	-	0.6	-	-	0.1

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	627	100	139	760	1	85	0	117	1	1	6
Future Volume (veh/h)	7	627	100	139	760	1	85	0	117	1	1	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	0.99		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1750	1723	1750	1750	1736	1750	1750	1750	1750	1750	1750	1750
Adj Flow Rate, veh/h	7	660	105	146	800	1	89	0	123	1	1	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	0	2	0	0	1	0	0	0	0	0	0	0
Cap, veh/h	55	1020	161	190	898	1	167	16	152	71	56	208
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.18	0.00	0.18	0.18	0.18	0.18
Sat Flow, veh/h	4	1443	228	184	1270	2	526	91	853	72	315	1162
Grp Volume(v), veh/h	772	0	0	947	0	0	212	0	0	8	0	0
Grp Sat Flow(s),veh/h/ln	1674	0	0	1456	0	0	1470	0	0	1550	0	0
Q Serve(g_s), s	0.0	0.0	0.0	19.8	0.0	0.0	7.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	17.4	0.0	0.0	37.3	0.0	0.0	9.6	0.0	0.0	0.3	0.0	0.0
Prop In Lane	0.01		0.14	0.15		0.00	0.42		0.58	0.12		0.75
Lane Grp Cap(c), veh/h	1236	0	0	1088	0	0	336	0	0	335	0	0
V/C Ratio(X)	0.62	0.00	0.00	0.87	0.00	0.00	0.63	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	1581	0	0	1384	0	0	450	0	0	451	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	5.6	0.0	0.0	8.0	0.0	0.0	27.5	0.0	0.0	23.7	0.0	0.0
Incr Delay (d2), s/veh	0.5	0.0	0.0	5.1	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	0.0	9.1	0.0	0.0	3.5	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.1	0.0	0.0	13.1	0.0	0.0	29.5	0.0	0.0	23.7	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	C	A	A	C	A	A
Approach Vol, veh/h		772			947			212			8	
Approach Delay, s/veh		6.1			13.1			29.5			23.7	
Approach LOS		A			B			C			C	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		16.5		53.4		16.5		53.4				
Change Period (Y+Rc), s		4.0		4.0		4.0		4.0				
Max Green Setting (Gmax), s		18.0		64.0		18.0		64.0				
Max Q Clear Time (g_c+I1), s		11.6		19.4		2.3		39.3				
Green Ext Time (p_c), s		0.6		7.6		0.0		10.2				
Intersection Summary												
HCM 6th Ctrl Delay			12.1									
HCM 6th LOS			B									

Intersection	
Intersection Delay, s/veh	13.4
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	772	947	212	8
Demand Flow Rate, veh/h	785	955	212	8
Vehicles Circulating, veh/h	148	96	681	1043
Vehicles Exiting, veh/h	903	797	252	8
Ped Vol Crossing Leg, #/h	0	2	12	4
Ped Cap Adj	1.000	1.000	0.998	1.000
Approach Delay, s/veh	12.2	15.4	9.1	7.8
Approach LOS	B	C	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	785	955	212	8
Cap Entry Lane, veh/h	1187	1251	689	476
Entry HV Adj Factor	0.983	0.992	1.000	1.000
Flow Entry, veh/h	772	947	212	8
Cap Entry, veh/h	1167	1240	688	476
V/C Ratio	0.662	0.764	0.308	0.017
Control Delay, s/veh	12.2	15.4	9.1	7.8
LOS	B	C	A	A
95th %tile Queue, veh	5	8	1	0

Intersection												
Int Delay, s/veh	12.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Future Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	100	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	102	9	441	6	259	99	276	265	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1372	1199	274	1152	1158	312	282	0	0	361	0	0
Stage 1	826	826	-	324	324	-	-	-	-	-	-	-
Stage 2	546	373	-	828	834	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	6.7	6.1	6.02	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	124	187	770	200	225	741	1292	-	-	1198	-	-
Stage 1	369	389	-	718	677	-	-	-	-	-	-	-
Stage 2	526	622	-	404	424	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	134	770	154	162	739	1292	-	-	1195	-	-
Mov Cap-2 Maneuver	38	134	-	154	162	-	-	-	-	-	-	-
Stage 1	367	282	-	712	671	-	-	-	-	-	-	-
Stage 2	208	616	-	290	308	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	85.3	28.1	0.1	4.4
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	55	154	688	1195	-	-
HCM Lane V/C Ratio	0.005	-	-	0.191	0.663	0.655	0.231	-	-
HCM Control Delay (s)	7.8	0	-	85.3	65.4	19.6	8.9	0	-
HCM Lane LOS	A	A	-	F	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	3.7	4.9	0.9	-	-

Intersection	
Int Delay, s/veh	12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Future Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	3	3	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	100	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	-2	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	102	9	441	6	259	99	276	265	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1372	1199	274	1152	1158	312	282	0	0	361	0	0
Stage 1	826	826	-	324	324	-	-	-	-	-	-	-
Stage 2	546	373	-	828	834	-	-	-	-	-	-	-
Critical Hdwy	7.1	6.5	6.2	6.7	6.1	6.02	4.1	-	-	4.12	-	-
Critical Hdwy Stg 1	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.1	5.5	-	5.7	5.1	-	-	-	-	-	-	-
Follow-up Hdwy	3.5	4	3.3	3.5	4	3.318	2.2	-	-	2.218	-	-
Pot Cap-1 Maneuver	124	187	770	200	225	741	1292	-	-	1198	-	-
Stage 1	369	389	-	718	677	-	-	-	-	-	-	-
Stage 2	526	622	-	404	424	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	134	770	154	162	739	1292	-	-	1195	-	-
Mov Cap-2 Maneuver	38	134	-	154	162	-	-	-	-	-	-	-
Stage 1	367	282	-	712	671	-	-	-	-	-	-	-
Stage 2	208	616	-	290	308	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	85.3	28	0.1	4.4
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1292	-	-	55	155	739	1195	-	-
HCM Lane V/C Ratio	0.005	-	-	0.191	0.72	0.597	0.231	-	-
HCM Control Delay (s)	7.8	0	-	85.3	72.4	16.8	8.9	0	-
HCM Lane LOS	A	A	-	F	F	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.6	4.3	4	0.9	-	-

Intersection	
Intersection Delay, s/veh	23.6
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Future Vol, veh/h	6	3	1	97	9	419	6	246	94	262	252	16
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	0	0	0	0	0	2	0	4	4	2	3	0
Mvmt Flow	6	3	1	102	9	441	6	259	99	276	265	17
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.2	26.8	25.6	19.4
HCM LOS	B	D	D	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	2%	60%	92%	0%	100%	0%
Vol Thru, %	71%	30%	8%	0%	0%	94%
Vol Right, %	27%	10%	0%	100%	0%	6%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	346	10	106	419	262	268
LT Vol	6	6	97	0	262	0
Through Vol	246	3	9	0	0	252
RT Vol	94	1	0	419	0	16
Lane Flow Rate	364	11	112	441	276	282
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.711	0.026	0.239	0.8	0.583	0.555
Departure Headway (Hd)	7.028	8.869	7.712	6.526	7.616	7.078
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	517	403	468	556	474	511
Service Time	5.055	6.938	5.426	4.24	5.36	4.822
HCM Lane V/C Ratio	0.704	0.027	0.239	0.793	0.582	0.552
HCM Control Delay	25.6	12.2	12.8	30.4	20.5	18.3
HCM Lane LOS	D	B	B	D	C	C
HCM 95th-tile Q	5.6	0.1	0.9	7.7	3.7	3.3

Intersection	
Intersection Delay, s/veh	8.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	10	552	364	558
Demand Flow Rate, veh/h	10	561	378	572
Vehicles Circulating, veh/h	657	281	291	117
Vehicles Exiting, veh/h	32	388	376	725
Ped Vol Crossing Leg, #/h	0	3	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.2	10.3	7.6	8.0
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	10	561	378	572
Cap Entry Lane, veh/h	706	1036	1026	1225
Entry HV Adj Factor	1.000	0.984	0.962	0.976
Flow Entry, veh/h	10	552	364	558
Cap Entry, veh/h	706	1019	987	1195
V/C Ratio	0.014	0.542	0.369	0.467
Control Delay, s/veh	5.2	10.3	7.6	8.0
LOS	A	B	A	A
95th %tile Queue, veh	0	3	2	3

Attachment B Enhanced Crossing Treatments

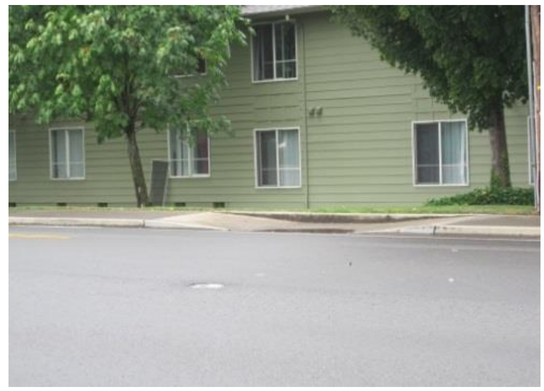
ENHANCED CROSSING TREATMENTS

Pedestrian Crossing Treatments

Pedestrian crossing facilities enable people to safely cross streets, railroad tracks, and other transportation facilities. Planning for appropriate pedestrian crossings requires the community to balance vehicular mobility needs with providing crossing locations that the desired routes of walkers. The following summarizes several enhanced pedestrian crossing treatments.

Unmarked Crosswalks

Under Oregon law, pedestrians have the right-of-way at all unsignalized intersections. On narrow, low-speed streets unmarked crosswalks are generally sufficient for pedestrians to cross the street safely, as the low-speed environment makes drivers more responsive to the presence of pedestrians. However, drivers are less likely to yield to pedestrians at unmarked crosswalks on high-speed and/or high-volume roadways, even when the pedestrian has stepped onto the roadway. In these situations, enhanced pedestrian crossing facilities are needed to remind drivers that they must yield when pedestrians are present.



Marked Crosswalks

Marked crosswalks are painted roadway markings that indicate the location of a crosswalk to motorists. Marked crosswalks can be accompanied by signs, curb extensions and/or median refuge islands, and may occur at intersections or at mid-block locations. Research has shown that marked crosswalks in certain situations do not improve pedestrian safety and can even make it worse. Recent research indicates that on multi-lane roadways (more than two lanes), marked crosswalks should not be installed without accompanying treatments, such as Rectangular Rapid Flash Beacons (RRFBs) or Pedestrian Hybrid beacons.

Rectangular Rapid Flashing Beacon (RRFB)

RRFBs are user-actuated amber lights that have an irregular flash pattern similar to emergency flashers on police vehicles. These supplemental warning lights are used at unsignalized intersections or mid-block crosswalks to improve safety for pedestrians using a crosswalk. RRFBs could be used at any unsignalized intersection or mid-block crossing where warrants require a higher level of crosswalk protection.

Pedestrian Hybrid Beacon

A Pedestrian Hybrid Beacon (sometimes called a HAWK) is a user-actuated signal that is unlit when not in use. It begins with a yellow light alerting drivers to slow, and then displays a solid red light requiring drivers to remain stopped while pedestrians cross the street. The beacon then shifts to flashing red lights to signal that motorists may proceed, after stopping, and after pedestrians have completed their crossing. A Pedestrian Hybrid Beacon can be used at mid-block crossings or, in some cases, at unsignalized intersections (the MUTCD suggests that the beacons be located at least 100-feet from an intersection). Pedestrian Hybrid Beacons could be used at any unsignalized intersection or mid-block crossing where warrants require a higher level of crosswalk protection.

Pedestrian Signal

Pedestrian Signals provide pedestrians with a signal-controlled crossing at a mid-block location or, in some cases at a previously stop-controlled intersection where pedestrian volumes warrant full signalization (the MUTCD no longer allows half signals at intersections). The signal remains green for the mainline traffic movements until actuated by a pushbutton to call a red signal for traffic. They are typically located at midblock crossings with high pedestrian or bicycle demand and/or high traffic volumes, such as where shared-use paths intersect with roadways.

Pedestrian Countdown Heads

Pedestrian Countdown heads inform pedestrians of the time remaining to cross the street with a countdown timer at the signalized crossing. The countdown should include enough time for a pedestrian to cross the full length of the street, or in rare cases, reach a refuge island. The current Manual on Uniform Traffic Control Devices (MUTCD) requires all new pedestrian signals, and any retrofitted signals to include pedestrian countdown heads.

Leading Pedestrian Interval (LPI)

Leading pedestrian intervals allow pedestrians to start crossing the street at a signalized intersections five to seven seconds before conflicting vehicles are given a green light and allowed to enter the intersection. They are most commonly used at signalized intersections where left- or right-turning vehicles interfere with pedestrian crossing movements. LPI could be applied at all existing or potential future traffic signals to improve crossing conditions for pedestrians.

Geometric Considerations

There are a number of geometric enhancements that can be considered at pedestrian crossings that may be implemented in conjunction with previously discuss treatments.

Curb Extensions

Curb extensions create additional space for pedestrians at crosswalks and allow pedestrians and vehicles to better see each other. Curb extensions are typically installed at intersections and midblock crossings located along roadways with on-street parking to help reduce crossing distances and the amount of exposure pedestrians have to vehicle traffic. Curb extensions can narrow the vehicle path, slow down traffic, and prohibit fast turns. Curb extensions could be applied along any street where on-street parking is allowed or where there is sufficient shoulder width so the curb extension does not conflict with on-street bike lanes.

Raised Median Island

Raised median islands provide a protected area in the middle of the roadway where pedestrians can stop while crossing the street. Raised median islands allow pedestrians to complete two-stage crossings if needed. Raised median islands can narrow the vehicle path and slow down traffic along the roadway. Raised median islands could be applied along any street where they would not interfere with turning movements at driveways and intersecting roadways.

Bicycle Crossing Treatments

Pavement Markings Through Intersections

Pavement markings can be extended through the intersection for bicyclists. Green paint can be used in "conflict zones" where vehicles and bicycles cross paths in intersections, at driveways, or at right-turn pockets. These pavement marking are typically used at signalized intersections to emphasize a connection in a larger bicycle network. They could be used at all signalized intersections and in other select "conflict zones".

Bike Box

Bicycle boxes are designated spaces at signalized intersections, placed between a set-back stop bar and the pedestrian crosswalk, that allow bicyclists to queue in front of motor vehicles at red lights. Bike boxes are typically used at signalized intersections to facilitate turn movements as well as other movements for cyclists.

Two-Stage Left-Turn Bike Box

Two-stage left-turn bike boxes allow bicyclists to safely and comfortably make left-turns at multilane intersections from a right-side bicycle lane or cycle track. Bicyclists arriving on a green light travel into the intersection and pull out into the two-stage turn queue box away from through-moving bicycles and in front of cross street traffic, where they can wait to proceed through on the side-street green signal. Two-stage left-turn bike boxes can be applied at signalized intersections to improve bicycle crossing conditions.

Bike only signal

Bicycle-only signals can be used at intersections to provide a separate signal phase that is dedicated to bicyclists. At this stage, the MUTCD does not allow bicycle signal to operation concurrent with permissive vehicle phases.

Bicycle Detection

Many traffic signals along are actuated, meaning that green indication is given to a movement when a vehicle is detected. However, actuating a signal as a cyclist can be difficult. Bicycle detection allows cyclists to actuate the traffic signal from the bicycle lane with a detector that is calibrated to recognize a bicycle. Pavement markings could be added to show cyclists where to stand to actuate a signal. Bicycle detection is typically applied at signalized intersections that accommodate bicycles and can be used at all of the signalized intersection to improve bicycle crossing conditions.

Attachment C Funding Programs

FUNDING PROGRAMS

Federal Sources

Fixing America's Surface Transportation Act (FAST Act)

Fixing America's Surface Transportation Act (FAST Act) funds surface transportation programs, including, but not limited to, federal-aid highways. The FAST Act is the first long-term surface transportation authorization enacted in a decade that provides long-term funding certainty for surface transportation. The FAST Act establishes and funds new programs to support critical transportation projects to ease congestion and facilitate the movement of freight on the interstate system and other major roads. The FAST Act is not a direct funding source; however, it funds programs at the federal and state levels that are direct funding sources for multimodal transportation improvements. More information on the Fast Act is available at: https://www.fhwa.dot.gov/fastact/.

Surface Transportation Block Grant Program (STBG)

The Surface Transportation Block Grant Program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Projects must be identified in the Statewide Transportation Improvement Program (STIP)/Transportation Improvement Program (TIP) and be consistent with the Long-Range Statewide Transportation Plan and the Metropolitan Transportation Plan(s). More information on the STBG Program is available at: https://www.fhwa.dot.gov/specialfunding/stp/160307.cfm#c.

Transportation Alternatives Program (TA Set-Aside)

The FAST Act replaced the former Transportation Alternatives Program (TA Set-Aside) with a set-aside of funds under the STBG Program. For administrative purposes, the FHWA refers to these funds as the TA Set-Aside. The TA Set-Aside authorizes funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities such as historic preservation and vegetation management, and environmental mitigation related to stormwater and habitat connectivity; recreational trail projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former divided highways. Oregon administers TA Set-Aside funds, giving grants to local governments, as part of the STIP Enhance funds (see below). Grants require a small local match (20%) and vary from $250,000 to $1.4 million. More information on the TA Set-Aside is available at: https://www.fhwa.dot.gov/environment/transportation_alternatives/.

Congestion Mitigation and Air Quality Program (CMAQ)

The Congestion Mitigation and Air Quality program (CMAQ) provides a flexible funding source to State and local governments for transportation projects and programs to help meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas) and for former nonattainment areas that are now in compliance (maintenance areas). Funds may be used for a transportation project or program that is likely to contribute to the attainment or maintenance of a national ambient air quality standard, with a high level of effectiveness in reducing air pollution, and that is included in the metropolitan planning organization's (MPO's) current transportation plan and transportation improvement program (TIP) or the current state transportation improvement program (STIP) in areas without an MPO. More information on the CMAQ Program is available at: https://www.fhwa.dot.gov/fastact/factsheets/cmaqfs.cfm.

Highway Safety Improvement Program (HSIP)

The Highway Safety Improvement Program (HSIP) is a core federal-aid program with the purpose of achieving a significant reduction in traffic fatalities and serious injuries on all public roads, including non-state-owned public roads and roads on tribal lands. The HSIP requires a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. Applications must focus on a strategy, activity or project consistent with a State Strategic Highway Safety Plan, and correct or improve a hazardous road location or feature, or address a highway safety problem, including automated enforcement in school zones. Infrastructure and non-infrastructure projects are eligible. Projects require a small local match (10%) and are administered through the STIP (See below). More information on the HSIP Program is available at: https://safety.fhwa.dot.gov/hsip/.

Better Utilizing Investments to Leverage Development (BUILD)

The Better Utilizing Investments to Leverage Development, or BUILD Transportation Discretionary Grants program, provides funding for road, rail, transit and port projects that promise to achieve national objectives. Previously known as Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grants, Congress has dedicated nearly $7.9 billion for eleven rounds of National Infrastructure Investments to fund projects that have a significant local or regional impact.

The eligibility requirements of BUILD allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. BUILD can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies). This flexibility allows BUILD and our traditional partners at the State and local levels to work directly with a host of entities that own, operate, and maintain much of our transportation infrastructure, but otherwise cannot turn to the Federal government for support.

The BUILD discretionary grant program is a very competitive pot of funds; a small percentage of funded projects have been bike/pedestrian related. Applications must highlight project benefits to safety, economic competitiveness, state of good repair, livability and environmental sustainability goals. More information on the BUILD discretionary grant program is available at: https://www.transportation.gov/BUILDgrants.

Recreational Trails Program

The Recreational Trails Program (RTP) provides funds to the States to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. The RTP is an assistance program of the Federal Highway Administration (FHWA). Federal transportation funds benefit recreation including hiking, bicycling, in-line skating, equestrian use, cross-country skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, or using other off-road motorized vehicles. The RTP is a set-aside under the TA Set-Aside for both motorized and non-motorized trail projects. ODOT currently sends Oregon's RTP funds to the Oregon Parks and Recreation Department for administration. More information on the RTP is available at: https://www.fhwa.dot.gov/environment/recreational_trails/.

State Sources

Statewide Transportation Improvement Program (STIP)

The Statewide Transportation Improvement Program (STIP) is ODOT's four-year capital improvement program for state and federally funded projects. The STIP includes projects on federal, state, city, and county transportation systems, multimodal projects (highway, passenger rail, freight, public transit, bicycle and pedestrian), and projects in the National Parks, National Forests, and Indian tribal lands. STIP project lists are developed through the coordinated efforts of ODOT, federal and local governments, Area Commissions on Transportation, tribal governments, and the public.

The STIP is divided into five major categories: **Fix-it** programs funds projects that fix or preserve the state's transportation system, including bridges, pavement, culverts, traffic signals, and others. The **Enhance** program funds projects that enhance or expand the transportation system - Area Commissions on Transportation recommend high-priority investments from state and local transportation plans in many of the Enhance programs. **Safety** programs reduce deaths and injuries on Oregon's roads. This includes the ARTS program (See below), which selects projects through a data-driven process to ensure resources have maximum impact on improving the safety of Oregon's state highways and local roads. **Non-highway** programs fund bicycle and pedestrian projects and public transportation**. Local government** programs direct funding to local governments so they can fund priority projects.

Project proposals for the STIP can be made to the state via regional offices; however, projects must be in a local adopted Transportation System Plan. More information on the STIP is available at: http://www.oregon.gov/ODOT/TD/STIP/Pages/default.aspx.

State Highway Trust Fund/Bicycle Bill

When roads are constructed or reconstructed, Oregon law requires walkways and bikeways be provided. Additionally, all agencies receiving State Highway Funds are required to spend at least 1% of those funds on bicycle and/or pedestrian infrastructure improvements (ORS 366.514). Currently, cities and counties receive 20% and 30% of the state's highway trust funds, respectively, which can be used for walking and biking projects along roads.

Sidewalk Improvement Program (SWIP)

The sidewalk improvement program (SWIP) builds pedestrian and bicycle facilities on state and local roads that help people moving across or around the state system. Projects should address needs identified in the region's Active Transportation Needs Inventory (ATNI) or other Oregon Bicycle and Pedestrian Plan (OBPP) priorities. All project phases are eligible for SWIP funding, but emphasis is on construction activities, per ORS 366.514. Funds may be used for standalone projects or as add-on to another project, if all region Active Transportation Leverage funds have already been allocated. More information on SWIP funds is available at:
https://www.oregon.gov/odot/programs/pages/bikeped.aspx.

Safe Routes to School Program (SRTS)

ODOT's Safe Routes to School (SRTS) program is focused on providing grants to make it safer for children to walk and bike to school, providing opportunity through investments in infrastructure and non-infrastructure. ODOT's grant funding for infrastructure programs help create and improve safe walking and biking routes to school, while its grant funding for non-infrastructure programs help raise awareness by focusing on education and outreach. Non-motorized transportation projects related to getting children to school safely, such as closing gaps in the sidewalk and bicycle networks, are eligible for infrastructure program funding. More information on ODOT's SRTS program is available at: https://www.oregon.gov/ODOT/Programs/Pages/SRTS.aspx.

All Roads Transportation Safety (ARTS)

The All Roads Transportation Safety (ARTS) program (formerly known as the Jurisdictionally Blind Safety Program) is intended to address safety needs on all public roads in Oregon. By working collaboratively with local jurisdictions, ODOT expects to increase awareness of safety on all roads, promote best practices for infrastructure safety, compliment behavioral safety efforts and focus limited resources to reduce fatal and serious injury crashes in the state of Oregon. The program is data driven to achieve the greatest benefits in crash reduction, including addressing hotspots. A portion is dedicated to a few proven low-cost measures to implement widely, where there is evidence that they would be most useful. Local agencies can submit applications for bicycle and pedestrian projects. More information on the ARTS program is available at: https://www.oregon.gov/ODOT/Engineering/Pages/ARTS.aspx.

Oregon Community Paths Program (OCP)

The Oregon Community Paths (OCP) program is a new grant program dedicated to helping communities create and maintain connections through shared-use paths. ODOT uses money from the state Multimodal Action Transportation Fund (See below) and the federal TA Set-aside (See above) to fund this program. The OCP program funds grants for project development, construction, reconstruction, major resurfacing or other improvements of shared-use paths that improve access and safety for people walking and bicycling. The OCP may also fund on-road improvements, such as enhanced crossing infrastructure that support a path although the focus of the program is on projects outside of the road right-of-way. Projects must improve a critical link, regional path or path crossing of a roadway. More information on the OCP program is available at: https://www.oregon.gov/ODOT/Programs/Pages/OCP.aspx.

House Bill (HB) 2017 Transportation Investments

In August 2017, Governor Kate Brown signed an eight-year transportation tax increase to raise roughly $5 billion for roads, bridges, mass transit, electric vehicles, and other transit options. House Bill (HB) 2017 affects drivers, bicyclists and payroll employees by increasing the gas tax, weight-mile tax, and other transportation-related fees such as excise tax on the sale of bicycles, new vehicles, and instituting a statewide payroll tax for transit equivalent to 1/10th of 1 percent of wages, deducted by employer from payment to employee. Though this funding source is one that can be used to finance multitude of project types, some cities have indicated that additional funds received from HB 2017 will be primarily allocated to maintenance of existing transportation facilities and operations. More information on HB 2017 is available at: http://www.oregon.gov/ODOT/Documents/HB2017-FAQ.pdf.

Multimodal Active Transportation Fund (MAT)

In 2019, the Oregon Legislature passed House Bill 2592 to clarify and amend House Bill 2017. The legislation establishes the Multimodal Active Transportation (MAT) Fund for bicycle and pedestrian projects, consisting of 7% of the Connect Oregon Fund plus revenues from Oregon's bicycle excise tax. The MAT is a separate grant program from Connect Oregon and requires a new set of administrative rules. With the separation of bicycle/pedestrian projects into the Multimodal Active Transportation fund, new rules for this fund are also anticipated to be established in 2020.

Local Sources

System Development Charges/Transportation Impact Fees

SDCs are one-time fees imposed on new developments (and some redevelopments) to help off-set the cost of new transportation infrastructure (and the expansion of existing transportation infrastructure) needed to accommodate traffic generated by the development. A city or county can offer SDC credits to developers that provide public improvements beyond the required frontage improvements, including those that can be constructed by the private sector at a lower cost. For example, an SDC credit might be given to a developer for providing improvements along both sides of an adjacent facility, for extending frontage improvements beyond the site frontage, or treatments at or connecting to nearby transit stops. SDCs are already a major transportation funding source for the City of Independence.

Transportation Utility Fees (TUF)

Transportation Utility Fees (also known as Street Utility, Road User, or Street Maintenance Fees) are monthly fees collected from residences and businesses via their water/sewer bills. Fees are assessed based on the expected number of trips for each land use. Funds are usually used for road maintenance and sidewalks but can cover capital improvements. At least nineteen Oregon cities currently have TUFs. Funds generated by these fees can add up; for example, roughly half of Medford's Public Works operations budget comes from a street utility fee. More information is available from the League of Oregon Cities in their 2008 report:
https://www.orcities.org/application/files/3015/7481/0598/TUFReport2011.pdf.

Local Fuel Tax

While every state collects an excise tax on fuel, Oregon is one of only nine states that permits cities and counties to impose a local fuel tax to pay for street operation, maintenance, and preservation activities. The taxes are paid to the cities and counties monthly by distributors of fuel. Voters would need to pass the tax, and the process for presenting such a tax to voters would need to be consistent with Oregon State law as well as the laws of the local jurisdiction. There are currently 27 cities and two counties in Oregon that have a local fuel tax. The taxes range from $0.01 to $0.10 per gallon. More information is available at:
https://www.oregon.gov/ODOT/FTG/Pages/Current%20Fuel%20Tax%20Rates.aspx?wp9904=p:2&wp4401=l:100#g_2d60aa8d_2408_4664_bd10_d745b56f361d.

Local Improvement Districts (LID)

Local Improvement Districts (LID) are most often used to construct projects such as streets, sidewalks, or bikeways. Through the LID process, the costs of local improvements are generally spread out among a group of property owners within a specified area. The cost can be allocated based on property frontage or other methods such as trip generation. The cost of LID projects are borne primarily by property owners, moderate administrative costs must be factored in, and the public involvement process must still be followed. If the cost of the local improvement is not 100 percent funded by property owners, the City/County is required to contribute the remaining unfunded portion of the improvement.

Economic Improvement Districts (EID)

Transportation improvements can often be included as part of larger efforts aimed at business improvement and retail district beautification. Economic Improvement Districts (EID) collect assessments or fees on businesses to fund improvements that benefit businesses and improve customer access within the district. Adoption of a mutually agreed upon ordinance establishing guidelines and setting necessary assessments or fees to be collected from property owners is essential to ensuring a successful EID.

Urban Renewal District/Tax Increment Financing

Urban Renewal Districts are separate taxing districts created to remove blight within a district. Each Urban Renewal Plan has identified actions that will remove the blight within the District. Those actions are funded by debt financing (e.g., bonds) using the incremental tax revenue generated from improvements on private property that increase the tax assessable value of that property that then create additional property tax revenue. The additional tax revenue (i.e., tax increment) is then directed to the Urban Renewal District to be used for blight removal. This public finance method is referred to as Tax Increment Financing (TIF) and is limited to Urban Renewal in the State.

Local Bond Measures

Local bond measures, or levies, are usually initiated by voter-approved general obligation bonds for specific projects. Bond measures are typically limited by time, based on the debt load of the local government or the project under focus. Funding from bond measures can be used for right-of-way acquisition, engineering, design, and construction of transportation facilities. Transportation-specific bond measures have passed in other communities throughout Oregon. Though this funding source is one that can be used to finance a multitude of project types, it must be noted that the accompanying administrative costs are high and voter approval must be gained. In addition, local bonds for transportation improvements will compete with local bonds for other public needs, such as fire and rescue, parks and recreation, schools, libraries, etc.

Street Utility Fees/Road Maintenance Fee

The fee is based a flat fee charged to each property, on the number of trips a particular land use generates, or some combination of both and is usually collected through a regular utility bill. For the communities in Oregon that have adopted this approach, it provides a stable source of revenue to pay for street maintenance allowing for safe and efficient movement of people, goods, and services.

Attachment D Development Code Review

MEMORANDUM

Independence Regulatory Review

Independence Transportation System Plan Update

DATE	July 30, 2020
TO	Project Management Team
FROM	Matt Hastie and Clinton "CJ" Doxsee, Angelo Planning Group
CC	FILE

INTRODUCTION

This memorandum presents a review of the City of Independence's Development Code (Code) for compliance with the State of Oregon's Transportation Planning Rule (TPR), OAR 660 Division 12. The memorandum provides the intent, purpose, and requirements for the TPR, followed by a comprehensive review in the subsequent table. This memorandum also includes a cursory review of the City's transportation system development charges as they relate to the Code, as well as an overview sidewalk standards found in the Code and other City documents.

Regulatory Review

The purpose of the TPR is *"…to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided."* The TPR also establishes requirements for coordination among affected levels of government for preparation, adoption, refinement, implementation, and amendment of transportation system plans.

Specifically, the TPR requires all local jurisdictions with a population greater than 2,500 to prepare, adopt and implement a Transportation System Plan (TSP). Section -0045 of the TPR addresses implementation of the Transportation System Plan. The table below identifies each applicable element required by 660-012-0045,[1] the existing City development code standards which address the requirement, and the preliminary conclusion of whether or not the City's existing standards

[1] Note, TPR Sections -0045(4) and (5) do not apply Independence due the size of the City and it being located outside of an MPO.

appear to be deficient in meeting the TPR requirements. This information will be used as the basis for amendments to the City's TSP and development code.

TPR Section -0060 (Plan and Land Use Regulation Amendments) addresses amendments to plans and land use regulations. It specifies measures to be taken to ensure that allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. Section -0060 establishes criteria for identifying the significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

In summary, the TPR requires that local governments revise their land use regulations to implement the Transportation System Plan in the following manner:

- Amend land use regulations to reflect and implement the Transportation System Plan.
- Clearly identify which transportation facilities, services, and improvements are allowed outright, and which will be conditionally permitted or permitted through other procedures.
- Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors, and sites for their identified functions, to include the following topics:
    - access management and control;
    - protection of public use airports;
    - coordinated review of land use decisions potentially affecting transportation facilities;
    - conditions to minimize development impacts to transportation facilities;
    - regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities; and
    - regulations assuring that amendments to land use applications, densities, and design standards are consistent with the Transportation System Plan.
- Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.
- Establish street standards that minimize pavement width and total right-of-way.

The following assessment of TPR compliance is based on the Independence Development Code. Table 1 lists TPR implementation requirements, an assessment of existing City code and regulatory provisions that meet the requirements, and recommendations for changes to the Code that will likely be needed to fully implement the a new TSP and bring the City regulations in compliance with the TPR. Recommended changes to local regulatory documents are intended to provide guidance to project staff during the update of the TSP. In particular, modifications to the Code will be drafted during the planning process and become implementation recommendations for inclusion in the draft TSP.

Transportation System Development Charges

City staff expressed interest in reviewing the Development Code for potential conflicts with the City's transportation system development charge (SDC) and other transportation improvement requirements.[2] The City wants to ensure that it does not require developers to pay twice for the same improvements through a combination of SDCs and off-site transportation improvements identified as part of the development review and Transportation Impact Analysis requirements.

An SDC is a one-time fee imposed on new development to provide equitable funding for growth and development. The SDC fees are used by the City on capital improvements to expand the capacity of infrastructure or public services such as transportation, stormwater, or similar utilities. In particular, fees from transportation SDCs are designated for upgrades to the transportation system and include, but are not limited to, streets, sidewalks, bike lanes and paths, street lights, traffic signs and signals, street trees, public transportation, vehicle parking, and bridges.

The imposition of SDCs in Independence are authorized in the City's Municipal Code under Article VII – Utility System Development Charges. SDCs are collected at the time of increased usage of a capital improvement, during issuance of a development or building permit, or when a new connection to the system is made.

Section 34-442 of the Article outlines the methodology for SDC fees and charges, stating the methodologies used to establish SDCs to be adopted by Council resolution.[3] The section requires the adopted methodology must include provisions for credits against the improvement fee for the construction of any qualified public improvement.[4]

Section 34-448 establishes provisions for providing SDC credits, which are summarized below.

- Credits for uses that were existing at the time of the ordinance adoption.
- Credits for qualified public improvements associated with a development, but only for the portion not located or wholly contiguous to the property.
- Credits for a capital improvement constructed as part of a development that reduces demand on existing improvements or the need for future improvements, or that would otherwise be constructed at the City's expense.

With one exception, the City's Code does not explicitly refer to the use of SDCs. However, the Code allows the City to impose conditions of approval for development subject to quasi-judicial or legislative approval that may potentially require a developer to construct capital improvements to

2 The City currently imposes SDCs to fund improvements for transportation, water, sewer, and storm drains. This review is focused on transportation SDCs only, as they relate to the Development Code.

3 Information on the methodology adopted by Council resolution was not available at the time of this review.

4 Qualified public improvements are defined in Section 34-438 as a capital improvement that is required as a condition of approval, in a CIP as identified in Section 34-445, and not located on or adjacent to land that is subject to residential development approval.

mitigate identified potential impacts associated the new development. Provisions in the Code that allow the City to impose such conditions include Section 11.15 (General Administrative Provisions) and Section Subchapter 71 (Conditional Uses). Section 11.15(E) establishes procedures for quasi-judicial actions (Type II and Type III land use actions) that include applying conditions of approval. The section provides limitations and direction on applying conditions of approval to land use actions. Uses subject to Conditional Use permits and the associated provisions in Subchapter 71 (Conditional Uses) are subject to conditions of approval.

The requirements for a traffic impact analysis (TIA) are provided in Sections 80.30.05 (Site Design Review) and 90.60.35 (Subdivisions). Like an SDC, a TIA is typically required when new development is anticipated to have impacts on the transportation system. TIAs are required to identify impacts and corresponding mitigation measure associated with demand from the new development. Neither section specifically applies the use SDCs as part of the provisions, however the identified mitigation measure may be used to establish conditions of approval that require a developer to construct the improvement.

Based on our review of these requirements, we believe that the City's SDC credit provisions should be sufficient to avoid requiring developers to pay for the same improvements twice. Any improvements identified as part of set of conditions of approval as a result of a development application and TIA should fall under the categories of "qualified (off-site) public improvements" or "capital improvement constructed as part of a development that reduces demand on existing improvements or the need for future improvements." To the extent that these same improvements are included in the City's SDC Capital Improvement Plan, the developer would receive corresponding credits to their SDCs. This process should be outlined in some sort of administrative document but would not typically be described in the City's Development Code.

Table 1: Independence Development Code Regulatory Review	
OAR 660-12-0045	
(1) Each local government shall amend its land use regulations to implement the TSP.	
(a) The following transportation facilities, services and improvements need not be subject to land use regulations except as necessary to implement the TSP and, under ordinary circumstances do not have a significant impact on land use: (A) Operation, maintenance, and repair of existing transportation facilities identified in the TSP, such as road, bicycle, pedestrian, port, airport and rail facilities, and major regional pipelines and terminals; (B) Dedication of right-of-way, authorization of construction and the construction of facilities and improvements, where the improvements are consistent with clear and objective dimensional standards; (C) Uses permitted outright under ORS 215.213(1)(j)–(m) and 215.283(1)(h)–(k), consistent with the provisions of OAR 660-012-0065; and (D) Changes in the frequency of transit, rail and airport services.	The IDC does not list the transportation facilities, services, and improvements in -0045(1)(a) as uses that are permitted outright, subject to standards. Independence does not have zones for exclusive farm use, therefore -0045(1)(a)(C) does not apply. **Recommendation:** Use authorized in individual zones of the IDC should be updated to include “Rights-of-way, easements and improvements for streets, water, sanitary sewer, gas, oil, electric and communication lines, stormwater facilities, and pump stations” as a use that is permitted outright, subject to the general development standards of the IDC.
(b) To the extent, if any, that a transportation facility, service or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment;	See recommendation to -0045(1)(a) above.
(c) In the event that a transportation facility, service or improvement is determined to have a significant impact on land use or to concern the application of a comprehensive plan or land use regulation and to be subject to standards that require interpretation or the exercise of factual, policy or legal judgment, the local government shall provide a review and approval process that is consistent with OAR 660-012-0050. To facilitate implementation of the TSP, each local government shall amend its land use regulations to provide for consolidated review of land use decisions required to permit a transportation project.	Applications of more than one quasi-judicial land use action may be combined and reviewed concurrently (IDC 11.15(E)(7)). The IDC does not include provisions that would allow consolidation of land use reviews/actions beside quasi-judicial review, such as ministerial review (Type I) or legislative review (Type IV). Provisions in Section 11.15(C) require the City to provide notice to affected public agencies such as ODOT, the County, City of Monmouth, or similar agencies, what the City’s actions may impact them. Provisions in Section 11.15(D) specify that notice of Ministerial Actions (Type I) will be sent to interested agencies. Notice requirements for quasi-judicial public hearings (Type II or Type III) and legislative public hearings (Type IV) are subject to the requirements in Section 11.25. The provisions specify requirements for the time and location of notices. **Recommendation:** The IDC Administrative Provisions should be updated to allow all development permits and land use actions processed under the City’s administrative procedures to be consolidated for a single development project.

Table 1: Independence Development Code Regulatory Review	
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions. Such regulations shall include:	
(a) Access control measures, for example, driveway and public road spacing, median control and signal spacing standards, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;	Access management spacing standards for private and public approaches on District Highways as well as access management requirements for City streets are regulated under Section 90.90.10(V). Access management spacing standards for District Highways are regulated according to the posted speed limit. Access spacing management standards for City streets are regulated according to the street's functional classification. The width, length, and shape of blocks are regulated under Section 90.90.15. The provisions generally limit the size of blocks to 600 feet (or 1,600 foot perimeter). Exceptions are allowed when average block sizes are proposed, adjacency to arterial streets, or for topographic conditions. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
(b) Standards to protect future operation of roads, transitways and major transit corridors;	Requirements for traffic impact analyses are provided in Section 90.60.35. The requirements include provisions for County/ODOT coordination, threshold requirements, transportation assessment letter alternative, analysis scope and contents requirements, and provisions for conditions of approval. Additional threshold requirements for when a traffic impact analysis is required as part of Site Design Review are provided in Section 80.30.05(F). The thresholds are triggered for development permits or land use applications that generate a net increase of 200 or more vehicles trips per day or are likely to increase the V/C ratio, or decrease the safety of a State transportation facility. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
(c) Measures to protect public use airports by controlling land uses within airport noise corridors and imaginary surfaces, and by limiting physical hazards to air navigation;	The City regulates development in areas surrounding the airport through the Airport Development District (ADD) in Subchapters 76 and 77 and Airport Safety & Compatibility Overlay (ASCO) in 78. The City also has a unique residential airpark (RSA) zone that regulates residential development adjacent and connected to the airport. These provisions are provided in Subchapter 48 – Residential Single-Family Airpark Overlay (RSA) Zone. The provisions restrict or limit development that negatively affects the approach zone and the airport in any way. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
(d) A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;	See response to -0045(1)(c).

Table 1: Independence Development Code Regulatory Review	
(e) A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;	Requirements for traffic impact analyses are provided in Section 90.60.35. The requirements include provisions for conditions of approval. Section 11.15(E) establishes procedures for quasi-judicial actions (Type II and Type III land use actions) that include applying conditions of approval. The section provides limitations and direction on applying conditions of approval to land use actions. Uses subject to Conditional Use permits and the associated provisions in Subchapter 71 (Conditional Uses) are subject to conditions of approval. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: (A) Land use applications that require public hearings; (B) Subdivision and partition applications; (C) Other applications which affect private access to roads; and (D) Other applications within airport noise corridors and imaginary surfaces which affect airport operations; and	See response to -0045(1)(c).
(g) Regulations assuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP.	Section 10.030 and 10.040 addresses amendments to the zoning map and development code, respectively. Section 11.02 specifies the level of review for specific land use actions. Zone changes and Comprehensive Plan Map amendments are subject to Type III actions while amendments to the Comprehensive Plan or zoning code are subject to Type IV action. Subchapter 12 includes provisions for zone changes and plan amendments. It specifies procedural requirements and approval standards. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth below. The purposes of this section are to provide for safe and convenient pedestrian, bicycle and vehicular circulation consistent with access management standards and the function of affected streets, to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel in areas where pedestrian and bicycle travel is likely if connections are provided, and which avoids wherever possible levels of automobile traffic which might interfere with or discourage pedestrian or bicycle travel.	
(a) Bicycle parking facilities as part of new multi-family residential developments of four units or more, new retail, office and institutional developments, and all transit transfer stations and park-and-ride lots;	Section 73.25 includes requirements for bicycle parking. The requirements specify minimum bicycle parking requirements for public or industrial parking lots with 10 or more vehicle parking spaces, for businesses in the MUPC zone, and for residential development with four or more dwellings or more

Table 1: Independence Development Code Regulatory Review	
	than 12 residents. The Section also includes design standards that that specify shelter, surface, and rack requirements. **<u>Recommendation:</u>** Current regulations are compliant with TPR provisions. No amendments are recommended.
(b) On-site facilities shall be provided which accommodate safe and convenient pedestrian and bicycle access from within new subdivisions, multi-family developments, planned developments, shopping centers, and commercial districts to adjacent residential areas and transit stops, and to neighborhood activity centers within one-half mile of the development. Single-family residential developments shall generally include streets and accessways. Pedestrian circulation through parking lots should generally be provided in the form of accessways. (A) "Neighborhood activity centers" includes, but is not limited to, existing or planned schools, parks, shopping areas, transit stops or employment centers; (B) Bikeways shall be required along arterials and major collectors. Sidewalks shall be required along arterials, collectors and most local streets in urban areas, except that sidewalks are not required along controlled access roadways, such as freeways; (C) Cul-de-sacs and other dead-end streets may be used as part of a development plan, consistent with the purposes set forth in this section; (D) Local governments shall establish their own standards or criteria for providing streets and accessways consistent with the purposes of this section. Such measures may include but are not limited to: standards for spacing of streets or accessways; and standards for excessive out-of-direction travel; (E) Streets and accessways need not be required where one or more of the following conditions exist: (i) Physical or topographic conditions make a street or accessway connection impracticable. Such conditions include but are not limited to freeways, railroads, steep slopes, wetlands or other bodies of water where a connection could not reasonably be provided; (ii) Buildings or other existing development on adjacent lands physically preclude a connection now or in the future considering the potential for redevelopment; or (iii) Where streets or accessways would violate provisions of leases, easements, covenants, restrictions or other agreements existing as of May 1, 1995, which preclude a required street or accessway connection.	**On-site circulation, connections and parking lots:** Section 19.005 provides residential design standards that specify building orientation and connectivity requirements to promote pedestrian circulation. Section 33.030(B) and 33.040(H) provide development standards for the MUPC and Downtown Riverfront Zone respectively. They specify the design and requirements for internal pedestrian connections in parking lots with more than 10 spaces. Similarly, each section requires pedestrian connections between the building and the sidewalk. The section also specifies maximum pedestrian lighting requirements. **Bikeways and sidewalks:** Subdivision requirements in Subchapter 90 include street design standards that specify sidewalk and bike lanes requirements by street classification. Bike lanes are required for all arterials and for collectors that exceed 2,000 ADT. Sidewalks are required on all street classifications. **Cul-de-sacs:** Subdivision requirements in Subchapter 90 restrict the use of cul-de-sacs to circumstances with a demonstrated need. Circumstances are defined to include slopes, wetlands/water bodies, or existing development. Cul-de-sacs are limited in length and the number of single-family dwellings they serve. **Street and accessway layout:** The width, length, and shape of blocks are regulated under Section 90.90.15. The provisions generally limit the size of blocks to 600 feet (or 1,600 foot perimeter). Exceptions are allowed when average block sizes are proposed, adjacency to arterial streets, or for topographic conditions. Public accessways may be required to connect cul-de-sacs, connect unusually long blocks, or to provide public paths according to adopted plans or to provide connections to schools, parks, or other public areas. **<u>Recommendation:</u>** The City's standards generally are consistent with the TPR provisions. However, the City should consider strengthening connectivity and circulation standards to include multifamily development and planned unit developments.

Table 1: Independence Development Code Regulatory Review	
(c) Where off-site road improvements are otherwise required as a condition of development approval, they shall include facilities accommodating convenient pedestrian and bicycle travel, including bicycle ways along arterials and major collectors; *[Note: Subsection (d) defines safe and convenient]*	See response to Section -0045(2)(e).
(e) Internal pedestrian circulation within new office parks and commercial developments shall be provided through clustering of buildings, construction of accessways, walkways and similar techniques.	Section 33.030(B) and 33.040(H) provide development standards for the MUPC and Downtown Riverfront Zone respectively. They require pedestrian connections between the building and the sidewalk, but do not specify standards or guidelines for clustering buildings and making pedestrian connections between other on-site buildings. **Recommendation:** The City should consider strengthening connectivity and circulation standards to encourage on-site pedestrian connections between buildings and to cluster buildings where feasible.
(4) To support transit in urban areas containing a population greater than 25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)–(g) below:	The City of Independence had an estimated population of 9,326 in the year 2017 and does not exceed the threshold for this provision.
(6) In developing a bicycle and pedestrian circulation plan as required by OAR 660-012-0020(2)(d), local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas. Appropriate improvements should provide for more direct, convenient and safer bicycle or pedestrian travel within and between residential areas and neighborhood activity centers (i.e., schools, shopping, transit stops). Specific measures include, for example, constructing walkways between cul-de-sacs and adjacent roads, providing walkways between buildings, and providing direct access between adjacent uses.	The TSP update will make recommendations to the bicycle and pedestrian plan that are consistent with TPR -0020. This TPR requirements is currently addressed in the following areas: - Walkways between cul-de-sacs and adjacent roads – See response and recommendations in Section -0045(3)(b). - Walkways between buildings – See response and recommendations related to accessways in Section -0045(3)(b). - Access between adjacent uses – See response and recommendations related to accessways in Section -0045(3)(b). **Recommendation:** This requirement will be addressed by the TSP update planning process and can be met by requiring improvements in developing areas consistent with adopted code provisions. In identifying pedestrian and bicycle improvements for inclusion in the TSP, the City should review recommendations in the City's Parks, Open Space and Trails Master Plan, which focused in part on improving pedestrian pathway and other connections between residential areas and activity centers.
(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total right-of-way consistent with the operational needs of the facility. The intent of this requirement is that local governments consider and reduce excessive standards for local streets and accessways in order to reduce the cost of construction, provide for more efficient use of urban land, provide for emergency vehicle access	Street standards are located in Section 90.90.10. Local streets are required to have a 52- foot right-of-way with 28-feet pavement width. The standard local street width is consistent with the recommended widths illustrated in the Transportation Growth Management Neighborhood Street Design Guidelines (listed below).

Table 1: Independence Development Code Regulatory Review	
while discouraging inappropriate traffic volumes and speeds, and which accommodate convenient pedestrian and bicycle circulation. Not withstanding section (1) or (3) of this rule, local street standards adopted to meet this requirement need not be adopted as land use regulations.	*Pavement ROW* *No On-Street Parking 20' 42-48'* *Parking on One Side 24' 47-52'* *Parking on Two Sides 28' 52-56'* **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.
OAR 660-12-0060	
Amendments to functional plans, acknowledged comprehensive plans, and land use regulations that significantly affect an existing or planned transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility.	Section 10.030 and 10.040 addresses amendments to the zoning map and development code respectively. Section 11.02 specifies the level of review for specific land use actions. Zone changes and Comprehensive Plan Map amendments are subject to Type III actions while amendments to the Comprehensive Plan or zoning code are subject to Type IV action. Subchapter 12 includes provisions for zone changes and plan amendments. It specifies procedural requirements and approval standards. The approval standards for zone changes and plan amendments include requirements for the change to be consistent the Comprehensive Plan and the Transportation System Plan. **Recommendation:** Current regulations are compliant with TPR provisions. No amendments are recommended.

Attachment G Tech Memo #6: Preferred Alternatives

TECH MEMO #6: PREFERRED ALTERNATIVES

Date: March 26, 2021 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Alec Kauffman, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Tech Memo #6: Preferred Alternatives

TABLE OF CONTENTS

INTRODUCTION

This memorandum presents the preferred alternatives developed by the project team to address the gaps, deficiencies, and needs identified throughout the planning process. The preferred alternatives identified in this memorandum will form the basis for the plans, policies, programs, and projects included in the Independence Transportation System Plan (TSP) update.

Previous technical memoranda documented existing gaps and deficiencies in the transportation system (see *Tech Memo 3: Existing Conditions Inventory and Analysis)*, future transportation system needs to address growth (see *Tech Memo 4: Future Systems Conditions*), and potential transportation system alternatives to address the gaps, deficiencies, and needs (see *Tech Memo 5: Alternatives Analysis and Funding Program*).

The project team combined information provided in these and other technical memoranda to select the preferred alternatives and identify priorities for the preferred and cost constrained plans. The priorities reflect the goals and objectives and evaluation criteria developed for the TSP update (see *Tech Memo 2: Project Goals and Objectives and Evaluation Criteria*). The information provided in this memorandum was revised based on input from the project team, the project advisory committees, and the community.

PROJECT GOALS, OBJECTIVES, AND EVALUATION CRITERIA

Project goals, objectives, and evaluation criteria were developed early in the planning process to guide the development of the TSP update. The project goals, objectives, and evaluation criteria reflect the vision of a vibrant community and emphasize the desire to increase options for people walking, biking, and taking transit. The project goals and objectives were used to select the preferred alternatives, while the evaluation criteria were used to prioritize them in the planned and cost constrained plans.

Preferred Alternatives

A qualitative assessment of the transportation system alternatives was conducted by the project team to identify the preferred alternatives. The qualitative assessment considered the goals and objectives of the TSP update as well as potential environmental impacts, engineering challenges, and input from the community. The goals of the TSP update are documented in Tech Memo 2 and summarized below.

- **Goal 1: Consistency with Community Vision** – Develop and maintain a transportation system that is consistent with the community vision of a vibrant, historic, riverfront, full-service community that celebrates its unique multi-cultural heritage and respects the environment while fostering a stable, diversified economy.
- **Goal 2: Smooth and Safe Traffic Flow** – Optimize the performance of the transportation system to provide smooth and safe traffic flow along area roads.
- **Goal 3: Increased Walking, Biking, Scooter, and Non-motorized Trips** – Enhance and expand the multimodal transportation system to encourage increased walking, bicycling, scooter, and other non-motorized trips.
- **Goal 4: Increased Transit Ridership** – Support the development of an efficient public transportation system to encourage increased transit ridership.
- **Goal 5: Future Focused** – Support the development and implementation of transportation solutions that are future focused and enhance the mobility and safety of all travel modes.
- **Goal 6: Financial Stability** – Develop funding solutions for transportation system improvements that maintain the financial stability of the City.

Alternatives that received the same or similar scores were discussed by the project team and, in most cases, a preferred alternative was identified. However, in some cases two or more preferred alternatives remain and are presented below for further consideration. *Attachment A contains the qualitative assessment of the alternatives.*

Prioritization

The preferred alternatives were further evaluated based on the project evaluation criteria to identify priorities for the cost constrained plan. The preferred alternatives were identified as high, medium, and low priority based on how well they meet the evaluation criteria and by extension, the goals of the TSP update. *The evaluation criteria are included in Attachment B. Attachment B also indicates how the evaluation criteria were used to evaluate and prioritize the projects.*

PLANNING LEVEL COST ESTIMATES

Planning level cost estimates were developed for the preferred alternatives based on average unit costs for similar projects within the Pacific Northwest. The cost estimates help provide a realistic plan that reflects the City's financial forecast. The cost constrained plan was developed by identifying forecasted transportation funding (see *Tech Memo 3: Existing Conditions Inventory and Analysis*) and selecting higher priority projects from the planned plan that can be funded with forecasted funds.

TRANSPORTATION FUNDING

The TSP will include a preferred plan, which identifies all the plans, policies, programs, and projects needed to address the gaps, deficiencies, and needs within the city over the next 20 years. The TSP will also include a cost constrained plan, which reflects the financial forecast and identifies what the City anticipates being able to fund over the next 20 years. The amount of local funds available for capital projects in the TSP is estimated to be approximately $10.0 million or roughly $0.5 million per year.

PLANNED TRANSPORTATION SYSTEM COST SUMMARY

Table 1 summarizes the full cost of the preferred and cost constrained plans for the TSP Update. As shown, the full cost of the preferred plan is approximately $60.8 million over the 20-year period, including $17.4 million in high priority projects, $7.3 million in medium priority projects, and $36.1 million in low priority projects. Based on the anticipated funds available for capital improvements, the cost constrained plan includes the high priority projects.[1]

[1] The high priority projects include those that are most likely to be funded by the City over the 20-year planning horizon. The medium and low priority project are aspirational and will be funded through grants and additional funding sources as they become available and/or by private developers as part of future development.

Table 1: Planned Transportation System Cost Summary

Project Type	High Priority	Medium Priority	Low Priority	Total
Planned Transportation System				
Roadway	$5,295,000	$9,875,000	$19,365,000	$34,535,000
Freight	$0	$0	$0	$0
Safety	$130,000	$285,000	$535,000	$950,000
Pedestrian	$2,975,000	$7,725,000	$10,615,000	$21,315,000
Bicycle	$1,075,000	$2,225,000	$3,240,000	$6,540,000
Transit	$55,000	$135,000	$255,000	$445,000
Rail	$0	$0	$0	$0
Safe Routes to School	$0	$0	$0	$0
Emerging Technology	$0	$0	$0	$0
Parking	$50,000	$0	$0	$50,000
TDM[1]	$0	$0	$0	$0
Total	**$9,580,000**	**$20,245,000**	**$34,010,000**	**$63,835,000**

TDM: Transportation Demand Management

Given limited funding, the City will need to identify additional revenue sources to implement all projects identified in the preferred plan over the next 20 years. A summary of these potential revenue sources is provided in Tech Memo 5.

ROADWAY SYSTEM

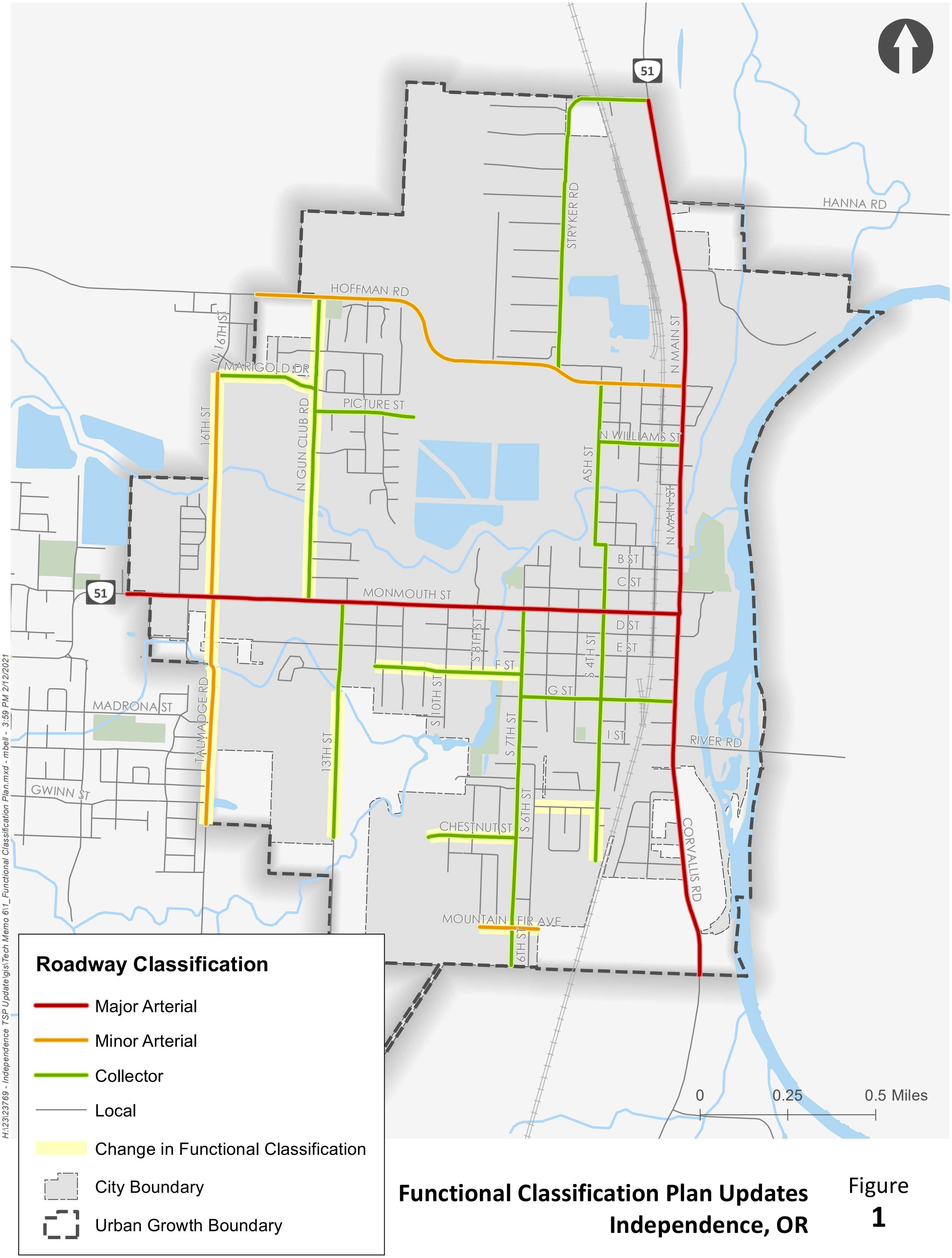
The preferred alternatives developed for the roadway system include changes to the functional classification plan, new major street (arterial and collector) connections, new local street connections, traffic safety and operational enhancements, and more. Collectively, these alternatives will help optimize the performance of the transportation system and provide *smooth and safe traffic flow* along city roadways, consistent with Goal 2 of the TSP update.

Functional Classification

The preferred alternatives include several changes to the City's functional classification plan, many of which increase the classification of City roadways (e.g., local street to collector, collector to arterial). The changes reflect a review of the City's existing functional classification plan along with the functional classification plans of ODOT, Polk County, Marion County, and the City of Monmouth. The changes are intended to better align the classifications with the roadway uses and to provide further arterial and collector connectivity within the built network. The proposed changes in functional classification are shown in Figure 1 and summarized in Table 2.

Street Design Standard Policies

The City of Independence Public Works Design Standards document includes design standards that reflect the functional classification of City streets. The Public Works Design Standards document will likely be updated following adoption of the TSP update. As it is updated, the City should include policies that ensure the street is designed as places for community, rather than places for motor vehicles.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\1_Functional Classification Plan.mxd - mbell - 3:59 PM 2/12/2021

Functional Classification Plan Updates
Independence, OR

Figure
1

Data Source: Polk County Data Portal, ODOT

Table 2: Proposed Changes in Functional Classification

Street	Segment	Existing Classification	Future Classification
16th Street	North city limits to Talmadge Road	Collector	Minor Arterial
16th Street	Talmadge Road to south city limits	Local	Minor Arterial
Marigold Drive	16th Street to Gun Club Road	Local	Collector
Gun Club Road	Hoffman Road to OR 51-Monmouth Street	Minor Arterial	Collector
Randall Way-F Street	12th Street to 7th Street	Local	Collector
13th Street	F Street to the south city limits	Local	Collector
Spruce Avenue	6th Street to 4th Street	Collector	Local
Chestnut Street	7th Street to western extents	Local	Collector
4th Street	Spruce Avenue to southern extents	Local	Collector
Mountain Fir Avenue	Roadway extents	Local	Minor Arterial

The City will coordinate with ODOT, Polk County, Marion County, and Monmouth to address discrepancies in the functional classification of roadways within the city.

Major Street Connectivity and Roadway Capacity Projects

The preferred alternatives include several new major street (arterial and collector) connections that will enhance north-south and east-west connectivity within the City. The new connections reflect a review of existing major street connections as well as planned connections identified in the 2007 TSP and the 2012 Southwest Independence Concept Plan. The future street system needs to balance the benefits of providing a well-connected grid system with the connectivity challenges in the city due to existing waterways (e.g., Ash Creek), detention ponds, the airport, the railroad, and existing development.

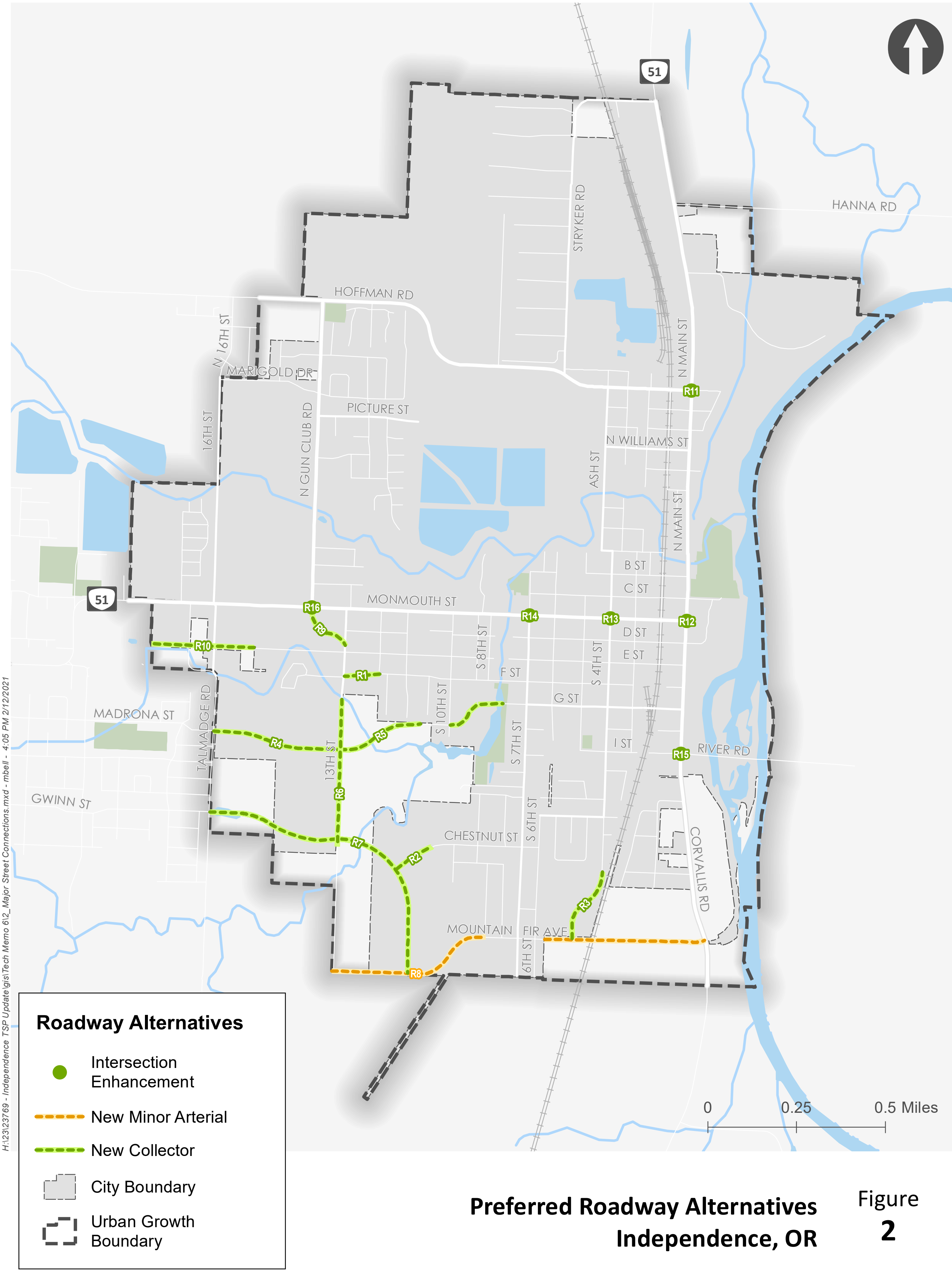
Table 3 identifies the preferred alternatives for the roadway system. The priorities shown in Table 3 are based on the project evaluation criteria as well as input from the project team; the priorities were updated based on input from the advisory committees and the community. The cost estimates are based on average unit costs for similar roadway improvements in the northwest. Figure 2 illustrates the location of the preferred roadway alternatives.

Table 3: Preferred Roadway Alternatives

Map ID	Location	Description	Priority	Cost
Major Street Connectivity				
R1	Randal Way Extension	Extend Randal Way west to 13th Street at F Street	Medium	$820,000
R2	Chestnut Street Extension	Extend Chestnut Street southwest to the new east-west collector 3	Low	$975,000
R3	4th Street Extension	Extend 4th Street south to the new east-west minor arterial	High	$1,800,000
R4	Madrona Street Connection (west)	Construct a new east-west collector from 16th Street at Madrona Street to 13th Street	Low	$2,995,000
R5	Madrona Street Connection (east)	Construct a new east-west collector from 13th Street at Madrona Street to G Street. The project should consider and reduce impacts to Inspiration Garden	Low	$3,445,000

R6	13th Street Extension	Extend 13th Street south to the south city limits	Low	$3,420,000
R7	Gwinn Street Connection	Construct a new east-west collector from 16th Street at Gwinn to Mountain Fir Drive Extension	Low	$7,245,000
R8	Mountain Fir Drive Extension (New east-west minor arterial)	Extend Mountain Fir Drive east to Corvallis Road and west to the west City limits; coordinate with City of Monmouth on final alignment west of the City limits	Medium	$9,055,000
R9	Gun Club Road-13th Street	Extend Gun Club Road south and realign to connect with 13th Street	Low	$1,285,000
R10	E Street Extension	Extend E Street west to 16th Street and the west city limit	High	$2,390,000
Intersection				
R11[1]	OR 51/Polk Street	Install a left-turn lane at the east-bound approach and a traffic signal when signal warrants are met; Coordinate with Project S2	High	$450,000
R12[1]	OR 51-Main Street/ OR 51-Monmouth Street	Install left- and right-turn lanes at the eastbound approach and a traffic signal when signal warrants are met	High	$350,000
R13[1]	OR 51-Monmouth Street/4th Street	Install a center two-way left-turn lane on OR 51-Monmouth Street from 7th Street to 4th Street and taper east of 4th Street – continue to monitor the intersection and a traffic signal if/when signal warrants are met; Coordinate with Project S5	High	$50,000
R14[1]	OR 51-Monmouth Street/7th Street	Install a center two-way left-turn lane on OR 51-Monmouth Street from 7th Street to 4th Street and taper west of 7th Street – continue to monitor the intersection and a traffic signal if/when signal warrants are met; Coordinate with Project S6	High	$50,000
R15	Main Street/ River Road	Install a southbound left-turn lane and reconfigure as all-way stop control; Install a westbound left- or right-turn lane in conjunction with a new bridge; Coordinate with Project S3 and P20	High	$195,000[2]
R16[1]	OR 51-Monmouth Street/Gun Club Road	Optimize the signal timing/phasing to provide more green time to the southbound left-turn movement	High	$10,000
			Total High Priority Cost	**$5,295,000**
			Total Medium Priority Cost	**$9,875,000**
			Total Low Priority Cost	**$19,365,000**
			Total Cost	**$34,535,000**

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.
1. Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer. Further evaluation may be required to determine the most appropriate form of traffic control.
2. Project cost includes the southbound left-turn lane. The westbound left- or right-turn lane will be provided with the new bridge.



H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\2_Major Street Connections.mxd - mbell - 4:05 PM 2/12/2021

Preferred Roadway Alternatives
Independence, OR

Figure
2

Data Source: Polk County Data Portal, ODOT

OR 51-Main Street/OR 51-Monmouth Street

Several alternatives were evaluated at the OR 51-Main Street/OR 51-Monmouth Street intersection, including several additional alternatives not previously vetted by the project advisory committee or the community. Two alternatives that offer unique opportunities for the community are presented below for further review and discussion.

Rectangle-about

The rectangle-about is a variation on the square-about presented in Tech Memo 5 that offers similar improvements in traffic operations. Two variations of the rectangle-about were considered, but ultimately one that incorporates OR 51-Main Street, OR-51 Monmouth Street, 2nd Street, and B Street was identified as the preferred alternative. This is primarily because it maintains OR 51-Monmouth Street as a primary route through the intersection and provides the opportunity to use C Street as plaza space. Exhibit 1 illustrates the rectangle about.

Exhibit 1: Rectangle-About

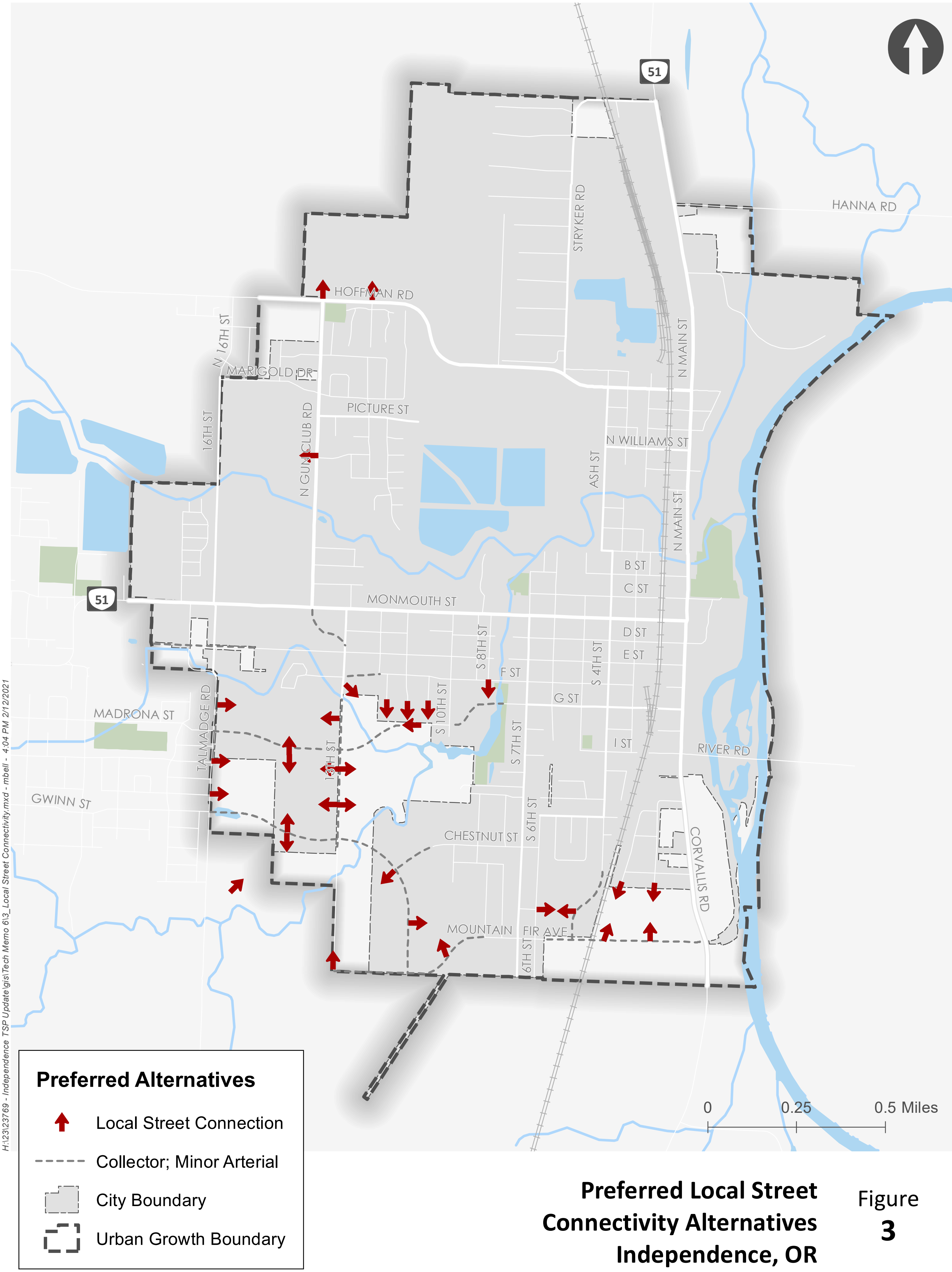
Further evaluation of this alternative is required to determine the configuration of the intersections as well as 2nd Street and how traffic will integrate with the rail line. However, it is worth noting that this alternative is similar to the configuration the City uses during street festivals to restrict traffic on OR 51-Main Street. Given the one-way configuration of OR 51-Main Street from OR 51-Monmouth Street to B Street, access to Riverfront Park would be constrained from the north. Motorists would need to travel around the rectangle-about to reach C Street.

No-build

The existing conditions analysis indicates that the OR 51-Main Street/OR 51-Monmouth Street intersection operates acceptably per its applicable mobility target, despite congestion during peak time periods. The future conditions analysis indicates that it is projected to exceed its applicable mobility standard in the horizon year of the TSP update, 2040; however, a sensitivity analysis indicates that it likely won't exceed its target until 2032. In the interim, the City could work to improve the street network around downtown, including implementation of the major street conditions and intersection improvements identified in Table 3, and extend the life of the intersection as all-way stop control. It is worth noting that the new east-west arterial (Project R8) would provide an alternative route and likely improve operations at the OR 51-Main Street/OR 51-Monmouth Street intersection, as well as all other intersections on OR 51-Monmouth Street, through the horizon year of the TSP update.

Local Street Connectivity

Several local street connections were identified for the Independence TSP update. Figure 3 illustrates the location and general orientation of the connections. Roadway alignments and cost estimates are not provided as they are anticipated to be determined as part of future development. Any local street connections that are desired to be city-initiated projects should be identified as a high priority and included in the cost-constrained plan. The City will refer to the local street connections shown in Figure 3 during development review to ensure future development and redevelopment improve local street access and circulation within the city.



Preferred Local Street Connectivity Alternatives Independence, OR

Figure 3

Data Source: Polk County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\3_Local Street Connectivity.mxd - mbell - 4:04 PM 2/12/2021

Freight System

The preferred alternatives developed for the freight system include designated freight and farm equipment routes and safety and operational enhancements at key locations throughout the City.

Freight and Farm Equipment Routes

The City designated freight and farm equipment routes were developed based on the location of major freight and farm equipment generators in the City as well as input from the project team. The designated freight and farm equipment routes will ensure that the city plans for the efficient movement of goods and services throughout the city while protecting neighborhood livability, maintaining public safety, and minimizing maintenance costs. The designated freight and farm equipment routes include:

- OR 51-Main Street from the north City limits to Polk Street
- Hoffman Road-Polk Street from the west City limits to OR 51-Main Street
- 16th Street from the north City limits to the south City limits
- Future east-west arterial from the west city limits to Corvallis Road
- Corvallis Road from south city limits to future east-west arterial

Figure 4 illustrates the designated freight and farm equipment routes. Each of these routes should provide adequate travel lane width for freight movement as well as separate facilities for pedestrian and bicycle activity. Adequate turning radii should also be provided at all major intersections along these roadways to ensure efficient freight travel.

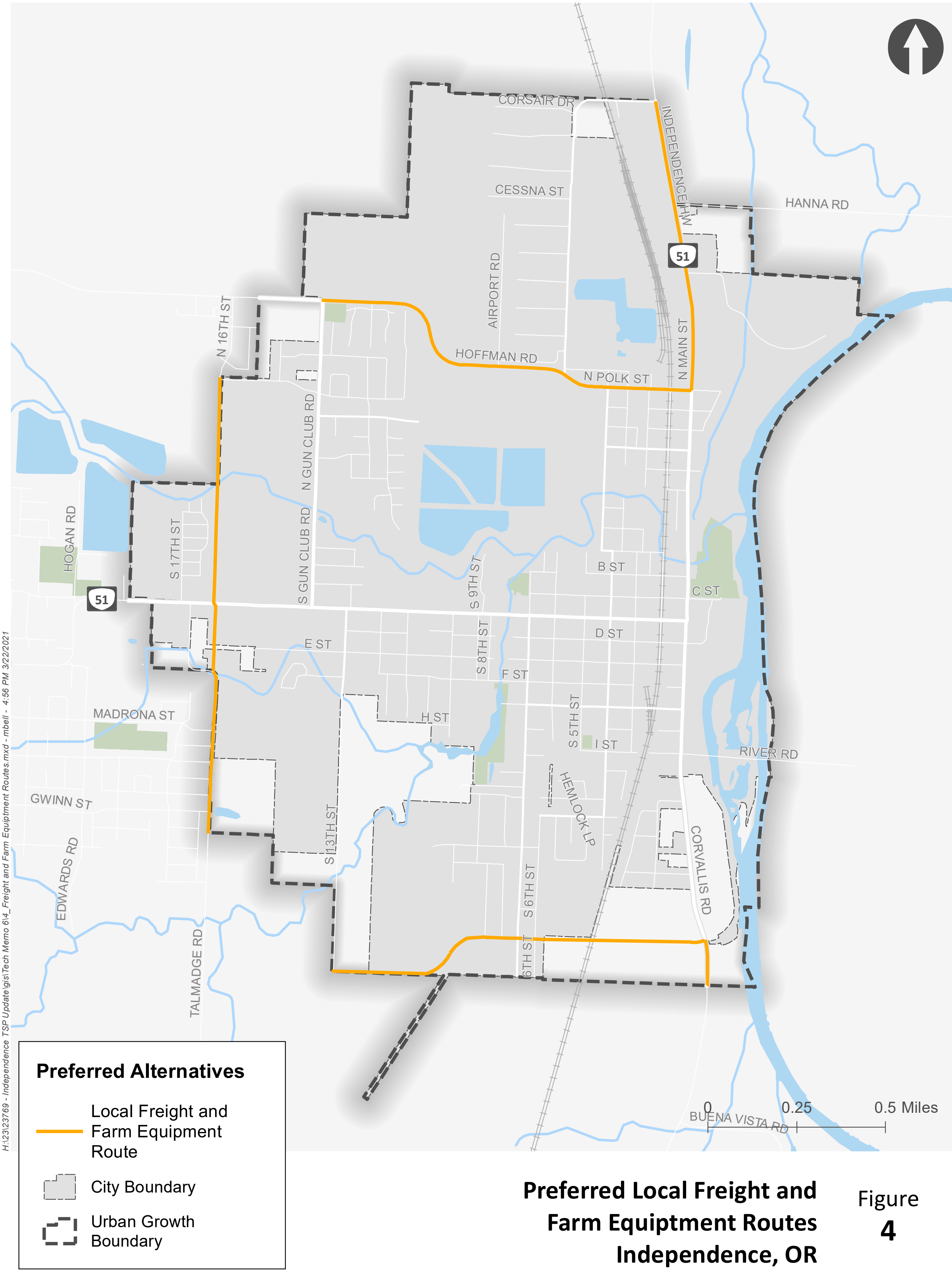
Freight System Alternatives

No freight-specific alternatives were developed for the freight system. However, several of the preferred alternatives developed for the roadway system will improve freight movement throughout the City, including the new east-west arterial and several of the safety and operational enhancements at the intersections.

Freight System Policies

The freight system policies are provided below.

- Establish truck loading zones within the downtown area and develop policies related to the use of the truck loading zones.
- Develop policies related to maintenance along designated freight and farm equipment routes to ensure the facilities do not become degraded over time.
- Develop policies related to pedestrian and bicycle facilities along designated freight and farm equipment routes to ensure greater separation of travel modes.



Preferred Local Freight and Farm Equiptment Routes Independence, OR

Figure 4

Data Source: Polk County Data Portal, ODOT

Traffic Safety

The preferred alternatives developed for the roadway system also include traffic safety enhancements at locations with a history of fatal and severe injury crashes as well as locations with high crash rates.

Traffic Safety Alternatives

Table 4 identifies the preferred alternatives developed to address traffic safety. The priorities shown in Table 4 are based on the project evaluation criteria as well as input from the project team; the priorities were updated based on input from the advisory committees and the community. The cost estimates are based on average unit costs for similar roadway improvements in the northwest. Figure 5 illustrates the location of the preferred alternatives.

Table 4: Traffic Safety Preferred Alternatives

Map ID	Location	Description	Priority	Cost
Intersections				
S1	Hoffman Road/ 16th Street	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the eastbound approach	High	$45,000
S2[1]	OR 51-Main Street/ Polk Street	Install advanced intersection warning signs and traffic calming measures at the southbound approach; Coordinate with Project R11	High	$35,000
S3	S Main Street/ River Road S	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the northbound approach; Coordinate with Projects R15 and P20	Medium	$55,000
S4[1]	OR 51-Main Street/ Stryker Road	Install advanced intersection warning signs, speed feedback signs[2], and traffic calming measures at the southbound approach	Medium	$55,000
S5[1]	OR 51-Monmouth Street/4th Street	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection; Coordinate with Project R13	Medium	$50,000
S6[1]	OR 51-Monmouth Street/7th Street	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection; Coordinate with Project R14	Medium	$50,000
S7	Hoffman Road/ Gun Club Road	Provide traffic calming measures on Hoffman Road approaching the intersection	High	$50,000
S8	Stryker Road/Hoffman Road-Polk Street	Close Hoffman Road at the westbound approach to Stryker Road; Coordinate with Project P21	Medium	$40,000
Roadways				
S9[1]	OR 51-Monmouth Street – West City Limits to Gun Club Road	Install eastbound dynamic speed feedback sign[2] east of west City Limits and reflectorized back plates for all traffic signal heads at 16th Street and Gun Club Road intersections	Medium	$15,000
S10	4th Street – OR 51-Monmouth Street to Spruce Avenue	Provide traffic calming measures on 4th Street; improve visibility between OR 51-Monmouth Street and Spruce Avenue by providing "No Parking" zones and additional lighting on both sides of the street at intersections	Low	$485,000

S11	Corvallis Road – South of River Road	Conduct a speed study to evaluate the ability to move the posted speed sign further south	Medium	$20,000[3]
S12	River Road Bridge	Install "Bike on Bridge" warning signs with actuated beacons	Low	$50,000
			Total High Priority Cost	**$130,000**
			Total Medium Priority Cost	**$285,000**
			Total Low Priority Cost	**$535,000**
			Total Cost	**$950,000**

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.
1. Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer.
2. Speed feedback signs are considered enforcement tools, and the City will be expected to fund, operate, and maintain the speed feedback signed under an ODOT permit.
3. ODOT will conduct the speed study if requested by the City at no cost. Therefore, the cost estimate reflects the cost to relocate the speed limit signs.

Several additional intersections and roadway segments were identified by the project team, the advisory committees, and the community as potential safety concerns. While specific projects to address these concerns have not been developed, there are a wide variety of potential safety treatments that could be considered for implementation. The City should continue to monitor these locations and, if necessary, implement the following treatments:

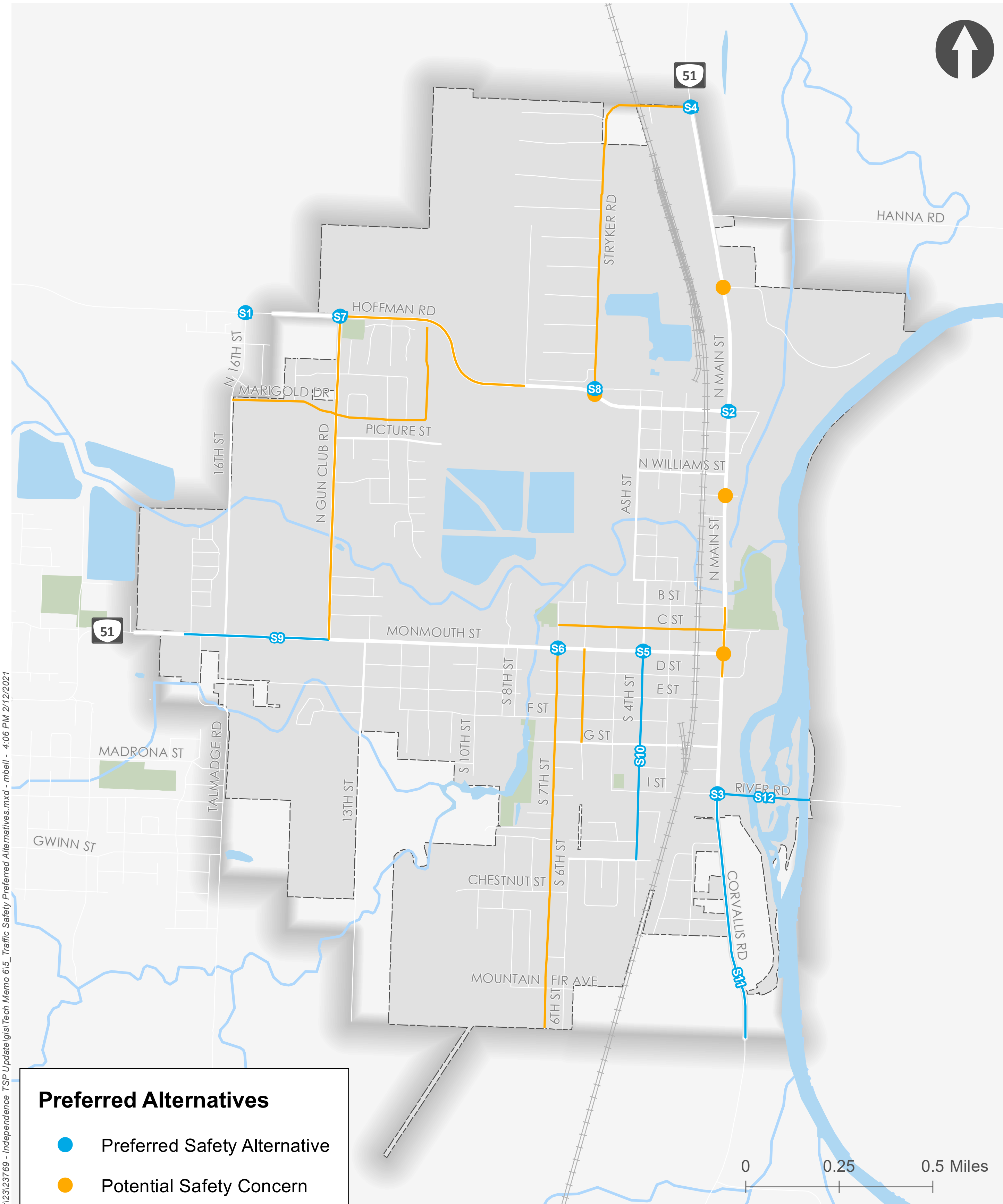
- Install advance intersection warning signs
- Install dynamic speed feedback sign
- Install traffic calming measures
- Install additional lighting

Figure 5 illustrates the additional locations. A comprehensive list of traffic safety alternatives for roadway segments, intersections (signalized and unsignalized), and for pedestrian and bicycle facilities is provided in Tech Memo 5.

Traffic Safety Policies

The traffic safety policies are provided below.

- Provide increased community education on sharing the road, both for drivers and bicyclists.
- Review lighting and systemically provide additional lighting on arterial and collector street segments and at intersections throughout Independence.
- Review sign reflectivity and visibility and systemically upgrade throughout Independence.



Preferred Alternatives

- Preferred Safety Alternative (point)
- Potential Safety Concern (point)
- Preferred Safety Alternative (line)
- Potential Safety Concern (line)
- City Boundary

Preferred Traffic Safety Alternatives
Independence, OR

Figure
5

Data Source: Polk County Data Portal, ODOT

Access Management

Numerous driveways and street connections increase the number of conflict points and potential for collisions and decrease mobility and traffic flow. *Tech Memo 5* identifies potential access management alternatives to preserve transportation system investments and guard against deteriorations in safety and increased congestion. The alternatives include:

- Update the city-wide access spacing standards to reflect conditions in the city;
- Define a variance process for when the standard cannot be met, and;
- Establish an approach for access consolidation over time to move in the direction of the standards at each opportunity.

Access Spacing Standards

The City's access spacing standards will continue to be determined by functional classification and provide standards for minimum intersection and driveway spacing. Table 5 summarizes City's access spacing standards.

Table 5: City Access Spacing Standards

Functional Classification	Minimum Intersection Spacing	Minimum Driveway Spacing
Major Arterial	350	175
Minor Arterial	350	175
Collector	350	100
Local Street	350	50

Access Management Policies

The access management policies are provided below.

- Defer to ODOT access spacing standards and policies on ODOT facilities.
- Ensure new development meets the access spacing standards.
- Consolidate non-conforming access points to move toward the access spacing standards.
- Establish access variance policies for parcels whose highway/street frontage, topography, or location would otherwise preclude conforming access spacing.

A comprehensive list of potential access spacing variance policies and an approach for access consolidation are provided in Tech Memo 5.

PEDESTRIAN SYSTEM

The preferred alternatives developed for the pedestrian system include sidewalks that fill gaps and provide new facilities along city streets, shared-use paths/trails that augment and support the sidewalks, and enhanced crossings that enable people to safely cross streets, railroad tracks, and other transportation facilities. Collectively, these alternatives will help enhance and expand the multimodal transportation system and encourage walking and other non-motorized trips consistent with Goal 3 of the TSP Update.

Pedestrian System Alternatives

Table 6 identifies the preferred alternatives developed for the pedestrian system. The priorities shown in Table 6 are based on the project evaluation criteria as well as input from the project team; the priorities were updated based on input from the advisory committees and the community. The cost estimates are based on average unit costs for similar roadway improvements in the northwest.

Table 6: Pedestrian System Preferred Alternatives

Map ID	Location	Description	Priority	Cost
Sidewalks				
P1[1]	OR 51-Main Street	Fill in the gaps on the east side of the road from Stryker Road to OR 51 Monmouth Street	Low	$715,000
P3	Main Street	Install sidewalks on the east side of the road from F Street to River Road	Medium	$225,000
P4	Corvallis Road	Install sidewalks on the east side of the road from River Road to the south city limits	Medium	$1,435,000
P5	Hoffman Road	Install sidewalks on the north side of the road from the west city limits to Airport Road; Coordinate with Project P37	Medium	$705,000
P6	Polk Street	Fill in the gaps on the north and south sides of the road from Ash Street to OR 51-Main Street	High	$170,000
P7	Gun Club Road	Fill in the gaps on west side of the road from Hoffman Road to OR 51-Monmouth Street	High	$520,000
P8	Stryker Road	Fill in the gaps on both sides of the road from OR 51-Main Street to Polk Street	High	$1,270,000
P9	Ash Street/4th Street	Install sidewalks on the west side of the road from the Ash Creek Bridge to A Street	High	$145,000
P10	16th Street	Fill in the gaps on the east side of the road from OR 51-Monmouth Street to south city limits	High	$150,000
P11	13th Street	Fill in the gaps on the east side of the road from OR 51-Monmouth Street to south city limits	High	$160,000
P12	4th Street	Fill in the gaps on the east side of the road from I Street to the south city limits	High	$225,000
P13	Williams Street	Install sidewalks on the north side of the road from Log Cabin Street to Marsh Street	Medium	$75,000
P14	F Street	Fill in the gap on the north side of the road from 10th Street to 7th Street	High	$260,000

Enhanced Crossings and Pedestrian Amenities				
P15[1,2]	OR 51-Main Street/ Stryker Road	Provide enhanced pedestrian crossing treatments	Low	$75,000
P16[1,2]	OR 51-Main Street/ Deann Drive	Provide enhanced pedestrian crossing treatments	Medium	$75,000
P17[1,2]	OR 51-Main Street/Williams Street	Provide enhanced pedestrian crossing treatments on the south leg of the intersection to connect the bus stop	Medium	$75,000
P18[1,2]	OR 51-Monmouth Street/13th Street	Provide enhanced pedestrian crossing treatments	Medium	$75,000
P19	Main Street/G Street	Provide enhanced pedestrian crossing treatments	Low	$40,000
P20	Main Street-Corvallis Road/River Road	Provide enhanced pedestrian crossing treatments; Coordinate with Projects R15 and S3	Medium	$40,000
P21	Stryker Road/Hoffman Road	Install a marked crosswalk on the north leg of the intersection; Coordinate with Project S8	Low	$25,000
P22	Ash Street/Polk Street	Provide enhanced pedestrian crossing treatments	Medium	$25,000
P23	Gun Club Road/Marigold Street	Provide enhanced pedestrian crossing treatments	Medium	$25,000
P24	Stryker Road Rail Crossing	Provide enhanced pedestrian crossing treatments across the rail line	Low	$150,000
P25[1,2]	OR 51-Main Street/Main Street	Consider opportunities for street patios, street furniture, and other amenities in the downtown area	Low	$25,000
P26[1,2]	OR 51-Monmouth Street/2nd Street	Consider opportunities for street patios, street furniture, and other amenities in the downtown area	Low	$25,000
P2	OR 51-Monmouth Street/11th Street	Provide enhanced pedestrian crossing treatments	High	$75,000
Shared-Use Paths/Trails				
P27	North South Connector Trail #1	Install a shared-use path/trail south from Hoffman Road to Wildfang Park	Low	$980,000
P28	North South Connector Trail #2	Install a shared-use path/trail north from OR 51-Monmouth Street to Wildfang Park	Low	$155,000
P29	Ash Creek Trail Phase I	Install an east-west shared-use path/trail from Riverview Park to Wildfang Park	Low	$2,665,000
P30	Mt. Fir North-South Trail	Install a north/south shared-use path/trail from F Street to Mt. Fir Park and south across Becken Road – may include some on-street segments	Low	$845,000
P31	Mt. Fir Connector Trail	Install an east/west shared-use path/trail from Mt. Fir Street to Corvallis Road	Low	$740,000
P32	River Trail	Install a north/south shared-use path/trail along Willamette Riverfront	Medium	$2,980,000

P33	Going to the River Trail	Install an east/west shared-use path/trail from Williams Street to Howard Court – may include some on-street segments	Medium	$1,210,000
P34	Central High School (HS) Connector Trail	Install a north/south shared-use path/trail from Central High School to neighborhoods south of OR 51-Monmouth Street	Medium	$780,000
P35	South Fork Trail	Install two north/south shared-use path/trails on the east/west sides of the South Fork Ash Creek	Low	$2,875,000
P36	Drainage Trail	Install an east/west shared-use path/trail from 13th Street to the South Fork Trails	Low	$395,000
P37	Old Highway 99 Trail	Install an east/west shared-use path/trail to the existing shared-use path along OR 99 – may include some on-street segments; Coordinate with Project P5	Low	$620,000
P38	Willamette Valley Trail	Install an east/west shared-use path/trail to the Willamette Valley Scenic Bikeway – may include some on-street segments; Coordinate with Project B23	Low	$335,000
P39	Polk Street Trail	Install an east/west shared-use path/trail from the eastern terminus of Polk Street to the River Trail	Low	$150,000
P40	E Street Trail	Install an east/west shared-use path/trail from 13th Street to OR 51-Monmouth Street – may include some on-street segments.	Low	$735,000
			Total High Priority Cost	**$2,975,000**
			Total Medium Priority Cost	**$7,725,000**
			Total Low Priority Cost	**$10,615,000**
			Total Cost	**$21,315,000**

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.
1. Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer.
2. The location and type of enhanced crossing treatment(s) will be determined at the design/implementation stage.

Figure 6 illustrates the location of the preferred pedestrian alternatives for sidewalks and enhanced crossings. Figure 7 illustrates the location of the preferred pedestrian alternatives for shared-use paths and trails.

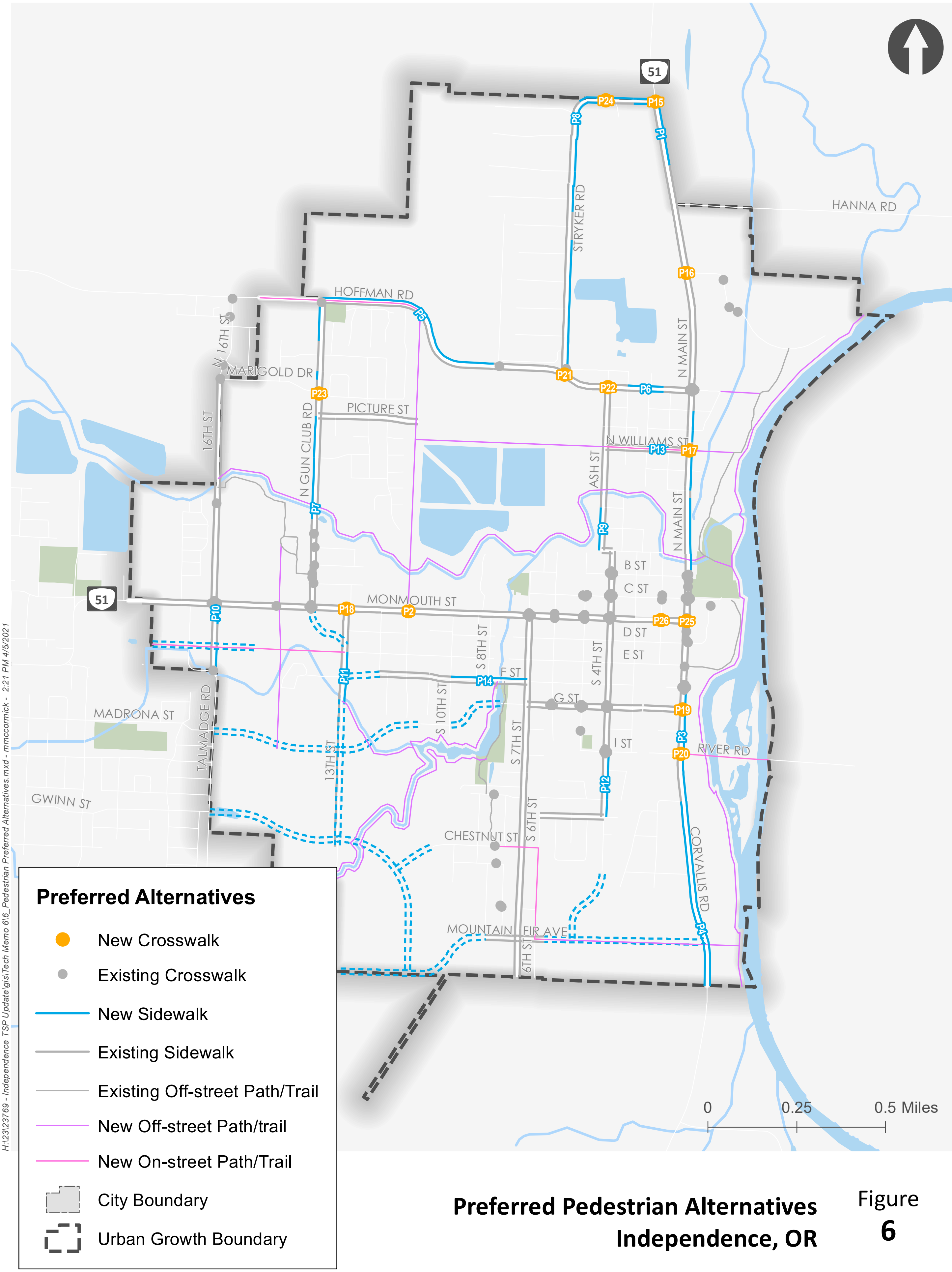
Pedestrian System Policies

The pedestrian system policies are provided below.

- Explore opportunities to further connect the shared-use path and trail system, including the locations adjacent to the river or the oxbow.

BICYCLE SYSTEM

The preferred alternatives developed for the bicycle system include on-street bike lanes, shared-lane pavement markings (sharrows), and bicycle boulevard treatments on city streets and enhanced bicycle crossings that enable people to safely cross streets, railroad tracks, and other transportation

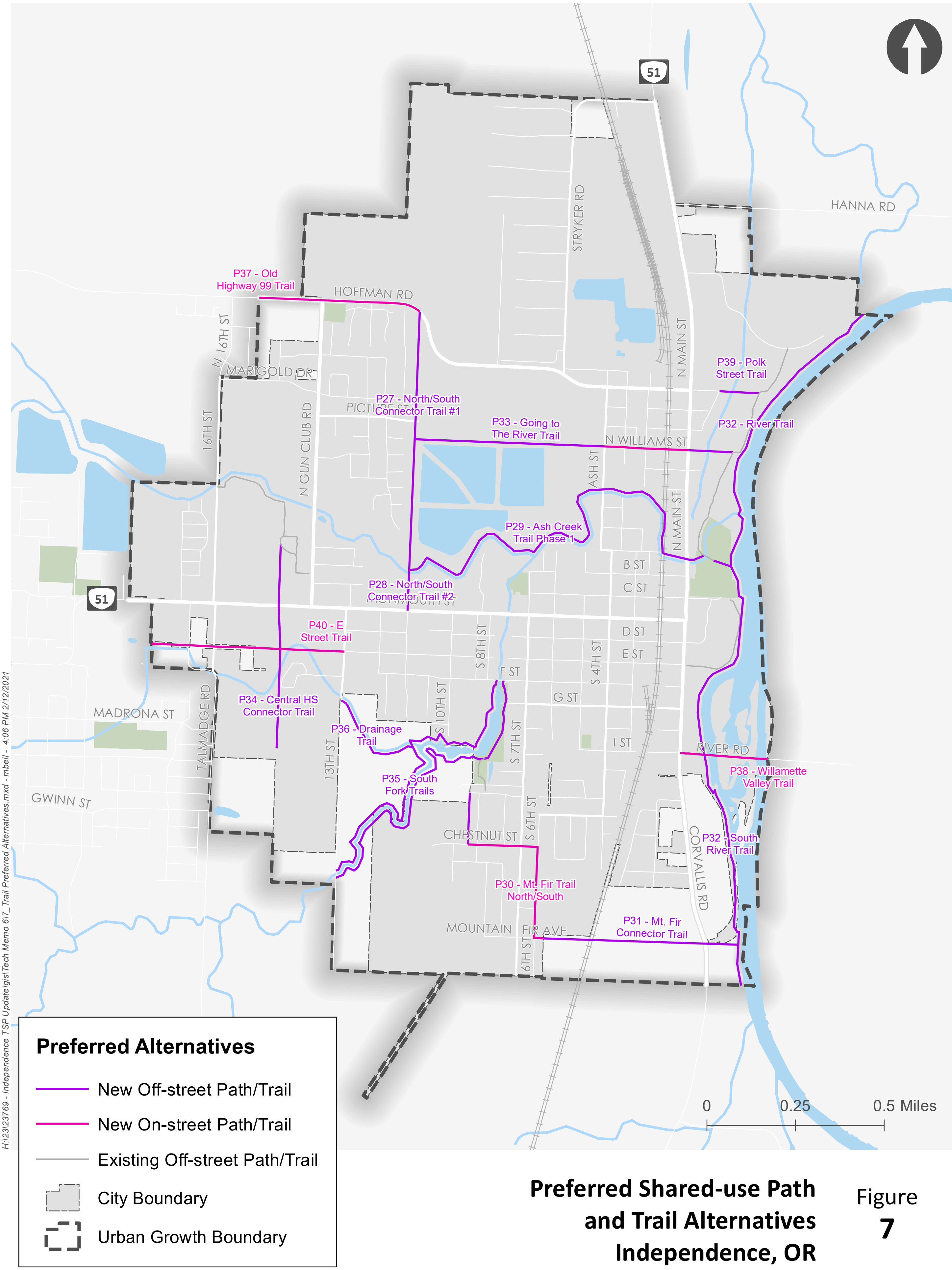


H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\6_Pedestrian Preferred Alternatives.mxd - mmccormick - 2:21 PM 4/5/2021

Preferred Pedestrian Alternatives
Independence, OR

Figure
6

Data Source: Polk County Data Portal, ODOT



Preferred Shared-use Path and Trail Alternatives
Independence, OR

Figure
7

Data Source: Polk County Data Portal, ODOT

facilities. Collectively, these alternatives will help enhance and expand the multimodal transportation system and encourage biking and other non-motorized trips consistent with Goal 3 of the TSP Update.

Bicycle System Alternatives

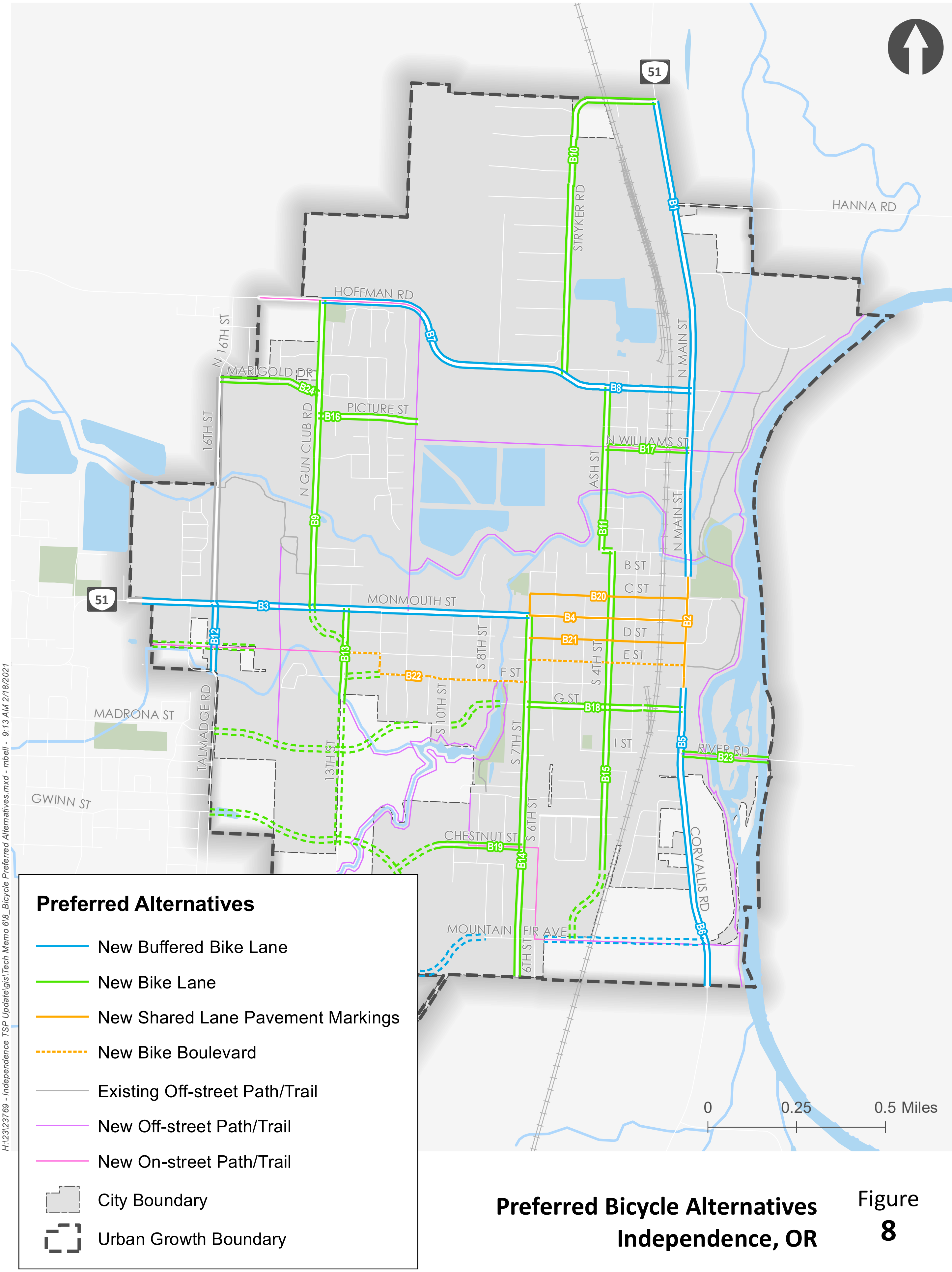
Table 7 identifies the preferred alternatives developed for the bicycle system. The priorities shown in Table 7 are based on the project evaluation criteria as well as input from the project team; the priorities were updated based on input from the advisory committees and the community. The cost estimates are based on average unit costs for similar roadway improvements in the northwest. Figure 8 illustrates the location of the preferred alternatives.

Table 7: Preferred Bicycle Alternatives

Map ID	Location	Description	Priority	Cost
Bike Lanes				
B1[1]	OR 51-Main Street	Install 7-foot buffered bike lanes on both sides of the roadway from Stryker Road to B Street (5-foot bike lane, 2-foot buffer) [2, 3, 4]	High	$125,000
B2[1]	OR 51-Main Street	Install shared lane pavement markings (sharrows) on both sides of the roadway from B Street to F Street	High	$10,000
B3[1]	OR 51-Monmouth Street	Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to the Ash Creek Bridge (5-foot bike lane, 2-foot buffer) [2, 3, 4]	High	$120,000
B4[1]	OR 51-Monmouth Street	Install shared lane pavement markings (sharrows) on both sides of the roadway from 7th Street to OR 51-Main Street	High	$10,000
B5	Main Street	Install 7-foot buffered bike lanes on both sides of the roadway from F Street to River Road (5-foot bike lane, 2-foot buffer) [2]	Low	$90,000
B6	Corvallis Road	Install 7-foot buffered bike lanes on both sides of the roadway from River Road to the south city limits (5-foot bike lane, 2-foot buffer) [2]	Low	$640,000
B7	Hoffman Road	Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to Airport Road (5-foot bike lane, 2-foot buffer) [2, 3]	Medium	$500,000
B8	Polk Street	Install 7-foot buffered bike lanes on both sides of the roadway from Airport Road to OR 51-Main Street (5-foot bike lane, 2-foot buffer) [2, 3]	Medium	$180,000
B9	Gun Club Road	Fill in the gaps with 6-foot bike lanes on both sides of the roadway from north of the high school property to Hoffman Road	Low	$305,000
B10	Stryker Road	Install 6-foot bike lanes on both sides of the road from Polk Street to OR 51-Main Street	Low	$1,275,000
B11	Ash Street/ 4th Street (north)	Install 6-foot bike lanes on both sides of the roads from Polk Street to OR 51-Monmouth Street [5]	Low	$295,000
B12	16th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits	Low	$160,000
B13	13th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits [4, 5]	High	$25,000

B14	7th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits [4, 5]	High	$420,000
B15	4 Street (south)	Install 6-foot bike lanes on both sides of the road from OR 51-Monmouth Street to Spruce Avenue [4, 5]	High	$345,000
B16	Picture Street	Install 6-foot bike lanes on both sides of the road from Gun Club Road to the eastern terminus [5]	Low	$25,000
B17	Williams Street	Install 6-foot bike lanes on both sides of the road from Ash Street to OR 51-Main Street [5]	Low	$115,000
B18	G Street	Install 6-foot bike lanes on both sides of the road from the western terminus to Main Street [4, 5]	Low	$280,000
B19	Chestnut Street	Install 6-foot bike lanes on both sides of the road from 6th Street to the western Terminus [5]	Low	$45,000
B20	C Street	Install shared-lane pavement markings from 7th Street to OR 51-Main Street	Medium	$10,000
B21	D Street	Install shared-lane pavement markings (sharrows) from 7th Street to Main Street	Medium	$10,000
B22	E Street/F Street	Install a bicycle boulevard along E Street/F Street from 13th Street to Main Street	High	$20,000
B23	River Road - Willamette River Bridge	Install 6-foot bike lanes on both sides of the Willamette River Bridge; this would require widening the bridge or providing cantilevered bike paths on one or two sides; Coordinate with Project P38	Medium	$1,500,000
B24	Marigold Drive	Install 6-foot bike lanes on both sides of the road from 16th Street to Gunn Club Road [5]	Medium	$25,000
Enhanced Crossings and Bicycle Amenities				
B25[1]	OR 51-Main Street/ OR 51-Monmouth Street	Install a bike corral on OR 51-Main Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection	Low	$5,000
B26[1]	OR 51-Main Street/ OR 51-Monmouth Street	Install a bike corral on OR 51-Monmouth Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection	Low	$5,000
			Total High Priority Cost	**$1,075,000**
			Total Medium Priority Cost	**$2,225,000**
			Total Low Priority Cost	**$3,240,000**
			Total Cost	**$6,540,000**

Note: The cost estimates presented do not include costs associated with right-of-way acquisition due to its high variability depending on location, parcel sizes, and other characteristics. The cost estimates also reflect the full cost of the projects, including costs likely to be funded by others, such as ODOT or private developers.
1. Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer.
2: This roadway contains segments with existing bike facilities (on-street bike lanes, shoulders, etc.). These facilities will be reconfigured to accommodate the preferred alternative.
3: Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.
4: Work with Cherriots to determine the bicycle facility configuration at bus stops for this intermodal facility.
5: On-street parking restrictions will be required and therefore the bike lane installation should be considered when traffic volumes exceed 2,000 ADT per City standard.



Preferred Bicycle Alternatives
Independence, OR

Figure
8

Data Source: Polk County Data Portal, ODOT

H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\8_Bicycle Preferred Alternatives.mxd - mbell - 9:13 AM 2/18/2021

TRANSIT SYSTEM

Public transit service within Independence is provided by Cherriots. In addition to coordinating with local and regional transit agencies to help implement their planned service enhancements, the City of Independence can support development of a more efficient transit service by providing easy and safe walking and bicycling connections between key roadways, neighborhoods, and local destinations; by providing amenities, such as shelters and benches, at transit stops; by encouraging an appropriate mix and density of uses that support public transit; and by providing and planning for park-and-ride locations. These types of enhancements can encourage increased transit ridership consistent with Goal 4 of the TSP update.

Transit System Alternatives

Table 8 identifies the preferred alternatives developed for the transit system. The priorities shown in Table 8 are based on the project evaluation criteria as well as input from the project team; the priorities were updated based on input from the advisory committees and the community. Figure 9 illustrates the location of the preferred alternatives, where applicable.

Table 8: Transit System Preferred Alternatives

Map ID	Location/Name	Description	Priority	Cost
T1	Local Transit System	Collaborate with Monmouth and other stakeholders to establish a local transit system based on the outcomes of the Local Transit Feasibility Study. This includes development of a complementary paratransit service if a dial-a-ride or deviated fixed route model is not put into service.[2]	High	TBD
T3[1]	Stop 1516: OR 51-Main Street/Polk Street (to Salem)	Install ADA-compliant pedestrian ramps leading to the bus stop; provide bicycle parking, storage, and/or repair station	High	$20,000
T4[1]	Stop 1517: OR 51-Main Street/Polk Street (to Dallas)	Install ADA-compliant pedestrian ramps leading to the bus stop; provide bicycle parking, storage, and/or repair station	High	$20,000
T5[1]	Stop 1515: Library – OR 51-Monmouth Street/ 2nd Street (to Salem)	Install a "No Parking" zone adjacent to the bus stop; provide bicycle storage and/or repair station	High	$15,000
T6[1]	Stop 1502: 13th Street/ OR 51-Monmouth Street (bi-directional)	Relocate the bus stop to Monmouth Street, east of Gun Club Road; Install street lighting; Install ADA-compliant pedestrian ramps leading to the bus stop; Install "No Parking" zone signage adjacent to the stop; Provide bicycle parking, storage, and/or repair station; Install a real-time bus arrival reader board; and Establish stops in both directions.	Medium	$60,000
T7	Main Street/Oak Street – both directions	Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	Low	$20,000
T8	4th Street/E/D Street – both directions	Install street lighting at the D Street (southbound) bus stop; Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	Low	$35,000

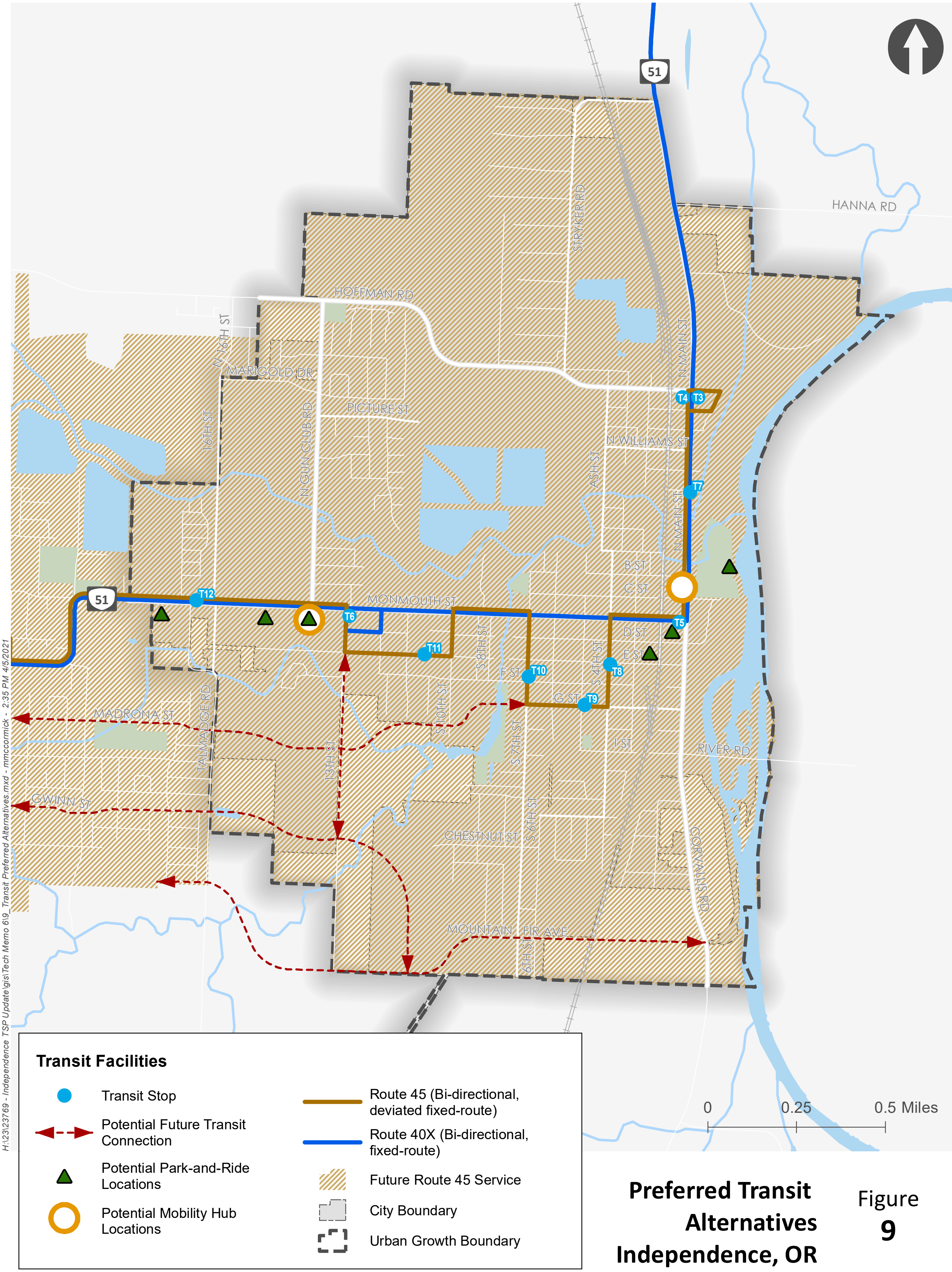
T9	5th Street/G Street – both directions	Install street lighting at both bus stops; Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	Low	$50,000
T10	7th Street/F Street – both directions	Install street lighting at both bus stops; Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	Low	$50,000
T11	1038 E Street (single stop to serve both directions)	Install street lighting; install ADA-compliant pedestrian ramps leading to the bus stop	Low	$50,000
T12	Monmouth Street/ Talmadge Road – both directions	Install street lighting at both bus stops; Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	Low	$50,000
			Total High Priority Cost	**$55,000**
			Total Medium Priority Cost	**$135,000**
			Total Low Priority Cost	**$255,000**
			Total Cost	**$445,000**

1. Project will require coordination with ODOT and approval from the State or Regional Traffic Engineer.
2: Project not shown on Transit Plan Map.
3: Project to be partially funded by others.

Transit System Policies

The transit system policies are provided below.

- Work with Cherriots to make Route 40X as efficient and frequent as possible.
- Consider the 40X the primary regional transit service in the community and ensure that any existing or new local service supports the service (through either making local connections to the stops or adding frequency to the service along the main route).
- Ensure safe walking and cycling routes to the bus stops.
- Support transit routes and facilities through on-street measures such as improved bus stops, pullouts, optimum road geometrics, or parking restrictions.
- Work with Cherriots to provide further marketing, outreach, and education about the available services.
- Collaborate with Cherriots, willing private property owners, and local stakeholders to establish mobility hubs/park-and-rides for public transit and carpool users. Potential locations to explore include:
    - Central Plaza (supporting Routes 40X and 45)
    - Independence Library/Sterling Savings Bank (supporting Routes 40X and 45)
    - Riverview Park (supporting Routes 40X and 45)
    - Independence Cinema 8 (supporting Routes 40X and 45)
    - First Baptist Church (supporting Routes 40X and 45)
    - Waremart (supporting Route 45)



H:\23\23769 - Independence TSP Update\gis\Tech Memo 6\9_Transit Preferred Alternatives.mxd - mmccormick - 2:35 PM 4/5/2021

Preferred Transit Alternatives Independence, OR

Figure 9

Data Source: General Transit Feed Service

- Work with Cherriots and other partner agencies to provide a "one-stop-shop" for real-time transit information for riders, especially as more routes and service types become available within the city.
- Ensure new retail, office, and institutional developments include transit routes and facilities and/or convenient pedestrian access to transit through walkways and connections.
- Allow existing developments to redevelop portions of parking areas for transit-oriented uses, such as carpool parking, park-and-ride parking, and public transit stations and platforms, where appropriate.
- Coordinate with Cherriots to evaluate fares for local service, such as Route 45, every two years beginning in 2021. Local service fares are recommended to be cheaper than a trip to Salem via private vehicle.
- Work with Cherriots to determine bus stop locations for any new roadways built within the city, including consideration of planned future routes that are not yet in place. Any new bus stop established should include the removal of on-street parking, per Cherriots service design standards.

RAIL SYSTEM

The rail line in Independence runs north-south along the entirety of the city. This introduces many intersecting locations with other modal networks. Through review of previous planning efforts, Tech Memo 5 identifies several policies to be considered for the rail system in Independence.

Rail System Policies

The rail system policies are provided below.

- Create a maintenance program to specifically address pavement condition on 2nd Street.
    - The City will keep all design solutions to the existing railroad subgrade failure along 2nd Street open for discussion, including a potential median strip to separate train and vehicular traffic.
- Create a maintenance/improvement program to ensure ADA compliance of pedestrian crossings of the rail line.
- Work with the rail operators to further reduce speed, and resulting noise, of trains passing through city limits.
    - Follow the Federal Railroad Administration's guidance for creating quiet zones, including installing of flashing lights and gates at each public crossing.
- Work with ODOT rail to determine the location of an at-grade or grade-separated rail crossing that would provide additional east-west connectivity of the roadway network.
    - Consideration can be given to removing a crossing to the north to ensure similar continued rail operations.
- Identify and evaluate the economic feasibility of various alternatives to provide for emergency access and response capabilities to the entire City. Some alternatives include building a collector/arterial crossing or providing a satellite emergency response capability for the east side of Independence.

- Work with ODOT rail to consider potential compromised emergency response capabilities should a train become stalled on the tracks and block crossings. The fire and police stations are located west of the track. Trains can delay and/or cause detours for emergency vehicles trying to reach the eastern edge of town, including the downtown, waterfront park, residences and businesses.
- Reduce environmental degradation (noise impacts) and conflicts by requiring new residential development adjacent to the railroad to use sound mitigation structures or planting buffers.
- Promote safe and efficient operation of the railroad and road system by allowing no new at-grade crossings by local roads and minimize the number of arterial and collector street at-grade crossings.

AIR SYSTEM

The Independence State Airport is located on the northern edge of the City and accommodates light single- and multi-engine aircraft. The Oregon Department of Aviation (ODA) updated the Independence State Airport Master Plan, with the final report published in March 2020. The majority of projects from the 2020 Independence State Airport Master Plan are outside of the City of Independence's right-of-way, but Independence can support the airport through policies.

Air Policies

The air system policies are provided below.

- Maintain airport overlay zoning that ensures future approach surfaces match FAR Part 77 standards and Oregon Department of Aviation guidelines.
- Collaborate with Oregon Department of Aviation to ensure land use along Hoffman Road does not impact the Runway Protection Zone.

SAFE ROUTES TO SCHOOL

Safe Routes to School (SRTS) plans make it safer for students to walk, bike, or take public transit to school. Safer routes encourage more walking and biking and provide convenient and accessible options to and from school and in surrounding neighborhoods. SRTS programs include six components known as the Six E's: evaluation, education, encouragement, engineering, enforcement, and equity.

Safe Routes to School Policies

The SRTS policies are provided below.

- Re-establish the Monmouth-Independence Safe Routes to School Program (Central School District 13J) and ensure that the program includes middle and high school students.
- Develop an evaluation program that assesses successful strategies and approaches, ensures that initiatives support equitable outcomes, and identifies unintended consequences or opportunities.
- Continue to implement physical improvements to the transportation system aimed at addressing specific needs which make walking and biking to school safer, more comfortable and convenient.

EMERGING TRANSPORTATION TECHNOLOGIES

Transportation technologies are rapidly evolving, and cities are evaluating what steps they can take to be prepared. The challenge is that most emerging technologies are initiated by the private sector and can be difficult to predict. So how can cities use their money efficiently while also seeing the benefits of emerging technology?

Emerging Transportation Technology Policies

The emerging transportation technology policies are provided below.

- Create a Transportation Liaison or Alternative Transportation Workgroup in conjunction with Monmouth, Western Oregon University, and Cherriots.
- Monitor emerging technologies that may be well suited for Independence and Monmouth.
- Establish mobility hubs (or areas served by multiple modes of travel), in collaboration with Cherriots, willing private property owners, and local stakeholders. Potential locations to explore include:
    - Downtown Independence, adjacent to Riverview Park (supporting Routes 40X and 45)
    - Central Plaza shopping center (supporting Routes 40X and 45)
    - Within the southwest concept plan area as it develops
    - In the vicinity of the Independence State Airport
- Establish an "alternative modes main street" designed for bicycles and pedestrians, as well as micromobility services such as E-scooters, trolleys, and/or people movers. E Street is one candidate facility.
- Consider adding an electric vehicle charging requirement to the development code.
- Allow ride-hailing and micromobility services (E-scooters, bike share, etc.) to be established in Independence.

PARKING PLAN

Parking in downtown Independence is provided along both sides of most streets, including OR 51-Main Street and OR 51-Monmouth Street. Parking is also provided in several public and private off-street parking lots. Several alternatives were considered to address parking concerns within the downtown area; however, further evaluation of parking conditions is required. Therefore, the preferred alternative includes a downtown parking study as indicated below.

Parking Alternatives

Table 9 identifies the preferred alternatives for the parking plan. The priority shown in Table 9 is based on the project evaluation criteria as well as input from the project team; the priority was updated based on input from the advisory committees and the community.

Table 9: Parking Plan Preferred Alternatives

Map ID	Location/Name	Description	Priority	Cost
PP1	Downtown Parking Study	Prepare a municipal parking management plan for downtown Independence	High	$50,000
			Total High Priority Cost	**$50,000**
			Total Medium Priority Cost	**$0**
			Total Low Priority Cost	**$0**
			Total Cost	**$50,000**

1. The cost of the downtown parking study includes the study only and does not include the costs associated with implementing recommendations.

The plan should consider the following parking management strategies (at a minimum):

- Truck loading zones, taxi zones, zones for rideshare vehicles (e.g., Uber, Lyft)
- Time limits (2-hours, 30 minutes, 15 minute) in the marked stalls on OR 51
- Disabled parking (location and design)
- Parking enforcement policies and strategies
- Work with local business owners to establish parking areas for employees
- Develop "how to park" resources and parking maps
- Invest in pick-up drop-off loops and adaptive reuse design for any parking structures/lots.

The City may need to coordinate with ODOT to implement the parking management strategies identified above within downtown Independence on OR 51-Main Street and OR 51-Monmouth Street.

TRANSPORTATION DEMAND MANAGEMENT PLAN

Transportation Demand Management (TDM) is a general term used to describe any action that removes single occupancy vehicle (SOV) trips from the roadway during peak time periods. The ability to change travel behavior and provide alternative modes will help accommodate the growth in trips without the need for significant investments in new infrastructure. A major focus of TDM is on major employers; however, there are many things the City can do to support TDM implementation.

Transportation Demand Management Alternatives

Tech Memo 5 identifies several policies and strategies that may be effective for managing demand in the City of Independence. Table 10 summarizes the strategies that best meet the goals and objectives of the TSP update. As with all new public and private investments, the implementation of TDM strategies is sure to draw opposition from some. Given Independence's limited experience with TDM strategies, it is important that decision-makers understand their long-term costs and benefits and are able to evaluate these along-side arguments from opponents in achieving outcomes that best reflect the City's vision and goals while effectively reducing travel demand.

Table 10: Potential TDM Strategies

Strategy	Description
Bicycle Improvements	Improved design and maintenance of shared streets, bike lanes, and paths
Bicycle Parking	Improved bicycle parking, storage, and changing facilities
Bike/Transit Integration	Improved bicycle access and storage at transit stops and stations, and the ability to carry bikes on transit vehicles
Pedestrian Improvements	Improved design and maintenance of sidewalks, crosswalks, paths, and amenities
Bike/Walk Encouragement	Promotion campaigns, events, educational programs, guides and user info
Transit Improvements	Improve transit facilities and service (stop amenities, hours, frequency, coverage)
Shuttle Service	Shuttle buses, demand response and other special mobility services
Ridesharing	Carpool/vanpool programs and services
Wayfinding	Provide wayfinding improvements and other multimodal navigation tools
Streetscape Improvements	Redesign roadways to support multimodal transportation and create more attractive and accessible communities
Connectivity Improvements	Improved roadway and pathway connectivity
Traffic Calming	Roadway design features intended to reduce traffic speeds and volume
Vehicle Use Restrictions	Limit vehicle traffic at a particular time or place
Parking Management	Various management strategies that result in more efficient use of parking
Park-and-ride	Park-and-rides can support ridesharing and public transit use
Downtown Centers	Creating vibrant downtowns mixed-use activity centers

Transportation Demand Management Policies

The TDM policies are provided below.

- Implement TDM solutions in the City.
- Build partnerships with community organizations (such as WOU, state employers in Salem, Cherriots, the City of Monmouth, and Central School District) to support TDM implementation.
- Promote carshare, ridesharing, bikeshare, e-scooters, and other micromobility services.
- Utilize TDM strategies, such as commute trip reductions programs for employees, and special transportation management when sponsoring events that attract crowds.

Attachment A Qualitative Evaluation of Transportation System Alternatives

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening: Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?	Total	Preferred Solution
Roadway System															
R1	Randall Way Extension	13th Street to 7th Street	Roadway extension	Extend Randall Way west to 13th Street at F Street.											✓
R2	Chestnut Street	Road end to new roadway	Roadway extension	Extend Chestnut Street southwest to the new east-west collector.											✓
R3	4th Street	Road end to new roadway	Roadway extension	Extend 4th Street south to the new east-west minor arterial.											✓
R4	New east-west collecter 1	16th Street at Madrona Street to 13th Street	New roadway	Construct a new east-west collector from 16th Street at Madrona Street to 13th Street.											✓
R5	New east-west collecter 2	13th Street to G Street	New roadway	Construct a new east-west collector from 13th Street to G Street.											✓
R6	New north-south local street	F Street to new roadway	New roadway	Construct a new north-south local street from F Street at 8th Street to the new east-west collector.											✓
R7	New east-west collecter 3	16th Street to new roadway	New roadway	Construct a new east-west collector from 16th Street at Gwinn Street to the new east-west minor arterial.											✓
R8	New east-west minor arterial in southwest Independence	16th Street to Corvallis Road	New roadway	Construct a new east-west minor arterial from 16th Street at Ash Creek Drive to Corvallis Road.											✓
R9	Gun Club Road-13th Street	OR 51-Monmouth Street to 13th Street	New roadway	Extend Gun Club Road south and realign to connect with 13th Street.											✓
R10	E Street Extension	Road end to Western City Limits	Roadway extension	Extend E Street west to 16th Street and the west city limit.											✓
R11	OR 51-Main Street/Polk Street Intersection	N/A	Intersection geometry	Install a left-turn lane at the eastbound approach.	Y	N	N	N	N	N	Y	Y	N	3	
			Intersection geometry	Reconfigure OR 51-Main Street to provide a center two-way left-turn lane at the northbound and southbound approaches.	Y	Y	N	N	N	Y	Y	Y	Y	6	
			Intersection geometry	Reconfigure OR 51-Main Street to provide a center two-way left-turn lane at the northbound and southbound approaches and install a left-turn lane at the eastbound approach.	Y	Y	N	N	N	N	Y	Y	Y	5	
			Traffic control	Install a single-lane roundabout. This alternative could require additional right-of-way.	Y	Y	N	N	N	N	N	N	N	2	
			Traffic control and intersection geometry	Install a separate left-turn lane at the eastbound approach and a traffic signal when signal warrants are met.	Y	Y	N	N	N	N	Y	Y	N/A	4	✓
R12	Main Street/Monmouth Street Intersection	N/A	Intersection geometry	Install a separate northbound left-turn lane and a separate southbound right-turn lane with 100 feet of storage.	Y	Y	N	N	N	N	Y	Y	N	4	
			Intersection geometry	Install a separate northbound left-turn lane, a separate southbound right-turn lane with 100 feet of storage, and a separate eastbound right-turn lane.	Y	Y	N	N	N	N	Y	Y	N	4	
			Traffic control	Install an actuated-uncoordinated traffic signal when warrants are met.	Y	N	N	N	N	N	N	Y	Y	3	
			Traffic control and intersection geometry	Install an actuated-uncoordinated traffic signal when warrants are met and install a separate eastbound right-turn lane with 100 feet of storage.	Y	Y	N	N	N	N	N	Y	Y	4	
			Traffic control and intersection geometry	Install an actuated-uncoordinated traffic signal when warrants are met and install a separate southbound right-turn lane with 100 feet of storage.	Y	N	N	N	N	N	N	Y	Y	3	
			Traffic control and intersection geometry	Install an actuated-uncoordinated traffic signal when warrants are met and install a separate northbound left-turn lane with 100 feet of storage.	Y	Y	N	N	N	N	N	Y	Y	4	
			Traffic control and intersection geometry	Create a couplet by reconfiguring OR 51-Monmouth Street as one-way eastbound from 4th Street to OR 51-Main Street and reconfiguring C Street to one-way westbound from 2nd Street to 4th Street.	Y	Y	N	N	N	Y	Y	N	N/A	4	
			Traffic control and intersection geometry	Reconfigure OR 51-Monmouth Street as one-way eastbound from 2nd Street to OR 51-Main Street.	Y	Y	N	N	N	Y	Y	N	N/A	4	

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening									Total	Preferred Solution
					Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?		
			Traffic control and intersection geometry	Install separate left- and right-turn lanes at the eastbound approach and a traffic signal when signal warrants are met.	Y	Y	N	N	N	N	Y	Y	N/A	4	✓
R13	OR 51-Monmouth Street/4th Street Intersection	N/A	Intersection geometry	Install a two-way left-turn lane on OR 51-Monmouth Street from the Ash Creek Bridge to 4th Street and taper to two lanes east of 4th Street.	Y	N	N	N	N	Y	N	Y	Y	4	
			Intersection geometry	Install a two-way left-turn lane on OR 51-monmouth Street and a separate left-turn lane at the northbound approach. This alternative could require additional right-of-way.	Y	N	N	N	N	N	N	Y	Y	3	
			Traffic control	Restrict the eastbound left, westbound right, northbound through, and southbound through movements for motorists.	Y	Y	N	N	N	Y	Y	Y	N/A	5	
			Traffic control and intersection geometry	Install separate left-turn lanes at the eastbound and westbound approaches and a traffic signal when signal warrants are met.	Y	Y	N	N	N	Y	Y	Y	N/A	5	✓
R14	OR 51-Monmouth Street/7th Street Intersection	N/A	Intersection geometry	Install a two-way left-turn lane on OR 51-Monmouth Street from the Ash Creek Bridge to 4th Street and taper to two lanes east of 4th Street.	Y	Y	N	N	N	Y	Y	Y	Y	6	
			Intersection geometry	Install a two-way left-turn lane on OR 51-Monmouth Street from the Ash Creek Bridge to 4th Street and and a separate northbound left-turn lane with 100 feet of storage. This alternative could require additional right-of-way.	Y	Y	N	N	N	N	N	Y	Y	4	
			Traffic control and intersection geometry	Install an actuated-uncoordinated traffic signal with separate eastbound and westbound left-turn lanes with 100ft of storage when warrants are met.	Y	Y	N	N	N	N	Y	Y	Y	5	✓
			Traffic control	Install a single-lane roundabout.	Y	Y	N	N	N	N	N	N	N	2	
R15	Main Street/River Road Intersection	N/A	Intersection geometry	Install a westbound left-turn lane with 100ft of storage. This alternative would require widening the bridge.	Y	Y	N	N	N	N	N	N	N/A	2	
			Traffic control and intersection geometry	Reconfigure the intersection with all-way stop-control, install a westbound right-turn lane with 100 ft of storage and a southbound left-turn lane with 100 ft of storage . This alternative would require widening the bridge.	Y	Y	N	N	Y	N	Y	N	N/A	4	✓
			Traffic control and intersection geometry	Reconfigure the intersection with all-way stop-control and allow the westbound right and southbound left/through/right to operate free. The southbound approach could also operate free.	Y	N	N	N	N	Y	Y	Y	N/A	4	
			Traffic control	Install a single-lane roundabout. This alternative could require additional right-of-way.	Y	Y	N	N	N	N	N	N	Y	3	
R16	OR 51-Monmouth Street/Gun Club Road Intersection	N/A	Traffic control	Optimize the signal timing/phasing to provide more green time to the southbound left-turn movement.	Y	Y	N	N	N	Y	Y	Y	Y	6	✓
			Intersection geometry	Extend the southbound left-turn storage.	Y	Y	N	N	N	Y	Y	Y	N	5	
Safety Plan															
S1	Hoffman Road/16th Street Intersection	N/A	Safety intersection	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the eastbound approach.											✓
S2	OR 51-Main Street/Polk Street Intersection	N/A	Safety intersection	Install advanced intersection warning signs and traffic calming measures at the southbound approach.											✓
S3	Main Street/River Road Intersection	N/A	Safety intersection	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the northbound approach.											✓
S4	OR 51/Stryker Road Intersection	N/A	Safety intersection	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the southbound approach.											✓
S5	OR 51-Monmouth Street/4th Street Intersection	N/A	Safety intersection	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection.											✓
S6	OR 51-Monmouth Street/7th Street Intersection	N/A	Safety intersection	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection.											✓
S7	Hoffman Road/Gun Club Road Intersection	N/A	Safety intersection	Provide traffic calming measures on Hoffman Road approaching the intersection.											✓
S8	Hoffman Road/Stryker Road Intersection	N/A	Safety intersection	Close Hoffman Road at the westbound approach to Stryker Road.											✓

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening									Total	Preferred Solution
					Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?		
S9	OR 51-Monmouth Street Segment	Western City Limits to Gun Club Road	Safety segment	Install eastbound dynamic speed feedback sign east of west City Limits and reflectorized back plates for all traffic signal heads at 16th Street and Gun Club Road intersections.											✓
S10	4th Street Segment	OR 51-Monmouth Street to Spruce Street	Safety segment	Provide traffic calming measures on 4th Street; improve visibility between OR 51-Monmouth Street and Spruce Street by providing "No Parking" zones and additional lighting on both sides of the street at intersections.											✓
S11	Main Street/Corvallis Road	N/A	Safety segment	Conduct a speed study to evaluate the ability to move the 30 mph posted speed sign further south.											✓
S12	River Road	N/A	Safety segment	Install "Bike on Bridge" warning signs with actuated beacons.											✓
Pedestrian System															
P1	OR 51-Main Street	Stryker Road to OR 51-Monmouth Street	Fill in sidewalk gaps	Fill in the gaps on the east side of the roadway with new sidewalks.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
			Reconstruct sidewalks	Reconstruct the sidewalks following ODOT guidelines for low stress facilities.	Y	Y	Y	Y	N	N	N	Y	N	5	
P2	OR 51-Monmouth Street	West City Limits to OR 51-Main Street	Fill in sidewalk gaps	Install sidewalks on the north side of the roadway with new sidewalks.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
			Reconstruct sidewalks	Reconstruct the sidewalks following ODOT guidelines for low stress facilities - Install 6-foot buffered sidewalks from the west city limits to 4th Street - Install 8-foot buffered sidewalks or 10-foot curb tight sidewalks from 4th Street to OR 51-Main Street	Y	Y	Y	Y	N	N	N	Y	N	5	
P3	Main Street	F Street to River Road	Fill in sidewalk gaps	Install sidewalks on the east side of the roadway with new sidewalks.											✓
P4	Corvallis Road	River Road t to South City Limits	Fill in sidewalk gaps	Install sidewalks on the east side of the roadway with new sidewalks.											✓
P5	Hoffman Road	West City Limits to Airport Road	Fill in sidewalk gaps	Install sidewalks on the north and south side of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N	4	
P6	Polk Street	Airport Road to OR 51-Main Street	Fill in sidewalk gaps	Fill in the gaps on the north and south side of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N	4	
P7	Gun Club Road	Hoffman Road to OR 51-Monmouth Street	Fill in sidewalk gaps	Fill in the gaps on west side of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N	4	
P8	Stryker Road	Hoffman Road to OR 51-Main Street	Fill in sidewalk gaps	Fill in the gaps on both sides of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	N/A	6	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N/A	4	
P9	Ash Street/4th Street	Ash Creek Bridge to A Street	Fill in sidewalk gaps	Install sidewalks on west side of the roadway with new sidewalks.											✓
P10	16th Street	OR 51-Monmouth Street to South City Limits	Fill in sidewalk gaps	Fill in the gap on the east side of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N	4	
P11	13th Street	OR 51-Monmouth Street to South City Limits	Fill in sidewalk gaps	Fill in the gap on the east side of the roadway with new sidewalks.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	Y	N	N	N	Y	N	5	
P12	4th Street	I street to roadway south terminus	Fill in sidewalk gaps	Fill in the gap on the east side of the roadway with new sidewalks.											✓

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening									Total	Preferred Solution
					Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?		
P13	Williams Street	Ash Street to OR 51-Main Street	Fill in sidewalk gaps	Install sidewalks on the north side of the roadway with new sidewalks.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Reconstruct sidewalks	Reconstruct the sidewalks consistent per City standards as part of future development/redevelopment projects.	Y	Y	Y	N	N	N	N	Y	N	4	
P14	F Street	10th Street to 7th Street	Fill in sidewalk gaps	Fill in the gap on the north side of the roadway with new sidewalks.											✓
P15	OR 51-Main Street/Stryker Road Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P16	OR 51-Main Street/Hanna Road Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P17	OR 51-Main Street/Oak Street Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments on the south leg of the intersection to connect the bus stop.											✓
P18	OR 51-Monmouth Street/13th Street Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P19	Corvallis Road/G Street Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P20	Main Street/River Road Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P21	Stryker Road/Hoffman Road Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments on the north leg of the intersection.											✓
P22	Ash Street/Polk Street Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P23	Gun Club Road/Picture Street Intersection	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments.											✓
P24	Stryker Road Rail Crossing	N/A	Enhanced crossing	Provide enhanced pedestrian crossing treatments across the rail line.											✓
P25	OR 51-Main Street/Main Street	B Street to E Street	Pedestrian amenities	Consider opportunities for street patios, street furniture, and other amenities in the downtown area											✓
P26	OR 51-Monmouth Street	3rd Street to OR 51-Main Street	Pedestrian amenities	Consider opportunities for street patios, street furniture, and other amenities in the downtown area											✓
P27	North South Connector Trail #1	South of Hoffman Road to Wildfang Park	Shared-use path/trail	Create a shared-use path/trail connection.											✓
P28	North South Connector Trail #2	North from OR 51-Monmouth Street to Wildfang Park	Shared-use path/trail	Create a shared-use path/trail connection.											✓
P29	Ash Creek Trail Phase I	Riverview Park to Wildfang Park	Shared-use path/trail	Create east/west shared-use path/trail connection.											✓
P30	Mt. Fir North-South Trail	F Street to Becken Road	Shared-use path/trail	Create north/south shared-use path/trail connection from F Street to Mt. Fir Park and south across Becken Road. This connection may include some on-street segments.											✓
P31	Mt. Fir Connector Trail	Mt. Fir Street to Corvallis Road	Shared-use path/trail	Create east/west shared-use path/trail connection.											✓
P32	River Trail	N/A	Shared-use path/trail	Create north/south shared-use path/trail connection along Willamette Riverfront.											✓
P33	Going to the River Trail	Williams Street to Howard Court	Shared-use path/trail	Create east/west shared-use path/trail connection. This connection may include some on-street segments.											✓
P34	Central High School (HS) Connector Trail	Central High School to south of OR 51-Monmouth Street	Shared-use path/trail	Create north/south shared-use path/trail connection from Central High School to neighborhoods south of OR 51-Monmouth Street.											✓
P35	South Fork Trail	N/A	Shared-use path/trail	Create two north/south shared-use path/trail connections on the east and west sides of the South Fork Ash Creek.											✓
P36	Drainage Trail	3th Street to the South Fork Trails	Shared-use path/trail	Create east/west shared-use path/trail connection.											✓
P37	Old Highway 99 Trail	N/A	Shared-use path/trail	Create east/west shared-use path/trail connection to the existing shared-use path along OR 99. This connection may include some on-street segments.											✓

					Preliminary Screening										
Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?	Total	Preferred Solution
P38	Willamette Valley Trail	N/A	Shared-use path/trail	Create east/west shared-use path/trail connection to the Willamette Valley Scenic Bikeway. This connection may include some on-street segments.											✓
P39	Polk Street Trail	Eastern terminus of Polk Street to the River Trail	Shared-use path/trail	Create east/west shared-use path/trail connection.											✓
P40	E Street Trail	13th Street at E Street to OR 51-Monmouth Street	Shared-use path/trail	Create east/west shared-use path/trail connection. This connection may include some on-street segments.											✓
Bicycle System															
B1	OR 51-Main Street	Stryker Road to B Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway consistent with ODOT standards. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	
			Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway (5-foot bike lane, 2-foot buffer) consistent with the BUD. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
			Cycle tracks	Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	N	N	N	N	4	
B2	OR 51-Main Street	B Street to OR 51-Monmouth Street	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.											✓
B3	OR 51-Monmouth Street	West City Limits to 4th Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway consistent with ODOT standards. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	
			Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway (5-foot bike lane, 2-foot buffer) consistent with the BUD. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
			Cycle tracks	Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	N	N	N	Y	5	
B4	OR 51-Monmouth Street	F Street to OR 51-Main Street	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.											✓
B5	Main Street	F Street to River Road	Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway from F Street to River Road (5-foot bike lane, 2-foot buffer)											✓
B6	Corvallis Road	River Road to South City Limits	Bike lanes	Install 6-foot bike lanes on both sides of the roadway consistent with ODOT standards. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	
			Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway (5-foot bike lane, 2-foot buffer) consistent with the BUD. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Cycle tracks	Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	N	N	N	N	3	

					Preliminary Screening										
Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?	Total	Preferred Solution
B7	Hoffman Road	West City Limits to Airport Road	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	
			Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway (5-foot bike lane, 2-foot buffer). Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Cycle tracks	Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	N	N	N	Y	4	
B8	Polk Street	Airport Road to OR 51-Main Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	
			Buffered bike lanes	Install 7-foot buffered bike lanes on both sides of the roadway (5-foot bike lane, 2-foot buffer). Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Cycle tracks	Install 6-foot separated bike lanes (cycle tracks) on both sides of the roadway. Install green skip striping on arterial and collector roadways where bike lanes continue through major intersections.	Y	Y	Y	N	N	N	N	N	Y	4	
B9	Gun Club Road	North of the high school property to Hoffman Road	Bike lanes	Fill in the gaps with 6-foot bike lanes on both sides of the roadway.											✓
B10	Stryker Road	Polk Street to OR 51-Main Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway.											✓
B11	Ash Street/4th Street	Polk Street to OR 51-Monmouth Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards.											✓
B12	16th Street	OR 51-Monmouth Street to South City Limits	Bike lanes	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits.											✓
B13	13th Street	OR 51-Monmouth Street to South City Limits	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards. Work with Cherriots to determine the configuration at bus stops.											✓
B14	7th Street	OR 51-Monmouth Street to South City Limits	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards. Work with Cherriots to determine the configuration at bus stops.											✓
B15	4th Street (south)	OR 51-Monmouth Street to Spruce Avenue	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.	Y	Y	Y	Y	N	Y	Y	Y	N	7	
			Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
B16	Picture Street	Gun Club Road to east roadway terminus	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.	Y	Y	Y	N	N	Y	Y	Y	N	6	
			Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
			Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.	Y	Y	Y	N	N	Y	Y	Y	N	6	

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening: Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?	Total	Preferred Solution
B17	Williams Street	Ash Street to OR 51-Main Street	Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
B18	G Street	West roadway terminus to Main Street	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.	Y	Y	Y	Y	N	Y	Y	Y	N	7	
			Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards. Work with Cherriots to determine the configuration at bus stops.	Y	Y	Y	Y	N	Y	Y	Y	Y	8	✓
B19	Spruce Avenue	6th Street to west roadway terminus	Shared street	Install shared lane pavement markings (sharrows) on both sides of the roadway.	Y	Y	Y	N	N	Y	Y	Y	N	6	
			Bike lanes	Install 6-foot bike lanes on both sides of the roadway. This would likely require restricting on-street parking along the road and therefore should be considered when traffic volumes exceed 2,000 ADT per City standards.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
B20	C Street	7th Street to OR 51-Main Street	Bicycle boulevard	Install low traffic bikeway (bicycle boulevard) treatments along the roadway.	Y	Y	Y	N	N	Y	Y	Y	N	6	
			Shared street	Install shared lane pavement marking (sharrows) on both sides of the roadway.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
B21	D Street	7th Street to Main Street	Bicycle boulevard	Install low traffic bikeway (bicycle boulevard) treatments along the roadway.	Y	Y	Y	N	N	Y	Y	Y	N	6	
			Shared street	Install shared lane pavement marking (sharrows) on both sides of the roadway.	Y	Y	Y	N	N	Y	Y	Y	Y	7	✓
B22	E Street/F Street	13th Street to Main Street	Bicycle boulevard	Install low traffic bikeway (bicycle boulevard) treatments along the roadway.											✓
B23	River Road - Willamette bridge	Main Street to Riverside Drive	Bike lanes	Install 6-foot bike lanes on both sides of the road across the Willamette bridge. This would require widening the bridge or providing cantilevered bike paths on one or two sides of the bridge.											✓
B24	Marigold Drive	16th Street to Gun Club Road	Bike lanes	Install 6-foot bike lanes on both sides of the road from 16th Street to Gun Club Road.											✓
B25	OR 51-Main Street/OR 51-Monmouth Street Intersection	N/A	Bike corral	Install a bike corral on OR 51-Main Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection.											✓
B26	OR 51-Main Street/OR 51-Monmouth Street Intersection	N/A	Bike corral	Install a bike corral on OR 51-Monmouth Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection.											✓
Transit System															
T1	Local Transit System	City-wide	New service	Collaborate with Monmouth and other stakeholders to establish a local transit system based on the outcomes of the Local Transit Feasibility Study.											✓
T2	Monmouth Street Autonomous Shuttle Study	N/A	Study	Study the feasibility of operating an autonomous shuttle along OR 51-Monmouth Street.											✓
T3	Stop 1516: OR 51-Main Street/Polk Street (to Salem)	N/A	Bus Stop Enhancement	Provide bicycle parking, storage, and repair station. Provide ADA-compliant pedestrian ramps leading to the bus stop.											✓
T4	Stop 1517: Or 51-Main Street/Polk Street (to Dallas)	N/A	Bus Stop Enhancement	Provide ADA-compliant pedestrian ramps leading to the bus stop. Provide bicycle parking, storage, and/or repair station.											✓
T5	Stop 1515: Library – OR 51-Monmouth Street/2nd Street (to Salem)	N/A	Bus Stop Enhancement	New “No Parking” zone. Provide bicycle storage and/or repair station (some bike parking already provided).											✓

Gap/ Deficiency ID (Future Project ID)	Location/Name	Extents	Alternative Type	Alternative Description	Preliminary Screening: Is it consistent with the community vision?	Does it provide smooth and safe traffic flow?	Does it increase nonmotorized trips?	Does it increase transit ridership?	Is it future focused?	Is it financially stable?	Are there minimal environmental impacts?	Are there minimal engineering challenges?	Is it preferred by the public based on completed outreach?	Total	Preferred Solution
T6	Stop 1502: 13th Street/OR 51-Monmouth Street (bi-directional)	N/A	Bus Stop Enhancement	Install “No Parking” zone signage in addition to the yellow curb. Install lighting. Provide ADA-compliant pedestrian ramps leading to the bus stop. Street intersection (i.e. marked crossing with pedestrian refuge). Provide bicycle parking, storage, and/or repair station. Real-time bus arrival reader board.											✓
T7	Main Street/Oak Street – both directions	N/A	Bus Stop Enhancement	Install ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
T8	4th Street/E Street – both directions	N/A	Bus Stop Enhancement	Install bus stop lighting at the westbound stop and ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
T9	5th Street/G Street – both directions	N/A	Bus Stop Enhancement	Install bus stop lighting and ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
T10	7th Street/F Street – both directions	N/A	Bus Stop Enhancement	Install bus stop lighting and ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
T11	E Street/11th Street – both directions	N/A	Bus Stop Enhancement	Install bus stop lighting and ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
T12	Monmouth Street/Talmadge Road – both directions	N/A	Bus Stop Enhancement	Install bus stop lighting and ADA-compliant pedestrian ramps leading to the bus stops for both directions.											✓
Parking Plan															
PP1	Parking Management Plan	City-wide	Study	Prepare a municipal parking management plan for downtown Independence. The plan should consider the following parking management strategies: - Truck loading zones, taxi zones, zones for rideshare vehicles (i.e. Uber, Lyft) - Time limits (2-hours, 30 minutes, 15 minute) in the marked stalls on OR 51 - Disabled parking (location and design) - Parking enforcement policies and strategies											✓

Attachment B Evaluation and Prioritization of Preferred Alternatives

Description of Evaluation Process and Evaluation Criteria

A qualitative process using the evaluation criteria will be used to evaluate potential modal solutions and prioritize projects developed through the TSP update. The rating method used to evaluate the alternatives is described below.

Most Desirable: The concept addresses the criterion and/or makes substantial improvements in the criteria category. (+2)
Desirable: The concept addresses the criterion and/or makes improvements in the criteria category. (+1)
No Effect: The criterion does not apply to the concept or the concept has no influence on the criteria. (0)
Less Desirable: The concept does not support the intent of and/or negatively impacts the criteria category. (-1)
Least Desirable: The concept does not support the intent of and/or substantially negatively impacts the criteria category. (-2)

Objective	Evaluation Criteria	Evaluation Score
Goal 1 – Consistency with Community Vision		
Objective 1A: Connectivity	Enhances connectivity within and between major activity centers and community resources	(-2 to +2)
Objective 1B: Goals and Vision	Is consistent with community goals and vision	(-2 to +2)
Objective 1C: Natural Resources	Complements natural resources, scenic and historic areas, and open spaces to the greatest extent possible, while minimizing negative impacts	(-2 to +2)
Objective 1D: Neighborhood Impacts	Minimizes negative impacts to existing and future neighborhoods	(-2 to +2)
Objective 1E: Development Impacts	Minimizes negative impacts to developable and developed commercial and industrial sites	(-2 to +2)
Objective 1F: Plan Consistency	Is consistent with local plan including the Comprehensive Plan, state plans, and the plans of neighboring jurisdictions	(-2 to +2)
Goal 2 – Smooth and Safe Traffic Flow		
Objective 2A: Additional Routes	Provides additional north-south and east-west routes through the City	(-2 to +2)
Objective 2B: Vehicle Mobility	Improves vehicle mobility (over the no build scenario)	(-2 to +2)
Objective 2C: Vehicle Delay	Reduces vehicle delay at key intersections	(-2 to +2)
Objective 2D: History of Safety Issues	Addresses known safety issues at a location with a history of fatal or sever injury (Injury A) crashes	(-2 to +2)
Objective 2E: Freight/Rail Mobility	Improves mobility on designated freight truck and rail routes (over the no build scenario)	(-2 to +2)
Objective 2F: Key Roadways	Manages access to key state, county, and city roadways	(-2 to +2)
Objective 2G: Access for All	Supports roadway improvements that provide safe access for all users, regardless of age, ability, or mode of transportation	(-2 to +2)
Goal 3 – Increased Walking, Bicycling, Scooter, and Nonmotorized Trips		
Objective 3A: Low Stress Network	Creates a non-motorized network that has a high degree of comfort (i.e. minimal Level of Traffic Stress) and, where possible, showcases Independence's unique natural and physical attributes	(-2 to +2)
Objective 3B: Non-motorized Connectivity	Provides pedestrian or non-motorized connectivity to schools, business districts, transit stops and corridors, and/or parks	(-2 to +2)
Objective 3C: Non-motorized Gaps	Closes key gaps in the pedestrian or non-motorized system, creating short, easy, and accessible loops within the network	(-2 to +2)
Objective 3D: Non-motorized Safety	Addresses locations with a history of pedestrian and bicycle-related crashes	(-2 to +2)
Objective 3E: Non-motorized Routes	Serves a neighborhood that has limited existing nonmotorized transportation routes	(-2 to +2)
Goal 4 – Increased Transit Ridership		
Objective 4A: Frequent and Reliable Service	Support frequent and reliable transit service for transit stops and corridors	(-2 to +2)
Objective 4B: Stop Access and Amenities	Promote ridership by improving access to and amenities at transit stops	(-2 to +2)
Objective 4C: Increased Frequency	Promote ridership by increasing transit frequency	(-2 to +2)

Objective	Evaluation Criteria	Evaluation Score
Goal 5 – Future Focused		
Objective 5A: Innovative	Encourages innovative and emerging transportation and mobility solutions	(-2 to +2)
Objective 5B: Flexibility	Provides flexibility in planned projects, planed programs, and the development code to consider evolving practices and standards within the transportation field	(-2 to +2)
Goal 6 - Financial Stability		
Objective 6A: Maximize Efficiency and Life	Maximizes the efficiency and life of existing transportation facilities	(-2 to +2)
Objective 6B: Leverage Existing System	Leverages investments in the existing transportation system where the existing system can meet future needs	(-2 to +2)
Objective 6C: Partnerships	Prioritizes investments and maximizes partnerships to provide maximum benefit and return on investment for the associated cost	(-2 to +2)
Objective 6D: Future Costs	Considers future operation and maintenance costs in investment choices	(-2 to +2)
Objective 6E: Achievable	Ensures planned improvements can be achieved given the City's existing financial stream, and/or potential financial sources	(-2 to +2)

			Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
ID	Location/Name	Description	Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized Connectivity	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency and Life	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
Roadway System																														
R1	Randal Way Extension	Extend Randal Way west to 13th Street at F Street	2	1	-1	-1	-1	1	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	1	1	0	0	0
R2	Chestnut Street Extension	Extend Chestnut Street southwest to the new east-west collector	2	1	-1	-1	-1	1	2	2	1	0	0	0	2	1	2	2	0	2	0	0	0	0	0	1	1	0	0	0
R3	4th Street Extension	Extend 4th Street south to the new east-west minor arterial	2	1	-1	-1	-1	1	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	1	1	0	0	1
R4	Madrona Street Connection (west)	Construct a new east-west collector from 16th Street at Madrona Street to 13th Street	2	1	-1	-1	-1	2	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	0	0	0	0	-1
R5	Madrona Street Connection (east)	Construct a new east-west collector from 13th Street at Madrona Street to G Street	2	1	-1	-1	-1	2	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	0	0	0	0	-1
R6	13th Street Extension	Extend 13th Street south to the south city limits	2	1	-1	-1	-1	2	2	2	1	0	0	0	2	1	2	2	0	2	0	0	0	0	0	0	1	0	0	0
R7	Gwinn Street Connection	Construct a new east-west collector from 16th Street at Gwinn to Mountain Fir Drive Extension	2	1	-1	-1	-1	2	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	0	0	0	0	-1
R8	Mountain Fir Drive Extension (New east-west minor arterial)	Extend Mountain Fir Drive east to Corvallis Road and west to the west City limits; coordinate with City of Monmouth on final alignment west of the City limits	2	1	-1	-1	-1	2	2	2	1	0	2	1	2	2	2	2	0	2	0	0	0	0	0	0	0	0	0	-2
R9	Gun Club Road-13th Street	Extend Gun Club Road south and realign to connect with 13th Street	1	1	-1	-1	-1	2	2	2	1	0	0	0	2	1	2	2	0	2	0	0	0	0	0	1	1	0	0	0
R10	E Street Extension	Extend E Street west to 16th Street and the west city limit	2	1	-1	-1	-1	1	2	2	1	0	0	0	2	2	2	2	0	2	0	0	0	0	0	1	1	0	0	1
R11	OR 51/Polk Street	Install a left-turn lane at the east-bound approach and a traffic signal when signal warrants are met; Coordinate with Project S2	1	1	0	1	1	1	0	2	2	1	0	2	1	0	0	0	0	0	1	0	0	0	0	2	2	1	1	1
R12	OR 51-Main Street/ OR 51-Monmouth Street	Install left- and right-turn lanes at the eastbound approach and a traffic signal when signal warrants are met	1	1	0	1	1	1	0	2	2	0	0	1	1	0	0	0	0	0	1	0	0	0	0	2	2	1	1	1
R13	OR 51-Monmouth Street/4th Street	Install a center two-way left-turn lane on OR 51-Monmouth Street from 7th Street to 4th Street and taper east of 4th Street – continue to monitor the intersection and a traffic signal if/when signal warrants are met; Coordinate with Project S5	1	1	0	1	1	1	0	2	2	1	0	1	1	0	0	0	0	0	1	0	0	0	0	2	2	1	1	1
R14	OR 51-Monmouth Street/7th Street	Install a center two-way left-turn lane on OR 51-Monmouth Street from 7th Street to 4th Street and taper west of 7th Street – continue to monitor the intersection and a traffic signal if/when signal warrants are met; Coordinate with Project S6	1	1	0	1	1	1	0	2	2	1	0	1	1	0	0	0	0	0	1	0	0	0	0	2	2	1	1	1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring)																														
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
R15	Main Street/ River Road	Install a southbound left-turn lane and reconfigure as all-way stop control; Install a westbound left- or right-turn lane in conjunction with a new bridge; Coordinate with Project S3 and P20	1	1	0	1	1	1	0	2	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	2	2	1	1	1
R16	OR 51-Monmouth Street/Gun Club Road	Optimize the signal timing/phasing to provide more green time to the southbound left-turn movement	1	1	0	1	1	1	0	2	2	0	0	1	1	0	0	0	0	0	1	0	0	0	0	2	2	1	1	1
Safety Plan																														
S1	Hoffman Road/ 16th Street	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the eastbound approach	0	1	0	1	1	1	0	1	0	2	2	0	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S2	OR 51-Main Street/ Polk Street	Install advanced intersection warning signs and traffic calming measures at the southbound approach; Coordinate with Project R11	0	1	0	1	1	1	0	1	0	1	2	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S3	S Main Street/ River Road S	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the northbound approach; Coordinate with Projects R15 and P20	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S4	OR 51-Main Street/ Stryker Road	Install advanced intersection warning signs, speed feedback signs, and traffic calming measures at the southbound approach	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S5	OR 51-Monmouth Street/4th Street	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection; Coordinate with Project R13	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S6	OR 51-Monmouth Street/7th Street	Provide traffic calming measures on OR 51-Monmouth Street approaching the intersection; Coordinate with Project R14	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S7	Hoffman Road/ Gun Club Road	Provide traffic calming measures on Hoffman Road approaching the intersection	0	1	0	1	1	1	0	1	0	2	2	0	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S8	Stryker Road/Hoffman Road-Polk Street	Close Hoffman Road at the westbound approach to Stryker Road; Coordinate with Project P21	0	1	0	1	1	1	0	1	0	1	2	0	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S9	OR 51-Monmouth Street – West City Limits to Gun Club Road	Install eastbound dynamic speed feedback sign east of west City Limits and reflectorized back plates for all traffic signal heads at 16th Street and Gun Club Road intersections	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S10	4th Street – OR 51-Monmouth Street to Spruce Avenue	Provide traffic calming measures on 4th Street; improve visibility between OR 51-Monmouth Street and Spruce Avenue by providing “No Parking” zones and additional lighting on both sides of the street at intersections	0	1	0	1	1	1	0	1	0	2	0	0	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
S11	Corvallis Road – South of River Road	Conduct a speed study to evaluate the ability to move the posted speed sign further south	0	1	0	1	1	1	0	1	0	2	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
S12	River Road Bridge	Install “Bike on Bridge” warning signs with actuated beacons	0	1	0	1	1	1	0	1	0	1	0	1	2	1	1	1	1	2	0	0	0	0	0	1	1	0	1	1
Pedestrian System																														
P1	OR 51-Main Street	Fill in the gaps on the east side of the road from Stryker Road to OR 51 Monmouth Street	2	-2	1	1	1	-2	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P3	Main Street	Install sidewalks on the east side of the road from F Street to River Road	1	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P4	Corvallis Road	Install sidewalks on the east side of the road from River Road to the south city limits	1	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P5	Hoffman Road	Install sidewalks on the north side of the road from the west city limits to Airport Road; Coordinate with Project P37	1	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P6	Polk Street	Fill in the gaps on the north and south sides of the road from Ash Street to OR 51-Main Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P7	Gun Club Road	Fill in the gaps on west side of the road from Hoffman Road to OR 51-Monmouth Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P8	Stryker Road	Fill in the gaps on both sides of the road from OR 51-Main Street to Polk Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P9	Ash Street/4th Street	Install sidewalks on the west side of the road from the Ash Creek Bridge to A Street	1	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P10	16th Street	Fill in the gaps on the east side of the road from OR 51-Monmouth Street to south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P11	13th Street	Fill in the gaps on the east side of the road from OR 51-Monmouth Street to south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P12	4th Street	Fill in the gaps on the east side of the road from I Street to the south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P13	Williams Street	Install sidewalks on the north side of the road from Log Cabin Street to Marsh Street	1	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	2	2	0	1	1
P14	F Street	Fill in the gap on the north side of the road from 10th Street to 7th Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	2	2	0	1	1
P15	OR 51-Main Street/Stryker Road	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	1	0	1	1
P16	OR 51-Main Street/Deann Drive	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1
P17	OR 51-Main Street/Williams Street	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1
P18	OR 51-Monmouth Street/13th Street	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring): Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
P19	Main Street/G Street	Provide enhanced pedestrian crossing treatments on the south leg of the intersection to connect the bus stop	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	1	0	1	1
P20	Main Street-Corvallis Road/River Road	Provide enhanced pedestrian crossing treatments	2	1	2	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	1	0	1	1
P21	Stryker Road/Hoffman Road	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	1	0	1	1
P22	Ash Street/Polk Street	Provide enhanced pedestrian crossing treatments; Coordinate with Projects R15 and S3	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1
P23	Gun Club Road/Marigold Street	Install a marked crosswalk on the north leg of the intersection; Coordinate with Project S8	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1
P24	Stryker Road Rail Crossing	Provide enhanced pedestrian crossing treatments	2	1	1	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	1	0	1	1
P25	OR 51-Main Street/Main Street	Provide enhanced pedestrian crossing treatments	0	1	1	1	1	1	0	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	0	1	1
P26	OR 51-Monmouth Street/2nd Street	Provide enhanced pedestrian crossing treatments across the rail line	0	1	1	1	1	1	0	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	0	1	1
P2	OR 51-Monmouth Street/11th Street	Provide enhanced pedestrian crossing treatments	2	1	2	1	1	1	2	-1	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	1	0	1	1
P27	North South Connector Trail #1	Install a shared-use path/trail south from Hoffman Road to Wildfang Park	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P28	North South Connector Trail #2	Install a shared-use path/trail north from OR 51-Monmouth Street to Wildfang Park	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P29	Ash Creek Trail Phase I	Install an east-west shared-use path/trail from Riverview Park to Wildfang Park	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P30	Mt. Fir North-South Trail	Install a north/south shared-use path/trail from F Street to Mt. Fir Park and south across Becken Road – may include some on-street segments	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P31	Mt. Fir Connector Trail	Install an east/west shared-use path/trail from Mt. Fir Street to Corvallis Road	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P32	River Trail	Install a north/south shared-use path/trail along Willamette Riverfront	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	0
P33	Going to the River Trail	Install an east/west shared-use path/trail from Williams Street to Howard Court – may include some on-street segments	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	0
P34	Central High School (HS) Connector Trail	Install a north/south shared-use path/trail from Central High School to neighborhoods south of OR 51-Monmouth Street	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	1	1	-1
P35	South Fork Trail	Install two north/south shared-use path/trails on the east/west sides of the South Fork Ash Creek	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
P36	Drainage Trail	Install an east/west shared-use path/trail from 13th Street to the South Fork Trails	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P37	Old Highway 99 Trail	Install an east/west shared-use path/trail to the existing shared-use path along OR 99 – may include some on-street segments; Coordinate with Project P5	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P38	Willamette Valley Trail	Install an east/west shared-use path/trail to the Willamette Valley Scenic Bikeway – may include some on-street segments; Coordinate with Project B23	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P39	Polk Street Trail	Install an east/west shared-use path/trail from the eastern terminus of Polk Street to the River Trail	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
P40	E Street Trail	Install an east/west shared-use path/trail from 13th Street to OR 51-Monmouth Street – may include some on-street segments.	2	1	2	1	1	2	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	1	-1
Bicycle System																														
B1	OR 51-Main Street	Install 7-foot buffered bike lanes on both sides of the roadway from Stryker Road to B Street (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	2	0	1
B2	OR 51-Main Street	Install shared lane pavement markings (sharrows) on both sides of the roadway from B Street to F Street	1	1	1	1	1	1	2	0	0	0	0	0	2	1	2	1	1	2	0	2	0	0	0	2	2	2	1	2
B3	OR 51-Monmouth Street	Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to the Ash Creek Bridge4th Street (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	2	0	1
B4	OR 51-Monmouth Street	Install shared lane pavement markings (sharrows) on both sides of the roadway from 7th4th Street to OR 51-Main Street	1	1	1	1	1	1	2	0	0	0	0	0	2	1	2	1	1	2	0	2	0	0	0	2	2	2	1	2
B5	Main Street	Install 7-foot buffered bike lanes on both sides of the roadway from F Street to River Road (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	0	0
B6	Corvallis Road	Install 7-foot buffered bike lanes on both sides of the roadway from River Road to the south city limits (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	0
B7	Hoffman Road	Install 7-foot buffered bike lanes on both sides of the roadway from the west city limits to Airport Road (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	0	1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
B8	Polk Street	Install 7-foot buffered bike lanes on both sides of the roadway from Airport Road to OR 51-Main Street (5-foot bike lane, 2-foot buffer)	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	0	1
B9	Gun Club Road	Fill in the gaps with 6-foot bike lanes on both sides of the roadway from north of the high school property to Hoffman Road	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B10	Stryker Road	Install 6-foot bike lanes on both sides of the road from Polk Street to OR 51-Main Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B11	Ash Street/4th Street (north)	Install 6-foot bike lanes on both sides of the roads from Polk Street to OR 51-Monmouth Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B12	16th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B13	13th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	0	0	1
B14	7th Street	Install 6-foot bike lanes on both sides of the roads from OR 51-Monmouth Street to the south city limits	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	0	0	1
B15	4 Street (south)	Install 6-foot bike lanes on both sides of the road from OR 51-Monmouth Street to Spruce Avenue	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	2	0	0	0	0	0	0	0	1
B16	Picture Street	Install 6-foot bike lanes on both sides of the road from Gun Club Road to the eastern terminus	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B17	Williams Street	Install 6-foot bike lanes on both sides of the road from Ash Street to OR 51-Main Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B18	G Street	Install 6-foot bike lanes on both sides of the road from the western terminus to Main Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B19	Chestnut Street	Install 6-foot bike lanes on both sides of the road from 6th Street to the western Terminus	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	0	0	0	0	0	0	0	0	1
B20	C Street	Install shared-lane pavement markings from 7th Street to OR 51-Main Street	1	1	1	1	1	1	2	0	0	0	0	0	2	1	2	1	1	2	0	1	0	0	0	1	2	0	0	1
B21	D Street	Install shared-lane pavement markings (sharrows) from 7th Street to Main Street	1	1	1	1	1	1	2	0	0	0	0	0	2	1	2	1	1	2	0	1	0	0	0	1	2	0	0	1
B22	E Street/F Street	Install a bicycle boulevard along E Street/F Street from 13th Street to Main Street	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	1	2	0	0	1
B23	River Road - Willamette River Bridge	Install 6-foot bike lanes on both sides of the Willamette River Bridge; this would require widening the bridge or providing cantilevered bike paths on one or two sides; Coordinate with Project P38	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	1	0	0	0	0

ID	Location/Name	Description	Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
			Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
B24	Marigold Drive	Install 6-foot bike lanes on both sides of the road from 16th Street to Gunn Club Road	2	1	1	1	1	1	2	0	0	0	0	0	2	2	2	2	1	2	0	1	0	0	0	0	0	0	0	1
B25	OR 51-Main Street/ OR 51-Monmouth Street	Install a bike corral on OR 51-Main Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection	0	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	2	0	2	0	0	0	0	0	0	1	1
B26	OR 51-Main Street/ OR 51-Monmouth Street	Install a bike corral on OR 51-Monmouth Street near the OR 51-Main Street/OR 51-Monmouth Street Intersection	0	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	2	0	2	0	0	0	0	0	0	1	1
Transit System																														
T1	Local Transit System	Collaborate with Monmouth and other stakeholders to establish a local transit system based on the outcomes of the Local Transit Feasibility Study. This includes development of a complementary paratransit service if a dial-a-ride or deviated fixed route model is not put into service	1	1	0	1	1	1	2	0	0	0	0	0	1	2	2	2	1	2	2	1	2	1	0	0	0	2	0	0
T3	Stop 1516: OR 51-Main Street/Polk Street (to Salem)	Install ADA-compliant pedestrian ramps leading to the bus stop; provide bicycle parking, storage, and/or repair station	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	2	2	0	2
T4	Stop 1517: OR 51-Main Street/Polk Street (to Dallas)	Install ADA-compliant pedestrian ramps leading to the bus stop; provide bicycle parking, storage, and/or repair station	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	2	2	0	2
T5	Stop 1515: Library – OR 51-Monmouth Street/ 2nd Street (to Salem)	Install a “No Parking” zone adjacent to the bus stop; provide bicycle storage and/or repair station	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	2	2	0	2
T6	Stop 1502: 13th Street/ OR 51-Monmouth Street (bi-directional)	Install street lighting at the bus stop; Iinstall ADA-compliant pedestrian ramps leading to the bus stop; Iinstall “No Parking” zone signage adjacent to the yellow curb; Pprovide bicycle parking, storage, and/or repair station; Iinstall a real-time bus arrival reader board; Establish a new westbound stop on Monmouth Street (OR-51) near 1430 Monmouth St, including an ADA-compliant pedestrian ramp. The new bus stop would make the 13th Street / Monmouth bus stop serve only the eastbound direction of travel.	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	2	2	0	1
T7	Main Street/Oak Street – both directions	Install ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1
T8	4th Street/E/D Street – both directions	Install street lighting at the D Street (southbound)westbound bus stop; Iinstall ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1

ID	Location/Name	Description	Evaluation Criteria (-2 to +2 scoring)																											
			Goal 1: Consistency with Community Vision						Goal 2: Smooth and Safe Traffic Flow							Goal 3: Increased Walking, Bicycling, Scooter, and Nonmotorized Trips					Goal 4: Increased Transit Ridership			Goal 5: Future Focused		Goal 6: Financial Stability				
			Objective 1A: Connectivity	Objective 1B: Goals and Vision	Objective 1C: Natural Resources	Objective 1D: Neighborhood Impacts	Objective 1E: Development Impacts	Objective 1F: Plan Consistency	Objective 2A: Additional Routes	Objective 2B: Vehicle Mobility	Objective 2C: Vehicle Delay	Objective 2D: History of Safety Issues	Objective 2E: Freight/Rail Mobility	Objective 2F: Key Roadways	Objective 2G: Access for All	Objective 3A: Low Stress Network	Objective 3B: Non-motorized Connectivity	Objective 3C: Non-motorized Gaps	Objective 3D: Non-motorized Safety	Objective 3E: Non-motorized Routes	Objective 4A: Frequent and Reliable Service	Objective 4B: Stop Access and Amenities	Objective 4C: Increased Frequency	Objective 5A: Innovative	Objective 5B: Flexibility	Objective 6A: Maximize Efficiency	Objective 6B: Leverage Existing System	Objective 6C: Partnerships	Objective 6D: Future Costs	Objective 6E: Achievable
T9	5th Street/G Street – both directions	Install street lighting at both bus stops; Iinstall ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1
T10	7th Street/F Street – both directions	Install street lighting at both bus stops; Iinstall ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1
T11	1038 E Street (single stop to serve/11th Street – both directions)	Install street lighting at both bus stops; install ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1
T12	Monmouth Street/ Talmadge Road – both directions	Install street lighting at both bus stops; Iinstall ADA-compliant pedestrian ramps leading to the bus stops for both directions	1	1	0	1	1	1	0	0	0	0	0	0	1	2	2	2	1	1	1	2	0	0	0	0	0	2	0	1
Parking Plan																														
PP1	Parking Management Plan	Prepare a municipal parking management plan for downtown Independence	1	1	0	1	1	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	2	2	2	1	1

Attachment H Analysis Methodologies and Assumptions

ANALYSIS METHODOLOGY AND ASSUMPTIONS MEMORANDUM

Date: April 3, 2020 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Hughart, Matt Bell, Molly McCormick, Alec Kauffman, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Analysis Methodology and Assumptions Memorandum

TABLE OF CONTENTS

INTRODUCTION

This memorandum documents the methodologies and assumptions associated with the existing and future transportation system operations analyses for the City of Independence Transportation System Plan (TSP) update. The methodologies and assumptions included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) Transportation System Plan Guidelines (Reference 1), the ODOT Analysis Procedures Manual (APM – Reference 2), and direction provided by City of Independence (City) and ODOT staff. The methodologies and assumptions described in this memorandum will help identify potential deficiencies in the transportation system, including:

- Traffic operations at the study intersections under existing and future traffic conditions,
- Traffic safety at the study intersections and along study area roadways,
- Gaps and deficiencies in bicycle and pedestrian facilities,
- Gaps and deficiencies in transit facilities and services, and
- Gaps and deficiencies in other travel modes.

This information will serve as a baseline for identifying a comprehensive list of multi-modal transportation system needs to be addressed as part of the TSP update. It will also serve as a baseline for identifying and evaluating potential solutions and developing a prioritized list of improvements for the TSP update.

STUDY AREA

The study area for the Independence TSP update is defined as the urban growth boundary (UGB) for the City of Independence. Figure 1 depicts the study area, including the UGB, city limits, and other key features.

STUDY INTERSECTIONS

The study intersections for the Independence TSP update were determined by the City in coordination with ODOT. There is a total of 18 study intersections located along City, County, and ODOT facilities, including two signalized intersections (intersections 9 and 10) and 16 unsignalized intersections. Figure 1 illustrates the location of the study intersections.

State Facilities

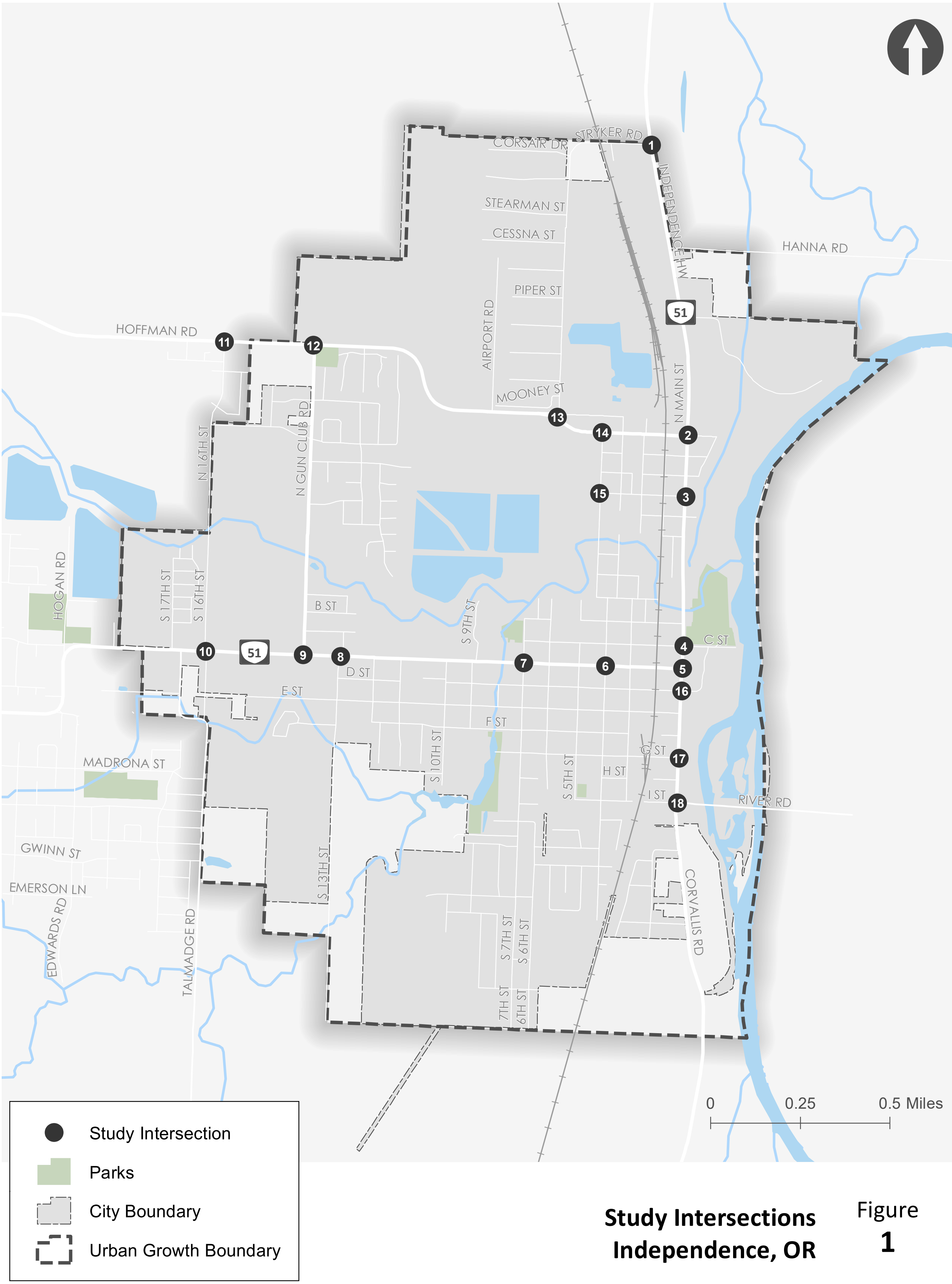
1. OR 51/Stryker Road
2. OR 51/Polk Street
3. Main Street/Williams Street
4. Main Street/C Street
5. Main Street/Monmouth Street
6. Monmouth Street/4th Street
7. Monmouth Street/7th Street
8. Monmouth Street/13th Street
9. Monmouth Street/Gun Club Road
10. Monmouth Street/16th Street

County/Monmouth Facilities

11. Hoffman Road/16th Street

Local Facilities

12. Hoffman Road/Gun Club Road
13. Hoffman Road/Stryker Road
14. Polk Street/Ash Street
15. Ash Street/Williams Street
16. Main Street/D Street
17. Main Street/G Street
18. S Main Street/River Road



H:\23\23769 - Independence TSP Update\gis\Method Memo\1_Study Area.mxd - mbell - 3:52 PM 4/2/2020

Study Intersections
Independence, OR

Figure
1

Data Source: Pok County Online Services, ODOT

VOLUME DEVELOPMENT

Traffic Counts

Turning movement counts were conducted at the study intersections on October 15th and 16th, 2019. The counts were conducted on a typical mid-weekday when school was in session. Nine counts were conducted over a 16-hour period (6:00 AM to 10:00 PM) and nine counts were conducted over a 4-hour period (2:00 to 6:00 PM). All the counts include the total number of pedestrians, bicyclists, and motor vehicles that entered the study intersections in 15-minute intervals from 2:00 to 6:00 p.m. and in 60-minute intervals throughout all other time periods, as applicable. Table 1 summarizes the traffic counts information for the Independence TSP update. *The traffic count worksheets are provided in Attachment A – the traffic counts were conducted by ODOT and post-processed by Quality Counts.*

Table 1: Traffic Count Summary

Map ID	Intersection	Count Date	Count Type	Duration
1	OR 51/Stryker Road	10/16/2019	4-hour	2 PM to 6 PM
2	OR 51/Polk Street	10/16/2019	16-hour	6 AM to 10 PM
3	Main Street/Williams Street	10/16/2019	4-hour	2 PM to 6 PM
4	Main Street/C Street	10/16/2019	4-hour	2 PM to 6 PM
5	Main Street/Monmouth Street	10/16/2019	16-hour	6 AM to 10 PM
6	Monmouth Street/4th Street	10/16/2019	16-hour	6 AM to 10 PM
7	Monmouth Street/7th Street	10/15/2019	4-hour	2 PM to 6 PM
8	Monmouth Street/13th Street	10/16/2019	4-hour	2 PM to 6 PM
9	Monmouth Street/Gun Club Road	10/16/2019	16-hour	6 AM to 10 PM
10	Monmouth Street/16th Street	10/16/2019	16-hour	6 AM to 10 PM
11	Hoffman Road/16th Street	10/16/2019	16-hour	6 AM to 10 PM
12	Hoffman Road/Gun Club Road	10/16/2019	16-hour	6 AM to 10 PM
13	Hoffman Road/Stryker Road	10/16/2019	4-hour	2 PM to 6 PM
14	Polk Street/Ash Street	10/16/2019	16-hour	6 AM to 10 PM
15	Ash Street/Williams Street	10/16/2019	4-hour	2 PM to 6 PM
16	Main Street/D Street	10/15/2019	4-hour	2 PM to 6 PM
17	Main Street/G Street	10/15/2019	4-hour	2 PM to 6 PM
18	S Main Street/River Road S	10/16/2019	16-hour	6 AM to 10 PM

Peak Hour Development

The traffic counts were reviewed to identify a system-wide peak hour and/or individual intersection peak hours for the operational analysis. The system-wide peak hour was found to occur from 4:30 to 5:30 PM while the individual intersection peak hours were found to occur at different times throughout the study period. However, because of the low variability between system-wide peak hour and the individual intersection peak hours at most intersections, the system-wide peak hour will be used to complete the operational analyses. Table 2 summarizes the individual intersection peak hours at the study intersections, the total entering volume (TEV) during the individual intersection peak hours, and the percent difference between the TEV during the individual intersection peak hours and the system-wide peak hour. As shown, where the percent difference is greater than five percent, the TEV is relatively low.

Table 2: Study Intersection Peak Hours

Map ID	Intersection	Intersection Peak Hour	Total Entering Volume (TEV)	% difference from System Peak Hour
1	OR 51/Stryker Road	4:30-5:30pm	980	0.0%
2	OR 51/Polk Street	4:30-5:30pm	1,081	0.0%
3	Main Street/Williams Street	4:30-5:30pm	879	0.0%
4	Main Street/C Street	5:00-6:00pm	836	0.5%
5	Main Street/Monmouth Street	5:00-6:00pm	1,170	1.1%
6	Monmouth Street/4th Street	5:00-6:00pm	1,104	3.1%
7	Monmouth Street/7th Street	4:45-5:45pm	1,278	1.5%
8	Monmouth Street/13th Street	4:45-5:45pm	1,395	2.1%
9	Monmouth Street/Gun Club Road	5:00-6:00pm	1,638	2.9%
10	Monmouth Street/16th Street	4:30-5:30pm	1,666	0.0%
11	Hoffman Road/16th Street	3:45-4:45pm	748	2.9%
12	Hoffman Road/Gun Club Road	3:45-4:45pm	895	5.1%
13	Hoffman Road/Stryker Road	4:00-5:00pm	754	5.8%
14	Polk Street/Ash Street	4:00-5:00pm	562	7.7%
15	Ash Street/Williams Street	4:00-5:00pm	150	12.7%
16	Main Street/D Street	4:30-5:30pm	856	0.0%
17	Main Street/G Street	4:30-5:30pm	1,048	0.0%
18	S Main Street/River Road S	4:45-5:45pm	1,198	2.6%

SEASONAL ADJUSTMENT FACTORS

30th Hour Volumes (30 HV) for the Independence TSP update will be developed based on the traffic counts collected at the study intersections and the application of seasonal adjustment factors consistent with the methodologies identified in the APM. The APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATRs) located in select locations throughout the State Highway System that collect traffic data 24-hours a day, 365 days a year. Each method was evaluated to determine the most appropriate method for the study intersections. Based on these evaluations, the ATR Characteristic Table Method was used to develop a seasonal adjustment factor for the study intersections along Monmouth Street and the Seasonal Trend Table method was used to develop a seasonal adjustment factor for the study intersections along OR 51 and Main Street. The results of the evaluations and proposed seasonal adjustment factors are summarized below.

ATR Characteristics Table Method

The ATR Characteristic Table is an Excel spreadsheet that provides general information on ATRs in Oregon. The table is filtered from left to right to find ATRs that share similar characteristics with roadways in the study area. Based on information provided in the 2018 ATR Characteristics Table (printed 06/18/2019), one ATR was found that shares similar characteristics with Monmouth Street; no ATR was found that shares similar characteristics with OR 51 or Main Street. The Woodburn ATR (#24-001) is located along a facility with a commuter seasonal trend in a small urban area, it has two travel lanes with a weekday traffic trend, and the average annual daily traffic (AADT) at the ATR is within 10% of the AADT along Monmouth Street. Additional information on this ATR is provided below.

The Woodburn ATR (#24-001) is located along OR 99E, approximately 0.11 miles south of NE Belle Passi Road. The ATR was installed in January 1937 and has traffic count data for the last 83 years. Based on data provided by the ATR, the peak month generally occurs in August. Table 3 summarizes the five most recent years of data available from the ATR for the peak month and compares it to the five most recent years of data available for the count month.

Table 3: Seasonal Adjustment Factor (ATR Characteristic Table Method)

Year	2014	2015	2016	2017	2018	Average	Seasonal Adjustment
Peak Month (August	112	109*	109	117*	109	110	N/A
Count Month (October)	109*	105	104*	107	106	106	1.04

*indicates values that were discarded from the average as indicated in the APM.

The seasonal adjustment factor shown in Table 3 will be applied to the study intersections along Monmouth Street.

Seasonal Trend Table Method

The Seasonal Trend Table provides average values from the ATR Characteristics Table for each seasonal traffic trend (i.e. commuter, summer, recreation summer, recreation winter). Based on a review of regional traffic trends in the Independence area, the Commuter seasonal traffic trend values were used to develop seasonal adjustment factors for OR 51 and Main Street. Table 4 summarizes the average values for the count month (October), and the peak period as provided in the 2018 ODOT Seasonal Trend Table (updated 06/26/2019).

Table 4: Seasonal Adjustment Factor (Seasonal Trend Table Method)

Year	15-Oct	Seasonal Tend Table Peak Period Factor	Seasonal Adjustment Factor (15-Oct)
Commuter	0.97	0.94	1.03

The season adjustment factor shown in Table 4 will be applied to the study intersections along OR 51 and Main Street.

HISTORICAL GROWTH FACTOR

All traffic counts were conducted in 2019; therefore, no historical growth factors are needed to adjust traffic volumes.

FORECAST TRAFFIC VOLUME

Forecast traffic volumes will be developed for the study intersections in accordance with the Zonal Cumulative Analysis methodology described in the APM. This methodology is suggested when analyzing entire cities of up to 10,000 residents. This methodology combines growth in regional traffic volumes with growth in local traffic volumes associated with projected household and employment growth in the city. The traffic volume projection process includes three steps (trip generation, trip distribution, and trip assignment). The process accounts for the following four categories of vehicle trips:

1. *External-External (through trips)*: vehicles with an origin and destination outside the UGB. An example of an external-external trip is someone traveling from Monmouth to Salem through Independence.
2. *External-Internal (inbound trips)*: vehicles with an origin outside the UGB and a destination inside the UGB. An example of an external-internal trip is someone who works in Salem but returns home to Independence during the evening peak hour.
3. *Internal-External (outbound trips)*: vehicles with an origin inside the UGB and a destination outside the UGB. An example of an internal-external trip is someone who works in Independence but returns home to Monmouth during the evening peak hour.
4. *Internal-Internal (local trips)*: vehicles with an origin and destination inside the UGB. An example of an internal-internal trip is someone who travels from their home to the grocery store without leaving the city.

Using these vehicle trip types, the basic steps for a zonal cumulative analysis are:

1. Identify the study area and divide into transportation analysis zones (TAZ).
2. Identify vacant lands, in-process developments, comprehensive plan allowed land uses/densities, and development rates using Census data and GIS data provided by the City.
3. Estimate future trip generation potential.
4. Determine the through trip percentages and E-E trips for the external station (external zone).
5. Determine the I-E and E-I trips at each external station (external zone).
6. Determine the trip distribution for the I-E and E-I trips for each internal TAZ.
7. Determine the trip distribution for I-I trips.
8. Calculate network link travel times.
9. Assign total trips to the network

TRAFFIC ANALYSIS

This section documents the mobility standards and targets that will be used to evaluate the performance of the study intersections and to identify potential alternatives to address operational issues on ODOT and City facilities.

ODOT Facilities

ODOT uses volume-to-capacity (v/c) ratios to assess intersection operations. Table 6 of the Oregon Highway Plan (OHP – Reference 3) and Table 10-2 of the Oregon Highway Design Manual (HDM – Reference 4) provide maximum v/c ratios for all signalized and unsignalized intersections located outside the Portland metropolitan area. The OHP ratios are used to evaluate existing and future no-build conditions, while the HDM ratios are used in the creation of future TSP alternatives which involve projects along state highways. The following summarizes the factors that determine the OHP and HDM ratios at the ODOT controlled intersections within the study area, which are located along OR 51, Main Street, and Monmouth Street.

- OR 51 is classified as a District Highway, it is located inside the Independence UGB, and it is a non-MPO outside of an STA with a posted speed limit of 55 miles per hour (mph) at Stryker Road and 35 mph at Polk Street.

- Main Street is classified as a District Highway, it is located inside the Independence UGB, it is a non-MPO outside of an STA with a posted speed limit of 35 mph at Williams Street, and it is an STA at C Street and Monmouth Street.
- Monmouth Street is classified as a District Highway, it is located inside the Independence UGB, it is an STA at 4th Street, and it is a non-MPO outside of an STA with posted speed limit of 35 MPH at 7th Street, 13th Street, Gun Club Road, and 16th Street.

Table 5 summarizes the v/c ratios that will be used to identify existing and projected future traffic conditions at the ODOT study intersections.

Table 5: ODOT Mobility Targets

Map ID	Intersection	Traffic Control	OHP Mobility Target	HDM Standard
1	OR 51/Stryker Road	TWSC	0.90	0.75
2	OR 51/Polk Street	TWSC	0.95	0.80
3	Main Street/Williams Street	TWSC	0.95	0.80
4	Main Street/C Street	TWSC	1.0	0.95
5	Main Street/Monmouth Street	AWSC	1.0	0.95
6	Monmouth Street/4th Street	TWSC	1.0	0.95
7	Monmouth Street/7th Street	TWSC	0.95	0.80
8	Monmouth Street/13th Street	TWSC	0.95	0.80
9	Monmouth Street/Gun Club Road	Signal	0.95	0.80
10	Monmouth Street/16th Street	Signal	0.95	0.80

County Facilities

The Hoffman Road/16th Street intersection is located outside the city limits in unincorporated Polk County. The intersection was evaluated in the current Independence TSP according to Polk County standards. Polk County uses level of service to assess intersection operations. Per the Polk County TSP, actions will be taken to prevent LOS falling below LOS C for signalized and unsignalized intersections. Table 6 summarizes the County mobility standards that will be used to evaluate existing and projected future traffic conditions at the County study intersection.

Table 6: County Mobility Standards

Map ID	Intersection	Traffic Control	County Standard
11	Hoffman Rd/16th Street	TWSC	LOS C

Local Facilities

The City of Independence uses v/c ratios to assess intersection operations. Per the current Independence TSP, all signalized and unsignalized intersection should maintain a v/c ratio of 0.80 or below, except for those bound by B Street to E Street and 2nd Street to Main Street, which should maintain a v/c ratio of 0.95 or below. Table 7 summarizes the City mobility standards that will be used to evaluate existing and projected future traffic conditions at City study intersections.

Table 7: City Mobility Standards

Map ID	Intersection	Traffic Control	City Standard
12	Hoffman Rd/Gun Club Rd	TWSC	0.80
13	Hoffman Rd/Stryker Rd	TWSC	0.80
14	Polk St/Ash St	TWSC	0.80
15	Ash St/Williams St	TWSC	0.80
16	Main St/D St	TWSC	0.95
17	Main St/G St	TWSC	0.80
18	S Main St/River Rd S	TWSC	0.80

Traffic operations at the study intersections will be evaluated based on the mobility standards and targets shown in Tables 5-7. Potential solutions will be identified and evaluated for the study intersections that are found to exceed the mobility standards and targets under existing and future traffic conditions.

TRAFFIC ANALYSIS PARAMETERS

The bullets below identify the specific sources of data and methodologies proposed to conduct the operational analyses. Analyses of all state facilities will be conducted according to the APM, unless otherwise agreed upon by the City and ODOT.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be collected through aerial photography and confirmed through a site visit. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography.
2. *Operational Data* (such as posted speeds, intersection control, parking, transit stops, rail crossings, right-turn on red, etc.) will be collected through a site visit.
3. *Peak Hour Factors (PHF)* will be calculated for each intersection and applied to the existing conditions analyses. Per the APM, PHFs of 0.95 will be used for the year 2040 analysis for high-order facilities (arterials), with 0.90 applied to medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.
4. *Signal Timing Data* will be requested from ODOT and the City for use in the existing conditions analysis. Signal parameters such as Flash Don't Walk, Walk, and Minimum Times will be retained in the forecast analysis with the signal splits optimized to better serve the future traffic volume patterns. Optimized signal cycle lengths may range between 60 and 120 seconds.
5. *Traffic Operations*

   a. The methodologies identified in the Highway Capacity Manual, 6th Edition (HCM – Reference 5) will be used to analyze traffic operations at the study intersections.

   b. Synchro 10 will be used to conduct the traffic operations analyses. Synchro 10 is a software tool designed to assist with operations analyses in accordance with HCM 6th methodologies. The analysis results will be reported for the overall intersection at signalized intersections and the critical movement at unsignalized intersections – overall intersection v/c ratios will be developed for the signalized intersections in accordance with the methodologies identified in the APM.

c. Synchro 10 will be used to conduct a queuing analysis at the signalized study intersections. The 95th percentile queue lengths will be reported for all separate left- and right-turn movements and compared to available striped storage lengths. The 95th percentile queue and storage lengths will be rounded to the nearest 25-feet. Microsimulation is not proposed as part of this long-range planning effort.

Traffic Analysis Software and Input Assumptions

Synchro 10 will be used to evaluate intersection performance under the following conditions and assumptions detailed below in Table 8.

Table 8: Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	From traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Signal Timing Data	From ODOT or City of Independence
Ideal Saturation Flow Rate (for all movements)	1,750 passenger cars per hour per lane
Lane Width	12 feet unless field observations suggest otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
Percent Grade	Estimated based on field observations
95th percentile vehicle queues	Synchro summary output

CRASH ANALYSIS

The five most recent years of complete crash data available will be obtained from ODOT's crash database and reviewed at the study intersections and along study area roadways consistent with the methodologies outlined in Chapter 4 of the APM. Currently, complete crash data is available for the period from January 1, 2013 through December 31, 2017; fatal and serious injury crash data is also available for a more recent period. The crash data will be analyzed for number, type, severity, and location to identify potential crash patterns. Crash rates and critical crash rates will be developed for the study intersections and roadway segments as applicable. Intersection crash rates will be compared to the 90th percentile crash rates in Table 4.1 of the APM and segment crash rates will be compared to Table II in the current ODOT State Highway Crash Rate Tables. In addition, ODOT's Safety Priority Index System (SPIS) will be reviewed to identify sites in the top 5% and 10%, as appropriate. Potential countermeasures (and resulting crash percentage reductions) will be taken from the All Roads Transportation Safety (ARTS) Crash Reduction Factors (CRF) listing, the CRF Appendix, or the Crash Modification Factor (CMF) Clearinghouse; CMFs from the Clearinghouse will be three stars or better.

MULTIMODAL ANALYSIS

The multimodal analysis will be performed in accordance with the methodologies identified in Chapter 14 of the APM and identify the needs associated with pedestrian, bicycle, and public transportation facilities and service. The pedestrian and bicycle analyses will follow the Pedestrian Level of Traffic Stress (PLTS) and Bicycle Level of Traffic Stress (BLTS) analysis methodologies outlined in the APM. Both PLTS and

BLTS methods group facilities into four different stress levels for segments, intersection approaches, and intersection crossings. Facilities with an LTS 1 rating have little to no traffic stress, require less attention, and are suitable for all users. Facilities with an LTS 2 rating have little traffic stress, but require more attention and therefore, may or may not be suitable for small children. Facilities with an LTS 3 rating have moderate traffic stress and are suitable for adults. Facilities with an LTS 4 rating have high traffic stress and are only suitable for able-bodied adults with limited options. The transit analysis will follow the qualitative multimodal assessment (QMA) methodology outlined in the APM. Transit QMA provides a qualitative "good", "fair", "poor" rating for transit service based on hours of service, service frequency, and service coverage.

REFERENCES

1. Oregon Department of Transportation. *Transportation System Plan Guidelines*, 2018.
2. Oregon Department of Transportation. *Analysis Procedures Manual*, 2018.
3. Oregon Department of Transportation. *Oregon Highway Plan*, 2015.
4. Oregon Department of Transportation. *Highway Design Manual*, 2012.
5. Transportation Research Board. *Highway Capacity Manual, 6th Edition*, 2016.

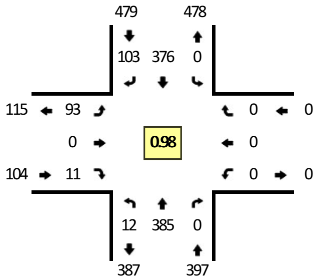
ATTACHMENTS

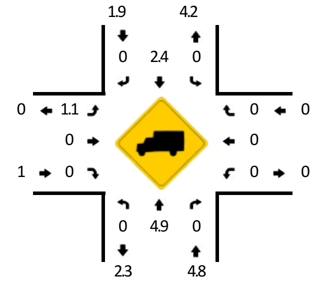
A. Traffic Counts – the traffic counts that will be used to evaluate traffic operations for the Independence TSP update were conducted by ODOT and post-processed by Quality Counts. The traffic count worksheets included in Attachment A summarize the traffic counts information. The images in the worksheets reflect the system-wide peak hour (4:30 to 5:30 PM) and include (from top to bottom and left to right) the total of number of motor vehicles, heavy vehicle percentages, pedestrians, bicyclists, busses, and scooters that entered the study intersections during the peak hour. The Tabular summaries in the worksheets include all motor vehicle movements during the count period (2:00 to 6:00 PM), as well as all movements during the peak 15-minutes of traffic at the intersection. The peak 15-minute flow rates are multiplied by four to extrapolate the effect of the peak 15 minutes over the whole hour.

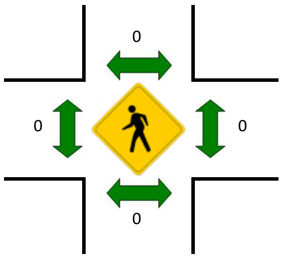
Attachment A Traffic Counts

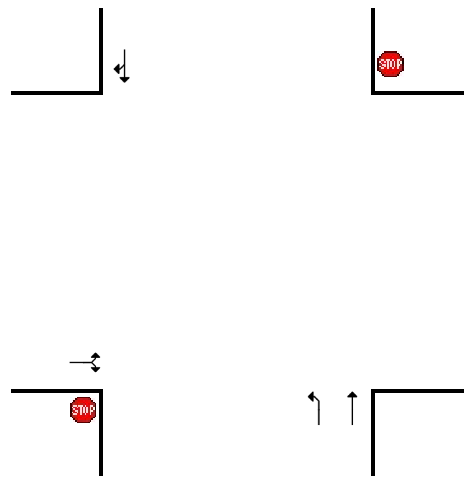
LOCATION: 53605_Hwy 51 -- Stryker Rd
QC JOB #: 15176506
CITY/STATE: Independence, OR
DATE: Wed, Oct 16 2019

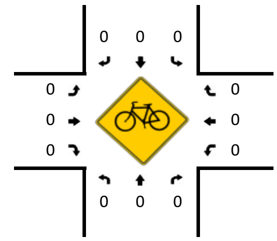
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

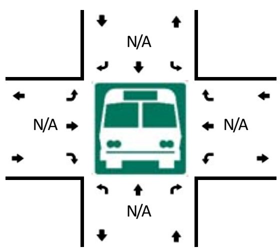


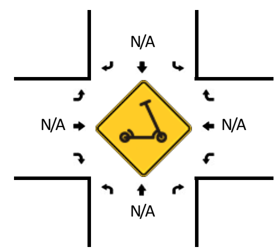












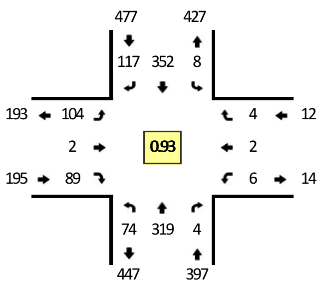
15-Min Count Period Beginning At	53605_Hwy 51 (Northbound)				53605_Hwy 51 (Southbound)				Stryker Rd (Eastbound)				Stryker Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	3	55	0	0	0	61	13	0	21	0	1	0	0	0	0	0	154	
2:15 PM	2	79	0	0	0	60	13	0	24	0	0	0	0	0	0	0	178	
2:30 PM	1	68	0	0	0	69	22	0	12	0	3	0	0	0	0	0	175	
2:45 PM	1	81	0	0	0	82	23	0	24	0	3	0	0	0	0	0	214	721
3:00 PM	1	70	0	0	0	85	13	0	22	0	1	0	0	0	0	0	192	759
3:15 PM	1	82	0	0	0	74	20	0	19	0	3	0	0	0	0	0	199	780
3:30 PM	1	89	0	0	0	65	24	0	22	0	2	0	0	0	0	0	203	808
3:45 PM	0	62	0	0	0	100	31	0	13	0	4	0	0	0	0	0	210	804
4:00 PM	0	97	0	0	0	84	26	0	30	0	1	0	0	0	0	0	238	850
4:15 PM	3	90	0	0	0	79	32	0	15	0	2	0	0	0	0	0	221	872
4:30 PM	5	99	0	0	0	96	15	0	25	0	3	0	0	0	0	0	243	912
4:45 PM	2	94	0	0	0	87	28	0	33	0	2	0	0	0	0	0	246	948
5:00 PM	2	111	0	0	0	87	33	0	14	0	3	0	0	0	0	0	250	960
5:15 PM	3	81	0	0	0	106	27	0	21	0	3	0	0	0	0	0	241	980
5:30 PM	2	80	0	0	0	96	31	0	23	0	3	0	0	0	0	0	235	972
5:45 PM	0	69	0	0	0	77	25	0	15	0	2	0	0	0	0	0	188	914

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	444	0	0	0	348	132	0	56	0	12	0	0	0	0	0	1000
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

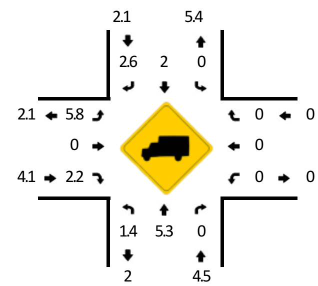
Comments:

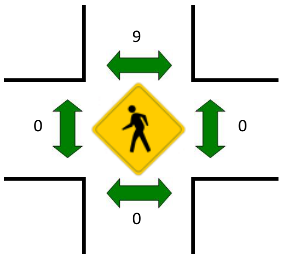
Report generated on 2/28/2020 12:53 PM
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

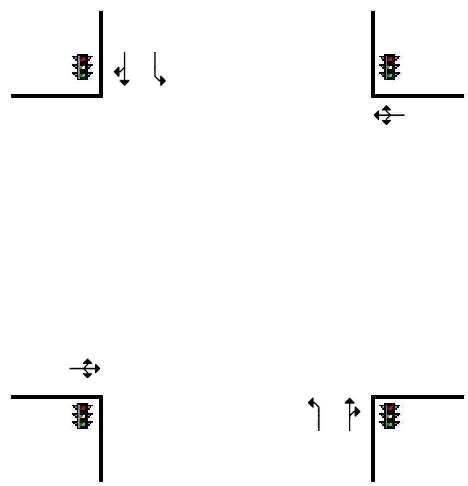
LOCATION: 53606_Hwy 51 -- Polk St
CITY/STATE: Independence, OR
QC JOB #: 15176507
DATE: Wed, Oct 16 2019

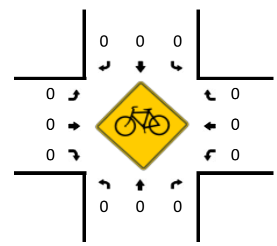


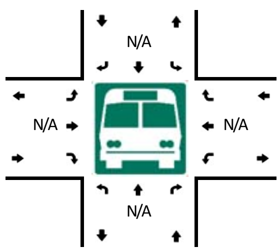
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

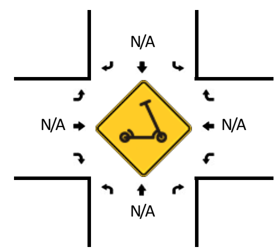












15-Min Count Period Beginning At	53606_Hwy 51 (Northbound)				53606_Hwy 51 (Southbound)				Polk St (Eastbound)				Polk St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	9	57	1	0	0	47	19	0	22	0	13	0	0	0	0	0	168	
2:15 PM	11	64	1	0	0	56	11	0	20	0	18	0	0	0	2	0	183	
2:30 PM	10	73	1	0	0	68	12	0	23	1	10	0	3	1	1	0	203	
2:45 PM	9	73	3	0	1	65	15	0	25	1	24	0	1	1	1	0	219	773
3:00 PM	16	77	2	0	1	63	24	0	23	0	21	0	0	0	1	0	228	833
3:15 PM	12	87	0	0	2	42	19	0	21	0	10	0	0	0	0	0	193	843
3:30 PM	18	86	2	0	2	52	19	0	27	2	28	0	0	2	1	0	239	879
3:45 PM	12	66	0	0	1	82	31	0	18	0	19	0	0	1	3	0	233	893
4:00 PM	10	82	0	0	1	73	29	0	40	1	28	0	0	0	0	0	264	929
4:15 PM	20	72	0	0	0	84	27	0	29	0	14	0	1	0	0	0	247	983
4:30 PM	20	80	2	0	0	92	38	0	32	1	23	0	0	0	2	0	290	1034
4:45 PM	17	83	0	0	2	79	22	0	22	0	20	0	1	1	0	0	247	1048
5:00 PM	15	87	1	0	5	86	32	0	32	0	23	0	2	0	0	0	283	1067
5:15 PM	22	69	1	0	1	95	25	0	18	1	23	0	3	1	2	0	261	1081
5:30 PM	16	74	1	0	0	100	30	0	23	1	19	0	0	1	1	0	266	1057
5:45 PM	25	72	0	0	2	84	35	0	12	2	12	0	1	1	0	0	246	1056

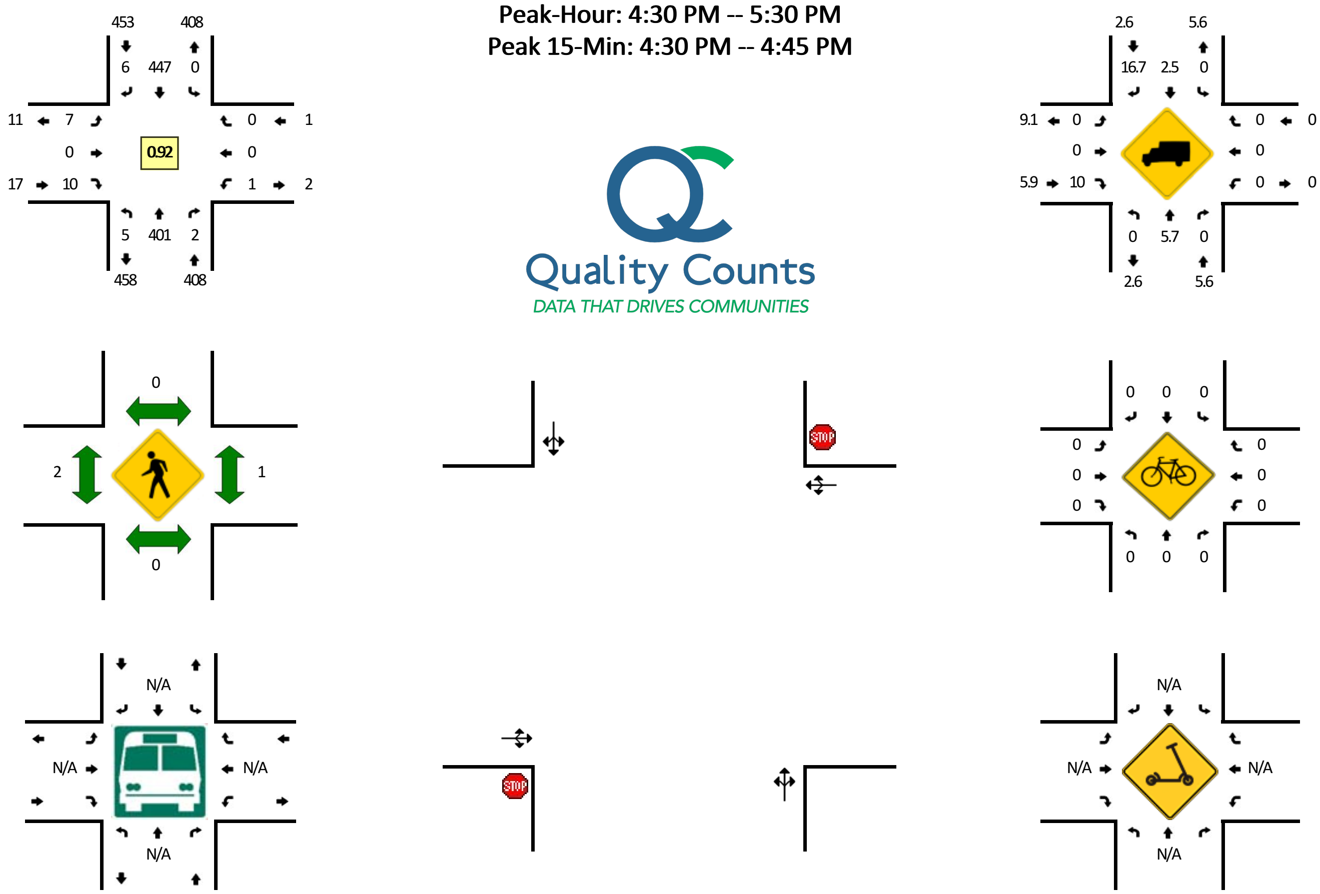
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	80	320	8	0	0	368	152	0	128	4	92	0	0	0	8	0	1160
Heavy Trucks	0	8	0		0	8	0		8	0	4		0	0	0		28
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/28/2020 12:53 PM
SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

LOCATION: 53616_Main St -- Williams St   **QC JOB #:** 15176517
CITY/STATE: Independence, OR   **DATE:** Wed, Oct 16 2019

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

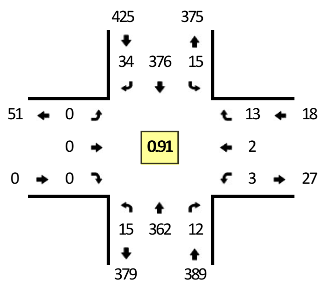


15-Min Count Period Beginning At	53616_Main St (Northbound) Left	Thru	Right	U	53616_Main St (Southbound) Left	Thru	Right	U	Williams St (Eastbound) Left	Thru	Right	U	Williams St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
2:00 PM	1	70	0	0	0	61	0	0	0	0	0	0	0	0	0	0	132	
2:15 PM	0	75	0	0	0	76	0	0	3	0	0	0	0	0	0	0	154	
2:30 PM	1	83	0	0	0	81	1	0	1	0	0	0	0	0	0	0	167	
2:45 PM	2	84	0	0	1	84	2	0	0	0	1	0	0	0	1	0	175	628
3:00 PM	3	92	0	0	0	87	1	0	0	0	1	0	0	0	0	0	184	680
3:15 PM	0	96	0	0	0	55	0	0	0	0	2	0	0	0	0	0	153	679
3:30 PM	2	104	0	0	0	80	1	0	3	0	2	0	0	0	0	0	192	704
3:45 PM	2	83	0	0	0	92	1	0	0	0	1	0	0	0	0	0	179	708
4:00 PM	1	86	0	0	0	103	2	0	2	0	0	0	0	0	0	0	194	718
4:15 PM	3	97	0	0	0	89	0	0	1	0	2	0	0	0	0	0	192	757
4:30 PM	3	105	2	0	0	123	1	0	2	0	3	0	1	0	0	0	240	805
4:45 PM	0	99	0	0	0	98	0	0	3	0	2	0	0	0	0	0	202	828
5:00 PM	0	104	0	0	0	117	2	0	2	0	3	0	0	0	0	0	228	862
5:15 PM	2	93	0	0	0	109	3	0	0	0	2	0	0	0	0	0	209	879
5:30 PM	1	94	0	0	1	108	3	0	1	0	5	0	0	0	0	0	213	852
5:45 PM	1	100	0	0	0	105	1	0	1	0	1	0	0	0	0	0	209	859

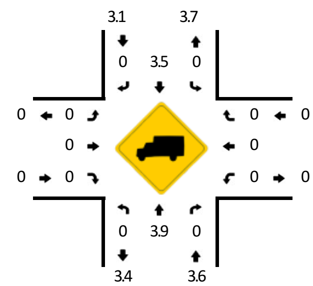
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	12	420	8	0	0	492	4	0	8	0	12	0	4	0	0	0	960
Heavy Trucks	0	4	0		0	16	0		0	0	0		0	0	0		20
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

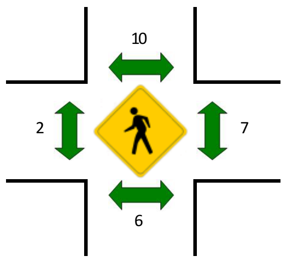
Comments:

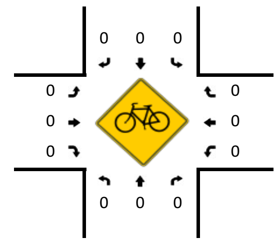
LOCATION: 53601_Main St -- C St **QC JOB #:** 15176502
CITY/STATE: Independence, OR **DATE:** Wed, Oct 16 2019

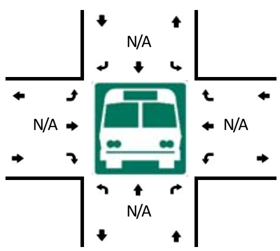


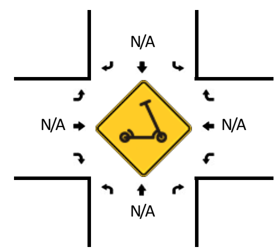
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM









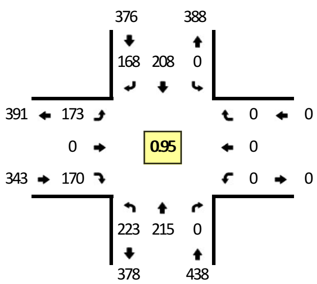


15-Min Count Period Beginning At	53601_Main St (Northbound) Left	Thru	Right	U	53601_Main St (Southbound) Left	Thru	Right	U	C St (Eastbound) Left	Thru	Right	U	C St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
2:00 PM	4	67	4	0	1	56	4	0	0	0	0	0	1	1	1	0	139	
2:15 PM	11	68	4	0	5	61	12	0	0	0	0	0	2	0	5	0	168	
2:30 PM	6	77	3	0	7	66	4	0	0	0	0	0	0	0	4	0	167	
2:45 PM	4	79	2	0	2	79	7	0	0	0	0	0	1	0	6	0	180	654
3:00 PM	4	89	4	0	4	79	3	0	0	0	0	0	2	0	2	0	187	702
3:15 PM	4	84	1	0	2	54	3	0	0	0	0	0	2	2	8	0	160	694
3:30 PM	6	96	4	0	3	64	6	0	0	0	0	0	2	0	8	0	189	716
3:45 PM	5	85	4	0	5	90	4	0	0	0	0	0	3	3	3	0	202	738
4:00 PM	2	80	2	0	2	97	3	0	0	0	0	0	1	0	5	0	192	743
4:15 PM	7	97	5	0	3	79	4	0	0	0	0	0	2	0	4	0	201	784
4:30 PM	5	95	3	0	3	108	9	0	0	0	0	0	2	0	3	0	228	823
4:45 PM	4	90	2	0	4	76	9	0	0	0	0	0	1	1	3	0	190	811
5:00 PM	2	92	4	0	4	95	7	0	0	0	0	0	0	0	3	0	207	826
5:15 PM	4	85	3	0	4	97	9	0	0	0	0	0	0	1	4	0	207	832
5:30 PM	3	94	0	0	2	102	6	0	0	0	0	0	2	2	5	0	216	820
5:45 PM	3	95	6	0	1	93	7	0	0	0	0	0	0	0	1	0	206	836

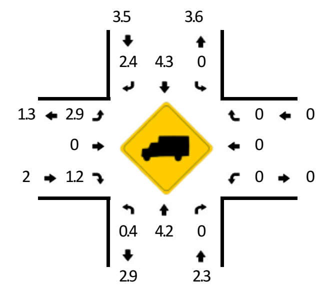
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	20	380	12	0	12	432	36	0	0	0	0	0	8	0	12	0	912
Heavy Trucks	0	8	0		0	20	0		0	0	0		0	0	0		28
Buses																	
Pedestrians		8				20				0				12			40
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

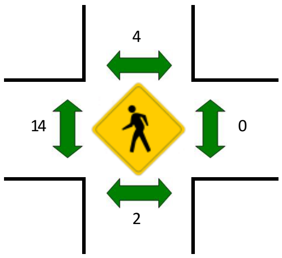
Comments:

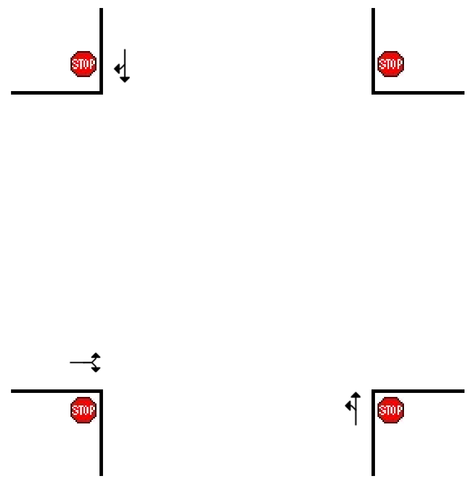
LOCATION: 15183_Main St -- Monmouth St | **QC JOB #:** 15176501
CITY/STATE: Independence, OR | **DATE:** Wed, Oct 16 2019

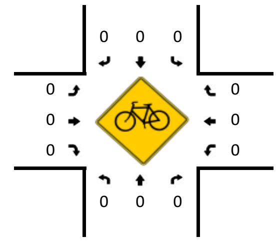


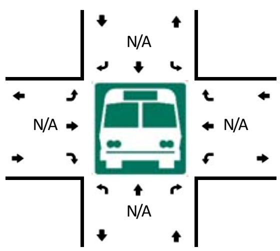
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

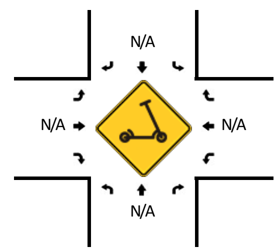










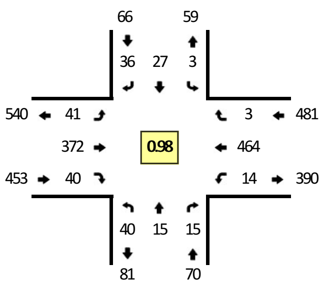


15-Min Count Period Beginning At	15183_Main St (Northbound) Left	Thru	Right	U	15183_Main St (Southbound) Left	Thru	Right	U	Monmouth St (Eastbound) Left	Thru	Right	U	Monmouth St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
2:00 PM	29	36	0	0	0	27	31	0	40	0	47	0	0	0	0	0	210	
2:15 PM	36	35	0	0	0	25	38	0	51	0	50	0	0	0	0	0	235	
2:30 PM	35	40	0	0	0	32	35	0	43	0	38	0	0	0	0	0	223	
2:45 PM	39	35	0	0	0	30	45	0	48	0	31	0	0	0	0	0	228	896
3:00 PM	33	46	0	0	0	47	33	0	51	0	33	0	0	0	0	0	243	929
3:15 PM	46	42	0	0	0	32	28	0	53	0	33	0	0	0	0	0	234	928
3:30 PM	52	52	0	0	0	34	32	0	51	0	33	0	0	0	0	0	254	959
3:45 PM	40	46	0	0	0	50	42	0	45	0	25	0	0	0	0	0	248	979
4:00 PM	57	48	0	0	0	49	47	0	40	0	46	0	0	0	0	0	287	1023
4:15 PM	56	57	0	0	0	41	41	0	51	0	47	0	0	0	0	0	293	1082
4:30 PM	52	58	0	0	0	57	49	0	46	0	42	0	0	0	0	0	304	1132
4:45 PM	53	54	0	0	0	46	37	0	42	0	37	0	0	0	0	0	269	1153
5:00 PM	61	55	0	0	0	51	42	0	42	0	46	0	0	0	0	0	297	1163
5:15 PM	57	48	0	0	0	54	40	0	43	0	45	0	0	0	0	0	287	1157
5:30 PM	56	50	0	0	0	60	43	0	49	0	38	0	0	0	0	0	296	1149
5:45 PM	54	56	0	0	0	41	57	0	46	0	36	0	0	0	0	0	290	1170

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	208	232	0	0	0	228	196	0	184	0	168	0	0	0	0	0	1216
Heavy Trucks	0	4	0		0	12	4		4	0	4		0	0	0		28
Buses																	
Pedestrians		4				0				20				0			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

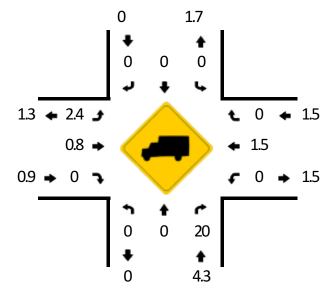
Comments:

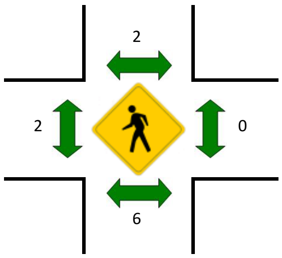
LOCATION: 53614_S 4th St -- Monmouth St | **QC JOB #:** 15176515
CITY/STATE: Independence, OR | **DATE:** Wed, Oct 16 2019

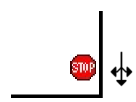


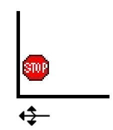
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

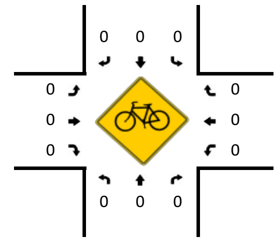
Quality Counts
DATA THAT DRIVES COMMUNITIES

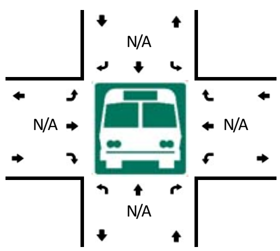


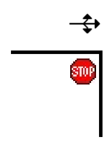


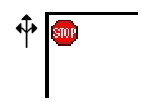


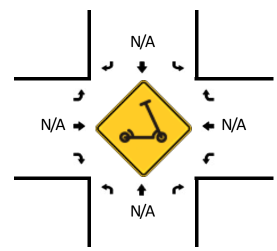












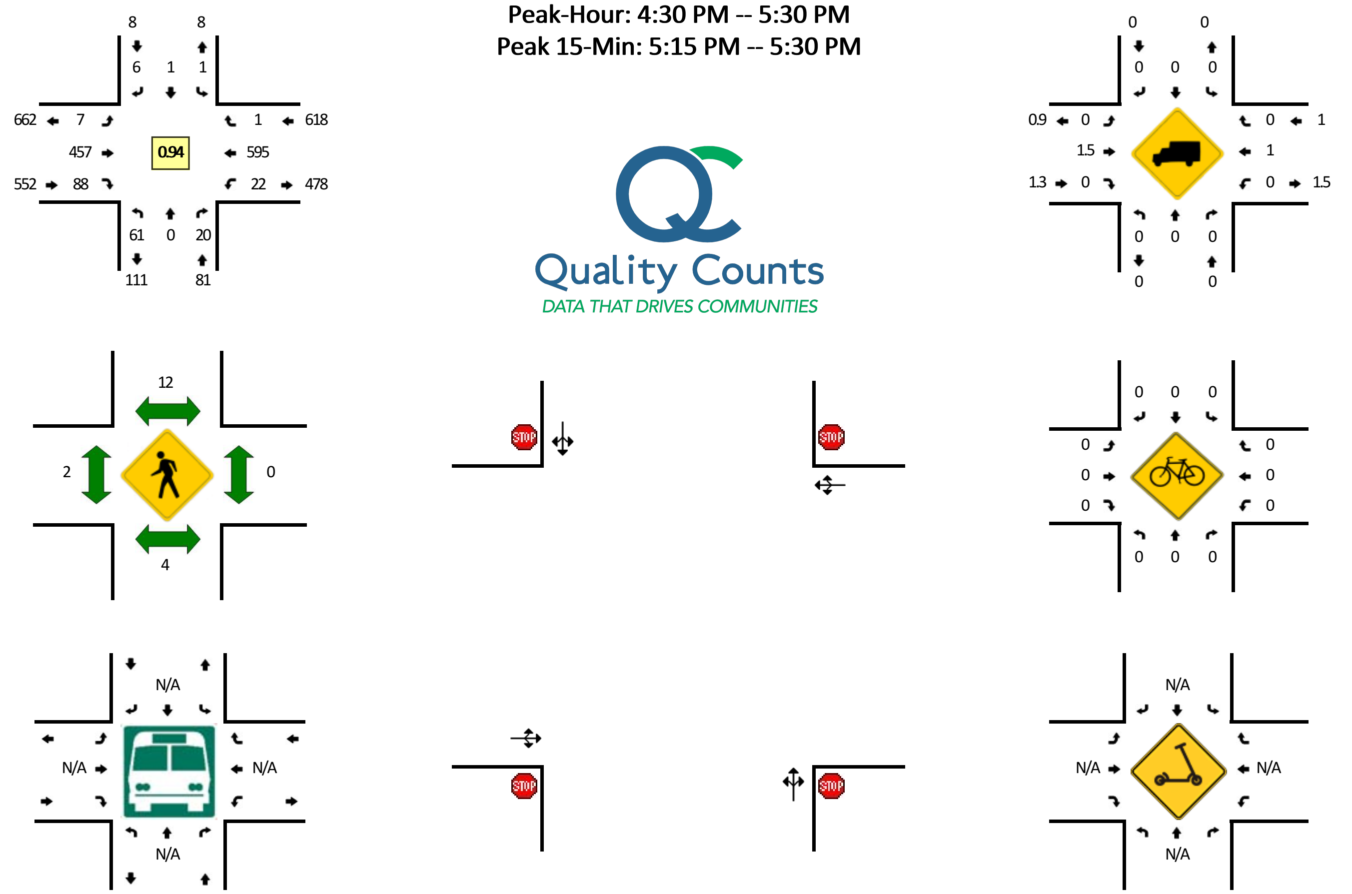
15-Min Count Period Beginning At	53614_S 4th St (Northbound)				53614_S 4th St (Southbound)				Monmouth St (Eastbound)				Monmouth St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	7	2	1	0	0	4	12	0	4	94	10	0	2	75	0	0	211	
2:15 PM	8	2	6	0	2	2	0	0	5	111	14	0	5	79	2	0	236	
2:30 PM	3	3	2	0	0	3	3	0	3	81	7	0	7	81	1	0	194	
2:45 PM	5	0	5	0	0	2	10	0	9	95	8	0	3	93	2	0	232	873
3:00 PM	3	3	3	0	0	1	5	0	3	84	7	0	1	72	0	0	182	844
3:15 PM	9	1	5	0	1	7	11	0	6	87	15	0	1	91	2	0	236	844
3:30 PM	7	5	3	0	0	1	7	0	5	84	4	0	3	102	3	0	224	874
3:45 PM	3	3	1	0	1	7	9	0	7	84	2	0	4	94	0	0	215	857
4:00 PM	7	6	6	0	0	11	7	0	7	102	8	0	2	115	0	0	271	946
4:15 PM	11	0	2	0	0	2	7	0	3	101	14	0	3	109	2	0	254	964
4:30 PM	8	3	3	0	0	7	13	0	9	98	7	0	3	120	1	0	272	1012
4:45 PM	11	4	3	0	1	5	5	0	11	87	14	0	3	115	0	0	259	1056
5:00 PM	10	5	0	0	0	10	9	0	9	99	5	0	6	119	2	0	274	1059
5:15 PM	11	3	9	0	2	5	9	0	12	88	14	0	2	110	0	0	265	1070
5:30 PM	10	6	4	0	1	2	12	0	9	120	6	0	3	122	2	0	297	1095
5:45 PM	7	1	5	0	0	5	6	0	19	81	9	0	8	126	1	0	268	1104

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	40	20	0	0	0	40	36	0	36	396	20	0	24	476	8	0	1096
Heavy Trucks	0	0	0		0	0	0		4	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

LOCATION: 53610_S 7th St -- Monmouth St **QC JOB #:** 15176511
CITY/STATE: Independence, OR **DATE:** Tue, Oct 15 2019

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM



15-Min Count Period Beginning At	53610_S 7th St (Northbound) Left	Thru	Right	U	53610_S 7th St (Southbound) Left	Thru	Right	U	Monmouth St (Eastbound) Left	Thru	Right	U	Monmouth St (Westbound) Left	Thru	Right	U	Total	Hourly Totals
2:00 PM	5	0	5	0	0	0	3	0	2	115	11	0	6	92	0	0	239	
2:15 PM	9	0	3	0	0	0	2	0	1	95	12	0	1	106	1	0	230	
2:30 PM	4	0	5	0	0	0	1	0	1	98	8	0	1	97	0	0	215	
2:45 PM	9	0	6	0	0	0	3	0	4	110	11	0	5	101	1	0	250	934
3:00 PM	12	0	5	0	0	0	9	0	0	89	12	0	11	118	1	0	257	952
3:15 PM	11	0	2	0	0	0	1	0	1	102	20	0	0	107	0	0	244	966
3:30 PM	15	0	5	0	0	0	4	0	3	134	27	0	3	107	0	0	298	1049
3:45 PM	6	0	9	0	0	0	1	0	0	115	18	0	8	124	0	0	281	1080
4:00 PM	14	0	9	0	0	0	3	0	0	135	14	0	7	121	0	0	303	1126
4:15 PM	16	0	4	0	0	0	4	0	2	154	17	0	4	133	1	0	335	1217
4:30 PM	20	0	7	0	0	0	1	0	1	122	16	0	8	148	0	0	323	1242
4:45 PM	10	0	5	0	0	0	1	0	2	110	20	0	5	162	0	0	315	1276
5:00 PM	19	0	4	0	1	1	1	0	2	98	26	0	5	129	1	0	287	1260
5:15 PM	12	0	4	0	0	0	3	0	2	127	26	0	4	156	0	0	334	1259
5:30 PM	18	0	3	0	0	0	0	0	1	119	27	0	4	170	0	0	342	1278
5:45 PM	13	0	3	0	0	0	1	0	0	99	25	0	5	120	0	0	266	1229

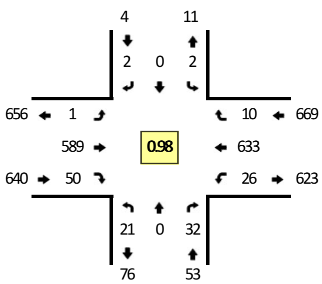
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	48	0	16	0	0	0	12	0	8	508	104	0	16	624	0	0	1336
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	12	0		24
Buses																	
Pedestrians		8				12				4				0			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/28/2020 12:53 PM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

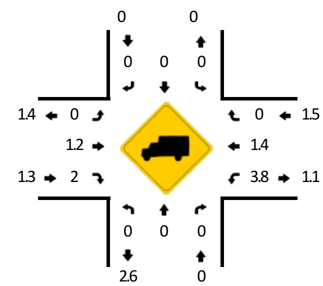
LOCATION: 53613_S 13th St -- Monmouth St
CITY/STATE: Independence, OR

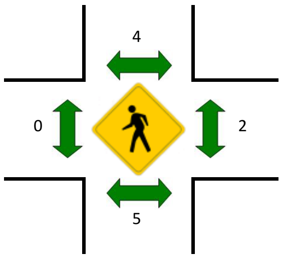
QC JOB #: 15176514
DATE: Wed, Oct 16 2019

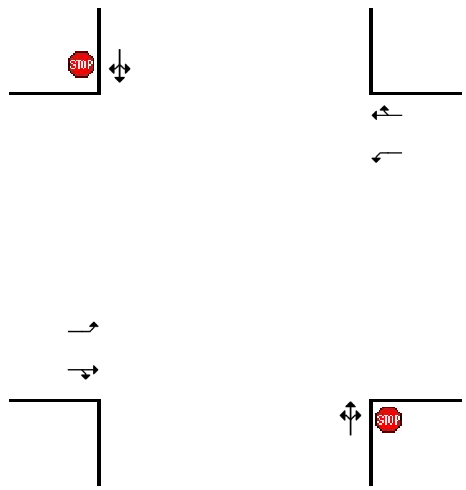


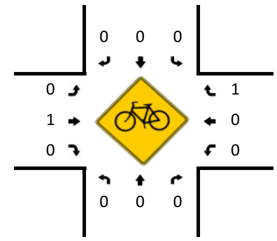
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

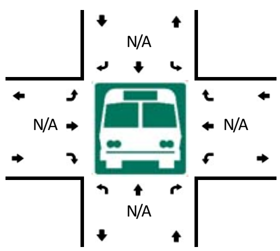
Quality Counts
DATA THAT DRIVES COMMUNITIES

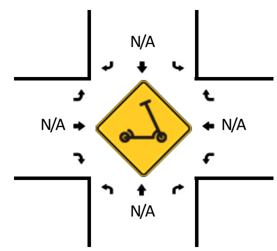












15-Min Count Period Beginning At	53613_S 13th St (Northbound)				53613_S 13th St (Southbound)				Monmouth St (Eastbound)				Monmouth St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	5	0	8	0	0	0	0	0	0	144	10	0	5	104	2	0	278	
2:15 PM	4	0	7	0	0	0	1	0	1	157	13	0	5	106	2	0	296	
2:30 PM	8	0	5	0	0	0	0	0	0	102	8	0	2	116	2	0	243	
2:45 PM	8	0	5	0	0	0	1	0	0	148	4	0	2	106	1	0	275	1092
3:00 PM	4	0	6	0	0	0	0	0	1	120	7	0	7	101	0	0	246	1060
3:15 PM	5	0	5	0	1	0	1	0	2	126	7	0	9	120	1	0	277	1041
3:30 PM	7	0	4	0	0	0	0	0	0	132	7	0	3	149	1	0	303	1101
3:45 PM	9	0	4	0	0	0	1	0	0	126	17	0	6	121	2	0	286	1112
4:00 PM	8	0	7	0	1	0	0	0	1	156	7	0	5	151	2	0	338	1204
4:15 PM	5	0	2	0	0	0	0	0	0	156	8	0	7	148	1	0	327	1254
4:30 PM	5	0	8	0	2	0	0	0	0	151	16	0	2	161	2	0	347	1298
4:45 PM	4	0	7	0	0	0	1	0	1	143	14	0	4	159	4	0	337	1349
5:00 PM	0	0	13	0	0	0	1	0	0	150	10	0	13	159	2	0	348	1359
5:15 PM	12	0	4	0	0	0	0	0	0	145	10	0	7	154	2	0	334	1366
5:30 PM	9	0	11	0	0	0	1	0	0	171	15	0	10	156	3	0	376	1395
5:45 PM	6	0	6	0	3	0	1	0	1	153	11	0	9	139	3	0	332	1390

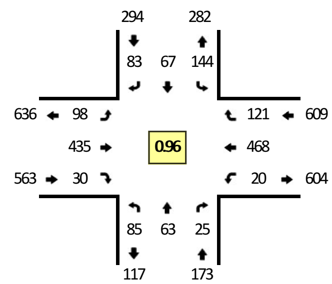
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	52	0	0	0	4	0	0	600	40	0	52	636	8	0	1392
Heavy Trucks	0	0	0		0	0	0		0	12	0		4	8	0		24
Buses																	
Pedestrians		4				4				0				0			8
Bicycles	0	0	0		0	0	0		0	4	0		0	0	0		4
Scooters																	

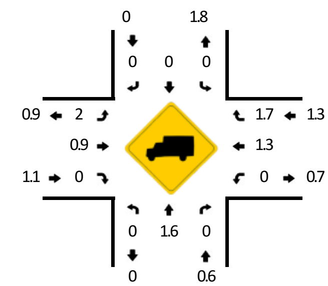
Comments:

LOCATION: 53611_S Gun Club Rd -- Monmouth St
CITY/STATE: Independence, OR

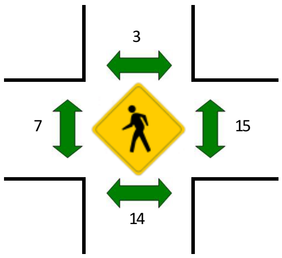
QC JOB #: 15176512
DATE: Wed, Oct 16 2019

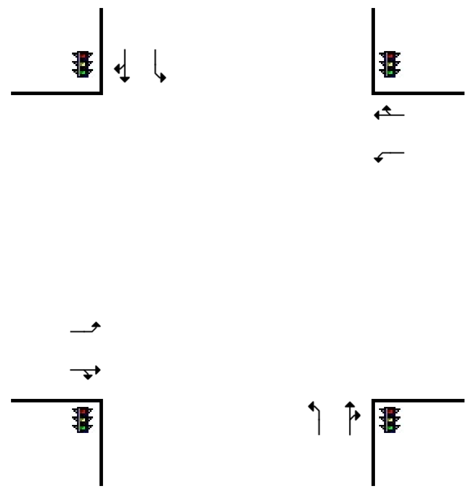
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

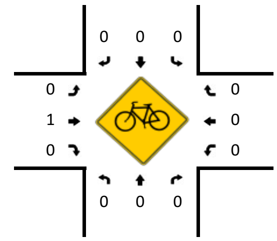


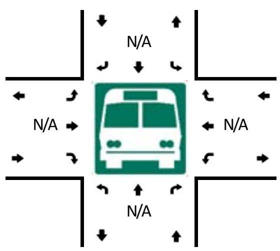


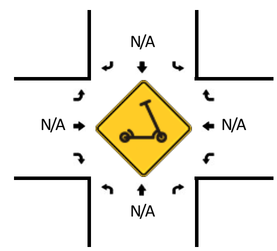
Quality Counts
DATA THAT DRIVES COMMUNITIES









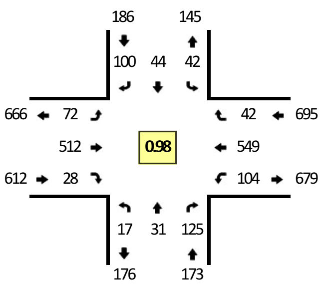


15-Min Count Period Beginning At	53611_S Gun Club Rd (Northbound)				53611_S Gun Club Rd (Southbound)				Monmouth St (Eastbound)				Monmouth St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	25	10	2	0	50	7	19	0	16	103	7	0	0	79	24	0	342	
2:15 PM	21	7	5	0	24	5	20	0	18	128	4	0	3	78	20	0	333	
2:30 PM	11	7	4	0	17	9	13	0	15	98	1	0	6	94	25	0	300	
2:45 PM	17	15	4	0	30	10	27	0	13	107	6	0	3	72	26	0	330	1305
3:00 PM	17	12	8	0	24	11	14	0	20	89	7	0	4	76	22	0	304	1267
3:15 PM	8	6	7	0	30	9	12	0	18	110	5	0	0	93	22	0	320	1254
3:30 PM	18	5	4	0	24	9	16	0	16	107	6	0	4	114	25	0	348	1302
3:45 PM	16	16	6	0	25	15	17	0	19	101	9	0	5	94	25	0	348	1320
4:00 PM	20	16	13	0	23	7	17	0	22	128	5	0	10	110	29	0	400	1416
4:15 PM	20	10	1	0	43	9	10	0	24	108	8	0	5	113	25	0	376	1472
4:30 PM	14	9	8	0	38	10	24	0	25	116	3	0	3	117	33	0	400	1524
4:45 PM	21	10	3	0	34	17	16	0	21	105	12	0	7	117	27	0	390	1566
5:00 PM	20	28	4	0	34	21	21	0	22	113	9	0	5	118	25	0	420	1586
5:15 PM	30	16	10	0	38	19	22	0	30	101	6	0	5	116	36	0	429	1639
5:30 PM	13	17	7	0	36	20	12	0	24	141	14	0	7	114	28	0	433	1672
5:45 PM	26	17	7	0	34	9	22	0	27	109	8	0	8	100	39	0	406	1688

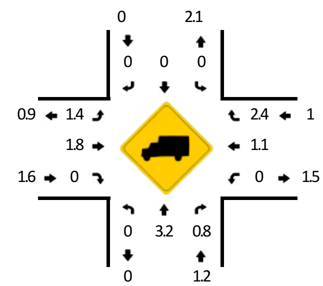
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	120	64	40	0	152	76	88	0	120	404	24	0	20	464	144	0	1716
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	8	0		8
Buses																	
Pedestrians		8				0				8				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

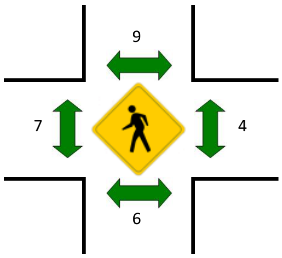
LOCATION: 53612_S 16th St -- Monmouth St
QC JOB #: 15176513
CITY/STATE: Independence, OR
DATE: Wed, Oct 16 2019

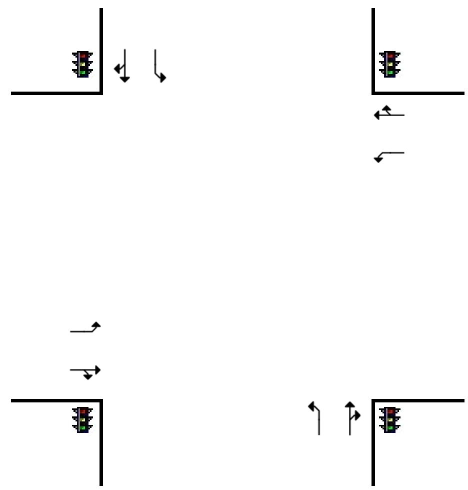


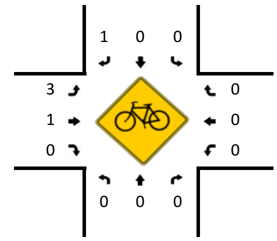
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:15 PM -- 5:30 PM

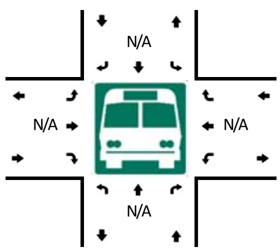


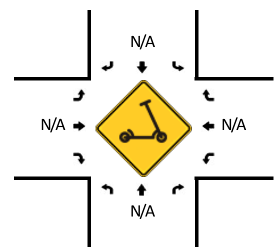
Quality Counts
DATA THAT DRIVES COMMUNITIES











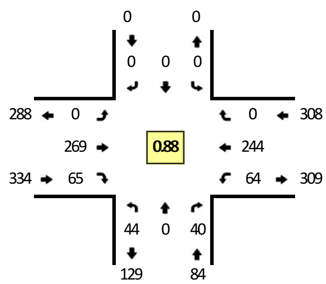
15-Min Count Period Beginning At	53612_S 16th St (Northbound)				53612_S 16th St (Southbound)				Monmouth St (Eastbound)				Monmouth St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	3	11	14	0	24	19	43	0	25	114	3	0	26	91	21	0	394	
2:15 PM	5	8	15	0	14	17	22	0	16	135	5	0	21	123	13	0	394	
2:30 PM	2	2	19	0	7	5	16	0	12	98	3	0	14	109	7	0	294	
2:45 PM	2	6	12	0	5	7	16	0	7	110	4	0	11	108	7	0	295	1377
3:00 PM	5	4	14	0	5	9	15	0	6	105	3	0	13	87	5	0	271	1254
3:15 PM	9	9	24	0	11	5	11	0	16	103	7	0	8	97	9	0	309	1169
3:30 PM	2	8	16	0	16	12	22	0	16	114	6	0	12	136	9	0	369	1244
3:45 PM	6	10	22	0	7	18	15	0	13	115	4	0	14	105	8	0	337	1286
4:00 PM	10	10	17	0	8	15	19	0	13	150	5	0	19	126	15	0	407	1422
4:15 PM	10	10	19	0	9	15	15	0	15	121	3	0	23	120	10	0	370	1483
4:30 PM	7	10	34	0	8	16	32	0	12	129	6	0	16	140	11	0	421	1535
4:45 PM	2	11	32	0	7	9	23	0	18	129	9	0	35	138	5	0	418	1616
5:00 PM	3	4	27	0	8	8	20	0	19	141	8	0	26	127	13	0	404	1613
5:15 PM	5	6	32	0	19	11	25	0	23	113	5	0	27	144	13	0	423	1666
5:30 PM	4	11	33	0	25	12	30	0	12	144	8	0	18	112	12	0	421	1666
5:45 PM	4	12	24	0	15	11	19	0	27	130	5	0	22	120	11	0	400	1648

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	20	24	128	0	76	44	100	0	92	452	20	0	108	576	52	0	1692
Heavy Trucks	0	0	0		0	0	0		4	0	0		0	0	4		8
Buses																	
Pedestrians		0				16				0				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

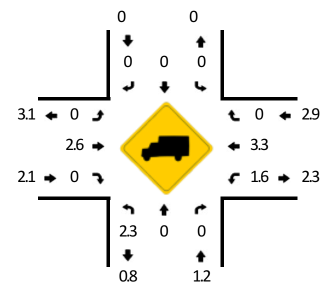
Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

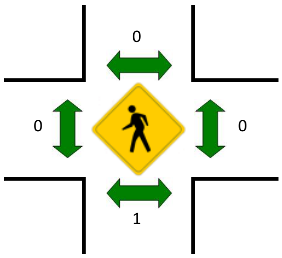
LOCATION: 53609_16th St N -- Hoffman Rd | **QC JOB #:** 15176510
CITY/STATE: Independence, OR | **DATE:** Wed, Oct 16 2019

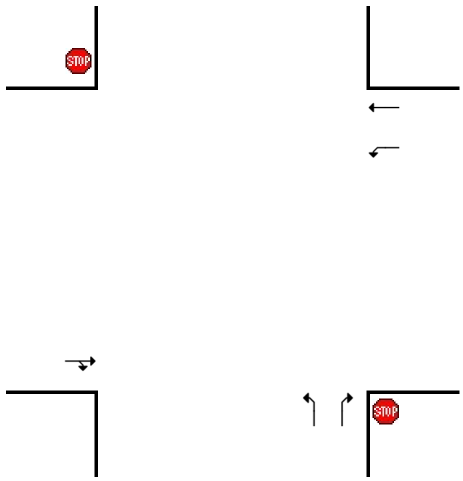


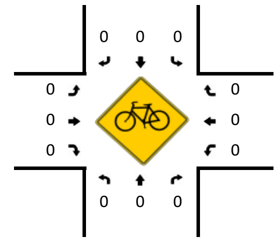
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

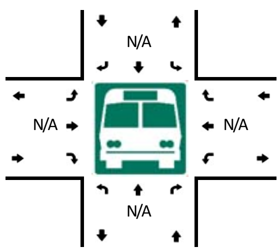
Quality Counts
DATA THAT DRIVES COMMUNITIES

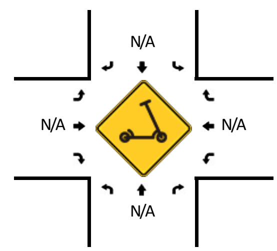












15-Min Count Period Beginning At	53609_16th St N (Northbound)				53609_16th St N (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	21	0	24	0	0	0	0	0	0	43	13	0	10	48	0	0	159	
2:15 PM	19	0	9	0	0	0	0	0	0	52	8	0	11	38	0	0	137	
2:30 PM	8	0	14	0	0	0	0	0	0	56	16	0	9	42	0	0	145	
2:45 PM	4	0	6	0	0	0	0	0	0	57	10	0	9	44	0	0	130	571
3:00 PM	3	0	12	0	0	0	0	0	0	59	9	0	11	45	0	0	139	551
3:15 PM	7	0	7	0	0	0	0	0	0	62	13	0	8	52	0	0	149	563
3:30 PM	10	0	15	0	0	0	0	0	0	51	13	0	11	56	0	0	156	574
3:45 PM	8	0	14	0	0	0	0	0	0	66	19	0	17	40	0	0	164	608
4:00 PM	10	0	18	0	0	0	0	0	0	56	14	0	22	73	0	0	193	662
4:15 PM	6	0	13	0	0	0	0	0	0	68	17	0	23	58	0	0	185	698
4:30 PM	12	0	14	0	0	0	0	0	0	73	14	0	19	74	0	0	206	748
4:45 PM	11	0	11	0	0	0	0	0	0	61	12	0	17	49	0	0	161	745
5:00 PM	7	0	4	0	0	0	0	0	0	63	16	0	14	68	0	0	172	724
5:15 PM	14	0	11	0	0	0	0	0	0	72	23	0	14	53	0	0	187	726
5:30 PM	23	0	17	0	0	0	0	0	0	78	13	0	19	62	0	0	212	732
5:45 PM	11	0	10	0	0	0	0	0	0	47	15	0	11	48	0	0	142	713

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	48	0	56	0	0	0	0	0	0	292	56	0	76	296	0	0	824
Heavy Trucks	4	0	0		0	0	0		0	8	0		0	4	0		16
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

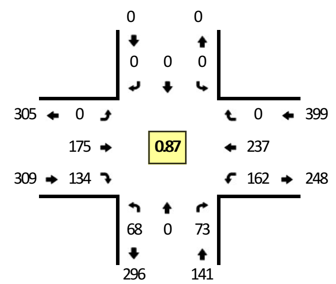
Comments:

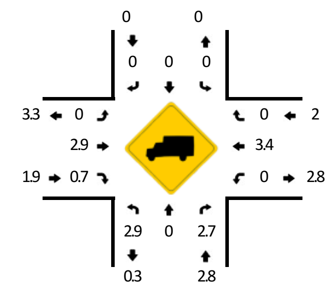
Report generated on 2/28/2020 12:53 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Type of peak hour being reported: User-Defined | Method for determining peak hour: Total Entering Volume

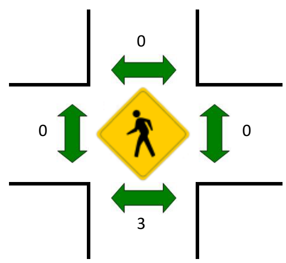
LOCATION: 53608_Gun Club Rd -- Hoffman Rd | **QC JOB #:** 15176509
CITY/STATE: Independence, OR | **DATE:** Wed, Oct 16 2019

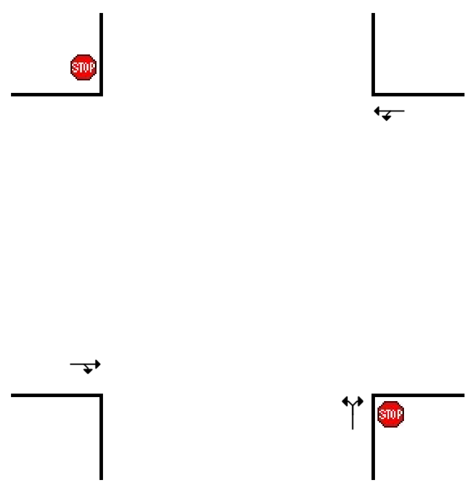
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

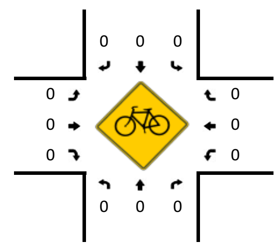


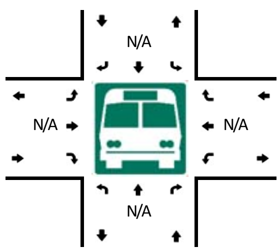


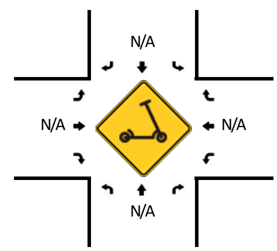
Quality Counts
DATA THAT DRIVES COMMUNITIES











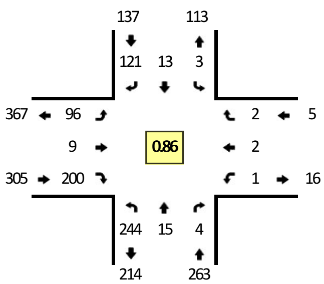
15-Min Count Period Beginning At	53608_Gun Club Rd (Northbound)				53608_Gun Club Rd (Southbound)				Hoffman Rd (Eastbound)				Hoffman Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	27	0	28	0	0	0	0	0	0	49	23	0	21	33	0	0	181	
2:15 PM	20	0	32	0	0	0	0	0	0	43	22	0	14	25	0	0	156	
2:30 PM	17	0	18	0	0	0	0	0	0	46	22	0	33	36	0	0	172	
2:45 PM	15	0	21	0	0	0	0	0	0	47	20	0	22	34	0	0	159	668
3:00 PM	23	0	23	0	0	0	0	0	0	48	23	0	24	38	0	0	179	666
3:15 PM	15	0	24	0	0	0	0	0	0	44	19	0	22	42	0	0	166	676
3:30 PM	19	0	19	0	0	0	0	0	0	44	21	0	29	54	0	0	186	690
3:45 PM	17	0	11	0	0	0	0	0	0	58	25	0	38	43	0	0	192	723
4:00 PM	20	0	27	0	0	0	0	0	0	51	25	0	41	73	0	0	237	781
4:15 PM	22	0	25	0	0	0	0	0	0	46	38	0	33	57	0	0	221	836
4:30 PM	20	0	17	0	0	0	0	0	0	50	33	0	46	79	0	0	245	895
4:45 PM	12	0	22	0	0	0	0	0	0	33	29	0	30	48	0	0	174	877
5:00 PM	21	0	17	0	0	0	0	0	0	38	43	0	41	60	0	0	220	860
5:15 PM	15	0	17	0	0	0	0	0	0	54	29	0	45	50	0	0	210	849
5:30 PM	17	0	33	0	0	0	0	0	0	47	33	0	41	60	0	0	231	835
5:45 PM	17	0	20	0	0	0	0	0	0	34	26	0	33	48	0	0	178	839

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	80	0	68	0	0	0	0	0	0	200	132	0	184	316	0	0	980
Heavy Trucks	0	0	4		0	0	0		0	4	4		0	4	0		16
Buses																	
Pedestrians		4				0				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

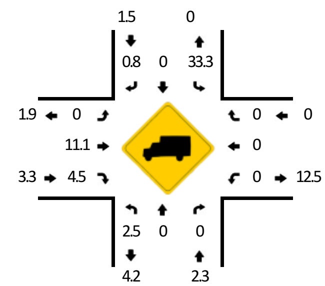
Report generated on 2/28/2020 12:53 PM | SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

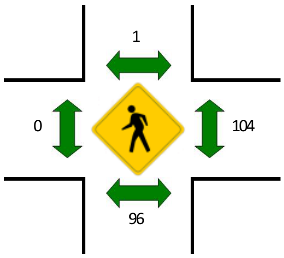
LOCATION: 53607_Stryker Rd -- Hoffman Rd/Polk St
QC JOB #: 15176508
CITY/STATE: Independence, OR
DATE: Wed, Oct 16 2019

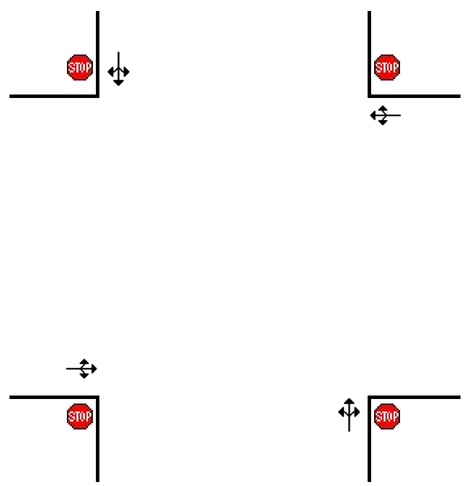


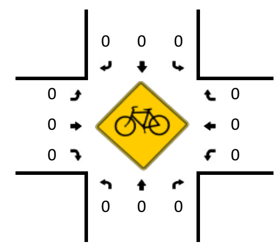
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

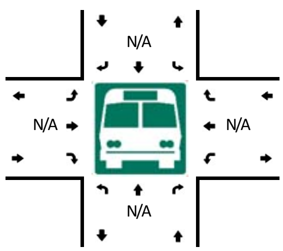
Quality Counts
DATA THAT DRIVES COMMUNITIES

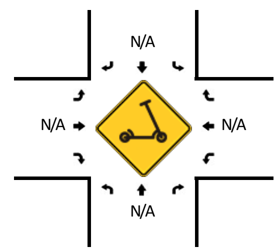












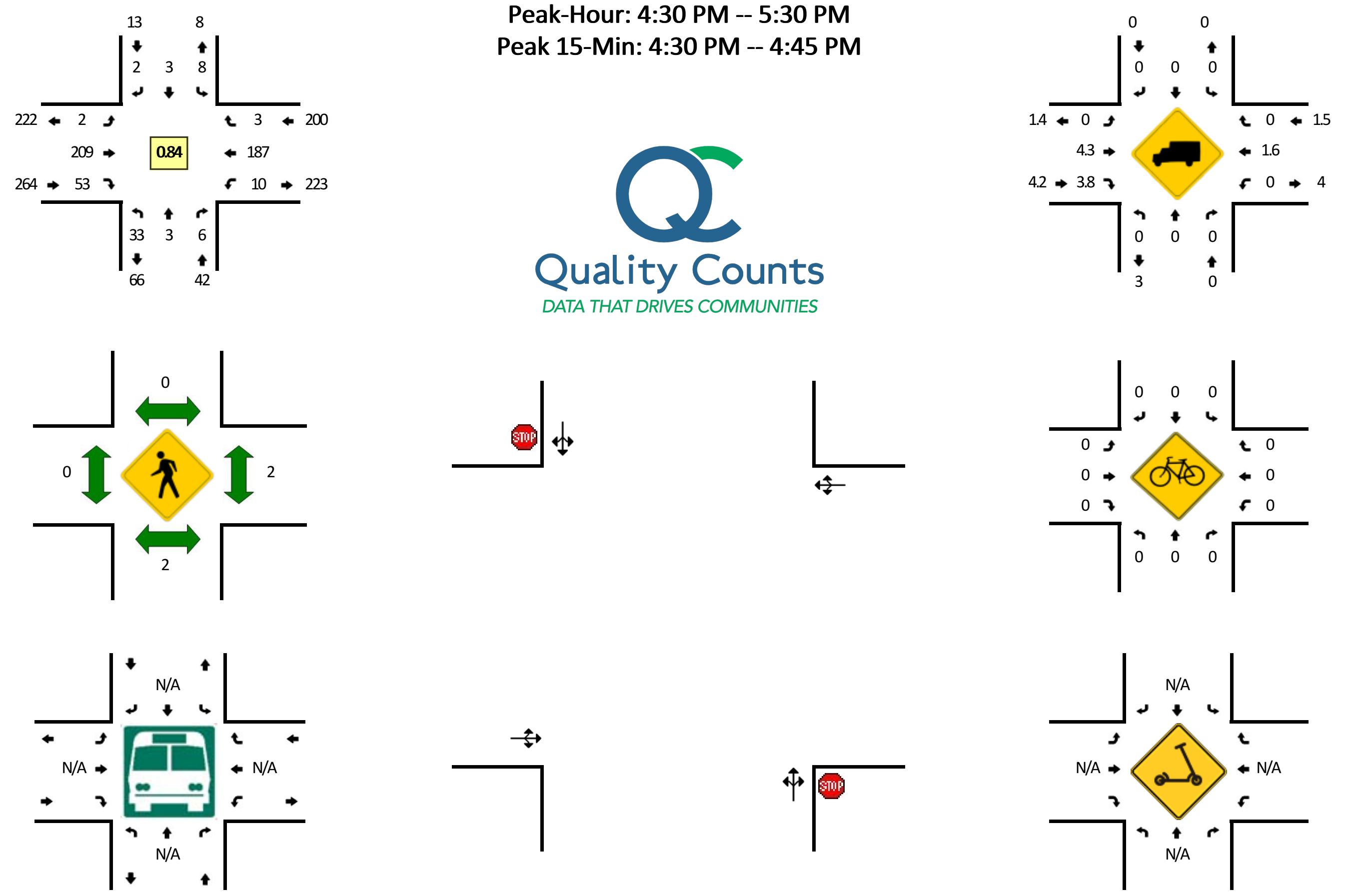
15-Min Count Period Beginning At	53607_Stryker Rd (Northbound)				53607_Stryker Rd (Southbound)				Hoffman Rd/Polk St (Eastbound)				Hoffman Rd/Polk St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	32	4	0	0	0	3	12	0	26	1	41	0	0	3	0	0	122	
2:15 PM	22	5	0	0	1	3	14	0	29	2	43	0	0	0	1	0	120	
2:30 PM	34	6	1	0	0	11	35	0	17	1	42	0	0	0	0	0	147	
2:45 PM	29	5	1	0	0	7	19	0	17	3	42	0	0	2	2	0	127	516
3:00 PM	45	2	1	0	1	6	16	0	29	3	37	0	0	0	4	0	144	538
3:15 PM	43	4	2	0	1	3	16	0	21	5	39	0	1	2	6	0	143	561
3:30 PM	53	4	1	0	1	4	25	0	24	0	52	0	0	1	0	0	165	579
3:45 PM	51	6	0	0	0	2	30	0	18	2	42	0	0	1	0	0	152	604
4:00 PM	68	5	0	0	0	3	27	0	33	0	62	0	0	0	2	0	200	660
4:15 PM	58	7	0	0	1	3	33	0	19	2	51	0	1	0	1	0	176	693
4:30 PM	60	1	0	0	1	3	26	0	35	0	81	0	0	0	0	0	207	735
4:45 PM	56	4	1	0	1	5	27	0	28	5	41	0	1	1	1	0	171	754
5:00 PM	69	8	2	0	0	2	32	0	9	3	28	0	0	1	1	0	155	709
5:15 PM	59	2	1	0	1	3	36	0	24	1	50	0	0	0	0	0	177	710
5:30 PM	62	5	0	0	0	2	32	0	30	0	51	0	0	1	1	0	184	687
5:45 PM	60	6	0	0	0	0	24	0	20	0	33	0	0	0	0	0	143	659

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	240	4	0	0	4	12	104	0	140	0	324	0	0	0	0	0	828
Heavy Trucks	0	0	0		0	0	4		0	0	12		0	0	0		16
Buses																	
Pedestrians		24				0				0				24			48
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

LOCATION: 53617_Ash St -- Polk St **QC JOB #:** 15176518
CITY/STATE: Independence, OR **DATE:** Wed, Oct 16 2019

Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

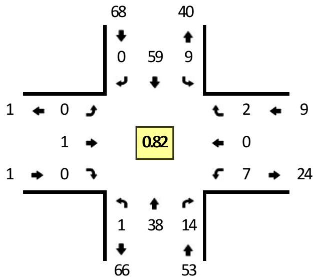


15-Min Count Period Beginning At	53617_Ash St (Northbound)				53617_Ash St (Southbound)				Polk St (Eastbound)				Polk St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	9	0	1	0	0	1	1	0	0	35	7	0	1	29	1	0	85	
2:15 PM	0	0	3	0	0	1	0	0	0	38	10	0	0	25	0	0	77	
2:30 PM	11	1	1	0	0	0	0	0	0	42	9	0	1	29	0	0	94	
2:45 PM	7	2	2	0	0	0	2	0	0	48	7	0	3	23	1	0	95	351
3:00 PM	9	1	1	0	2	0	2	0	0	41	7	0	3	38	1	0	105	371
3:15 PM	12	0	1	0	3	2	5	0	0	30	11	0	4	31	0	0	99	393
3:30 PM	6	0	1	0	0	0	3	0	0	55	6	0	1	43	0	0	115	414
3:45 PM	10	3	2	0	0	2	3	0	0	37	1	0	3	41	0	0	102	421
4:00 PM	13	1	4	0	4	6	12	0	0	61	10	0	6	44	1	0	162	478
4:15 PM	9	0	0	0	3	0	4	0	0	44	11	0	3	52	1	0	127	506
4:30 PM	7	0	2	0	1	0	0	0	0	70	18	0	4	51	1	0	154	545
4:45 PM	8	3	1	0	3	2	2	0	1	42	9	0	4	42	2	0	119	562
5:00 PM	10	0	1	0	2	1	0	0	1	55	12	0	2	43	0	0	127	527
5:15 PM	8	0	2	0	2	0	0	0	0	42	14	0	0	51	0	0	119	519
5:30 PM	9	0	1	0	0	0	0	0	0	47	8	0	4	53	0	0	122	487
5:45 PM	9	0	3	0	0	0	1	0	0	25	4	0	0	54	0	0	96	464

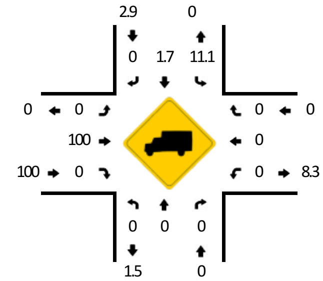
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	28	0	8	0	4	0	0	0	0	280	72	0	16	204	4	0	616
Heavy Trucks	0	0	0		0	0	0		0	12	0		0	0	0		12
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

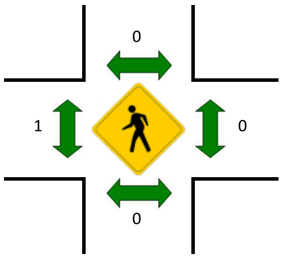
Comments:

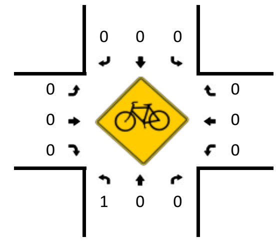
LOCATION: 53615_Ash St -- Williams St | **QC JOB #:** 15176516
CITY/STATE: Independence, OR | **DATE:** Wed, Oct 16 2019

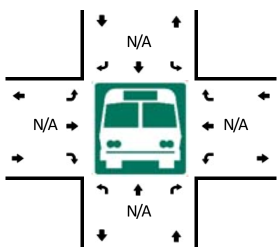


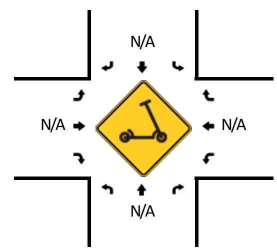
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM









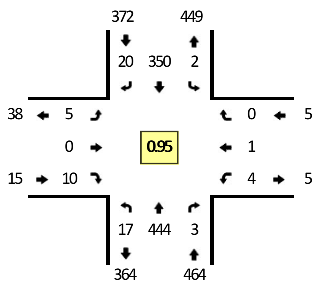


15-Min Count Period Beginning At	53615_Ash St (Northbound)				53615_Ash St (Southbound)				Williams St (Eastbound)				Williams St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	8	1	0	0	10	0	0	0	0	0	0	2	0	1	0	22	
2:15 PM	0	3	4	0	2	9	0	0	0	0	0	0	2	0	0	0	20	
2:30 PM	0	11	3	0	1	9	0	0	0	0	0	0	2	0	1	0	27	
2:45 PM	0	11	2	0	0	9	0	0	0	0	0	0	2	0	3	0	27	96
3:00 PM	0	7	3	0	0	10	0	0	0	0	0	0	0	1	0	0	21	95
3:15 PM	0	13	0	0	0	17	0	0	0	0	0	0	1	0	1	0	32	107
3:30 PM	0	6	2	0	2	3	0	0	0	1	0	0	0	0	1	0	15	95
3:45 PM	0	16	4	0	0	9	0	0	0	0	0	0	0	0	2	0	31	99
4:00 PM	0	14	3	0	1	21	0	0	0	0	0	0	5	0	2	0	46	124
4:15 PM	0	5	1	0	2	12	0	0	0	0	0	0	5	0	2	0	27	119
4:30 PM	1	7	4	0	4	20	0	0	0	0	0	0	3	0	1	0	40	144
4:45 PM	0	13	8	0	1	13	0	0	0	1	0	0	1	0	0	0	37	150
5:00 PM	0	11	1	0	2	15	0	0	0	0	0	0	2	0	0	0	31	135
5:15 PM	0	7	1	0	2	11	0	0	0	0	0	0	1	0	1	0	23	131
5:30 PM	0	9	3	0	1	13	0	0	0	0	0	0	2	0	2	0	30	121
5:45 PM	0	7	4	0	0	8	0	0	0	0	0	0	1	0	1	0	21	105

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	28	16	0	16	80	0	0	0	0	0	0	12	0	4	0	160
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

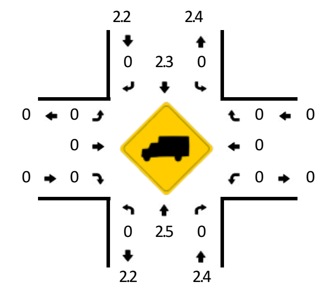
Comments:

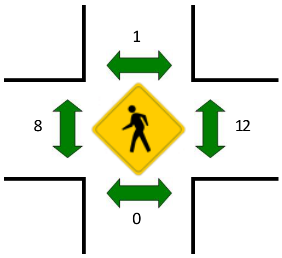
LOCATION: 53602_Main St -- D St
QC JOB #: 15176503
CITY/STATE: Independence, OR
DATE: Tue, Oct 15 2019

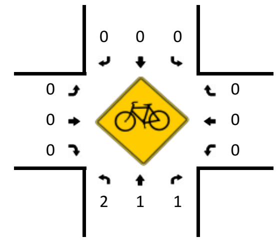


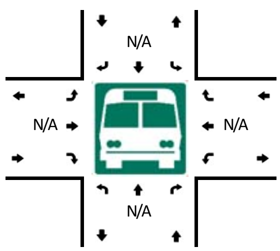
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

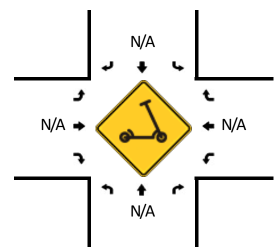
Quality Counts
DATA THAT DRIVES COMMUNITIES









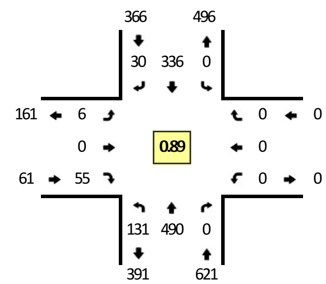


15-Min Count Period Beginning At	53602_Main St (Northbound)				53602_Main St (Southbound)				D St (Eastbound)				D St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	3	58	1	0	0	61	3	0	1	0	3	0	0	0	1	0	131	
2:15 PM	1	74	0	0	0	62	4	0	1	0	3	0	4	1	2	0	152	
2:30 PM	2	61	2	0	1	56	4	0	2	0	3	0	1	1	1	0	134	
2:45 PM	3	83	0	0	0	61	2	0	1	0	2	0	2	0	1	0	155	572
3:00 PM	2	80	1	0	2	81	1	0	0	0	3	0	1	0	1	0	172	613
3:15 PM	2	79	3	0	0	65	3	0	1	1	2	0	1	0	0	0	157	618
3:30 PM	1	68	0	0	0	99	3	0	4	0	3	0	1	0	1	0	180	664
3:45 PM	5	97	0	0	0	72	7	0	3	0	2	0	0	4	2	0	192	701
4:00 PM	4	99	3	0	0	102	5	0	2	1	4	0	0	0	1	0	221	750
4:15 PM	2	97	1	0	0	94	3	0	2	0	3	0	0	0	1	0	203	796
4:30 PM	2	123	1	0	0	87	5	0	0	0	5	0	1	1	0	0	225	841
4:45 PM	3	103	1	0	2	78	3	0	0	0	1	0	1	0	0	0	192	841
5:00 PM	3	107	0	0	0	93	7	0	2	0	0	0	2	0	0	0	214	834
5:15 PM	9	111	1	0	0	92	5	0	3	0	4	0	0	0	0	0	225	856
5:30 PM	8	121	3	0	1	80	2	0	0	0	1	0	0	0	0	0	216	847
5:45 PM	5	99	1	0	0	77	5	0	1	0	0	0	1	0	0	0	189	844

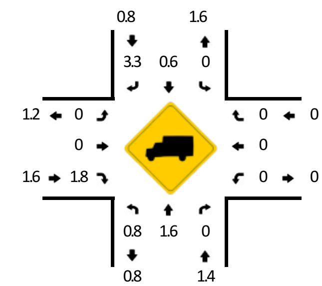
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	492	4	0	0	348	20	0	0	0	20	0	4	4	0	0	900
Heavy Trucks	0	16	0		0	12	0		0	0	0		0	0	0		28
Buses																	
Pedestrians		0				4				8				8			20
Bicycles	0	0	4		0	0	0		0	0	0		0	0	0		4
Scooters																	

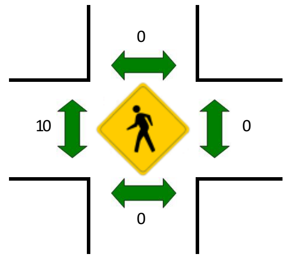
Comments:

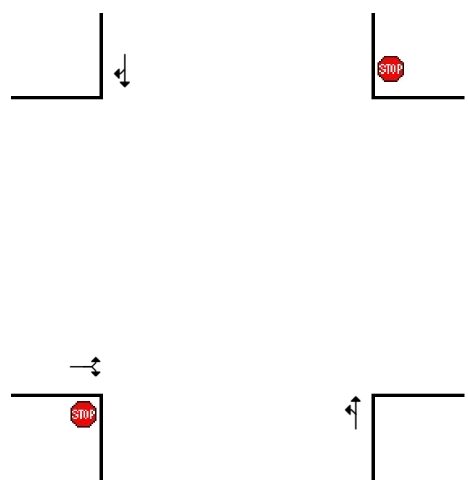
LOCATION: 53603_Main St -- G St **QC JOB #:** 15176504
CITY/STATE: Independence, OR **DATE:** Tue, Oct 15 2019

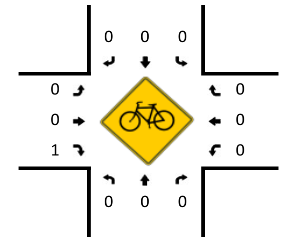


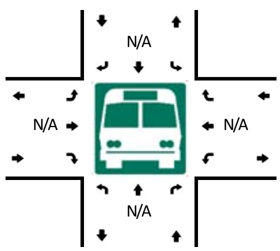
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 4:30 PM -- 4:45 PM

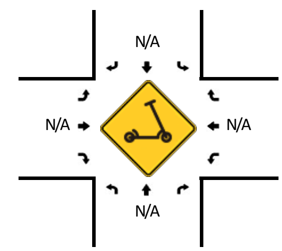












15-Min Count Period Beginning At	53603_Main St (Northbound)				53603_Main St (Southbound)				G St (Eastbound)				G St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	6	59	0	0	0	70	1	0	0	0	11	0	0	0	0	0	147	
2:15 PM	7	71	0	0	0	67	3	0	5	0	7	0	0	0	0	0	160	
2:30 PM	10	63	0	0	0	51	5	0	2	0	6	0	0	0	0	0	137	
2:45 PM	10	85	0	0	0	59	6	0	2	0	15	0	0	0	0	0	177	621
3:00 PM	9	71	0	0	0	87	4	0	1	0	8	0	0	0	0	0	180	654
3:15 PM	8	76	0	0	0	61	0	0	3	0	7	0	0	0	0	0	155	649
3:30 PM	19	76	0	0	0	107	6	0	3	0	14	0	0	0	0	0	225	737
3:45 PM	11	100	0	0	0	73	6	0	2	0	9	0	0	0	0	0	201	761
4:00 PM	14	105	0	0	0	109	7	0	1	0	14	0	0	0	0	0	250	831
4:15 PM	24	107	0	0	0	99	4	0	2	0	16	0	0	0	0	0	252	928
4:30 PM	38	148	0	0	0	76	12	0	2	0	19	0	0	0	0	0	295	998
4:45 PM	32	94	0	0	0	72	6	0	2	0	8	0	0	0	0	0	214	1011
5:00 PM	37	105	0	0	0	95	6	0	2	0	12	0	0	0	0	0	257	1018
5:15 PM	24	143	0	0	0	93	6	0	0	0	16	0	0	0	0	0	282	1048
5:30 PM	27	142	0	0	0	78	10	0	2	0	15	0	0	0	0	0	274	1027
5:45 PM	27	102	0	0	0	67	11	0	0	0	8	0	0	0	0	0	215	1028

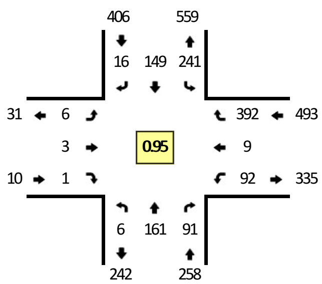
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	152	592	0	0	0	304	48	0	8	0	76	0	0	0	0	0	1180
Heavy Trucks	4	12	0		0	0	4		0	0	0		0	0	0		20
Buses																	
Pedestrians		0				0				16				0			16
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

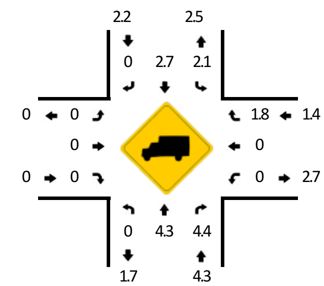
Comments:

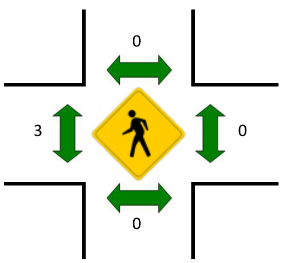
Report generated on 2/28/2020 12:53 PM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

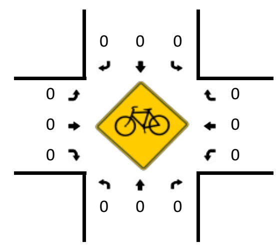
LOCATION: 53604_Main St -- River Rd/I St **QC JOB #:** 15176505
CITY/STATE: Independence, OR **DATE:** Wed, Oct 16 2019

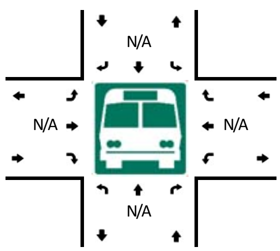
Peak-Hour: 4:30 PM -- 5:30 PM
Peak 15-Min: 5:00 PM -- 5:15 PM

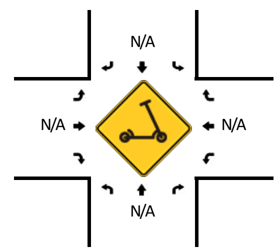












15-Min Count Period Beginning At	53604_Main St (Northbound)				53604_Main St (Southbound)				River Rd/I St (Eastbound)				River Rd/I St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
2:00 PM	0	27	10	0	55	21	3	0	2	1	0	0	7	0	41	0	167	
2:15 PM	0	27	7	0	58	34	6	0	2	0	0	0	8	0	47	0	189	
2:30 PM	0	25	12	0	36	29	4	0	1	1	0	0	12	1	50	0	171	
2:45 PM	0	19	12	0	48	19	7	0	0	1	0	0	9	0	52	0	167	694
3:00 PM	0	20	9	0	51	28	0	0	1	1	0	0	11	0	61	0	182	709
3:15 PM	0	38	11	0	40	27	2	0	0	1	0	0	8	0	58	0	185	705
3:30 PM	0	34	8	0	45	16	1	0	2	0	0	0	14	0	64	0	184	718
3:45 PM	0	27	16	0	50	27	1	0	1	0	0	0	9	0	73	0	204	755
4:00 PM	0	45	15	0	70	29	3	0	0	0	1	0	20	2	70	0	255	828
4:15 PM	0	25	20	0	68	31	3	0	0	1	0	0	24	0	111	0	283	926
4:30 PM	1	42	22	0	62	36	4	0	2	2	0	0	18	3	89	0	281	1023
4:45 PM	0	47	21	0	56	34	2	0	2	1	0	0	17	0	109	0	289	1108
5:00 PM	3	38	27	0	63	37	6	0	1	0	1	0	28	4	98	0	306	1159
5:15 PM	2	34	21	0	60	42	4	0	1	0	0	0	29	2	96	0	291	1167
5:30 PM	0	35	15	0	75	29	6	0	1	1	1	0	21	1	127	0	312	1198
5:45 PM	0	38	12	0	38	39	4	0	2	1	0	0	16	3	87	0	240	1149

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	12	152	108	0	252	148	24	0	4	0	4	0	112	16	392	0	1224
Heavy Trucks	0	4	0		0	0	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 2/28/2020 12:53 PM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Attachment I Implementing Ordinances and Findings

MEMORANDUM

Task 6.7: Adoption Draft Implementing Amendments (FINAL)

Independence Transportation System Plan Update

DATE	July 30, 2021
TO	Fred Evander, City of Independence Michael Duncan, Oregon Department of Transportation Project Advisory Committee and Technical Advisory Committee members
FROM	Emma Porricolo and Matt Hastie, Angelo Planning Group (APG)
CC	Matt Bell, Kittelson & Associates, Inc.

The purpose of this memorandum is to provide final adoption draft amendments to the Independence Comprehensive Plan and Independence Development Code (IDC) to meet the objectives of the Transportation System Plan (TSP) update, as well as the requirements of the Transportation Planning Rule (OAR 660, Division 12). Proposed amendments to the Comprehensive Plan are needed to reference updated policies in the TSP and indicate that the TSP represents the transportation element of the Comprehensive Plan. This memo reflects comments received from City and ODOT staff and members of the project's Citizens Advisory Committee (CAC) and Technical Advisory Committee (TAC), as well as the Independence Planning Commission and City Council.

Proposed amendments to the IDC are broken into two categories: TPR compliance or additional transportation updates. The TPR compliance recommendations were identified as part of an earlier assessment of consistency with the TPR. The additional amendments have been identified through conversations with the consulting team and City staff as an outgrowth of specific TSP recommendations and/or transportation-related code issues noted over time by City staff.

The amendments are summarized in Table 1 below.

Table 1. Summary of Implementing Amendments

	Recommendation	IDC Code Reference
TRANSPORTATION PLANNING RULE COMPLIANCE		
1.	**Transportation Facilities, Services, and Improvements as Permitted Uses** **Recommendation:** Uses authorized in individual zones of the IDC should be updated to include "Transportation Facilities; includes construction, operation, and maintenance of facilities located within right-of-way	17, 30, 40.010, 41.010, 42.010, 50.010, 53.015, 76.030

	Recommendation	IDC Code Reference
	controlled by a public agency (e.g., water, sanitary sewer, gas, oil, electric and communication lines, stormwater facilities, and pump stations) consistent with Independence Transportation System Plan," as uses that are permitted outright, subject to the general development standards of the IDC.	
2.	Consolidated Review for A Single Development Project **Recommendation:** The IDC Administrative Provisions should be updated to allow all development permits and land use actions processed under the City's administrative procedures to be consolidated for a single development project.	11.015
3.	On-Site Pedestrian Connections **Recommendation:** The City should consider strengthening connectivity and circulation standards to encourage on-site pedestrian connections between buildings and to cluster buildings where feasible.	33.030
4.	Multi-family Development Connectivity and Circulation Standards **Recommendation:** Strengthen pedestrian connectivity and circulation standards that apply to multi-family development.	21.065, 22.065, 23.065
ADDITIONAL TRANSPORTATION UPDATES		
5.	Arterial and Collector Walkability **Recommendation:** Adopt provisions explicitly allowing alleys for all residential development. Amend fence height provisions and establish a minimum fence setback and potentially reduce the allowable maximum height for rear fences that abut collectors or arterials.	90.90.10, 74.020(A)(1)(a)
6.	Street Cross-Section Standards **Recommendation:** Remove street cross-section standards from the IDC. Instead reference the appropriate section of the TSP or the City's Public Works Design Standards for the street cross-section standards.	90.90.010
7.	Access Spacing Standards **Recommendation:** Remove access management standards from the IDC. Instead, reference the appropriate section of the TSP or the City's Public Works Design Standards for the access management standards.	90.90.010(V)
8.	Parking Requirements **Recommendation:** Amend the IDC parking standards to be consistent with the Model Code for Small Cities, resolving the discrepancies noted in Table 2.	73.010
9.	Parking Requirements for Infill Residential Development **Recommendation:** Exempt conversions from single family detached housing to middle housing (duplexes, triplexes, fourplexes) from the provisions of IDC Subsection 75.025.	75.025

COMPREHENSIVE PLAN AMENDMENTS

As part of this planning process, Angelo Planning Group (APG) have reviewed existing Comprehensive Plan policies for consistency with the TSP and also have considered different options for how to continue to ensure consistency between the two documents over the long term. In general, we recommend that policies related to transportation be included in just one document to avoid confusion between multiple and potentially different policies in two different documents and to avoid the need to update both documents in the future if policy amendments are needed. We suggest that same approach for Independence and recommend that the Comprehensive Plan be updated to reference the TSP as the Transportation Element of the Comprehensive Plan, with transportation policies found in the TSP. The existing transportation policies in the Comprehensive Plan should be replaced with the following statement:

The City of Independence Transportation Plan (TSP) serves as the transportation elements of the Comprehensive Plan. All policies related to Transportation are found in Chapter 2 of the TSP.

CODE AMENDMENTS

A. TRANSPORTATION PLANNING RULE COMPLIANCE

Oregon's Transportation Planning Rule (OAR 660, Division 12) (TPR) requires local governments to implement a TSP through local land use regulations. To help the City of Independence meet TPR requirements, APG has conducted an audit of TPR requirements and the Independence Development Code The results of the TPR audit are described below, along with recommended changes to the Independence Development Code. Where changes are suggested, specific language or other information is provided.

1. Transportation Facilities, Services, and Improvements as Permitted Uses

The IDC does not list the transportation facilities, services, and improvements in -0045(1)(a) as uses that are permitted outright, subject to standards.

> **Recommendation**: Uses authorized in individual zones of the IDC should be updated to include "Transportation Facilities. These facilities include construction, operation, and maintenance of facilities located within right-of-way controlled by a public agency (e.g., water, sanitary sewer, gas, oil, electric and communication lines, stormwater facilities, and pump stations) consistent with Independence Transportation System Plan," as uses that are permitted outright, subject to the general development standards of the IDC.

Proposed Code Amendments:

SUBCHAPTER 17: ALLOWED USES IN RESIDENTIAL ZONES

Allowed Uses	***Zone***			
	RS	***RM***	***RH***	***MX***
RESIDENTIAL USES				
…				
PUBLIC/QUASI-PUBLIC USE				
Structure or facility necessary for the City or for a public utility to provide service ~~to the neighborhood in which it is located~~ within the City. Such structures shall include, but not be limited to: construction, operation, maintenance or repair of electric service meters, lines, transformers, and poles; natural gas lines; telephone lines and poles; water and sewer lines; streets, pathways and sidewalks~~;~~ ~~and~~, including any project~~s~~ identified in the Transportation System Plan.	*P*	*P*	*P*	*P*

SUBCHAPTER 30: ALLOWED USES IN COMMERCIAL ZONES

ALLOWED USES	***ZONE***	
	MUPC	***DRZ***
MANUFACTURING/INDUSTRIAL USES		
…		
PUBLIC/QUASI-PUBLIC USE		
Structure or facility necessary for the City or for a public utility to provide service ~~to the neighborhood in which it is located~~ within the City. Such structures shall include, but not be limited to: construction, operation, maintenance or repair of electric service meters, lines, transformers, and poles; natural gas lines; telephone lines and poles; water and sewer lines; streets, pathways and sidewalks~~; and~~, including any project~~s~~ identified in the Transportation System Plan.	*P*	*P*
…		

SUBCHAPTER 37: ALLOWED USES IN INDUSTRIAL ZONES

ALLOWED USES	***ZONE***		
	IL	***IH***	***IP***
GENERAL USES			
…			
PUBLIC ~~IMPROVEMENTS~~/QUASI-PUBLIC USE			
~~Streets and sidewalks~~	*~~P~~*	*~~P~~*	*~~P~~*
~~Projects identified in the Transportation System Plan~~	*~~P~~*	*~~P~~*	*~~P~~*
Structure or facility necessary for the City or for a public utility to provide service within the City. Such structures shall include, but not be limited to: construction, operation, maintenance or repair of electric service meters, lines, transformers, and poles; natural gas lines; telephone lines and poles; water and sewer lines; streets, pathways and sidewalks, including any projects identified in the Transportation System Plan.	*P*	*P*	*P*

SUBCHAPTER 50: PUBLIC SERVICES (PS) ZONE

50.010 Permitted Uses

Within any PS zone, no structure shall be used, constructed, erected, or altered and no lot shall be used or occupied for any purposes except the following:

> *….*
>
> *E. Municipal or government service structure or use, including, but not limited to construction, operation, maintenance or repair of electric service meters, lines, transformers, and poles; natural gas lines; telephone lines and poles; water and sewer lines; fire stations; streets, pathways and sidewalks, including any projects identified in the Transportation System Plan~~a reservoir, water tower, pump station, bus terminal or station, transformer station or sub-station~~*
>
> *….*
>
> *~~P. Projects identified in the Transportation System Plan~~,*

SUBCHAPTER 53: AGRICULTURE (AG) ZONE

53.015 Permitted Uses

Within any Agriculture Zone, no building, structure or land shall be used, and no building or structure shall be hereafter erected, structurally altered, enlarged, or maintained, except for the following uses:

> *….*
>
> *C. Utility facilities necessary for public service, including, but not limited to construction, operation, maintenance or repair of electric service meters, lines, transformers, and poles; natural gas lines; telephone lines and poles; water and sewer lines; streets, pathways and sidewalks, including any projects identified in the Transportation; and ~~except~~ not including commercial facilities for the purpose of generating power for public use by sale.*

….

SUBCHAPTER 76: AIRPORT DEVELOPMENT DISTRICT

76.030 Permitted Uses

N. Roadways, <u>transportation facilities located within the right-of-way controlled by a public agency,</u> parking areas and storage yards located in such a manner that vehicle lights will not make it difficult for pilots to distinguish between landing lights and vehicle lights, or result in glare, or in any other way impair visibility in the vicinity of the land approach.

2. Consolidated Review for A Single Development Project

The TPR requires local governments to allow for consolidated review of land use decisions to permit transportation facility projects. In Independence, only multiple quasi-judicial land use action can have consolidated review (per IDC 11.15(E)(7)). However, certain transportation-related projects may fall under other types of land use reviews or actions, such as ministerial review (Type I) or legislative review (Type IV).

> **Recommendation:** The IDC Administrative Provisions should be updated to allow all development permits and land use actions processed under the City's administrative procedures to be consolidated for a single development project.

Proposed Code Amendments:

11.015 General Provisions

<u>D. Consolidated Review of Applications. When an applicant applies for more than one type of land use action for the same one or more contiguous parcels of land, the proceedings shall be consolidated for review and decision. When proceedings are consolidated, required notices may be consolidated, provided the notice shall identify each application to be decided. When more than one land use action is reviewed in a hearing, separate findings and decisions shall be made on each land use action.</u>

<u>E.</u> ~~D.~~ Ministerial Actions – Type I. This subsection establishes…

<u>F.</u> ~~E.~~ Quasi-Judicial Actions. This subsection establishes the procedures to be followed in Type II and Type III land use actions…

~~7. Combination of Review Procedures: Applications for more than one quasi-judicial land use action for the same property may, at the applicant's discretion, be combined and heard or reviewed concurrently. Applications so combined will be heard at the higher level decision authority.~~

…

[Modify numbering of subsequent subsections and provisions.]

3. On-Site Pedestrian Connectivity and Circulation Connections

In OAR 660-012-0045(3)(b), the TPR requires provisions for internal pedestrian circulation requirements for new office parks and commercial development through clustering of buildings, construction of accessways, walkways and similar techniques. Section 33.030(F) and 33.040(I) provide development standards for the Mixed Use Pedestrian-Friendly Commercial (MUPC) and Downtown Riverfront Zone respectively. They require pedestrian connections between the building and the sidewalk, but do not specify standards or guidelines for clustering buildings and making pedestrian connections between other on-site buildings.

For residential development, some building orientation and connectivity requirements promoting pedestrian circulation are found in IDC Section 19.005(E). This section requires the primary pedestrian entrance(s) to connect to the sidewalk via a straight path that is a minimum of 5 feet wide. However, those provisions could be strengthened for residential development, particularly multi-family development and Planned Unit Developments (PUDs).

PUDs require residential development to meet all applicable land use and development standards, which includes the proposed on-site pedestrian circulation standards for multifamily development.

Currently, these types of standards are found within each base zone subchapter where they exist. The following proposed amendments are recommended to be included in Subchapter 73 (Parking) and apply to all developments with more than 10 parking spaces located in most of the City's zones

> **Recommendation:** Strengthen pedestrian connectivity and circulation standards that apply to commercial, multi-family and other non-industrial development.

Proposed Code Amendments:

SUBCHAPTER 73: PARKING

73.020 General Requirements for Parking and Loading Areas

…

K. Off-street parking areas shall be landscaped in accordance with the requirements found in Subchapter 54 (Buffering, Screening, Landscape and Ash Creek Setback Requirements) <u>and/or the requirements of the underlying zone</u>.

<u>L. Internal Pedestrian Connections</u>. <u>Internal pedestrian connections shall be provided in parking lots with greater than ten (10) spaces, the following standards shall apply:</u>

- *<u>a.</u> <u>A continuous pedestrian walkway system shall extend throughout the development site and connect to adjacent sidewalks, if any, and to all future phases of the development, as applicable.</u>*
- *<u>b.</u> <u>Walkways shall be reasonably direct between pedestrian destinations and minimize crossings where vehicles operate.</u>*

c. *The pedestrian connections shall be a minimum of six (6) feet wide and distinguished from vehicular areas through changes in elevation or materials.*

d. *The Americans with Disabilities Act (ADA) contains different and stricter standards for some walkways. The ADA applies to the walkway that is the primary building entrance and walkways that connect transit stops and parking areas to building entrances. Where the ADA applies to a walkway, the stricter standards of ADA shall apply.*

~~L~~M. Vehicle parking spaces used for curb side pick-up shall be located off street, shall be clearly marked, and shall be in addition to the minimum vehicle parking spaces required for the associated use(s) based on the standards in IDC Section 73.010.

…

B. ADDITIONAL TRANSPORTATION UPDATES

4. Arterial and Collector Walkability

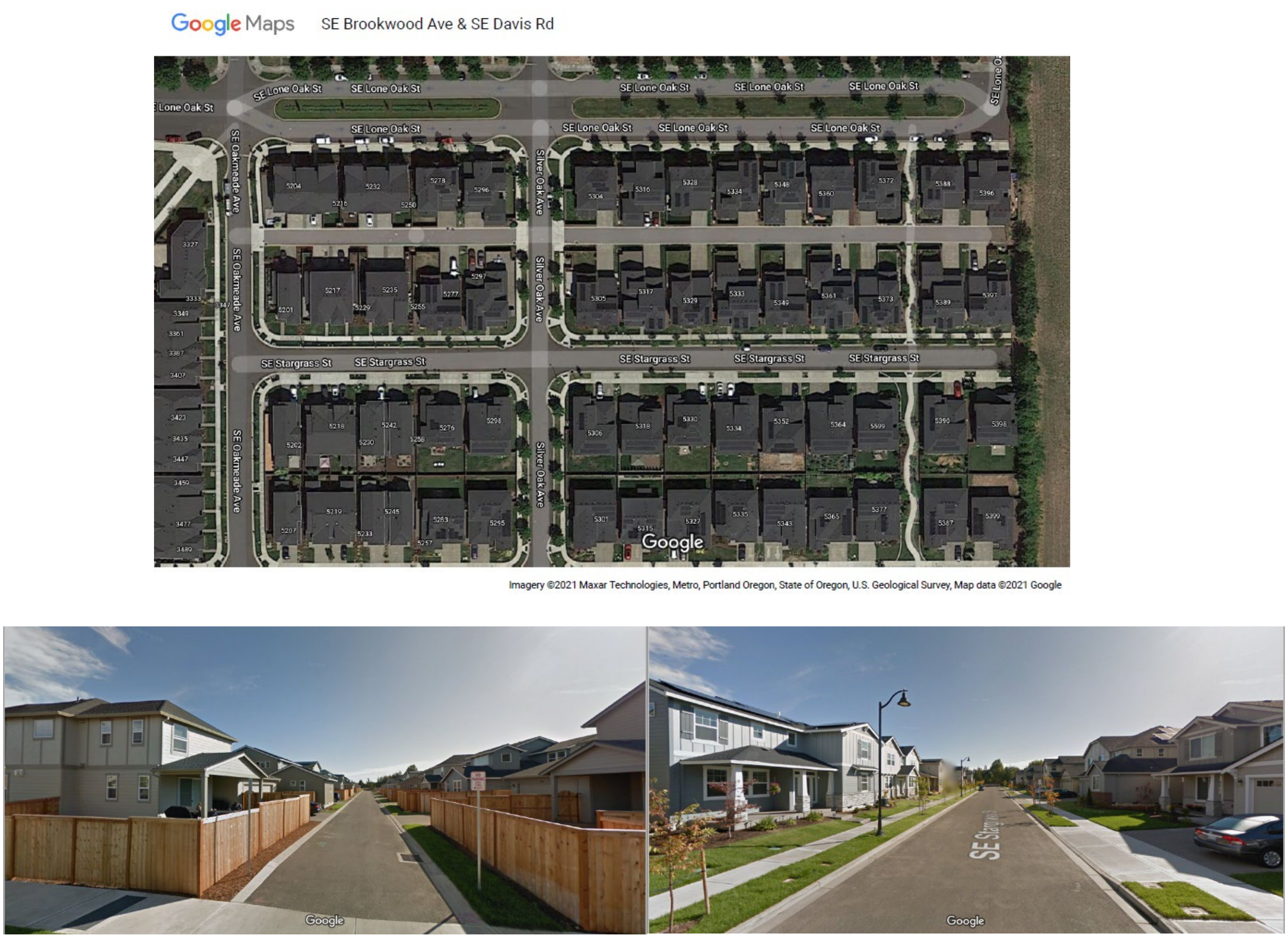
Generally, development standards require vehicular access from the lowest functional class street (e.g., local streets) when a development abuts multiple streets. However, a result of those provisions is that rear yards and fencing facing arterial or collector streets often create an uninviting pedestrian environment on the streets that are intended to connect pedestrians to local destinations (e.g., schools, downtown, parks, etc.). In Independence, examples of this can be seen along Hoffman Rd. (see Figure 1).

Figure 1. Example of Unfavorable Pedestrian Environment along Hoffman Rd.

There are various approaches to mitigating this issue, including:

- *Permit double-loaded alleys*. Double loaded alleys – an alley that has accesses on both sides of the corridor (see Figure 2) - is a way to mitigate the issue without conflicting with access standards. Alleys are permitted in Independence. Where alleys are permitted, there are no provisions that prohibit double-loaded alleys. However, the Residential Design Standards are vague on permitting alleys for all residential development. IDC Subsection 90.90.010(R) subdivision standards require alleys for certain commercial and industrial development. IDC Subsection 19.020(A)(2) permits alleys for duplexes, rowhouses, and townhouses; and for garage access for corner lot development. Both sections fail to address the ability to provide alleys and do not include requirements for alley-accessed development for other types of residential development. To encourage alley development when abutting collectors or arterials, the City should permit alleys more broadly for all residential development.

Figure 2. Example of a Double-loaded Alley in Hillsboro, OR (Source: Google)



- *Ensure building and entry orientations don't prohibit homes from facing arterials or collectors*. Building entry orientation standards found in IDC Subsection 19.005(E) do not prohibit alley access and have options for where entrances can face the street when an alley is a part of the development.
- *Reduce rear fence setback requirements.* The IDC does not establish rear fence setback standards, except for fences abutting Ash Creek. The City can adopt a minimum fence setback for rear fences to ensure there is some space between the fencing and the sidewalk, providing some additional green space for pedestrian comfort. In the RS, RM, and MX zones, rear fences must not exceed 7 feet in height. However, front yard setbacks are required to be 3.5 feet or less and non-sight-obscuring. The City can adopt specific provisions for rear fences abutting arterial or collector streets. Establishing a lower maximum height requirement will improve walkability and pedestrian safety by encouraging the "eyes on the street" principal. Additionally, a minimum fence setback can create more green space next to the sidewalks, creating a more comfortable pedestrian environment and reducing the potential a tunnel-like environment.

Recommendation: Adopt provisions explicitly allowing alleys for all residential development. Amend fence height provisions and establish a minimum fence setback for rear fences that abut collectors or arterials.

SUBCHAPTER 19: RESIDENTIAL DESIGN STANDARDS

[Note: The following standards are noted for reference and no amendments to them are recommended.]*19.005 Residential Design Standards*

F. Vehicular Access and Garages

1. Vehicular Access

a. When a project is proposed on a corner lot along an arterial or collector road, the garage shall be accessed off the lower classified street or an adjacent alley, unless the applicant demonstrates to the satisfaction of the Public Works Director (per the Public Works Design Standards) that the access via the lower classified street or alley is not possible.

19.020 Special Standards for Certain Uses

A. Single-family Attached Townhomes, Rowhouses, and Duplexes. Single-family attached housing (townhome units on individual lots), rowhouse and duplex developments shall comply with the standards in 1-4, below. The standards are intended to control development scale; avoid or minimize impacts associated with traffic, parking, and design compatibility; and ensure management and maintenance of common areas

…

2. Townhome, rowhouse and duplex subdivisions (4 or more lots) may receive vehicle access from a rear alley. Alley(s) shall be created at the time of subdivision approval. Alleys are not required when existing development patterns or topography make construction of an alley impracticable (See #3 for standards). As necessary, the city shall require dedication of right-of way or easements and construction of pathways between townhome lots (e.g., between building breaks).

3. Collector and Residential Lot Access to Arterials and Collectors. When a residential development abuts an existing or proposed arterial or collector, the Planning Commission shall require that access to such streets be limited by one of the following means:

a. The lots of the development back onto the arterial or collector and front onto a parallel local street. Subchapter 90 / Amended by Ordinance No. 1570, 02-12-19.
b. A series of cul-de-sacs, U-shaped streets, shared driveways, or short loops entered from and designed generally at right angles to the arterial or collector street and where no lots derive direct access to the arterial or collector street.
c. Lots that would only have access to an arterial or collector shall be restricted to the collector street.

…

SUBCHAPTER 90: SUBDIVISION REGULATIONS

90.90.010 Streets.

R. <u>Commercial and Industrial</u> Alleys. Alleys shall be provided in commercial and industrial districts, unless other permanent provisions of access to off street parking and loading facilities are approved by the Planning Commission. The corners of alley intersections shall have a radius of not less than 12 feet.

1. Dedication. The Planning Commission may require ~~adequate and proper~~ alleys <u>that meet the City's design and construction standards</u> to be dedicated to the public by the land divider of such design and in such location as necessary to provide for the access needs of the subdivision or partition in accordance with the purpose of Section 90.10.010 of this chapter.

2. Width. Width of right-of-way and paving design for alleys shall be not less than 20 feet. Slope easements shall be dedicated in accordance with specifications adopted by the City Council.

3. Corner Cut-Offs. Where two alleys intersect, 10 feet corner cut-offs shall be provided.

4. Grades and Curves. Grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.

5. Other Requirements. All provisions and requirements with respect to streets in this subchapter shall apply to alleys the same in all respects as if the word "street" or "streets" therein appear as the word "alley" or "alleys" respectively.

S. Residential Alleys. Alleys may be provided in residential developments with four or more lots.

1. Dedication. The Planning Commission may require alleys that meet the City's design and construction standards to be dedicated to the public by the land divider of such design and in such location as necessary to provide for the access needs of the subdivision or partition in accordance with the purpose of Section 90.10.010 of this chapter.

2. Width. Width of right-of-way and paving design for alleys shall be not less than the width specified in the Independence Public Works Design Standards. Slope easements shall be dedicated in accordance with specifications adopted by the City Council.

3. Vision Clearance. Where two alleys intersect, the intersections shall be designed to meet vision clearance standards found in Section 75.055 of this code.

4. Grades and Curves. Grades shall not exceed 12 percent on alleys, and centerline radii on curves shall be not less than 100 feet.

5. Other Requirements. All provisions and requirements with respect to streets in this subchapter shall apply to alleys the same in all respects as if the word "street" or "streets" therein appear as the word "alley" or "alleys" respectively.

T.~~S~~. Street trees are required …

[Modify subsequent subsection and provisions numbering accordingly]

SUBCHAPTER 74: ACCESSORY STRUCTURES

74.020 Specific Standards for Accessory Uses

A. Fences.

1. Standards for Zones

a. Residential Zones.

i. Height. In the RS, RM and MX zones, fences in the front yard shall not exceed 3 ½ feet in height unless the fence is constructed of a non sight-obscuring material. Side, rear and non sight-obscuring front yard fences shall not exceed seven (7) in height. Except, when a rear yard fence is abutting a minor collector, major collector, or arterial, the fences shall not exceed five (5) feet in height.

ii. Materials. Fences shall be made of wood, brick, vinyl or wrought iron. Chain link fences shall be prohibited.

iii. Residential Development Abutting a Collector or Arterial. In the RS, RM, RH, and MX zones, when a residential development with a rear yard abutting a minor collector, major collector, or arterial, the following standards apply:

a. *Setbacks. The rear yard fence shall be setback a minimum of six (6) feet.*

b. *Height. The rear yard fence shall not exceed five (5) feet in height.*

2. Vision Clearance Standards for All Fences. All fences which are located within vision clearance areas at street and alley intersections shall not exceed 3 ½ feet in height from the adjacent curb elevation and shall be constructed of a material which is non sight-obscuring.

5. Street Cross-Section Standards

Currently, street cross-section requirements are described in the Table in IDC Section 90.90.010(D). To ensure the requirements reflect the cross-section standards recommended in the updated TSP and reflect best practices, we recommend the actual street standards be removed from the IDC and instead reference the appropriate TSP standard.

Recommendation: Remove street cross-section standards from the IDC. Instead, referenced the appropriate section of the TSP for the street cross-section standards. Alternatively, the standards could be included in the City's Public Works Design Standards and referenced accordingly in the code amendments below.

Proposed Code Amendments:

Chapter 90.90 DESIGN AND DEVELOPMENT STANDARDS

90.90.010 Streets.

A. General. The location, width, and grade of streets, bikeways and pedestrian facilities shall be considered in their relation to existing and planned streets, bikeways and pedestrian facilities, to topographical conditions, to public convenience and safety, and to the proposed use of the land to be served by the streets. All streets, bikeways and pedestrian facilities shall connect to other said facilities within the development and to existing and planned streets, bikeways, and pedestrian facilities outside the development. Where location is not shown in the Independence Transportation System Plan or other a development plan, the arrangement of streets in a subdivision shall either:

1. Provide for the continuation or appropriate projection of existing and planned streets, bikeways and pedestrian facilities in surrounding areas; or

2. Conform to a plan for the neighborhood approved or adopted by the Planning Commission to meet a particular situation where topographical or other conditions make continuance or conformance to existing streets, bikeways and pedestrian facilities impractical.

B. Widths of street rights-of-way and paving design for streets shall not be less than those set forth in the ~~table below~~ Independence Public Works Design Standards. The street section shall be designed in accordance with Subsection 90.80.005.D. Streets within the Southwest Independence Concept Plan area shall be designed in accordance with the street cross sections provided in the Southwest Independence Concept Plan. Where applicable, the street cross-sections provided in the Southwest Independence Concept Plan supersede any conflicting standards in this section. Engineering staff may make exceptions to the standards based on individual site conditions.

~~C. The width of street rights-of-way provided in the table below shall be the minimum widths of rights-of-way for streets existing along and adjacent to any boundary of the subdivision or partition which is the natural or planned continuation of the alignment of the existing or proposed streets, and the applicant shall dedicate additional rights-of-way, as determined by the City in accordance with such table, for any such adjacent street where the existing width of rights-of-way for such street is less than the minimum in said table.~~

~~D. Street Standards:~~

~~Independence Street Design Standards:~~

	~~Major Arterial Streets~~	~~Minor Arterial Streets~~	~~Collector Streets~~	~~Local Streets (1)~~
~~Right-of-way width~~	~~84 ft (2)~~	~~66 ft(2)~~	~~66 ft(2)~~	~~52 ft~~
~~Curb-to-curb width~~	~~60 feet~~	~~36 feet~~	~~36 feet~~	~~28 feet~~
~~Moving Lanes~~	~~2-4~~	~~2~~	~~2~~	~~2~~
~~Turn Lanes~~	~~See (3)~~	~~See (3)~~	~~See (3)~~	~~See (3)~~
~~Bike Lanes~~	~~2@6~~	~~2@6~~	~~See(4)~~	~~Shared~~
~~Parking Lanes~~	~~See(5)~~	~~See(5)~~	~~See(4)~~	~~2 sides~~
~~Sidewalks(6)~~	~~2@6~~	~~2@6~~	~~2@6~~	~~2@6~~
~~Parking Strip~~	~~2@6~~	~~2@6~~	~~2@5~~	~~2@5~~

~~(1) The City may require up to 36 foot wide (60 foot right-of-way) Local Service streets in or along high density residential, industrial or commercially zoned areas, or those expected to exceed 400 ADT.~~
~~(2) Additional right-of-way and roadway improvements may be required at major intersections to provide for turn lanes.~~
~~(3) At all intersections where separate lanes are need due to volume of turning movement activity. (~~
~~4) Collectors with 2,000 ADT the city will study the need to eliminate on-street parking and provide bike lanes.~~
~~(5) The City of Independence may allow parking along sections of Major and Minor Arterial Streets, balancing the needs for accessibility to property, public safety, bicycle facilities, and roadway congestion. Parking allowances will be evaluated on an on-going basis as a part of roadway projects.~~

~~*(6) Parking strips are encouraged, but not required, along Local Service streets. If built, parking strips should be 4 feet wide, to accommodate tree plantings.*~~

D. ~~E.~~ Slope Easements. Slope easements shall be dedicated in accordance with specifications adopted by the City Council.

…

[Modify numbering of subsequent subsections and provisions.]

6. Access Spacing Standards

Similar to street spacing standards, access management standards originate in the TSP and can be referenced in the development code in order to permit future modifications without code amendments. Currently, access management standards are found in IDC Section 90.90.010(V).

> **Recommendation**: Remove access management standards from the IDC. Instead, reference the appropriate section of the Public Works Standards for the access management standards.

Proposed Code Amendments:

Chapter 90.90 DESIGN AND DEVELOPMENT STANDARDS

90.90.010 Streets.

V. Access Management. New access to arterials and collectors shall be limited. Shared or consolidated access shall be required for development or land divisions adjacent to these facilities unless demonstrated to be unfeasible. Number of access points and access spacing standards shall be consistent with the standards set forth in the Independence Public Works Design Standards.

~~*1. Number of Access Points. All proposed development shall have access to a public right-of-way. Spacing requirements for access points and intersections on arterials and collector streets shall be as shown in the following two tables:*~~

~~*Access Management Spacing Standards for Private and Public Approaches on District Highways(1)(2)(3)(4) (OAR 734-051-0115) (Measurement is in Feet)**~~

~~*Posted Speed*~~	~~*Urban***~~	~~*STA*~~
~~*55*~~	~~*700*~~	
~~*50*~~	~~*550*~~	
~~*40&45*~~	~~*500*~~	
~~*30&35*~~	~~*350*~~	~~*(6)*~~

~~*Less than or equal to 25*~~	~~*350*~~	~~*(6)*~~

~~*NOTE: The numbers in superscript (1) refer to explanatory notes that follow Table 4. *Measurement of the approach road spacing is from center to center on the same side of the roadway.*~~

~~***These standards also apply to Commercial Centers. Notes on Tables 4: (1) These access management spacing standards are for unsignalized approaches only. Signal spacing standards supersede access management spacing standards for approaches. (2) These access management spacing standards do not apply to approaches in existence prior to April 1, 2000 except as provided in OAR 734-051-0115(1)(c) and 734-051-0125(1)(c). (3) For infill and redevelopment, see OAR 734-051-0135(4). (4) For deviations to the designated access management spacing standards see OAR 734-051- 0135. (5) Posted (or Desirable) Speed: Posted speed can only be adjusted (up or down) after a speed study is conducted and that study determines the correct posted speed to be different than the current posted speed. In cases where actual speeds are suspected to be much higher than posted speeds, the Department reserves the right to adjust the access management spacing accordingly. A determination can be made to go to longer access management spacing standards as appropriate for a higher speed. A speed study will need to be conducted to determine the correct speed. (6) Minimum access management spacing for public road approaches is the existing city block spacing or the city block spacing as identified in the local comprehensive plan. Public road connections are preferred over private driveways and in STAs driveways are discouraged. However, where driveways are allowed and where land use patterns permit, the minimum access management spacing for driveways is 175 feet (55 meters) or mind-block if the current city block spacing is less than 350 feet (110 meters).*~~

~~Access Management Requirements (City Streets)~~

~~*Functional Class*~~	~~*Minimum Posted Speed*~~	~~*Minimum Spacing Between Driveways*~~	~~*Spacing Between Intersections*~~
~~*Major Arterial*~~	~~*35 – 50*~~	~~*250 feet*~~	~~*¼ mile*~~
~~*Minor Arterial*~~	~~*35 – 50*~~	~~*250 feet*~~	~~*250 feet*~~
~~*Major Collector*~~	~~*25 – 40*~~	~~*100 – 150 feet*~~	~~*250 feet*~~
~~*Collector*~~	~~*25 – 40*~~	~~*100 – 150 feet*~~	~~*250 feet*~~

~~*2. The distance between access points shall be measured from the centerline of the proposed driveway or roadway to the centerline of the nearest adjacent roadway or driveway.*~~

7. Parking Requirements

The IDC parking requirements, found in Subchapter 73, were compared to the standards in the Model Code for Small Cities[1] (Model Code). Only a few discrepancies were found; those comparisons are shown in Table 2 below. The most significant difference between IDC and Model Code standards is that the Model Code includes specific parking standards for various types of retail and service-oriented businesses, while Independence provides a standard requirement for all of those types of uses. We do not recommend any changes in the City's approach to standards for those uses. However, we suggest a few targeted adjustments for the other uses noted below.

Table 2. Parking Standard Comparisons.

Use	IDC Standard	Model Code Standard
Hospital	Two (2) spaces per patient bed.	One (1) space per 300 square feet of gross floor area.
Warehousing	One (1) space per 1,000 square feet of gross floor area.	0.5 paces per 1,000 square feet of gross floor area.

Recommendation: Amend the IDC parking standards to be consistent with the Model Code, resolving the discrepancies noted in Table 2.

Proposed Code Amendments:

73.010 Required Number of Parking Spaces

The number of parking spaces required for any building or land use shall be determined from the following table.

B. INSTITUTIONS:

3. Hospital - ~~Two (2) spaces per patient bed.~~ One (1) space per 300 square feet.

E. INDUSTRIAL

2. Warehousing – One-half ~~(1)~~ (0.5) spaces per 1,000 square feet of gross floor area.

8. Parking Requirements for Infill Residential Development

Consistent with state law, cities cannot require parking for accessory dwelling units as indicated in the City's existing standards found in IDC Section 74.010(A)(3). For conversions from single-family

[1] The Oregon Model Development Code and User's Guide for Small Cities is widely used across the state of Oregon and was developed by the Transportation and Growth Management Program. For more information see: https://www.oregon.gov/lcd/TGM/Pages/Model-Code.aspx.

(detached) dwelling to middle housing (duplex, triplex, and fourplexes), the City requires the development to provide a minimum of one (1) space per unit. This is a reasonable requirement and generally consistent with state guidelines for off-street parking requirements associated with middle housing. However, parking location standards may prohibit siting of conversions on existing lots. To address this issue for these forms of housing, the City could exempt middle housing conversions from those provisions.

> **Recommendation:** Exempt conversions from single family detached housing to middle housing (duplexes, triplexes, fourplexes[2]) from the provisions of IDC Subsection 75.025.

Proposed Code Amendments:

75.025 Parking in Required Yards

No parking of an automobile, truck, camper, boat, trailer, or other vehicle shall be allowed within 15 feet of any street, except in a driveway. No parking shall be allowed within any required landscaped area or common area. No driveway or required yard adjacent to a street shall be used for the permanent storage of any trailer, camper, or boat.

<u>Conversions of single-family dwelling to a duplex or multi-family dwelling, up to four units, is exempt from this provision.</u>

[2] Per IDC Definitions in Subchapter 13, duplexes are defined and triplex and fourplexes fall under the definition of multi-family dwellings.

Attachment J Public Involvement and Communications Summary

PUBLIC AND STAKEHOLDER INVOLVEMENT AND COMMUNICATIONS SUMMARY REPORT

Date: July 12, 2021 Project #: 23021.005

To: Fred Evander, *City of Independence*
Michael Duncan, *Oregon Department of Transportation*

From: Matt Bell, Molly McCormick, Matt Hughart, *Kittelson & Associates, Inc.*

Project: Independence Transportation System Plan (TSP) Update

Subject: Public and Stakeholder Involvement and Communications Summary Report

TABLE OF CONTENTS

INTRODUCTION

The public and stakeholder involvement process implemented throughout the Independence Transportation System Plan (TSP) update consisted of committee meetings, public meetings/virtual open houses, community events and briefings, and regular communication via the project website (www.independencetsp.com). The following provides a summary of the public and stakeholder involvement activities and their effectiveness.

COMMITTEE MEETINGS

The TSP update was developed in coordination with City of Independence (City) and Oregon Department of Transportation (ODOT) staff along with key stakeholders and representatives from the community. Two formal committees - a Community Advisory Committee (CAC) and a Technical Advisory Committee (TAC) - oversaw the TSP update and provided input at each step in the planning process.

Meeting materials (e.g., agendas, presentations, tech memos, etc.) were posted to the project website up to one week prior to the CAC and TAC meetings. City staff also made copies of the meeting materials available for pick up at City Hall upon request.

Community Advisory Committee

The CAC consisted of local residents and property owners with an interest in transportation who were appointed to serve on the CAC as well as representatives from the Independence Planning Commission and City Council. The CAC served as the voice of the community and the caretakers of the goals and objectives of the TSP update. CAC members reviewed and commented on technical memorandums and participated in committee meetings, community meetings, and workshops. The CAC was comprised of the following members:

- Brennan S Burbank, *Local resident*
- Rich Clark, *Local resident*
- Sally Coen, *Independence Planning Commission*
- Harvey Cummings, *Developer*
- Kate Schwarzler, *Independence Planning Commission*
- Tom Takacs, *Independence City Council*

The project team met with the CAC four times throughout the TSP update, including one joint meeting with the TAC. The meetings were announced via the project website and emails to the CAC members and were open to the public.

Technical Advisory Committee

The TAC consisted of representatives from city, county, and state agencies as well as local transportation and emergency service providers. The TAC provided technical guidance and coordination throughout the project. TAC members reviewed and commented on technical memorandums and participated in committee meetings, community meetings, and workshops.

- Ramón Martínez, *Independence*
- Kie Cottam, *Independence*
- Robert Mason, *Independence*
- Emmanuel Macias, *Western Oregon University*
- Suzanne Dufner, *Monmouth*
- Mike Cook, *Central School District*
- Ted Stonecliffe, *Cherriots*
- Todd Whitaker, *Polk County*
- Keith Blair, *ODOT*
- Dorothy Upton, *ODOT*
- Daniel Fricke, *ODOT*
- Kristie Gladhill, *ODOT*

The project team met with the TAC four times throughout the TSP update, including a joint meeting with the TAC. The meetings were announced via the project website and emails to the TAC members.

Committee Meetings Summary

TAC and CAC members met separately for their first three meetings and met jointly for the fourth meeting. A summary of each meeting's purpose, attendees, and key action items based on committee member feedback are shown in Table 1.

Table 1: Committee Meetings Summary

Committee Meetings	Date	Meeting Purpose	Attendees	Key Action Items
TAC and CAC Meetings #1	May 21, 2020	Provide an overview of the project; consider the project goals, objectives, and evaluation criteria; and review existing conditions	• All CAC members • Nine TAC members and one additional partner agency representative	Updates to the goals and objectives presented in *Tech Memo #2: Goals, Objectives, and Evaluation Criteria*, additional information for public transportation services, and updates to figures in *Tech Memo #3: Existing Conditions*
TAC and CAC Meetings #2	August 20, 2020	Review and discuss the future "no-build" traffic conditions analysis as well as potential alternatives to address gaps and deficiencies in the City's transportation system	• All CAC members • Seven TAC members and three additional partner agency representatives	Further considerations for SW Independence, farm equipment accommodations in the classifications, additional connections and alternatives, updates to future transit service, and additional review of forecasted traffic operations
TAC and CAC Meetings #3	February 18, 2021	Review and discuss the preferred alternatives to address gaps and deficiencies in the City's transportation system	• Two CAC members[1] • Five TAC members and three additional partner agency representatives	Further coordination with partner agencies, additional alternatives to explore, and updates to figures in *Tech Memo #6 Preferred Alternatives*
Joint TAC and CAC Meeting #4	May 20, 2021	Review and discuss the Draft TSP Update and Draft Implementing Ordinances	• Two CAC members, four TAC members, and two additional partner agency representatives	Further considerations for 16th Street, updates to project descriptions, and adjustments to project cost estimates

1. Due to the small group in attendance for CAC meeting #3 and the participants all scheduled for the upcoming Planning Commission/City County work session, the prepared presentation was not covered. Instead, the meeting was an open discussion around questions from the participants.

PUBLIC MEETINGS AND OPEN HOUSES

In addition to advisory committee meetings, the project team also hosted three virtual open houses via the project website and two YouTube Live events that offered participants the opportunity to provide input on project materials and share their concerns related to key issues in the transportation system. The public involvement events were announced via the project website and utility bills, advertised through the Polk County Itemizer-Observer, and/or discussed through the City's social media pages. The open houses were generally scheduled to occur over a two-week period near delivery of utility bills; however, the timelines were extended for each open house to encourage additional participation.

- Online Open House #1 was available on the project website in May and June 2020. The purpose of the open house was to gain feedback on the goals, objectives and evaluation criteria, the transportation system inventory, and the existing conditions analysis. The open house asked participants to confirm information shown in the maps and tables and identify additional transportation-related issues not shown. The open house included interactive maps by mode to help collect input. Over 110 comments were received through comment boxes and interactive forms. At least 13 people participated in the open house, although additional comments were provided anonymously.
- Online Open House #2 was available on the project website in August and September 2020. The purpose of the open house was to gain feedback on the alternatives developed to address gaps and deficiencies in the City's transportation system. The open house incorporated the use of Survey Monkey and asked participants to rate various alternatives and identify where additional alternatives should be considered. A total of 51 people participated in the open house, with over 300 individual responses.
- YouTube Live Event #1 was held on December 2nd, 2020. The recorded event is archived on the City's YouTube channel for public access. The event was focused on gathering community input around alternatives to address six key transportation issues in Independence: east-west connectivity, north-south connectivity, traffic operations along Main Street, access to southwest Independence, Monmouth Street, and bicycle route to Monmouth. During the meeting, there were approximately 25 comments provided by ten members of the public via the live chat function. As of June 30, 2021, the recording on the City's YouTube channel has been viewed over 120 times.
- Online Open House #3 was available on the project website in February and March 2021. The purpose of the open house was to gain feedback on the preferred alternatives. Similar to Online Open House #1, the open house used a combination of comment boxes and interactive maps. Over 45 comments were received through comment boxes and interactive forms. At least eight people participated in the open house, although additional comments were provided anonymously.
- YouTube Live Event #2 was held on March 3rd, 2021, in conjunction with Online Open House #3. The recorded event is archived on the City's YouTube channel for public access. The event provided the community an opportunity to provide input on the preferred alternatives directly to the project team. During the meeting, there were approximately 11 comments provided by four members of the public via the live chat function. As of June 30, 2021, the recording on the City's YouTube channel has been viewed over 75 times.

COMMUNITY AND SMALL GROUP BRIEFINGS

In addition to the online open houses, City staff conducted two rounds of unscheduled outreach within the community and provided briefings to several community groups.

- City staff spoke to a Spanish-speaking community group on Friday, June 5th, 2020. The purpose of the meeting was to provide an overview of the project and gather input on key transportation issues in the community. Main concerns included sight distance at intersections with parking, pedestrian safety, and lack of lighting at key intersections.
- City staff spoke to the Monmouth-Independence Rotary Club and Independence Downtown Association during summer 2020 to inform the community groups about the ongoing project and gather input.
- City staff surveyed community members in the downtown area in September 2020 to gather input on key transportation issues. Main concerns included the River Road bridge, downtown traffic safety and parking, additional east-west connectivity, and Monmouth Street.
- City staff engaged the community through social media outreach in February 2021. Specific questions regarding key locations in Independence were posed through the City's Facebook account, with dialogue around preferred alternatives provided by community members. Approximately 100 comments were received in response to the post about the OR 51-Main Street/OR 51-Monmouth Street intersection.
- City staff filmed multiple videos in Independence to share updates on the project and highlight key transportation issues in the city. There were three videos created, all provided in both English and Spanish versions online.

The project team met with the Planning Commission and/or City Council five times throughout the planning process. Each work session/hearing was open to the general public. The goal of the public involvement process was to develop a TSP that addresses the gaps and deficiencies in the transportation system while meeting the needs of the community.

- The project team provided a project overview to City Council on Tuesday, July 28th, 2020. The purpose of the presentation was to describe the transportation system plan update process and to gain feedback on the goals, objectives and evaluation criteria, the transportation system inventory, and the existing conditions analysis.
- Joint Planning Commission/City Council Work Session #1 was held on Tuesday, February 23rd, 2021 via Zoom. The purpose of the work session was to provide an overview of the planning process to commissioners and council members and discuss the preferred alternatives developed to address gaps and deficiencies in the City's transportation system.
- Joint Planning Commission/City Council Work Session #2 was held on Tuesday, May 25th, 2021 via Zoom. The purpose of the work session was to provide an update on the planning process and discuss the draft TSP update.
- A Planning Commission hearing was held on Monday, June 14th, 2021 via Zoom to consider adoption of the TSP update. The Planning Commission voted to recommend adoption of the TSP with minor modifications. No public comments or testimony was received during the hearing.
- A City Council hearing was held on Tuesday, July 27th, 2021 at Independence City Hall to consider adoption of the TSP update. No public comments or testimony was received during the hearing.

- A second City Council hearing was held on Tuesday August 24th, 2021 at Independence City Hall to consider adoption of the TSP update with edits based on the July hearing.

STAKEHOLDER DATABASE

Stakeholders were encouraged to subscribe to the project website to receive e-mail notifications when there was an update to the Latest News, Meetings, and Project Documents pages of the website. For example, when a meeting was announced or when a new document was ready for review, the website would e-mail anyone who subscribed to notify them of the update. A total of 40 people subscribed to the project website. *Attachment A contains the stakeholder database.*

COMMENT LOG SUMMARY AND KEY PUBLIC ISSUES

The project team maintained a comment log throughout the course of the TSP update. The comment log contains a summary of comments from City and ODOT staff, TAC and CAC members, and local residents about project materials, including who provided the comment, when it was provided, and how it was addressed. Throughout the project process, the key transportation issues that were recurring through public outreach included:

- Need for additional east-west and north-south connectivity,
- Traffic operations along Main Street,
- Access to southwest Independence as development takes place,
- Monmouth Street modal priorities and traffic operations, and
- Establishing a bicycle route to Monmouth.

PROJECT WEBSITE ANALYTICS

Continuous web-based communications about project status, draft documents for review, and upcoming meetings, open houses, and work sessions were provided to the public via the project website (www.independencetsp.com). The project website also included an interactive map that allowed anyone with internet access to provide comments to the project team about transportation-related issues within the community. Between August 2020 and February 2021, the website-based interactive map received 12 comments from eight individual community members. At least five people participated in the interactive map, although additional comments were provided anonymously. These comments are separate from the interactive map comments provided through the open houses.

Via the project website, members of the public could use the Contact page to send the project team an email. Ten emails were sent between June 2020 and May 2021, including comments on existing transportation conditions, potential alternatives to consider, and input on preferred alternatives.

Attachment A Stakeholder Database

STAKEHOLDER DATABASE

The following individuals subscribed to the project website to receive updates on the latest news and information, meetings, and project documents.

- camas666@msn.com
- d4burch@gmail.com
- acaro@polkio.com
- rcooper@ci.monmouth.or.us
- jimnewbeck@yahoo.com
- tiedinknots@msn.com
- valeriewatts@live.com
- boe.jamie@gmail.com
- littlegem72@yahoo.com
- marianneholtzinger@me.com
- jasper.smith@co.benton.or.us
- scottcarver@gmail.com
- CMichaelJewell@Gmail.Com
- davidclyne29@gmail.com
- casajay007@yahoo.com
- ludwigadvocate@gmail.com
- hri83@outlook.com
- brachapdx@gmail.com
- ALAN_L_WRIGHT@HOTMAIL.COM
- tjhempel@gmail.com
- pinefinch@gmail.com
- nmdownes@gmail.com
- tierapage@yahoo.com
- acaballero@protonmail.com
- rmartinez@ci.independence.or.us
- wolfgardens1@yahoo.com
- maureen.white@pbsusa.com
- bodiebemrose@gmail.com
- pacwestpi@outlook.com
- danandmichaella.mailings@gmail.com
- gaildorr@comcast.net
- brad_harris1@outlook.com
- jennifer.d.potter@gmail.com
- dawna_hain@icloud.com
- Randy_Hain@yahoo.com
- mgarrett1215@hotmail.com
- bjjlovland@gmail.com
- maggyespitia@gmail.com
- director@luckiamutelwc.org
- jeff.fossil25@gmail.com
- dragond40@hotmail.com

Attachment B Comment Log Summary

Independence Transportation System Plan (TSP) Update Tech Memo #2: Goals, Objectives, and Evaluation Criteria				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
1	6/1/2020	Rich Clark	I am wondering when we will be discussing goals and objectives in a thorough way as a committee, so we can exchange ideas, and come up with goals and objectives specific to Independence. I don't do this sort of thing that often, but I've never had a consulting group provide the goals and objectives. I think it's helpful to have a framework and a starting point, but I think that our group should be creating goals and objectives, with the consultants' help.	No action needed/recommended. TAC/CAC #1 were the meetings to discuss the goals and objectives with the committees to gain feedback and consensus. The feedback provided has been incorporated into the final memo.
2	6/1/2020	Rich Clark	I think that a lot of the objectives listed are actually goals, in that they are not specific, measurable, with a clear time frame for completion.	No action needed/recommended
3	6/1/2020	Rich Clark	Tech Memo #2 is titled "Goals, Objectives, and Evaluation Criteria". I do not see any evaluation criteria.	No action needed/recommended. Evaluation criteria are included starting on page 4 of the draft memo (page number may change for the final memo).
4	6/1/2020	Rich Clark	Contributing to a TSP is a steep learning curve for me. After the CAC has created a draft set of goals and objectives, it would be helpful to meet with the TAC to hear feedback, and to have help with further refining of goals, objectives, and evaluation criteria. It might take more than one joint meeting to do that.	No action needed/recommended. TAC/CAC #1 were the meetings to discuss the goals and objectives with the committees to gain feedback and consensus. The feedback provided has been incorporated into the final memo.
5	6/1/2020	Rich Clark	Additional goals oImprove livability with transportation system design oPromote health with transportation system design oDesign Roadway, Pedestrian, and Bicycle network systems in anticipation of future development, and establish right of ways prior to further housing development oEnhance safety of pedestrian & bicycle use, including the use of input from the Police Department when designing walking/bicycle multimodal networks oDecrease downtown congestion oEnhance downtown pedestrian/bicycle access oCreate enjoyable walking/bicycle routes throughout town serving different mobility needs oDesign the pedestrian/bicycle network to create opportunities for healthy lifestyles, nature enjoyment, family strolls, athletic training for individuals of all ages, wildlife and riparian management projects for Independence students. oDesign the pedestrian/bicycle network with short, easy loops for older and younger residents, as well as handicap access. These easier loops should be in open, safe areas, where bicycle police officers can patrol, and adjacent housing is designed to provide 'eyes on the street'. oDesign the pedestrian/bicycle network to enhance protection and enjoyment of natural resources, including Ash Creek and the South Fork of Ash Creek.	Comment resolved. Livability, comfort, and health adressed in new Objective 3A. Design prior to development not included in goals/objectives. Safety for pedestrians addresed in new Objective 3A and in existing Objective 3C. Downtown congestion addressed in existing Objectives 2A, 2B, and 2C. Downtown bicycle access adressed in new Objective 3A. Short, easy loops addresed in updated Objective 3C. Enhanced protection and enjoyment addressed in new Objective 3A and updated Objective 1C.
6	6/1/2020	Rich Clark	I also need to review Tech Memo #4 (Future Systems Conditions) and Tech Memo #5 (Alternative Analysis & Funding Program) before I can have an informed opinion on creating goals and objectives	No action needed/recommended. Tech Memos #4 and #5 are the next project task.

7	5/22/2020	Ted Stonecliffe	Goal 4 should be changed to “increased transit service frequency” rather than “increased transit ridership.” In the post-COVID environment, ridership will not be as important as access, frequency, and the ability of transit to meet the mobility needs of the community.	Comment resolved. Objective 4C added.
8	5/28/2020	Brennan Burbank	Existing Objective 7: is this possible downtown with ODOT owning the highway?	No action needed/recommended. ODOT looks to local TSPs to identify needs on state highways
9	5/28/2020	Brennan Burbank	Goal 1: Do we want to be full service? This takes lots of resources	No action needed/recommended. The City's visions is for a full-service community
10	5/28/2020	Brennan Burbank	Objective 4B: Would this help?	No action needed/recommended. Comments from Ted support this objective.
11	5/21/2020	TAC Meeting	Update Objective 1C to “Minimize negative impacts…”	Comment resolved. Text updated as noted.
12	5/21/2020	TAC Meeting	Update Objective 2D to address typo – “severe”	Comment resolved. Text updated as noted.
13	5/21/2020	TAC Meeting	Update Objective 3A to “transit stops and corridors”, not “transit corridors”	Comment resolved. Text updated as noted.
14	5/21/2020	TAC Meeting	Update Objective 3C to “address locations with a history of…”	Comment resolved. Text updated as noted.
15	5/21/2020	TAC Meeting	Consider updating Goal 4 to “Improve Access to Transit”	No action needed/recommended. The goal is to make transit more viable, improving access is one of the objetives
16	5/21/2020	TAC Meeting	Update Objective 4A to refer to “transit stops and corridors”	Comment resolved. Text updated as noted.
17	5/21/2020	TAC Meeting	Provide further clarification on Goal 5	Comment resolved. Existing objective 5A updated and new Objective 5B added.
18	5/21/2020	CAC Meeting	Update Objective 1F to include consistency with local plans, including the Comprehensive Plan	Comment resolved. Text updated as noted.
19	5/21/2020	CAC Meeting	Update Objective 2F to “Manage access to key state…”	Comment resolved. Text updated as noted.
20	5/21/2020	CAC Meeting	Update Goal 3 to include an objective relate to community health and enhanced enjoyment of nature	Comment resolved. New Objective 3A added.
21	5/21/2020	CAC Meeting	Update Goal 5 to clarify the intent of the goal – not getting in the way of future technologies or enhancements	Comment resolved. Existing objective 5A updated and new Objective 5B added.
22	See Comments_Open House #1_English tab		1225: Rather than just "minimize impacts", the goals ought to be eliminating existing impacts and providing sustainable transportation modes going forward.	No action needed/recommended. It is not reasonable to eliminate all impacts given the already built environment. Sustainable modes are addressed in Goals 3 and 4.
23	See Comments_Open House #1_English tab		1256: It's important to maintain the cultural and historical nature of our community.	No action needed/recommended. Agreed with this statement. This is addressed in Goal 1.
24	See Comments_Open House #1_English tab		1262: I appreciate that Goal 1 focuses on alignment with community vision, including respect for the environment. I think Objective 1C could be improved by going above and beyond seeking to minimize impact - that should be a basic value underlying the plan - not a specific objective. Minimizing impact is the baseline level of effort - it's not aspiring or innovative. A suggested wording could be: Obj. 1C: Complement natural resources, scenic and historic areas, and open spaces to the greatest extent possible; while minimizing negative impacts.	Comment resolved. Text updated as noted.

25	See Comments_Open House #1_English tab	1263: I would suggest an additional objective of "increased community education on sharing the road" This is 2-way - drivers in this town seem unfamiliar with how to drive with cyclists (often treating them like pedestrians rather than vehicles) and cyclists should learn to be better about visibility and acting like a vehicle rather than a pedestrian on wheels.	Comment to be addressed in future tasks. This suggestion can be reviewed for a future program. Not recommended as an objective.
26	See Comments_Open House #1_English tab	1229: Would like to see an emphasis on sustainable modes as well; near zero carbon footprint	No action needed/recommended. Sustainable modes are addressed in Goals 3 and 4.
27	See Comments_Open House #1_English tab	1210: I've heard recently of an additional tax coming that will burden home owners already paying some of the state's highest property taxes AND some of the highest water bills as well. We are very concerned that living in this great city will become increasingly more expensive and wonder how much we can handle. We would not be in support of burdening residents further with new projects that we can't fund with existing taxes. I chose "I like this" because the wording makes it sound like the plan is to be sensitive to that, but it's just vague enough to be a little confusing.	No action needed/recommended
28	See Comments_Open House #1_English tab	1230: Might need a goal that references leveraging private resources where possible. Also, include language to address existing pathway systems that might require assessment districts to complete or restore. Finally, it would be useful to consider the payback ROI in quality of life measures as well as strictly financial.	Comment resolved. Objective 6C updated.
29	See Comments_Open House #1_English tab	1261: Yes, it's important to balance city spending with other funding sources: county, state and federal. Collaborate with nearby cities and encourage support from the business community and developers.	Comment resolved. Addressed in existing Objective 6E and updated Objective 6C.

Independence Transportation System Plan (TSP) Update Tech Memo #3A: Inventory				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
1	5/31/2020	Tom Takacs	Monmouth Street pavement is listed as in poor condition and we get requests for improvements like crosswalks in the area of Monmouth and 10th or 11th. How can we better influence ODOT to bring about more timely improvements to the primary street in our city?	Comment to be addressed in future tasks
2	5/31/2020	Tom Takacs	On page 7 of the Draft Tech Memo #3A, table 1 lists F Street as a major collector. Is it engineered to be a major collector? Do we want to consider that since it has the only other bridge over Ash Creek in town? Would that mean removing all parking on F Street?	Comment to be addressed in future tasks
3	5/31/2020	Tom Takacs	Do we need to look at alternative financing to maintain sidewalks especially in the poorer parts of town?	Comment to be addressed in future tasks
4	5/31/2020	Tom Takacs	On page 59 of the Draft Tech Memo #3A, the map shows Total Population in Poverty. Do we really consider the Airpark as one of the poorest parts of town?	Comment resolved
5	6/1/2020	Rich Clark	It would be helpful to have presentations from members of the TAC related to the existing gaps and deficiencies identified by Kittelson & Associates in these areas: oRoadway System oPublic Transportation System oPedestrian System oBicycle System oRail System oFunding Considerations ・Existing funding sources: Gas tax + SDC ・State transportation revenue (Gas tax) ・Transportation system development charge (SDC's)	No action needed/recommended. TAC/CAC #1 were the meetings to discuss the existing inventory and conditions with the committees to gain feedback and consensus. The feedback provided has been incorporated into the final memo.
6	6/1/2020	Rich Clark	The City can offer SDC credits to developers that provide public improvements beyond the required street frontage, including those that can be constructed by the private sector at a lower cost. For example, SDC credits might be given for providing off-site improvements, such as sidewalks and bike lanes that connect the site to nearby transit stops. Independence uses the revenue from SDCs on eligible projects that cannot be funded by other means.	Comment to be addressed in future tasks
7	6/1/2020	Rich Clark	The CAC may need additional meetings to do a thorough job.	No action needed/recommended. TAC/CAC #1 were the meetings to discuss the existing inventory and conditions with the committees to gain feedback and consensus. The feedback provided has been incorporated into the final memo.

8	6/1/2020	Rich Clark	It would be helpful for our committee to identify and review best practices, and to use whatever resources have already been developed in Oregon, and nationally. Some examples: oThe Oregon Transportation and Growth Program has a nice topic library: TGM Topic library oA nice review related to parking created by the Oregon Transportation and Growth Program----https://www.oregon.gov/lcd/Publications/ParkingMadeEasy_2013.pdf--Parking Made Easy-A Guide to Managing Parking in Your Community. oODOT created a paper, Transportation System Plan Guidelines, Best Practices and Emerging Topics (5/31/17), which highlighted best practices related to TSP development, from Oregon and other states. oA nice presentation on planning for pedestrians: https://itdpdotorg.wpengine.com/wp-content/uploads/2018/02/pedestrians_FINAL.pdf It appears that the Oregon Transportation and Growth Management Program will do Transportation System Plan Assessments: https://www.oregon.gov/lcd/TGM/Pages/TSP-Assessment.aspx. I wonder if this might be helpful for us.	Added Links to the project website under Project Documents/Reources
9	6/1/2020	Rich Clark	New transportation oBicycle taxis oHoverboards (just joking!)	Comment to be addressed in future tasks
10	6/1/2020	Rich Clark	Are there ways for low-income neighborhoods to benefit from the TSP?	Comment to be addressed in future tasks
11	6/1/2020	Rich Clark	Local jurisdictions may need to rethink the notion and design of traditional transit hubs to be more inclusive of other alternate forms of transportation. Mobility hubs provide a more robust array of options for transit riders such as sheltered layover waiting areas, bike share stations, car share facilities, taxi/ride-sourcing pick-up/drop-off zones, bike storage, repair, and retail space.	Comment to be addressed in future tasks
12	6/1/2020	Rich Clark	Local jurisdictions may need to define desired car/bikesharing service areas within the larger city based on density and connectivity.	Comment to be addressed in future tasks
13	6/1/2020	Rich Clark	Plugin stations at mobility hubs	Comment to be addressed in future tasks
14	5/22/2020	Ted Stonecliffe	In the graphic showing existing road classifications, 13th Street should not be shown as a collector where it becomes a gravel road.	Comment resolved. Updated as noted.
15	5/22/2020	Ted Stonecliffe	I recommend that you revise the section on paratransit to state that Cherriots does not provide paratransit in Independence since Route 40X is classified as a “commuter express” service, which is exempt from the requirement to provide paratransit service. This type of service also is limited to one to three stops in each city or rural community served. Therefore, if more transit stops are desired for Independence, a service that satisfies the paratransit requirement should be provided, such as a deviated fixed-route. The current Polk County Flex (PCF) and future Route 45 are exempt from the paratransit requirement since they are demand responsive services that provide access within three quarters of a mile from the route path. The PCF is not paratransit since it is open to the general public, not just those who would be eligible for paratransit through the typical application process.	Comment resolved. Text added as noted.
16	5/22/2020	Ted Stonecliffe	In Memo #3A, change “income level” in Table 2 to “Household Income Level.”	Comment resolved. Text updated as noted.
17	5/22/2020	Ted Stonecliffe	Fig. 9 “Transit Facilities and Service” should indicate the Polk County Flex as a demand responsive service operating within the city limits of Independence.	Comment resolved. Updated as noted.
18	5/22/2020	Ted Stonecliffe	In the second paragraph for the Polk County Flex, please change “In spring/summer 2020” to “In fall 2020…” to describe when the service will be converted to the Route 45.	Comment resolved. Text updated as noted.

19	5/22/2020	Ted Stonecliffe	In Fig. 10 “Pedestrian Facilities,” there are sidewalks on both sides of E Street between 10th and 11th Streets. Picture Street does not have any sidewalks. There is not a continuous sidewalk along 13th Street once it turns into a gravel road four blocks south of Monmouth Street.	Comment resolved. Updated as noted, except Picture Street does have sidewalks based on Google streetview and were maintained in the Figure.
20	5/22/2020	Ted Stonecliffe	There was no mention of the feasibility study that will be done by the city to look at transit solutions for transportation in and between Monmouth and Independence. A $300,000 grant was obtained in the fall 2019 to hire a consultant to look at transit options. Cherriots has agreed to participate in the study, so I think it is worth mentioning in the TSP if certain planning and capital projects will be listed in future memos.	Comment to be addressed in future tasks
21	5/28/2020	Brennan Burbank	Provided table of "the most current years of the State fund exchange (Page 32 of Memo 3A) in state dollars" 2017 Allocation: $106,473.00; $100,084.62 2018 Allocation: $110,980.00; $104,321.20 2019 Allocation: $115,873.00; $108,920.62 2020 Allocation: $112,807.00; $106,038.58	Comment resolved. Verified funding with City.
22	5/21/2020	TAC Meeting	Update functional classification map to remove all “future” roadways	Comment resolved. Updated as noted.
23	5/21/2020	TAC Meeting	Indicate that Route 45X is postponed due to COVID 19, likely until September	Comment resolved. Based on comments from Ted.
24	5/21/2020	TAC Meeting	Transit map comments: - Indicate the current flex service area (within the city limits). - Consider showing the route direction areas or add the text "runs in both directions" to the legend.	Comment resolved. Updated as noted.
25	5/21/2020	TAC Meeting	Include information about the Western Oregon University Wolf Ride Program – WOLF is not a public service, so it should not be included with public service.	Comment resolved
26	5/21/2020	TAC Meeting	Differentiate between shared use paths and trails on maps	Comment resolved - Layer renamed to "Shared-use Paths and Trails", "Shared-use path" is typically reserved for improved (i.e. paved) paths, whiles is reserved for unimproved (i.e. unpaved) trail; however the city refers to some of these as "trails", so this term is intended to be all-encomapssing
27	5/21/2020	TAC Meeting	Add trails in the fields of Deann Drive – identify other trails as appropriate	No action needed/recommended - added all trails based on available data
28	5/21/2020	TAC Meeting	Consider G, E, and F Streets for collector classifications and more continuity.	Comment to be addressed in future tasks
29	5/21/2020	TAC Meeting	Indicate that there is recreational water transportation along the river, such as kayaking, which the city promotes	Comment resolved

30	5/29/2020	Fred Evander	1.Independence is near two pretty significant regional bikeways - the Willamette Valley Scenic Bikeway (see here: https://traveloregon.com/wp-content/uploads/2019/11/SB-WV-Maps-and-Cues.pdf) and the separated trail along 99W, which eventually connects to the trail along OR 22. 2.The City's connection to those bikeways is poor. a.The connection to the Willamette Scenic Bikeway is across the Willamette River bridge (there is no dedicated space for bikes and vehicular speeds are fast) b.There is no good connection to the trail along OR 99W. To reflect these points, I think we should include a note about the regional bike facilities and show how the facilities in Independence are poorly connected to those facilities.	Comment resolved
31	6/1/2020	Tori Middelstadt	River Road Bridge and integration with downtown is poor.	Comment resolved - identified as gap/deficiency
32	6/1/2020	Tori Middelstadt/ Kevin Mahoney	G Street poor pedestrian crossing. People try and beat traffic on Main Street.	Comment resolved - identified as gap/deficiency
33	6/1/2020	Tori Middelstadt	Corvallis Road at the south end of town is a fast and often bikes on road.	Comment resolved - identified as gap/deficiency
34	6/1/2020	Corby Chappell	Randall Way speeds are excessive	Comment resolved - identified as gap/deficiency
35	6/1/2020	Kevin Mahoney/ Kate Schwarzler	Higher visibility crosswalks in downtown would be beneficial	Comment resolved - identified as gap/deficiency
36	6/1/2020	Karin Johnson	There is no pedestrian connection into Central Plaza from intersection of Gun Club and Monmouth	Comment resolved - identified as gap/deficiency
37	6/1/2020	Corby Chappell/ Alex Paraskevas	People travel fast coming from the north into town. The motorists sometimes maintain that speed into downtown - a flashing speed sign would potentially be beneficial potentially before the bridge.	Comment resolved - identified as gap/deficiency
38	6/1/2020	Natascha Cronin/ Sally Coen	It is hard to ride a bike on Monmouth Avenue both with and without the bike lane. The grates go into the bike lane and make it difficult to ride along the road.	Comment resolved - identified as gap/deficiency
39	6/1/2020	Fred Evander	Not fun to ride a bike on North Main Street. Speeds too fast.	Comment resolved - identified as gap/deficiency
40	6/1/2020	Kate Schwarzler	Bike system is disjointed. Makes car the only option.	Comment resolved - identified as gap/deficiency
41	6/1/2020	Natascha Cronin	Need to figure out how to make it cheaper for homeowners to maintain their sidewalks.	Comment to be addressed in future tasks
42	6/1/2020	Tori Middelstadt	Bike connection from south part of town east of the railroad is very poor. Have to ride on sidewalks to get into downtown.	Comment resolved - identified as gap/deficiency
43	6/5/2020	Spanish Language Group	Polk and Main Street is dark in the winter and it is difficult to see pedestrians.	Comment resolved - identified as gap/deficiency
44	See Comments_Open House #1_Maps tab		3: 8th st. connects to Monmouth St. and is not shown here on the map.	Comment resolved. Updated as noted.

Independence Transportation System Plan (TSP) Update Tech Memo #3B: Existing Conditions Anlaysis				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
1	5/31/2020	Tom Takacs	Is there a point where it would be beneficial to add a full traffic light at Main and Monmouth?	Comment to be addressed in future tasks
2	5/31/2020	Tom Takacs	Where exactly do we want to put an east west bypass to access the new development at the south side of town? If we can't get an economical solution to crossing the rail lines, is there an alternative? How can we phase in the bypass construction to help alleviate the increasing traffic caused by current construction?	Comment to be addressed in future tasks
3	6/1/2020	Rich Clark	For Roadway System, Existing Traffic Operations figure, is "Approaching Standards" equivalent to "Does Not Meet Standards"?	No action needed/recommended. The figure showing intersections that are approachig standards was developed for the open house and is not included in the technical memo
4	6/1/2020	Rich Clark	For Roadway System, Existing Traffic Operations figure, what standards are used for the Main St./River Road intersection? For example, when I am commuting home from Salem, and I am stopped in traffic in Marion County for a stop sign in Polk County, is that considered "Meeting Standards'?	No action needed/recommended. The standards are explained in the traffic operations analysis section and shown in Table 1.
5	5/22/2020	Ted Stonecliffe	In Memo #3B, p.8, frequency and on-time reliability should not be "poor." As discussed, please remove "on-time reliability" from the chart. Here is my recommendation of what to show in the Excellent, Good, Fair, and Poor columns: "12 daily round trips, 8-10 daily round trips, 5-7 daily round trips, 4 or fewer daily round trips."	Comment resolved. Text updated as noted.
6	5/22/2020	Ted Stonecliffe	If you want to show the on-time performance of Route 40X, you can state that it was 89% on-time in Fiscal Year 19, which is higher than the Cherriots Regional average of 85%.	Comment resolved. Text updated as noted.
7	5/22/2020	Ted Stonecliffe	Another category for ADA accessibility should be added to this section. ADA accessibility of bus stops, including parking prohibitions should be highlighted as necessary for the bus stops to be complete. The "excellent" category could say that all bus stops are ADA compliant and have parking prohibited to allow the bus to serve the curb and load/unload mobility devices safely. "Good" could be 85-99% of stops which are ADA compliant and/or have parking removed. "Fair" could be 70-84% of stops. And "poor" could be anything 69% or fewer stops ADA compliant.	Comment resolved. Text updated as noted. Additional category subsection added.
8	5/22/2020	Ted Stonecliffe	Somewhere in the document, if you are prioritizing capital improvements, pedestrian and bicycle facilities also benefit transit users since our riders usually arrive to the bus by walking or bicycling (it has been shown that the single best thing to do to increase transit ridership is to increase the availability of sidewalks and bicycle facilities leading to the transit stops).	Comment to be addressed in future tasks
9	5/21/2020	TAC Meeting	Reconsider the frequency and on-time reliability ranges for the transit QMA	Comment resolved. Based on comments from Ted.
10	5/21/2020	TAC Meeting	Consider a separate criterion for ADA accessibility (e.g. landing pads)	Comment resolved. Based on comments from Ted.
11	5/21/2020	TAC Meeting	Crash analysis appears to be missing a fatal bike crash	No action needed/recommended. The crash is located outside the city limits/UGB
12	5/21/2020	TAC Meeting	Consider including a summary of "other safety concerns"	Comment resolved as indicated below
13	6/1/2020	Corby Chappell	7th Street intersection with Monmouth needs some form of traffic control	Comment resoved - added as additional safety concern

14	6/1/2020	Corby Chappell	Difficult to turn left onto Monmouth at certain times of the day from 11th Street	Comment resoved - added as additional safety concern
15	6/1/2020	Tori Middelstadt/ Kevin Mahoney	Turn from River Road south onto Main Street is a difficult turn. Tough to find a gap, and speeds of northbound traffic can sometimes be too fast. Northbound Main Street/Corvallis Road drops from 50 to 35 right before the bridge, and sometimes people do not slow before the bridge.	Comment resoved - added as additional safety concern
16	6/1/2020	Natascha Cronin	Three way stop in downtown has many close calls for pedestrians	Comment resoved - added as additional safety concern
17	6/1/2020	Natascha Cronin	Access from dog park has poor visibility at Main	Comment resoved - added as additional safety concern
18	6/1/2020	Tori Middelstadt	Osprey Lane gets blocked by traffic backups at 3-way stop	Comment resoved - added as additional safety concern
19	6/1/2020	Alex Paraskevas	The Gun Club and Hoffman intersection is not stellar. The speed on Hoffman is 35 to 40 mph, and people have to dart between traffic.	Comment resoved - added as additional safety concern
20	6/1/2020	Sally Coen/ Kate Schwarzler	The Polk and Main Street intersection is difficult. A lot of activity comes into the small intersection – truck travel, pedestrian traffic, bus stop nearby, etc. People potentially cut by on Stryker to get around the intersection.	Comment resoved - added as additional safety concern
21	6/1/2020	Kate Schwarzler	Downtown intersections sometimes unsafe for pedestrians. Sometimes people don't stop.	Comment resoved - added as additional safety concern
22	6/5/2020	Spanish Language Group	6th has lots of cars between Monmouth and G, and visibility on side streets is poor.	Comment resoved - added as additional safety concern
23	6/5/2020	Spanish Language Group	The three-way stop at Main and Monmouth is not safe for pedestrians.	Comment resoved - added as additional safety concern
24	See Comments_Open House #1_English tab		1224: I cannot believe you show BLTS 1 on south 16th street! Once one is south of Ash Creek there is no space for a bicyclist!	No action needed/recommended. 16th Street was reviewed. There are bike lanes provided south of Ash Creek.
25	See Comments_Open House #1_English tab		1236: Bicycle stress on Independence Highway south should be at least the equal of Main Street north as there are no designated bike lanes on the south contrary to the north (where there is also an off-system river trail). Given the narrow walkways or non-existent walkways in the South, there is an enhanced feeling of stress in this locale	No action needed/recommended. BLTS charateristics were reviewed and verified. Althrough the BLTS follows the ODOT APM procedure, the analysis is only a starting point for identifying potential project locations. Main Street, OR 51, and Corvallis Road will be further reviewed in future tasks.

Independence Transportation System Plan (TSP) Update Tech Memo #4: Future (No-build) Conditions Anlaysis				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
N/A	8/5/2020	Fred Evander	See PDF for comments	Comments resolved.
1	8/7/2020	ODOT	P. 2 3rd paragraph, last sentence, "yeas" should likely be "year".	Comment resolved. Text updated.
2	8/7/2020	ODOT	P. 8 Table 4, in the v/c column it should be >1 instead of <1 when the intersection is over capacity, same for Figure 4 on p. 10. Region Traffic prefers the TSP process identify the actual calculated v/c ratio (1.##) up to 2.0 and identify "> 2" for ratios over 2.0.	Comment resolved. Text updated.
3	8/7/2020	ODOT	P. 12 95th percentile queues should always be rounded UP to the nearest 25 (as is stated in the last paragraph on p. 11): -Gun Club at Monmouth EBL 57 -> 75', WBL 16 -> 25' -Monmouth/16th WBL 78 -> 100' -see Appendix C reports on pp. 44 and 47/56 of pdf.	Comment resolved. Text updated.
4	8/7/2020	ODOT	P. 16 Traffic volumes do impact BLTS in mixed traffic, see APM Exhibits 14-5, 14-6 for BLTS; and PLTS for arterial unsignalized intersection crossings, see Exhibits 14-26, 14-28, 14-29; so a future analysis of both of these performance measures may need to be performed.	Comment resolved. BLTS analysis updated.
5	8/10/2020	ODOT	Page 7 – Regional Growth –the growth on OR 51 at the north city limits is projected to be 18.7% and only 3.6 on Monmouth by 2040. Prior assumptions were that most of the new households are thought to be in the SW part of the city while employment is in the north part of the city. In addition to confirming that this is the correct growth, the project team should be prepared to respond to comments/questions on this topic that may come from the PAC/TAC/Open House.	Comment resolved. Updates to the projected growth and regional growth based on comments from City and ODOT.
6	8/10/2020	ODOT	Page 8 – Table 4 and descriptors – spell out delay (not just 'del'). Also, intersection #11 has the different standards. Please add a footnote on use of different standards for this intersection.	Comment resolved.
7	8/10/2020	ODOT	As a general note, the signal at OR 51 and 16th has had a recent modification that changed the side street green ball to flashing yellow arrow along with some timing changes (not ped and peak hour conditions).	No action needed/recommended. The provide signal timing plans included the side street flashing yellow arrow update and was analyzed for both existing and future conditions.
8	8/20/2020	TAC	Verify traffic operations at the Hoffman Road/Gun Club Road intersection and compare the volumes and results to the County TSP – Coordinate w/ Kie on County Contacts.	No action the County TSP does not identify operational issues or needed improvements at the Hoffman Road/Gun Club Road intersection.
9	8/20/2020	TAC	Update Route 45 bus stop locations – Coordinate with Ted on locations.	Comment resolved. Based on comment 13 provided by Ted.
10	8/20/2020	TAC	Add concrete landing pad to evaluation criteria for transit facilities.	Comment resolved. Text added.
11	8/20/2020	TAC	Review traffic safety at OR 51/Deanne Drive	No action the crash history of the intersection was reviewed in previous memos as part of a segment analysis. Further review of the intersection alone shows no additional trends or patterns in the available data.

12	8/20/2020	CAC	Consider wetland/density information for SW Independence – Coordinate with Harvey Cummings on data.	No action needed/recommended. Coordinated with Harvey, and no changes needed beyond the other edits already occuring from City and ODOT review.
13	8/24/2020	Ted Stonecliff	Fig. 5: correct bus stops on E Street to show only one bus stop at 1038 E Street (north side of the street).	Comment resolved. Figure updated.
14	8/24/2020	Ted Stonecliff	Correct total number of bus stops for Route 45 from 12 to 11 throughout the document.	Comment resolved. Text updated.
15	8/24/2020	Ted Stonecliff	P. 13: evaluation of transit: qualitative assessment should include the Route 40X, not just an evaluation of Route 45.	Comment resolved. Text added.
16	8/24/2020	Ted Stonecliff	P. 13: ADA accessibility – bus stop landing pads will not be provided at 5 of the 11 new Route 45 bus stops.	Comment resolved. Text added.

Independence Transportation System Plan (TSP) Update Tech Memo #5: Alternatives Anlaysis				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
1	8/17/2020	Keith Blair	P. 2. "Functional Classification" section – For changes to the existing functional classification and updating the federal classification map, coordinate with ODOT's Jennifer Campbell.	No action needed/recommended. This is a note for the City when the TSP update is finalized.
2	8/17/2020	Katie Brown	P. 4. Fig. 2 It'd be nice if the legend didn't cover the SW corner of the network especially because it seems like something of interest may be going on there.	Comment resolved. Figure updated as noted.
3	8/17/2020	Katie Brown	P. 6 Why is the intersection "not expected" to meet PSW? Conducting the PSW analysis is a pretty quick process. Shouldn't the PSW at that intersection just be evaluated? I think that is a standard piece of the analysis procedure. This comment applies to all of the intersection descriptions. It's also confusing that all of the intersections are described to not meet PSW but then mostly offer a signal as a feasible mitigation.	Comment resolved. Updated text and tables according to signal warrants.
4	8/17/2020	Keith Blair	P. 6-7 "Main Street/Monmouth Street" section – If a traffic signal with NBL turn lane was evaluated, why was maintaining the AWSC with the additional of a NBL and/or SBR turn lane(s) not also evaluated? While it may not be desirable for the City to remove parking near this intersection for turn lane(s), it could be one of the more context-appropriate designs.	Coment resolved. Evaluated as AWSC with separate turn lanes.
5	8/17/2020	Kristie Gladhill	P. 7 "OR 51-Monmouth Street/4th St" first bullet, clearly state which roadway changes are being proposed on, in this case I believe it's for Monmouth. This comment repeats throughout this section of the TM.	Comment resolved. Updated text as suggested.
6	8/17/2020	Kristie Gladhill	P. 7 "OR 51-Monmouth Street/7th St" first bullet, clearly state which roadway changes are being proposed on, in this case I believe it's for Monmouth. This comment repeats throughout this section of the TM.	Comment resolved. Updated text as suggested.
7	8/17/2020	Dorothy Upton	P. 7 Regional Growth – please verify that the growth on OR 51 at the north city limits is projected to be 18.7% and only 3.6 on Monmouth by 2040. Most of the new households are thought to be in the SW part of the city while employment is in the north part of the city.	No action. The growth rates were developed from ODOTs future volumes tables in accordance with the APM and confirmed with TPAU.
8	8/17/2020	Keith Blair	P. 8 "OR 51-Monmouth Street" section – It is not clear to me where this "intersection" is. I believe this is a typo and should be titled "Monmouth Street/Gun Club Road?"	No action. We are consistently referring to "Monmouth Street" as "OR 51-Monmouth Street" and "Main Street" as "OR 51-Main Street"
9	8/17/2020	Dorothy Upton	P. 8 Table 4 and descriptors – spell out delay (not just del). Also, why does intersection #11 have the different standards? Also, note that the signal at OR 51 and 16th has had a recent modification that changed the side street green ball to flashing yellow arrow along with some timing changes (not ped and peak hour conditions).	Comment resolved. See Tech Memo #4 comment log.
10	8/17/2020	Katie Brown	P. 9 Table 1 Is this table depicting the revised standards? If so, it would be nice to add a column identifying what the current standard is so the reader can ascertain how large the potential deviation from the existing standard is.	Comment resolved. Added table showing current standards and updated text to indicate what has changed.
11	8/17/2020	Keith Blair	P. 16 Figure 3 – This figure only shows what the system will look like after all improvements have been implemented. I recommend it be modified to show the locations of the improvements.	Comment resolved. Updated figures to show the location of existing sidewalks, sidewalk gaps, and stress levels.

12	8/17/2020	Keith Blair	P. 22 Figure 4 – This figure only shows what the system will look like after all improvements have been implemented. I recommend it be modified to show the locations of the improvements.	Comment resolved. Updated figures to show the location of existing bike lanes, bike lane gaps, and stress levels.
13	8/17/2020	Katie Brown	P. 24 If the BLTS analysis indicates that Ash St/4th St is already suitable for most bicyclists, why are mitigations proposed?	Comment resolved. Updated text to reflect purpose of recommendations.
14	8/17/2020	Katie Brown	P. 24 If the BLTS analysis indicates that 13th St/7th St is already suitable for most bicyclists, why are mitigations proposed?	Comment resolved. Updated text to reflect purpose of recommendations.
15	8/17/2020	Katie Brown	P. 24 If the BLTS analysis indicates that Picture St/Williams St …. is already suitable for most bicyclists, why are mitigations proposed?	Comment resolved. Updated text to reflect purpose of recommendations.
16	8/17/2020	Katie Brown	P. 32 Do the numbers in the gold circles refer to anything? If they are just residual from the source the image was pulled from, it might be better to choose an image without those.	Comment resolved. Figure notes updated.
17	8/17/2020	Katie Brown	P. 34 There is a small typo. "Entirely" should be "entirety".	Comment resolved. Text updated.
18	8/17/2020	Katie Brown	P. 39 There is a typo here. Not totally sure what this sentence is trying to say: "Expand SRTS program to middle school and high school students and consider within the Independence."	Comment resolved. Text updated.
19	8/17/2020	Keith Blair	P. 40 "Intersections" section – As roundabouts are one of the most beneficial safety countermeasures, it should also be listed as an traffic control device example.	Comment resolved. Text updated.
20	8/17/2020	Keith Blair	P. 41 This page is visually uncomfortable. Perhaps all the headings in the two columns should be aligned with each other?	Comment resolved. Formatting updated.
21	8/17/2020	Katie Brown	P. 46 Figure 8 - I'm having a hard time interpreting this map. I don't understand what the red arrows are meant to depict. Are they all of the dangling local roads? Or are they dangling local roads that have been identified to provide a significant improvement if extended? And some of them kind of point to nowhere so it's confusing to me what improvement they are indicating is needed. Also, I think the addition of a few of the more major street names would help. When I was trying to locate the identified Street Extensions it was pretty difficult to orientate.	Comment resolved. Updated text to further clarify the use of the arrows and updated figures to include street names.
22	8/17/2020	Kristie Gladhill	P. 45-46 Street Extensions and Fig. , would prefer lines showing connections to red arrows; and numbers identifying these to correspond to bullet list of street extensions, rather than needing to try tofigure all these out.	Comment resolved. Updated text to further clarify the use of the arrows.
23	8/17/2020	Katie Brown	P. 48 There are a couple of small typos. ". . . .desired future technology than alterations . . . .". than should be then. Also ridged policies should be rigid policies (I think).	Comment resolved. Text updated.
24	8/17/2020	Kristie Gladhill	P. 48 You should specify that you mean a fiber optic cable network, not fiber from plants.	Comment resolved. Text updated.
25	8/17/2020	Kristie Gladhill	P. 49 Regarding e-scooters, policies should include, amoung other things: - Where are they to be used, i.e. are they allowed to use vehicle traffic lanes? - If using traffic lanes, what are turn signal requirements?	Comment to be addressed in future tasks.
26	8/17/2020	Katie Brown	P. 49-50 Is parking currently an issue in Independence? That wasn't really clear. If so, it would be nice to get a sense of how big of an issue it is. Does the community see it as a problem?	Comment to be addressed in future tasks.
27	8/17/2020	Katie Brown	P. 52 "….significant reduction in traffic facilities and serious injuries….". Should that be fatalities?	Comment resolved. Updated text as suggested.
28	8/17/2020	Kristie Gladhill	P. 52 ARTS used HSIP funds, please indicate this in the funding sections including Tabel 3. Listing HSIP under federal, and ARTS as part of STIP (which it is) and again spearately under state funds may lead readers to think these are separate funding sources.	Comment resolved. Updated table as suggested.
29	8/17/2020	Keith Blair	P. 55-56 Table 3 – Why does this table only list bicycle and pedestrian infrastructure as applicable project types for essentially all funding sources?	Comment resolved. Removed applicable project types.
30	8/17/2020	Kristie Gladhill	P. 56 "Intended use" column should list the systemic areas for ARTS: roadway departure, intersection safety, and bicycle and pedestrian safety.	Comment resolved. Updated table as suggested.

31	8/17/2020	Kristie Gladhill	P. 60 2nd sentence, suggested re-wording, just say "trips" instead of "vehicle trips (see strike through edit below): increased demand will increase trips; TDM is an attenpt to keep that from increasing vehicle trips by promoting travel other than in SOV's. "As population and employment increase in the city, the number of ~~vehicle~~ trips will also increase."	Comment resolved. Updated text as suggested.
32	8/17/2020	Keith Blair	As the traffic analysis software reports were not included within the appendix, I am not able to review or comment on the accuracy of the reported traffic analysis of the various alternatives.	Comment resolved. Added traffic operations worksheets.
33	8/20/2020	TAC	Consider shared-use paths and trails as alternatives to on-street bike lanes.	Comment to be addressed in future tasks.
34	8/20/2020	TAC	Consider connection to WOU, the Willamette River, the OR 99E Trail, and the Willamette Valley Trail.	Comment resolved. Added to list of shared-use path/trail projects.
35	8/20/2020	TAC	Include shared-use paths and trails on pedestrian and bicycle maps.	Comment resolved. Added a trails map
36	8/20/2020	TAC	Consider an east-west connection between G Street and Madrona Street.	Comment resolved. Added an east-west connection as suggested.
37	8/20/2020	TAC	Consider a roundabout at G Street/Main Street to address traffic operations at Corvallis Road/River Road.	Comment to be addressed in future tasks.
38	8/20/2020	TAC	Change the Picture Street extension to a pedestrian/bicycle connection.	Comment resolved. Text and figures updated.
39	8/20/2020	TAC	Consider a couplet in the downtown area to address operations at Monmouth Street/Main Street.	Comment resolved. Added a couplet to the intersection alternatives for OR 51-Main Street/OR 51-Monmouth Street.
40	8/20/2020	TAC	Note that state highway access spacing needs to meet ODOT standards.	No action needed/recommended. This is already noted in the memo text.
41	8/20/2020	TAC	Explain “ROW” in bicycle hand-out/appendix materials. Also identify other areas where ROW may be impacted by alternatives.	No action. The handout were used for the TAC/PAC meetings and the open house.
42	8/20/2020	TAC	Consider additional transit connections on G and/or I Streets.	Comment resolved. Alternative added.
43	8/20/2020	TAC	Reconsider 16th Street as designated freight route – all local schools are located along 16th.	Comment resolved. Keep 16th as a route based on PMT #6 and direction from Harvey.
44	8/20/2020	TAC	Add improvements to the rail alternatives necessary to achieve a quiet zone.	Comment resolved. Text added.
45	8/20/2020	TAC	Review traffic safety at OR 51/Deanne Drive.	Comment resolved. Text added.
46	8/20/2020	CAC	Identify which alternatives have potential right-of-way impacts.	Comment resolved. Text added.
47	8/20/2020	CAC	Consider impacts of TWLTL on on-street bike lanes.	Comment to be addressed in future tasks.
48	8/20/2020	CAC	Consider traffic control alternatives for the Hoffman Road/Gun Club Road intersection.	No action. Hoffman/Gun Club Road does not have any existing operational or safety issues per the existing and future conditions analysis.
49	8/20/2020	CAC	Include “Farm Equipment” in description of need for local freight routes.	Comment resolved. Text added.
50	8/20/2020	CAC	Consider changes to freight route designations to accommodate farm equipment – Coordinate with Harvey Cummings on freight route information.	Comment resolved. Farm equipment included in designations. Route designations updated based on PMT #6 and direction from Harvey.
51	8/20/2020	CAC	Consider improvements to E and F Streets to decrease pedestrian/bicycle use of Monmouth.	No action. We are considering improvements to C and D Street to serve as a parallel routes to OR 51-Monmouth Street.

52	8/20/2020	CAC	Consider a pedestrian network map, similar to the local street connectivity map.	No action. Figure 3 illustrates the pedestrian network map.
53	8/24/2020	Ted Stonecliff	P. 25: multiple stops in Independence "throughout the community." Instead of "along OR51."	Comment resolved. Text updated.
54	8/24/2020	Ted Stonecliff	P. 26: change "trash cans" to "trash receptacles."	Comment resolved. Text updated.
55	8/24/2020	Ted Stonecliff	Change statement of local garbage company picking up trash at bus stops to the city public works crews.	Comment resolved. Text updated.
56	8/24/2020	Ted Stonecliff	Transit alternatives section could mention the need for transit ITS components such as real time bus arrival reader boards at major stops and the development of apps.	Comment resolved. Text added.
57	8/24/2020	Ted Stonecliff	Transit fares: include a recommendation for the Route 45 local service to be cheaper than a trip to Salem.	Comment resolved. Text added.
58	8/24/2020	Ted Stonecliff	Fig. 5: I'm happy to discuss options for the future transit network shown in this figure. Should we show a future trolley running on Monmouth Street that will be the outcome of the feasibility study going on now?	Comment resolved. Figure updated.
59	8/24/2020	Ted Stonecliff	We should also have a statement somewhere in the document stating that transit stops should be considered for any new street built in the city.	Comment resolved. Text added.
60	8/24/2020	Ted Stonecliff	P. 27: last paragraph: "cover" is redundant in 3rd sentence.	Comment resolved. Text updated.
61	8/24/2020	Ted Stonecliff	P. 29: transit stop improvements: - Stop 1515 – ADA ramps were completed in August 2020. - Stop 1516 – the concrete pad is already present; add "provide bicycle parking, storage, and repair station." - Stop 1518 – concrete pad already present; parking already restricted; ADA ramps already exist. - Stop 1502 – concrete pad already present.	Comment resolved. Text updated.
62	8/24/2020	Ted Stonecliff	P. 50: State grant funding sources: replace HB 2017 with Statewide Transportation Improvement Fund (STIF); add Special Transportation Fund and Section 5310 grant programs.	Comment to be addrssed in future tasks.
63	8/31/2020	Rich Clark	1. When is Chestnut St. bridge over South Fork of Ash Creek happening? I think it is important to have the bridge built before much further residential building, to decrease traffic load on 7th St.	Comment to be addressed in future tasks. The updated TSP will include high-level priorities, although exact timing of any project will be dependent on funding and City staff
64	8/31/2020	Rich Clark	2. The Alternative Analysis did not incorporate multi-use trails along both sides of the riparian zone of south fork of Ash Creek, and did not discuss much about multi-use trails along the main stem of Ash Creek.	Comment resolved. Added trails and trail map
65	8/31/2020	Rich Clark	3. I would suggest flashing light pedestrian crossings on Monmouth Ave, and at Grand St. and Hwy 51.	No action. The pedestrian alternatives identifeies the need for enhanced crossings on OR 51-Monmouth Street. We tend to not identify specific crossing locations in TSPs, particularly on ODOT facilities.
66	8/31/2020	Rich Clark	4. Signal optimization—can it adjust for rush hour traffic, e.g. have flashing yellow light on 51/flashing red on Polk for most of the day, then traffic control during high flow times? Can it adjust to current traffic flow? This seems like it would warrant further investigation.	No action needed/recommended. If signal optimization is the preferred alternative and included in the updated TSP, a more detailed study will be conducted to determine appropriate changes based on traffic conditions when the project is funded.

67	8/31/2020	Rich Clark	5. Parking: - I don't think we spent adequate looking at design for meeting parking needs downtown - One option for improving traffic flow at Monmouth/Main was to 'install an actuated-uncoordinated traffic signal with a northbound left turn lane with 100ft of storage when warrants are met – this would require restricting on-street parking for two blocks.' This would further limit parking availability.	Comment to be addressed in future tasks.
68	8/31/2020	Rich Clark	6. To improve future traffic flow at Monmouth/7th Ave, I think we need to install alternative routes prior to much further construction: - Install southern corridor – this alternative would redistribute volumes away from the intersection. - Extend Chestnut Street southwest to the new east-west collector. - Extend 7th Street south to the new east-west minor arterial. - Construct a new east-west collector from 16th Street at Madrona Street to 13th Street. - Construct a new east-west collector from 16th Street at Gwinn to the new east-west minor arterial. - Construct a new east-west minor arterial from 16th Street at Ash Creek Drive to Corvallis Road.	No action needed/recommended. The six roadway extensions or new major roadways listed are included in memo.
69	8/31/2020	Rich Clark	7. I would wonder if it would be useful to us signal timing/phasing optimization for the following intersections: - OR 51/Pol - Main Street/Monmouth St. - Hoffman/Stryker	No action needed/recommended. Signal timing/phasing optimation is an alternative for signalized intersections. Potential signalization of failing study intersections is considered in the memo.
70	8/31/2020	Rich Clark	8. At Main St./River Rd., a traffic light seems like the best choice to me.	Comment to be addressed in future tasks.
71	8/31/2020	Rich Clark	9. I think it's a very good idea to create the share use connections: - North South Connector Trail #1 – south of Hoffman Road to Wildfang Park. -North South Connector Trail #2 – north from OR 51-Monmouth Street to Wildfang Park - Ash Creek Trail Phase I – east/west trail connection from Riverview Park to Wildfang Park - Mt. Fir North-South Trail – north/south trail from F Street to Mt. Fir Park and south across Becken Road - Mt. Fir Connector Trail – east/west connection from Mt. Fir Street to Corvallis Road - River Trail – north/south trail along Willamette Riverfront - Going to the River Trail – east/west connection from Williams Street to Howard Court - Central High School Connector Trail – north/south connection from Central High School to neighborhoods south of OR 51-Monmouth Street These shared pathways are not included on the bicycle or pedestrian facilities maps (pp. 16 & 22) of Alternatives Analysis.	Comment to be addressed in future tasks.
72	8/31/2020	Rich Clark	10. I would suggest to make the E St./F. St./Randall Way east west connector friendly for pedestrians and bicycles.	Comment to be addressed in future tasks.
73	8/31/2020	Rich Clark	11. Because making Monmouth Ave more bicycle/pedestrian friendly makes it less vehicle friendly, it might be better to make Monmouth Ave. vehicle friendly, and route bike/pedestrian traffic along C and D streets, or E. St./F. St./ Randall Way.	Comment to be addressed in future tasks.
74	8/31/2020	Rich Clark	12. I would think it would be a good idea to make a shared use connection from Mt. Fir Park across Becken Lane and Maple St., through Unnamed Park, then across Chestnut St. to Washington St., to Mt. Fir Ave. This would be a more pleasant than on 7th St., as there is high traffic volume. (A pedestrian crossing might be useful at Chestnut St.)	Comment resolved. Added trails and trail map

75	8/31/2020	Rich Clark	13. A major omission in the pedestrian and bike connectivity sections: including shared pathways along <u>both edges of the riparian areas along the South Fork of Ash Creek</u>, and along the main stem of Ash Creek, where feasible. This would have great recreation and wildlife enhancement value, and it should highlight the gem of Inspiration Garden. It would be helpful to review the SW Independence Concept Plan.	Comment resolved. Added trails and trail map
76	8/31/2020	Rich Clark	14. Shared use (not automobile) bridges over the South Fork of Ash Creek, which connect to south 10th or 11th streets (and other locations) would create walking/biking routes of enhanced interest and variable lengths for users of different capabilities. The bridges would help create safe routes to school and business for residents of south and southwest Independence.	Comment resolved. Added trails and trail map
77	8/31/2020	Rich Clark	15. Would it be feasible to put in shared use pathways from 13 St., just south of F St., in a southeast direction along the drainage into the South Fork of Ash Creek? This would help to create safe routes from south and southwest Independence to businesses and school, and would help to create a network of trails along South Fork of Ash Creek.	Comment resolved. Added trails and trail map
78	8/31/2020	Rich Clark	16. A general comment about meeting format. I think there was inadequate time for CAC member discussion and questions.	Comment to be addressed in future tasks. Will take this into consideration for future meetings.
79	8/31/2020	Rich Clark	17. Also, is the lighting used in the future consistent with the International Dark Sky Initiative (https://www.darksky.org/)?	No action needed/recommended. All new street lighting would analyzed, designed, and implemented in accordance with local, state, and/or federal standards as appropriate.
80	8/31/2020	Tom Takacs	1. Main /Monmouth St intersection. Traffic light seems to be the only acceptable alternative. Seem much too tight for a roundabout and even after removing the bump outs, it seems pretty tight for turn lanes. What about a light where each direction takes a turn?	Comment resolved. Removed roundabout and added a few additional signal alternatives.
81	8/31/2020	Tom Takacs	2. Hoffman Rd/Stryker. Roundabout might work there. How much space is needed to tractor-trailer traffic?	No action needed/recommended. If a roundabout is the preferred alternative and included in the updated TSP, the design of the roundabout and considerations for freight vehicles will be conducted when the project is funded.
82	8/31/2020	Tom Takacs	3. Monmouth St/4th St. Didn't understand what was meant by "One Way SB" but it gave me a thought. Would it be useful to create a NB/SB gridwork of streets to improve flow to and from some of the new development?. I know it would drive some people crazy but it is a solution many cities have had to go to with their older neighborhoods.	Comment to be addressed in future tasks
83	8/31/2020	Tom Takacs	4. Main St./River Rd. Like the idea of a roundabout but, again, is there really space for one?	Comment to be addressed in future tasks.
84	8/31/2020	Tom Takacs	5. Bicycle Lanes East/West. I don't mind road sharing on some of the residential streets such as C and D St. but I would be concerned about lost parking if we add dedicated bike lanes.	Comment to be addressed in future tasks.
85	8/31/2020	Tom Takacs	6. Ash Creek Bike Trail. Are the same obstacles that stopped it 15-18 years ago still in place? It would be an ideal connection from Downtown to WOU.	Comment to be addressed in future tasks.
86	8/31/2020	Tom Takacs	7. New East/West Southside Bypass. Have not heard much about it but it seems to be a critical piece for future transportation.	No action needed/recommended. The southern major arterial is included in the memo.
87	8/31/2020	Tom Takacs	8. How does the Parks Master Plan affect the TSP with proposed biking and walking trails	Comment to be addressed in future tasks - Projects identifed in the parks plan will be incoporated into the TSP.

88	9/15/2020	Janelle Shanahan (Marion County)	Rear-end collisions on bridge due to limitations on sight visibility. Could benefit from warning system (a warning system may actually have dual purpose of alerting individuals to cyclists)	Comment resolved. Text added.
89	9/15/2020	Janelle Shanahan (Marion County)	A couple of alternatives at the intersection were not considered in the alternative analysis. Would benefit from looking at the possibility of a four-way stop and reversing the stop priority at the intersection.	Comment resolved. Considered all-way stop with left and right-turn lanes.
90	9/15/2020	Janelle Shanahan (Marion County)	Potentially it is possible to cantilever a bike path off the bridge.	Comment resolved. Updated text to include a cantilevered bike path.
91	9/15/2020	Janelle Shanahan (Marion County)	An actuated bike signal or similar warning system may be possible. Linking the system with a similar vehicular alert system on the bridge may make sense.	Comment resolved. Added River Road alternatives to the Bike Connectivity section.
92	9/17/2020	Lance (Independence Police)	Traffic off the bridge is the worst issue. Often backed up into Marion County. Too bad that there is not more space - it is a perfect space for a roundabout. A three-way stop may not be useful due to the amount of traffic on Corvallis.	Comment resolved. An all-way stop-control and roundabout were evaluated as potential alternatives.
93	9/17/2020	Lance (Independence Police)	Write a lot of tickets on Corvallis Road. Very high speeds in the area both south and northbound. Many people coming off bridge heading south go fast. Northbound people tend to slow down by the time they hit the bridge, though recently wrote a ticket for 52 mph at G St.	No action needed/recommended. Alternatives to address speed on Corvallis Road are included in the memo.
94	9/17/2020	Lance (Independence Police)	A lot of traffic at Main and Monmouth. Don’t think that residents want a full-blown intersection in the area.	Comment to be addressed in future tasks
95	9/17/2020	Lance (Independence Police)	Speeds are too fast on 7th Street. Stop signs are helpful to slow the speed, though the E Street stop is weird and feels like it should be four-way. Write a lot of tickets of people running the stop sign at 7th and G Streets.	Comment resolved. Added traffic calming measures on 7th Street as potential safety measures.
96	9/17/2020	Lance (Independence Police)	A through route from G to Randall would increase speeding complaints.	Comment to be addressed in future tasks
97	9/17/2020	Lance (Independence Police)	Gun Club - Should be a 25 mph zone	Comment resolved. Added traffic calming measures on Gun Club Road as potential safety measures.
98	9/17/2020	Lance (Independence Police)	Stryker Road is used for commuters heading north (in the morning), who take a straight line to their destination. Their route is reversed in the evening. People avoid the 25 mph Polk Street. Speeds can be an issue on Stryker Road as a reuslt.	Comment resolved. Text added.
99	9/17/2020	Lance (Independence Police)	Some crazy fast traffic on Hoffman - partially because the facility feels like a rural road. Written some tickets for people travelling in the high 60 mphs. (Fred's Note: Potentially, an alternative that attempts to make the road feel more urban - street trees on the north, narrower lanes, etc.) is warranted.	Comment resolved. Text added.
100	See Comments_Open House #2_English tab		1003: There is no east west crosswalk on Hoffman crossing Stryker. It isn't even clear how or where one could safely cross. There is no connection to the sidewalk/enhanced crosswalk on the east side of Stryker or to the sidewalk on the south side of Polk. The intersection is busy and dangerous to cross. Also, although there is a crosswalk at Polk/Hwy 51, few cars actually stop for someone. Needs a flashing pedestrian light.	Comment resolved. Text added.
101	See Comments_Open House #2_English tab		1005: There is an existing 'no left turn sign' posted at the intersection of Hoffman and Stryker. It is routinely ignored. Traffic leaving Hoffman in front of Marquis spas turns left onto Stryker to get to Polk/continuation of Hoffman. This intersection needs to be re- engineered. Eastbound traffic on Hoffman turning north onto Stryker routinely cuts the corner crossing Strykers southbound lanes, or if continuing onto Hoffman essentially drives straight across intersection. There is no safe way to cross Stryker east-west.	Comment resolved. Text added.
102	See Comments_Open House #2_English tab		1013: Connect the River and Ash Creek trails in a big loop around Independence	Comment resolved. Added trails and trail map
103	See Comments_Open House #2_English tab		1023: I live on 4th street. I get that it needs to be a route for people. But when those people drive 45 miles per hour it is not okay. It needs humps, bumps, and some ticket writing.	Comment resolved. Text added.

104	See Comments_Open House #2_English tab	1041: There are stretches of sidewalk on 3rd, 4th, and 5th streets on either side of Or 51 that need rebuilding. Stryker Road at Or51 and RR crossing needs sidewalk.	Comment resolved. Added pedestrian improvements to Stryker Road
105	See Comments_Open House #2_English tab	1047: Complete loop at south end of river trail along former RR ROW to Mt. Fir Park	Comment resolved. Added trails and trail map
106	See Comments_Open House #2_English tab	1048: Create trail and park amenities to and through Airpark	Comment resolved. Added trails and trail map
107	See Comments_Open House #2_English tab	1052: Consider local fuel taxes for additional maintenance funding. Consider mix of bond funding and assessment bonds for major improvements with a mix of citywide and localized benefit; eg East/west connector.	Comment to be addressed in future tasks
108	See Comments_Open House #2_English tab	1053: Place stop sign on 5th at G eventually remove stop sign on G at 5th. Retain 4 way stop at 4th and G.	No Action 5th/G is an all way stop, 4th/G is not. Also, these types of projects are typically not addressed in TSPs
109	See Comments_Open House #2_English tab	1056: Multiple stop signs or speed bumps throughout Gun Club Rd.	Comment resolved. Text added.
110	See Comments_Open House #2_English tab	1122: Do you agree with the local street connections shown in the figure above? Keep Morning Glory Dr a culti sac	Comment resolved. Figure updated.
111	See Comments_Open House #2_English tab	1171: Where else should we consider shared-use paths and trails in Independence? The is a huge disconnection East/West for the subdivision and community living south of the River Road Bridge. A connection to east/west would help better connect the community.	Comment resolved. Added trails and trail map
112	See Comments_Open House #2_English tab	1172: Where else should we consider shared-use paths and trails in Independence? save paths to the grocery stores	Comment resolved. Added trails and trail map
113	See Comments_Open House #2_English tab	1173: Where else should we consider shared-use paths and trails in Independence? We fought the horribly design for the Ash Creek Trail with many citizens. The city went ahead bull headed and would not acknowledge the cost & the impact upon the riparian zone alongside Ash Creek + the high cost of construction & maintenance. The stupidity of this trail is aware to most citizens but not staff members, council members & the mayor of Independence. It is time to put this fantasy to rest and focus on connectivity of sidewalks and focus on trails along the river which are safer, and would have more pedestrians.	Comment resolved. Added trails and trail map
114	See Comments_Open House #2_English tab	1174: Where else should we consider shared-use paths and trails in Independence? Multiple shared use trails across South Fork of Ash Creek Shared use trail on both side of South Fork of Ash Creek Trails connecting 10th/11th streets to trails along South Fork of Ash Creek	Comment resolved. Added trails and trail map
115	See Comments_Open House #2_English tab	1175: Where else should we consider shared-use paths and trails in Independence? Your map is difficult to read on a computer. Where does the Mt. Fir path go south of Chestnut Street? It is all built up there, no pathway through a greenway. Is it to be on streets? When will the path be extended South? That isn't in your options listed above. The concrete is already south in Mt. Fir park to Becken Lane.	Comment resolved. Added trails and trail map
116	See Comments_Open House #2_English tab	1176: Where else should we consider shared-use paths and trails in Independence? Inexpensive vacant lots scattered in the high residential areas of Monmouth should be surveyed for community green space (like Edwards Addition)	No action. Not directly related to transportation
117	See Comments_Open House #2_English tab	1177: Where else should we consider shared-use paths and trails in Independence? I would like to see a pedestrian and bike friendly ash creek trail that extends from Independence to the West of Highway 99 to provide a safe and pleasant bike and walking connection between Independence and Monmouth.	Comment resolved. Added trails and trail map
118	See Comments_Open House #2_English tab	1260: Where do you think traffic calming should be provided? Speed humps Northgate Dr. east of Gun Club	Comment resolved. Text added.
119	See Comments_Open House #2_English tab	1263: Where do you think traffic calming should be provided? Gun Club & C Street	Comment resolved. Text added.
120	See Comments_Open House #2_English tab	1265: Where do you think traffic calming should be provided? morning glory dr is dense residential and fast speeding cars.	Comment resolved. Text added.

121	See Comments_Open House #2_English tab		1267: Where do you think traffic calming should be provided? Speed bump(s) on morning glory dr.	Comment resolved. Text added.
122	See Comments_Open House #2_English tab		1269: What other rail enhancements should be considered? MAKE SURE THERE IS A TIME WHERE THEY TRAIN MAKES NOISE (ALARMS)	Comment resolved. Text updated.
123	See Comments_Open House #2_English tab		1311: Which areas do you believe Independence should focus more effort on? Improve disabled parking sidewalk access. Current disabled parking on both Main Street and C Street require the person to enter the roadways then enter the crosswalks before they can enter a sidewalk.	Comment resolved. Text updated.
123	11/19/2020	Cherriots additional comments	See "Cherriots comments on Tech Memo 6.xlsx"	Comments resolved.

Independence Transportation System Plan (TSP) Update Tech Memo #6: Preferred Alternatives				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
i	1/25/2021	Ted Stonecliffe	See Independence_transit draft_ts 1-25-21.docs	Updated as suggested
ii	1/27/2021	Fred Evander	See tsp_techmemo_6.pdf	Updated as suggested
iii	1/27/2021	Fred Evander	See tsp_techmemo_6_policies.docs	Updated as suggested
1	2/8/2021	Kristie Gladhill	Page 3, Table 1 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
2	2/9/2021	Katie Brown	Page 4, Functional Classification - I'm not sure, but is it standard practice to identify the characteristics which triggered a change in future classification (i.e..-speed, vol, etc.)? That felt like it was missing here.	As stated in the report, the changes are intended to better align the classifications with the roadway uses and to provide further arterial and collector connectivity within the built network
3	2/10/2021	Kristie Gladhill	Page 4-5, Table 2, Figure 1 - Re-classifying Mountain Fir Ave. as a minor arterial makes sense since Table 3 identifies this as part of Alternative R8; but with low priority and inadequate funding for the high priority projects, it's likely to be more than 20 years out before such a connection is built. Perhaps identifying this as a collector would be more appropriate at this time - unless identifying it as a minor arterial now helps in some way. Table 6 has minimum intersection spacing at 350 - these intersections on this segment are <250' apart.	Comment to be addressed in future tasks - this will be further defined in the TSP
4	2/11/2021	Kristie Gladhill	Page 6, Table 3 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
5	2/12/2021	Katie Brown	Page 9, Paragraph 1 - There is something confusing about this sentence "… a sensitivity analysis indicates that it will likely exceed its target until 2032." Probably need to change to "… it likely won't exceed its . . . ."	Updated as suggested
6	2/13/2021	Katie Brown	Page 10, Figure 3 - The map should include the Map IDs identified in Table 4 (L1, L2, etc.)	Table 4 was removed per City comments
7	2/14/2021	Katie Brown	Page 11, Traffic Safety Section - It seems like the Traffic Safety section should be placed after Figure 4 adjacent to the corresponding Table 5 and Figure 5 discussed in this section.	Updated as suggested
8	2/15/2021	Kristie Gladhill	Page 12, Figure 4 - Legend has some typos - should read "Farm Equipment Route" for both colors.	Updated as suggested
9	2/16/2021	Kristie Gladhill	Page 13, Table 5 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
10	2/17/2021	Kristie Gladhill	Page 14, 1st paragraph - 2nd sentence, likely should be ". . . have not been . . " rather than "be"	Updated as suggested
11	2/18/2021	Katie Brown	Page 15, Figure 5 - Similar to comment No. 7, it seems like Figure 5 should be located adjacent to the Traffic Safety section and before the Access Management discussion.	Updated as suggested
12	2/19/2021	Kristie Gladhill	Page 15, Figure 5 - Alternatives S11, S12 are not indicated on the map. Legend spelling correction "Perceived"	Changed to Potential Safety Concern per comment below
13	2/20/2021	Kristie Gladhill	Page 16-17, Table 7 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
14	2/21/2021	Kristie Gladhill	Page 19, Figure 6 - Circles for pedestrian crossing are difficult to distinguish, should make bigger or a different color to distinguish from sidewalk projects.	Updated as suggested
15	2/22/2021	Kristie Gladhill	Page 21-22, Table 8 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
16	2/23/2021	Kristie Gladhill	Page 24-5, Table 9 - Align costs to the right, not centered, so it's easier to see the relative magnitude of numbers.	Updated as suggested
17	2/24/2021	Katie Brown	Page 27, Rail System - Remove the word "a" in this sentence "…. Tech Memo 5 identifies a several policies to be . . . . . .".	Updated as suggested

18	2/25/2021	Katie Brown	Page 32, Attachment A Table - This may have been explained elsewhere, but why are there so many projects that do not have the Y/N indication for the preliminary screening evaluation? Are these projects intended to have the preliminary screening evaluation later?	Projects that do not include Y/N indicators do not have alternatives
19	2/26/2021	A. Ferber	Page 4, Table 1 - Duplicate header for Table 1 on page 4 to retain readability. In addition, Parking does not have any costs which should be High: $0, Medium: $0, Low: $50,000. Total row costs should be updated accordingly Low: $36,130,000 and Total: $60,821,000	Updated as suggested
20	2/27/2021	A. Ferber	Page 4, Functional Classification - Recommend including discussion of what each classification consists of. It would be helpful to show how the future classification changes/affects the roadway	Added lables to all roadways
21	2/28/2021	A. Ferber	Page 4, Table 2 - Spruce Street is actually Spruce Avenue	Updated as suggested
22	3/1/2021	A. Ferber	Page 5, 6, Table 2, Figure 1 - Recommend adding Map ID's to Table 2 and Figure 1. Not all of the roadways are labeled on Figure 1.	Added lables to all roadways
23	3/2/2021	A. Ferber	Page 5, Figure 1 - Map doesn't print well to black and white. Recommend adding in line types to help differentiate between the symbols for b&w	Not addressed
24	3/3/2021	A. Ferber	Page 6, 7, Table 3 - All of the intersection traffic control modification recommendations are either all-way stop-control or traffic signal. Were roundabouts considered at any of the intersection locations?	Yes, roundabouts were considered at all locations where traffic signals were considered
25	3/4/2021	A. Ferber	Page 8, Figure 2 - Legend should include all symbols displayed on map. Solid red, solid orange, and solid green are not included in the legend.	Updated as suggested
26	3/5/2021	A. Ferber	Page 9, No-build; bolded sentence - This sentence makes it sounds like analysis was already conducted confirming. Consider rewording to "would provide an alternative route for traffic and likely significantly improve operations"	Updated as suggested
27	3/6/2021	A. Ferber	Page 10, Figure 3 - Recommend adding in Map ID's to better tie to Table 4	Table 4 was removed per City comments
28	3/7/2021	A. Ferber	Page 14, Figure 5 - S11 and S12 are not shown on Figure 5	Updated as suggested
29	3/8/2021	A. Ferber	Page 14, Paragraph 1 - "potential safety concerns" are labeled as labeled as "perceived safety issue" on Figure 5. Recommend referring to these items in the same way for consistency	Updated as suggested
30	3/9/2021	A. Ferber	Page 16, 30, Table 7, Table 10 - Remove ($1,000) from the cost header. It reads as the cost is in the "thousands" i.e. P1 $715,000 is really $715,000,000	Updated as suggested
31	3/10/2021	A. Ferber	Page 19, Figure 6 - New crosswalk is hard to differentiate from plain Map ID, perhaps increase size of crosswalk circle. Legend should include all symbols displayed on map. Dotted line should be added (shared use paths?)	Updated as suggested
32	3/11/2021	A. Ferber	Page 20, Figure 7 - Off-Street and On-Street symbols cannot be differentiated when printed in b/w. Consider changing line type(s)	Not addressed
33	3/12/2021	A. Ferber	Page 22, Table 8 - Medium Priority Cost and Low Priority Cost values should be switched	Updated as suggested
34	3/13/2021	A. Ferber	Page 23, Figure 8 - Legen should include all symbols displayed on map (shared use paths?)	Updated as suggested
35	3/14/2021	A. Ferber	Page 28, Paragraph 2 - Missing bullet (?) for "Work with ODOT rail to consider…"	Updated as suggested
36	3/15/2021	A. Ferber	Page 28, Paragraph 3 - RE requiring residential development adjacent to railroad to use sound mitigation. Should this be qualified as new residential developments?	Updated as suggested
37	3/16/2021	A. Ferber	Page 30, Parking Plan - Consider noting that the projected cost of the downtown parking study includes the study only and does not include any costs associated with implementing recommendations	Updated as suggested
38	3/17/2021	D. Upton	Page , Formatting - The use of yellow for section titles does not show up..change color	Not addressed
39	3/18/2021	D. Upton	Page 3, Cost Estimates - While it simplifies the estimating, the project should have an element either includes or at least acknowledge there are site specific costssuch as right-of-way or environmental	Added a footnote

40	3/19/2021	D. Upton	Page 3, Cost Summary - This seems out of place since this section is not a summary of the memo so it needs to be at a different location i.e. after the data has been presented	The TSP will show the cost summary at the end
41	3/20/2021	D. Upton	Page 5, Figure 1 - Is there some way to show the change (what is up vs down)	Table 2 shows the existing and proposed classifications
42	3/21/2021	D. Upton	Page 6-7, Table 5 - Intersection improvements suggest traffic signals at multiple intersections, but no signal warrant investigations are included in this or TM#5.	Signal warrants were conduceted in the alternatives analysis (Tech Memo #5)
43	3/22/2021	D. Upton	Page 7, Table 5 - Project R16 - Signal timing is NOT a TSP level project - it is based on the operational needs	Not addressed
44	3/23/2021	D. Upton	Page 7, Exhibit 1 - This figure is too dark to be clear - it would be better to do an aerial on just a street map.	Updated as suggested
45	3/24/2021	D. Upton	Page 7, Rectangle About - How does this address access into Riverfront Park?	Added a sentence highlighting constrained access to the Riverfront Park
46	3/25/2021	D. Upton	Page 8, Figure 2 - Can the enhancement show what the intersection enhancement is - which are signals versus something else?	Futher analysis is required to determine intersection configuration
47	3/26/2021	D. Upton	Page 9, Paragraph 1 line 4 - I think this is missing a word - " … analysis indicates that is will likley not exceed its target until 2032"	Updated as suggested
48	3/27/2021	D. Upton	Page 12, Figure 4 - In legend - Farm Equipment Route	Updated as suggested
49	3/28/2021	D. Upton	Page 13, Table "5" - I believe this is misnumbered - Table 5 is on Page 6-7	Updated as suggested
50	3/29/2021	D. Upton	Page 13, Table - Has 4 locations of intersections on ODOT highway calling for traffic calming (vague) and feature may need approval.	Comment to be addressed in future tasks - this will be further defined in the TSP
51	3/30/2021	D. Upton	Page 13, Table - S4 and S9 - speed feedback signs are considered enforcement tool and the city is expected to fund, operate and maintain under an ODOT permit.	Added a footnote
52	3/31/2021	D. Upton	Page 13, Table - S11 - Does this mean the City is going to authorize and pay for a speed study? ODOT will do, if requested, at no cost, but within our staffing ability	Added a footnote
53	4/1/2021	D. Upton	Page 14, Access Standards - ODOT Access management standards also need to be acknowledged and used along state highways - city can have stricter.	Added a policy that the City will defer to ODOT on ODOT facilities
54	4/2/2021	D. Upton	Page 17, Table 7 - Enhanced crossings (P15,P16, P17, P18) - what are these? ODOT has to approve any marked crossings and enhancements on state highways. ODOT does not typically have every crosswalk at every intersection marked. Costs may be low depending on what is desired	Added a footnote for all projects on ODOT facilities
55	4/3/2021	D. Upton	Page 17 and 22, Table 7 and Table 8 - P25 and P26 - Opportunities for more streetscape may be limited - need to have clear ADA paths. This may also effect to bike corrals	Comment to be addressed in future tasks - this will be further defined in the TSP
56	4/4/2021	D. Upton	Page 19, Figure 6 - Should show which leg has marked crossing - also note all of the marked crossing on statehighways may not currently be approved and will have to be evaluated along with any request for new enhanced crossings.	Added a footnote
57	4/5/2021	D. Upton	Page 21, Bicycle System - B1, and B3 all call for striped buffered bike lanes - How will this be accomplished? Removal of parking? B2 and B4 call for sharrows- has this been checked against ODOT policy for the placement?	Comment to be addressed in future tasks - this will be further defined in the TSP
58	4/6/2021	D. Upton	Page 24-25, Transit - Are these City planned projects (ADA curb ramps) or will they be ODOT projects? Parking restrictions along state highways need approval	Comment to be addressed in future tasks - this will be further defined in the TSP
59	4/7/2021	D. Upton	Page 27, Rail System - Don't think that ODOT Rail will work to provide additional connectivity but they may work to improve for all users.	Comment to be addressed in future tasks - this will be further defined in the TSP
60	4/8/2021	D. Upton	Page 30, Parking Plan - Bullet list - #2 - This should be work with ODOT for consideration of Time limited parking (ODOT has to approve)	Added a sentence indicating that the City may need to coodinate with ODOT

61	2/16/2021	Jolynn Franke	Table 8, p. 25 - Please change project T6 to reflect Cherriots plan to move the bus stop from 13th @ Monmouth Streets to Monmouth @ Gun Club Rd (far side of the intersection near the east property line of McDonald's. All of the amenities mentioned can remain, but eventually, we would like to put the bus stop on Monmouth Street instead of 13th.	Updated as suggested
62	2/16/2021	Jolynn Franke	Fig. 9 - Update map legend, still says "Future Route 45", but the service began on Jan. 4, 2021, so it is no longer a "future" route.	Updated as suggested
63	2/16/2021	Jolynn Franke	Pg. 28 - Update 4th bullet, still says "future Route 45".	Updated as suggested
64	2/16/2021	Ted Stonecliffe	p. 12 - Fig. 4 Legend and figure title both have "Equipment" spelled incorrectly.	Updated as suggested
65	2/16/2021	Ted Stonecliffe	Table 6, p. 17 - sidewalks already are finished on the north side of Monmouth Street between 2nd and 3rd, so you can remove P2.	Updated as suggested
66	2/16/2021	Ted Stonecliffe	Table 6, p. 18 - add sidewalk on the south side of the F Street bridge to connect the existing sidewalks, which are currently not constructed. A proper driveway needs to be provided for access to Mt. Fir Park as well. Cherriots considered operating Route 45 on F Street, but because of the lack of sidewalks, we decided we had to go up to Monmouth Street instead. This would be the preferred routing for local transit to cut time off the route.	Not addressed - sidewalks will be provided on the south side of the bridge prior to adoption of the TSP
67	2/19/2021	Ted Stonecliffe	Table 6, p. 18 - Suggest adding a marked pedestrian crossing at Monmouth & 11th Streets; also, median planters at periodic points along Monmouth Street would enhance the street's feel, especially east of 7th Street.	Updated as suggested
68	2/19/2021	Ted Stonecliffe	Table 8, p. 25 - Delete project T2 because this is contrary to the recommendations that will be received by the consultant for the local transit study, which is just about to issue their final recommendation report.	Updated as suggested
69	2/19/2021	Ted Stonecliffe	p. 26, insert "on" after "based" in the second sentence under "Transit System Alternatives": the priorities will be updated based _on_ input from the advisory committees and the community.	Updated as suggested
70	2/18/2021	TAC Meeting #3	Reorganize the memo with the cost summary at the end.	Not addressed - the TSP will include the cost summary following the project tables
71	2/18/2021	TAC Meeting #4	Add considerations for different funding sources or agencies.	Updated as suggested
72	2/18/2021	TAC Meeting #5	Work with ODOT to verify if a local freight route designation would be supported.	Comment to be addressed in future tasks - this will be further defined in the TSP
73	2/18/2021	TAC Meeting #6	Work with Monmouth to verify the city’s stance on 16th Street classifications, especially with the school accesses.	Comment to be addressed in future tasks - this will be further defined in the TSP
74	2/18/2021	TAC Meeting #7	For the OR 51/Polk Street intersection, the project should allow for traffic control modification that could be a traffic signal or a roundabout.	Updated as suggested
75	2/18/2021	TAC Meeting #8	Further explore Main Street/River Road options: - Review signal warrants with the heavy left turn movement. If met, how does a traffic signal handle the queues? - Review a roundabout alternative.	Updated as suggested - a traffic signal works well, but does not significantly reduce the vehicle queues at the northbound and westbound approaches relative to the AWSC. Queues at the southbound approach get worse with traffic signal as compared to separate left turn lane.
76	2/18/2021	TAC Meeting #11	Update to “pedestrian improvements”.	Not addressed
77	2/18/2021	TAC Meeting #12	Need to include the west portion of Ash Creek Trail and some of the trail options in the south.	Updated as suggested
78	2/18/2021	TAC Meeting #13	Remove the autonomous shuttle alternative.	Updated as suggested
79	2/18/2021	TAC Meeting #14	Update Route 45 to running instead of “future”.	Updated as suggested
80	2/26/2021	Rich Clark	What is timeline for south east-west connector?	No action needed/recommended. This is not a near-term project.

81	2/26/2021	Rich Clark	Parking plan should be high priority. How is new TSP decreasing downtown intersection traffic, and improving pedestrian experience? I like rectangle traffic flow on B street and 2nd street. •Pedestrian/bike route on E. St., starting from 13th St. going east, with foot/bike bridge over S. Fork of Ash Creek. •I also like E Street as collector, and F street with bike lane—that gives good access to Inspiration Garden, and for eastbound bikes, good connection to G street. •P38 (Willamette Valley Bikeway): Could link local bike lane east-west to wider bicycle route.	Updated as suggested
82	2/26/2021	Rich Clark	Have sidewalk and bicycle lane on 10th, going south from F street to the trail on the north side of South Fork of Ash Creek. Would be great to build shared trail going north from Monmouth Ave. around 10th/11th street, it would be a good north-south connector, and provide access to Ash Creek trail.	No action needed/recommended.
83	2/26/2021	Rich Clark	Polk St. and Hwy 51: signal timing optimization to facilitate pedestrian/bike crossing	No action needed/recommended. Any new signals will take pedestrians and bicycles into consideration.
84	2/26/2021	Rich Clark	For South Fork, Drainage, Ash Creek, and River Trail (and any other riparian trail): Don't need to do whole project at once. Could start with survey, riparian management plan, invasive species control. It would be nice to start development of South Fork trail at same time as housing development. All riparian trails are listed as low priority, except the River Trail (medium). The trails along South Fork and Ash Creek are walkable distance from a lot of the residents in town. This TSP focuses on transportation needs, but nature trails have health, psychological, and environmental benefits—these should also be factored when prioritizing projects. This ties in with Park & Recreation goals, and South Independence plan.	No action needed/recommended.
85	2/26/2021	Rich Clark	Sidewalk needed on south side of F street, at Inspiration Garden northern entrance.	Comment to be addressed in future tasks - this will be further defined in the TSP
86	2/26/2021	Rich Clark	Establish an "alternative modes main street" designed for bicycles and pedestrians, as well as micromobility services such as E-scooters, trolleys, and/or people movers. E Street is one candidate facility.	Comment to be addressed in future tasks - this will be further defined in the TSP
87	2/26/2021	Rich Clark	Consider adding an electric vehicle charging requirement to the development code.	Comment to be addressed in future tasks - this will be further defined in the TSP
88	See Comments_Open House #3_Maps tab		6: It appears this is proposing a bridge over S. Fork Ash Creek at G street to create this new collector. This would be through Inspiration Garden, a City park area and trail currently enjoyed by many people - including families and youth. Can you avoid disrupting this park? It seems adding a collector through the park will create a new safety hazard by adding traffic through a park area. Also why add a bridge 1 block away from the F St. bridge which is about to be replaced?	Updated to include language for considering impacts to Inspiration Garden.
89	See Comments_Open House #3_Maps tab		10: Are there priorities for new cross-walks? Monmouth St could use some new cross-walks at high pedestrian use areas like this intersection near the Dollar General. Maybe a set up like on 9th St in Corvallis where the pedestrian can trigger blinknig lights to alert drivers of a pedestrian. It's hard to get a across Monmouth St. safely unless at the Gun Club intersection.	Updated to include new crossing location

90	See Comments_Open House #3_Maps tab	14: It would be great to have a bridge and path onto and through the island on the east side of the oxbow that connected to the southern river path, kind of a loop around the oxbow.	Updated as suggested

Independence Transportation System Plan (TSP) Update Draft TSP				Comment resolved Comment to be addressed in future tasks No action needed/recommended
Comment No.	**Date**	**Contributor**	**Comment**	**Response**
1	5/19/2021	ODOT	page 12 Figure 1 looks to be missing project S2, though it could be due the number of projects happening around that intersection.	Comment resolved. Offset safety project labels.
2	5/19/2021	ODOT	Table 1, Footnote 2: This footnote doesn't seem to apply to project T1	Comment resolved. Note removed.
3	5/19/2021	ODOT	Page 22 In the section for STA. last paragraph. A quick look at the ODOT TransGIS layers indicates that the section of OR-51 Monmouth St from S Tenth St to approximately Boyd Ln is also a STA, UBA, or CC which may have additional impacts on the evaluation of proposed improvements. According to the TSP 10th to east of 17th is identified as a CC. What about 17th to Boyd? This should be an extension of the same CC I believe, or is there another reason to not include it?	Comment resolved. Updated as noted to reflect the latest info on TransGIS.
4	5/19/2021	ODOT	Pages 27-32, exhibits 1-6. Images are nice, might be help the reader understand relative size differences quicker if they were to the same scale if possible.	No action needed/recommended. The cross sections show relative differences; however, they are very small.
5	5/19/2021	ODOT	Pg. 28 – Exhibit 1 - #2 cross-section is labeled as 38 but the numbers add to 44 curb-to-curb width	Comment resolved for revised draft for TAC-CAC meeting.
6	5/19/2021	ODOT	Pgs. 33-34 – Projects can specify only traffic signal – ICE reports needed -R-11 needs ICE report -R12 and 14 – the text refers to a signal but the costs are more for just striping/signing -R16 – Not a TSP project – ODOT maintains/times signal	Comment resolved. Added text for intersection control change. Maintained Project R16 because it is a City priority, although will be maintained/timed by ODOT.
7	5/19/2021	ODOT	B2 and B4 – Sharrows may not be appropriate and need ODOT approval for use on state highways.	No action needed/recommended. There are footnotes covering this comment.
8	5/19/2021	ODOT	Pg. 36 – The ICE for a traffic control change signal at Main/Monmouth would likely include the constraints (building, downtown core, etc.) but should not only call out a signal	Comment resolved. Added text for intersection control change.
9	5/19/2021	ODOT	Pg. 38 – S2 and S4 – what are the traffic calming measures for these arterials? This should not be so general.	Comment resolved. Added text.
10	5/19/2021	ODOT	Pg. 39 – Speed zone change is not a TSP project – the cost if a change is implemented would be like replacing maintaining in place signing.	No action needed/recommended. Maintained as a project because it is a city priority. The cost does not include the study itself.
11	5/19/2021	ODOT	Pg. 45 – T4 and T5 – Parking restrictions on state highway need to ODOT approval	No action needed/recommended. ODOT approval already included in table notes.
12	5/19/2021	ODOT	Page 54 Pedestrian System section Page 54 end of paragraph one, Reads "existing bicycle facilities" should say "existing pedestrian facilities"	Comment resolved for revised draft for TAC-CAC meeting.
13	5/19/2021	ODOT	Pg. 57 – P15,16,17 -costs are likely low given the facility type/characteristics since likely could need more that striping and signs (RRFB's)	Comment resolved. Updated cost to $125,000 for crossings on OR 51.
14	5/19/2021	ODOT	Page 57, Table 8,: "Shared-Use Paths/Trails" header should be moved to the next page	Comment resolved. Page spacing updated based on latest TSP version.
15	5/19/2021	ODOT	Page 67 There's a section of writing that is hidden behind the TSP header at the top of the page. Looks like it says "Management Plan", might just need to be removed.	Comment resolved for revised draft for TAC-CAC meeting.

16	5/19/2021	ODOT	Pg. 69 – Top of page – Parking on state highways has to be coordinated with ODOT.	Comment resolved. Adjusted text to say the City will need to coordinate with ODOT.
17	5/19/2021	ODOT	For roadway projects such as R11, R13, and R14 the project includes signalizing the intersection. However, changing traffic control will require an intersection control evaluation in the future which will review a signal as well as roundabout traffic control. Consider updating the project descriptions or adding footnotes "review intersection control and update as needed to a traffic signal or roundabout to better serve operational and safety needs"	Comment resolved. Added text for intersection control change.
18	5/21/2021	Fred Evander (Independence)	See "23769_Draft_TSP_Update_2021-05-13_fredit.pdf"	Comments resolved.
19	5/28/2021	Rich Clark (CAC)	1. Two reasons to put bike lanes on S. 7th St. sooner, rather than later: a. There is barely curb-to-curb width for 2 driving lanes and 2 parking lanes on S.7th, and with traffic getting busier it is more difficult for traffic to pass through. I frequently see damaged rear-view mirrors. South 7th has also been upgraded to a collector street. b. Looking at the Preferred Bicycle Alternatives map, I see that S. 7th is the main route for bicyclists from most of the southwest Independence development area accessing the downtown area, and to some degree, north Independence via 4th and Ash.	No action needed/recommended. Project B14 is already a high priority.
20	5/28/2021	Rich Clark (CAC)	I wanted to clarify if the bridge over the South Fork of Ash Creek at E. Street would be an auto bridge, or a bicycle/pedestrian bridge. Having just a bike/ped bridge would help to create a nice bike & pedestrian east-west throughway, without the associated vehicle traffic. I believe there was a bikeway route on E. Street in the final presentation, but it is not shown in the Final TM 6 alternative, figure 8—will that be updated?	Comment resolved. New bridge project added for E Street, which will include vehicular traffic. Tech Memo 6 will not be updated because many projects have been updated as part of the process.
21	5/28/2021	Rich Clark (CAC)	I wanted to include implementation/regulation for assuring right of way for future Off-street Path/Trail to be included with the TSP, such that, as new developments are approved, right of way has been set aside for the shared use trails.	Comment resolved. Policy added to pedestrian section.
22	5/28/2021	Rich Clark (CAC)	What type of bridge is planned for the east-west connector from Madrona over South Fork of Ash Creek, to G Street? It looks like it would have to go through the present industrial site. How likely is it that section will be built? In the roadway map, R5 is shown—is a road bridge cost-prohibitive?	Comment resolved. Cost estimate updated to include a 100-foot bridge with a 44-foot cross section.
23	5/28/2021	Rich Clark (CAC)	There was discussion of a roundabout at Polk St & Hwy 51—I'm concerned that it would make pedestrian crossing more difficult/dangerous.	No action needed/recommended. Comment noted. Any intersection control change will go through a full design process where pedestrian access and safety will be reviewed and incorporated. Intersections under ODOT jursidiction need to include consideration of a roundabout as part of an intersection control evaluation.
24	5/28/2021	Rich Clark (CAC)	I don't think there is an adequate plan for downtown parking.	No action needed/recommended. The TSP scope/budget did not allow for an in-depth review of downtown parking as part of this project. Therefore, Project PP1 is included to conduct a downtown parking study and is already a high priority.

25	5/28/2021	Todd Whitaker (Polk County)	1. The document proposes revised functional classification on some portions of roadway that are under the jurisdiction of Polk County (i.e. Talmadge Road). I suggest that areas such as these be discussed as proposed functional classifications that will be revised when Independence takes jurisdiction in the future.	Comments resolved. Functional classification map now only shows streets under City jurisidiction or within city limits.
26	5/28/2021	Todd Whitaker (Polk County)	2. The document proposes revised functional classifications on some portions of roadway that will be shared jurisdiction with the City of Monmouth or Polk County. There should be some coordination with these other agencies TSP's so that there is good continuity between the three documents.	No action needed/recommended. Coordination between the agencies to continue into the future.
27	5/28/2021	Todd Whitaker (Polk County)	3. Freight/Farm routes have been designated that rely on roads/streets under the jurisdiction of other agencies. In keeping with the requirements of the Urban Growth Management Agreement between Polk County and City of Independence, this should involve acceptance of this designation by Polk County.	No action needed/recommended. Coordination between the agencies to continue into the future.
28	5/28/2021	Todd Whitaker (Polk County)	4. I am concerned that the 4-way Stop at River Road will cause a queue to back up onto Corvallis Road, which is under the jurisdiction of Polk County and could block access onto Corvallis Rd from private residences during these periods.	No action needed/recommended. The all-way stop-control project provides overall improvement on County roads.
29	5/28/2021	Todd Whitaker (Polk County)	5. The proposed improvement at the intersection of Main/Monmouth shows left- and right-turn lanes being added. With the bulb-out curbs at that location, I am concerned there will be a problem for larger vehicles turning south that may create safety concerns.	Comment resolved. Added text to footnote for design considerations.
30	3/25/2021	Todd Whitaker (Polk County)	In the existing TSP, the City has stated the following policy, which is consistent with our understanding and past practice. However, the new TSP does not contain this language. We believe it should. This language provides for the orderly transfer of jurisdiction of the ROW by accepting maintenance responsibility upon annexation. The County is currently trying to clean up its jurisdictional transfer of public roads, so this was on my radar. Other Roadway System Policies Polk County maintains the County road system, which exists largely outside of urban areas,to a rural standard. Traditionally, as city limits expand to encompass County road segments, ownership of these road segments are transferred to the city, so the roads may be maintained to urban standards. The following policy will help ensure County road segments are transferred to the City of Independence as city limits are expanded: • The city will simultaneously annex land and the county roads found within, or bordering, the newly annexed land.	Comment resolved. Added to the "overall transportation system policies" in chapter 2.
31	3/25/2021	Todd Whitaker (Polk County)	Figure 2 shows Hanna Road under City jurisdiction. It should show all, or nearly all, of Hanna as County jurisdiction. I don't know if the short section inside city limits was formally transferred, but I would be surprised if it was.	Comment resolved. Updated in Final Tech Memo #3, which will be included in Volume II of the TSP.

32	5/27/2021	David Clyne	R15 River Road and Main Preferred Option: I am asking the City to reconsider the preferred alternative of new turn laneage in favor of the roundabout option that was considered as part of the TSP. The preferred option is merely a stopgap temporary solution that will merely reduce the problem but not solve. Moreover, for full build out of even this option, the City must wait for a bridge replacement project that even City staff acknowledges is not likely during the 20-year horizon of this plan, The roundabout not only does a much better job of solving that actual stacking problem, but it is an once-in-a-generation opportunity to make a statement at a key gateway to the community. Further, it opens an opportunity to connect a forthcoming extension of the Willamette River Trail by providing a multi-modal interconnect at roundabout with a trailhead for the path. The City can make a statement of welcome at this location at one of the busiest entries to the City instead of a half-solution that will only continue to degrade during the life of the TSP.	Comment resolved. The all-way stop-control is still recommended as the near-term option, but the long-term vision is updated to consider all intersection control types.
33	5/28/2021	Shannon Corr (City Council)	Only one comment. Has thinking changed regarding Hoffman now that Monmouth is building a 60+ home development on Hoffman between 16th and 99? I'm curious if any of the projects, for instance the safe routes to school project, or anything else associated with Hoffman Road has been reprioritize given the fact that Monmouth is building a large home development on Hoffman Road. Specifically, I'm concerned about the Safe Routes To School Grant for work on Hoffman. As you know, the traffic light on Gun Club and Hoffman was a portion of that grant request but it didn't get approved. With a 62 unit housing development going up on Hoffman, I think this is needed even more than before. Can we get it into the TSP as an unfunded project just to keep visibility on it?	Comment resolved. Added comment to coordinate with City of Monmouth at Hoffman/16th.
34	6/1/2021	Wayne Nutsch	I don't see the Independence State Airport on the agenda. This city has an airport which would serve many in Independence but it seems to be put aside. If anyone wants a one-on-one meeting to discuss our opinions as to what infrastructure should be added/improved, I would be pleased to meet with you. I cannot attend lengthy meetings to discuss the other endeavors. Thanks, Wayne Nutsch FAA Safety Inspector (ret)	No action needed/recommended. The TSP references the recent Independence State Airport Master Plan.
35	5/20/2021	Joint TAC and CAC Meeting #4	Add language for recognition of the schools on 16th Street with the functional classification.	Comment resolved. Added note to Table 2.
36	5/20/2021	Joint TAC and CAC Meeting #4	Update the extents of 16th Street-Talmadge Road to accurately show Independence jurisdiction. Portion north of UGB is in Monmouth. Portion south of 16th Street end where it transitions to Talmadge Road is in Polk County.	Comment resolved. Updated extents, specifically changed Figures 2 and 3.
37	5/20/2021	Joint TAC and CAC Meeting #4	Verify 16th Street functional classification with Monmouth.	Comment resolved. Added note to Table 2.
38	5/20/2021	Joint TAC and CAC Meeting #4	Add language on the functional classification map – “explore minor arterial”.	Comment resolved. Added note to Table 2.
39	5/20/2021	Joint TAC and CAC Meeting #4	In the description for intersection capacity projects, say “Intersection control change that may include a traffic signal or roundabout”. Provide the cost of the more expensive option.	Comment resolved. Added text for intersection control change.
40	5/20/2021	Joint TAC and CAC Meeting #4	For Main Street/Polk Street, potentially add language in the body text or potential a table footnote to note the potential ROW impacts and proximity of the apartments to the roadway. Add language to note that when a signal or roundabout is designed, it would need to address the large vehicle truck turning movements from Main Street.	Comment resolved. Added footnote.

41	5/20/2021	Joint TAC and CAC Meeting #4	Would the Main Street/River Road project create a queue that extends south onto Corvallis Road? If the queue extends south onto County roadways, the County should know.	No action needed/recommended. The all-way stop-control project provides overall improvement on County roads.
42	5/20/2021	Joint TAC and CAC Meeting #4	Review the impacts of the crown for the two-way left-turn lane on Monmouth Street. Potentially updated the cost estimate.	Comment resolved. Cost estimate updated to include pavement rehabilitation.
43	5/20/2021	Joint TAC and CAC Meeting #4	For the adopting ordinance, the City with take the consultant memo and put it in ordinance format, including a 35-day notice.	No action needed/recommended. This is an action item for the City.
44	5/20/2021	Joint TAC and CAC Meeting #4	Verify cost estimates for bike lanes on 7th Street and 4th Street.	Comment resolved. Cost estimate updated for 7th Street bike lanes.
45	5/20/2021	Joint TAC and CAC Meeting #4	R13 and R14 both mention a two-way left-turn lane, with $50,000 each. Verify whether it should be in the project list once or twice.	Comment resolved. Projects combined and include pavement rehabilitation.
46	5/20/2021	Joint TAC and CAC Meeting #4	Revisit the shared roadway call out for Monmouth Street adjacent to C/D Street parallel routes.	No action needed/recommended. Maintaining shared roadway.
47	5/20/2021	Joint TAC and CAC Meeting #4	Emphasize E Street multi-modal corridor idea and include a bridge project.	Comment resolved. Project added to roadway plan. A section about E Street also included in the document text.
48	5/20/2021	Joint TAC and CAC Meeting #4	Add a project for 4th Street between B Street and E Street, potentially a circulation study or other collaboration with the school district.	Comment resolved. New project S12.
49	5/20/2021	Joint TAC and CAC Meeting #4	For a bridge bike warning system, it might not be feasible due to the slope and finding a place for a pushbutton	Comment resolved. Removed project S12.