CITY OF MEDICAL LAKE

TRANSPORTATION MASTER PLAN

June 2026

City of Medical Lake

ACKNOWLEDGEMENTS:

CITY OF MEDICAL LAKE

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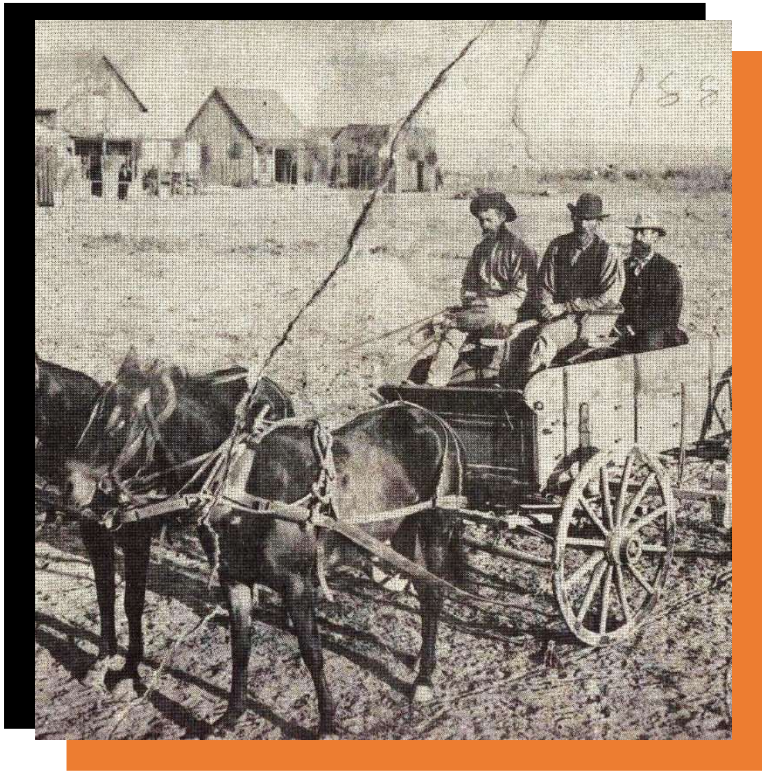
INTRODUCTION



Chapter 1

Medical Lake, Washington has experienced a steady rate of population growth during the City's 135-year history. The city has grown from 617 people in 1890 to 4,915 people in 2023; an average 1.57% annual growth rate in population over time. However, there have been decades with strong gains, 30% increases have occurred, as precipitated by events like the construction of Eastern State Hospital in 1891 or the development of Fairchild Air Force Base in 1942. More recently, the early 2000's saw a significant increase in population with the construction of large housing developments.

City leadership desires and is promoting continued growth in the community. They are working to advance projects that increase water and sewer capacity, this will allow for housing and commercial/retail business development. In addition, leadership is promoting the family-friendly feel of a small and enjoyable downtown environment complimented by bike and pedestrian improvements to enhance primary routes with multimodal enhancements, designating some roads as complete streets. Leaders postulate that a walkable and bikeable City, supported by Spokane Transit Authority (STA) services, will support travel alternatives, reducing reliance on personal autos, to minimize travel demand, promote healthy lifestyles, provide context sensitive street appeal, and diminish environmental impacts.

A leading example includes the recently finalized Lefevre Street (SR 902) Pedestrian and Bicycle project, Hancock Street to Brooks Road. City officials collaborated with the Transportation Improvement Board (TIB) of Washington to upgrade 0.55-miles of sidewalk, lighting, planter boxes, bike lanes (coming this year), and trees in the downtown core. This has enhanced streetscapes and active transportation facilities, which are widely used by citizens who can walk or bike to work, or for those who enjoy active movements in the Medical Lake central business district for recreational purposes.

With growth, City leaders understand the potential does exist to increase vehicle travel demand. However, it is understood that the practical capacity of arterial streets and collectors is likely sufficient to support reasonable growth trends over the next 25-plus years. Yet, a few pivotal junctions and select street segments may experience capacity issues. With that understanding, the City would like to focus on transportation endeavors that improve multimodal networks, like Lefevre Street, to improve travel options and the community-focus of Medical Lake, as well as affecting environmental benefits. Again, the City recognizes the great benefits offered by Spokane Transit Authority (STA); they wish to incorporate bus facilities into street designs, where appropriate and as supported by STA.

At the direction of the Medical Lake City Council and City Leaders, the Medical Lake Transportation Master Plan (TMP

or Plan) recommends multimodal strategies and solutions for the City. The Plan recommends active transportation and transit solutions to build mobility options and help diminish impact on the operation of key intersections and roadways. The Plan provides goals and policy advice to help promote active mobility and complete streets objectives. The intent of the Plan is to present a network strategy for assuring safe, practical, and context sensitive movements for all modes of travel as based on the consideration/review of current and forecast travel conditions.

1.1 Purpose & Study Area

The Transportation Master Plan was developed in compliance with " best " Complete Street practices, pursuant to Title 8 of the Medical Lake Municipal Code (MLMC). Also, the Plan recognizes the guidance provided with Revised Code of Washington (RCW) Chapters 47.04.320 and 47.24.06. The Plan works to recommend multimodal projects relevant to and supportable by funding agencies like TIB and the Washington State Department of Transportation (WSDOT), as it pertains to complete streets, transit, and active transportation.

This Plan recommends mobility and multimodal solutions for addressing travel demand issues in Medical Lake over two horizons; the year 2050 and a full-build scenario. Improvements for the 2050 scenario are referred to as "short-term" and are meant for the 6-Year Medical Lake Transportation Improvement Program (TIP). The horizon is 2032, recognizing Council will adopt this plan by years end, and TIP updated and finalized by June of 2026.

At the request of City leaders, a full-build land use scenario was developed. The purpose of this analysis is to identify where roadway capacity constraints may emerge over the long term, enabling City leaders to plan for potential right-of-way needs and building setbacks when reviewing land use proposals or advancing street improvement projects for 2032 or 2050.

Traditional capacity and unique multimodal measures of effectiveness were employed to help identify projects and quantify how residents will interact with the street network. These analyses were used to develop solutions for the year 2032, 2050, and long-term conditions for Medical Lake.

Study Area

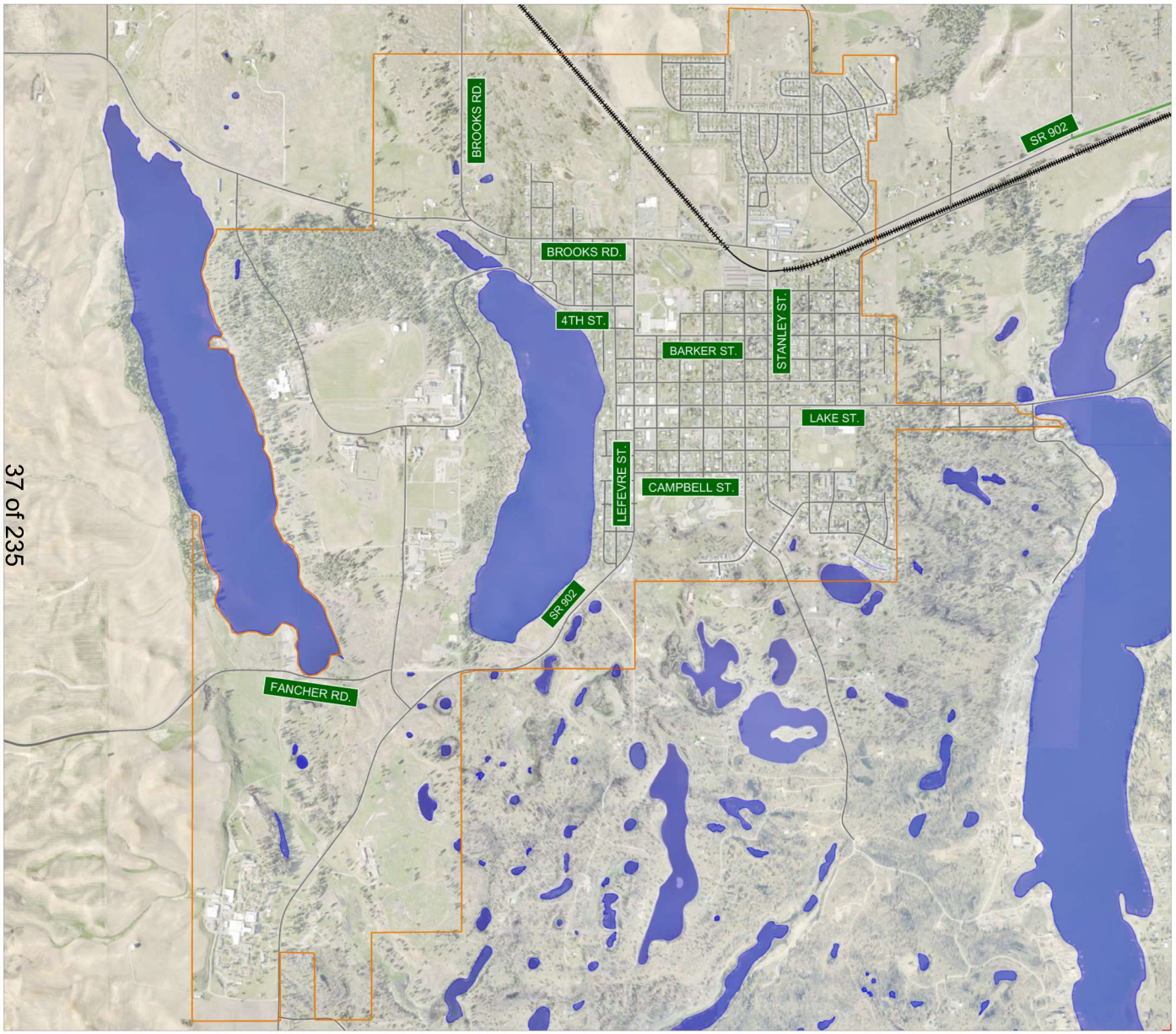
Medical Lake is situated in West Plains region of Spokane County about 14 miles southwest of the City of Spokane; aligned roughly midway between Interstate-90 (I-90) and U.S. Highway 2 (US 2). Access to/from the City is provided by State Route 902 (SR-902), Brooks Road, Lake Street, and Espanola Road/San Salvador Street. Fairchild Air Force base is 3.9 miles to the north; Airway Heights is 8.3 miles northeast. The City has commercial centers on Lake Street and Lefevre Street. Residential areas are aligned throughout the community. Streets are arranged mostly in a grid network; however,

newer neighborhoods have been laid out with limited through streets, the balance as dead-end streets with cul-de-sacs. SR 902 separates newer residential developments from rest of Medical Lake.

Arterials and collectors support most city commute needs as shown in Exhibit 3.1. A summary of these federally classified roads include:

- Arterials:
  - State Route 902 (East city limit to Lefevre)
  - Lefevre Street
- Major Collectors:
  - Brooks Road
  - Howard Street (Brooks Road to 4th Street)
  - 4th Street (Jefferson to DSHS campus)
  - Jefferson Street (4th Street to Lake Street)
  - Lake Street
  - Fancher Road
  - State Route 902 (Waterfront Park to South city limit)
- Minor Collectors:
  - San Salvador Street
  - Barker Street (Lefevre Street to Stanley Street)
  - Stanley Street (SR 902 to Campbell Street)
  - Campbell Street (Lefevre Street to Stanley Street)

The Plan was developed per directives of the City Council and staff, but it is recognized that other authorities have influence within Medical Lake's municipal boundaries. The Plan will be shared for review and comment by agencies such as Spokane County, WSDOT, and STA. **Exhibit 1.1** displays municipal boundaries and what will constitute the study area for the Plan.



N.T.S.

LEGEND

- CITY URBAN BOUNDARY
- WASHINGTON EASTERN RAIL

Exhibit 1.1

CITY AREA AND BOUNDARY

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON

CHAPTER 2

GOALS & POLICY

Chapter 2

City officials are working on the 2026 to 2046 update to the Medical Lake Comprehensive Plan. This Transportation Plan highlights key objectives, goals and policies, which will guide development of the multimodal transportation network for the City. This section highlights the conclusions that will feed into the Transportation Element of the Comprehensive Plan.

2.1 City Background Documents

The context of the overarching visions of Medical Lake must be understood when developing this Transportation Master Plan. Through coordination with City leaders and the public, staff created a Vision Statement that supports development of the Comprehensive Plan. This statement is as follows:

> *The Comprehensive Plan endeavors to shape the City into the kind of place worth living, working, learning, and playing in all seasons of life by:*
>
> - *Nurturing Medical Lake's small-town charm and community spirit while honoring its history.*
> - *Integrating the natural and built environment in a thoughtful and sustainable manner.*
> - *Creating safe, walkable neighborhoods with accessible parks and housing for all.*
> - *Establishing equitable access to resources, strong social connections, and a healthy environment.*
> - *Encouraging a thriving economy through community partnerships and recreational tourism, with a focus on downtown revitalization.*

The statements of "*Creating safe, walkable neighborhoods with accessible parks and housing for all*" and "*Establishing equitable access to resources, strong social connections, and a healthy environment*" guide development of this Transportation Master Plan. The goals and policies identified, and many of the improvements highlighted by the Transportation Improvement Program, were developed to encourage a multi-modal network that provides access to community resources, connects citizens, and promotes healthy lifestyles.

In addition, City leaders created a foundation document for the Comprehensive Plan through prior development of a 2025 Strategic Plan that sets goals and objectives for managing the City. The Strategic Plan guides "*the important work of staff, citizen advisory boards, and Council as we strategically and collectively achieve the stated vision, mission, and values;*" resulting to the following target as it relates to transportation:

> *Multi-modal connections into and throughout the community. Advancing safe and reliable multi-modal transportation that facilitates the safe, efficient movement of people, goods, and services.*

The transportation strategic objectives that support this statement and the subsequent development of the Comprehensive and Transportation Master Plans were identified from the Strategic Plan. A summary of these select statements (from a range of objectives) include:

4.1 Integrated Multi-modal Transportation Network -

4.1.1. Have convenient, attractive, and visible pedestrian and bicycle access to community facilities and neighborhoods, making the trail system one of the state's best.

4.1.2. Use and maintain the transportation system effectively for all motorized and nonmotorized transportation modes within the city and between Medical Lake and neighboring communities.

4.1.3. Improve pedestrian and vehicular safety along city streets, especially SR-902, and enhance SR-902's ability to serve commercial land uses.

4.1.4. Improve aging and/or missing transportation infrastructure with safe accommodations for people and vehicles.

4.1.5. Improve safety for all travel modes in an attractive and distinctive streetscape and public realm.

4.2 Access to Transit -

4.2.1. Make public transportation available to all city residents and workers.

4.2.2. Improve transit availability and increase ridership.

2.2 Goals, Objectives, and Policies

The Strategic Plan and the draft vision statement for the Comprehensive Plan demonstrate the desire to improve mobility and safety along SR 902 and provide multimodal enhancements throughout the community. The following Goals and Policies were developed to meet the visions and objectives identified in these documents in coordination with City leaders.

Goal 1: A Safe, Low-Risk, and Human-Centered Transportation System

Create and maintain a transportation system that protects the lives and well-being of all users—including pedestrians, bicyclists, transit riders, motorists, and people with mobility challenges—through safe-systems design, proactive planning, and a commitment to reducing accidents.

Policy 1: Prioritize Vulnerable Users

Design and operate streets to protect the safety of people walking, rolling, biking, and using mobility devices, especially near schools, parks, downtown, transit stops, and along the State Route 902 corridor.

Policy 2: Adopt Safe-Systems and Complete Streets Principles

Design streets, crossings, and public spaces using safe-systems and complete-streets principles to reduce conflict points, slow vehicle speeds where appropriate,

improve crossings, and create safer conditions for all modes and ages.

Policy 3: Reduce Collisions

Focus investments and interventions on State Route 902 corridor and the intersection of Stanley and Lake Streets to reduce the likelihood and severity of collisions.

Goal 2: A Connected, Accessible, and Seamlessly Navigable Transportation System

Create a transportation system that provides convenient, and complete access for all people—regardless of age, ability, or mode—through a well-connected network of streets, sidewalks, trails, and transit that links homes, jobs, parks, schools, commercial centers, community services, and regional destinations.

Policy 1: Build a Complete, Connected Multimodal Network

Develop and maintain a network of walking, rolling, biking, and transit facilities that offer continuous, direct, and barrier-free connections between key destinations, including beginning and end of trip facilities.

Policy 2: Prioritize Accessibility for All Users

Ensure that transportation facilities meet ADA standards, support mobility-assistive devices, and remove barriers that limit access for seniors, youth, and individuals with disabilities.

Policy 3: Strengthen Local and Regional Connectivity

Enhance connections between neighborhoods and public services, parks, schools, transit stops, and commercial areas.

Policy 4: Enhance Wayfinding and Network Legibility

Provide clear signage, route information, and intuitive street and trail design that make the transportation network easy to navigate for residents and visitors.

Policy 5: Address Gaps and Barriers Proactively

Identify and fix sidewalk gaps, missing crosswalks, inaccessible transit stops, disconnected trail segments, and poor street connectivity.

Goal 3: A Mobility-Focused, Efficient, and Reliable Transportation System

Provide a transportation system that enables efficient, reliable, and seamless mobility for all users.

Policy 1: Improve Network Efficiency Across All Modes

Enhance the performance of the street, trail, and transit networks through system management, connectivity improvements, and multimodal planning.

Policy 2: Enhance Regional Mobility

Collaborate with regional partners to improve mobility between Medical Lake, Fairchild Air Force Base, and other West Plains job and commercial centers.

Goal 4: A Transportation System That Strengthens Community and Economic Vitality

Develop and maintain a transportation system that supports a thriving local economy, strengthens community identity, and enhances access to businesses, jobs, public services, and cultural destinations, while fostering vibrant, connected neighborhoods and commercial districts.

Policy 1: Support Local Business Districts Through Transportation Investments

Prioritize transportation improvements that enhance access, visibility, and circulation for local businesses.

Policy 2: Strengthen Community Identity Through Street Design

Use street design, public spaces, signage, and landscaping to reinforce community character, support placemaking, and create attractive gateways and corridors.

Policy 3: Promote Tourism Through Mobility Enhancements

Improve transportation access to parks, trails, historical sites, and regional attractions to support tourism, recreation, and local spending.

Policy 4: Integrate Transportation and Land Use to Foster Vibrant, Walkable Places

Coordinate transportation planning with zoning and development patterns to encourage mixed-use, walkable centers that attract businesses and enhance community vitality.

Goal 5: A Healthy, Sustainable, and Equitable Transportation System

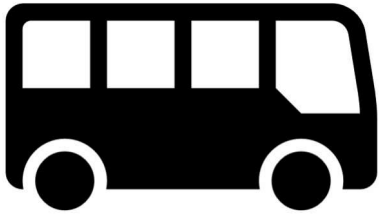
Create a transportation system that supports public health, reduces environmental impacts, and provides equitable and sustainable travel options for all residents—walking, biking, transit, and driving—while reducing greenhouse gas emissions and promoting active lifestyles.

Policy 1: Promote Active Transportation

Prioritize walking, rolling, and bicycling through infrastructure and land-use decisions that encourage daily physical activity and reduce dependence on single-occupancy vehicles.

Policy 2: Reduce Transportation-Related Emissions

Support low-carbon mobility options—including transit, EV infrastructure, and compact development patterns—to reduce greenhouse gas emissions, air pollution, and climate impacts.



CHAPTER 3

EXISTING CONDITIONS

Chapter 3

This section documents current travel conditions within the City and provides a basis for gauging the impact of future changes, as precipitated by land use development with associated traffic increases.

3.1 Demographics

Demographics were found using U.S. Census Bureau Data, available through American Community Survey, Decennial Census[1]. Also, the 2046 Medical Lake Land Capacity Analysis was used to augment population and land use discussions.

Population

Medical Lake was confirmed to have a current population of 4,874 people in 2020 by US Census. The 2046 Medical Lake Land Capacity Analysis confirms a 2023 population of 4,915, representing nearly 1% growth in 3-years. The Land Capacity analysis indicates the population of Medical Lake will increase to 5,159 persons by 2046, over a 5% increase over 23 years. This equates to 0.24% growth annually.

Relevant to the future condition's discussion, confirming the growth in population is important as it assures associated traffic gains will also occur. With that said, while population forecasts are useful for confirming that growth is anticipated by City leaders, per Chapter 4, land use forecasts provide the basis for estimating forecast travel demands.

This is mentioned to indicate that, even if population growth trends vary from what has been discussed, this will not have a bearing on the conclusions derived for this Plan. Land use is the basis for forecasting, and traffic impacts are related to development growth regardless of forecast year.

Current and future populations summaries are as follows:

- **2020:** 4,874 residents, Census
- **2023:** 4,915 residents, Land Capacity Analysis
- **2032:** 5,022 residents, Estimated from Annual Growth
- **2046:** 5,195 residents, Land Capacity Analysis
- **2050:** 5,245 residents, Estimated from Annual Growth

Medical Lake and the surrounding area are comprised of a single census tract. A tract is a geographic area for which the Census Bureau defines demographics, like population, housing, age, ethnicities, etc. Census Tract 139 encompasses the City of Medical Lake. This is shown by **Exhibit 3.1** on the next page. Key year 2024 census for Medical Lake is below:

- 19.1% are age 19 and under
- 15.8% are age 65 and older
- 49.2% are female persons
- 15.8% have a disability
- 8.4% of persons are in poverty
- 87.9% are White
- 6.2% are Hispanic or Latino
- 4.1% are Black

1. https://data.census.gov/all?q=Medical+Lake+city,+Washington

Economic

Economic demographics were studied to identify commute times, degree of vehicle dependency, and network use. Commute data helps provide an understanding of how residents are moving in the network, given employment data. This also provides insight into how the community is traveling in the system (travel mode). Salary data supports deductions regarding need for travel options. **Table 3.1** shows key economic factors identified from Medical Lake 2024 Census data.

Table 3.1. Economic Demographics

Category	Population Percentage
Employment:	
Employed	56.7%
Unemployed	0.7%
Not in Labor Force	43.3%
Commuting:	
Drives Alone	76.5%
Carpools	7.4%
Public transit	3.0%
Walked	2.1%
Work from Home	10.9%
Error / Not Known	0.3%
Income per Household:	
Less than $10,000	4.0%
$10,000 to $14,999	7.1%
$15,000 to $24,999	3.2%
$25,000 to $34,999	7.0%
$35,000 to $49,999	4.8%
$50,000 to $74,999	17.6%
$75,000 to $99,999	15.5%
$100,000 to $149,999	29.3%
$150,000 to $199,999	10.8%
$200,000 or more	0.8%

Source: United States Census Bureau

As shown, 43.7% of residents have household salaries that fall below a Spokane County median annual income of $75,000. 43.3% of the city population is not in the labor force (not of working age, does not work, or is retired). Also, 76.5% of the workforce drive or commute alone. Also, 10.9% of employees work from home, 7.4% commute by carpool, 3.0% use transit, and 2.1% walk or bike to work.

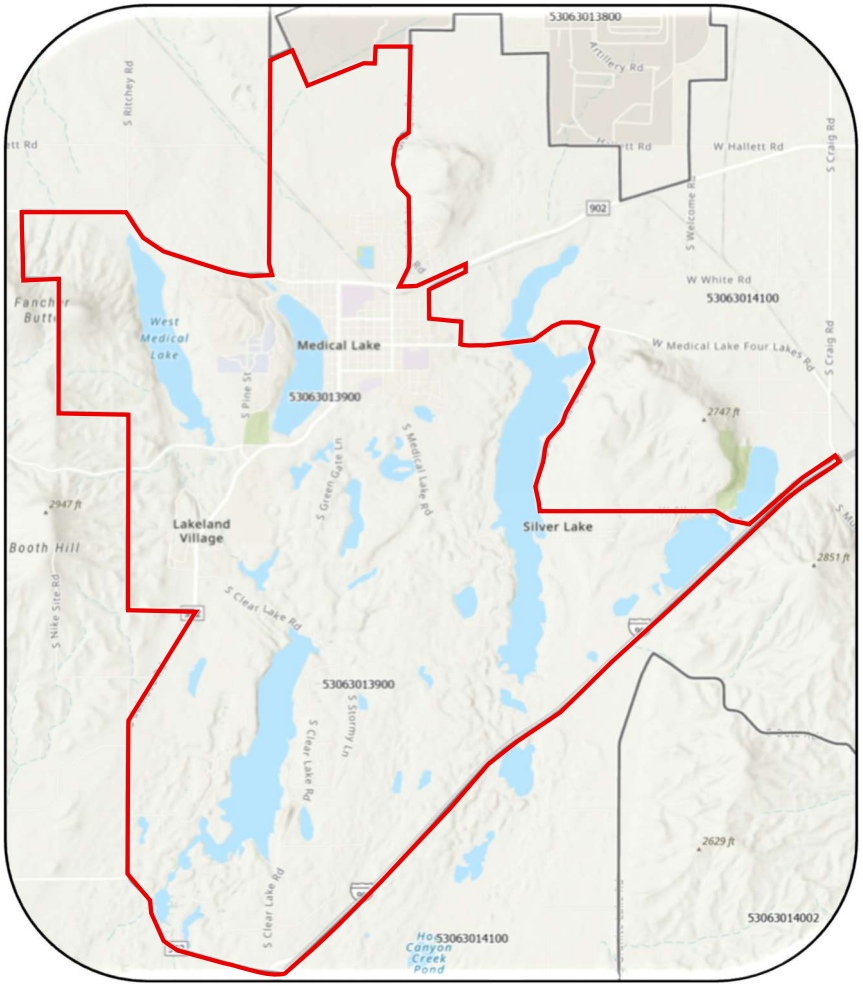


Exhibit 3.1. Medical Lake Census Tract 139 (Boundary Red Line)

A conclusion offered from Census data is an apparent reliance on personal automobiles. Increased multimodal infrastructure options could offer the benefit of improved health and/or reduced costs of autos. An extension of multimodal facilities would also reduce travel demand on roads, resulting in a reduction of infrastructure maintenance.

This reliance on personal autos will continue with growth and development unless multimodal projects are advanced. Providing accessible, connected multimodal networks is a focus of this Plan, per the direction of City officials, to address commute imbalances. The focus is on pedestrian, bicycle, and transit facilities to help redirect citizens away from single-use automobiles.

Housing

The US Census provides household data that may be used as an additional economic indicator, and this also provides growth details for Medical Lake. This data includes the number of homes, household types, and average housing size. **Table 3.2** summarizes key 2024 housing demographics for the city.

Data indicates 2,055 existing households have an average household size of 2.13 persons per home. With that said, there are 1,195 families in Medical Lake with an average size of 2.93 persons per family. The proportion of families having dependents older than 60 and younger than 18 are 30.7% and 21.7%, respectively.

The data indicates most residents own their homes (68.9%) with others as renters (31.1%). Most dwellings are single family homes (67.6%) with the next segment including multifamily units (26.6%) like town homes, apartments, or condominiums. The balance (5.8%) are mobile homes.

Table 3.2. Housing Demographics

Category	Percentage of Population
Household:	
Total households	2,055
Average household size	2.13
Families:	
Total families	1.195
Average family size	2.80
Household Type:	
Households with one or more people under 18 years	21.7%
Households with one or more people 60 years and over	30.7%
Householder living alone	36.5%
Units:	
1-unit structures	63.9%
2-or-more-unit structures	30.2%
Mobile homes and all other types of units	5.9%
Tenure:	
Owner-occupied housing units	66.1%
Renter-occupied housing units	33.9%

Source: United States Census Bureau

Collectively, a conclusion can be derived from housing data that enforces household income determinations. There is a need for multimodal infrastructure to provide travel choice;

this is evidenced by households with young or elderly drivers. There is also a high percentage of renters correlating with a high percentage of multifamily units and mobile homes; these are also strong indicators for the need for active transportation and transit accommodations.

Transportation

With housing and economic demographics established, the US Census provides travel characteristic information for the City of Medical Lake. Demographic data relates to commute times, which infers where people are working in relation to dwellings within Medical Lake.

The average commuter has a 21.4-minute commute (one-way). Of commuters, 29.0% of residents work in Medical Lake, the near areas of the West Plains, and at Fairchild Air Force Base; supported by commute lengths of 14 minutes or less. About 70% work outside of the city, defined by commutes that exceed 15 minutes, traveling to and from areas such the City of Spokane, City of Spokane Valley, and other areas of Spokane County. Roads with the most demand during the commute peak hours (in traveling to/from Medical Lake) include SR-902, Brooks Rd, I-90, US-2, and Craig Road.

3.2 Street Network

The street network within Medical Lake is primarily aligned as a grid system, which is an efficient way of moving residents between land uses. Contrarily, while providing residential appeal, cul-de-sacs and curved streets can have dead ends and are often disconnected. This creates longer travel distance between major streets and destinations. A grid system with more connecting streets should be implemented to promote multimodal mobility. A network with dead ends, long blocks, and horizontal curves should be limited as to not reduce mobility. The City prefers an enhanced network approach. In fact, dead end streets (cul-de-sacs) are limited by MLMC, allowed only with permission of the Public Works Director.

Most of the City's older neighborhoods, including the downtown and business districts, follow a traditional street grid that provides multiple access points, short blocks, and no dead-end streets. In contrast, some newer residential areas were built with cul-de-sacs, curvilinear streets, and limited connectivity. The City is now moving away from this development pattern, consistent with MLMC standards, to reduce barriers to mobility and strengthen the overall transportation network.

I-90 and US 2 are the major Highways that access this region; of which, Medical Lake capitalizes on regional access mostly from I-90. State Route 902 is the highest utilized route to access the City from I-90; this route loops through the City to connect with I-90 at the Cheney-Medical Lake Interchange (Exit 264) and the Medical Lake Interchange (Exit 272).

San Salvador Road (Espanola Road), Brooks Road, Fancher Road, and Lake Street (Medical Lake / 4-Lakes Road) are secondary routes to/from the City. They extend into Spokane

County, and in the case of Brooks Road, extend north to provide access to/from US 2. Dominant travel patterns/commutes include:

- City of Spokane by SR 902 east to I-90 and Exit 272.
- West Plains industry by SR 902 east.
- Fairchild Air Force Base by Brooks Road to US 2 or SR 902 to Craig Road.
- Airway Heights via SR 902 to Craig Road or Hayford Road.
- Western Washington via SR 902 to Exit 264 or Brooks Road to US 2.

Inventory

Roads are classified to understand how each serves local, regional, and State mobility. Federal Functional Classification (FFC) is the designation used by the Federal Highway Administration (FHWA) to classify roads, and this has been adopted by Washington State and most local agencies. Medical Lake's FFC map is shown in **Exhibit 3.2**.

Compliance with the FFC is imperative for funding requests, as grants require class designations to be eligible for award. Classes include interstates, highways, principal and minor arterials, major and minor collectors, and local streets, often with urban or rural distinction. Class definitions are noted by mobility and accessibility characteristics that define as found on the FHWA website:

https://www.fhwa.dot.gov/planning/processes/statewide/related/highway_functional_classifications/section03.cfm

A description of functional classifications is as follows:

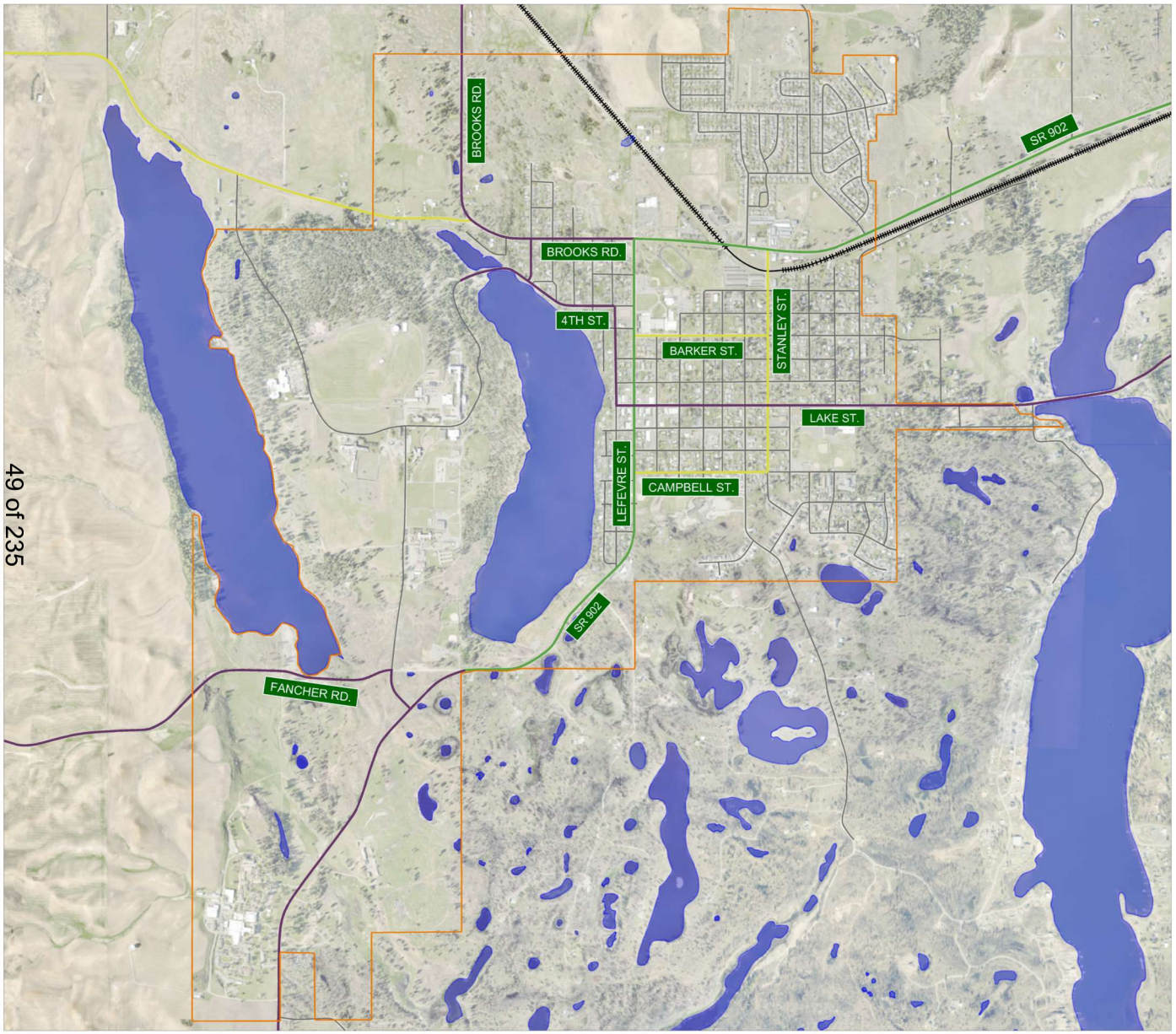
Principal Arterial. Streets and roads connecting primary community centers with major facilities. Principal arterials serve through traffic with limited direct access to abutting land uses.

Minor Arterial. Streets and roads connecting community centers to principal arterials, with partially controlled and infrequent access to abutting land uses.

Collector. Streets and roadways connecting residential commercial centers and residential neighborhoods with smaller community centers and facilities as well as access to minor and principal arterials. Through traffic is a lesser priority and access to abutting land uses is a priority.

Local Street. Streets and roadways providing access to abutting land uses as well as principal, minor and collector arterials. Through traffic is not a priority.

Access Street. Perform a variety of functions with the primary purpose of providing access to abutting land uses. Through traffic is not encouraged and buses and heavy trucks are not recommended except as needed for commercial or industrial uses. Also serve as easements for utilities and open spaces between buildings and as an element to the urban environment.



N.T.S.

LEGEND

	PRINCIPAL ARTERIAL
	MINOR ARTERIAL
	MAJOR COLLECTOR
	MINOR COLLECTOR
	LOCAL STREET
	CITY URBAN BOUNDARY
	WASHINGTON EASTERN RAIL

Exhibit 3.2

EXISTING FEDERAL FUNCTIONAL CLASSIFICATIONS (FFC)

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON

Medical Lake uses a statutory speed limit of 25 mph unless posted otherwise per MLMC Ordinance 8.08. A summary of classifications, speed limits, and other road characteristics is summarized with **Table 3.3**. Note there are no principal arterials within the City.

Table 3.3. Road Data

Functional Class and Street	Alignment/Limits (North to South & West to East)	No. Lane	Speed (mph)
Minor Arterial			
SR 902	Lefevre St to City Limit	2	30
SR 902 (Lefevre St)	Brooks to Waterfront Park	2	30
Major Collector			
W 4th Street	Howard St to Jefferson St	2	20 - 25
Brooks Road	City limits to Lefevre St	2	30
Howard Street	Brooks Rd to W. 4th St	2	25
Jefferson St	W. 4th St to Lake St	2	20 - 25
Lake Street	Lake St to City Limit	2	20 - 25
SR 902	Waterfront Park to City Limit	2	30
Fancher Road	City Limit to SR 902	2	25 - 30
Minor Collector			
Barker Street	SR 902 to Stanley St	2	20
Campbell Street	SR 902 to Stanley St	2	20 - 25
San Salvador Street	City Limit to Brooks Rd	2	30
Stanley St	SR 902 to Campbell St	2	25

3.3 Traffic Counts & Capacity

This Plan focuses on the safety and multimodal elements of the street network. Available average daily traffic (ADT) counts were assembled for baseline information, and for a high-level capacity analysis. Counts were collected from WSDOT for functionally classified SR 902.

Capacity Methodology

Street capacity review for this Transportation Master Plan measures current and forecast average daily traffic (ADT) volumes against levels-of-service (LOS) thresholds shown in the 2020 Quality/Level-of-Service Handbook (Florida DOT, 2020). The methods presented by this handbook use street cross-section (i.e., number of lanes), speed, class, and travel assumptions to quantify conditions. The fundamental capacity methods are based on the regionally and locally accepted/endorsed methods of the Highway Capacity Manual (HCM); this FDOT resource presents an approach which simplifies capacity results for use in planning analyses. Further definition and description of LOS are included as **Appendix B**.

Thresholds used for this Plan are based on the FDOT category that pertains to "State Signalized Arterials" in a suburban environment. Per FDOT methodology, these volumes are reduced by 10% in application for town streets. However, an adjustment of 15% was applied to establish capacity for three and five-lane sections. The resulting LOS capacity thresholds used for the City are shown in **Table 3.4**.

Table 3.4. Street Capacity Thresholds				
Functional Class	Arterial	Collector	Local	Alley
Number Lanes	Average Daily Traffic			
- Two lanes	13,300	6,600	2,000	200
- Three lanes	15,300	7,600	NA	NA
- Four lanes	29,200	13,100	NA	NA
- Five lanes	33,600	15,100	NA	NA

The volumes above are thresholds that suggest a practical capacity limit; over which, the roadway will not function well. An additional metric is the volume-to-capacity ratio.

A volume-to-capacity (V/C) assessment is performed by dividing the count or forecast volume with the applicable threshold above. When using this metric, a V/C ratio of 0.79 or less indicates practical street capacity is available. An assessment of 0.80 to 0.99 is noted as "approaching standard." Finally, V/C noted at 1.0 or higher should be identified as surpassing available street capacities.

The City does use level of service (LOS) as the rating system for the capacity of roads. LOS "D" is a reasonable and an achievable standard for the City of Medical Lake's principal arterial roadways. The thresholds prior relate to the LOS C standard for arterials and collectors. If the V/C above are below the approaching threshold condition, a LOS A or B equivalent is reached, 0.79 or less. If the V/C of 0.80 to 0.99 occurs, a LOS C equivalency is reached. Exceeding 1.0 indicates the LOC C standard is not met; possibly triggering need for mitigating improvement measures.

Volumes and Capacity Review

The traffic counts identified prior were reviewed against FDOT capacity thresholds relating to V/C and LOS requirements. Again, SR 902 counts were identified from WSDOT GIS for the year 2023. These counts are recent enough for capacity analysis. A summary of the volume, capacity threshold, a V/C calculation, and an equivalent LOS grade is provided with **Table 3.5** for the typical weekday.

Table 3.5. Existing Street Capacity Analysis				
SR 902 Location	ADT* Volume	LOS Threshold	V/C Calculation	Equivalent City LOS
East City Limit	8,765	13,300	0.66	≤ LOS B
Stanley Street	6,390	13,300	0.48	≤ LOS B
Lefevre Street	5,790	13,300	0.44	≤ LOS B
Lake Street	4,630	13,300	0.35	≤ LOS B
Jefferson Street	2,765	13,300	0.21	≤ LOS B

As shown, an equivalent LOS B or better is noted for SR 902 from Lefevre Street to the eastern City limits. The conclusion is also confirmed for Lefevre Street to the southern City limit. The determinations are made as V/C are all below 0.79.

3.4 Freight

WSDOT officials specify five tonnage classes for roadways in the State ranging from T5 with 20,000 tons in 60 days to T1 with

over 10,000,000 tons per year. The truck routes in and around Medical Lake with tonnage class listings as follows:

- T3 (300,000 to 4,000,000 tons/year) – SR 902 (Lefevre Street), Brooks Road, and San Salvador/Espanola Road.
- T5 (20,000 to 105,000 tons/year) – Fancher Road

The Washington Eastern Gateway rail line is aligned through the north City limits, owned by WSDOT. This line extends from Coulee City to Cheney spanning the Cities of Hartline, Almira, Wilbur, Creston, Davenport, and Reardon. There is a transfer location in Cheney where access is secured to the Burlington Northern-Santa Fe and Union Pacific rail lines, respectively.

This is a R3 rail line, supporting 300,000 to 4,000,000 tons/year. A map of freight and rail routes are shown with **Exhibit 3.3,** as distinguished by routes by tonnage class.

3.5 Safety

Collision histories were reviewed for all roads in Medical Lake, including intersections, driveways, and mid-block locations. Collisions were reviewed for a timeline ranging from January 1, 2020, to December 31, 2024. Collision data was sourced through a records request of the WSDOT safety office. Raw Collision data is provided in Appendix C.

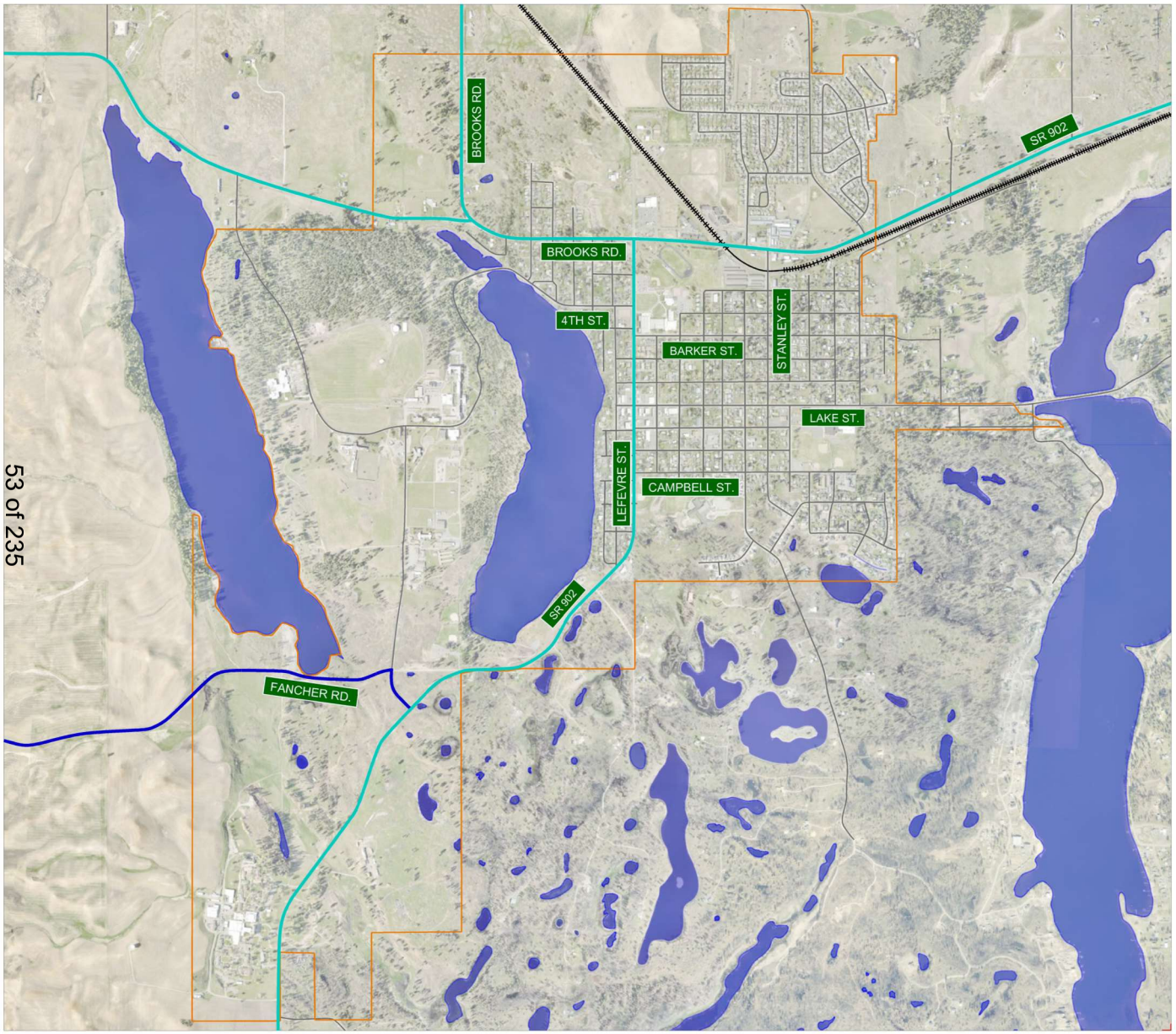
A total of 83 recorded collisions occurred in the 5-year study period, an average of 17 incidents a year. When reviewing collision data, it is important to note an incident may involve two or more vehicles, but this is reported as one accident. Thus, it should be noted that there were 151 vehicles involved in 83 reported collisions within the City of Medical Lake.

Overall, 33% of collisions involved injuries (27-incidents). Three (3) incidents included a serious injury. There were no fatalities noted from collision data. No pedestrian or bicycle-related incidents were reported. Per WSDOT data, 57% of collisions (47 incidents) occurred at intersections. 7% of collisions (6-incidents) were noted at driveways. 36% of collisions (30-incidents) occurred between intersections and driveways.

Collision types and occurrence summaries are as follows:

- 39% right angle; a right-turn vehicle and a through vehicle collide at an intersection or driveway.
- 29% object; vehicle collides with an object, a parked vehicle, or runs off road.
- 18% same direction sideswipe; vehicle strikes another in an adjacent lane traveling same direction.
- 6% left angle; left-turn vehicle tees into another going straight or turning left opposite direction.
- 5% opposite sideswipe; through vehicle hits another through vehicle traveling opposite direction.
- 2% Animal Strike; vehicle hits a wild or domesticated animal large enough to cause vehicle damage.

Accidents were shown graphically by **Exhibit 3.4** for years 2020 to 2024 for Medical Lake.



N.T.S.

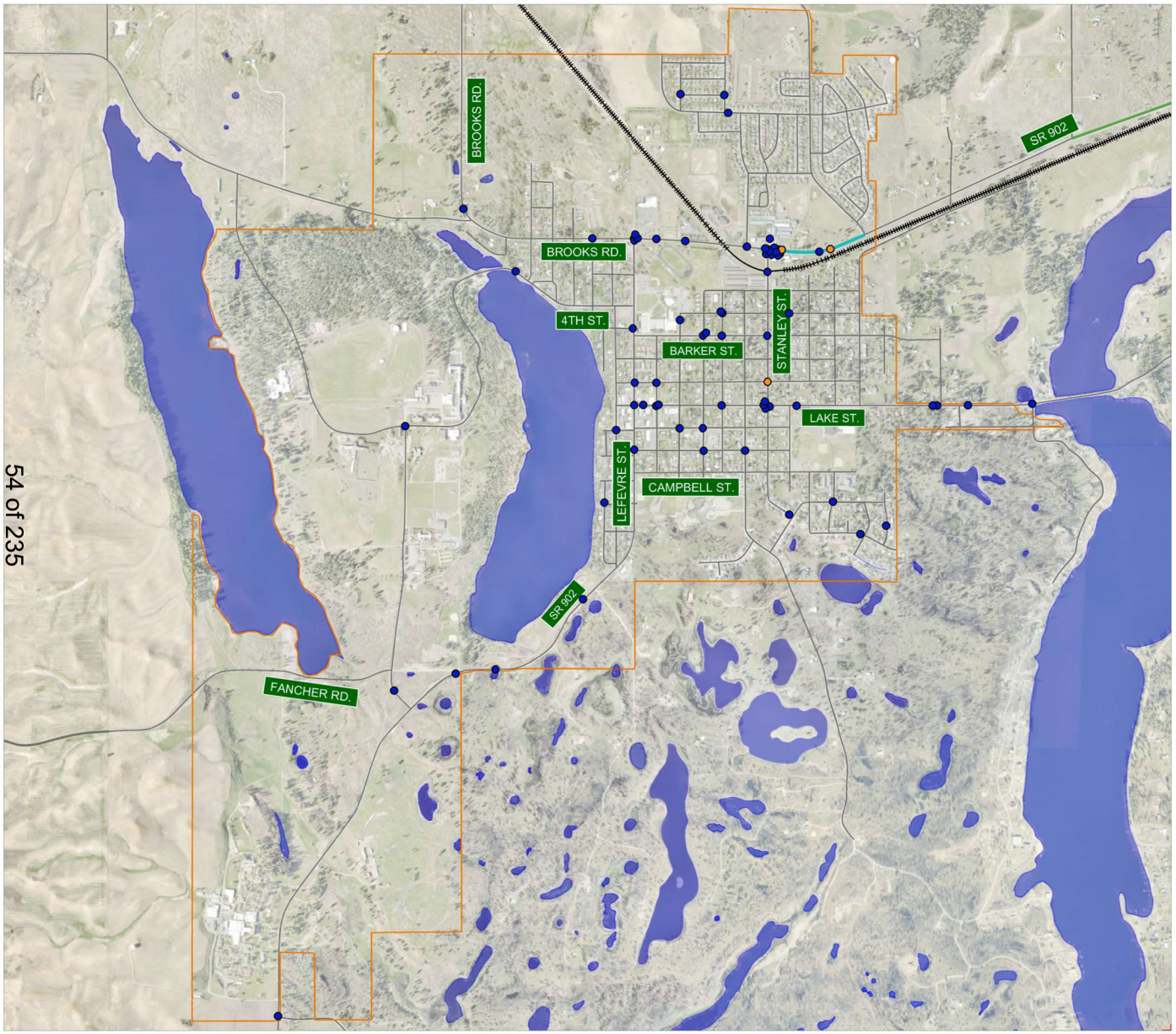
LEGEND

	T-3 TRUCK ROUTE
	T-5 TRUCK ROUTE
	CITY URBAN BOUNDARY
	WASHINGTON EASTERN RAIL - R-3 RAIL ROUTE

Exhibit 3.3

MEDICAL LAKE FREIGHT MAP

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON



N.T.S.

LEGEND

	CITY URBAN BOUNDARY
	WASHINGTON EASTERN RAIL
	DAMAGE ONLY OR MINOR INJ.
	SEVERE INJURY
	SRTC HIGH INJURY NETWORK

Exhibit 3.4

5-YEAR COLLISION (2020-24) HISTORY MAP

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON

Table 3.6. Summary Intersection Collisions		
Intersections	Total	Avg
Lake & Stanley	13	2.6
SR 902 & Stanley North	5	1.0
SR 902 & Lefevre	5	1.0
Barker & Brower	2	0.4
Fellows & Walker	2	0.4
SR 902 & Stanley North	1	0.2
Barker & Stanley	1	0.2
Fellows & Prentis	1	0.2
Fellows & Barker	1	0.2
Grace & Washington	1	0.2
Herb & Hallett	1	0.2
Herb & Brower	1	0.2
Lake & Walker	1	0.2
Lake & Broad	1	0.2
Lake & Freeman	1	0.2
Maple & Spruce	1	0.2
Broad & Ladd	1	0.2
Stanley & Ladd	1	0.2
Stanley & SR 902	1	0.2
Grant & Evergreen	1	0.2
Jefferson & Hancock	1	0.2
William & Connie Ray	1	0.2
SR 902 & Hancock	1	0.2
SR 902 & Lake	1	0.2
SR 902 & Ladd & First	1	0.2
SR 902 & Third	1	0.2
Totals	47	9.4

Focus Area

Intersections are typically the focal point of incidents within a community. As indicated, 57% of recorded City collisions occurred at intersections. Collision data was reviewed to identify high incident intersections in. A summary of recorded incidents is shown with **Table 3.6** (page 22).

As shown, most intersections in the City experienced a single incident in 5 years. Of 26 intersections, only five experienced two or more collisions, and three with five or more incidents. These later three intersections are of concern to the City.

A review of safety conditions was performed for the three high incident intersections. Solutions were developed using guidance provided by a *Manual on Uniform Traffic Control Devices* (*MUTCD, 11th Edition, FHWA*) and *A Policy on Geometric Design of Highways and Streets* (*7th Edition, AASHTO*). A summary of discussion is as follows.

Lake Street / Stanley Street, 13-Incidents

Data indicates 12 of the 13 collisions were right angle, the primary contributing factors include "Did not grant right-of-way to other vehicle" or "disregard traffic sign." From the field review and consideration of data, it seems that drivers do not expect a two-way stop at this location. In addition, clear sight lines are limited in three of four corners.

Drivers commuting Stanley Street stop and roll forward, not expecting moving traffic and having a blocked view of approaching vehicles. Conversely, moving eastbound and westbound drivers, also with limited sight lines, do not anticipate vehicles pulling forward into the intersection. The result is an incident.

Improvement options to incrementally help address the incident issue:

- Add cross traffic (MUTCD W2-1) and street name (W16-8P) signs on Lake Street in advance of Stanley Street letting drivers know there is cross traffic ahead.
- Add stop signs (MUTCD R1-1) to convert into an all-way stop. This could be blinking solar lights if the City wished

to increase visibility. Advanced "stop ahead" signs (MUTCD W3-1) can be used to notify drivers of the all-way stop. The signs would replace those noted above.

- Install a compact urban roundabout with pedestrian and bicycle treatments, spitter islands with crossing refuge, and a mountable-center island.

SR 902 & Stanley Street North, 5-incidents

WSDOT data indicates 4 of 5 collisions were same direction sideswipes. Contributing circumstances include "Following too closely," "Did not grant right-of-way to other vehicle," and "Exceeding reasonable safe speed" were identified for 4 out of the 5 collisions as well.

A field visit and data suggest there is a geometric issue staging incidents between the westbound through and right-turn vehicle movements. The causal factor of incidents is not as apparent as the prior issue. However, a narrow westbound through-lane matched with a right turn lane having a shorter than MUTCD-recommended taper, given posted speed, and with location of the driveway in the turn lane, may contribute to the collision issue.

Incremental improvements to help address the issue include:

- Reflective pavement markers could be used to clearly separate through and right-turn lanes at the junction.
- Relocate drive west and lengthen the taper of the right-turn lane, as possible; the AASHTO recommended transition rate is 165-feet, but this will not be fully achievable given built environment.
- Install a compact urban roundabout with pedestrian and bicycle treatments, spitter islands with crossing refuge, and a mountable-center island.

SR 902 & Lefevre Street, 5-incidents

WSDOT data indicates all incidents involved "Entering at angle" with the contributing circumstances "Did not grant right-of-way to other vehicle" and "Exceeding reasonable safe speed."

As before, WSDOT data and a field visit do not indicate a strong causal factor. However, this is a large intersection, and the westbound SR 902 movement does not stop (free movement). These factors likely lead to confusion over driver right-of-way.

Potential remediations to incrementally help address the collision issue include:

- Add a stop sign (MUTCD R1-1) on the westbound approach to convert into an all-way stop. Advanced "stop ahead" signs (MUTCD W3-1) should be used to notify approaching drivers of the

all-way stop. Solar stop signs with flashing lights can be used if the City wishes to promote higher visibility.

- Install a compact urban roundabout with pedestrian and bicycle treatments, splitter islands with crossing refuge, and a mountable-center island.

SRTC High Injury Network

The Spokane Regional Transportation Council (SRTC) reviews collision data for Spokane County. Through this regional review, the SRTC has identified SR 902 as a part of the high injury network (HIN) for a segment extending from south Stanley Street to Graham Road. An HIN determination was based on eight collisions identified from a review of 2018 to 2022 collision data.

There are two incidents that occur in this segment with the 2020 to 2025 data used by this Plan. This is a reduction from the SRTC data. The conclusion from this comparison is that this is a "watch" segment of the corridor; meaning the City should monitor collision data for this area. If the incident trend goes up, then remediations can be considered. In the interim, no recommendations are provided.

CHAPTER 4

FORECAST CONDITIONS

Chapter 4

This section summarizes forecast transportation conditions for roadways identified for analysis by City officials. Provided is a description of the forecast land use assumptions, developed traffic forecasts, capacity conditions, and recommended road and intersection improvements.

4.1 Traffic Forecasts

Travel forecasts were generated from land uses assumptions documented by the Medical Lake Land Capacity Analysis, refined in coordination with City officials. The Land Capacity Analysis (LCA) indicates there are 150-acres of undeveloped or underdeveloped residential and commercial properties in corporate limits. These were assumed for future land use development with this Transportation Plan.

In addition, City staff has proposed two urban growth area expansions for future development, anticipating the growth areas above will be absorbed in the indefinite future. A summary of these locations include:

1. **North Growth Area**
   90-acres, north City limits between Washington Eastern Rail and Graham Road.
2. **East Growth Area**
   100-acres, south of Lake Street and east of Sherman Avenue to Silver Lake.

Further, the LCA indicates Medical Lake is expected to gain an additional 204 single family homes and 89 multi-family units, based on the current zoning ordinance. Minimal commercial growth is anticipated; a 5,000 square-foot retail pad was assumed in coordination with City officials. These comprise year 2050 development forecasts.

Full build land uses were developed per discussion with City staff. Full growth includes the occupancy of 150-existing acres and 230-expansion acres; total growth of 380-acres. Including year 2050 development assumptions, full build represents the construction of 615 single family units, 1,035 apartments and townhomes, and 27,000 acres of commercial/retail area.

A 550-student elementary school was also assumed on a 10.3-acre site owned by the school district; just north of the City wastewater treatment plant and west of Tara Lee Avenue. The full-build scenario is to assess system capacity, not predict the need in a certain year.

A summary of land use assumptions for year 2050 and the full build condition is summarized as follows:

Year 2050 Land Use Assumptions

- Single Family Homes, 204 homes
- Multifamily (Apartments & Townhomes), 89 units
- Shopping center/Commercial, 5,000 square feet (s.f.)

Full Build Assumptions

- Single Family Homes, 615 homes
- Multifamily (Apartments & Townhomes), 1,035 units
- Shopping Center/Commercial, 27,000 s.f.
- 550-Student Elementary School

These are land uses for new construction and not businesses or residences that exchange hands and/or are reoccupied. In most situations, such an exchange results in the roughly equal generation of trips and there is minimal need for reconciliation for a study like this Transportation Master Plan.

Land Use Allocation

The location and allocation of land uses are driven by parcel location, land use type, and density assumptions (i.e., housing units and building area), as developed in coordination with City officials. Residential and commercial land uses were organized into 23 aggregated transportation analysis zones (TAZs) which help simplify the presentation of data and help with the assignment of forecast trips onto the street network.

Exhibit 4.1 shows the City TAZ's; also listed is a development assumption for each zone. The following TAZ's are noted as the urban growth areas specified prior.

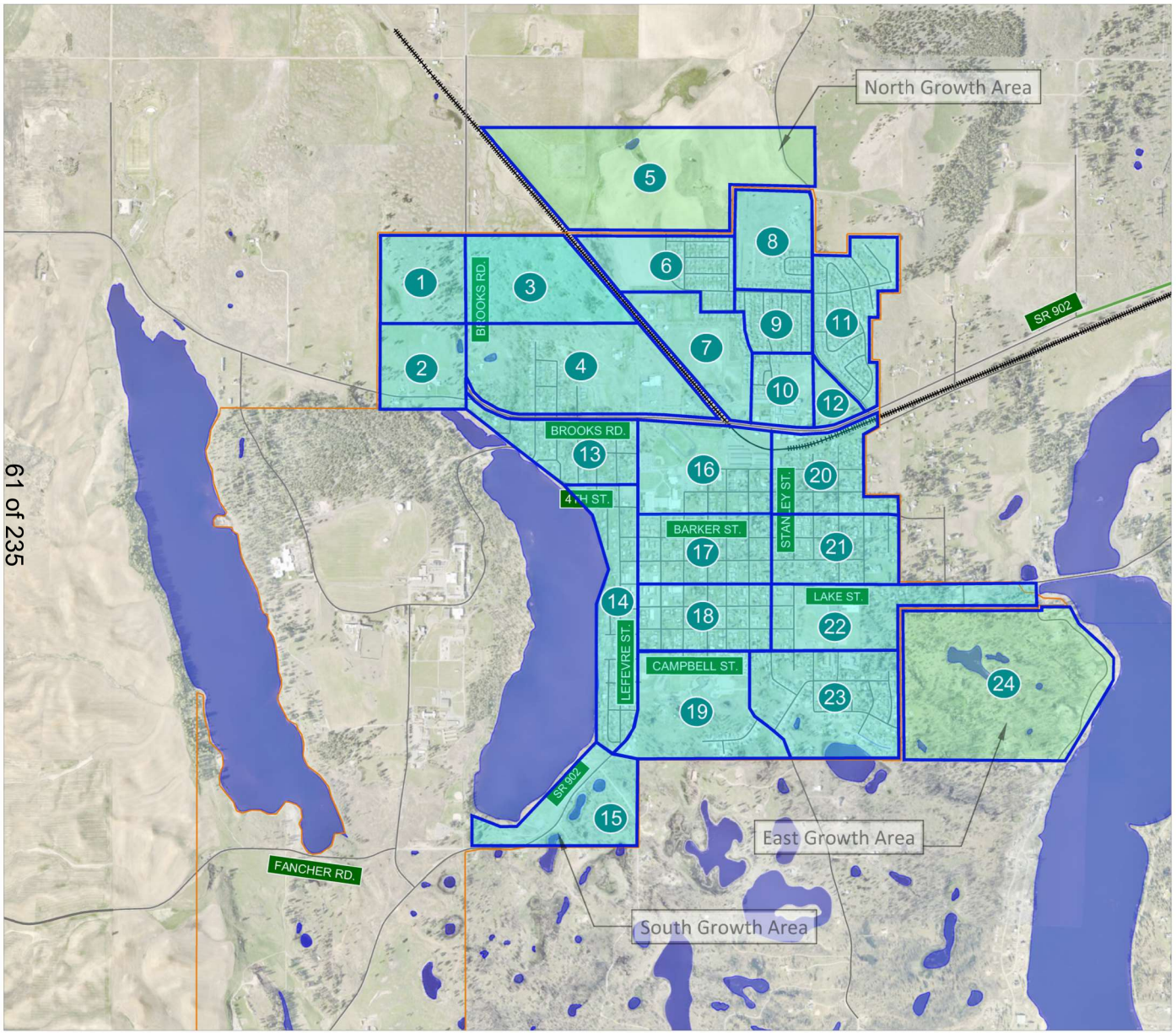
1. North Growth Area – TAZ #5
2. East Growth Area – TAZ #24

Trip Generation

Residential and commercial trip generation was forecast using the *Institute of Transportation Engineers (ITE), Trip Generation Manual* (11th Edition, 2018). Trip Generation is a nationally recognized and locally accepted approach for forecasting traffic for a range of commercial, retail, residential, and institutional land uses. The ITE provides rates and equations that forecast trips for different land uses based on variables such as building area or the number of dwellings.

ITE Land Use Codes 210 and 220 were used to forecast trips for single family homes and multifamily units, respectively. The multifamily land use includes apartments and townhomes for this Transportation Master Plan; this traditionally is a general land use that has wide application. Commercial trips were forecast using Land Use Code 822, which is small-venue retail comparable to "strip" style shops, services, and restaurants) within a small footprint building or buildings). Code 520 was used to predict trip generation for an elementary school.

Trip generation was forecast for the weekday and PM peak hour, periods of travel relevance for Medical Lake. Forecasts were prepared for year 2050 and the full-build condition. Trip generation summaries are provided by **Table 4.1** (page 30).



N.T.S.

LEGEND

	CITY URBAN BOUNDARY
	TAZ BOUNDARY
5	TAZ AREA
5	UGA TAZ AREA

TAZ UNIT ASSIGNMENTS

	Year 2050			Full Build			
TAZ	Single Family (Units)	MultiFamily (Units)	Commercial (Square-Feet)	Single Family (Units)	MultiFamily (Units)	Commercial (Square-Feet)	School (Students)
1	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0
4	12	0	5,000	12	265	27,000	0
5	50	0	0	375	0	0	0
6	0	0	0	0	0	0	550
7	0	0	0	0	0	0	0
8	50	0	0	50	0	0	0
9	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0
12	0	0	0	0	115	0	0
13	15	0	0	15	0	0	0
14	5	0	0	5	0	0	0
15	25	30	0	80	30	0	0
16	2	0	0	2	0	0	0
17	2	0	0	2	0	0	0
18	3	0	0	3	0	0	0
19	2	30	0	3	115	0	0
20	1	0	0	1	0	0	0
21	4	0	0	7	0	0	0
22	5	0	0	7	0	0	0
23	3	0	0	4	0	0	0
24	25	30	0	50	510	0	0
Totals	204	90	5000	616	1035	27000	550

Exhibit 4.1

CITY TRANSPORTATION ANALYSIS ZONES

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON

Table 4.1. Year 2050 & Full-Build Trip Generation						
Land Use	ITE Code	Units	Weekday Trips	PM Peak Hour		
				In	Out	Total
Year 2050 Trip Generation						
Single-Family Homes	210	204 homes	1,915	123	71	194
Multifamily Homes	220	89 units	600	28	17	45
Commercial / Retail	822	5,000 s.f.	270	17	16	33
		Trip Totals	***2,785***	***168***	***104***	***272***
Full Build Trip Generation						
Single-Family Homes	210	616 homes	5,805	366	215	581
Multifamily Homes	220	1,035 units	6,975	332	196	528
Commercial / Retail	822	27,000 s.f.	1,470	89	89	178
Elementary School	520	550 students	1,250	40	48	88
		Trip Totals	***15,500***	***827***	***548***	***1,375***
* Source ITE Trip Generation Manual, 11th Edition						

As shown, 2,785 weekday trips are forecast for 2050 with 272 trips generated during the weekday PM peak hour. Peak hour trips comprise 9.8% of weekday trips with the 25-year horizon. Expected with full build of the City, approximately 15,500 trips are projected during the weekday with 1,375 trips generated during the PM peak hour. PM peak hour trips comprise 9% of daily trips with the long-range analysis horizon.

Note this project was initiated prior to the recent release of the 12th Edition of the *Trip Generation Manual*. A conversion from the 11th Edition was not made as work had been performed. However, trip generation forecast with Land Use Codes 210, 220, 520, and 822 did not differ notably between the 11th and 12th Editions. Thus, the source of trip forecasts is inconsequential within the scope of the land uses reviewed for this Plan

Trip Assignment

Given the scope of this study was limited to a few major City streets, a hand-forecasting method was used for this Plan. It was confirmed with City officials that development of a travel demand model was unnecessary, being beyond the scope of what the City was looking to accomplish for this project, given: 1) the understanding that capacity was not going to be the primary issue for this project and 2) the City's wish to focus primarily on multimodal needs and issues for this Plan.

TAZs were aggregated into areas of Medical Lake that share cohesion in terms of accessibility. These are land use areas that use the same roads for commute purposes around town and to/from the area. Peak hour and daily traffic counts were reviewed and compared to confirm how travelers access the City. Trip distributions were derived from count comparisons; a summary of assignment routes with a percentage assumption of approaching and departing distributions include:

- SR 902 east of City limits, 65%
- San Salvador Street/Espanola Rd west of City limits, 15%
- SR 902/Lefevre Street south of City limits, 10%
- Lake Street east of City limits, 5%
- Brooks Road north of City limits, 5%

The trips of each aggregate area were assigned to/from these routes based on travel distance, meaning the shortest route

between the area and the commute route. This process was used to assign trips for year 2050 and the full build condition for the typical weekday. The only diversion from the distributions above where for school trips, assuming a higher number of trips traveling directly to/from the City versus travel easterly along SR 902 with the full build condition.

Travel Forecasts

Forecasts reflect the combination of land use trip assignments with baseline traffic. Baseline growth includes traffic increases resulting from influences outside of the City, yet commuting through or accessing areas in Medical Lake. An increase of commuters traveling from origins outside the City to Eastern State hospital is an example of how baseline growth occurs.

Historical traffic counts were reviewed for four locations along SR 902, and three locations along Lefevre Street. These counts, available from WSDOT, were reviewed from 2012 and 2024. A linear regression analysis indicates traffic increasing at a rate of 1.0 to 1.8% annually in this period, and a weighted average of 1.26% per year between all count locations.

The forecasting objective was to address baseline traffic with understanding that land use trip assignments would comprise most future traffic growth. As such, a 1% baseline growth rate was compounded annually and applied to ADT counts to generate a 28% adjustment by year 2050. This growth was also used for the full-build condition, given the conservative nature of the baseline forecasting process.

The trip assignments developed for year 2050 and the full-build condition were developed based on the distributions noted prior. They were added to baseline forecasts to generate total forecasts. The forecasts process is shown with **Table 4.2** for the weekday. Also shown are elements that comprise forecasts, including counts, baseline growth, and land use trips.

Table 4.2. Year 2050 &Full-Build Traffic Forecasts

Year 2050 Condition				
SR 902 Location	Existing ADT	Baseline Growth	ADT Assignment	Year 2050 Forecasts
East City Limit	8,765	2,475	1,825	13,065
Stanley Street	6,390	1,805	1,445	9,640
Lefevre Street	5,790	1,635	760	8,590
Lake Street	4,630	1,710	695	7,035
Jefferson Street	2,765	780	635	4,180
Full Build Condition				
SR 902 Location	Existing ADT	Baseline Growth	ADT Assignment	Full Build Forecasts
East City Limit	8,765	2,475	6,430	17,670
Stanley Street	6,390	1,805	5,650	13,845
Lefevre Street	5,790	1,635	3,780	11,205
Lake Street	4,630	1,710	3,030	9,370
Jefferson Street	2,765	780	2,755	6,300

A review of year 2050 forecasts shows volumes along SR 902 / Lefevre Street are projected to experience a 50% (+/-) gain over counts, an average of the five locations shown. This is a 1.6 to 1.7% annual growth rate with a 1.64% weighted annual average. The conclusion is that forecast 25-year growth will

exceed 12-year historical figures, 1.26% versus 1.64% annually. This represents an increased annual growth rate for Medical Lake streets, confirming land use gains will have an impact, but not to an unreasonable extent as less than a 0.4% difference is noted between forecast and historical growth.

Full build forecasts are 100% higher than ADT counts, an approximate average of locations. The timeline for growth to materialize is unknown given this is a full development scenario. However, it would require 54 years for growth to be achieved using the historical growth rate of 1.26%, for comparison, and 42-years with 1.64% annual land use growth.

4.2 Forecast Performances

Year 2050 and full-build forecasts were reviewed against the FDOT capacity thresholds disclosed with section 3.3; also, V/C were calculated. Again, the V/C ratio of 0.79 or less indicates practical street capacity is available, 0.80 to 0.99 is noted as "approaching standard," and 1.0 or higher is an indication of surpassing available street capacities.

The City has a LOS D standard for Medical Lake's principal arterial roads and LOS C for arterials and collectors. If the V/C above are below the approaching threshold condition, a LOS A or B equivalent is reached, 0.79 or less. If the V/C of 0.80 to 0.99 is calculated, a LOS C is achieved. Above 1.0 indicates the LOC C standard is not met, precipitating need for improvement. A summary of forecast conditions, capacity thresholds, a V/C calculation, and an LOS determination is provided with **Table 4.3** for the typical weekday.

Table 4.3. Street Capacity Thresholds

SR 902 Location	ADT Volume	LOS Threshold	V/C Calculation	Equivalent City LOS
Year 2050 Condition				
East City Limit	13,065	13,300	0.98	LOS C
Stanley Street	9,640	13,300	0.72	≤ LOS B
Lefevre Street	8,590	13,300	0.65	≤ LOS B
Lake Street	7,035	13,300	0.53	≤ LOS B
Jefferson Street	4,180	13,300	0.31	≤ LOS B
Full Build Condition				
East City Limit	17,670	13,300	1.33	≥ LOS D+
Stanley Street	13,845	13,300	1.04	≥ LOS D
Lefevre Street	11,205	13,300	0.84	LOS C
Lake Street	9,370	13,300	0.70	≤ LOS B
Jefferson Street	6,300	13,300	0.47	≤ LOS B

As shown, a LOS C condition is noted on SR 902 at the east City limits; this is where traffic is highest in Medical Lake. LOS C is allowed for an arterial per City criteria. Though approaching standard, V/C has not yet reached 1.0 and is acceptable per standard convention. All remaining locations are well within allowable standards by year 2050. The data suggests that long-term improvements could be considered for SR 902, though not immediately given vehicle capacity needs alone.

The long-term analysis confirms this supposition. V/C and LOS surpass limits for most of SR 902, with a high LOS, and V/C that

exceed the LOS C threshold to Stanley Street, then a high LOS C grade to Lefevre Street. This confirms the possible need for long-term capacity projects.

Intersection Considerations

Note from forecast conditions that volumes decrease between road segments at intersections (between ADT counts). This occurs because turning vehicles depart and enter routes at intersections. This may suggest need for mobility improvements at major intersections, given they support high turning volumes and/or are a junction between functionally classified roads.

The PM peak hour is the most frequently reviewed period in the region for intersection capacities; travel demands are highest during this time versus other times of the typical weekday. The LOS capacity analysis was performed for four of the highest-volume intersections in the City, SR 902 with Lefevre Street, Stanley Street North, Stanley Street South, and Graham Road.

Turning movement counts were available from the West Plains Subarea Transportation Plan, Phase II (S3R3 & Ardurra, 2025) for Lefevre Street and Graham Road with SR 902. These counts were used for the capacity analysis. Turning movements were not available for the Stanley Street intersections. As such, counts were estimated for the north and south legs of Stanley Street given review of volume changes between the Lefevre and Graham intersections as it relates to residential densities and commercial site locations on SR 902. The result is actual or estimated counts which should be sufficient for helping to confirm the need for potential intersection improvements along SR 902, the busiest road in Medical Lake.

As with roadway volumes, intersection traffic was forecast to year 2050 and a full-build condition based on prior methods; baseline growth applied to counts and peak hour volumes assigned to streets to generate forecast volumes. A summary of the turning movements for these intersections, existing and forecast conditions, is shown with **Exhibit 4.2** (Page 34).

An LOS analysis was performed using Synchro Software Suite (Cubic, 2025); which gauges capacity using the prevailing and accepted methods of the Highway Capacity Manual (TRB, 7th Edition, 2022). An LOS D standard is typical for a City like Medical Lake; this has been used as the threshold for this Transportation Master Plan.

A summary of LOS for study intersections under both forecast Plan conditions is shown with **Table 4.4** (Page 35) with summary results provided for the existing year 2050, and full-build conditions during the PM peak hour.

Exhibit 4.2. Current & Forecast Intersection Turn Movements

Existing Conditions

SR 902 / Lefevre Street / Brooks

				57	108	51											
				IN		OUT											
				17	32	8											
				SBR	SBT	SBL											
150	OUT	19	EBL	TEV =			WBR	5	IN	170							
361		142	EBT	653			WBT	80		455							
211	IN	50	EBR				WBL	85	OUT	285							
				NBL	NBT	NBR											
				53	27	135											
				OUT		IN											
				167	382	215											

SR 902 / Stanley Street N

				32	135	103											
				IN		OUT											
				14		18											
				SBR	SBT	SBL											
170	OUT	46	EBL	TEV =			WBR	57	IN	213							
455		239	EBT	530			WBT	156		470							
285	IN		EBR				WBL		OUT	257							
				NBL	NBT	NBR											
				OUT		IN											
				0	0	0											

SR 902 / Stanley Street S

				0	0	0											
				IN		OUT											
				SBR	SBT	SBL											
213	OUT		EBL	TEV =			WBR		IN	241							
470		222	EBT	580			WBT	182		514							
257	IN	35	EBR				WBL	59	OUT	273							
				NBL	NBT	NBR											
				31		51											
				OUT		IN											
				94	176	82											

SR 902 / Graham Road

				55	184	129											
				IN		OUT											
				19		36											
				SBR	SBT	SBL											
274	OUT	48	EBL	TEV =			WBR	81	IN	336							
600		278	EBT	717			WBT	255		650							
326	IN		EBR				WBL		OUT	314							
				NBL	NBT	NBR											
				OUT		IN											
				0	0	0											

Year 2050 Condition

SR 902 / Lefevre Street / Brooks

				75	141	66											
				IN		OUT											
				20	45	10											
				SBR	SBT	SBL											
215	OUT	26	EBL	TEV =			WBR	5	IN	255							
501		190	EBT	926			WBT	115		650							
286	IN	70	EBR				WBL	135	OUT	395							
				NBL	NBT	NBR											
				80	35	195											
				OUT		IN											
				250	560	310											

SR 902 / Stanley Street N

				65	235	170											
				IN		OUT											
				30		35											
				SBR	SBT	SBL											
255	OUT	75	EBL	TEV =			WBR	95	IN	320							
650		320	EBT	780			WBT	225		675							
395	IN		EBR				WBL		OUT	355							
				NBL	NBT	NBR											
				OUT		IN											
				0	0	0											

SR 902 / Stanley Street S

				0	0	0											
				IN		OUT											
				SBR	SBT	SBL											
320	OUT		EBL	TEV =			WBR		IN	415							
675		270	EBT	890			WBT	275		760							
355	IN	85	EBR				WBL	140	OUT	345							
				NBL	NBT	NBR											
				45		75											
				OUT		IN											
				225	345	120											

SR 902 / Graham Road

				95	300	205											
				IN		OUT											
				30	0	65											
				SBR	SBT	SBL											
435	OUT	70	EBL	TEV =			WBR	135	IN	540							
905		400	EBT	1105			WBT	405		1005							
470	IN	0	EBR				WBL	0	OUT	465							
				NBL	NBT	NBR											
				0	0	0											
				OUT		IN											
				0	0	0											

Full Build Condition

SR 902 / Lefevre Street / Brooks

				90	165	75											
				IN		OUT											
				20	55	15											
				SBR	SBT	SBL											
230	OUT	25	EBL	TEV =			WBR	10	IN	390							
540		205	EBT	1195			WBT	130		895							
310	IN	80	EBR				WBL	250	OUT	505							
				NBL	NBT	NBR											
				80	40	285											
				OUT		IN											
				385	790	405											

SR 902 / Stanley Street N

				100	305	205											
				IN		OUT											
				45		55											
				SBR	SBT	SBL											
390	OUT	65	EBL	TEV =			WBR	140	IN	485							
895		440	EBT	1090			WBT	345		980							
505	IN		EBR				WBL		OUT	495							
				NBL	NBT	NBR											
				OUT		IN											
				0	0	0											

SR 902 / Stanley Street S

				0	0	0											
				IN		OUT											
				SBR	SBT	SBL											
485	OUT		EBL	TEV =			WBR		IN	670							
980		380	EBT	1335			WBT	420		1155							
495	IN	115	EBR				WBL	250	OUT	485							
				NBL	NBT	NBR											
				65		105											
				OUT		IN											
				365	535	170											

SR 902 / Graham Road

				175	480	305											
				IN		OUT											
				65	0	110											
				SBR	SBT	SBL											
695	OUT	105	EBL	TEV =			WBR	200	IN	830							
1315		515	EBT	1625			WBT	630		1455							
620	IN	0	EBR				WBL	0	OUT	625							
				NBL	NBT	NBR											
				0	0	0											
				OUT		IN											
				0	0	0											

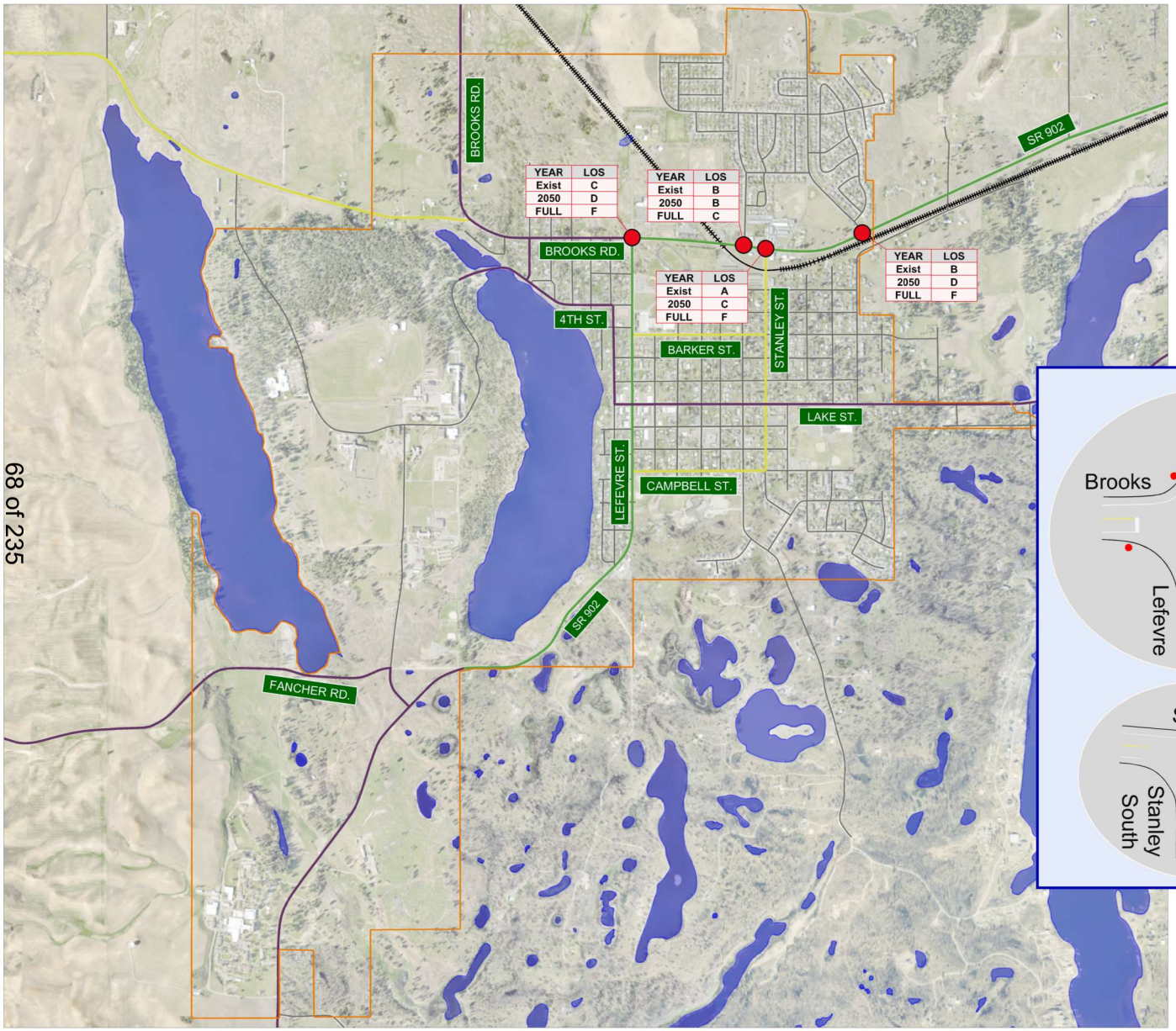
Table 4.4. Intersection Levels-of-Service, PM Peak Hour			
SR 902 Location	LOS	Control Delay	V/C Calculation
Existing Condition			
SR 902 / Lefevre St / Brooks Rd*	C	16.3	0.22
SR 902 / Stanley Street North	B	11.3	0.06
SR 902 / Stanley Street South	A	7.4	0.04
SR 902 / Graham Rd	B	14.3	0.13
Year 2050 Condition			
SR 902 / Lefevre St / Brooks Rd	D	32.4	0.50
SR 902 / Stanley Street North	B	14.1	0.15
SR 902 / Stanley Street South	C	17.6	0.32
SR 902 / Graham Rd	D	27.3	0.39
Full Build Condition			
SR 902 / Lefevre St / Brooks Rd	F	> 150.0	1.05
SR 902 / Stanley Street North	C	20.2	0.32
SR 902 / Stanley Street South	F	113.8	0.99
SR 902 / Graham Rd	F	>150.0	1.46

The intersection LOS analysis compliments the street capacity analysis. No current issues are identified for the Medical Lake intersections of focus as LOS C or better is achieved with lane V/C below 0.79 limits. The year 2050 analysis for the PM peak hour indicates that deficiencies will evolve with growth, but the LOS D standard is still maintained at Plan intersections with V/C within lane targets. The analysis does confirm that issues would evolve over time, between year 2050 and with the full-build of the City. PM peak hour results are forecast at LOS F with high lane V/C for three out of the four study intersections.

Although turn movement counts were not available to assess LOS conditions on Lefevre Street/SR 902 south of Brooks Road, there are no issues expected through the City to Fancher Connection Road. This supposition is supported by two points. First, there are no arterial capacity issues identified with the forecast year 2050 and full-build conditions, LOS B is shown with Table 4.3.

Second, forecast ADT along the corridor falls in the 4,000 to 7,000 ADT range by year 2050, and 6,000 to 9,000 ADT range with full-build. Note, existing counts range between 6,000 and 9,000 ADT for SR 902 between Lefevre Street and the east City limit under existing conditions; these volumes are comparable with forecast conditions for Lefevre Street south of Brooks Road. As there are no intersection LOS failures noted for the SR 902 intersections with Lefevre Street, Stanley Street North, Stanley Street South, and Graham Road under the current condition, there are no LOS issues anticipated for the Lefevre Street intersections compared with forecast conditions given comparable ADT.

For convenient review, summary intersection configurations, controls, and resulting LOS has been provided with **Exhibit 4.3**. Summaries are shown for the existing and future conditions. LOS summary worksheets are attached as Appendix D.

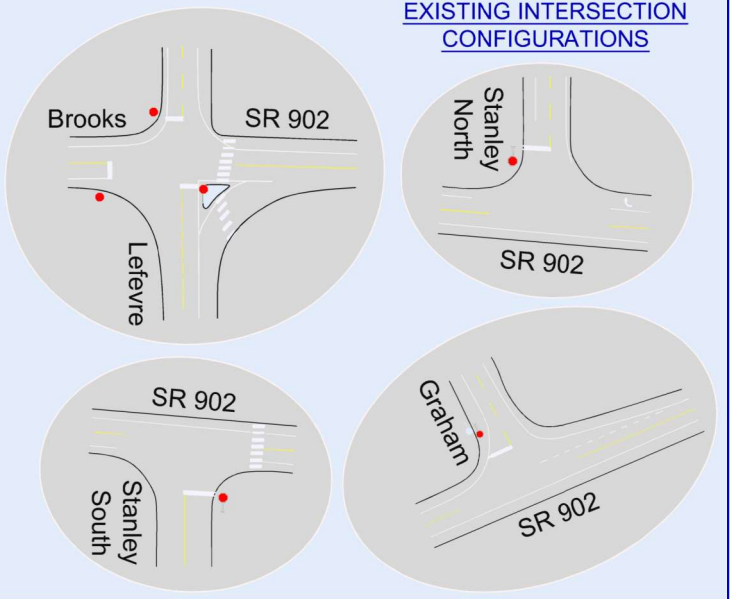


N.T.S.

LEGEND

	PRINCIPAL ARTERIAL
	MINOR ARTERIAL
	MAJOR COLLECTOR
	MINOR COLLECTOR
	LOCAL STREET
	CITY URBAN BOUNDARY
	WASHINGTON EASTERN RAIL
	STUDY INTERSECTION
	LOS TEXT BOX

EXISTING INTERSECTION CONFIGURATIONS



N.T.S.

Exhibit 4.3

INTERSECTION CONFIGURATION AND LOS RESULTS

CITY OF MEDICAL LAKE
TRANSPORTATION MASTER PLAN
MEDICAL LAKE, WASHINGTON

4.3 Roadway Improvements

Medical Lake benefits from having no evident capacity issues identified from the current or year 2050 conditions. Roadway improvements are suggested only in the long-term to provide capacity for full-build, this is forecast after the year 2050 horizon year. This allows City officials time to plan, secure funding, and deploy improvements. The balance of Section 4.3 recommends projects to address long-term capacity needs for City roadways.

To be clear, this does not relate to safety mitigations and active transportation improvements. Also, as highlighted next, there are City collectors and arterials that do not conform with current Medical Lake design standards.

Roadway Improvements

Summarized are roadway improvements; recommended for deployment as funding opportunities arise organically given no capacity need is urgent. With that said, the importance of pedestrian and bicycle activities may advance the need for multimodal/complete street and safety improvements, regardless of capacity performance results. Discussion on project timing is provided in Chapter 6, the Capital Facilities summary of this Transportation Master Plan.

Roadway Public Works Design Standards

Chapter 11.20 and Chapter 15.20 of Medical Lake Municipal Code (MLMC) provide partial guidance on design standards for City streets. Although both Chapters identify complete street policy, this Plan recommends that the City could benefit from a more extensive Public Works standard. These standards provide a heighted level of detail regarding the design of City collector and arterial roads and intersections, addressing requirements relating to, but not limited to:

- Design reports, studies, and documentation,
- Plan set requirements,
- Signing and striping details,
- Pavement and surfacing design,
- Cul-de-sac, alley, private street, and driveway details,
- Private development and frontage expectations,
- Intersection control and geometric design guidance,
- Landscaped areas that function as buffers to pathways, trails, and sidewalks, with curb and gutter details,
- Planned unit development standards,
- General street lighting, signal, and PHB/RRFB guide, and
- Complete street guidelines.

Complete streets advancement is a directive that comes from City leadership. To that end, although lacking definition on specifics, this Plan offers complete streets and multimodal improvements recognizing that Public Works Standards would follow to provide design details and clarify construction cost estimates beyond what is highlighted in Chapter 6.

SR 902 Complete Street

As indicated, a recommendation of this Plan is for City officials to define new street design standards that include guidance on the advancement of multimodal and/or complete street facilities, in addition to traditional capacity and pavement thickness details, as associated with functional classes. These determinations will influence the recommendations of this Plan particularly from a right-of-way and cost perspective. However, for the sake of Chapter 6.0 TIP recommendations, arterials and collectors were assumed to have widening modifications with active transportation adaptations identified by Chapter 5.

This section recognizes potential capacity improvement may be needed to support vehicle mobility within the City. SR 902 was noted to have a practical capacity impact; conditions that approach standard by year 2050 and exceed standard with full buildout of Medical Lake.

The full-build condition suggests a four or five lane roadway may be needed to address long-range capacity concerns. This Transportation Master Plan does not advocate this level of lane widening. Travel demand forecasts are conservative, meaning higher end. Also, the timing of such need was noted as indefinite, meaning the timeline for forecasts in excess of 18,000 ADT is unknown and are not likely to occur for nearly 50-years, if at all. As such, the strategy of this Plan is to recommend that right-of-way and setbacks be preserved with development, as possible, for the possibility of a four or five lane road. In the interim, more sensible improvements are suggested, with the intersection control improvements noted subsequently, to promote acceptable capacity levels that address need indefinitely.

To that end, expansion of SR 902 includes a center, two-way left-turn lane recommended from Lefevre Street to Graham Road. Per Table 3.4, this will elevate the capacity limit of the street to 15,300 ADT; given increased capacity provided for vehicles turning to/from the Highway. This will promote capacity through the year 2050, given a threshold of 15,300 ADT, plus provides room for 40% of full-build volumes following year 2050 (2,200 additional ADT, after year 2050 with the forecast of 13,065 ADT.

Recommendation (Long-Term): Add a center, two-way left-turn lane along SR 902 extending from Lefevre Street to the east City limit.

Functionally Classified Streets

Although developed to the prevailing standard of the time, most Medical Lake arterials and collectors were improved with only partial multimodal accommodation. Principally, this included features like sidewalk along a single side of a street or a paved road with wide shoulders; most roadways lack gutter and curb sections except along a few sections with sidewalk. Also, it appears that most developed sidewalks were not buffered or offset from existing curb, as typical with the prevailing complete street guidelines applied.

As indicated, a recommendation of this Plan is for City officials to define new street design standards that include guidance on the advancement of multimodal facilities and complete streets. As it pertains to capacity details, road mobility can be improved with definition of curb and gutter sections, along with the improvement of pavement to a depth standard.

The active mobility element is discussed in Chapter 5. This section recommends the City develop an approach to improving arterials and collectors throughout town, focusing on providing curb and gutter with improved pavement sections, as warranted. The priority of these improvements is as follows:

- SR 902, Lefevre Street to east City limits; improvements were better described prior.
- Lefevre Street, Hancock Street to Jefferson Street (match current TIB project)
- Lake Street, Sherman Street to Freeman Drive
- Jefferson Street, W 4th Street to Lake Street
- W. 4th Street, North Trail Head to Jefferson Street
- Howard Street, Brooks Road to W. 4th Street
- Brooks Road, San Salvador Street to Lefevre Street
- Stanley Street, Percival Street to Campbell Street
- Barker Street sidewalk (South side), Lefevre Street to Stanley Street
- Campbell Street, Lefevre Street to Stanley Street

Recommendation (Long-Term): Deploy complete street improvements to bring roadways to standards developed by City officials; focusing on arterials followed by major and then minor collectors.

SR 902 Intersections

The forecast conditions analysis indicates LOS D conditions for the SR 902/Lefevre Street/Brooks Street and SR 902/Graham Road intersections by year 2050 and LOS F under the full build condition. In addition, the SR 902/Stanely Street intersection is also forecast to degrade to LOS F under the full-build condition. The conclusion from the analysis is that intersection control improvements should be considered for deployment in the future; this will improve the capacity/function of intersections, and for SR 902 overall.

There are three principal approaches to increasing capacity at intersections: geometric improvements (adding turn lanes), signalization, and the deployment of a roundabout. Of these approaches, the roundabout provides the highest degree of strategic benefit to the City and WSDOT.

A roundabout improvement provides capacity comparable to a signal, yet minimal delay is experienced as traffic moves without interruption. As indicated in Section 3.5, two of these intersections have high collision rates. A roundabout offers the best safety benefit of the three improvement options. Lastly, the roundabout provides the best integration with complete streets and (arguably) provides the best protection bicycle and pedestrian movements/crossings.

The shorter-term improvements noted with Section 3.5 are still recommended; these are low-cost measures to help preserve safety until roundabouts can be developed. Roundabouts are ultimately recommended for the SR 902 intersection with Lefevre Street, Stanley Street South, and Graham Road. The design of roundabouts would accommodate the three-lane, complete street section recommended prior. However, they would also be designed so they could be constructed without street improvements, if/when warranted.

These would be single-lane roundabouts provided with splitter islands on the north-south legs of the intersection, and with elongated splitters or minor chicanes on the east-west legs. All legs to the intersection would be designed with crossings, islands would be designed with refuges. If the City were to select bike-lanes for application along SR 902, as a complete street, then transitions to/from the roadway to the pedestrian crossings could be developed. Pathways would simply tie into crossings, if selected as the element of the complete street.

Recommendation (Long-Term): Deploy a single-lane, multimodal roundabout at the intersections of SR 902 and Lefevre Street, Stanley Street South, and Graham Road.

Lake Street / Stanley Street

As indicated, short-term improvements are recommended in Section 3.5 to help preserve safety at this highest incident intersection within the City. Although capacity has not been quantified, and it is unlikely that LOS is an issue at the junction, this is also a good roundabout candidate given the safety and complete street integration reasons mentioned earlier. This would negate sight-distance issues, given right-turns only occur at these junctions, and provide a traffic calming effect for the community.

Recommendation (Long-Term): Deploy a single-lane, multimodal roundabout at intersection of Lake Street and Stanley Street.